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Tourist Destinations and Cooperative Agreements between Airlines

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Tourist Destination and Cooperative Agreements between Airlines

Highlights

- Tourist destination value influences the strategic behaviour of airline firms
- Airline firms will tend not to cooperate on routes with top tourist destinations
- The type of route influences the cooperative behaviour of Airline firms
- Scarce resources prompt cooperation on international routes to top destinations
- Airlines prefer to cooperate on routes with no hubs but with top tourist destinations

Tourist Destinations and Cooperative Agreements between Airlines

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Keywords: code-share agreement, tourist destination, routes typology, strategic behaviour, Airlines

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1. Introduction

The interrelations between tourist destinations and the firms that operate within the tourism industry are beyond all doubt. Their mutual influence is evident. Recent works have underlined the utility of interconnecting studies both on the airline industry and on the tourism industry (Bieger & Wittmer, 2006; Duval, 2013; Pike, Pontes & Kotsi, 2021; Spasojevic, Lohmann & Scott, 2018). In particular, Duval (2013) identified the relation between destinations and airline business models as a principal issue in tourism studies. Bieger & Wittmer (2006) pointed out that tourism is a driving factor and a stimulus for change in air transport and that airlines must consider the business model of tourist destinations. There are works that have shown how airline business decisions affect destinations (Spasojevic et al., 2018). However, many authors have underlined the influence of both directions between tourist destinations and transport (Currie & Falconer, 2014; Lohmann & Pearce, 2012) and air transport (Bieger & Wittmer, 2006; Graham, Papatheodorou & Forsyth, 2008; Hvass, 2014; Tang, Weaver, & Lawton, 2017).

Certainly, destination marketing and planning managers can influence certain airlines in such a way that they cover a specific flight route that connects certain destinations (Castillo-Manzano, López-Valpuesta & González-Laxe, 2011). It is likewise true that the combined action of governments and airlines can contribute to the growth of a tourist destination (Lohmann., Albers, Koch & Pavlovich., 2009; Pike et al., 2021). Therefore, knowledge of airline network structures is important for tourist destinations. In fact, the development of airline routes will generate direct benefits for tourist destinations (Tan, Koo & Duval, 2017), because tourists constitute a high percentage of airline traffic (Graham et al., 2008). Cooperation with other airlines will facilitate the interconnection of a destination very rapidly and with less need for resources and will provoke new direct and indirect influxes of tourists (Hvass, 2014).

The strongest strategic opportunity to have affected airlines over recent years is the tendency to cooperate and to set up agreements and alliances (Castiglioni, Gallego & Galán, 2018). Thus, code-share agreements are the most common type of alliance within the airline industry (Zhou & Chen, 2016), although they coexist with another significant trend: Competition between the three global alliances within the sector, Oneworld, SkyTeam, and Star Alliance (Gomes-Casseres, 1994).

There is plenty of literature in which the motives that incentivize airlines to reach code-sharing agreements are emphasized (Evans, 2001; Goetz & Shapiro, 2012). Some are internal to the firm, such as cost reduction, network planning of routes, access to partner resources, *etc*, while others are external to the firm, such as economic and market-related factors. However, there is scarce research on the explanatory factors that account for this cooperative behaviour in the area of tourism activity. This study is centred on filling that gap through an analysis of the relation between the value of tourist destinations and the decision to form codeshare alliances within the airline sector.

In addition, not all routes are similar. In the process of developing the routes, the agents that are involved (airline, airports, Destination Management Organizations-DMOs-authorities and other stakeholders) will consider different aspects when deciding on whether to operate new routes and to integrate them within a global network (Halpern & Graham, 2015; Spasojevic, Lohmann & Scott, 2019). Each type of route has an intrinsic value due to its characteristics. Routes can be the object of a more detailed analysis by their typology, because of their different features, such as distance (Bhadra & Hogan, 2008; Chu, 2014) and their international itineraries (Oum, Yu & Zhang, 2001), or because of their position in the operative network of the firm (Goetz & Shapiro, 2012). In addition to the generation of value for an airline, each type of route needs a greater or a lesser quantity of resources for its development or to be operated. It will all mean that the different types of routes can affect the relation between high-value tourist destinations and the cooperative behaviour of the airline.

The objective of this study is, on the one hand, to examine the relations that exist between the importance attached to tourist destination value and the cooperative alliances between airlines that are formed through codeshare agreements. On the other hand, different types of routes are considered to establish whether they play some role in that relation. Almost 50,000 global routes and the principal tourist destinations throughout the world were analysed to conduct the study.

