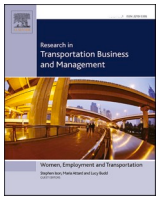
Research in Transportation Business & Management 60 (2025) 101386

Contents lists available at ScienceDirect

Research in Transportation Business & Management

journal homepage: www.elsevier.com/locate/rtbm



Cruise passengers' perception of port attributes and their influence on revisiting and recommending. Evidence from the Canary Islands

J.F. Baños-Pino [a], B. Tovar [b,*]

[a] Oviedo Efficiency Group, Department of Economics, University of Oviedo, Avenida del Cristo s/n, 33071, Spain
[b] University of Las Palmas de Gran Canaria (ULPGC). University Institute of Tourism and Sustainable Economic Development (TiDES), Tourism and Transport Group (ITyT), Campus Tafira. Modulo D, 2.20, 35017 Spain

ARTICLE INFO

Keywords:
Cruise passengers' perceptions
Port of call attributes
Word-of-mouth
Intention to revisit
Multilevel mixed effects ordered logistic regression

ABSTRACT

This article aims to explore whether various attributes related to the Canary Islands' ports of call and their differences from other ports of Europe and the world could influence a cruise passenger's intention to revisit the island or recommend Canary Islands cruises through word-of-mouth to their professional and social networks. Information on cruise passengers' perceptions was collected in each port of call via survey responses over several cruise seasons.

The results indicate that a higher rating of the port services and infrastructure, organization and its information services upon the arrival of cruise passengers, positively and significantly influences both the probability of recommending a cruise to the Canary Islands and revisiting the destination in the future. These probabilities also increase when the ports of the Canary Islands receive higher ratings than those in the rest of the world.

Enhancing these port-related attributes can increase the likelihood of cruise passengers returning, whether as traditional tourists or as repeat passengers. Moreover, identifying these key attributes is essential for gaining support from policymakers for designing more effective policies and conditions to attract the necessary investment.

1. Introduction

Despite the significant impact of the pandemic, the cruise industry continues to be one of the fastest-growing sectors of tourism and it is expected that by 2023 it will recover to the levels of business seen in 2019 (CLIA, 2023; FCCA, 2024). Although cruise tourism represents only a small fraction of the global tourism industry, before the Covid−19 pandemic, 25 % of total cruise passengers cruised in European waters, making Europe the second-largest cruise market both in terms of a source of passengers and as a cruise destination.

The traditionally impressive growth rates of the cruise industry and the associated economic impact have tempted port authorities worldwide to attract this activity, and European ports are not an exception. However, attracting cruise ships may require substantial investments by port authorities to accommodate not only the ships but also their passengers. As has been pointed by Pallis (2015), the growth of the cruise industry has been based on the upgrading of existing infrastructures and/or building new facilities. Each port chooses its own strategies when cruise tourism becomes a goal (Martín-Duque et al., 2023). In this vein and based on Verhoeven's (2010) typology of port authorities managing cruise ports, Pallis et al. (2019) defined four port management models. The management model chosen by the port authority determines the different levels of investment required to adapt the port for the cruise industry.

The development of port infrastructure to serve cruise passengers influences the cruise destination's economic performance. Indeed, Chen et al. (2017) have shed light on the interdependence of cruise passengers, cruise lines and cruise ports, where the latter could be considered as public enterprises seeking to optimize the positive economic impacts for port cities. In the same vein, Chen (2016) reinforces the importance of actively upgrading the various software and hardware facilities in cruise ports, and Chen et al. (2020) advance the theoretical understanding of how cruise demand and cruise port supply interact through online rating systems.

Recently, Machado da Luz et al. (2022) analysed, from the perspective of the cruise industry players, whether port infrastructures

* Corresponding author at: University Institute of Tourism and Sustainable Economic Development (TiDES), ULPGC, Tourism and Transport Group (ITyT), Campus Tafira. Modulo D, 2.20, 35017 Spain.
E-mail addresses: jbanos@uniovi.es (J.F. Baños-Pino), beatriz.tovar@ulpgc.es (B. Tovar).

https://doi.org/10.1016/j.rtbm.2025.101386
Received 4 April 2024; Received in revised form 19 April 2025; Accepted 21 April 2025
Available online 26 April 2025

Table 1
Studies analysing port attributes as determinants of cruise passengers' intentions to recommend the cruise or revisit/recommend the port of call.

Study	Data				Method	Port related variables included
	Seasons	Ports	One cruise line?	Valid Questionnaries		
Silvestre et al. (2008)	one season 2004	Azores ports (Portugal)	no	973	EFA CFA	– Quality of port conditions – Quality of the transport as components of satisfaction with locals and services
Brida et al. (2012)	one season 2009	Cartagena (Colombia)	no	1213	SEM	– Satisfaction of harbour facilities and services – Satisfaction with transport – Safety in the harbour as components of physical capital satisfaction
Satta et al. (2015)	one season 2012	Genoa, Messina, Bari (Italy)	yes	669	OLS ORLR	– Cruise terminal facilities – Welcome reception – Tourism information in the port area – Shopping areas – Ground transportation inside the port area – Security checkpoints – as determinants of overall destination satisfaction
Ozturk and Gogtas (2016)	one season 2013	Oahu, Hawaii (USA)	no	237	BLR ORLR	– Harbour facilities (including physical capital, prices and safety) as part of the destination attributes obtained via principal component analysis as determinants of overall destination satisfaction
Rungroueng (2024).	one season 2020	Laem Chabang (Thailand)	no	465	PLS-SEM	– Provision of port services – Accessibility – Environmental quality – Cruise terminal facilities – Passenger transportation in port as components of cruise port attributes
Present study	six seasons: 2001–02 2003–042008–092011–122,014–15	Canary Island ports (Spain)	no	9364	ORLR MORLR	– Port services and infrastructure – Port safety – Port organization – Port hygiene and cleanliness – Access to the city from the port – Information available upon arrival at the port – Canary Islands ports vs. european ports – Canary Islands ports vs. world ports as determinants of the intention to recommend or revisit the port of call (island), or to recommend a cruise in the Canary Island

Note: EFA = Exploratory factor analysis; CFA = Confirmatory factor analysis; SEM = Structural equation model; OLS = Ordinary least squared; BLR = Binary logistic regression; ORLR = Ordinal logistic regression; PLS-SEM = Partial Least Squares - Structural Equation Model; MORL = Multilevel mixed-effects ordered logistic regression.
Source: Authors' own elaboration.

and superstructures (site conditions of the port) are one of the drivers influencing the Macaronesia Islands' ports' economic performance; they concluded that site-related factors always have an influence but this is more important in less developed ports. Sun et al. (2019), examining the passenger's perspective, concluded that quality cruise terminal services and efficient customs clearance at docks or harbours have a significant impact on the cruise passenger's travel experience. In addition, Teye and Paris (2011) showed that ports with well-developed cruise terminals attract more cruise passengers to spend time in the port areas.

Even though there is a growing academic literature related to the role of cruise passengers' satisfaction with the destination in their behavioural intentions, and especially on the factors that influence them to revisit or recommend a destination (Montesdeoca & Tovar, 2024; Sanz-Blas et al., 2017) there is a lack of studies analysing how their port experience might influence tourists' travel experiences, even though the port of call is the first impression they receive of the destination (Lu et al., 2020; Teye & Leclerc, 1998). Indeed, Whyte et al. (2018) consider that the co-destination between the ship and the port of call requires their joint consideration to effectively study cruise tourists' perceptions. Moreover, Whyte (2017), when analysing the cruise-related pull factor, found that cruise passengers identified several port-related attributes, such as hygiene and cleanliness, safety and comfort, and ease of access to the destination from the port, as the top individual onshore factors.

While some authors have highlighted the role of port attributes in overall cruise satisfaction and how the cruise port experience could affect a cruise passenger's travel experience and, consequently, their destination loyalty (Yoon & Uysal, 2005), there is a lack of research analysing the influence of a port's attributes on passengers' satisfaction and whether the latter has any influence on their word-of-mouth (WOM) attitude or intention to revisit. As our review shows (see Section 2), only five studies have analysed this issue (Brida et al., 2012; Ozturk & Gogtas, 2016; Rungroueng, 2024; Satta et al., 2015; Silvestre et al., 2008).

The present study contributes to investigating the influence of port attributes on the probability of revisiting the destination or recommending cruising in the Canary Islands by examining the level of the cruise passengers' satisfaction with those port attributes. We also analyse whether there are significant differences between cruise passengers who are on their first cruise voyage and repeat passengers regarding the influence of port attributes. Moreover, to the best of our knowledge, this is the first study investigating how repeat cruise passengers rate the port of call compared to other cruise ports and how these ratings affect their behavior regarding revisiting or recommending.

2. Literature review and research questions

The simplest definition of cruise tourism is an all-inclusive holiday

on board a cruise ship with an itinerary where the ship calls at several ports (Alves & Santos, 2022). Although there are cruises to nowhere, the majority of cruise ships offer round-trip voyages that include a home-port, where passengers embark and disembark, and several ports of call, where passengers may go on tours or stay aboard (Esteve-Perez & Garcia-Sanchez, 2015, 2017). No matter what type of port or how many passengers visit the destination, a cruise vessel calling at a port always generates economic activity due to the demand for port services required by the ship and also the demand of the crew and the cruise passengers on shore.

When it comes to analysing the impact of the cruise industry on ports, as occurs with any economic activity, it is necessary to distinguish between economic, social and environmental impact. Although the academic literature has always been and continues to be interested in the first one, the other two have also come to receive increasing attention (Papathanassis & Beckmann, 2011). Indeed, and as has been pointed out by Tovar et al. (2022), when talking about the residents' perceptions and attitudes toward the impact of cruise tourism, critiques are increasingly frequent and extend not only to the real profit that the cruise industry brings to the destination (Baños & Tovar, 2021; Lopes & Dredge, 2018), but also to their undesirable side effects: e.g. air and/or noise pollution (Schuster et al., 2018; Tovar & Tichavska, 2019), overcrowding (Baumann, 2021; Tattara, 2014), and so on.[1] Having said that, as this paper is related to economic issues, in the following we focus on those studies related with economic issues.

In analysing the direct[2] economic impact of cruises on a destination, scholars have traditionally distinguished between a short-term and a long-term perspective (Parola et al., 2014; Satta et al., 2015). The short-term perspective is mainly related to the monetary value received in port cities through the expenditures made by cruise passengers, crew and cruise companies (FCCA, 2024). Among these three categories, the first, cruise passengers' spending patterns, has received the most academic attention (recent reviews can be found in Pino & Tovar, 2019; Baños & Tovar, 2021), while it has recently been suggested that the other two categories are under-researched (Chen et al., 2019). Moreover, Chen and Nijkamp (2018) highlight the key role that cruise lines' lengths of stay in ports play in the onshore experience of cruise passengers and, consequently, in their onshore spending levels.

The long-term perspective, which is the focus of this paper, concerns the potential of the cruise industry to promote the growth of tourism through the intention to revisit and/or recommend a destination. By facilitating the showcasing of tourist attractions (Satta et al., 2015) the cruise industry contributes to the marketing of the destination and, therefore, could influence cruise passengers not only to recommend the destination to their families, social network and so on, but also to coming back as a cruise passenger or a land tourist, thereby increasing the economic wealth of the destinations (Andriotis & Agiomirgianakis, 2010; Gabe et al., 2006).

The academic literature has related tourists' satisfaction with their behavioural intentions, such as the intention to revisit or recommend the destination, regardless of whether the context is tourism in general (Bruwer, 2012) or the particular case of cruises (Satta et al., 2015). That is, most of the studies find a strong link between a satisfied cruise passenger regarding the destination and how likely he/she is to revisit or recommend it. Furthermore, particularly concerning cruises, several studies have also investigated the factors driving the probability of revisiting or recommending the destination (Brida et al., 2012; Gabe et al., 2006; Pranić et al., 2013; Parola et al., 2014; Satta et al., 2015) or the cruise itself (Castillo-Manzano et al., 2022; Hosany & Witham, 2010; Silvestre et al., 2008). There is scant literature that has focused on the influence of port attributes as drivers. We only found 5 studies that have addressed this issue: Silvestre et al. (2008), Brida et al. (2012), Satta et al. (2015), Ozturk and Gogtas (2016), and Rungroueng (2024), which are summarized in Table 1 where we have included also the present study.

Silvestre et al. (2008) analyse whether there is a relation between cruise passengers' satisfaction and their behavioural intentions regarding several issues: repeating the cruise, recommending it or recommending the Azores to their social networks. The data were gathered from a survey administered to the passengers of cruises calling at ports of the Azores between March and December of 2004. Among the exogenous variables, they included the quality of port conditions and the quality of the transport. Unfortunately, these were two items with a large number of non-responses which, according to the authors, "raise questions that need to be answered". However, they stated that there is a significant positive effect of satisfaction with the locals and services (where those port variables are included), via the value of money, on behavioural intentions. Further, Brida et al. (2012), using data from surveys conducted with cruise passengers visiting Cartagena de Indias, Colombia, in 2009 also included those drivers (satisfaction with harbour facilities and services & satisfaction with transport) as determinants of one of the latent variables included in their model (satisfaction with physical capital) when analysing a cruise passenger's intention to return to or to recommend Cartagena. They also included one variable to take into account "safety in the harbour". They concluded that satisfaction with the physical capital and safety positively affects loyalty to Cartagena, which enhances the probability of recommending or revisiting. Therefore, they stated that policymakers and destination managers should expand investment in infrastructure, services, and improve their overall quality.

