Evaluation of the competitiveness of tourist zones of an island destination: An application of a Many-Facet Rasch Model (MFRM)

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Abstract

Increasing the competitiveness of tourism destinations requires new methods to evaluate destinations’ current situations and to provide a clear indication of the strategic actions needed to promote their competitive factors. Objective measurement by the application of the Rasch Measurement Theory (RMT), specifically the Many-Facet Rasch Model (MFRM), enables these aims to be met. This model also facilitates positioning strategies, even when there is a lack of statistical information about a destination, in which case evaluations by experts are used. The use of this methodology is a step forward in the measurement of tourism destination competitiveness for its ability to compare data generated by experts. This methodology also provides clear indications for destination managers, hoteliers and policymakers of the competitive factors that affect the positioning of tourism destinations.

1. Introduction

The competitiveness of tourism destinations continuously evolves. In particular, positioning changes over time as the different tourism stakeholders attempt to formulate new positioning strategies in line with current conditioning factors. Strategic action requires an in-depth knowledge of alternative strategies and their possible impact, so that when they are implemented, they achieve the success expected of them. Various theoretical works have focused on determining a construct that reflects the factors of competitiveness and its subsequent modeling. The key issue is to establish a system of objective measurements that enables homogeneous units to be compared and consistent results to be obtained. The studies of Crouch and Ritchie (1999) and Dwyer and Kim (2003) represent the main works on tourism competitiveness, not only in the construction of conceptual models and in the understanding of competitive factors, but also in the search for measurement systems that can compare tourism destinations.

The principal objective of this study is to apply a Many Facet Rasch Model (MFRM) to concepts outlined in the literature on tourism competitiveness. The key feature of a MFRM is that it can facilitate comparisons among a range of tourism factors as a way of evaluating the competitiveness of tourist zones. The island of Tenerife (Spain) is used as the geographical context for this application. Tenerife is one of the most important tourist destinations in Europe receiving around 5 million tourists per year, and is particularly popular among British and German tourists. Based on an analysis of Tenerife’s tourist zones, the study aims to highlight the relative importance of each of the indicators in the measurement of tourism competitiveness.

The paper is divided into three main sections. Section 2 contains a review of models used in analyzing tourism destination competitiveness and introduces the one used in this work. There is also a description of the situation of Tenerife within international tourism. Section 3 sets out the methodology involving the use of a Many Facet Rasch Model (MFRM), first developed by Linacre (1989). In Section 4, the MFRM is applied to data obtained from the application of a previously designed questionnaire. The paper ends with a summary of the main conclusions and recommendations for future uses and/or advances of a Many Faceted Rasch model in this field.

2. Models of tourism destination competitiveness: a review

Various models of tourism competitiveness have been developed in the literature. Based on the distinction between comparative advantage and competitive advantage, Crouch and Ritchie (1999) propose a theoretical model that is neither predictive nor causal, but simply a conceptual model, whose fundamental purpose is to use highly abstract concepts and relationships to explain the factors determining tourism competitiveness. Thus, in
their conceptual model, destination competitiveness is conditioned by both the competitive environment and the global environment. The former is the immediate environment to which the destination must adapt to be able to compete, and which comprises the different agents operating in the tourism sector (i.e. tour operators, travel agencies, destination residents, employees, hotel establishments, financial institutions). The latter consists of global forces that change the composition and nature of tourism in the destination, such as the growing concern for the environment, demographic changes in tourist origin markets, the increasingly complex relationship between technology and humans and the spread of democratic government (Ritchie, 1992). Crouch and Ritchie (1999) warned of the rapidly changing and evolving nature of both environments and particularly advised destination managers to regularly adapt the destination to the reality of the moment.

Crouch and Ritchie (1999) went on to highlight the importance of elements such as “principal resources and attractions”, “complementary factors and resources”, “destination management” and, finally, the so-called “local determinants”: elements that have been used in the development of questionnaires and fieldwork for this study.

