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Tourism competitiveness drivers and tourism performance: a multi-regional analysis

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Abstract: The aim of this research is to identify tourism competitiveness drivers with the greatest explanatory power in determining the performance of the five geographical areas established by the WEF (Europe and Eurasia, Asia-Pacific, The Americas, The Middle East and North Africa, and Sub-Saharan Africa). These drivers should be able to predict in these regions, simultaneously, the number of international tourist arrivals and the revenues derived from these arrivals. In order to achieve this objective, an initial sample of 141 countries was used, grouped into the aforementioned geographical areas, along with their respective scores obtained in the TTCI, subsequently applying different statistical techniques, including Partial Least Squares (PLS) Regression. The drivers that offer the highest prediction capacity are: nature, culture, infrastructure, environmental sustainability, and safety and security.

Keywords: Tourism competitiveness; Tourism competitiveness drivers; Tourism performance; Tourism arrivals; Tourism receipts.

Impulsores de la competitividad turística y resultados del turismo: un análisis multirregional

Resumen: El objetivo del presente trabajo consiste en identificar qué drivers de competitividad turística tienen un mayor poder explicativo en el desempeño de las cinco áreas geográficas establecidas por el WEF (Europa y Eurasia, Asia-Pacífico, Las Américas, Medio Oriente y África del Norte y África Subsahariana); permitiendo dichos drivers predecir en dichas regiones, de forma simultánea, tanto el número de llegadas internacionales de turistas como los ingresos derivados de dichas llegadas. Para lograr dicho objetivo, se parte de una muestra inicial de 141 países, agrupados en las citadas áreas geográficas, y sus respectivas puntuaciones obtenidas en el TTCI para, posteriormente, aplicar distintas técnicas estadísticas, entre la que destaca Partial Least Square Regression (en adelante, PLS). Los drivers que tienen una mayor capacidad predictiva son: naturaleza, cultura, infraestructura, sostenibilidad ambiental y seguridad y protección.

Palabras clave: Competitividad turística, determinantes de la competitividad turística, desempeño turístico, llegadas de turistas, ingresos por turismo.

1. Introducción

The benefits derived from tourism in terms of revenue generation, job creation, contribution to GDP, and investment activity, among others, make competitiveness a key element for researchers, policy

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makers, and practitioners. Additionally, given that competitiveness is seen as a fundamental element that directly influences a destination's ability to attract tourists and increase their spending (Enright & Newton, 2005), this has become one of the main objectives of the economic policy of tourism and a crucial factor in the success of a destination (Crouch & Ritchie, 1999; Nasr, 2017). In this scenario, it is useful to study the factors and strategies that condition this competitiveness in international tourism markets, between countries and regions (Bazargani & Kiliç, 2021).

Currently, there is a plethora of models available to study the competitiveness of tourist destinations at country, multi-country/regional, and even global levels. These conceptual models are based on more or less common premises and consider different typologies of comparative and competitive advantages. Of all the indices that measure the competitiveness of tourist destinations, the most comprehensive one was developed by the World Economic Forum (WEF) (Uyar et al., 2022). Based on the theoretical references for competitiveness models (Crouch & Ritchie, 1999; Dwyer & Kim, 2003; Kim, 2001; Porter, 1990), this index rates tourism competitiveness in 141 countries. Thus, the Travel & Tourism Competitiveness Index (TTCI), developed by the WEF, aims to measure different aspects identified as determining factors of tourism competitiveness.

Given that competitiveness is a factor that conditions the development of different regions (Zhang et al., 2020) and that these regions compete with each other to attract tourist flows (Lopes et al., 2018), the question arises about the heterogeneity of the determinants of tourism competitiveness encompassed by the TTCI and the extent to which each of these determinants explains performance in the five geographical areas contemplated by the WEF. In this case, performance is understood to mean the ability to attract tourists (Enright & Newton, 2004; Ritchie & Crouch, 2003) and increase tourist spending (Croes, 2010; Crouch & Ritchie, 1999; Ritchie & Crouch 2003). In addition, policymakers and tourism investors have limited knowledge of how the TTCI influences tourism performance and are unable to identify which components of this index are most relevant (Andrades & Dimanche, 2017; Kubickova &Martin, 2020).

Therefore, the aim of this research is to identify tourism competitiveness drivers with the greatest explanatory power when it comes to determining the performance of the five geographical areas established by the WEF (Europe and Eurasia, Asia-Pacific, The Americas, The Middle East and North Africa and Sub-Saharan Africa). These drivers should be able to predict, simultaneously, the number of international tourist arrivals and the revenues derived from these arrivals (tourism receipts). In order to achieve this objective, an initial sample of 141 countries was used, grouped into five geographical areas, along with their respective scores obtained in the TTCI, subsequently applying different statistical techniques, including Partial Least Squares (PLS) Regression. On the basis of the above, the following hypotheses are formulated:

H1: There is a positive correlation between the Travel & Tourism Competitiveness Index (TTCI) and the performance of each of the five geographical areas established by the WEF; the higher the score in the area as a whole, the better the performance in terms of number of international tourist arrivals and receipts.

H2: It is possible to identify different dimensions or underlying constructs of tourism competitiveness in all five areas analysed, which explain both the variability of tourism competitiveness and the prediction of tourism performance in that geographical area.

H3: There are drivers of tourism competitiveness capable of predicting, simultaneously, the tourism performance of each of the five geographical areas (number of international tourist arrivals and receipts), and certain drivers offer a greater power of prediction.

2. Theoretical framework

2.1. Tourism destination competitiveness and tourism competitiveness drivers

As with the concept of competitiveness, there is no commonly accepted definition of what is meant by tourism competitiveness or the competitiveness of tourist destinations, partly because of the relative nature of competitiveness – competitive with respect to what or whom –, its multidimensional nature – economic, political, organisational, entrepreneurial – (Abreu-Novais et al., 2018; Crouch, 2011) –, and the complexity and heterogeneity of factors that it encompasses – technology, capital, human resources, government policies, etc. (Enright & Newton, 2005).

