



Building composite indicators in tourism studies: Measurements and applications in tourism destination competitiveness



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HIGHLIGHTS

- The proposed protocol can be useful to researchers interested in building composite indicators in tourism.
- Available composite indicators of tourism destination competitiveness were analyzed and evaluated.
- The assessment of indicators' ability to capture tourism competitiveness complexity showed the need for improvements.
- The guidelines facilitate comparability, standardization and quality assurance of composite indicators.

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ABSTRACT

Composite indicators are useful tools to synthesize and monitor multidimensional phenomena. The aim of this paper is twofold: to offer the methodological foundations to build composite indicators in tourism and to evaluate a set of currently available composite indicators. Tourism destination competitiveness indicators constitute the object of this contribution. Their definitions, concepts and measures are analyzed and their evaluation is performed through the application of an original protocol. The results highlight that several methodological issues still surround the measurement of destinations competitiveness indicators. This paper provides tourism scholars and practitioners with a set of statistical guidelines to build composite indicators and with an operative scheme to assess indicators' effectiveness in empirical evaluations.

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1. Introduction

The role of indicators in assisting tourism planners and decision makers in evaluating performances, setting targets and anticipating future scenarios has been widely acknowledged by scholars (e.g. Croes, 2011; Crouch, 2011; Dwyer & Kim, 2003). Indicators help in tracking changes and identifying trends, and can be used to measure outputs and reveal relative performance of entities (Volo, 2015). Particularly, composite indicators (CIs) are “much easier to interpret than trying to find a common trend in many separate

indicators” (Nardo, Saisana, Saltelli, & Tarantola, 2005, p. 6). Depending on the number of input variables, indicators are: (a) individual or simple, in other words based on a single input variable, or (b) composite, which means based on two or more input variables. A composite indicator is a mathematical combination of individual indicators that represent different dimensions of a concept whose description is the object of the analysis (Saisana & Tarantola, 2002). By conveying rich and relevant information into a single figure, CIs provide social and economic policy makers with a holistic picture of the phenomenon under observation (Saltelli, 2007).

In several scientific areas, CIs are well established tools to monitor social phenomena such as development, deprivation, social exclusion, quality of life, well-being, pollution and other social issues (e.g. Sirgy, Efraty, Siegel, & Lee, 2001; Slottje, 1991; UNDP, 2014; Weziak-Białowolska & Dijkstra, 2014). On the contrary, examinations of social and economic phenomena in tourism are only

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occasionally accompanied by the construction of CIs, whose development remains mostly at a germinal stage when compared to other fields of social research. The difficulties in creating a system of tourism indicators have been recognized in past literature; indeed, several authors have raised concerns and pointed out deficiencies in the methodological and procedural aspects of indicators' building processes (e.g. Croes, 2011; Lozano-Oyola, Blancas, González, & Caballero, 2012; Mazanec & Ring, 2011; Tanquay, Rajaonson, & Therrien, 2013; Torres-Delgado & Saarinen, 2014).

The aim of this paper is to offer a contribution to the methodological foundation in building CIs in tourism. By providing an empirical assessment of a set of currently available CIs, namely composite indicators of tourism destination competitiveness, this study proves how caution ought to be used when abridging a multitude of data into monodimensional information. Tourism scholars and practitioners can benefit from a set of easily implementable statistical guidelines useful to build CIs and to assess the empirical effectiveness of those available.

2. Composite indicators in tourism destination competitiveness studies

The most frequently used simple and composite indicators in tourism are those referring to destination competitiveness. The application of these indicators to international tourism areas has: spotted relevant input attributes, provided destinations rankings and opened the debate on the appropriateness of currently used definitions and measurements of destination competitiveness (Croes, 2005, 2011; Mazanec & Ring, 2011; Papatheodorou & Song, 2005). Given the relevance of the topic, tourism destination competitiveness (TDC) indicators constitute the object around which this study frames the methodological, applied and managerial considerations essential when building a CI. This section provides a cohesive critical review of previous studies on tourism destination indicators and discusses their measurement approaches.

TDC literature is quite extensive and definitional; conceptual and empirical studies have proliferated (Croes, 2011; Crouch, 2011; Crouch & Ritchie, 1999, 2006; Dwyer & Kim, 2003; Enright & Newton, 2004, 2005; Hassan, 2000; Mangion, Durberry, & Sinclair, 2005; Ritchie & Crouch, 2000, 2003; Tsai, Song, & Wong, 2009). Early studies focused on identifying those attributes that characterize destination competitiveness (e.g. Crouch & Ritchie, 1999; Ritchie & Crouch, 2000) and proposed extensive lists of individual indicators (e.g. Dwyer & Kim, 2003). Accordingly, there is a plethora of attempts to identify, classify and use individual competitiveness indicators for tourism destinations.

