

## Tourism accessibility competitiveness. A regional approach for Latin American countries

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**ABSTRACT:** Tourism competitiveness is a topic of concern for everyone involved in planning, investing and studying the tourism sector. Researchers face challenges in measuring competitiveness and evaluating which issues to include in their analyses. The aim of this work is to determine to what extent adequate accessibility—defined as a set of conditions that a destination should have to be used optimally by individuals, including people with disabilities—represents an additional determinant for tourism demand, in a regional context. Using data from 17 Latin American countries during the period 1995-2015, we estimate a gravitational panel data model with fixed effects and show that the attractive assets declared by UNESCO as world heritage sites, as well as the component of accessibility, together increase international tourism demand. In this way, this paper shows the value of prioritizing discussion of issues like accessible tourism to reach a broad and «modern» measurement of competitiveness.

**JEL Classification:** R1; O32; L83; J14.

**Keywords:** tourism accessibility; regional tourism demand; competitiveness.

### La competitividad turística en accesibilidad. Una aproximación regional para países latinoamericanos

**RESUMEN:** La competitividad turística es un asunto de preocupación para todos aquellos involucrados en el planteamiento, la inversión y el estudio del sector turístico. Los investigadores se enfrentan constantemente a retos con respecto a la medición de la competitividad y a la evaluación de qué aspectos incluir en sus análisis. El propósito de este trabajo es determinar hasta qué punto una accesibilidad adecuada—definida como un conjunto de condiciones que un destino debe tener

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para ser usado de manera óptima por individuos, incluyendo personas con discapacidades— supone un determinante adicional para la demanda turística, en un contexto regional. Utilizando datos de 17 países latinoamericanos durante el periodo 1995-2015, estimamos un modelo gravitacional de datos de panel con efectos fijos y mostramos que los atractivos turísticos declarados por la UNESCO como patrimonio de la humanidad, junto con el componente de accesibilidad, combinados, aumentan la demanda turística internacional. De esta forma, este artículo muestra el valor de priorizar la discusión de aspectos como el turismo accesible para conseguir una medida amplia y «moderna» de competitividad.

**Clasificación JEL:** R1; O32; L83; J14.

**Palabras clave:** accesibilidad turística; demanda turística regional; competitividad.

## 1. Introduction

Over the last decade, tourism researchers have shown particular interest in identifying, measuring and systematizing variables that determine the competitive position of tourism destinations. These variables are important for management decisions made by policymakers, destination managers, tourism entrepreneurs and other stakeholders (Pulido-Fernández and Rodríguez-Díaz, 2016). Do accessibility, technological aspects of smart destinations, innovation, and sustainability hold a place in the measurement of competitiveness? In this paper, we focus on one of these dimensions, accessibility, to shed some light on its definition, alternative methods of measurement, and its potential relationship with technological aspects of smart city destinations.

This work aims to determine to what extent adequate accessibility serves as a determining factor for regional tourism demand. We define adequate accessibility as a set of conditions that a destination must possess to be used optimally by all persons, including those with disabilities. Using data from 17 Latin American countries during the period 1995-2015 we estimate a gravitational panel data model with fixed effects to analyze the determinants of tourism flows. The results show that the UNESCO declaration of tourist attractions as heritage sites, as well as a component of accessibility, increase international tourism demand. This paper illustrates that several fundamental issues need to be taken into account in order to formulate an encompassing and «modern» definition of competitiveness. It proposes that accessibility is key among these.

Why should accessibility be taken into consideration? Two primary facts illustrate its significance. First, more than a billion people, or about 15% of the world's population, are estimated to live with some form of disability (based on 2010 global population estimates); by 2050 this figure is set to increase to approximately 1.2 billion (WHO, 2011). Other non-disabled persons may also benefit directly or indirectly from enhanced accessibility, including pregnant women, people with temporary dis-

abilities, seniors, and families with young children; together these groups constitute more than one-fifth of the world's population (Domínguez, Darcy and González Alén, 2015). We expect disability to be an even greater concern in the future, as its prevalence increases alongside an aging population, given that the risk of disability is higher among older adults. The global increase in chronic diseases such as diabetes, cardiovascular diseases, cancer and mental health disorders (WHO, 2011) also indicate that these numbers will increase. Second, the Convention of Rights of People with Disabilities (UN, 2006), an international treaty of human rights, includes accessibility and participation in cultural life, recreation, leisure and sport as a specific right for persons with disabilities. People with disabilities often choose not to travel for vacation due to a combination of factors, including a lack of reliable information, lack of financial resources, and negative prior experiences (Gfk, 2015). A lack of accessible services and places can curtail many disabled persons' desires to travel (Neumann and Reuber, 2004). UNWTO (2014) considers accessible tourism as an opportunity for economic, social and cultural growth.