In the scientific literature on tourism, different contributions enjoy some degree of acceptance in their attempt to conceptualise the competitiveness of tourist destinations. Ritchie & Crouch (2003) identify destination competitiveness with the ability to increase tourist spending, increasing the number of

visitors, while providing them with successful experiences, in a profitable way, increasing the well-being of the resident population, and preserving the natural capital of the destination. A more comprehensive cause-and-effect synthesis of TDC that integrates the various strands of general conceptualisations about tourism competitiveness is proposed by Azzopardi (2011:22): "*The ability of the destination to identify and exploit comparative advantages and create and improve competitive advantages to attract visitors to a destination by offering them a unique global experience at a fair price that satisfies the profitability requirement of the industry and its constituent elements, as well as the objective of economic prosperity of the residents, without endangering the inalienable aspirations of future generations*." More recently, several authors have argued that the competitiveness of a destination refers to its ability to create and deliver value, while preserving available resources and maintaining its market position relative to its competitors (Goffi et al., 2019).

The determinants of destination competitiveness lie in both its comparative and its competitive advantages (Crouch & Ritchie, 1999); both types of advantages provide the theoretical basis necessary to develop models of destination competitiveness. More specifically, comparative advantages refer to factors or resources that the territory has, and which have allowed that territory to configure itself as a tourist destination, whether these are natural or the result of human action. Competitive advantages, on the other hand, are the strategies implemented by the destination to manage its resources efficiently and sustainably over time. Therefore, even if a territory has important comparative advantages, this does not necessarily imply that it is competitive, just as not having such advantages does not necessarily mean that the destination cannot be competitive, if value is bestowed on the resources available to that destination (Pulido-Fernández & Rodríguez-Díaz, 2016). The competitiveness of a destination will therefore be related both to the resources available to it and the efficient management of those resources.

Along these lines, a large body of research analyses the drivers that determine the competitiveness of a destination. As shown in Table 1, different authors focus on price as the dominant driver of international competitiveness, while for another large group of authors the dominant drivers are infrastructures – land, rural, general, or tourist – natural resources, cultural resources, sustainability, human resources, safety and security, or an appropriate environment, among others.

Table 1. Drivers of Tourism Competitiveness

Drivers	Authors
Price	Enright & Newton (2004); Craigwell & Worrell (2008); Dwyer et al. (2000); Uyar et al. (2022).
Infrastructure	Adeola & Evans (2020); Bazargani, & Kiliç (2021); Michael et al. (2019); Nazmfar et al. (2019); Salinas-Fernández et al. (2020); Stefan (2014); Uyar et al. (2022).
Cultural resources	Bazargani, & Kiliç (2021); Nazmfar et al. (2019); Salinas-Fernández et al. (2020); Stefan (2014); Uyar et al. (2022)
Natural resources	Bazargani, & Kiliç (2021); Nazmfar et al. (2019); Stefan (2014).
Sustainability	Goffi et al. (2019); Nazmfar et al. (2019); Pulido-Fernández et al. (2015).
Business environment	Michael et al. (2019); Nazmfar et al. (2019); Stefan (2014)
Enabling environment	Bazargani, & Kiliç (2021).
Human resources and labor market	Nazmfar et al. (2019); Stefan (2014); Uyar et al. (2022).
Safety and secutiry	Nazmfar et al. (2019); Uyar et al. (2022).
ICT infrastructure	Adeola & Evans (2020); Kumar & Kumar (2020); Nazmfar et al. (2019).

Source: Authors' own.

However, there is little scientific literature that addresses the relationship between drivers of competitiveness and tourism performance. On the one hand, some authors relate the drivers of competitiveness to just one factor of tourism performance – number of arrivals –, ignoring the revenues or receipts derived from international tourism. On the other hand, the scope of study is usually focused at the country or global level, with only one study carrying out an analysis of competitiveness factors

at a multi-regional level (Bazargani & Kiliç, 2021). However, as previously stated, this study does not link drivers of tourism competitiveness and international tourism revenues.

More specifically, with regard to research that relates competitiveness and tourism performance factors, for Adeola & Evans (2020), land and airport infrastructures determine the competitiveness of a destination and, moreover, are positively correlated with the revenues from international tourism. While Uyar et al. (2022) identify a positive association between price competitiveness, air transportation infrastructure, and cultural resources with tourism receipts. Moreover, while safety and security, human resources and labour market, and air transportation infrastructure sub-indices drive a positive change in tourist arrivals, ICT readiness and natural resources drive a negative change in tourist arrivals, and none of the sub-indices drives a change in tourism receipts. Hanafiah & Zulkifly (2019) affirm that core resources, complementary conditions, globalisation, and tourism prices significantly explain tourism performance. Finally, Bazargani, and Kiliç (2021) argue that infrastructure is a universal driver of tourism performance, while policy conditions favouring environment, and natural, and cultural resources are also critical determinants of tourism performance.

2.2. Travel & Tourism Competitiveness Index

Among all the indices that measure the competitiveness of a destination, the Travel & Tourism Competitiveness Index (TTCI) enjoys widespread acceptance (Gómez-Vega & Picazo-Tadeo, 2019; Rodríguez- Díaz & Pulido-Fernández, 2020), having been prepared by the World Economic Forum since 2007. The TTCI (World Economic Forum, 2019) aims to measure different aspects identified as determining factors of tourism competitiveness in 141 countries around the world. Through detailed analysis of these determinants, companies and governments can understand the challenges they face when seeking to grow tourism activity, thereby favouring decision-making (Salinas-Fernández et al., 2020;). The TTCI is made up, in turn, of four sub-indices, divided into fourteen pillars (Figure 1), each of which is composed of a series of indicators – more than ninety in total – that measure competitiveness in certain specific aspects.