Two years later, Kim (2001) proposed a new model of tourism competitiveness that considered four sources of competitiveness:

1. Primary sources of competitiveness comprise subjects (politicians, employees, and travel agents), environment, and resources (historical, cultural and natural).
2. Secondary sources encompass tourism policy, destination planning and management, investment in the sector, and tourist taxes and prices.
3. Tertiary sources of competitiveness are tourism infrastructure, visitors’ accommodation, attraction of the resources, advertising, and the qualifications of personnel.
4. Finally, quaternary sources (which Kim considers the result of the previous three sources) refer to tourist demand, employment created by the sector, the “behavior of tourism” (growth rate, balance of payments of the sector, the sector’s contribution to the GDP of the country or region), and tourism exports.

These sources of competitiveness are the tourism outputs obtained from different inputs (sector productivity), thus, they constitute a direct indicator for the assessment and comparison of competitiveness.

Kim’s (2001) model considers that each source of competitiveness should have different weightings, with quaternary sources always receiving greater weighting. One significant criticism of this model is that it does not justify why a source of competitiveness should be considered a primary, secondary or tertiary source. It has even been argued that rather than the quaternary sources of competitiveness being sources in themselves, they could be considered as the effects or consequences of competitiveness, itself (Garau Taberner, 2006).

In 2003, Dwyer and Kim proposed a model of tourism competitiveness based on the earlier model by Crouch and Ritchie (1999), but which was used to determine the competitiveness of a country as a tourism destination, although it can also be applied to regions, provinces, and cities. They clearly differentiate between “inherited resources” and “created resources”, and consider that these two types of resources, together with “complementary factors and resources” have their own identities. These three elements determine whether a destination is attractive or not and the success of the destination’s tourist industry should be based on them. Therefore, they conclude that these elements constitute the basis of tourism competitiveness.

However, in the Dwyer and Kim (2003) model, once again, there is a lack of justification of which factors belong to which source. For example, why does tourism infrastructure constitute a tertiary source of competitiveness? Something similar applies to the destination’s subjects (tourism actors), which although important in a model of competitiveness cannot be justified as a tertiary source.

In their model, “destination management” and “conditions of demand” constitute what are called the local conditions, which can limit, modify or strengthen a destination’s competitiveness. “Destination management” refers to all those factors that strengthen the appeal of local tourism resources and adapt the destination to its particular conditions, including actions regarding tourism management, tourism policy, planning and development and environmental management. The “conditions of demand” refer to tourism awareness, tourists’ perceptions and preferences, all of which determine tourism destination competitiveness.

Thus, while the competitiveness of a destination depends both on the “base” and “local” conditions, it, in turn, is a determinant of the destination’s socio-economic “productivity”. It is, in fact, an intermediate objective to achieve the final goal, which is residents’ socio-economic well-being. Dwyer and Kim (2003) propose a broad range of indicators, both objective and subjective, of tourism competitiveness, as well as indicators of socio-economic productivity (i.e. employment levels, income per capita, economic growth rate). This makes it evident that, irrespective of the tourism competitiveness model used, competitiveness has a character that is not directly observable and its quantification requires the use of indirect indicators. In this respect, Scott and Lodge (1985) consider that competitiveness is a phenomenon that cannot be characterized by only objective indicators (those related to quantitatively measurable aspects) or by only subjective indicators (mainly related to tourist perceptions). In 2001, the World Travel & Tourism Council (WTTC) introduced the Competitiveness Monitor that covered almost 200 countries and used eight broad indexes, each constructed from various indicators of competitiveness. A comparative analysis of the indicators proposed by Dwyer and Kim (2003) and those of the World Travel & Tourism Council reveals that there is no consensus on which indicators should be used to quantify tourism competitiveness and, moreover that the measurement of tourism competitiveness entails enormous difficulties, since its measurement is, to a great extent, conditioned by the indicators used.