Accessibility should not only be considered a right but also as an essential issue in city planning. Improved accessibility has the potential of developing general well-being, increasing the usability and enjoyment of touristic sites, services, and products, and capturing a new segment of the tourist market. It can also make sites more competitive. In this sense, this paper conducts an initial exercise of including a broad concept of accessibility in the explanation of regional tourism flows. Ultimately, it aims to see an accessibility indicator included as a part of a competitiveness measurement in destination competitiveness models.

## **2. Literature Review**

### **2.1. A broad conceptualization of destination competitiveness**

The concept of competitiveness, fundamentally related to international trade theories, has a long history in economic literature. Garelli (2006) outlines the evolution of the idea of competitiveness, tracing its evolution from Adam Smith in 1776 to the current vision of Porter at the beginning of the 1990s. In recent times, factors like the 1970s oil crisis, the Latin American fiscal crisis of the 1980s, and innovations and technological improvements in each country, explain the growing importance of competitiveness measurements (Chudnovsky and Porta, 1990). Thus, this concept ceases to be sustained solely by international trade theory or national market protection, and instead incorporates issues such as economic well-being and quality of life (Fagerberg, 1988; Fajnzylber, 1988; Jones and Teece, 1988). In this way, defining and measuring the phenomenon of competitiveness is not a simple task. It is a multidimensional, relative and complex concept that encompasses many elements, some of which are difficult to rigorously measure (Gooroochurn and Sugiyarto, 2004). Competitiveness in tourism has become more relevant in the literature since the 1990s but correctly measuring it still represents a challenge. The transversality of the tourism

sector and the lack of unique criteria in its definition complicate efforts at quantification.

Since the first public presentation of the conceptual model of competitiveness in tourist destinations in 1993, Ritchie and Crouch (2003) have promoted the continuous review and modification of variables that make up a competitiveness model. The model is determined by sociocultural, economic, anthropological, technological, behavioral and environmental factors, among others. It takes comparative and competitive advantages into account and is based on two strengths: the destination's resources (human, physical, knowledge, historical and cultural, availability of capital, tourist infrastructure, and size of the economy) and its capacity to use those resources over the long-term (audit and inventory, growth and development, efficiency and effectiveness, and maintenance). The model recognizes a global environment through the identification of the previously mentioned factors (economic, technological, environmental, political, legal, sociocultural and demographic) and includes the most important elements for characterizing a destination's tourism competitiveness. For their part, Dwyer and Kim (2003) present a comprehensive approach to measuring tourism competitiveness in destinations based on the Ritchie and Crouch (2003) model, with the difference that they group together planning and tourism development factors.

One of the most commonly used measures of tourism destination competitiveness is the Travel and Tourism Competitiveness Index (TTCI) developed by the World Economic Forum (WEF) in 2007. It defines competitiveness as «the set of institutions, policies, and factors that determine the level of productivity of a country» (WEF, 2010:4). The TTCI provides a global tourism competitiveness index and four competitiveness sub-indices: i) enabling environment; ii) travel and tourism policy and enabling conditions; iii) infrastructure, and iv) natural and cultural resources. In order to develop these indices, available data is organized into 14 pillars of tourism competitiveness, which are split, in turn, into 90 competitiveness variables or indicators. Even though the TTCI has been criticized for not making use of previous tourism research (Crouch, 2007), for the weakness of its prediction ability (Mazanec and Ring, 2011) and the arbitrary weighting of the variables within each pillar (Pulido-Fernández and Rodríguez-Díaz, 2016), it is nevertheless a first step towards measuring destination competitiveness, based mainly on economic factors.