Figure 1: Composition of the Travel & Tourism Competitiveness Index

World Economic Forum Tourism Competitiveness Index			
Enabling environment	**Travel and tourism facilitating policies and conditions**	**Infrastructures**	**Natural and cultural resources**
Business environment	**Prioritization of travel and tourism**	**Air infrastructure**	**Natural resources**
Safety and security	**International openness**	**Ground and port infrastructure**	**Cultural resources and business travel**
Health and hygiene	**Price competitiveness**	**Tourist services infrastructure**	
Human resources and the labour market	**Environmental sustainability**		
ICT readiness			

Source: World Economic Forum (2020:11)

However, the index is not without criticism, especially from a methodological point of view (Croes & Kubickova, 2013; Pérez et al., 2020). According to Pérez et al. (2020), although the index may be broken down, its explanatory power is low, due to the difficulty in identifying the contribution of dimensions, pillars, and indicators to the global value. Along these same lines, Uyar et al. (2022) state that "*policy-makers and tourism investors have limited knowledge of how TTCI influences the tourism*

performance of countries" and are unable to identify which components of this index are most relevant to a destination's tourism performance (Andrades & Dimanche, 2017; Kubickova &Martin, 2020).

In light of the above, the present paper clarifies the interpretation of the TTCI, allowing policy makers, destination managers, and investors to know and interpret which drivers of tourism competitiveness have a greater weight or explanatory power in determining the performance – number of international tourist arrivals and receipts – of the different regions encompassed by the WEF.

3. Methodology

3.1. Data collection

The sample consists of two data matrices: X – explanatory data–, corresponding to the scores obtained by each country in each of the fourteen pillars that make up the TTCI (WEF, 2020); and Y – observed data (Table 1), in 141 countries of the world (UNWTO, 2020), with complete data available, both on the number of international tourist arrivals and international tourism receipts, in 120 countries. Subsequently, these countries are grouped by geographical areas, as established by the WEF. (Europe and Eurasia, Asia-Pacific, The Middle East and North Africa, The Americas and Sub-Saharan Africa).

It is important to note that there is more recent information available, corresponding to the TTCI (years 2021 and 2022). However, the information for 2020 has been selected, with data for 2019, because the objective is to relate the score of each country obtained in the TTCI and its tourism performance (international tourist arrivals and receipts); identifying which drivers of competitiveness determine this performance and making predictions about both indicators. During 2020 and 2021, world tourism destinations continued to be affected by the consequences of COVID-19, which has had a direct impact on tourism flows and on the income derived from these flows. Therefore, the intention in this paper is to isolate the data from the effect of Covid-19 so as not to distort the analysis, results, and conclusions reached.

The X matrix of explanatory variables corresponds to the measurement in the same sample (countries) of fourteen explanatory variables; A1-A5, B6-B9, C10-C12 and D13-14, described in Table 2. The Y matrix consists of the measurement of two variables of interest – Tourist arrivals (number of international tourist arrivals) and Receipts (income from international tourism) (Table 3).

Tabla 2: Explanatory variables that configure the X-matrix data

A1	Business environment, 1-7 (best)	Enabling Environment
A2	Safety and security, 1-7 (best)	
A3	Health and hygiene, 1-7 (best)	
A4	Human resources and labour market, 1-7 (best)	
A5	ICT readiness, 1-7 (best)	
B6	Prioritization of Travel & Tourism, 1-7 (best)	T&T Policy and Enabling Conditions
B7	International Openness, 1-7 (best)	
B8	Price competitiveness, 1-7 (best)	
B9	Environmental sustainability, 1-7 (best)	
C10	Air transport infrastructure, 1-7 (best)	Infrastructure
C11	Ground and port infrastructure, 1-7 (best)	
C12	Tourist service infrastructure, 1-7 (best)	
D13	Natural resources, 1-7 (best)	Natural and Cultural Resources
D14	Cultural resources and business travel, 1-7 (best)	

Tabla 3: Explanatory variables that configure the Y-matrix data

Tourists	international tourist arrivals (en millones de visitantes)
Receipts	international tourism receipts (en miles de millones US$)

The fourteen variables that make up the X-matrix data correspond to 14 fundamental pillars in tourism development, which are grouped into four sub-indices. These pillars are summarised in a single indicator, the Global Index, which ranks countries according to the score obtained. The global index summarises all sample information in a weighted average based on the following expression:

Global Index = (Mean A + Mean B + Mean C + Mean D)/4.

According to this expression, it is easy to see that each subindex has a 25% impact on the final score. The average in each subindex is calculated through its pillars proportionally. Thus, each of the five pillars of Subindex A has an impact on the final index with a 5% weighting, the four pillars of Subindex B with 6.25%, the three pillars of C with 8.33% and the two pillars of D with 12.5%.

Consequently, the higher or lower score on each of the above pillars has a different impact on the final index. A simple regression analysis between the scores obtained by each country in the TTCI and its performance clearly shows that the global indicator is positively correlated with the variables number of international tourist arrivals and receipts, for the five geographical areas under study, both coefficients being significant (p-value <0.005). In spite of the high correlation, condensing the pillars of tourism into a single measure does not make it easy to visualise which pillars have a greater influence on the variables of interest (Tourists and Receipts). Therefore, the main objective of this work is, through PLS analysis, to determine the dimensionality of the explanatory and explained variables and the relationship between them. This analysis is of particular relevance due to the collinearity that exists between the explanatory pillars and between the two variables of interest, as outlined in the next section.

