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METHODS AND MEASUREMENT TECHNIQUES IN TOURISM¹

*Statistical thinking will one day be as
necessary a qualification
for efficient citizenship as the ability
to read and write.*

H.G. WELLS

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Tourism has become an important economic and social activity in the world since the end of World War II. According to the World Tourism Organization (UNWTO), the number of inbound tourists increased from 25 million in the 1950s to almost 1,2 billion in 2016 (UNWTO, 2017), and the number of domestic trips is calculated to be between 5 to 6 billion in 2015 (UNWTO, 2016). Significant efforts have been carried out by the World Tourism Organization together with the Department of Statistics of United Nations to build new methodologies for measuring inbound, domestic, and outbound tourism trips and expenditures (UNWTO, 2010, 2015). The need for measuring tourism activities is in the spirit of William Petty, Gregory King, Arthur Young and the group of physiocrats, who carried out statistical and accounting activities in England and France (17th and 18th centuries) to measure national income, salaries, assets, population and the interrelationship between sectoral activities (Cortés & Pinzón, 1996).

Several academic works have investigated tourism from an economic perspective, in which statistical models of tourism demand and supply have been employed (see Lundberg, Krishnamoorthy, & Stavenga, 1995; Mak, 2004; Reece, 2010; Stabler, Papatheodorou, & Sinclair, 2010; Vanhove, 2005). Analyses of the methods and techniques to measure tourism from a statistical perspective have received less attention in the literature. The book under review contributes to filling this gap by guiding research through different chapters on research methods (chapter 1), measurements in tourism (chapter 2), the design of questionnaires as a tool of statistical analysis and sampling (chapters 3 and 6), descriptive statistics and hypothesis testing (chapters 4 and 7), probability theory (chapter 5) and regression analyses (chapter 8), as well as tourism satellite accounts (chapter 9).

One of the most important tools for conducting research on tourism topics is the utilised research method. Leguizamón's book shows the adequacy of the scientific method to examine research problems in tourism issues. The systematic process described in the book includes the research problem delimitation, research hypothesis formulation, data collection, hypothesis testing and analysis and interpretation of results. The scientific method has been applied in experimental studies (whether causal or quasi-experiments as noted by the author) on diverse tourism issues, including the demand for international (Schiff & Becken, 2011) and domestic (Alegre, Mateo, & Pou, 2013) tourism, on competition in the package tour industry (Davies & Downward, 1998), on the impact of tourism on economic growth (Ivanov & Webster, 2007) and poverty alleviation (Croes & Vanegas, 2008), among other issues. The volume provides other research designs besides experimental research that can be applied to tourism related issues, including exploratory, descriptive and evaluative designs.

The book contains tourism indicators associated with the hotel industry, including the hotels' average occupation price and percentage, an index of hotel capacity (or accommodation index), the hotel occupancy index, and the average overnight stay. From the perspective of revenue management in the hotel industry, the author shows how to calculate the average daily hotel price, the average revenue per available room and other financial indicators such as gross operational profit per available room, and the relative change of room sales. Indicators associated with other tourism related industries, as presented in UNWTO (2010), could have been included here: the index of occupation and capacity in restaurants could be added, as well as other indices for entertainment, cultural activities, transport, storage and communication. The latter group of industries have between 30 and 40 percent of economic

activities associated with tourism, according to the International Standard Industrial Classification, revision 4 (United Nations, 2008).

The separation of indices per target market promises an important challenge for tourism statistics. Ultimately, hotels, restaurants and other tourism-characteristic industries provide services for domestic and international tourists, as well as for locals. The differentiation of consumer types would be useful in designing specific marketing strategies aimed at maximizing companies' profits, as well as identifying the value of contribution of each tourist profile to national tourism consumption. As noted by the World Travel and Tourism Council (WTTC), the consumption of domestic tourists accounts for 70,7 percent of total tourism spending across the world (WTTC, 2017). In Colombia, the National Administrative Department of Statistic (DANE) found that domestic tourism spending contributed to 77,7 percent of total tourism spending between 2000-2005 (DANE, 2011).