Other models have revised the components included in a measure of destination competitiveness. In their work, Gooroochurn and Sugiyarto (2005) develop and use the World Travel and Tourism Council's Tourism Competitiveness Monitor (TCM), emphasizing that technology and social indices are the most important factors in determining competitiveness. Keeping in mind the challenges of measuring tourism destination competitiveness, Ring (2011) questions whether it is feasible to actually measure overall competitiveness in an undifferentiated way. A sound measure of competitiveness for the whole tourism industry that could also serve as a reliable predictor of performance or growth is desirable. However, it is difficult to capture the tourism industry, in all its heterogeneity, in one single index. A question that

still needs to be answered is how competitiveness in different kinds of tourism and markets is connected to overall competitiveness of a nation. In a theoretical sense, destination competitiveness lends itself to a hierarchical construct, i.e. countries will exhibit different levels of competitiveness in different parts of the industry as well as in different markets; regions within a country will also not be equally competitive. It is still unknown how much this complexity should be taken into account in models of total competitiveness<sup>1</sup>.

Although a great number of studies have focused on measuring the competitiveness of tourism destinations (Ritchie and Crouch, 2003; Dwyer and Kim, 2003; WEF, 2011), others have looked at technological and social indices (Gooroochurn and Sugiyarto, 2005), and a few have studied accessibility in tourism in the context of competitiveness, though not in a broader sense (Madeiro Barbosa, 2008; Domínguez, Darcy and González Alén, 2015; Porto and Rucci, 2016).

## **2.2. Accessible tourism destinations**

Madeiro Barbosa (2008) applied a methodology to measure competitiveness in 65 tourism destinations in Brazil based on five macro-variables: infrastructure (general and access); tourism (tourism infrastructure, tourist attraction and promotion of destinations); public policies; economy (economic activities and business capacity); and sustainability (social, environmental and cultural aspects). These included a total of thirteen micro-variables. Examining one of these macro-variables (tourism), this study includes a measurement of compliance with the access requirements for persons with disabilities. Although the main objective of the research was not the measurement of accessibility in tourism, it is one of the first competitiveness investigations that include accessibility as a variable in competitiveness destination measurements. Starting in 2008 and based on the information detailed above, Brazil's Ministry of Tourism computed the National Tourism Competitiveness Index, which has included, since 2011, the measurement of accessibility as one of its variables (access). Since 2013, accessibility has been included for three other variables: general infrastructure, tourist services and equipment, and tourist attractions. The 2015 index results show that accessibility conditions increase the competitiveness value of the different variables.

In another investigation of destination competitiveness, Domínguez *et al.* (2015) consider 17 attributes and focus on the measurement of two variables: level of accessibility (degree of access) and the number of accessibility products and services offered. The authors analyze competitiveness in accessible tourism between Australia and Spain at the country level as well as for the tourist regions of both countries. They use a cluster analysis, suggesting three possible accessibility situations:

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<sup>1</sup> Some authors point out the need to discuss how the concept of destination competitiveness can be brought closer to the central point -namely, the visitor's experience (Crouch and Ritchie, 1999; Dwyer and Kim, 2003; Hong, 2009).

i) destinations that have advanced in tourist accessibility through the offer of specific products; ii) destinations that have identified the accessible tourism market as a business opportunity and incorporated accessibility conditions as a policy of differentiation; and iii) destinations that are not working to improve tourism accessibility and, therefore, will not have advantages derived from the exploitation of this segment or, indirectly, from the segment of family and senior tourism. While the study concluded that tourism destinations in both countries illustrate similar behavior, interesting findings emerged in the detailed comparison. It was observed that intrinsic tourism attractions such as climate, location, or tourism structure are more important for Spain, whereas the quality of services, brand and infrastructure were more significant for Australia's competitive position. The investigation suggests that any tourism destination has the potential to become an accessible tourism market. In the cases studied, there existed a concordance of demands to promote the development of infrastructure, products, services, promotion and marketing information, and the provision of adequate information for people with disabilities. Finally, the findings suggest that a destination's competitive factors are country-dependent and that destination competitiveness must be considered according to different types of disabilities because the needs of people with disabilities vary. For instance, larger cities tend to be the main focal points of greater accessibility (for example, Sydney, Melbourne, Madrid and Barcelona)<sup>2</sup>.