3.2. Methodology

Partial least squares regression (PLS regression) addresses the problem of finding a linear regression model by mapping the explanatory variables and the observed variables into a new space. Originally developed for econometrics and chemometrics by Herman O. Wold in Wold (1982) and later developed by his son in Wold et al. (2001), it is a multivariate statistical tool with applications in many academic disciplines as social sciences, chemometrics, bioinformatics, sensometrics and precision agriculture, among others. It is an easy and intuitive method that analyzes associations between two sets of data and highly recommended when the explanatory variables are correlated. It is a non-parametric technique which makes no distributional assumptions that works with small sample sizes. Unlike the classical principal components analysis regression, the PLS transformations of the explanatory variables try to explain the covariance between the explanatory and observed variables as far as possible. To summarize, the PLS regression intends to extract non-observable variables which simultaneously collect most of the variation of the explanatory variables and are able to model the response variables as good as possible. It is worth mentioning that PLS is denoted by PLS2 when having more than one response variable as in our case. For further details, the reader is referred to Abdi (2010), Abdi and Willians (2010) and Krishnan et al. (2011).

Moreover, this methodology is especially valuable for modeling and analyzing complex relationships between multiple variables, which, in turn, facilitates data-driven decision making (Enríquez, 2019). One of the key advantages of PLS is its flexibility, as it does not require data to follow a particular distribution, nor is it limited by measurement scale or sample size. Unlike traditional regression methods, PLS allows you to work with multiple highly correlated independent variables (Villalva, 2021), as is the case in the present study.

Next we provide the algorithm of the PLS2 regression:

Step 1. We start by considering the matrices X and Y given by the standardized explanatory and response variables, respectively.

Step 2. We compute a linear combination of the columns of X and Y, denoted by t1 and u1, respectively, such that maximize the covariance, cov(t1, u1).

Step 3. We compute a classical linear regression model for the explanatory and response variables based on the value of the component t1, given by

$$X = t_1 p_1^t + X_1 \text{ and } Y = t_1 r_1^t + Y_1,$$

where p1 and r1 are the regression coefficients.

Step 4. We repeat the first step by substituting X and Y by the residual matrices X1 e Y1. Analogously, we obtain two new components t2 and u2, as linear combinations of the columns of X1 and Y1, respectively, which maximize the covariance, cov(t2, u2). We compute again a linear regression model,

$$X_1 = t_2 p_2^t + X_2 \text{ and } Y_1 = t_2 r_2^t + Y_2,$$

where X and Y can be expressed recursively by the components t1 and t2,

$$X = t_1 p_1^t + t_2 p_2^t + X_2 \text{ and } Y = t_1 r_1^t + t_2 r_2^t + Y_2.$$

Step 5. We repeat this process until no significant improvement is seen in the explanation of Y. The algorithm ensures orthogonal components -uncorrelated- which are linear combinations of X.

Step 6. From the expression of Y as a function of the selected h components, t1,…, th, one can easily compute the PLS regression equations of any response variable based on the explanatory variables.

The criteria of selecting the number of components, h, is based in the so called leave-one-out cross validation (LOOCV) scheme. A single sample is deleted from the calibration set, developing a model with the remaining ones and predicting for the single left-out sample. We repeat the process as many times as samples and the squared prediction errors are summed up. This leads to the computation of the predicted residual sum of squares (PRESS) for the kth response variable as a function of model dimensionality, PRESS(k, h). Based on PRESS(k, h) the predicted R-squared is computed, R2(k, h). Finally, the mean predicted R-squared, R2(h), is computed as the average of R2(k, h) for all response variables -also PRESS (h) can be computed as the sum of PRESS(k, h)-. In our model a R2(h) plot is used to draw conclusions. The best number of components is the one that maximize the overall mean predicted R-squared. Of course, using the parsimony principle, if the R2(h) plot does not exhibit abrupt changes we choose the model having a fewer number of parameters.

4. Results

Firstly, a summary of the predictive capabilities of the model is provided. Table 4 shows its ability to reflect the variability of X and Y with the average value of R2 (mean predicted R2) based on the number of components extracted by the PLS model. This prediction is based on a sample of 120 complete cases, from which components are extracted and cross-validated, eliminating one at a time. Thus, the PLS model provides an ANOVA analysis for each of the explanatory variables, which is significant (p-value < 0.05) in all cases, i.e., we can affirm that there is a significant relationship between the Tourist Arrivals and Receipt variables, and the observed variables as a whole. Next, we show the predictive capability of the model and discuss the underlying dimensions.

Table 4: Independent and dependent variables (tourist arrivals and receipts)

	% Variance	% Cumulative	% Variance	% Cumulative	Mean Prediction
Component (h)	**X**	**X**	**Y**	**Y**	**R-Squared**
Region 1. Europe and Eurasia					
1	52.6711	52.6711	55.1637	55.1637	47.855
2	15.6759	68.347	22.3562	77.5198	69.9365
Region 2. Asia-Pacific					
1	55.0865	55.0865	49.1888	49.1888	31.4164
2	14.4715	69.558	27.5454	76.7342	49.4295
Region 4. The Americas					
1	47.1864	47.1864	74.0073	74.0073	64.5341
2	11.3621	58.5485	10.6059	84.6132	67.5591
Region 5. Sub-Saharan Africa					
1	37.8383	37.8383	43.28	43.28	20.3868
2	22.86	60.6983	19.0444	62.3243	39.4849

Source: Authors' own.

With just two components or constructs, in four of the five geographical areas, the model is capable of explaining 68.34%, 69.55%, 58.54% and 60.69%, respectively, of the variability of the explanatory variables in each region analysed. Additionally, using the LOOCV validation process, the model has an average predictive capacity of R2 equal to 69.93% for the regions of Europe and Eurasia, 49.42% for the Asia-Pacific region, 67.55% for the Americas region, and 39.48% for the Sub-Saharan Africa region. In the case of The Middle East and North Africa, with only twelve countries, cross-validation is not possible. Table 5 and Table 6 below show the prediction capacity of PLS analysis for each of the response variables (number of international tourist arrivals and receipts).