However, a comprehensive view of such a complex phenomenon, and of its dynamics over time, can be captured only through an explicative framework that should render meaningful and effective information to scholars, managers and policy makers (Assaker, Hallak, Esposito Vinzi, & O'Connor, 2014; Mazanec & Ring, 2011; Mazanec, Wöber, & Zins, 2007). Thus, recent efforts –recognizing the complex, latent and holistic nature of tourism destination competitiveness– propose composite indicators to measure its multifaceted aspects (e.g. Blanke, Chiesa, & Crotti, 2013; Croes & Kubickova, 2013; Gooroochurn & Sugiyarto, 2005; Mazanec & Ring, 2011).

Literature on TDC composite indicators reveals several common concerns herein presented.

-Definitional differences: Past studies on TDC do agree on the two paradigms at the basis of TDC, the Ricardian comparative advantage theory (Ricardo, 1817) and the Porterian competitive advantage framework (Porter, 1990). Nevertheless, definitions vary

across studies showing both the growing interest in the phenomenon and its natural mutations (from market share oriented to sustainability oriented). Still, “a universal and precise definition does not exist” (Croes & Kubickova, 2013, p.148). The mainstream literature struggles with the TDC concept and its application. The former often rendered vaguely and with multiple connotations, the latter made challenging by the fuzzy nature of the concept. Several concerns relate to the TDC construct; with some definitions appearing distant from the operational construct and, as Mazanec et al. (2007) noticed, a comprehensively and artfully designed concept of TDC that is unrelated to actual destination performance provides limited contribution.

- Construct complexity: The multi-layered nature of the construct, characterized by cause–effect relationships and interaction effects has been discussed by several authors (e.g. Croes, 2011; Mazanec & Ring, 2011). Despite several attempts, past literature on TDC barely frames the construct within its real complexity. This vagueness seriously affects the quality and usefulness of the obtained indicators because hardly a measure can be sharper than the concept it is aiming at quantifying (Mendola, Contu, Oliveri, & Burgio, 2013). Furthermore, Croes (2011) and Crouch (2011) argue that no consensus is reached on the set of TDC determining factors and their valence. Thus, Mazanec et al. (2007) and Croes (2011) notice that most of the attempts to isolate the determinants of TDC fail in distinguishing among inputs, outcomes and instruments. Finally, complexity relates also to the managerial challenge of transforming the potential to compete in ability or actual competitiveness (Croes & Kubickova, 2013); most past studies do not address this issue.

- Challenges in the selections of relevant components/attributes: Leading pieces in TDC literature (Crouch & Ritchie, 1999; Dwyer & Kim, 2003; Ritchie & Crouch, 2000, 2003) are considered fundamental to study the construct and to identify pillars or dimensions, sub-dimensions and simple indicators. Furthermore, several studies that build a CI of tourism destination competitiveness (e.g. Blanke et al., 2013; Gooroochurn & Sugiyarto, 2005) made the effort to establish a set of basic indicators to use and constantly update for the purpose of comparability across time. Still some authors point out that the available CIs are weakly related to TDC construct. The use of non-relevant components creates a problem in the advisory power of the CI: indicators containing variables weakly related to tourism might be misleading. Furthermore, as Mazanec et al. (2007) noticed there is still weak evidence on how the theoretical dimensions of TDC are interrelated and are altogether responsible for destination success.

- Variety of destination types and of markets: The variety in size, location, economic and social development of destinations poses limits to the indicators' building processes and on the resulting competitiveness rankings. Lall (2001), Mazanec et al. (2007) and Croes (2011) pointed out how several available CIs of competitiveness ignore geographical, economical and market related differences among destinations. Recent studies acknowledge these limits and do investigate homogeneous destinations sets (Croes & Kubickova, 2013) or address these issues at an exploratory level (Ayikoru, 2015).

- Suitability of the indicator building procedure: Most of the published studies provide little evidence of having followed statistical advancements in building CIs. Furthermore, early composite indicators in TDC did lack explanatory and predicting capacity, as pointed out by Mazanec and Ring (2011). Consequently, as discussed in past studies (Croes, 2011; Lall, 2001; Mazanec & Ring, 2011) the methodological building procedure of several available CIs is inappropriate or unclear. Among the most compelling issues are those of: imputation of missing data, erroneous causality effects, arbitrary weighting of dimensions, and lack of robustness and

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