Satta et al. (2015) investigate the influence of port-related services on the overall satisfaction of cruise passengers with the destination. They considered 6 port-related attributes and 10 control variables (sociodemographic, destination-related, and behavioural). They gathered the information through questionnaires administered to Royal Caribbean Cruise Line passengers visiting three Italian ports during July–September 2012. They concluded that there is a positive relation between the investigated port-related satisfaction attributes and overall satisfaction with the destination and confirmed the positive association between the latter and the intention to recommend. Ozturk and Gogtas (2016) also used questionnaires to gather information from cruise passengers visiting Oahu, Hawaii, USA, in the spring of 2013. They estimated a model that included, as exogenous variables, dummy variables to take into account potential differences due to arriving on different ships and days, sociodemographic variables, and the 4 components obtained through a principal components analysis which summarizes the 15 different attributes used in measuring the visitors' satisfaction with the destination. The first component included the harbour facilities. They found that satisfaction with port-related attributes contributes to overall satisfaction of the cruise passengers, which increases the probability of recommending as well as the probability of revisiting.

Based on a sample of 465 surveys conducted in 2020 at the Port of Laem Chabang in Thailand, Rungroueng (2024) used a structural equation model to analyse cruise passenger behavior. The study found that cruise port attributes—including the provision of port services, accessibility, environmental quality, passenger terminal facilities, and on-site transportation—positively influence both cruise passenger satisfaction and their intention to recommend.

Finally, it should be noted that port services and facilities often serve as cruisers' first point of contact with the city and are therefore important for achieving a pleasant experience. Factors such as the integration of the port with the city (Pugliano et al., 2018) or the quality of port services (Vaggelas & Pallis, 2010), if adequate, help create value for

[1] Aware of the criticism surrounding them, the industry has become proactive in trying to ameliorate or eliminate all these undesirable effects and, in accordance with CLIA, the industry continues to strive to be a model for responsible and sustainable tourism (CLIA, 2023).

[2] It should be noted that the total economic impact of the cruise industry in the destination is greater than the total land-based expenditure due to the indirect and induced impacts derived from this expenditure (Chen et al., 2019).

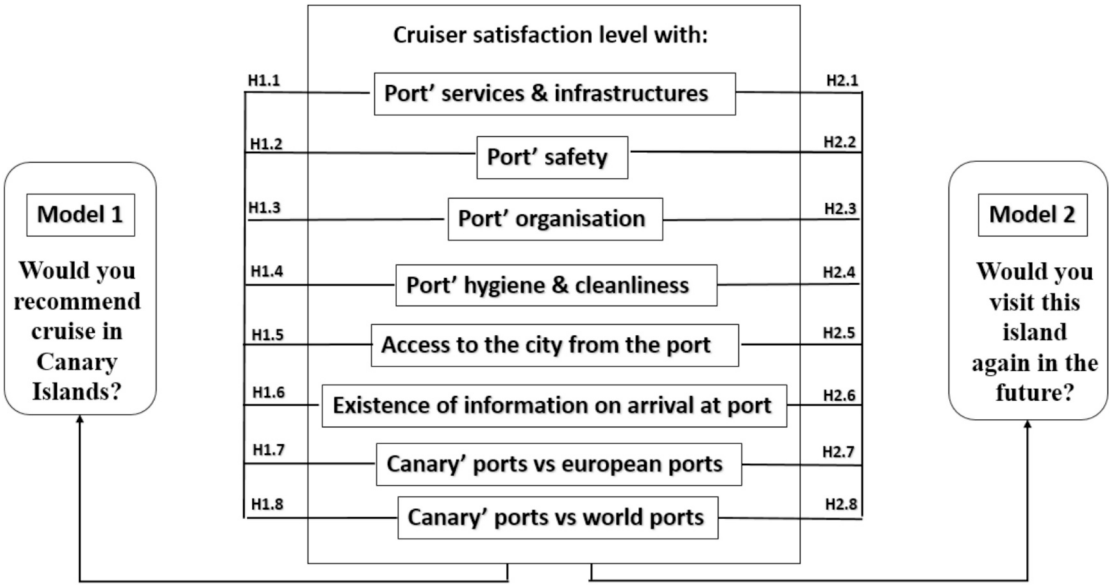


Fig. 1. Research Hypothesis and proposed model.
Source: Authors' own elaboration.

cruisers and positively influence their behavioural intentions to return or recommend. In line with this, the differences between new and repeat cruisers have been explored in previous studies (Chen et al., 2016; Li et al., 2008; Petrick, 2004, 2005; Toudert & Bringas-Rábago, 2016). In a recent study, Sun et al. (2018) concluded that there are notable behavioural differences between first-time and repeat cruisers in terms of price sensitivity, proximity to embarkation ports, length of cruise, cabin type, and booking time in terms of sailing date. However, to our knowledge, no research has examined whether there are differences in their perceptions of port attributes. As it is well known that "comparisons are inevitable", the level of satisfaction of repeat cruisers with port attributes may be influenced either positively or negatively by their previous experiences in other cruise ports they have visited.

As a consequence of our previous discussion, we estimated two models to investigate the hypotheses outlined in Fig. 1:

Model 1: Intention to recommend a cruise in the Canary Islands (VOMCI, hereafter):

- H1.1: Satisfaction with port services and infrastructure has a positive effect on VOMCI
- H1.2: Satisfaction with port safety has a positive effect on VOMCI
- H1.3: Satisfaction with port organization has a positive effect on VOMCI
- H1.4: Satisfaction with port hygiene and cleanliness has a positive effect on VOMCI
- H1.5: Satisfaction with access to the city from the port has a positive effect on VOMCI
- H1.6: Satisfaction with the availability of information upon arrival at the port has a positive effect on VOMCI
- H1.7: Satisfaction with Canary ports compared to other European ports has a positive effect on VOMCI
- H1.8: Satisfaction with Canary ports compared to other world ports has a positive effect on VOMCI

Model 2: Intention to visit the island again (VIA, hereafter):

- H2.1: Satisfaction with port services and infrastructure has a positive effect on VIA
- H2.2: Satisfaction with port safety has a positive effect on VIA
- H2.3: Satisfaction with port organization has a positive effect on VIA

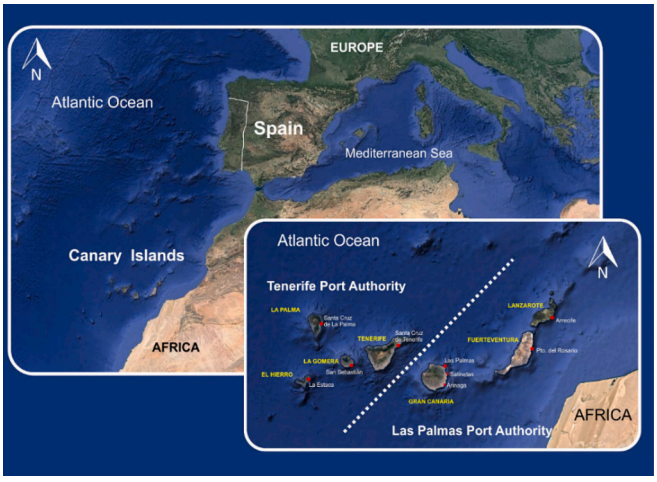


Fig. 2. Canaries and its two Port Authorities.
Source: Own work of the authors on the basis of Google Earth.

- H2.4: Satisfaction with port hygiene and cleanliness has a positive effect on VIA
- H2.5: Satisfaction with access to the city from the port has a positive effect on VIA
- H2.6: Satisfaction with the availability of information upon arrival at port has a positive effect on VIA
- H2.7: Satisfaction with Canary Islands ports compared to other European ports has a positive effect on VIA
- H2.8: Satisfaction with Canary Islands ports compared to other world ports has a positive effect on VIA

In summary, if the endogenous variable is the intention to recommend a cruise in the Canary Islands, we use Model 1, but if it is the intention to visit the island again, we use Model 2. We estimate 6 versions of each model. The odd-numbered models (Models M1, M3, and M5) are estimated using the full sample, while the even-numbered models are estimated using the subsample of repeat visitors, who are specifically asked to compare the Canary Islands ports with other cruise ports they have visited.

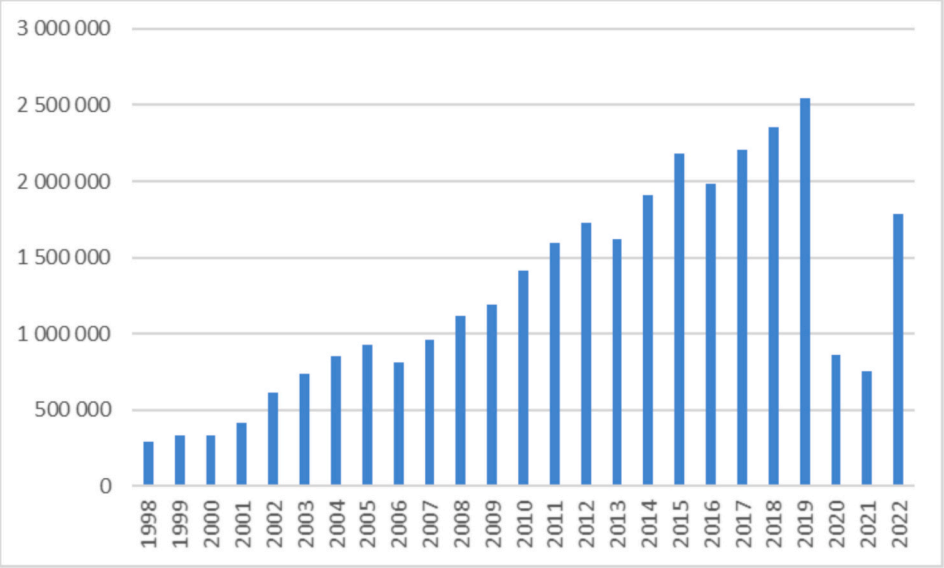


Fig. 3. Canary Islands cruise passengers' evolution.
Source: Authors' own elaboration based on Port Authorities Yearbook, various years.

3. Analysing cruise activity in the canary islands

3.1. The origin and evolution of cruise activity: Main ports involved

Cruise tourism in the Canary Islands started in the year 2000. Two Port Authorities operate the most important ports of the Canary Islands, one for each province, as shown in Fig. 2.

The Port Authority of Las Palmas is a public institution that manages 5 ports: Las Palmas (LPA), Salinetas, Arinaga, Arrecife (ARR) and Rosario Port (PR) in three different islands: Gran Canaria, Lanzarote and Fuerteventura. Three out of the five ports receive cruise ships: LPA (Gran Canaria), ARR (Lanzarote) and PR (Fuerteventura). The Santa Cruz de Tenerife Port Authority currently manages 5 ports in 4 islands: the ports of Santa Cruz de Tenerife (TFE), Santa Cruz de La Palma (SCP), Los Cristianos, San Sebastián de La Gomera (SSG) and La Estaca (LE), and all of them except Los Cristianos are involved in cruise traffic.

The sustained growth experienced since 2000 was only disrupted by the emergence of the COVID-19 pandemic, culminating in the suspension of cruise operations worldwide in mid-March 2020 (see Fig. 3). Although cruise ships were banned in Spain at that date, in November 2020 cruise ships were allowed to resume sailing in the Canaries as long as they complied with the new protocols to mitigate the risk of COVID-19 set by the regional authorities.

Fig. 4 displays cruise ship passengers, ship stopovers and cruise ships in the Canaries from 1997 to 2015 by port authority showing the evolution of the sector during the period on which our empirical model focuses.[3] Cruise traffic has greatly increased at both port authorities during the period. This evolution seems to be comparable when looking at both panels in Fig. 4, except for the number of cruise passengers in a home port in the last two years, which increased significantly for those in the Las Palmas Port Authority and represented 81 % of the total share for the archipelago. However, there are several differences between the ports, not evident from the aggregate figures.

As Fig. 5 shows, at the start of operations, only 4 Canary Island ports received cruise passengers, TFE being the most important, followed by LPA and ARR and, lastly, SCP with a much lower figure than the other three ports. After these initial years, the cruise sector expanded not only in these four ports, but also in others, such as SSG and LE, which received their first cruise ships in 2005 and 2012, respectively. Thus, nowadays cruise ships operate on all the islands except for a very small one, La Graciosa.

Fig. 5 also shows that at the end of the period, Las Palmas Port held one of the largest shares in continuous growth. This can be attributed to the concentration of ships with hub operations (e.g. in 2014, 72.3 % were cruise passengers on hub operations).