Table 5: Prediction Model for Log (Arrivals)

Components	% Variance in Y	R-Squared	Mean Squared PRESS	R-squared Prediction
Region 1. Europe and Eurasia				
1	43.3726	43.3726	1.22485	35.3935
2	33.0552	76.4278	0.594543	68.6399
Region 2. Asia-Pacific				
1	38.6264	38.6264	1.58605	18.5419
2	29.8471	68.4735	1.25783	35.3986
Region 4. The Americas				
1	70.9686	70.9686	0.627957	62.6487
2	12.5565	83.5251	0.576647	65.7007
Region 5. Sub-Saharan Africa				
1	41.5683	41.5683	1.03811	16.8784
2	27.8727	69.441	0.654153	47.622

Source: Authors' own.

Table 6: Prediction Model for Log (Receipts)

Components	% Variance in Y	R-Squared	Mean Squared PRESS	R-squared Prediction
Region 1. Europe and Eurasia				
1	66.9548	66.9548	1.09974	60.3165
2	11.6571	78.6119	0.797207	71.2332
Region 2. Asia-Pacific				
1	59.7513	59.7513	1.51838	44.291
2	25.2436	84.9949	0.995907	63.4604
Region 3. The Middle East and North Africa				
1	60.6615	60.6615		
2	5.58533	66.2469		
Region 4. The Americas				
1	77.0461	77.0461	0.754639	66.4194
2	8.65525	85.7014	0.687262	69.4176
Region 5. Sub-Saharan Africa				
1	44.9917	44.9917	1.5708	23.8952
2	10.216	55.2077	1.41697	31.3479

Source: Authors' own.

The prediction is similar for both variables, being somewhat lower for the tourist arrivals variable, with a lower value of R2 – calculated from the whole sample, in the classical sense – and a lower average predictive value of R2 – calculated from the cross-validation procedure. In general, moderate-to-high predictability is detected. However, in the case of The Middle East and North Africa , analysis of variance is not significant for the number of tourist arrivals (p-value =0.0620754) but is significant for receipts. Therefore, only the relationship between the pillars and receipts has been shown, where, as mentioned previously, cross-validation does not appear. The regression coefficients for standardised variables are shown in Table 7; these coefficients can be used to make predictions about the performance of a tourist destination. These equations have been calculated according to step 6 of the algorithm described in the methodology.

Table 7: Standardised regression coefficients to make predictions of tourism performance

	Log Tourists	Log Receipts	Log Tourists	Log Receipts	Log Tourists	Log Receipts	Log Tourists	Log Receipts	Log Tourists	Log Receipts
	Europe and Eurasia		Asia-Pacific		The Middle East and North Africa		The Americas		Sub-Saharan Africa	
Constant	0.0	0.0	0.0	0.0	--	0.0	0.0	0,0	0.0	0.0
A1	-0.116	-0.054	0.045	0.063	--	0.095	0.021	0.035	0.046	0.060
A2	-0.189	-0.108	-0.175	-0.159	--	-0.035	-0.003	0.007	-0.171	-0.133
A3	0.064	0.067	-0.112	-0.094	--	-0.012	0.032	0.043	0.005	0.029
A4	-0.058	-0.008	0.154	0.169	--	0.039	0.108	0.114	0.026	0.044
A5	0.005	0.046	0.001	0.020	--	0.069	0.011	0.028	0.075	0.086
B6	0.033	0.053	0.142	0.150	--	0.235	0.055	0.059	0.059	0.069
B7	0.099	0.107	0.094	0.109	--	0.007	0.049	0.041	0.170	0.142
B8	-0.017	-0.051	-0.054	-0.069	--	-0.001	-0.061	-0.068	0.189	0.132
B9	-0.053	-0.002	-0.102	-0.083	--	0.186	-0.059	-0.042	-0.028	-0.019
C10	0.165	0.157	0.172	0.189	--	0.190	0.170	0.166	0.057	0.073
C11	0.087	0.103	0.107	0.122	--	-0.004	0.002	0.017	0.013	0.038
C12	0.149	0.145	0.033	0.050	--	0.184	0.132	0.135	0.047	0.063
D13	0.254	0.211	0.258	0.257	--	0.139	0.260	0.239	0.358	0.282
D14	0.334	0.267	0.305	0.308	--	0.151	0.319	0.290	0.299	0.239

Source: Authors' own.

According to the table above, region 1 (Europe and Eurasia) shows the greatest homogeneity. The variables associated with nature and culture offer the greatest predictive capacity for both tourist receipts and arrivals. Infrastructures and airports are seen to be equally important. In addition, surprisingly, the development coefficients A1 and A2 linked to business environments and safety and security have a negative effect, possibly because they are overlapping a negative effect of the value--for-money ratio. In region 2 (Asia-Pacific), as in the region of Europe and Eurasia, the variables that show the highest prediction capacity are linked to the Nature and Culture block. Airport infrastructures also have an influence, and port infrastructures also appear, unlike in Europe and Eurasia, with C12 declining in importance (Tourist service infrastructure). Again, there is a negative impact associated with development, especially the assessment of safety and security, and health and hygiene. In region 3 (The Middle East and North Africa), the variables with the highest predictive capacity are linked to tourism predisposition, B6 (Prioritisation of Travel & Tourism) and B9 (Environmental sustainability), which seems logical in these kinds of countries. Of course, Infrastructure and Nature and Culture also have a significant influence. It is noted that these coefficients do not have as much weight here as they do in the other regions. In Region 4 (The Americas), the variables with the greatest predictive capacity are those related to Nature and Culture, followed by the variables linked to Infrastructures, C10 (Air transport infrastructure) and C12 (Tourist service infrastructure). Development variable A4 (human resources and labour market) also has predictive power. Finally, in the Sub-Saharan African countries that make up Region 5, the block of variables linked to Nature and Culture have a notable influence on the prediction of both tourist arrivals and receipts. It should be noted that the variables linked to tourist predisposition, B7 (International Openness) and B8 (Price competitiveness), are equally positively correlated. It should also be emphasised that development variable A2, linked to safety and security, has a negative weight.