Gooroochurn and Sugiyarto (2005, p. 27–30) based on the methodology of the WTTC, produced a synthetic indicator of competitiveness, obtaining a weighted average of each competitive item, composed of eight indicators, where weights are obtained using techniques of factorial analysis. These authors believe that not all factors have an equal impact on the competitiveness of the destination. After calculating the competitiveness index, they provided a ranking based on the degree of competitiveness of each country. The study concludes that competitive tourism destinations are the United States, Sweden, Norway, Finland and Australia. It also concludes that the least competitive countries are Burkina Faso, Chad, Benin, Ethiopia and Cambodia. The main contribution of the Gooroochurn and Sugiyarto (2005) study is that it attempts to resolve the problem caused by lack of data, while still comparing the competitiveness of different countries.

More recently, Hong (2009) refers to the model of Ritchie and Crouch (2003) as the most important work on the analysis of tourism competitiveness and attempts to improve their results. Hong aims to resolve some of the weaknesses in the Crouch and Ritchie model by arguing that the order of the factors and categories of variables should be treated according to their importance. He also claims that the Crouch and Ritchie model
does not analyse the interaction between comparative and competitive advantages and tourism competitiveness. Finally, Hong indicates that many of the factors in the model of Ritchie and Crouch are qualitative and not quantitative. Thus, the model and methodology proposed weighs and ranks the importance of each factor and indicator regarding the relevance of its contribution to the competitiveness of the destination. There are other models of tourism competitiveness of less relevance than those reviewed in this paper, which in the main do not offer clear and concise measurements of competitiveness: Poon (1993), Hassan (2000), Mihalíc (2000), Bosch Camprubi, Pujol Marco, Serra Cabado, and Vallespínos Riera (2001), Huybers and Bennett (2003), Hu and Wall (2005), Mazaro (2007) and Navickas and Malakauskaitė (2009).

Table 1 displays the principal advantages and disadvantages of models of tourism competitiveness, together with comments on their indicators of competitiveness.

The design of the different measurement models to date can be classified into two groups. The first group uses objective data referring to the different concepts of competitiveness: these cannot be combined with one another since they differ conceptually. The use of econometric models to obtain joint measurements, based on a series of assumptions, permits comparable results to be obtained. However, the second group of instruments uses subjective data based on the methodologically invalid assumption that the scores given to the items (competitiveness factors) are their measurements and can be added together. In fact, the scores are ordinal values, without the required properties of interval in the addition process; therefore, the results obtained are neither valid nor reliable.

The construct “competitiveness of tourist zones” used in this research includes items that reflect the variety of the concept components highlighted by Crouch and Ritchie (1999), Dwyer (2001), Kim (2001), and Dwyer and Kim (2003), as well as those in the works of Sánchez and Fajardo (2004), and Sánchez (2006) in a unidimensional context. These studies analyzed the tourism competitiveness of geographical areas of Spain by means of a two-parameter model of the Item Response Theory (Birnbaum, 1968). The items included in the instrument to measure the construct are shown in Table 2.

The selection aims to consider both the broadness of the concept of competitiveness and the availability of information. Thus, while factors of inherited resources are important, they are not the only factors that form the basis of competitiveness and should not be considered exclusively, and neither should the created resources and complementary factors. This work seeks a certain balance between the different categories of factors: more specifically, using seven factors that reflect inherited resources (both natural and cultural), six factors that aim to measure the provincial tourism competitiveness via created resources, four factors representing complementary resources, and another five factors that complement the previous ones and represent the tourism activity in the geographical area under study.

2.1. “Tenerife” in the international context

Tenerife is the main island of the Canarian archipelago, and the one that attracts the highest number of tourists, satisfying 45% of tourism demand in the archipelago. It has an area of 2059 km², and a population, in 2011, of 908,555 (a density of 414.12 inhabitants per km²).

Tourism activity on this island can be considered from a perspective of zones or of products in response to the competitiveness strategy created by the Tenerife Island Council through Turismo de Tenerife: the official Tenerife Tourist Board (SPET, using its Spanish initials) that is responsible for the island’s tourism strategy and management.