The UNWTO (2015) conducted another effort to measure accessibility tourism and has published a model of indicators to measure accessibility as part of the tourism value chain. The model has eight stages (and sub-stages); each stage includes a number of indicators. In the first, UNWTO suggests a definition of the tourism value chain and then application of the given indicators, which must be evaluated through the following key-issues: access, cleanliness, common spaces, management, information and communication, mobility, staff training, services, and use. While considered a comprehensive measurement of accessible tourism, this method has the disadvantage of being very difficult to put in practice: the information required is often difficult to come by.

Recently, Porto, Rucci and Ciaschi (2016, 2017) completed several studies related to accessible tourism and competitiveness. Porto and Rucci (2016) developed a methodology to measure accessibility in tourism, in a broad sense. This study is

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<sup>2</sup> Another study, Kastenzholz, Eusébio, Figueiredo and Lima (2012), presented the municipality of Lousa in Portugal's initiative to become the first accessible tourism destination in that country. Lousa has a long history of supporting initiatives for persons with disabilities, given the area's nature and rural tourism potential. The study, which showed the results of the Lousa project, consisted in an analysis of the municipality's potentialities to enhance its competitiveness and the central strategy to become an accessible destination. These strategies included making the accommodation units more accessible, generating a certificate called «Lousa Accessible» to award those establishments that had invested in making their products and services more accessible, create an accessible route to observe the destination's wildlife, among other. The study indicates that Lousa used accessible tourism as a strategic tool to gain competitiveness by attracting an underserved and typically loyal market, and by creating a culture of social responsibility that would enhance a shared, human vision of the destination amongst stakeholders, including tourists, who increasingly value socially-responsible positions.

built on an examination of overarching tourism destination competitiveness from a disability and accessibility perspective. It takes into account variables that show the political will of countries for accessible tourism, including the population of people with disabilities, legal frameworks, government capacity to implement legislation that supports tourism infrastructure, and services that cater to travelers with disabilities. Special focus is granted to accessibility at UNESCO World Heritage Sites in each country. In Porto, Rucci and Ciaschi (2016) six countries of Latin America (Argentina, Brazil, Chile, Paraguay, Uruguay and Venezuela) for the 1995-2014 period are analyzed. Some results indicate that accessibility has been increasing over the years, especially since 2006. The Convention of Rights of People with Disabilities (CRPD) and the 2010 conditions of accessibility for the World Heritage Sites, have both made an impact. According to this study, Brazil and Argentina have greater accessibility in terms of the political will (legal frameworks, organizations for the treatment of tourism and disability, national programs) and at World Heritage Sites. Porto, Rucci and Ciaschi (2017) also applied a revised version of the Porto and Rucci (2016) index related to tourism specialization for four South American countries (Argentina, Brazil, Chile and Uruguay), showing that when destinations become more accessible, in a broad sense, the change has a positive effect on tourism flows.

### **2.3. A future step in competitiveness: smart accessible cities**

Recent literature has begun to consider accessibility as one of the four axes (innovation, technology, sustainability and accessibility) for the development of smart cities and smart destinations. The accessibility component makes it an important item to be included in the measurement of competitiveness.

The Ministry for Industry, Energy and Tourism of Spain (2015) considers that a country, region or industry's leadership over time depends on its ability to anticipate the future and consciously prepare itself to welcome the best possible conditions. Given this, the study shows the decision to invest in a transformation of the Spanish tourism model in 2012 using an structure based on innovation, technology, sustainability, and accessibility, secured both the present and the future of tourism in the country.

Lheureux-De-Freitas and Macanar (2013) present the case of Porto Alegre in Brazil, which employed different initiatives to become a smarter city. One of those initiatives is accessibility. A Master Plan for accessibility was created to make Porto Alegre a pioneer in the country on the issue, it considered: i) the «accessible route», a project to make service, tourism and culture sites accessible to all; ii) the «blue area», free parking to people with disabilities; iii) the «free pass», an initiative through which mentally, physically, visually or hearing disabled persons are entitled to free passes on buses, as long as their monthly income does not exceed six times the minimum wage; iv) a public employment access program for persons with disabilities, and v) Ombudsman's Special Department for Social Inclusion and



Accessibility that deals with complaints by persons with disabilities concerning city services.

