A GPS-Based Analysis of Cruise Tourism Impacts on Mediterranean Destinations.

Mauro Ferrante, Associate Professor, Department of Culture and Society, University of Palermo (Italy), e-mail: mauro.ferrante@unipa.it (*corresponding author*)

Sandra Navarro-Ruiz, PhD Researcher, Tourism Research Institute, University of Alicante (Spain), e-mail: sandra.navarro@ua.es

Ana B. Casado-Díaz, Full Professor, Department of Marketing, University of Alicante (Spain), e-mail: ana.casado@ua.es

Salvador Anton-Clavé, Full Professor, Department of Geography, Universitat Rovira i Virgili (Spain), e-mail: salvador.anton@urv.cat

Abstract: The mobility of cruise visitors at urban destinations is a relatively emerging research topic. The first works on this issue used observational techniques and time-space budgets (Debbage, 1991). Nowadays, the widespread availability of GPS tracking devices has enabled the collection of spatio-temporal data on human movements, bringing new challenges and opportunities to social and economic research. First used in travel surveys in the late 1990s, GPS technology has developed rapidly over the past decade. Shoval and Ahas (2016) provide an overview and assessment of the development and progress of this burgeoning field of study within tourism research. Prior to the advent of GPS technology, traditional travel surveys relied on methods such as paper-and-pencil interviews (PAPI), computer-assisted telephone interviews (CATI), or computer-assisted self-interviews (CASI). However, these traditional survey approaches were often burdensome for respondents, requiring them to recall detailed information - including trip timing, mode and purpose - for each trip during the survey period (Wolf et al., 2003). In the context of cruise tourism, De Cantis et al. (2016) analyzed the spatial behavior of independent cruise passengers in Palermo by using GPS technologies. Navarro-Ruiz (2019) examined the different spatiotemporal flows of cruise visitors in Valencia. Domènech, Gutiérrez, and Anton–Clavé (2020) also checked for spatial–temporal behavior differences among cruise visitors in Tarragona based on their expenditure levels. Finally, Shoval et al. (2020) used GPS technology to investigate the impact of incentives on the space-time activities of cruise passengers. All these studies share a common methodological framework, in terms of units under analysis (i.e. cruise visitors), sampling strategy and survey instruments. Given the availability of micro-level information, this paper aims at combining the three case studies, to compare similarities and differences in cruise passengers' behavior, for three Mediterranean destinations, namely Palermo (Italy), Valencia (Spain), and Tarragona (Spain). More in particular, the aim of this paper is twofold. From a methodological perspective, this study attempts to establish a robust method for resampling different case studies in order to achieve similar distribution of the samples on a set of relevant characteristics, for the phenomenon under analysis. From the empirical perspective, it contributes to expand and advance the understanding of cruise passengers' spatial-temporal mobility by examining three different Mediterranean destinations, Palermo (Italy), Valencia (Spain), and Tarragona (Spain). A matching procedure is employed to balance data, reduce the selection bias, gain precision estimating the proposed effects and control for variables (covariates) difficult to measure (Rosenbaum & Rubin, 1983). This approach has been previously used in the tourism domain to improve the reliability of available sample surveys (e.g. Aroca et al., 2017). Additionally, the current study attempts to identify which factors affecting the cruise passengers' mobility patterns are stable across destinations, and which one vary, and how, according to destination's characteristics. In this study, several mobility variables were examined as outcomes, drawing on the existing literature on cruise passengers' mobility at their destination. These variables include: Total duration of the trip; Total length of the trip; Maximum distance from port; Total number of stops; Average stop duration; Expenditure (stratified by destination).
In addition, the study considers a number of following covariates as pre-treatment characteristics to be balanced, including cruise passengers' socio-demographic characteristics, type of company trip, and previous visits to the destination. Preliminary findings demonstrate a different impact of visited destination on cruise passengers' behaviour and expenditure. These findings would provide practical implications regarding flows and concentration of visitors, especially for management of developing cruise tourism destinations and ports of call.

Keywords: cruise tourism, matching method, spatio-temporal mobility; tracking technology; survey methodology.

References

Aroca, P., Brida, J. G., & Volo, S. (2017). Tourism statistics: Correcting data inadequacy. Tourism Economics, 23(1), 99-112.

De Cantis, S., Ferrante, M., Kahani, A., & Shoval, N. (2016). Cruise passengers' behavior at the destination: Investigation using GPS technology. *Tourism Management*, 52, 133-150.

Debbage, K.G. (1991). Spatial behavior in a Bahamian resort. *Annals of Tourism Research*, 18(2), 251-268.

Domènech, A., Gutiérrez, A., & Anton-Clavé, S. (2020). Cruise passengers' spatial behavior and expenditure levels at destination. *Tourism Planning and Development*, 17(1), 17-36.

Navarro-Ruiz, S. (2019). *Comportamiento intradestino de los visitantes e implicaciones para la gestión turística local. Estudio de los visitantes de crucero en Valencia*. University of Alicante. https://www.educacion.es/teseo/mostrarRef.do?ref=1814226

Rosenbaum, P.R. & Rubin, D.B (1983). The central role of the propensity score in observational studies for causal effects. *Biometrika*, 70, 41-45.

Shoval, N. & Ahas, R. (2016). The use of tracking technologies in tourism research: the first decade. *Tourism Geographies*, 18(5), 587-606.

Shoval, N., Kahani, A., De Cantis, S., & Ferrante, M. (2020). Impact of incentives on tourist activity in space-time. *Annals of Tourism Research*, 80, 102846.