One of the reasons for the approach adopted by this work is the possibility to assess the island by zones, according to the competitive positioning strategy:

1. There are four clearly defined tourist zones, each geographically separated from the others. These tourist zones are Zone 1: Isla Baja; Zone 2: Puerto de La Cruz – Valle de la Orotava; Zone 3: Santa Cruz de Tenerife – La Laguna; and Zone 4: South Tenerife (see Fig. 1).

2. The tourism offer can also be divided into different products according to the services and target public. The following products can be identified: Tenerife Convention Bureau (congress and convention tourism); Tenerife Select (prestige and quality tourism, products of excellence); Tenerife Golf (golf tourism); Tenerife Natural (markets nature, rural and cultural tourism); Tenerife and the Sea (promotes the sea and water sports) and Tenerife Film Commission (promotes the possibility of making advertisements or films in Canarian locations).

The strategic tourism policy of the Island is composed of these products/zones, generating a systematic competitive process, the

<table>
<thead>
<tr>
<th>Model</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crouch and Ritchie (1999)</td>
<td>Proposes quantitative indicators</td>
<td>Conceptual model based on the qualitative concepts of competitiveness and highly abstract relationships</td>
</tr>
<tr>
<td>Kim (2001)</td>
<td>Proposes quantitative and qualitative indicators of competitiveness</td>
<td>The same weight is given to all the indicators</td>
</tr>
<tr>
<td>Dwyer and Kim (2003)</td>
<td>Difference between the basis of competitiveness and the destination’s local conditions</td>
<td>It does not justify the differences between the primary, secondary and tertiary sources of competitiveness</td>
</tr>
<tr>
<td>Gooorochurn and Sugiyarto (2005)</td>
<td>Proposes quantitative (or strong) and qualitative (or soft) indicators of tourism competitiveness</td>
<td>The same weight is given to all the indicators</td>
</tr>
<tr>
<td>Hong (2009)</td>
<td>Gives different weights to each factors Let’s compare the competitiveness of different destinations and develop a ranking according to their degree of competitiveness</td>
<td>Final results are not consistent with the reality of destinations</td>
</tr>
<tr>
<td></td>
<td>Use indicators and variables proposed by other authors in their models, which provides reliability</td>
<td>The weight to be given to indicators may be questionable</td>
</tr>
<tr>
<td></td>
<td>Weighs and prioritizes the importance of each factor and indicator with respect to the relevance in contributing to destination competitiveness tourism</td>
<td>The questionnaires were sent to academic researchers with experience in the field and to government officials work in tourism. So it would interesting to contrast the study all those involved in the tourism sector to complete the perspective</td>
</tr>
</tbody>
</table>
Table 2
Instrument to measure the construct “competitiveness of tourism zones of Tenerife”.

<table>
<thead>
<tr>
<th>Study of competitiveness of tourism zones of tenerife expert no.</th>
<th>Year</th>
<th>Expert No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>To what extent does the level of availability of the indicated factor</td>
<td>Zone 1</td>
<td>Zone 2</td>
</tr>
<tr>
<td>Support the competitiveness of the tourist zones of Tenerife?</td>
<td>Zone 3</td>
<td>Zone 4</td>
</tr>
<tr>
<td>Factors of competitiveness</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FC1: Average temperature (AvTemp)</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>FC2: Low Rainfall (LowRain)</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>FC3: Hours of sunshine (HrsSun)</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>FC4: Coast and beaches (CoBeach)</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>FC5: National Parks (NatPark)</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>FC6: World Heritage municipalities (Heritage)</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>FC7: Festivals of National tourist interest (FestNat)</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>FC8: Hotel Infrastructures (HotInfra)</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>FC9: Restaurants and bars (RestBar)</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>FC10: Complementary leisure infrastructure (golf courses) (Golf)</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>FC11: Complementary leisure infrastructure (Theme and leisure parks) (ThemePk)</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>FC12: Complementary leisure infrastructure (Museums)</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>FC13: Complementary leisure infrastructure (others: scuba, hiking, climbing, ..) (OthLeis)</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>FC14: Road infrastructure (Roads)</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>FC15: Other land transport (trains, buses, trans…) (OthTransp)</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>FC16: Civil airports (Airports)</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>FC17: Other infrastructure (ports) (Ports)</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>FC18: Average price level (Price)</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>FC19: Market share (% of incoming passengers to Tenerife) (MktSh)</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>FC20: Foreign Tourism (FrgnTour)</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>FC21: Average length of stay per tourist (AvStay)</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>FC22: Hotel occupancy (Occup)</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

