



## Case study

## Graphical models for estimating network determinants of multi-destination trips in Sicily

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## ABSTRACT

This paper proposes a two-step approach for analysing the main determinants of multi-destination trip behaviour. It is based on a combination of graphical models and of a multinomial logistic regression model; the aim is to analyse direct and indirect effects of a wide set of tourist- and trip-related characteristics on multi-destination trip behaviour. Empirical data have been derived from a frontier survey of approximately 4000 incoming tourists in Sicily (Italy) at the end of their trip. Results suggest that multi-destination trips depend directly on the length of stay, the number of previous visits and motivation for the trip, and only indirectly on the interview month, travel party, organization of the trip, and country of origin. The role of other socio-demographic characteristics, such as age or gender is confirmed to be marginal or even irrelevant.

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## 1. Introduction

The topic of *tourist mobility* has received much attention in the previous decade (Masiero & Zoltan, 2013). It is now acknowledged that the assumption that a tourist may visit a single destination is almost unreliable (Hwang & Fesenmaier, 2003). However, official tourism statistics are often unable to provide information regarding the number of destinations visited since they are based on the collection of information at only one point in the tourism system: where the trip began (region of origin) or in the destination region (Leiper, 1989). Although a considerable number of studies have focused their attention on multi-destination travel (Lue, Crompton, & Fesenmaier, 1993; Lue, Crompton, & Stewart, 1996; McKercher & Zoltan, 2014), little empirical evidence is available, mainly due to the problems in gathering data on travel itineraries (Lew & McKercher, 2002). Multi-destination trips have been recognized as a positive phenomenon for tourism destinations since they provide distinct benefits associated with the spatial interaction among tourist destinations (Gooroochurn & Hanley, 2005; Marrocu & Paci, 2013; Yang, Fik, & Zhang, 2017). Subsequently, a knowledge of factors affecting multi-destination trip decision-making could help destination

marketing organizations (DMOs) in designing marketing campaigns, which are oriented to tourists segments more likely to undertake a multi-destination trip. The knowledge of consumer preferences and characteristics can assist tour operators and DMOs in offering the best combination of destinations as a package tour for attracting more travellers (Tussyadiah, Kono, & Morisugi, 2006). Bearing in mind these premises, the aim of this paper is to provide answers to the following questions, including

- What category of tourists is more likely to undertake multi-destination visits? That is, do socio-demographic characteristics, such as gender, age, country of origin, and trip companions have an influence on multi-destination trip decision-making?
- Why do tourists decide to make a multi-destination trip? Are variables, such as trip motivation, type of holiday undertaken or trip organization, associated with the choice of making a multi-destination trip?
- When are multi-destination trips more frequent? Is there a season-related effect on multi-destination trip behaviour? The answer to this question may help DMOs in planning tourism and transportation services, according to the specific tourist season, and not only on basing their considerations on the absolute size of tourist flows.

In order to provide an answer to these research questions, a two-step approach will be proposed. This will bear in mind the wide set of

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variables involved in the analysis of multi-destination trip behaviour, and consider the complex nature of the relationships (i.e. direct and indirect) of the phenomena being analysed. In an initial step, graphical models are used in order to investigate and represent the inter-relationship among a set of tourist- and trip-related characteristics and the propensity to take a multi-destination trip, via a conditional interdependence graph. This approach will provide us with a picture of the direct and indirect relationships existing between trip-characteristics and tourist-behavioural variables. In a second step, a multinomial logistic regression will be implemented in order to quantify the effect of a set of covariates on multi-destination trip behaviour.

The results can improve the knowledge of the main determinants of tourist behaviour in terms of mobility at different destinations, as well as investigate the structure of relationships among tourist- and trip-related characteristics. From an empirical perspective the focus of this paper is the analysis of multi-destination trips in Sicily (Italy), by which a variety of potential tourism products can attract different tourist segments.

Sicily is one of twenty administrative regions of Italy. With more than 5 million inhabitants, it is the largest Italian region by land mass and the fifth most populated. In 2015 the number of arrivals at accommodation structures was approximately 2.5 million Italian tourists and 2 foreign tourists, thereby producing a total of 7.5 million and 7 million overnight stays respectively. Despite the economic crisis throughout Italy and the southern regions in particular, tourism is one of the few economic activities which has remained stable or increased slightly. On account of its cultural and environmental resources, the tourism products of Sicily enjoy great potential (Cracolici & Nijkamp, 2009), even if the sun-and-sand tourism product is still the main source of tourist flows (Volo & Giambalvo, 2008). Sicily, therefore, is characterized by a dual situation: on the one hand, there are some well-known destinations in the international market, such as Cefalù or Taormina, which can be placed in the stagnation or post-stagnation phase of Butler's destination life cycle (Butler, 1980). On the other hand, the interior of the island is generally at an initial stage of tourism development or completely outside the tourism market. However, and given the availability of many natural and cultural resources, many places are of great appeal as secondary destinations on a multi-destination trip. Thus, a knowledge of tourist segments more likely to be included in multi-destination trips could also assist secondary destinations in designing tourism product and services, in accordance with the characteristics of the demand for tourist goods and services (Lue et al., 1993). An improved understanding of the main determinants of multi-destination visits can assist cooperative marketing strategies for optimizing the potential of tourism destinations.