Suryotrisongko, Kusumaa and Ginardib (2017) provide a concept for a smart city designed as a disability-friendly environment. Four standards are defined to make smart city designed with persons with disabilities in mind: accessibility, safety, problem solving, and flexibility. Accessibility means that disability service facilities should be easily accessible and not difficult to use; safety means that disability service facilities does not cause harm; problem solving is a standard used as a determinant of the feasibility of facilities, describing if the service facility is in accordance with the needs of the problem rather than creating new problems; flexibility reflects whether the service facilities provided are easy to use anywhere, anytime, and by anyone.

### 3. Explanation of the accessible tourism index

As already noted, this work computes a broad measure of accessible tourism as an index. It lays out the conditions of accessibility in the tourism sector showing, on the one hand, political willingness for accessibility tourism in a country and, on the other hand, tourism accessibility as a measured component of destination competitiveness.

The index computes four components: i) international tourism and the share of population with disability; ii) legal framework; iii) policy, and iv) access conditions in tourism resources (Table 1). Therefore, it sets out a logic that shows that, if a country has people with disabilities, which it recognizes as a vulnerable population (WHO, 2011) with needs that must be attended to, and international tourism in that country is significant, the government must guarantee the full exercise of rights to persons with disabilities; the tourism sector is a critical arena for such achievement. In this way, the index is a tool that shows: i) the political will of the countries through the existence of laws that establish rights; ii) the implementation of such willingness, through the existence of organizations that design and develop policies with disabled persons in mind, and iii) the conditions of access at tourism attractions and World Heritage Sites (UNESCO)<sup>3,4</sup>.

**Table 1.** Accessibility tourism index

<b>I. International tourism and disability importance</b>
i. Population with disability - Total population relationship.
ii. International tourist arrivals (number of arrivals) - Total population relationship.

<sup>3</sup> The methodology of the accessible tourism index is described in Porto and Rucci (2016) and Rucci (2018).

<sup>4</sup> Because of lack of information, the index does not include information on smart destinations variables.



<b>II. Legal Framework</b>
<ul style="list-style-type: none"> <li>i. Adherence to the Convention on the Rights of Persons with Disabilities (CRPD) and its Optional Protocol.</li> <li>ii. Considerations of PWD rights into Constitution.</li> <li>iii. Tourism normative regulation.</li> <li>iv. Disability normative regulation.</li> <li>v. Accessible Tourism normative regulation.</li> </ul>
<b>III. Policy</b>
<ul style="list-style-type: none"> <li>i. Tourism organization.</li> <li>ii. Disability organization.</li> <li>iii. Accessible Tourism organization.</li> </ul>
<b>IV. Access Conditions in tourism resources</b>
<ul style="list-style-type: none"> <li>i. Access conditions in the World Heritage Sites (UNESCO).</li> </ul>

Source: elaborated by authors.

Developing a methodology that can measure accessibility in tourism serves a practical contribution to the literature; it strengthens and supports research on disability while also fulfilling WHO recommendations (2011) for the improvement of disability data collection. It prioritizes nine areas of implementation, organized by sector (health, education, social protection, labor, transport, housing) and actors (governments, civil society organizations, including disabled people’s organizations, professionals, the private sector, and people with disabilities and their families). WHO (2011) also mentions that it is fundamental that methodologies for collecting data on people with disabilities be developed, tested cross-culturally, and applied consistently. Data must be standardized and internationally comparable so that it can be used for benchmarking, to monitor progress regarding disability policies, and for the national and international implementation of the CRPD. Moreover, to improve the well-being of the disabled community, studies on accessibility must be supported.

#### 4. Methodology and estimations

In this work, an analysis of the economic determinants of regional tourist flows is made for 17 Latin American countries for the period 1995-2015 using a panel data model; this method permits variability for both time and the countries’ dimensions (cross section).

The role of accessibility, calculated by computing the previously mentioned index, is included.