Fig. 1. Tourism zones of Tenerife.
Source: Tourism of Tenerife (2012).

current situation is the following (Renovación de la estrategia turística de la Isla de Tenerife, 2012–2015):

(a) A total of 5,160,203 tourists visited Tenerife in 2012, and the average occupancy for that year was 63.7%. The outstanding origin markets were the Spanish, 25.23% (65% mainland Spanish and 35% Canarian); British, 32.1%; German, 11.44% and Nordic, 9.3% (with lower percentages of Dutch, Irish and French).

(b) Tourists that visit Tenerife are, on average, aged 47.8 (the youngest tourism is from mainland Spain), travel with their families or partners (71%), although only 14.9% are accompanied by their children. Their level of income is high and increasing, their spending at the destination has reached 36.06 € per day. Holiday budgets are mostly spent on restaurants (28.3%), shopping (18.7%), and food purchases (13.2%). The level of loyalty is around 62.4%, the vast majority of which comprises British tourists.

(c) “Sun and Beach” is the principal tourist motivation; therefore, this is the tourism model developed on the island. However, there are other motivations, such as getting to know the island’s culture and nature. The principal activities carried out by tourists are visits to theme parks (27.7%), whale watching (11.4%), hiking (13.4%), visits to other islands (5.9%); health and spa treatments (5%), cultural visits to museums, concerts, etc. (5.2%), attending local fiestas (4.4%), scuba diving (1.9%), sailing (2.1%), surfing/windsurfing (0.9%), golf (1.7%) and adventure sports (1.2%).

(d) This multi-product model has captured various market segments, with tourists staying in accommodation in the different tourist zones (see Fig. 1). However, they travel round the island to a greater or lesser extent in order to get to know the whole of the island’s offer. The product and overseas promotion policy of Turismo de Tenerife is one that offers multiple experiences with the aim of attracting different segments, and of promoting repeat visits, motivated by satisfaction with the previous visit, as well as the chance to enjoy other holiday experiences.

3. Methodology: the Many Facet Rasch Model (MFRM)

In Latent Trait Theory, when applied to social sciences, there are two major approaches to modern theories of the Test (Thissen & Orlando, 2001). The difference between the two is reflected in the type of relationship established between the data and the statistical model applied to the information.

The first of these approaches is grouped around Item Response Theory (IRT). IRT attempts to find a model that best fits the data available by the parameterization (Weinstein, Eric W. “Parameterization”, from MathWorld) of the latent features and the properties of the items (see Birnbaum, 1968; Thissen & Orlando, 2001).

The other approach is the Rasch Measurement Theory (RMT). In the RMT paradigm, data have to fit a theoretical model. This model has all the characteristics required to be able to compare measurements from its application. These characteristics are unidimensional, psychometric, invariant, locally independent and sufficiently statistical (see Wang, 2010; Salzberger, 2009; Wright and Mok, 2004). If the data generated by the tests (raw scores) fit the model, these data
have the model’s characteristics, thus, comparisons can be made between the measurement intervals obtained. If the data do not fit the model, they do not acquire the model’s characteristics, but the analysis of the misfits (residuals) that arise in the process can indicate the causes of this. RMT has traditionally been considered a special case of IRT, which corresponds to a model of one parameter (1-PL Model, Birnbaum, 1968). However, significant differences exist among these models; for a complete comparison see Linacre (2003).

Historically, there has been criticism of the use of RMT. This criticism has focused on the mathematical formulation, and the possibility of general and viable solutions to the problems of measurement. The state of the debate can be consulted in various publications, for example, Linacre (1996) or, more recently, Linacre and Fisher (2012) or Wang (2010).