3.2. Data

The relevant data for the empirical part of this paper come from several market studies[4] on cruise tourism in the Canary Islands, commissioned by the two Canary port authorities. Specifically, we are interested in information on passengers' perceptions of port attributes and the passengers' intentions as to revisiting or recommending the island where they were interviewed.

Information on passengers' perceptions was collected in these market studies through survey responses over several years (6 seasons covering from 2001 to 2015). Face-to-face interviews were carried out from December to May (the time of the high season for cruises) in each port of call visited by cruise ships operating in the Canary Islands. The questionnaire, available in Spanish, English, and German, was administered by trained assistants and consisted of 5 main blocks of questions: general characterisation of the visit, motivation and satisfaction with the destination choice, evaluation of the cruise experience, assessment of the port, and intention to repeat or recommend. The characteristics of each study are quite similar, not only in terms of sample size but also in terms of sampling error for a 95 % confidence interval, as shown in Table 2.

The sampling strategy followed a two-step stratified approach. In the first phase, cruise vessels in each port were selected by systematic sampling based on the following criteria: the last port or one of the last port calls of the ship, the port not being the cruise's home port, and no ship being selected more than once per trip. In the second stage, a

[3] Our econometric analysis spans multiple seasons, with the final one being the 2014–2015 season. Therefore, we subsequently concentrate on the sector's evolution up to this year.

[4] The work was carried out in accordance with the criteria of the ISO 20252 standard for market and opinion research and in compliance with the ICC/ESOMAR International Code of Conduct.

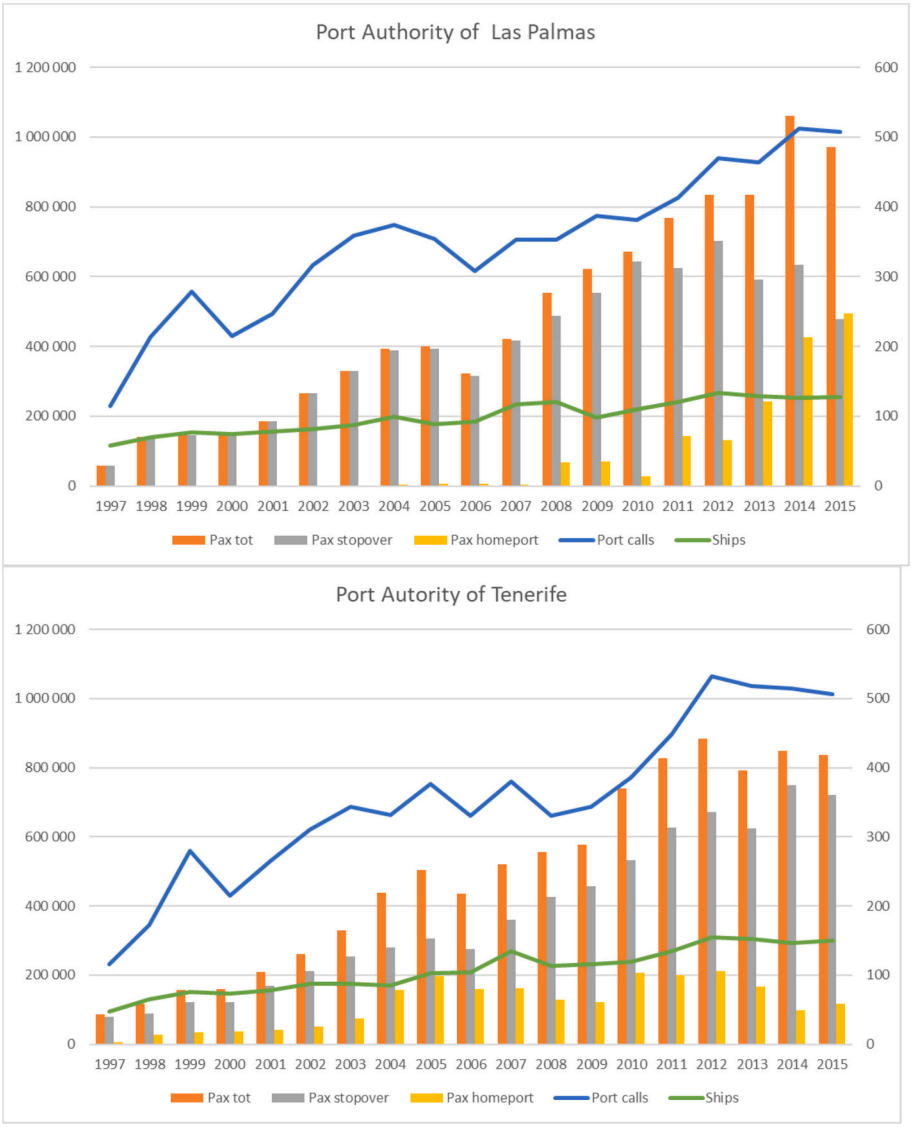


Fig. 4. Canary Islands cruise passengers by Port Authority (1997–2015).
Source: Authors' own elaboration based on Port Authorities Yearbook, various years.

convenience random sample of cruise passengers was drawn from the previously selected ships.

The questionnaire included standard socio-demographic variables as well as questions aimed at assessing cruise passengers' satisfaction with port services during the stopover, which is the focus of our study. Following a 5-point Likert scale, they had to assess their level of satisfaction with the following factors related to the port: services & infrastructure; safety; organization; hygiene & cleanliness; access to the city from the port; and existence of information on arrival at port. Moreover, they were asked to compare another cruise's ports which they had visited with the ports of the Canary Islands. Finally, they were asked about their intentions to revisit the island and to recommend a cruise to the Canary Islands to family and friends.

Table 3 shows the explanatory variables used to explain whether the passengers' perception of port attributes influences not only their intent to revisit and/or recommend the island where they were surveyed, but also to recommend the cruise. Table 3 provides some descriptive statistics for this set of explanatory variables. To detect potential multicollinearity issues among the explanatory variables, we used the Variance Inflation Factor (VIF). Since all explanatory variables have very low VIF (see Table A.1 in the Annex), we can conclude that there are no serious collinearity problems.

4. Methodology

Since the dependent variables in our models are ordinal and reflect cruise passengers' stated intentions, we test our hypotheses using ordered logit regression methods. Unlike ordinary regression models, which deal with continuous response variables, ordered logit models are particularly useful when the dependent variable consists of ordered categories without fixed intervals between them. The ordered logit model is an extension of the binary logit model, where the dependent variable has more than two categories following a specific order. In our case, we work with 5 ordered response categories based on a Likert scale representing passengers' opinions: Strongly Disagree ($y = 1$), Disagree ($y = 2$), Neither Agree nor Disagree ($y = 3$), Agree ($y = 4$), and Strongly Agree ($y = 5$).

These ordered outcome variables are modeled to increase sequentially as a latent variable y^* surpasses progressively higher thresholds. In our case, y^* would be an unobserved variable measuring satisfaction with each of the questions, so that for a cruise passenger i one can pose

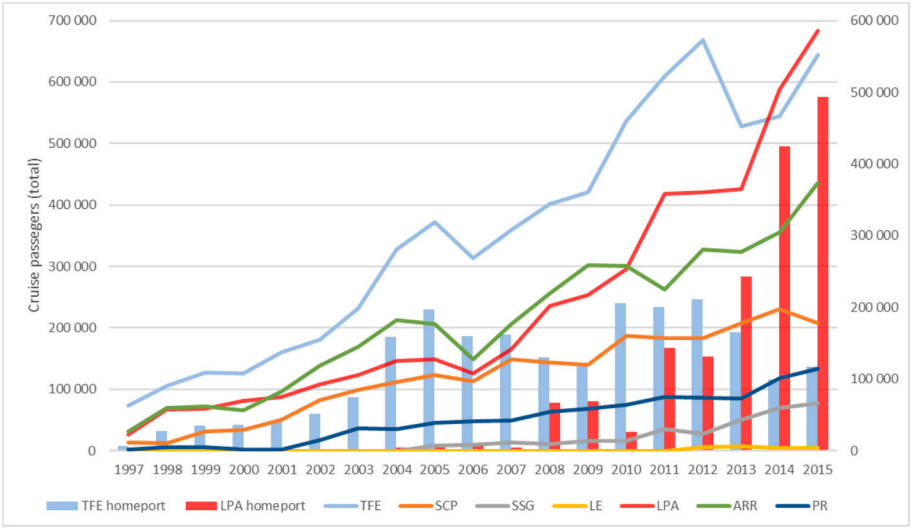


Fig. 5. Evolution of number of cruise passengers by port (1997–2015).
Source: Authors' own elaboration based on Port Authorities Yearbook, various years.

Table 2
Characteristics of the Market Study.

Season	2001–02	2003–04	2004–05	2008–09	2011–12	2014–15
Sample size (n° questionaries)	1134	1780	1801	1442	1603	1604
Sampling error	0.0291	0.0232	0.0231	0.0258	0.0245	0.0245

Source: Authors' own elaboration based on EDEI (2015).

Table 3
Explanatory variables and descriptive statistics.

VARIABLES	N	mean	sd	min	max
Recommend the cruise	9364	4.680	0.670	1	5
Revisiting the Canary Islands	9364	4.411	0.960	1	5
Age (years)	9364	55.82	13.32	18	100
Age square (years)	9364	3293	1419	324	10,000
Gender (ref. male)	9364	0.484	0.500	0	1
Previous cruises (number)	9364	3.650	3.729	1	15
Traveling as a couple	9364	0.635	0.481	0	1
Traveling with friends	9364	0.187	0.390	0	1
First visit Canary Islands (ref. YES)	9364	0.486	0.500	0	1
Cruise season year	9364	6.974	4.519	1	14
(Cruise season year)^2	9364	69.05	70.81	1	196
German	9364	0.330	0.470	0	1
Italian	9364	0.0452	0.208	0	1
Tenerife	9364	0.214	0.410	0	1
La Palma	9364	0.213	0.409	0	1
Gran Canaria	9364	0.220	0.414	0	1
Lanzarote	9364	0.214	0.410	0	1
La Gomera	9364	0.0526	0.223	0	1
Socioeconomic status	9364	1.552	0.852	0	4
Port calls before the survey (number)	9364	2.506	1.455	1	8
Cruiser satisfaction level with:					
-Port services and infrastructure	9364	4.114	0.655	1	5
-Port safety	9364	4.244	0.593	1	5
-Port organization	9364	4.176	0.630	1	5
-Port hygiene and cleanliness	9364	4.262	0.626	1	5
-Access to the city from the port	9364	4.191	0.710	1	5
-Information available upon arrival at the port	9364	3.950	0.786	1	5
Canary Islands ports vs. european ports	2312	0.132	0.591	-1	1
Canary Islands ports vs. world ports	2312	0.179	0.618	-1	1

Source: Authors' own elaboration

$$y_i^* = \boldsymbol{x}_i'\beta + e_i$$

where the regressors $\boldsymbol{x}$ do not include the intercept, so that for lower levels of y*, the cruise passenger's satisfaction with a particular item is very bad. Meanwhile, for values of $y^* > \alpha_1$, their satisfaction would be bad; for $y^* > \alpha_2$, it improves to fair; for $y^* > \alpha_3$, it improves to good; and if $y^* > \alpha_4$, it would be excellent.

Thus, in the case of the 5 alternatives in our models, we would have.

$$y_{i=k} \text{ if } \alpha_{k-1} < y_i^* < \alpha_k, \text{for k} = 1, 2, \ldots 5.$$

Then, for $\alpha_0 = -\infty$ and $\alpha_5 = +\infty$ it would be

$$\begin{aligned}\Pr(y_i = k) &= \Pr\left(\alpha_{k-1} < y_i^* < \alpha_k\right) = \Pr(\alpha_{k-1} < \boldsymbol{x}_i\beta + e_i < \alpha_k) \\ &= \Pr(\alpha_{k-1} - \boldsymbol{x}_i\beta < e_i < \alpha_k - \boldsymbol{x}_i\beta) = F(\alpha_k - \boldsymbol{x}_i\beta) - F(\alpha_{k-1} - \boldsymbol{x}_i\beta) \\ &= \frac{1}{1 + \exp(-\alpha_k + \boldsymbol{x}_i\beta)} - \frac{1}{1 + \exp(-\alpha_{k-1} - \boldsymbol{x}_i\beta)}\end{aligned}$$

where $F(\cdot)$ is the logistic cumulative distribution function of e_i.

Then, the ordered logit model assumes the relation between the linear predictor and the cumulative probability of falling into a specific category follows a logistic distribution. This assumption serves as the foundation for the modeling of the cumulative probabilities. Additionally, the model assumes proportional odds, i.e. that the odds of falling into a lower category versus a higher one remain constant across all levels of the independent variables. Both the regression parameters (β) and the thresholds (α_1, α_2, α_3 and α_4) are estimated through maximum likelihood. The interpretation of the coefficients requires an understanding of their impact on the odds of being in a lower category versus a higher one.