The loadings shown for the observed variables are then used to predict Y from the factor loadings. The loadings shown for the explanatory variables are used to create the factor loadings matrix from the standardised explanatory variables. The loadings are associated with the two dimensions that summarise the data for each geographical area (Table 8 and Table 9).

Table 8: Loadings for the variables explained

	1	2
Region 1. Europe and Eurasia		
Log (Tourists)	0.256265	0.413498
Log (receipts)	0.318399	0.245555
Region 2. Asia-Pacific		
Log (Tourists)	0.240616	0.426157
Log (receipts)	0.299265	0.391917
Region 3. The Middle East and North Africa		
Log (Tourists)	--	--
Log (receipts)	0.387301	0.149095
Region 4. The Americas		
Log (Tourists)	0.332558	0.311114
Log (receipts)	0.346505	0.2583
Region 5. Sub-Saharan Africa		
Log (Tourists)	0.320161	0.348373
Log (receipts)	0.333083	0.210909

Source: Authors' own.

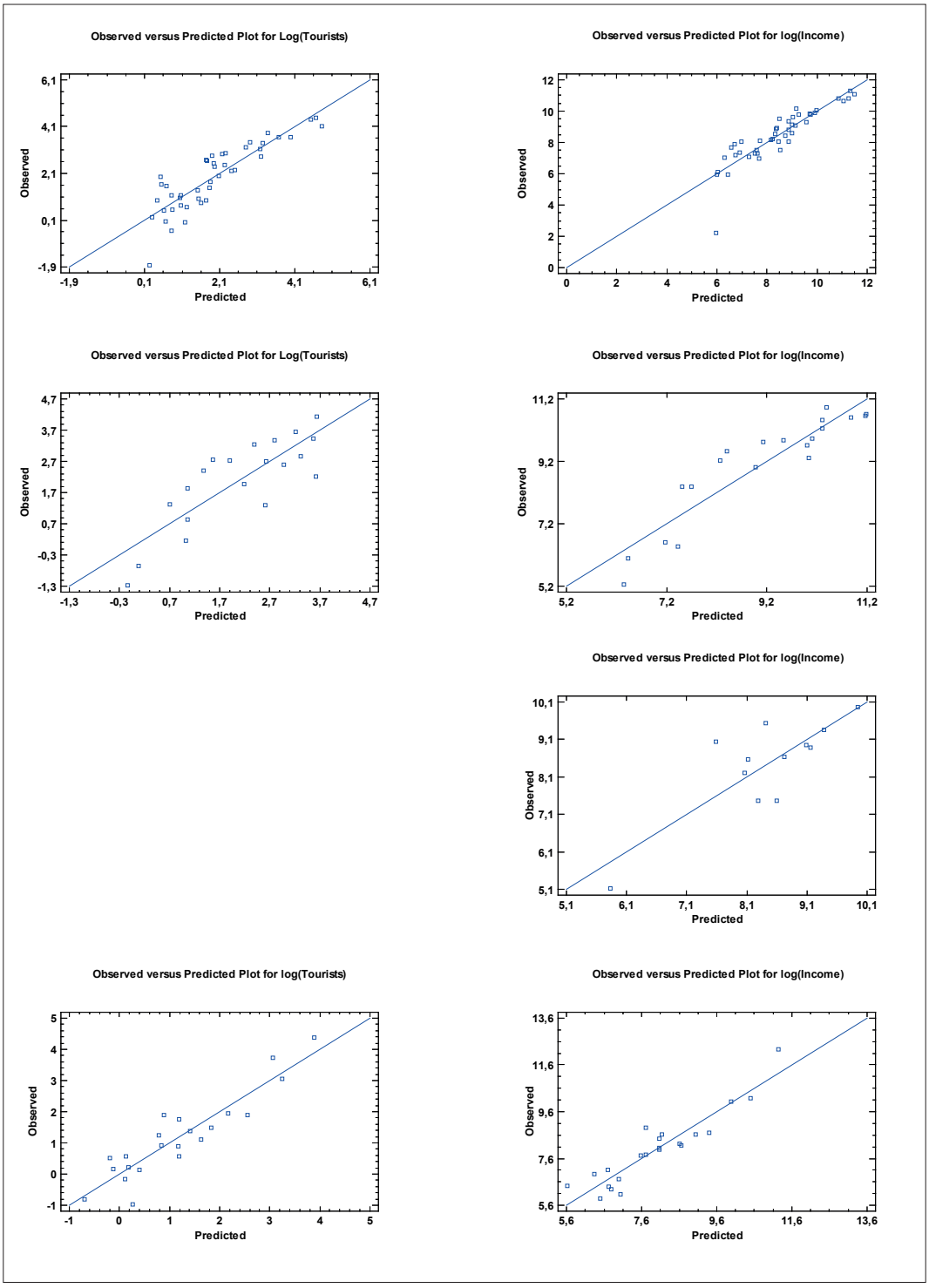
Table 9: Loadings for the explanatory variables that configure the constructs