The dichotomous Rasch (1980) model is the seminal cornerstone used to develop the family of Rasch models (Wright & Mok, 2004). This dichotomous model was developed for two facets (subjects and items): the subjects interviewed had two options to respond (dichotomy) to the items: true or false.

Andrich (1978) and Master (1982) introduced the possibility of interviewees having more than two options or organized categories of responses to items known as polytomous alternatives to the two facets. The polytomous Rasch models which are referred to are the Rating Scale Rasch Model (Andrich, 1978) and Partial Credit Rasch Model (Masters, 1982).

The main features of RMT regarding the items and categories in which interviewees frame their answers are highlighted by Oreja-Rodriguez and Armas-Cruz (2012) and by Fischer, Frewer, and Nauta (2006, p. 1327) who state that ‘the Rasch Model differs from additive scales in that it does not rely on the following assumptions: (1) all items have the same descriptive impact on the scoring scale score, and (2) all item categories have the same distance from the next category’.

The polytomous Rasch model for two facets has already been applied to the analysis of the tourism sector in the works of Santos-Arrebola (2002), Oreja-Rodriguez and Yanes-Estévez (2007) and Oreja-Rodriguez and Armas-Cruz (2012). Santos-Arrebola (2002) also researched tourist satisfaction in Marbella (Spain) using this model: the facets were tourists (subjects) and Arrebola (2002) also researched tourist satisfaction in Marbella (Spain) using this model: the facets were tourists (subjects) and Santos-Arrebola (2002), Oreja-Rodriguez and Yanes-Estévez (2007), and Oreja-Rodriguez and Yanes-Estévez (2007), they studied organizational environment taking into account perceived environmental uncertainty. They used two facets: tourism firms (subjects) and the complexity and dynamism of the organizational environment (items). Later, Oreja-Rodriguez and Armas-Cruz (2012) developed and validated a measurement instrument to evaluate environmental performance in the hotel sector. The two facets used were hotels (subjects) and environmental performance (items of).

The Many Facet Rasch Model (MFRM) is part of the RMT and was developed by Linacre (1989) for many facets and is based on the cited polytomous expansions of Andrich (1978) and Masters (1982). MFRM has been applied to a wide variety of scientific fields (Linacre, 2013), however, this is the first implementation of MFRM to the tourism sector.

This model extends the two facets used in the polytomous models of Rasch previously mentioned, with, at least, a third facet, experts as judges of the relationship between the latent variable and the evaluated subjects. The objective is to map the possible interactions of facets with each other and to identify bias, susceptible to “co-governing actions” in the interpretation of the final results (Lunz and Linacre, 1998).

In their work, Lunz and Linacre (1998) developed the use of this probabilistic model to carry out objective measurements in business research. They stress that this model permits the analysis of the influence that the different facets in the measurement (persons/ subjects: tourist zones, items: factors of competitiveness, judges: experts) and the measurement scale used have on the results obtained.

The unique contribution of MFRM is that all the facets that can influence the results are found in the same measurement framework, thus facilitating comparisons between the elements of the facets. It can be seen how the elements are combined to produce the results, and the impact of each facet on these results can be understood.

The purpose of MFRM analysis is to take variations into consideration, thus highlighting the possible misfits and the elements that produce them. This aids the interpretation of results and, where necessary, the adoption of appropriate decisions.

One of the unique facets of the model is the use of experts. These expert opinions have been used before in the analysis of tourism destination competitiveness (see for example Crouch, 2011; Enright & Newton, 2004, 2005; Gomezelj & Mihalic, 2008). The MFRM provides a utility that is not available in other models of data treatment, it has a measurement system particularly suited to managing data generated by experts and has efficient tools to discover and compensate for measurement errors or bias generated by them (Ecker, 2011).