The equation to estimate (in natural logarithm) is the following:

$$Y_{it} = \alpha_{it} + \gamma_i + \beta_1 Acces_{it} + \beta_2 Sites_{it} + \beta_3 Acces_{it} * Sites_{it} + \beta_4 GDPpc_{i,t} + \beta_5 Pop_{i,t} + \beta_6 rer_{it} + \beta_7 crisis_{it} + u_{it} \tag{1}$$

where  $Y_{it}$  represents the tourist inflow to country  $i$  in period  $t$ ;  $\alpha_{it}$  is the constant of the regression;  $\gamma_i$  are characteristics of country  $i$ , which are assumed to be constant over time.  $Acces_{it}$  represents the accessibility index of country  $i$  at time  $t$ ;  $Sites_{it}$  makes reference to the number of heritage sites in country  $i$  in year  $t$ . Lastly,  $GDPpc_{it}$ , represents the Gross Domestic Product per capita of country  $i$  in period  $t$ ;  $Pop_{it}$  expresses the population of the country  $i$  for period  $t$ ;  $rer_{it}$  is the real exchange rate of country  $i$  in period  $t$ ; and  $crisis_{it}$  is a dichotomous variable that takes the value of one if a crisis happened in the country  $i$  during this period; and  $u_{it}$  is the error term that complies with the properties that ensure the consistency of the regressors.

According to the theory and the empirical evidence, we expect a positive sign both in the coefficient associated with country population and its GDP per capita. This is because both variables represent the size of a nation; GDP per capita, in particular, indicates the country's degree of development and, as a result, would indicate more favorable conditions for economic activity and tourism. The coefficient associated with a country's real exchange rate is also expected to have a positive sign as, in principle, a greater value implies that the country offers a cheaper alternative to its competitors in tourism services. The coefficient associated with an economic crisis is expected to have a negative sign: a country that is suffering from social or economic instability, for security reasons, becomes less attractive to potential tourists.

Finally, we expect that the coefficients associated with the number of heritage sites and the accessibility index still have positive signs. As mentioned, evidence suggests that the appointment of tourist attractions as heritage sites by UNESCO encourages tourism demand. Regarding the accessibility index, we expect improved facilities—in broad terms—at these sites will generate a greater influx of tourists. The estimation of this last coefficient represents the main motivation of this work; its calculation reflects an effort to encourage the inclusion of accessibility in existing measures of tourism competitiveness.

In the literature, it is common to use fixed-effect estimates with panel data (Cheng and Wall, 2004; Vargas da Cruz, Camargo Rolim and Vampre, 2007) to estimate the econometric model presented in equation (1). We discard Ordinary Least Squares (OLS) estimates because this method cannot capture unobserved heterogeneities across countries, and thus results in biased and inconsistent estimators of the interest coefficients. To avoid this problem, one can make estimations with fixed effects or random effects. In this work, we choose to renounce the gains in efficiency given by random effects estimates; we instead used the gain in consistency which implies the use of fixed effects estimates. In this way, it is possible to control for all unobservable heterogeneities that do not vary in time, or that vary only slightly.

Additionally, it is possible to perform a Hausman test that indicates, in terms of consistency of the estimates, if it is convenient to use random effects or fixed effects. Test results provide evidence that rejects the null hypothesis that both estimators are consistent for all levels of significance. We also performed a test of absence of fixed effects; these results suggest that, for all levels of significance, there is evidence to reject the null hypothesis of the absence of fixed effects.

In conclusion, both the existing literature and the econometric theory support the use of fixed effects methodology to estimate the coefficients of equation (1) and, in particular, those associated with the number of heritage sites in the country and the accessibility index, both of which are of central interest in this work.

## 5. Alternative accessibility measures

It is possible to create alternative measures of this variable that generate a better analysis of the effect of accessibility on regional tourist demand.

The first alternative measure we define in this work is the remoteness of accessibility. Based on a definition of remoticity already applied in the literature<sup>5</sup>, a new index is computed. Instead of taking into account the distance between alternative destinations, we consider the accessibility of potential competitors. For example, the remoticity accessibility index for one country in one year is given by the sum of the ratios of the accessibility index to GDP per capita for its potential competitors, in the region, in that year. The advantage of this indicator, given the econometric specification of fixed effects used, is its greater variability both temporally and between countries. This variability allows for improved estimation of the effect of accessibility on tourist arrivals.