	1	2	1	2	1	2	1	2	1	2
	Europe and Eurasia		Asia-Pacific		The Middle East and North Africa		The Americas		Sub-Saharan Africa	
A1	0.088	-0.337	0.271	-0.045	0.269	-0.058	0.255	-0.205	0.229	-0.076
A2	0.022	-0.471	0.031	-0.430	-0.006	-0.224	0.149	-0.169	-0.210	-0.299
A3	0.177	0.046	0.107	-0.323	0.034	-0.173	0.232	-0.144	0.189	-0.157
A4	0.159	-0.239	0.351	0.164	0.173	-0.186	0.350	-0.026	0.205	-0.112
A5	0.258	-0.146	0.245	-0.134	0.221	-0.110	0.271	-0.252	0.291	-0.050
B6	0.197	-0.040	0.259	0.187	0.463	0.377	0.197	-0.033	0.241	-0.052
B7	0.292	0.058	0.287	0.058	0.134	-0.301	0.014	0.142	0.280	0.232
B8	-0.246	0.110	-0.251	0.014	-0.085	0.209	-0.240	0.058	0.128	0.424
B9	0.178	-0.239	0.137	-0.318	0.401	0.209	0.105	-0.304	-0.015	-0.066
C10	0.359	0.176	0.389	0.185	0.408	0.215	0.361	0.159	0.275	-0.087
C11	0.311	0.017	0.297	0.085	0.108	-0.308	0.216	-0.223	0.222	-0.166
C12	0.342	0.149	0.250	-0.061	0.426	0.131	0.372	0.027	0.247	-0.091
D13	0.366	0.387	0.254	0.463	0.198	0.418	0.327	0.486	0.473	0.593
D14	0.416	0.551	0.361	0.511	0.212	0.463	0.359	0.642	0.418	0.476

Source: Authors' own.

Within Region 1 (Europe and Eurasia), the main underlying dimension is dominated by Nature and Culture plus the Infrastructure block; all of these are offset by the value-for-money ratio. Certain development variables also have an influence. In the second dimension, it is strongly linked to the business environment, and safety and security. In Region 2 (Asia-Pacific), the first component has a similar interpretation to that of Europe and Eurasia, with a slight difference in the weightings of the variables linked to development. It should be noted that safety and security have a significant influence on the weight of the second component. In Region 3 (The Middle East and North Africa), on the other hand, they have a different pattern to the first and second regions. Firstly, the pillars have no predictive ability to predict the number of tourist arrivals. Other alternative indicators would therefore need to be measured. With regard to receipts, they have a moderate capacity. As for dimensionality, the construct that has the greatest capacity to predict receipts is heavily dominated by infrastructures, C10 (Air transport infrastructure) and C12 (Tourist service infrastructure), and Tourist predisposition, B6 (Prioritisation of Travel & Tourism) and B9 (Environmental sustainability). In Region 4 (The Americas), the weightings of the first dimension are strongly linked to the overall development of the country in all its pillars, counteracting the value-for-money ratio. There is a second dimension that clearly counteracts global economic capacity with Nature and Culture. Finally, in Region 5 (Sub-Saharan Africa), the construct that has the best predictive capacity is strongly linked to development with special emphasis on the variables of Nature and Culture. It is significant that development is counteracted by safety and security, A2 (Safety and security); these countries are generally subject to endless conflicts. Finally, for each of the five regions, the graphs of observed versus predicted values are shown for each of the two observed variables taking into account a model with two components (Figure 2), which again demonstrates the fit and prediction ability of the model.

Figure 2: Observed values vs. predicted values for explained variables per geographical área



5. Discussion

The ANOVA analysis carried out in each of the five geographical areas demarcated by the WEF was significant (p-value < 0.05). Therefore, it can be said that there is a significant relationship between the number of tourist arrivals and receipts, and each of the observed variables. Thus, the first hypothesis formulated can be accepted. This leads to the conclusion that there is an incentive for each region as a whole to improve its competitive position with respect to the other regions, since a higher score indicates better tourism performance, which will result in more tourists and receipts in the region as a whole. These results are partially in line with the conclusions reached by Uyar et al. (2022), who claim that the main TTCI index is positively associated with tourist arrivals but not tourism receipts.

Both the methodological deficiencies present in the TTCI, and the difficulty faced by policymakers, destination managers, and investors in identifying which tourism competitiveness factors have the strongest influence on tourism performance in each geographical region defined by the WEF have been highlighted previously. Therefore, the second hypothesis was formulated around clarifying the interpretation of the TTCI. More specifically, by applying PLS Regression, two dimensions or underlying constructs of tourism competitiveness in the set of countries analysed through the TTCI (WEF, 2020) have been identified, which explain both the variability of tourism competitiveness and the prediction of tourism performance in each of the five regions, thus accepting hypothesis number 2. These results provided a clear understanding of the behaviour of the index, resolving, at least partially, the limitations presented by the TTCI from a methodological point of view (Croes & Kubickova, 2013; Pérez et al., 2020), which prevented policymakers and tourism investors from understanding how the TTCI influences the tourism performance of countries (Uyar et al., 2022).

Finally, it has been possible to identify in each of the two dimensions or underlying constructs the existence of certain drivers of tourism competitiveness that have a greater capacity to predict the tourism performance of a destination (number of international tourist arrivals and income derived from those arrivals). Hypothesis number 3 is partially accepted, given that in the case of the Middle East and North Africa region, the fourteen pillars defined by the WEF only have the ability to predict receipts, and not the number of international tourist arrivals.

In the regions of Europe and Eurasia and Asia-Pacific, with the influence of similar drivers of competitiveness, the results regarding the influence of Natural Resources on the performance of these regions are in line with the findings of Bazargani & Kiliç (2021) and contradict those of Uyar et al. (2022). As for the influence of Culture, the results confirm the findings of Bazargani, and Kiliç (2021), Salinas- Fernández et al. (2020) and Uyar et al. (2022). While, in the case of Infrastructure, the results confirm the findings of Bazargani, and Kiliç (2021), Adeola and Evans (2020) and Michael et al. (2019). With regard to the second dimension, the competitiveness driver linked to safety and security has the greatest explanatory power in both regions; partly in line with the results achieved by Uyar et al. (2022:14), who claim that "*safety and security (…) drive a positive change in tourist arrivals*". Additionally, in the case of the second construct in the Europe and Eurasia region, Business environment possesses a high explanatory power in the performance of the region, confirming the findings of Michael et al. (2019); Nazmfar et al. (2019) and Stefan (2014).