A Many Facet Rasch Model using a scoring scale of $m + 1$ ordered categories with a level of 0 for the lowest category and a level $m$ for the highest is expressed as the logarithm of ratio odds:

$$\ln \frac{P_{nijk}}{P_{nijk-(k-1)}} = \beta_n - \delta_i - \xi_j - \tau_k$$

In which,

- $P_{nijk}$: the probability that an expert $j$ gives subject $n$ score $k$ in item $i$.
- $P_{nijk-(k-1)}$: the probability that an expert $j$ gives subject $n$ score $k - 1$ in item $i$.
- $\beta_n$: subject ability $n$ (Facet 1: subject)
- $\delta_i$: item difficulty $i$ (Facet 2: item)
- $\xi_j$: judge severity $j$ (Facet 3: judge as expert)
- $\tau_k$: the Rasch–Andrich threshold or calibration of stage $k$. This threshold is not considered a facet in the model.

The MFRM can be expressed as

$$P_{nijk} = \frac{1}{\gamma} \exp \left[ k(\beta_n - \delta_i - \xi_j - \sum_{h=1}^{m} \tau_h) \right]$$

in which $\tau_1$ is 0, and $\gamma$ is a standardized factor that encompasses the sum of all the possible numerators.

4. Results: measuring the competitiveness of Tenerife’s tourist zones

The units of research are the four tourist zones of Tenerife; namely: Zone 1: Isla Baja; Zone 2: Puerto La Cruz-Valle La Orotava; Zone 3: Santa Cruz de Tenerife–La Laguna; and Zone 4: South Tenerife.

A panel of seven experts undertook the assessment of these zones:

(a) Four of the experts are involved in teaching and research in the La Laguna University, whose experience includes research on national tourism projects and articles in international tourism journals.

(b) Two are hoteliers, one of whom is the managing director of Ashotel (Association of Hotels of the islands of Tenerife, La Palma, La Gomera and El Hierro), and the second expert
is the managing director of the Tourism cluster of the island of Tenerife (this cluster includes the 25 largest tourism firms in Tenerife).

(c) Finally, there is one policy-maker, who leads the Tenerife Tourism Board and is deputy minister for tourism on the island of Tenerife.

These experts were selected due to their training and experience in the tourism sector and because they represented academic, business and legislative stakeholders within the industry, and following the methodology of the MFRM. The scores that the experts gave to the factors of competitiveness in each destination correspond to a numerical scale of 1–5.

Table 3 presents a summary of the most relevant statistics provided by the FACETS program (Linacre, 2007) in the analysis of the three facets (tourist zones, competitiveness factors and experts). The model used for Tenerife complements the definition of the facets with the following definitions: Facet 1: subject=competitiveness of tourist zone; Facet 2: item=competitiveness factors; Facet 3: judges= experts. By means of the FACETS program, the parameters of the three facets were obtained and placed on the same scale (see Fig. 2), which provides a reference framework for the interpretation of results.

The first column of Fig. 2 represents the linear continuum on which the measures obtained by the different facets are placed. In the second column, the tourism zones of Tenerife are shown in order of competitiveness (most competitive: Zone 4, Zone 2, Zone 3, Zone 1: least competitive). Their measurements range from 0.44 (Zone 1) to 0.85 (Zone 4), with 50% of the measurements above 0.80.

The third column orders the factors of competitiveness (from very great support of competitiveness to very little support). The measures vary between 1.28 (temperature) and 0.65 (Port). Thus, it can be said that the experts agree on the conceptual delimitation of competitiveness by giving higher scores to the variables that, for example, make up the territory, a key element in defining strong competitiveness. This is in agreement with the models presented in the theoretical framework.

Finally, the fourth column shows the measurements of severity (from very high severity to very low severity). The experts are familiar with the tourist destinations and the content of the concepts used as factors of competitiveness, according to the definition of the construct, tourism competitiveness. Experts may have a high level of exigency (severity) or a low level (lenience) regarding which destinations meet the criteria of the competitiveness factors and so assign a low score (severe) or a high score (lenient) to a destination for a specific factor of competitiveness. In this case, the measurements ranged from 0.32 (Expert 2) and −0.41 (Expert 6).