The log likelihood is

$$\ln L = \sum_{i=1}^{N}\sum_{k=1}^{K} I_k(y_i)\Pr(y_i = k)$$

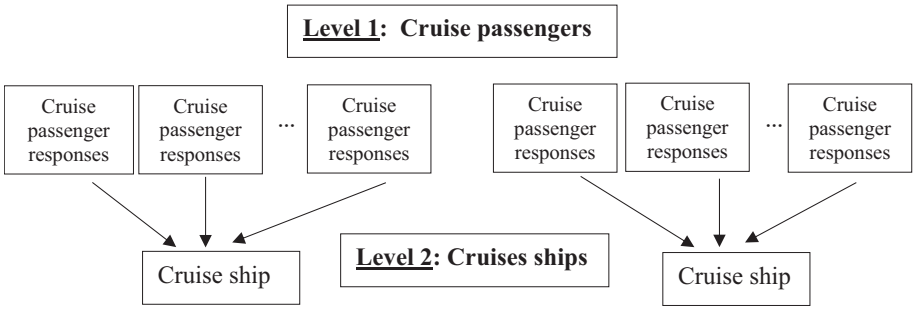


Fig. 6. Analytical Framework: Two-level model.
Source: Authors' own elaboration.

where

$$I_k(y_i) = \begin{cases} 1 \text{ if } y_i = k \\ 0 \text{ otherwise} \end{cases}$$

We employ the ordered logistic regression model as the benchmark and extend our analysis to account for the nested data structure by fitting a multilevel mixed-effects logistic model. This regression model incorporates both fixed effects and random effects (see, for example, Agresti, 2010, or Rabe-Hesketh and Skrondal, 2008). The use of a multilevel structure is justified by the fact that cruise passengers traveling on the same ship share a number of similar experiences that may influence their perceptions of the trip and the ports visited. For this reason, our analysis adopts a two-level model, in which individual passenger responses constitute the first level, nested within a second level that represents the cruise ships and captures the associated random effects, as illustrated in Fig. 6.

In this context, the cumulative probability of the response falling into a category higher than k, given a set of M independent clusters (cruise ships) and conditional on a series of fixed effects ($\mathbf{x_i}$), a set of cutpoints (α), and a set of random effects ($\boldsymbol{u_j}$), is

$$\begin{aligned} \Pr\left(y_{ij} = k|\alpha, u_j\right) &= \Pr\left(\alpha_{k-1} < y_{ij}^{*} < \alpha_k\right) = \Pr\left(\alpha_{k-1} < \boldsymbol{x_{ij}}\beta + \boldsymbol{z_{ij}}\boldsymbol{u_j} + \varepsilon_{ij}\right. \\ &\left. < \alpha_k\right) = \Pr\left(\alpha_{k-1} - \boldsymbol{x_{ij}}\beta - \boldsymbol{z_{ij}}\boldsymbol{u_j} < \varepsilon_{ij} < \alpha_k - \boldsymbol{x_{ij}}\beta - \boldsymbol{z_{ij}}u_j\right) \\ &= F\left(\alpha_k - \boldsymbol{x_{ij}}\beta - \boldsymbol{z_{ij}}\boldsymbol{u_j}\right) - F\left(\alpha_k - \boldsymbol{x_{ij}}\beta - \boldsymbol{z_{ij}}\boldsymbol{u_j}\right) \end{aligned}$$

$$\frac{1}{1+\exp\left(-\alpha_k + \boldsymbol{x_i'}\beta + \boldsymbol{z_{ij}}\boldsymbol{u_j}\right)} - \frac{1}{1+\exp\left(-\alpha_{k-1} - \boldsymbol{x_i'}\beta + \boldsymbol{z_{ij}}\boldsymbol{u_j}\right)}$$

The vector $\boldsymbol{x_{ij}}$ comprises the covariates for the fixed effects, similar to the covariates in the standard logistic regression model, where the regression coefficients β represent the fixed effects. We omit the inclusion of a constant term in $\boldsymbol{x_{ij}}$, as it is accounted for within the cutpoints. The random effects $\boldsymbol{u_j}$ are M realizations from a multivariate normal distribution with mean 0 and variance matrix $\boldsymbol{\Sigma}$.

We can also rewrite the model in terms of the latent variable y_{ij}^{*}, where the ordinal response observed by cruiser i on ship j, y_{ij}, is generated from the latent continuous responses as follows:

$$y_{ij}^{*} = \boldsymbol{x_{ij}}\beta + \boldsymbol{z_{ij}}\boldsymbol{u_j} + \varepsilon_{ij}$$

$$y_{ij} = \begin{cases} 1 \text{ if } y_{ij}^{*} \le \alpha_1 \\ 2 \text{ if } y_{ij}^{*} \le \alpha_2 \\ \quad . \\ \quad . \\ 5 \text{ if } y_{ij}^{*} > \alpha_4 \end{cases}$$

Since the $\boldsymbol{u_j}$ follow a multivariate normal distribution, the log-likelihood requires integrating out this random effect, which can be achieved through a method such as mean–variance adaptive Gauss–Hermite quadrature.

5. Results

Tables 4.1 and 4.2 display the estimated parameters of the multilevel mixed-effects ordered logit models[5] to test Hypotheses 1 to 8, where the dependent variable is the probability of recommending a cruise to the Canary Islands (Model 1). All estimated models include sociodemographic attributes and characteristics of the cruise passenger as explanatory variables. Model 1.1 additionally includes the overall assessment of port characteristics. Model 1.3 also incorporates the evaluation of the islands visited as ports of call, while Model 1.5 builds on the structure of Model 1.1 but replaces the overall port evaluation with specific ratings of port attributes at each stopover. Models 1.2, 1.4, and 1.6 are similar to the previous ones, each including the opinions of cruise passengers on ports in the Canary Islands compared to those in Europe and the rest of the world. Each of these last three models comprises 2312 observations, compared to the 9364 observations of their less restricted counterparts.[6]

As noted earlier, the hierarchical structure of the models includes a second level corresponding to the cruise ships. In our case, the second level comprises 68 different cruises, each represented by at least 25 observations in the total sample, within which the surveyed passengers are nested. In all cases, estimation of the multilevel mixed-effects models is preferred over the simpler alternative of ordered logit regressions, as evidenced by the likelihood-ratio test, indicating that there is enough variability across ships that it needs to be taken into account. Furthermore, apart from the fixed effects associated with the control variables, Tables 4.1 and 4.2 report the estimated cutpoints (α_1, α_2, α_3, and α_4), and the estimated variance component (σ_u^2), which summarizes the random intercept.

Our results suggest that there is a U-shaped relationship between the traveler's age and their stated probability of repeating the cruise: this relationship is negative up to the age of 60, and becomes positive thereafter.[7] Other things being equal, having more experience in cruise travel has a favorable impact on the intention to recommend a cruise to the Canary Islands. Furthermore, having previously visited the islands significantly increases the likelihood of recommending the cruise. This effect is also observed among travelers with prior cruise experience who expressed a favorable perception of the ports in the Canary Islands compared to other international ports (Models 1.2, 1.4, and 1.6). In these models, cruise passengers already familiar with the Canary Islands are more likely to recommend the cruise. Likewise, a positive relationship is observed, albeit at decreasing rates, between the successive cruise

[5] All estimations were conducted using robust standard errors.

[6] Respondents who did not answer any of the questions about the comparison of the ports of the Canary Islands with those of Europe or the rest of the world were excluded.

[7] See in Figure A.1 of the Appendix the marginal effects for Model 1.5.

Table 4.1
Multilevel mixed-effects ordered logit results: Determinants of cruise recommendation to the Canary Islands.

VARIABLES	Model 1.1	Model 1.2	Model 1.3	Model 1.4
Age (years)	−0.0250**	−0.0469*	−0.0238**	−0.0490*
Age square (years)	0.0002**	0.0004*	0.0002**	0.0004*
Gender (ref. male)	−0.0130	0.0228	−0.0150	0.0184
Previous cruises (number)	0.0140*	0.0269**	0.0157**	0.0241*
Traveling as a couple	0.1380**	0.2321*	0.1363**	0.2338*
Traveling with friends	0.0071	0.0690	0.0135	0.0714
First visit Canary Islands (ref. YES)	0.0567	0.3723***	0.0318	0.3563***
Cruise season (year)	0.1026***	0.1858***	0.1095***	0.1976***
(Cruise season)^2	−0.0064***	−0.0111***	−0.0067***	−0.0117***
German	0.1371	0.1105	0.1924**	0.1225
Italian	0.2105	0.4483	0.2222	0.5190
Socioeconomic status	−0.0233	−0.0658	−0.0310	−0.0687
Port calls (number)	−0.0127	−0.0488	−0.0220	−0.0344
Port of call (ref. Fuerteventura)				
Tenerife			0.2627**	0.4050*
La Palma			−0.0426	−0.0609
Gran Canaria			0.5090***	0.0171
Lanzarote			0.2938***	−0.0893
La Gomera			0.6361***	0.5097
Canary Islands ports vs. european ports		0.1944**		0.1834**
Canary Islands ports vs. world ports		0.4097***		0.4092***
Cruiser satisfaction level with:				
P1	0.1628***	0.1560	0.1390***	0.1718
P2	0.0431	−0.0567	0.0581	−0.0515
P3	0.1372**	0.0388	0.1432**	0.0486
P4	0.0034	0.0985	0.0027	0.1024
P5	0.0183	0.1000	0.0246	0.0865
P6	0.1187***	0.1349*	0.1144***	0.1337*
cut1	−2.8480***	−3.2680***	−2.5624***	−3.0961***
cut2	−1.8574***	−2.1087**	−1.5718***	−1.9358**
cut3	−1.6428***	−1.8122**	−1.3573***	−1.6387*
cut4	0.6992*	0.3147	0.9940**	0.4982
var(_cons[cruise ship])	0.1162***	0.1770**	0.1246***	0.1783**
Log likelihood	−6372.87	−1572.18	−6342.31	−1565.29
AIC	12,793.73	3196.37	12,742.61	3192.58
BIC	12,965.20	3345.76	12,949.81	3370.70
LR test vs. ologit model (χ^2_1)	50.56	13.88	55.44	13.17
Prob $\geq \chi^2$	0.0000	0.0001	0.0000	0.0001
Number of groups	68	68	68	68
Observations	9364	2312	9364	2312

Notes: *, ** and *** indicate statistical significance at 10 %, 5 % and 1 %, respectively.
P1 = Port services and infrastructure; P2 = Port safety; P3 = Port organization; P4 = Port hygiene and cleanliness; P5 = Access to the city from the port; P6 = Information available upon arrival at the port.
Source: Authors' own elaboration.

seasons analysed and the intention to repeat the cruise, suggesting that the industry has been improving its service offerings with acquired experience.

Concerning other sociodemographic variables or factors related to the cruise mode, a positive effect is also observed for the explanatory variable "traveling as a couple", as well as for the German nationality in Models 1.3 and 1.5. Interestingly, neither the gender nor the socioeconomic status of the cruise passenger, nor the number of stops made during the cruise, appears to influence their intention to recommend the cruise.

Regarding the variables capturing port management, only those related to a higher assessment of port services and infrastructure, port organization, and the availability of information upon arrival at the port were found to have a positive and significant influence on the probability of recommending a cruise to the islands, supporting, therefore, Hypotheses H1.1, H1.3 and H1.6. In an attempt to disaggregate these results by island, Models 1.5 and 1.6 of Table 4.2 indicate that a higher assessment of port services and infrastructure in La Palma, Gran Canaria and Fuerteventura increases the probability of recommending the cruise. Better port organization at the ports of Tenerife and Lanzarote, and better information at the ports of Tenerife, La Palma, and Lanzarote would make the cruise passenger more likely to recommend the cruise. It should also be noted that the results of Models 1.2, 1.4, and 1.6 indicate that a higher rating of the Canary ports compared to those in Europe and the rest of the world exerts a positive influence on the intention to repeat the cruise to the Canary Islands, thus supporting Hypotheses H1.7 and H1.8.

In order to provide a simpler interpretation of the results, Table 5 displays the average marginal effects associated with a higher intention to recommend the cruise. For the sake of clarity, these effects are displayed for Models 1.5 and 1.6, which are selected within the same set of observations according to the information criteria (AIC, BIC) and a likelihood-ratio test.[8]

It should be noted that, in most cases, the marginal effects associated with cruise passengers' opinions on port conditions are quantitatively more important than those related to traveler characteristics or their sociodemographic profile. Thus, in Model 1.5, the average marginal effects on the probability of 'strongly agreeing' to recommend the cruise range from 3.7 % for the information received by the cruise passenger at the port of La Palma to 11.2 % for the ease of access from the port of La Gomera to the city. In Model 2.6, it is worth highlighting that the average marginal effect on the probability of 'strongly agreeing' to recommend the cruise increases by 3.15 % when the ports of the Canary Islands are rated better than those in the rest of Europe, and rises to 6.3 % when this comparison is made against other ports worldwide.

The results of the different multilevel mixed-effects ordered logit models for the intention to revisit the island are presented in Tables 6.1 and 6.2. The explanatory variables are the same as those used in Models 1.1 to 1.6. As before, Model 2.3 incorporates the ports of call as control variables in relation to Model 2.1, while Model 2.5 includes the ratings of port characteristics at each stopover. Additionally, Models 2.2, 2.4, and 2.6 introduce comparisons between the ports of the Canary Islands and those at other international destinations.