The remoticity of accessibility is defined as:

$$RemAcc_{i,t} = \sum_h \frac{Accessibility\ Index_{i,h}}{GDP_{h,t}}$$

Where  $i$  indexes the country of interest (the country for which the index is calculated), whereas  $h$  references the rest of the countries in the region.

Another alternative to measuring accessibility is to consider the difference in the accessibility of each country with respect to the average accessibility for the region, for each year. For example, for one country in one determined year, we first compute the average accessibility index of the region and then we compute the difference between that value and the accessibility index for each country for the same year.

## 6. Results

The results of this work are exposed in Tables 2-4. Models a, b and c (Table 2) use the accessibility index shown in section 3. The specifications d, e, and f (Table 3) use the remoticity accessibility index as a measure of accessibility. The g, h

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<sup>5</sup> The remoticity index (Anderson, 1979; Deardorff, 1998) refers to how far apart spatially the country  $i$  and its potential competitors are. That is, it is a sum of distances weighted by the size of the economies of the alternative destinations. For a detailed explanation on the remoticity index, see Porto, Garbero and Espínola (2013).

and i models (Table 4) consider the difference in the countries' accessibility with respect to the regional average. The analysis is reinforced by estimating the models b, c, f, g, h and i, controlling first by capital inflow variables, as in the work of Yang, Lin and Han (2010), and second, by trade volume, as in Roh, Bak and Ming (2015). Capital inflow is measured by direct foreign investment (FDI), which is used as a proxy for the volume of business carried out by foreigners within each country. The volume of trade refers to the total sum of goods and services exchanged abroad; that is, the total sum of imports plus exports. The results seem to reaffirm that the dependent variable reflects the behavior of recreational tourism and not that of business tourism<sup>6</sup>.

**Table 2.** Determinants of international tourism - Accessibility index

<i>Tourist Inflow</i>	(a)	(b)	(c)
<b>Population</b>	1.162*** (0.373)	1.216*** (0.394)	1.297*** (0.382)
<b>GDP</b>	0.708*** (0.0878)	0.763*** (0.0901)	0.671*** (0.0974)
<b>Real Exchange Rate</b>	-0.0512 (0.0705)	-0.0995 (0.0707)	0.000832 (0.0750)
<b>Crisis</b>	-0.0645* (0.0381)	-0.0631* (0.0380)	-0.0601 (0.0400)
<b>Accessibility Index</b>	0.244*** (0.0539)	0.316*** (0.0505)	0.245*** (0.0536)
<b>Constant</b>	7.464*** (0.659)	8.940*** (0.638)	7.737*** (0.673)
<b>Observations</b>	324	324	319
<b>R-Squared</b>	0.726	0.769	0.728
<b>Number of countries</b>	17	17	17

Standard errors in parentheses.

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

**Table 3.** Determinants of international tourism - Accessibility remoteness index

<i>Tourist Inflow</i>	(d)	(e)	(f)
<b>Population</b>	1.216*** (0.394)	1.784*** (0.377)	1.058*** (0.399)
<b>GDP</b>	0.763*** (0.0901)	-0.0618 (0.149)	0.768*** (0.0944)

<sup>6</sup> Estimations are available upon request.

<i>Tourist Inflow</i>	(d)	(e)	(f)
<b>Real Exchange Rate</b>	-0.0995 (0.0707)	0.164** (0.0766)	-0.124* (0.0710)
<b>Crisis</b>	-0.0631* (0.0380)	-0.0463 (0.0355)	-0.0671* (0.0376)
<b>Accessibility Index</b>	0.127*** (0.0387)	0.191*** (0.0373)	0.120*** (0.0387)
<b>Constant</b>	7.833*** (0.681)	9.075*** (0.661)	8.080*** (0.689)
<b>Observations</b>	313	313	308
<b>R-Squared</b>	0.708	0.748	0.710
<b>Number of countries</b>	17	17	17

Standard errors in parentheses.  
 \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