Fig. 2 shows that the average measurement of the zones (0.70) is higher than that of the factors of competitiveness and experts (0.00). This indicates the high level of competitiveness achieved by the tourist zones of Tenerife as a whole. The three highest-scoring factors have measurements above those of all the competitiveness factors. However, Zone 1 has an average (0.44) below those of the Port (0.65), Golf (0.48), Market Share (0.48) and Museums (0.45), which reveals shortcomings that must be addressed in strategies of positioning.

All the measures of the experts are below the least competitive zone (Zone 1), which indicates the experts’ demanding assessment of the tourist destination of Tenerife as a whole.

5. Conclusions

Analysis of the competitiveness of tourism destinations requires a previous stage to delimit the construct to be measured. The use of competitiveness indexes and the non-determination of the relative importance of the different variables of the construct calls for the use of measurement models to obtain comparative measures that can also determine the possible actions to be taken by tourism destinations to achieve competitive improvements.

The main aim of this work has been to integrate the various concepts of competitiveness present in the literature, and by using the Many Facet Rasch Model to measure them. Therefore, we use a paradigm based on a measurement perspective in which data must fit a model, and the specification of the relational structures needed to give it meaning (Fisher, 2005). This concept is the basis of the Rasch Measurement Theory. FACETS software (Linacre, 2007) is used with a Many Facet Rasch Model (MFRM), which resolves some of the methodological difficulties that appeared in the literature review. The specification of the degree of importance of the different items is one significant contribution of this work. Another is that it offers destinations the possibility of implementing strategic actions to modify their level of competitiveness, since the use of the MFRM has enabled us to obtain competitive positioning based on expert evaluations. The analysis of experts’ assessment allows a focus on the items that determine the differences in their positions and the reasons for those differences.

The use of the 22 indicators (see Table 2) of tourism competitiveness that were measured for the four tourism zones on Tenerife has verified that a good offer of accommodation, a good infrastructure of restaurants and bars, a high relative importance of coast and beaches, a set of inherited resources proposed by Crouch and Ritchie (1999), and moderate temperatures and low rainfall are determining factors in the measurement of the competitiveness of the different tourism zones on the island.

Moreover, this technique enables us to establish rankings of the competitiveness of the tourism zones of Tenerife, with Zone 4 (South Tenerife) and Zone 2 (Puerto de la Cruz-Valle de la Orotava) heading these rankings. However, it is necessary to conduct a more detailed analysis of the competitive factors determining this situation, with the aim of proposing the necessary corrective actions. At the other extreme, Zone 3 (Santa Cruz-La Laguna) is relatively close to Zones 4 and 2, which demonstrates the efforts made to improve its competitive factors. Zone 1 (Isla Baja) has great potential but needs to make a strategic effort in those competitive factors that need improvement. The MFRM provides information on bias in the evaluations of the experts in the initial
map. In the case of such bias, “co-governing actions” could be carried out to complement the internal ones already adopted by the model.

In general, it can be concluded that the competitive level of Tenerife is substantially above the average of the competitive factors, which indicates its competitive positioning. However, not only do managers need to take a more ambitious strategic approach, it is also necessary to continue along this competitive route with efforts like Future Brands 2004. This was a study aimed at creating a single Canarian brand (Plan estratégico de Canarias), which was commissioned by the Canarian Government. The study attempted to define the competitive factors of the Canary Islands and reached the conclusion that the factors which are constant include “agreeable climate” throughout the year, “open and friendly people”, and a “safe” destination with an adequate “infrastructure”. On the negative side, the study identified issues such as “a poor, limited cultural offer”, a focus on sun and beach tourism, an imbalanced and out-of-date image, as well as a “clear lack of autochthonous traditions”. Although this study was undertaken for the Canary Islands as a whole and not just Tenerife, it does reinforce the implications of our work. Furthermore, the degree to which the results of the above study concurs with our work clearly demonstrates the ability of the MFRM tool to measure, as realistically as possible, factors of competitiveness.

References


Web references