In the case of the Middle East and North Africa region, with a different pattern to the regions of Europe and Eurasia and Asia-Pacific, the pillars only have moderate predictive power for tourist receipts. More specifically, the construct that has the greatest ability to predict receipts is heavily dominated by Infrastructure (Air transport infrastructure and Tourist service infrastructure), in line with the findings of Bazargani, & Kiliç (2021), Adeola & Evans (2020) and Michael et al. (2019). Additionally, Environmental sustainability also influences the region's performance, confirming the findings of Pulido-Fernández and Rodríguez-Díaz (2016), as these authors identified sustainability's association with destination competitiveness by considering the TTCI.

In the Americas region, the weightings of the first dimension are strongly linked to Human resources and the labour market, in line with the findings of Nazmfar et al. (2019), Stefan (2014) and Uyar et al. (2022); with a strong influence noted for Air infrastructure and Tourism services infrastructure and the driver Cultural resources and business travel, in line with the results of Bazargani, & Kiliç (2021), Adeola & Evans (2020) and Michael et al. (2019). It should be noted that the predictive capacity of these drivers in determining regional tourism performance is countered by the value-for-month ratio, in line with the findings of Enright and Newton (2004), Craigwell and Worrell (2008) and Dwyer et al. (2000). Additionally, there is a second dimension that clearly counteracts global economic capacity with Nature and Culture.

Finally, in the Sub-Saharan Africa region, the first construct is strongly linked to the drivers of Nature and Culture, exerting a greater influence on the tourism performance of the region. These results confirm the findings of Bazargani, and Kiliç (2021), Salinas-Fernández et al. (2020) and Uyar et al. (2022) for the case of cultural resources but contradict the work of Uyar et al. (2022) regarding the influence of natural resources on tourism performance in relation to the number of international tourist arrivals. In addition, tourism development in Sub-Saharan Africa is counteracted by safety and security, partially confirming the results of Uyar et al. (2022).

6. Conclusions

Over the past few decades, there has been an increase in competition in international tourist markets. And this competition does not only occur between countries within the same geographical area, but also between regions that group together different countries. In this context, the competitiveness of the different regions becomes one of the main elements of study, so that actions can be prioritised, and resources assigned with a view to developing the tourism industry and continuing to obtain the benefits derived from its activity.

However, there is little scientific literature that addresses the relationship between drivers of competitiveness and tourism performance. Hence, the research presented here aims to fill that gap, identifying which drivers of tourism competitiveness have a greater explanatory power in the performance of the five regions identified by the World Economic Forum. These drivers are able to predict, simultaneously, both the number of international arrivals of tourists and the revenues derived from these arrivals.

Based on one of the most widely accepted global indices – TTCI developed by the WEF – for each geographical area (Europe and Eurasia, Asia-Pacific, The Americas, The Middle East and North Africa and Sub-Saharan Africa), two dimensions or constructs have been identified that would provide policymakers with a clear interpretation of the index and enable them to identify which drivers in each dimension have greater explanatory and predictive power in the tourism performance of each geographical area. While the drivers that have proven to have greater predictive capacity in the tourism performance of each region are not homogeneous, certain drivers are established as determinants of tourism performance in several geographical areas. More specifically, in the regions of Europe and Eurasia, Asia-Pacific, The Americas and Sub-Saharan Africa, natural resources and cultural resources are drivers with high predictive power with respect to the performance of these geographical areas, in terms of the number of international tourist arrivals and the revenues derived from such arrivals. In addition, infrastructures also offer high predictive power in tourism performance in the regions of Europe and Eurasia, Asia-Pacific, The Middle East and North Africa and The Americas. Finally, safety and security, and business environment appear as two key factors in the tourism performance of Europe and Eurasia and Asia-Pacific. While in the case of The Middle East and North Africa, Environmental sustainability appears, and in The Americas, human resources and the labour market also offer some predictive power in the tourism performance of the region.

Regarding the significance of the results, this study suggests that, for the different regions identified by the WEF to promote the development of the tourism industry, adequate attention should be paid to improving the tourism competitiveness of the destination. As well as taking into account the multidimensional nature of the relationship between destination competitiveness and tourism performance. Additionally, the adoption of tourism development policies focused on the drivers that have proven to have greater predictive power in the performance of each geographic area will allow each of them to maximize the benefits derived from tourism activity. Such as increasing employment opportunities, promoting the growth of the social economy and the development of other related industries, reducing poverty, stimulating investment in infrastructure, human capital and technology, as well as improving the quality of life of the population. local and human development, among others.

In terms of managerial implications, the findings of this study serve as a guide for tourism planners, policymakers and investors to explore which drivers of tourism competitiveness have proved to be determinants in the performance of each of the regions addressed. This allows policymakers to carry out adequate strategic planning, allowing them to prioritise action plans and investments in the determinant drivers for each of the constructs, with a view to increasing the number of arrivals and receipts. Finally, as for the limitations of this work, it should be noted, as already indicated in the methodology section, that the WEF report for 2020, which contains information concerning the TTCI for 2019, has been

used. Additionally, the tourism competitiveness index developed by the World Economic Forum is not exempt from criticism from a methodological point of view.

Finally, regarding future lines of research, a cluster analysis or conglomerate analysis will be carried out with the objective of grouping the different individuals (countries) into a set of conglomerates (clusters) according to some criterion of homogeneity, and depending on the variables independent considered. Thus, beyond belonging to a geographical area, it will be possible to identify which countries compete with each other based on the homogeneity of the competitiveness factors they possess.

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