Regarding the variables related to the individual characteristics of cruise passengers, the results show that those with previous experience in this type of travel are generally more likely to revisit the islands. Similarly, passengers who have visited the Canary Islands on previous occasions exhibit a higher probability of repeating their experience. However, other control variables—such as age, gender, travel party composition, socioeconomic status, or the number of previous cruise stops—do not appear to influence the intention to revisit the destination. The results also indicate that, compared to Fuerteventura, disembarking at other ports (Tenerife, La Palma, Gran Canaria, Lanzarote, and La Gomera) strengthens the intention to revisit or recommend the islands.

Concerning the assessment of port-of-call characteristics, it is worth noting that a higher rating of port organization positively influences cruise passengers' intention to revisit the islands. This result suggests that Hypothesis H2.3 of our analytical framework cannot be rejected, particularly in the cases of La Gomera and Lanzarote, according to Model 2.5, and Tenerife in Model 2.6. Additionally, based on the results of Models 2.1 and 2.3, higher ratings of port services and infrastructure, as well as the ease of obtaining information upon arrival, support Hypotheses H2.1 and H2.6. The estimates also suggest that, for tourists

[8] The LR test that Model 1.1 is nested within Model 1.3 is $\chi^2(5) = 61.12$, and that Model 1.3 is nested within Model 1.5 is $\chi^2(25) = 61.20$. On the other hand, the LR test that Model 1.2 is nested within Model 1.4 is $\chi^2(5) = 13.79$, while Model 1.4 is nested within Model 1.6 is $\chi^2(25) = 40.71$.

Table 4.2
Multilevel mixed-effects ordered logit results: Determinants of cruise recommendation to the Canary Islands.

VARIABLES	Model 1.5	Model 1.6	VARIABLES	Model 1.5	Model 1.6
Age (years)	−0.0224*	−0.0487*	p3 Gomera	0.3921	0.9048
Age square (years)	0.0002**	0.0004*	p3 Lanzarote	0.3246**	0.3579
Gender (ref. male)	−0.0202	0.0085	p4 Tenerife	0.0211	0.0978
Previous cruises (number)	0.0165**	0.0252*	p4 La Palma	−0.2550*	0.0396
Traveling as a couple	0.1280*	0.2644*	p4 Gran Canaria	0.0223	−0.0338
Traveling with friends	0.0162	0.0883	p4 Fuerteventura	−0.0695	0.1223
First visit Canary Islands (ref. YES)	0.0331	0.3646***	p4 Gomera	0.0428	−0.3476
Cruise season (year)	0.0972***	0.1979***	p4 Lanzarote	0.2896*	0.3960
(Cruise season)^2	−0.0060**	−0.0119***	p5 Tenerife	0.0195	−0.1386
German	0.1912**	0.1214	p5 La Palma	0.1009	−0.0319
Italian	0.2283	0.4823	p5 Gran Canaria	0.0189	0.2999
Socioeconomic status	−0.0375	−0.0827	p5 Fuerteventura	0.1490	0.5253
Port calls (number)	−0.0137	−0.0243	p5 Gomera	0.6220***	1.5192***
Canary Islands ports vs. european ports		0.1908**	p5 Lanzarote	−0.0850	−0.0848
Canary Islands ports vs. world ports		0.3833***	p6 Tenerife	0.2346***	0.2743*
Cruiser satisfaction level with:			p6 La Palma	0.2072***	0.2157
p1 Tenerife	−0.1575	−0.1091	p6 Gran Canaria	0.1120	−0.1219
p1 La Palma	0.3993***	0.3854	p6 Fuerteventura	−0.0008	−0.1413
p1 Gran Canaria	0.2083*	0.5903**	p6 Gomera	−0.3153	−0.6134
p1 Fuerteventura	0.2309	0.8914**	p6 Lanzarote	0.0095	0.3791**
p1 Gomera	0.2913	−0.0362			
p1 Lanzarote	−0.0121	−0.2196	cut1	−2.7189***	−3.1201***
p2 Tenerife	0.0873	0.4329*	cut2	−1.7275***	−1.9431**
p2 La Palma	0.0754	0.2352	cut3	−1.5126***	−1.6408*
p2 Gran Canaria	0.1502	−0.2361	cut4	0.8484**	0.5264
p2 Fuerteventura	0.1017	−0.6968	var(_cons[cruise ship])	0.1248***	0.1871**
p2 Gomera	−0.4576	−0.8016	Log likelihood	−6311.71	−1544.94
p2 Lanzarote	−0.0280	−0.3571	AIC	12,731.42	3201.87
p3 Tenerife	0.3070***	0.0313	BIC	13,117.23	3523.64
p3 La Palma	−0.0761	−0.3586	LR test vs. ologit model (χ^2_1)	54.83	13.18
p3 Gran Canaria	0.0576	−0.0026	Prob ≥ χ^2	0.0000	0.0001
p3 Fuerteventura	0.0265	−0.1823	Number of groups	68	68
			Observations	9364	2312

Notes: *, ** and *** indicate statistical significance at 10 %, 5 % and 1 %, respectively. P1 = Port services and infrastructure; P2 = Port safety; P3 = Port organization; P4 = Port hygiene and cleanliness; P5 = Access to the city from the port; P6 = Information available upon arrival at the port.
Source: Authors' own elaboration.

Table 5
Average marginal effects of multilevel mixed-effects ordered logit models on the probability of recommending a cruise to the Canary Islands.

	dy/dx Strongly Agree (y = 5)				
VARIABLES	Model 1.5	Model 1.6	VARIABLES	Model 1.5	Model 1.6
Age	0.00053*	0.0003	p3 Tenerife	0.05523***	0.0052
Gender (ref. male)	−0.00363	0.0014	p3 La Palma	−0.01370	−0.0592
Previous cruises (number)	0.00298**	0.0042**	p3 Gran Canaria	0.01036	−0.0004
Traveling as a couple	0.02303*	0.0436**	p3 Fuerteventura	0.00477	−0.0301
Traveling with friends	0.00291	0.014	p3 Gomera	0.07055	0.1493
First visit Canary Islands (ref. YES)	0.00596	0.0602***	p3 Lanzarote	0.05840**	0.0591
Cruise season (year)	0.00268**	0.0022			
German	0.03441**	0.0200	p4 Tenerife	0.00380	0.0161
Italian	0.04108	0.0796	p4 La Palma	−0.04587*	0.0065
Socioeconomic status	−0.00674	−0.0137	p4 Gran Canaria	0.00401	−0.0056
Port calls (number)	−0.00246	−0.0040	p4 Fuerteventura	−0.01250	0.0202
Canary Islands ports vs. european ports		0.0315**	p4 Gomera	0.00770	−0.0574
Canary Islands ports vs. world ports		0.0633***	p4 Lanzarote	0.05211**	0.0654
Cruiser satisfaction level with:					
p1 Tenerife	−0.02834	−0.0180	p5 Tenerife	0.00351	−0.0229
p1 La Palma	0.07184***	0.0636	p5 La Palma	0.01816	−0.0053
p1 Gran Canaria	0.03748*	0.0974**	p5 Gran Canaria	0.00339	0.0495
p1 Fuerteventura	0.04154	0.1471**	p5 Fuerteventura	0.02681	0.0867
p1 Gomera	0.05241	−0.0060	p5 Gomera	0.11192***	0.2507**
p1 Lanzarote	−0.00218	−0.0362	p5 Lanzarote	−0.01530	−0.0140
p2 Tenerife	0.01570	0.0714*	p6 Tenerife	0.04220***	0.0453*
p2 La Palma	0.01356	0.0388	p6 La Palma	0.03728***	0.0356
p2 Gran Canaria	0.02702	−0.0390	p6 Gran Canaria	0.02015	−0.0201
p2 Fuerteventura	0.01830	−0.1150	p6 Fuerteventura	−0.00014	−0.0233
p2 Gomera	−0.08233	−0.1323	p6 Gomera	−0.05673	−0.1012
p2 Lanzarote	−0.00505	−0.0589	p6 Lanzarote	0.00170	0.0626**

Notes: *, ** and *** indicate statistical significance at 10 %, 5 % and 1 %, respectively. P1 = Port services and infrastructure; P2 = Port safety; P3 = Port organization; P4 = Port hygiene and cleanliness; P5 = Access to the city from the port; P6 = Information available upon arrival at the port.
Source: Authors' own elaboration.

Table 6.1
Multilevel mixed-effects ordered logit results: Determinants of intention to revisit the island.

VARIABLES	Model 2.1	Model 2.2	Model 2.3	Model 2.4
Age (years)	−0.0100	−0.0059	−0.0087	−0.0057
Age square (years)	−0.0000	−0.0000	−0.0001	−0.0000
Gender (ref. male)	0.0065	−0.0237	−0.0032	−0.0272
Previous cruises (number)	0.0210***	0.0325**	0.0224***	0.0303**
Traveling as a couple	0.0048	−0.1065	0.0096	−0.1023
Traveling with friends	0.1832	−0.1173	0.1918	−0.1063
First visit Canary Islands (ref. YES)	0.2254***	0.4958***	0.2191***	0.5002***
Cruise season (year)	0.0263	−0.0069	0.0243	−0.0164
(Cruise season year) ^2	−0.0012	−0.0001	−0.0008	0.0004
German	−0.2095**	−0.2118	−0.1184	−0.1710
Italian	0.2533	0.7023**	0.2893*	0.7681**
Socioeconomic status	0.0494	−0.0092	0.0416	−0.0194
Port calls (number)	0.0178	0.0236	0.0238	0.0394
Port of call (ref. Fuerteventura)				
Tenerife			0.7315***	0.5224**
La Palma			0.5870***	0.5600**
Gran Canaria			1.0486***	0.5284**
Lanzarote			0.7735***	0.3495
La Gomera			0.8924***	0.5606**
Canary Islands ports vs. european ports		0.0386		0.0400
Canary Islands ports vs. world ports		0.2716**		0.2724**
Cruiser satisfaction level with:				
P1	0.2290***	0.1060	0.2033**	0.1061
P2	−0.1275	−0.3034*	−0.1071	−0.2877
P3	0.1853***	0.3701**	0.1912**	0.3749**
P4	−0.0032	0.0030	−0.0141	−0.0153
P5	−0.0201	0.0556	−0.0194	0.0431
P6	0.1065***	0.0905	0.1000**	0.0916
cut1	−2.4426***	−2.8791***	−1.7329***	−2.4688***
cut2	−1.1273***	−1.4906*	−0.4075	−1.0792
cut3	−1.0204***	−1.3696*	−0.2994	−0.9580
cut4	0.8352**	0.5357	1.5792***	0.9508
var(_cons[cruise ship])	0.1436***	0.1018**	0.1442***	0.0775**
Log-likelihood	−8818.46	−2070.96	−8751.68	−2065.97
AIC	17,684.89	4193.92	17,561.36	4193.94
BIC	17,856.36	4343.308	17,768.55	4372.06
LR test vs. ologit model (χ^2_1)	103.13	10.43	86.98	5.63
Prob $\geq \chi^2$	0.0000	0.0004	0.0000	0.0089
Number of groups	68	68	68	68
Observations	9364	2312	9364	2312

Notes: *, ** and *** indicate statistical significance at 10 %, 5 % and 1 %, respectively.
P1 = Port services and infrastructure; P2 = Port safety; P3 = Port organization; P4 = Port hygiene and cleanliness; P5 = Access to the city from the port; P6 = Information available upon arrival at the port.
Source: Authors' own elaboration.

with previous cruise experience, a higher evaluation of the ports of the Canary Islands—compared to those in non-European destinations—positively influences their intention to revisit the islands. This result indicates that Hypothesis H2.8 cannot be rejected either.

Interestingly, higher ratings for port safety, port hygiene and cleanliness, and ease of access from the port to the city do not appear to increase the probability of revisiting the island—except in the latter case for Lanzarote, according to Model 2.6. These results therefore do not support Hypotheses H2.2, H2.4, and H2.5.

To facilitate the interpretation of the results, Figs. 7 and 8 show the average marginal effects on the probability of "strongly agree" to revisit the island for Models 2.2 and 2.3, selected according to the information criteria (AIC and BIC) and likelihood ratio test.[9]

In Model 2.2, it is noteworthy that having previously visited the Canary Islands or coming from Italy has a marginal effect exceeding 10 %. Additionally, a higher rating of the ports of the Canary Islands compared to those in non-European regions increases the probability of revisiting the islands by approximately half a percentage point, a result similar to that observed for cruise passengers' perception of port organization.

In Model 2.3, the positive marginal effects are also noteworthy—exceeding 5 % in this case—and are associated with having previously visited the Canary Islands, as well as favorable perceptions of port services and infrastructure, port organization, and the availability of information upon arrival at the port.

Table A.2 of the Appendix displays the results of the ordered logit models[10] for revisiting each specific island, including comparisons with other international ports. Overall, the positive effect attributed to port organization is prominent across most stopover points, as is the direct relation with previous experience at the destination.