**Table 4.** Determinants of international tourism - Accessibility versus average accessibility

<i>Tourist Inflow</i>	(g)	(h)	(i)
<b>Population</b>	1.297*** (0.382)	1.519*** (0.367)	1.166*** (0.383)
<b>GDP</b>	0.671*** (0.0974)	0.0231 (0.149)	0.661*** (0.0996)
<b>Real Exchange Rate</b>	0.000832 (0.0750)	0.199** (0.0800)	-0.0245 (0.0756)
<b>Crisis</b>	-0.0601 (0.0400)	-0.0420 (0.0383)	-0.0636 (0.0396)
<b>Accessibility Index</b>	0.103** (0.0519)	0.141*** (0.0500)	0.110** (0.0517)
<b>Constant</b>	7.636*** (0.662)	8.726*** (0.662)	7.903*** (0.672)
<b>Observations</b>	324	324	319
<b>R-Squared</b>	0.698	0.726	0.701
<b>Number of countries</b>	17	17	17

Standard errors in parentheses.  
 \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

Within the presented models, all the estimated coefficients of interest have the expected signs and are significant in explaining tourism demand for the 17 Latin American countries. The only exception can be found with the real exchange rate:

given the heterogeneity of exchange rates in the countries included in the sample, we can expect that the estimated coefficient will not be significant. In sum, these results suggest that accessibility (measured by the index) is a relevant determinant of tourism demand in the Latin American sample and can explain even a 30% of demand, depending on the specification used.

## 7. Conclusion

Over the last decade, tourism researchers have held particular interest in identifying, measuring, and systematizing the variables used to determine the competitive position of tourism destinations. These calculations are important factors in decisions made by policymakers, destination managers, tourism entrepreneurs, and by stakeholders, in general (Pulido-Fernández and Rodríguez-Díaz, 2016). What place do accessibility, technological aspects of smart destinations, innovation, and sustainability, hold in the measuring of competitiveness? In this paper, we focus on one of these dimensions—accessibility—to shed some light on its broader definition, alternative ways to measure it, and its potential relationship with technological aspects of smart cities destinations.

Although a number of studies have focused on measuring the competitiveness of tourist destinations (Ritchie and Crouch, 2003; Dwyer and Kim, 2003; WEF, 2011) and several include technological and social indices (Gooroochurn and Sugiyarto, 2005), only a few have studied accessibility in tourism in the context of competitiveness (Madeiro Barbosa, 2008; Domínguez, Darcy and González Alén, 2015; Porto and Rucci, 2016; Rucci, 2018). More recently, accessibility began to be considered as one of four axes (innovation, technology, sustainability, and accessibility) for the development of smart cities and smart destinations (Kastenholz, Eusébio, Figueiredo and Lima 2012; Lheureux-De-Freitas and Macanar, 2014; The Ministry for Industry, Energy and Tourism of Spain, 2015; Suryotrisongko, Kusumaa and Ginardib, 2017). Accessibility in tourism is a challenge that those seeking destination competitiveness must take on. These issues highlight the potential of accessible tourism as a destination competitiveness measure. However, it is important to keep in mind that this potential should be combined with concrete action to generate the conditions of full accessibility, including investments in infrastructure, human resources training, and promoting awareness on the subject. Accessibility and the universal design of tourism products, services and environments guarantee full use of rights. Recognizing the rights of people with disabilities (in its broadest definition) is one of the most important goals of contemporary society. When these rights include the enjoyment of recreational, cultural and recreational activities, two key issues appear: first, that people with disabilities possess the right to tourism and, second, the consequent need to incorporate accessibility as a means of effectively recognizing that right

In this paper, a broad measure of accessible tourism is computed as an index, allowing for the identification of necessary future policies at the national and regional levels. It sets out to consider the conditions of accessibility in the tourism

sector, taking into account, on one hand, the political willingness of a country, and on the other, the issue of tourism accessibility, which includes a destination competitiveness measure. The results of the exercise presented in this paper show that, for our case study of the Latin American countries, the approach used to measure tourism accessibility goes in the right direction: the models showed that accessibility is important in explaining international tourism demand. Now, the challenge is to consider it as a determinant of competitiveness tourism destination and to learn how to measure it.

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