## 2. Literature review

The current literature relating to tourist mobility is particularly extensive, and a complete review of this topic is beyond the scope of this work. McKercher and Zoltan (2014) have grouped the studies relating to tourist mobility into three broad categories. An initial field of study, which was dominant in the 1990s, was based on the analysis of travel routes (Lew & McKercher, 2006; McKercher & Lau, 2008; Oppermann, 1995). The main findings of these studies, in the work by McKercher and Lew (2004), were grouped into a general framework of travel itineraries, based on the combination of different transit and destination touring components. More recently, applications of this topic have included the use of network analysis (D'Agata, Gozzo, & Tomaselli, 2013; Shih, 2006) and the sequence alignment method (McKercher, Shoval, Ng, & Birenboim, 2012; Shoval & Isaacson, 2007). A second emerging field of investigation is based on an analysis of intra-destination movements. The

emerging of tracking devices, such as GPS data loggers, allows for the collection of detailed and accurate information on tourist movements among attractions (Shoval & Isaacson, 2010; Shoval, Isaacson, & Chhetri, 2014). New approaches in this research are also based on the use of mobile instruments (Asakura & Iryo, 2007) or geo-tagged photos (Vu, Li, Law, & Ye, 2015; Zheng, Zha, & Chua, 2012). Issues related to data collection and a lack of a theoretical framework of the tourist's decision-making process (in turn related to visiting a particular destination), comprise two main aspects which complicate the study of intra-destination movements (McKercher & Zoltan, 2014; Nicolau & Más, 2005). The third area of investigation, which is consistent with the aims of the study outlined in this paper, is related to factors affecting the multi-destination decision-making process.

Factors affecting the choice of making a multi-destination trip can be distinguished by physical factors; human factors; time availability and budget (McKercher & Lew, 2004). As concerns physical factors, several authors (Lue et al., 1996) have highlighted the importance of cumulative attractions which, concerning multi-destination trips, can arouse more interest than when each attraction is visited separately on different trips. This would imply that a set of destinations could attract more tourists when they are located close to each other than when they are distant and isolated. As for human factors, a number of studies have concluded that single and multi-destination tourists differ in terms of tourist motivation, travel distance, party size, modes of transportation used, and previous visits to the destination (Tideswell & Faulkner, 2003; Yang, Fik, & Zhang, 2013). In terms of motivation, pleasure holiday-makers generally tend to visit more destinations than people visiting friends and relatives (VFR) or business travellers (Lue et al., 1993, 1996; McKercher & Wong, 2004; Santos, Ramos, & Rey-Maqueira, 2012). VFR tourists tend to spend more time with their family or friends, than visiting several destinations; similar considerations hold for business tourists who are generally constrained by the location of the business centre (Santos et al., 2012; Tideswell & Faulkner, 1999; Yang et al., 2013). In addition, the distance from the region of origin to the destination can exert an influence on multi-destination travel, thereby determining different behaviour between domestic and international tourists. Since long-distance trips to destinations require investing resources for transportation, lodging, and food, it is rational for tourists to visit more places, rather than to take separate trips to single principal destinations (Lue et al., 1993).

As concerns travel party, several authors (Fesenmaier & Lieber, 1988; Lue et al., 1996) have pointed out that people travelling together, such as those travelling with family or friends, are likely to seek different benefits from a trip and these may be best met by a variety of destinations in the same area. Still, the transportation mode selected by tourists during their visit may influence their movement patterns (Masiero & Zoltan, 2013). Car touring behaviour provides more flexibility in time and itinerary choice (Taplin & Qui, 1997), thus increasing the propensity to take a multi-destination trip (Tideswell & Faulkner, 1999). Several authors (Hwang, Gretzel, & Fesenmaier, 2006; Koo, Wu, & Dwyer, 2012; Lehto, O'Leary, & Morrison, 2004; Oppermann, 1997; Santos et al., 2012; Tideswell & Faulkner, 2003; Wang, 2004) have pointed out various differences in terms of mobility behaviour between those visiting the destination for the first time and repeat visitors. However, the findings of these studies are not always the same. Since multi-destination trips can reduce the risks associated with visiting unfamiliar areas (Lue et al., 1996; Yang et al., 2017), this type of travel can be favoured by first-time visitors (Hwang et al., 2006; Tideswell & Faulkner, 2003). Moreover, those at a given destination for the first time tend to visit the more traditional places; on the contrary, repeat visitors tend to explore secondary places (Lau & McKercher, 2006). Nevertheless, Wang (2004) has observed that the tendency to make multi-destination trips is higher for repeat visitors than for first-time visitors. Santos et al. (2012) have also considered the effect

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