6. Discussion and implications

This study examines the relation between cruise passengers' satisfaction with the attributes of ports of call in the Canary Islands and their behavioural intentions to recommend the cruise to friends and relatives, as well as to revisit the destination in the future. For this purpose, various multilevel mixed-effects ordered logistic models have been analysed. Specifically, two-level random-intercept models have been estimated, considering that tourists are nested within different cruise ships and thus taking into account the correlations between variables at both levels. The regression models, in addition to including control variables that capture the ratings of the ports in the Canary Islands and their comparison with other ports worldwide, include socioeconomic variables of the cruise passengers or their trip-related characteristics.

The results obtained from the marginal effects in the models with the best fit, according to statistical information criteria and likelihood ratio tests, indicate that port-related variables have the most substantial positive influence on cruise recommendation decisions, particularly those concerning the port's services and infrastructure, port organization, and the availability of information upon the cruise passenger's arrival at the port of call. Similarly, regarding the intention to revisit the destination, certain port-related variables, such as the assessment of its organization and infrastructure, have a significant positive effect comparable to factors like traveling with friends or having prior knowledge of the Canary Islands. These findings are aligned with the results provided by Satta et al. (2015), suggesting the existence of a positive association between the quality of port-related services and overall destination satisfaction. Also, Ozturk and Gogtas (2016) estimate that port facilities, along with other attributes of the stopover, have a positive impact on overall destination satisfaction. A similar conclusion can be drawn from the work of Brida et al. (2012) and Rungroueng (2024), as they did find a direct influence of harbour facilities and services on satisfaction with the destination, and therefore, on the probability of revisiting or of recommending. But Silvestre et al. (2008) found no relation between the intention to repeat the cruise and recommending the destination with the perceived quality of the conditions of the port of

[9] The LR test that Model 2.1 is nested within Model 2.3 is $\chi^2(5) = 133.53$, but the hypothesis that Model 2.3 is nested within Model 2.5 is not rejected since $\chi^2(25) = 24.45$. Likewise, the null hypothesis that Model 2.2 is nested within Model 2.4, $\chi^2(25) = 9.98$, and within Model 2.6, $\chi^2(25) = 23.17$, is not rejected.
[10] In this case, the multilevel models were rejected in favor of the simpler alternative of ordered logit models, probably due to the smaller number of observations available at some of the stop-overs.

Table 6.2
Multilevel mixed-effects ordered logit results: Determinants of intention to revisit the island.

VARIABLES	Model 2.5	Model 2.6	VARIABLES	Model 2.5	Model 2.6
Age (years)	−0.0088	0.0006	p3 Gomera	0.6132**	1.0903*
Age square (years)	−0.0000	−0.0001	p3 Lanzarote	0.3179***	0.6884*
Gender (ref. male)	−0.0057	−0.0289	p4 Tenerife	0.1399	0.3071
Previous cruises (number)	0.0231***	0.0315**	p4 La Palma	−0.0242	−0.2242
Traveling as a couple	0.0150	−0.0874	p4 Gran Canaria	−0.0958	−0.0668
Traveling with friends	0.2003***	−0.0726	p4 Fuerteventura	−0.2580*	−0.6714
First visit Canary Islands (ref. YES)	0.2197***	0.5021***	p4 Gomera	−0.0210	0.4164
Cruise season (year)	0.0203	−0.0121	p4 Lanzarote	0.0130	−0.1199
(Cruise season year)^2	−0.0006	0.0000	p5 Tenerife	−0.0384	0.0354
German	−0.1216	−0.1560	p5 La Palma	0.0977	0.1415
Italian	0.2800**	0.7822**	p5 Gran Canaria	−0.0641	−0.3018
Socioeconomic status	0.0407	−0.0182	p5 Fuerteventura	0.0358	−0.2271
Port calls (number)	0.0218	0.0462	p5 Gomera	−0.0377	−0.3610
Canary Islands ports vs. european ports		0.0216	p5 Lanzarote	−0.0433	0.4226***
Canary Islands ports vs. world ports		0.2768***	p6 Tenerife	0.1819***	−0.0315
Cruiser satisfaction level with:			p6 La Palma	0.0751	0.0777
p1 Tenerife	−0.0317	−0.1419	p6 Gran Canaria	0.0787	0.3050*
p1 La Palma	0.1181	0.2062	p6 Fuerteventura	0.1249	0.1988
p1 Gran Canaria	0.3937***	0.3800	p6 Gomera	0.1444	0.4010**
p1 Fuerteventura	0.4872***	0.6595***	p6 Lanzarote	0.0304	−0.1195
p1 Gomera	0.1046	−0.4751			
p1 Lanzarote	0.1899*	−0.0201	cut1	−2.4342***	−2.9214***
p2 Tenerife	−0.0488	−0.3268	cut2	−1.1064***	−1.5154*
p2 La Palma	−0.1253	−0.3074	cut3	−0.9979***	−1.3923*
p2 Gran Canaria	0.0276	−0.1783	cut4	0.8850**	0.5424
p2 Fuerteventura	−0.2351	0.3925	var(_cons[cruise ship])	0.1457***	0.0887**
p2 Gomera	−0.3874	−0.7589	Log−likelihood	−8739.46	−2049.37
p2 Lanzarote	−0.1369	−0.5972*	AIC	17,586.91	4210.74
p3 Tenerife	0.1584	0.4267**	BIC	17,972.72	4532.51
p3 La Palma	0.1830*	0.4097	LR test vs. ologit model (χ^2_1)	7.80	6.55
p3 Gran Canaria	0.1003	0.1738	Prob ≥ χ^2	0.0000	0.0053
p3 Fuerteventura	0.0596	−0.1957	Number of groups	68	68
			Observations	9364	2312

Notes: *, ** and *** indicate statistical significance at 10 %, 5 % and 1 %, respectively. P1 = Port services and infrastructure; P2 = Port safety; P3 = Port organization; P4 = Port hygiene and cleanliness; P5 = Access to the city from the port; P6 = Information available upon arrival at the port. Source: Authors' own elaboration.

call.

As concerns port security, this variable has been analysed by Brida et al. (2012), Satta et al. (2015), Ozturk and Gogtas (2016), and the present paper, yielding different results. Brida et al. (2012) and Ozturk and Gogtas (2016) found a positive and statistically significant effect on the intention to revisit or recommend the destination (WOM). Similarly, Silvestre et al. (2008) concluded that satisfaction with the destination, including safety, has a direct and significant impact on both the intention to repeat the cruise and to recommend the cruise and the destination—in his case, the Azores—to friends and family. However, the results reported by Satta et al. (2015) are ambiguous: they find a positive and statistically significant influence only when the security variable is included as the sole attribute of port satisfaction, whereas its effect becomes insignificant when it is considered alongside other port evaluation attributes. This latter pattern is consistent with our findings across all the models we have estimated. These results suggest that further research is needed to better understand the role of port security in shaping cruise passengers' behavioural intentions.

Regarding the other explanatory variables, our results show that cruise passengers who have previously traveled to the Canary Islands are more likely to repeat visits, thus showing more loyalty to the destination. This finding is similar to the conclusions of Gabe et al. (2006) about Maine, Toudert and Bringas-Rábago (2016) about Baja California, and Brida et al. (2012) for Cartagena, Colombia, although it contradicts the effect found by Ozturk and Gogtas (2016) for Honolulu. Furthermore, the evidence found indicates that neither the gender nor the socioeconomic status of the cruise passenger influences their intention to repeat visits to the destination, aligning with the conclusions of Ozturk and Gogtas (2016) and Satta et al. (2015). We also did not find a significant relation between the age of the cruise passenger and their intention to revisit the port of call. In contrast, Gabe et al. (2006) found an inverse dependency, while Parola et al. (2014) observed evidence of a positive correlation for younger passengers and a negative one for those aged over 65. This last result differs from what we found for the probability of recommending the cruise, as the combined coefficients of the control variables containing "age" suggest that it is older cruise passengers who show a greater willingness for the WOM recommendation of the cruise. Finally, as in Gabe et al. (2006), we also observed that the previous number of cruises taken by the tourist positively influences their intention to revisit the destination, a result opposite to that noted in Brida et al. (2012).

7. Conclusions and future research

This article has analysed whether various attributes of the ports of call in the Canary Islands and their differences from other European/world ports influence cruise passengers' intention to revisit the island or recommend cruises to the Canary Islands to their professional and social networks. Regarding methodological issues, it contributes to the existing literature as it is the first time that such an analysis has been conducted using, additionally, a multilevel analysis where tourists are considered as nested within the different cruise ships. Therefore, the present article represents a step toward an improved understanding in the empirical literature concerning this topic.

In terms of empirical contributions, the study is also the first in the literature that includes information on cruise passengers' perceptions collected in several ports of call for several cruise seasons. The latter allows us not only to study the temporal evolution of the sector but also to obtain more precise estimates. Furthermore, unlike previous studies (Brida et al., 2012; Ozturk & Gogtas, 2016; Rungroueng, 2024; Satta et al., 2015; Silvestre et al., 2008), this paper explores whether the level of satisfaction of cruise passengers with ports of the Canary Islands

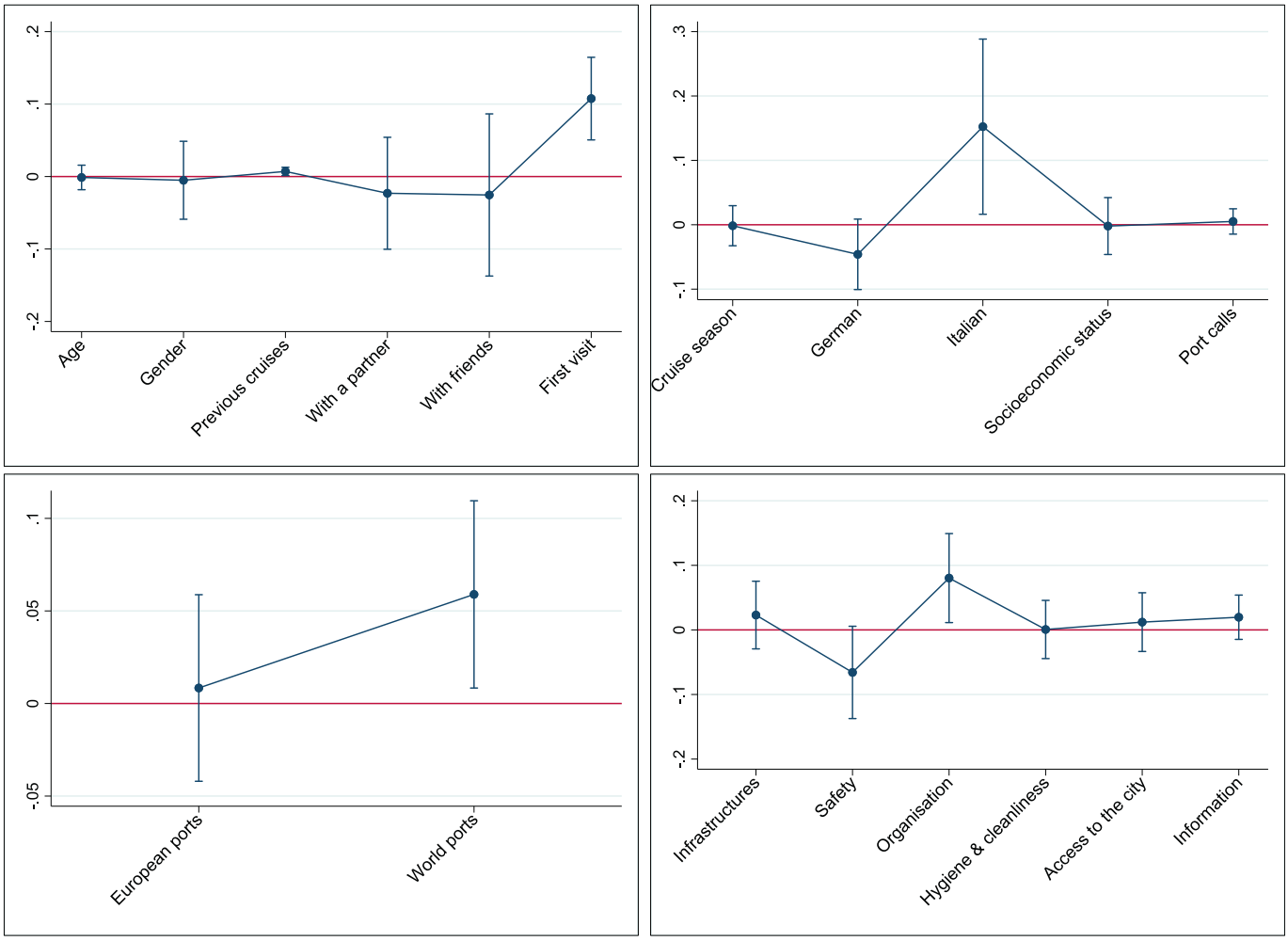


Fig. 7. Average marginal effects with 95 % CIs of Model 2.2.
Source: Authors' own elaboration.

compared to European or world ports has any influence on their intention to revisit the islands or to recommend cruises to the Canary Islands.