From a macroeconomic perspective, Leguizamón describes sectorial indicators in tourism, including the relative frequency of tourism trips by motivation (leisure and recreation, business and professional, studies, health, and others as described by the UNWTO (2010)), and the average length of stay. It highlights the need of including the set of integrated statistics that the UNWTO and the UN have developed for tourism (see UNWTO, 2010, 2015). Other economic indicators that show the sectorial contribution of tourism spending to Gross Domestic Product (GDP), the per capita tourism consumption (by visitor residents and non-residents), and the contribution of tourism to employment generation are also described in this book.² Due to the nature of data used for these sectorial

² Another set of indicators used in tourism are described in DANE's (2013) publication on the methodology of the internal spending survey in tourism (EGIT) 2012-2013.

indicators, it could be argued that the supply side of tourism is the only side that can be examined. Further sectorial indicators associated with the demand side of tourism are worthy of exploration. Based on theoretical foundations, indicators linked to destination attributes at the urban and provincial levels such as climate (Bujosa & Rosselló, 2013), nature-based attractions such as beaches (Marrocu & Paci, 2013), and man-made attractions such as theme parks, gondola lifts, museums, restaurants, sky towers, and so forth (Swarbrooke & Page, 2012) could be explored.

The type of data that can be used in tourism analyses are also described by this volume. Data collected from surveys have been widely used to test hypotheses on international (Seddighi & Theocharous, 2002), domestic (Nicolau & Más, 2006) and outbound (Eugenio-Martín & Campos-Soria, 2011) tourism. Questionnaires are the main instrument of measurement in research according to Leguizamón, through which survey data are collected. The book also describes the structure of a questionnaire and the type of questions that it can contain (including the scale of measure for each type of question) and shows the importance of designing a good questionnaire to have consistent analyses. It also examines solutions for limitations that arise from data collection. Since primary data on tourism issues are collected from visitors and tourists (who belong to households, companies or both), the author shows how to best carry out sampling to get information from the universe population (statistical inference).

A common practice in tourism research is to present descriptive statistics on the dependent and independent variables. Statistics on the frequency distribution and measures of localization and dispersion are explained in detail by the author. The role of descriptive statistics can be observed in tourism studies,

including Balli, Balli, & Cebeci (2013) and Su & Lin (2014), in which the variables' mean, median, standard deviation, minimum and maximum were analysed before estimating the proposed econometric model. For Casa & Santos (2002), descriptive or inductive statistics should be understood by professionals in economics and administrative areas, as descriptive statistics show introductory and basic analyses of data that stem from primary and secondary sources.

Studies that use primary data as the source of analysis usually employ discrete choice models, which are linked to probability theory (see Manski & McFadden, 1981). For instance, the latest advances in tourism demand studies that use primary data are conducted using binary and multinomial choice models to examine tourists' behaviour (see Hsu, Li, & Yang, 2013; Lyons, Mayor, & Tol, 2009; Nicolau & Más, 2006). Probabilistic choice models are usually estimated using nonlinear methods in cross section or panel data analyses (see Train, 2009). Leguizamón devotes a chapter on probability theory, in which the concepts of random experiments and variables are explained in detail. Probabilistic choice theory and methods have been worked by a group of experts, including the Nobel prize in economics of 2000 (see McFadden, 2001).

Linear regression models and correlation analyses are also described in this book. Linear regression models have been used to study several research problems in tourism. For instance, Crouch (1994) and Song & Li (2008) noted that linear regression models are widely used in the literature to examine the determinants of tourism demand, and within the gamut of estimation methods, the classical ordinary least square is regularly employed. Leguizamón's analysis of linear regression models that are estimated with ordinary least squares is a fundamental foundation for more

elaborate models that are currently employed in tourism (see Song, Dwyer, Li, & Cao, 2012; Song & Li, 2008).

Finally, the volume introduces the tourism satellite account (TSA), with which the economic contributions of tourism activities to GDP can be analysed. Details on the methodology utilised to calculate tourism satellite accounts in Colombia are also presented in DANE (2011). Vanhove (2005) and Reece (2010) extend analyses on the use of tourism satellite accounts and input-output tables in tourism, respectively. The construction of tourism satellite accounts (TSA) at the provincial levels (in parallel with the construction of input-output matrices) would be fundamental for two main reasons. First, TSA would help to identify the contribution of tourism characteristic industries to the provinces' GDP. Second, TSA would support analyses on the impacts of changes in tourism demand (domestic and international) on the overall regional economy (employment, taxes, profits, and intermediate consumption).

In conclusion, this review shows the author's view on the importance of understanding statistical methods and techniques to assist research questions in tourism. The review also highlights opportunities to develop further tourism indicators and research advanced econometric methods that can develop strategies and policy initiatives in tourism.

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