The results indicate that a higher rating of the organization of a port and its information services upon the arrival of cruise passengers positively and significantly influences both the probability of recommending a cruise to the Canary Islands and that of revisiting the destination in the future. These probabilities are also increased when a port in the Canary Islands receives higher ratings than ports from the rest of the world. This result is related to the indirect effect of port aesthetics on tourist loyalty via destination image and tourist satisfaction, which Lu et al. (2020) found when they studied this issue at the ferry pier in Tsim Sha Tsui, Hong Kong; and suggests that this indirect effect could also play a role when it comes to cruise ports. On the other hand, the findings regarding port security highlight the need for a deeper understanding of how it may impact passengers' future intentions to recommend the cruise or the destination.

Our results provide valuable implications for policymakers and stakeholders as they confirm the influence of cruise passengers' satisfaction with attributes of their port-of-call on cruise WOM and their intention to revisit. This information is crucial for port authorities, enabling them to prioritise their efforts to improve port-related attributes that significantly enhance the likelihood of cruise passengers returning, whether as traditional tourists or repeat cruise passengers. Identifying these key attributes is also essential for garnering support from policymakers to design more effective policies and conditions to attract necessary investments.

Beyond the empirical implications for port management and cruise marketing strategies, these findings also engage with broader debates within the academic field of cruise tourism. Our results contribute to the evolving literature in this area, aligning with the forward-looking agenda proposed by Papathanassis (2025), which advocates for a more transformative and anticipatory approach to cruise research. In this regard, the present study highlights the importance of capturing differentiated cruise passenger experiences as a basis for improving port service quality and enhancing destination competitiveness.

Finally, it's important to acknowledge some limitations of this study. Firstly, while our dataset covers multiple ports, they are all located in the Canary Islands, thus further research incorporating other geographical markets would be desirable for a broader understanding. This is particularly important given the heterogeneity of cruise markets, not only in terms of brand offerings (mid-market, all-inclusive), but also in terms of market maturity (e.g. Europe vs Asia) or even cultural differences between cruisers (e.g. Hong Kong vs Taiwan). Additionally, our dataset spans several seasons prior to the COVID-19 pandemic, suggesting that the results could differ in the current context due to potential changes in the profile of cruise passengers, such as sociodemographic characteristics. Lastly, a possible avenue for future investigation is to extend the analysis beyond 2015 to examine the impact of the new cruise terminal that opened in 2016 in Tenerife, which offers passengers enhanced facilities and modern amenities.

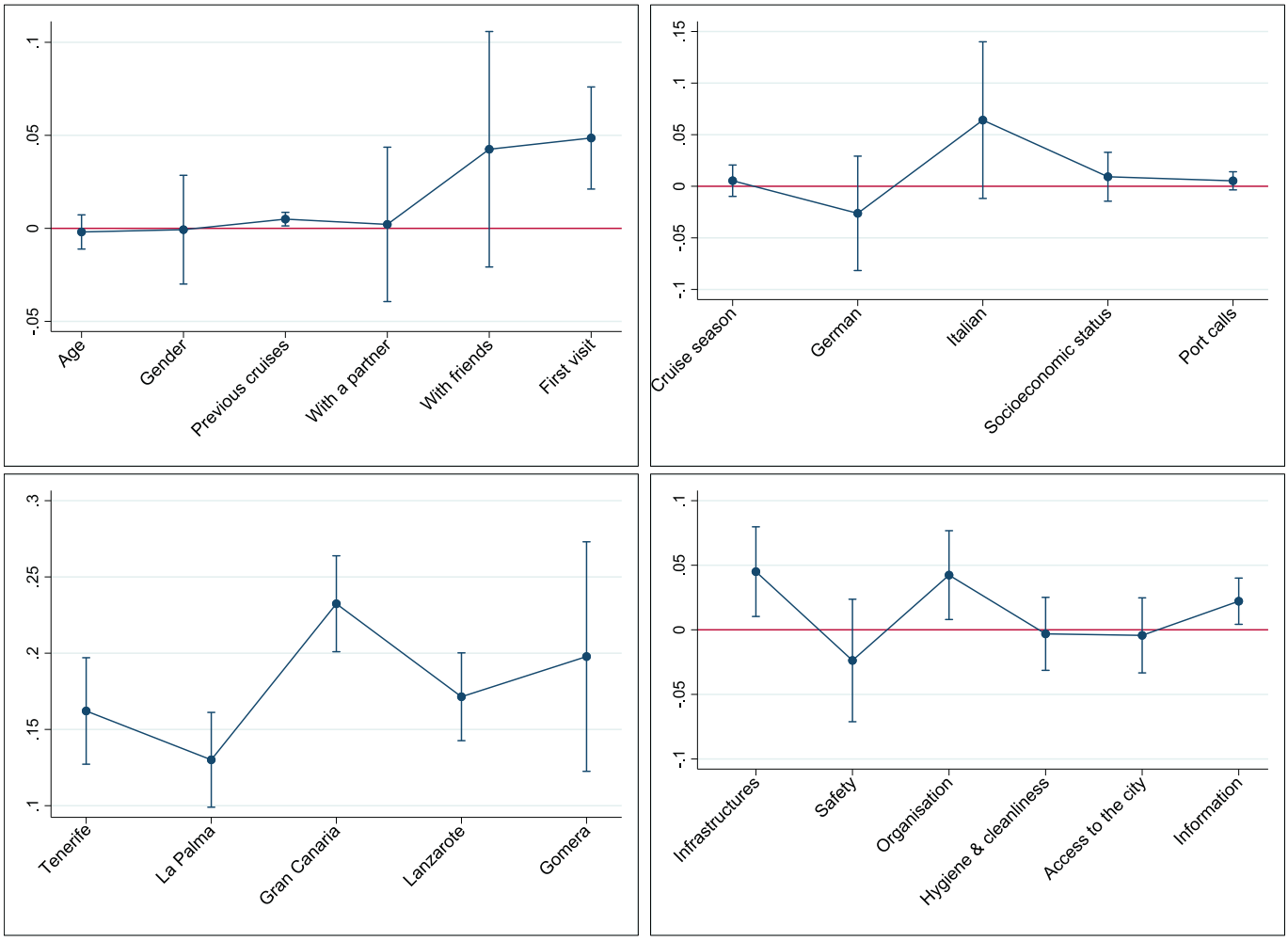


Fig. 8. Average marginal effects with 95 % CIs of Model 2.3.
Source: Authors' own elaboration.

CRediT authorship contribution statement

J.F. Baños-Pino: Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Software, Resources, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **B. Tovar:** Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Software, Resources, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization.

Funding

This work was supported by Spanish Ministry of Science and Innovation [grant PID2020-119639RB-I00].

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgements

A previous version of this paper has been presented in Congreso IAME 2024 Conference celebrated in Valencia (Spain). The authors wish to acknowledge the help provided by Juan Francisco Martín Naranjo and Jose Luis Saavedra Alvarado who provide the data used in this article.

Appendix A. Appendix

Table A.1
VIF multicollinearity test results.

Explanatory variables	VIF
Age (years)	1.26
Gender (ref. male)	1.02
Previous cruises (number)	1.24
Traveling as a couple	1.72
Traveling with friends	1.71
First visit Canary Islands (ref. YES)	1.11
Cruise season year	1.15
German	1.21
Italian	1.10
Tenerife	4.16
La Palma	3.54
Gran Canaria	3.63
Lanzarote	3.32
La Gomera	1.88
Socioeconomic status	1.08
Cruiser satisfaction level with:	
– Port services and infrastructure	2.14
– Port safety	2.31
– Port organization	2.29
– Port hygiene and cleanliness	1.96
– Access to the city from the port	1.47
– Information available upon arrival at the port	1.36
Canary Islands ports vs. european ports	1.19
Canary Islands ports vs. world ports	1.19
Mean VIF	1.84

Source: Authors' own elaboration.

Table A.2
Results of ordered logit models: Factors influencing the probability of revisiting the island.

Variables	Tenerife	La Palma	Gran Canaria	Fuerteventura	Gomera	Lanzarote
Age (years)	0.0404	0.0341	−0.0077	−0.0542	−0.0949	−0.0499
Age square (years)	−0.0004	−0.0004	−0.0000	0.0005	0.0008	0.0002
Gender (ref. male)	−0.0306	−0.0047	0.0778	−0.1915	−0.3520	0.1636
Previous cruises (number)	−0.0033	0.0383	0.0599**	−0.0379	0.0069	0.0557**
Traveling as a couple	0.7357**	−0.0077	0.0670	0.4914	−0.1219	0.0559
Traveling with friends	0.8472**	−0.2638	0.1982	0.8219	−0.3651	0.4456
First visit Canary Islands (ref. YES)	0.2577	0.5192**	0.5826**	1.2500**	0.5334	0.3487
Cruise season (year)	0.0382	−0.2358**	0.1262	−0.8680**	−1.9213	0.0119
(Cruise season year)^2	−0.0028	0.0225***	−0.0133*	0.0412*	0.0859	−0.0059
German	−0.0163	−0.1557	−0.8722**	−0.0948	0.1332	−0.4163*
Italian	0.4988	2.0867	−0.5772	14.1669***	15.7734	0.2737
Socioeconomic status	0.0139	−0.1830	0.0210	0.0497	−0.3038	0.0587
Port calls (number)	0.1232	0.1381*	0.0335	−0.0493	0.6129**	−0.0584
Port of call (ref. Fuerteventura)						
Canary Islands ports vs. european ports	0.0639	0.1139	0.0715	0.4105	0.3857	0.0808
Canary Islands ports vs. world ports	0.1676	0.8780***	−0.0560	0.6100	0.3302	0.2618
Cruiser satisfaction level with:						
P1	−0.1447	−0.0723	0.4274	0.3488	−0.6311	−0.0696
P2	−0.3598	−0.2443	−0.2064	−0.6310	−0.9360	−0.6126*
P3	0.4826**	0.4260**	0.2458	0.3505	1.2595**	0.7421***
P4	0.1902	−0.0449	−0.0952	−0.2760	0.7496	−0.1671
P5	0.0701	0.3414	−0.3729	−0.0124	−0.3964	0.3703**
P6	−0.0953	0.0716	0.3405**	0.4686	0.3337	−0.0481
cut1	−3.1955*	−1.5329	−2.2690	−8.5575*	−14.4140*	−4.9933***
cut2	−1.6260	−0.1951	−1.4006	−5.4337	−12.3559	−3.6770**
cut3	−1.5616	−0.1633	−1.2339	−5.2804	−12.0337	−3.5335**
cut4	0.6207	2.0660	0.7454	−3.0804	−10.8181	−1.6516
Observations	589	510	486	129	147	426

Notes: *, ** and *** indicate statistical significance at 10 %, 5 % and 1 %, respectively.
P1 = Port' services & infrastructures; P2 = Port' safety; P3 = Port' organization; P4 = Port' hygiene & cleanliness; P5 = Access to the city from the port; P6 = Information available upon arrival at the port.
Source: Authors' own elaboration.

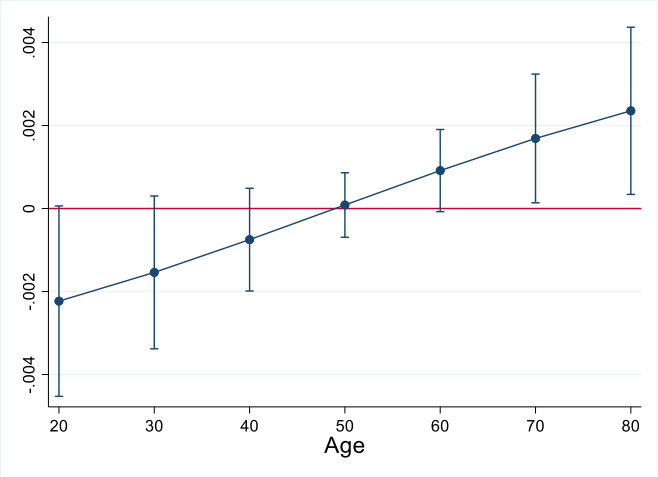


Fig. A.1. Average marginal effects of Age with 95 % CIs.
Source: Authors' own elaboration.

Data availability

Data will be made available on request.

References

Agresti, A. (2010). *Analysis of ordinal categorical data* (2nd ed.). Chichester, England: John Wiley & Sons.

Alves, R. L. C., & Santos, T. A. (2022). Cruise ship itinerary design considering port attractiveness for passengers. *Research in Transportation Business & Management, 43*, Article 100815. https://doi.org/10.1016/j.rtbm.2022.100815

Andriotis, K., & Agiomirgianakis, G. (2010). Cruise visitors' experience in a Mediterranean port of call. *International Journal of Tourism Research, 12*(4), 390–404. https://doi.org/10.1002/jtr.770

Baños, J. F., & Tovar, B. (2021). Estimating cruise passenger's expenditure: A censored system approach. *Tourism Management Perspectives, 38*, Article 100808. https://doi.org/10.1016/j.tmp.2021.100808

Baumann, A. C. (2021). On the path towards understanding overtourism – Cruise tourism and the transportation infrastructure. *World Leisure Journal, 63*(1), 5–13. https://doi.org/10.1080/16078055.2021.1887995

Brida, J. G., Pulina, M., Riaño, E., & Zapata-Aguirre, S. (2012). Cruise visitors' intention to return as land tourists and to recommend a visited destination. *Anatolia, 23*, Article 395412. https://doi.org/10.1080/13032917.2012.712873

Bruwer, J. (2012). Service quality perception and satisfaction: Buying behaviour prediction in an Australian Festivalscape. *International Journal of Tourism Research, 16*(1), 76–86. https://doi.org/10.1002/jtr.1901

Castillo-Manzano, J. I., Castro-Nuño, C., & Pozo-Barajas, R. (2022). Addicted to cruises? Key drivers of cruise ship loyalty behavior through an e-WOM approach. *International Journal of Contemporary Hospitality Management, 34*(1), 361–381. https://doi.org/10.1108/IJCHM-05-2021-0642

Chen, C. A. (2016). How can Taiwan create a niche in Asia's cruise tourism industry? *Tourism Management, 55*, 173–183. https://doi.org/10.1016/j.tourman.2016.02.015

Chen, J. M., Lijesen, M. G., & Nijkamp, P. (2017). Interpretation of cruise industry in a two-sided market context: An exploration on Japan. *Maritime Policy & Management, 44*(6), 790–801. https://doi.org/10.1080/03088839.2017.1335898

Chen, J. M., Neuts, B., Nijkamp, P., & Liu, J. (2016). Demand determinants of cruise tourists in competitive markets: Motivation, preference, and intention. *Tourism Economics, 22*(2), 227–253. https://doi.org/10.5367/te.2016.0546

Chen, J. M., & Nijkamp, P. (2018). Itinerary planning: Modelling cruise lines' lengths of stay in ports. *International Journal of Hospitality Management, 73*, 55–63. https://doi.org/10.1016/j.ijhm.2018.02.005

Chen, J. M., Petrick, J. F., Mackay, J., & Nijkamp, P. (2020). Decision-making in cruise operations management: A double-hurdle approach. *Research in Transportation Business & Management, 37*, Article 100524. https://doi.org/10.1016/j.rtbm.2020.100524

Chen, J. M., Petrick, J. F., Papathanassis, A., & Li, X. (2019). A meta-analysis of the direct economic impacts of cruise tourism on port communities. *Tourism Management Perspectives, 31*, 209–218. https://doi.org/10.1016/j.tmp.2019.05.005

Cruise Lines International Association (CLIA). (2023). 2023 State of the Cruise Industry Outlook. Available online at: https://cruising.org/-/media/clia-media/research/2023/clia_state-of-the-cruise-industry-report-sept-2023-update-live.ashx. (Accessed 24 January 2024).

EDEI. (2015). Estudios de Mercado de Turismo de Cruceros Temporada 2014-2015. http://www.datosdelanzarote.com/itemDetalles.asp?idFamilia=26&idItem=6725. (Accessed 16 November 2024).

Esteve-Perez, J., & Garcia-Sanchez, A. (2015). Cruise market: Stakeholders and the role of ports and tourist hinterlands. *Maritime Economics & Logistics, 17*(3), 371–388. https://doi.org/10.1057/mel.2014.21

Esteve-Perez, J., & Garcia-Sanchez, A. (2017). Characteristics and consequences of the cruise traffic seasonality on ports: The Spanish Mediterranean case. *Maritime Policy & Management, 44*(3), 358–372. https://doi.org/10.1080/03088839.2017.1295326

Florida Caribbean Cruise Association (FCCA). (2024). Economic contribution of cruise tourism to the destination economies. Retrieved from https://f-cca.com/downloads/2024-Caribbean-Cruse-Analysis-Vol-I.pdf#page=18.07 (Accessed 07/01/2025).

Gabe, T. M., Lynch, C. P., & McConnon, J. C., Jr. (2006). Likelihood of cruise ship passenger return to a visited port: The case of Bar Harbor, Maine. *Journal of Travel Research, 44*(3), 281–287. https://doi.org/10.1177/0047287505279107

Hosany, S., & Witham, M. (2010). Dimensions of cruisers' experiences, satisfaction, and intention to recommend. *Journal of Travel Research, 49*(3), 351–364. https://doi.org/10.1177/0047287509346859

Li, X., Cheng, C., Kim, H., & Petrick, J. F. (2008). A systematic comparison of first-time and repeat visitors via a two-phase online survey. *Tourism Management, 29*, 278–293. https://doi.org/10.1016/j.tourman.2007.03.010

Lopes, M. J., & Dredge, D. (2018). Cruise tourism shore excursions: Value for destinations? Cruise tourism shore excursions. *Journal of Tourism Planning and Development, 15*(6), 633–652. https://doi.org/10.1080/21568316.2017.1366358

Lu, C. S., Weng, H. K., Chen, S. Y., Chiu, C. W., Ma, H. Y., Mak, K. W., & Yeung, T. C. (2020). How port aesthetics affec destination image, tourist satisfaction and tourist loyalty? *Maritime Business Review, 5*(2), 211–228. https://doi.org/10.1108/MABR-12-2019-0056

Machado da Luz, L., Pais Antunes, A., Caldeirinha, V., Caballé-Valls, J., & Garcia-Alonso, L. (2022). Cruise destination characteristics and performance: Application of a conceptual model to North Atlantic islands of Macaronesia. *Research in Transportation Business & Management, 43*, Article 100747. https://doi.org/10.1016/j.rtbm.2021.100747

Martín-Duque, C., Romero-Padilla, Y., Babinger, F., & Ruiz-Guerra, I. (2023). Key cooperation strategies between Spanish ports and tourist destinations: An exploratory analysis. *Research in Transportation Business & Management, 47*, Article 100942. https://doi.org/10.1016/j.rtbm.2022.100942

Montesdeoca, S., & Tovar, B. (2024). Factors influencing the cruisers in recommending onshore excursions in Gran Canaria. *Heliyon, 10*(12), Article e31993. https://doi.org/10.1016/j.heliyon.2024.e31993

Ozturk, U. A., & Gogtas, H. (2016). Destination attributes, satisfaction, and the cruise visitor's intent to revisit and recommend. *Tourism Geographies, 18*(2), 194–212. https://doi.org/10.1080/14616688.2015.1124446

Pallis, A. (2015). Cruise shipping and urban development: State of the art of the industry and cruise ports. In *Discussion paper no. 2015–14*. International Transport Forum.

Pallis, A., Arapi, K., & Papachristou, A. (2019). Models of cruise ports governance. *Maritime Policy & Management, 46*(5), 630–651. https://doi.org/10.1080/03088839.2019.1590657

Papathanassis, A. (2025). Cruise tourism research: A horizon 2050 paper. *Tourism Review, 80*(1), 165–180. https://doi.org/10.1108/TR-12-2023-0829

Papathanassis, A., & Beckmann, I. (2011). Assessing the 'poverty of cruise theory' hypothesis. *Annals of Tourism Research, 38*(1), 153–174. https://doi.org/10.1016/j.annals.2010.07.015

Parola, F., Satta, G., Penco, L., & Persico, L. (2014). Destination satisfaction and cruiser behaviour: The moderating effect of excursion package. *Research in Transportation Business & Management, 13*, 53–64. https://doi.org/10.1016/j.rtbm.2014.11.001

Petrick, J. F. (2004). First timers' and repeaters' perceived value. *Journal of Travel Research, 43*(1), 29–38. https://doi.org/10.1177/004728750426

Petrick, J. F. (2005). Segmenting cruise passengers with price sensitivity. *Tourism Management, 26*(5), 753–762. https://doi.org/10.1016/j.tourman.2004.03.015

Pino, J. F., & Tovar, B. (2019). Explaining cruisers' shore expenditure through a latent class tobit model: Evidence from the Canary Island. *Tourism Economics, 25*(7), 1105–1133, 25879 https://doi.org/10.1177/1354816618823599.

Pranić, L., Marušić, Z., & Sever, I. (2013). Cruise passengers' experiences in coastal destinations–floating "B&Bs" vs. floating "resorts": A case of Croatia. *Ocean and Coastal Management, 84*, 1–12. https://doi.org/10.1016/j.ocecoaman.2013.07.002

Pugliano, G., Benassai, G., & Benassai, E. (2018). Integrating urban and port planning policies in a sustainable perspective: The case study of Naples historic harbour area. *Planning Perspectives, 1-21*. https://doi.org/10.1080/02665433.2018.1455068

Rabe-Hesketh, S., & Skrondal, A. (2008). *Multilevel and longitudinal modeling using Stata*. STATA press.

Rungroueng, T. (2024). A model for managing standardization of cruise port attributes influencing cruise passenger satisfaction toward positive word-of-mouth: The GSCA application approach. *ABAC Journal, 44*(4), 312–332.

Sanz-Blas, S., Carvajal-Trujillo, E., & Buzova, D. (2017). Assessing cruise port of call performance: A passenger-based approach using PLS modelling. *Maritime Policy & Management, 44*(8), 967–980. https://doi.org/10.1080/03088839.2017.1371346

Satta, G., Parola, F., Penco, L., & Persico, L. (2015). Word of mouth and satisfaction in cruise port destinations. *Tourism Geographies, 17*(1), 54–75. https://doi.org/10.1080/14616688.2014.938689

Schuster, M., Schnabel, P., Büchler, T., Beiersdorf, A., & Hastedt, L. (2018). Technical noise investigations at Hamburg City cruise terminals. Available online at: https://nachtlawaai-haven.be/wp-content/uploads/2020/04/Technical-Noise-Investigations-at-Hamburg-City-Cruise-Terminals-2018.pdf. (Accessed 31 January 2024).

Silvestre, A. L., Santos, C. M., & Ramalho, C. (2008). Satisfaction and behavioural intentions of cruise passengers visiting the Azores. *Tourism Economics, 14*, Article 169184. Retrieved from https://doi.org/10.5367/000000008783554802.

Sun, X., Kwortnik, R., & Gauri, D. (2018). Exploring behavioral differences between new and repeat cruisers to a cruise brand. *International Journal of Hospitality Management, 71*, 132–140. https://doi.org/10.1016/j.ijhm.2017.12.006

Sun, X., Xu, M., Lau, Y., & Gauric, D. (2019). Cruisers' satisfaction with shore experience: An empirical study on a China-Japan itinerary. *Ocean and Coastal Management, 181* (2019), Article 104867. https://doi.org/10.1016/j.ocecoaman.2019.104867

Tattara, G. (2014). Quantifying cruising study on the economic impact of large cruise ships at Venice. Available at: https://www.researchgate.net/publication/277297441_Quantifying_Cruising. (Accessed 24 November 2021).

Teye, V., & Leclerc, D. (1998). Product and service delivery satisfaction among north American cruise passengers. *Tourism Management, 19*(2), 153–160. https://doi.org/10.1016/S0261-5177(97)00107-6

Teye, V., & Paris, C. (2011). Cruise line industry and Caribbean tourism: Guests' motivations, activities, and destination preference. *Tourism Review International, 14*, 17–28. https://doi.org/10.3727/154427211X12954639814858

Toudert, D., & Bringas-Rábago, N. (2016). Impact of the destination image on cruise repeater's experience and intention at the visited port of call. *Ocean and Coastal Management, 130*, 239–249. https://doi.org/10.1016/j.ocecoaman.2016.06.018

Tovar, B., Espino, R., & Lopez-del-Pino, F. (2022). Residents' perceptions and attitudes towards the cruise tourism impact in gran Canaria. *Research in Transportation Business and Management, 45*(Part B), Article 100586. https://doi.org/10.1016/j.rtbm.2020.100586

Tovar, B., & Tichavska, M. (2019). Environmental cost and eco-efficiency from vessel emissions under diverse SOx regulatory frameworks: A special focus on passenger port hubs. *Transportation Research Part D: Transport and Environment, 69*, 1–12. https://doi.org/10.1016/j.trd.2019.01.019

Vaggelas, G., & Pallis, A. (2010). Passenger ports: Services provision and their benefits. *Maritime Policy & Management, 37*(1), 73–89. https://doi.org/10.1080/03088830903461209

Verhoeven, P. (2010). A review of port authority functions: Towards a renaissance? *Maritime Policy & Management, 37*(3), 247–270. https://doi.org/10.1080/03088831003700645

Whyte, L. J. (2017). Understanding the relationship between push and pull motivational factors in cruise tourism: A canonical correlation analysis. *International Journal of Tourism Research, 19*(5), 557–568. https://doi.org/10.1002/jtr.2129

Whyte, L. J., Packer, J., & Ballantyne, R. (2018). Cruise destination attributes: Measuring the relative importance of the onboard and onshore aspects of cruising. *Tourism Recreation Research, 43*(4), 470–482. https://doi.org/10.1080/02508281.2018.1470148

Yoon, Y., & Uysal, M. (2005). An examination of the effects of motivation and satisfaction on destination loyalty: A structural model. *Tourism Management, 26*, 45–56. https://doi.org/10.1016/j.tourman.2003.08.016