2. Theoretical Review

2.1 Tourist Destination and Airline Industry

The concept of a tourist destination is complex in so far as different agents and researchers employ it different ways. None of these conceptualizations of a tourist destination is better than another, but each one places the spotlight on one aspect, lessening the importance of others (Framke, 2002; Lohmann & Pearce, 2010). Framke (2002) proposed four points to define a tourist destination: the geographic limits of a destination; the content of a destination in terms of services and attractions; its consideration as a package in which cooperation takes place between such agents as firms, tourism organizations and authorities; and the behavioural patterns of tourists at that destination. In this study, the tourist destination is considered from that multi-faceted viewpoint, but understanding that the central reference point is its strong link to the concept of place.

A tourist destination can be seen as something more than the place that is visited on a trip or the endpoint of a trip. Lohmann & Pearce (2010, 2012) affirmed that when tourist flows and their planning are considered, a place can play roles that are not only destinations, such as points of departure, hubs, gateways, and stopovers. A place of tourism usually plays multiple roles some of which can be intensified due to the others (Lohmann et al., 2009; Tang et al., 2017).

This nodal perspective of tourist flows and of the functions that touristic places play is parallel to the one that is adopted in air transport when considering the structure of airline networks and passenger flows between airports. An airport and likewise an airline destination can also be analysed by considering its nodal positions (departure point, destination, hub, gateway, *etc*) within a network. An airline destination, understood as a nodal position of airline network, can serve one or various tourism destinations. These touristic places linked to a node of the airline can be an airport in itself, a city, an area, a region or a touristic attraction at more or less at some distance from an airport.

The connections within the nodal network in networks of touristic places and airline destinations or airports highlight the relations between air transport and tourist destination. Spasojevic et al. (2018) conducted an extensive exploration of those relations. After establishing the interdependencies between the economic sectors of tourism and airline transport, they analysed the ever-larger number of papers in an area of convergence between both lines of study. Their conclusion was that a very necessary intersection is emerging for research and that it is of interest to study the influence in both directions: how airlines affect tourist destinations and how destinations affect the airline industry. They likewise pointed to relevant topics in this area of convergence, such as: the role of low-cost airlines, the impact of aviation on destinations, environmental questions, the existence of collaborative networks, the expansion of new routes or new direct routes of a larger radius. In particular, they pointed out that most studies on the role of destinations have been centred on examining how the airline industry impacts on the development of tourist destinations (Spasojevic et al., 2018). Lohman and Duval (2014) characterized both sectors as co-dependent and pointed to the need for joint tourism and transport policies.

The connection between destinations and airline management is also situated at a strategic level. Duval (2013) explicitly pointed to the relations between destinations and the airline business model as a relevant question. Wachsman (2006) proposed cooperative strategies between tourism firms at a destination. Liasidou (2013) also pointed to the influence of airline strategies on destinations in terms of passengers. Likewise, Lohmann et al. (2009) showed the use of strategies that combined airlines and destinations for tourism development.

Other authors have pointed to the interdependence of the different agents who are involved in the development of a tourist destination (Halpern & Graham, 2015; Hvass, 2014; Spasojevic et al., 2019; Stephenson, Lohmann, & Spasojevic, 2018). These authors underlined the importance of the relations (and of cooperation) between the relevant stakeholders for a tourist destination, principally between an airline, an airport and a DMO, but also between other stakeholders such as tourism firms, suppliers and authorities. The influence of some on others arises in multiple aspects and in all directions (Hvass, 2014; Spasojevic et al., 2019; Stephenson et al., 2018).

The interdependencies pointed out earlier suggest that the development of the route network of an airline is linked to both the features of a tourist destination and the agents that are present within it (Stephenson et al., 2018, Tan et al., 2017). These stakeholders are co-participants in the development process of the routes (Halpern & Graham, 2015; Hvass, 2014; Stephenson et al., 2018). Spasojevic, et al. (2019, p. 4) noted that "the influence of air transport on tourism is not a one-way relationship, and the influence of tourism on air transport is evident in air route development".

In this study, the focus is placed on tourist destinations and their influence on the decisions and the behaviour of the airlines when planning their route networks (Chang Woon, Yen, & Hsu, 2017; Stephenson et al., 2018). In particular, the study presents an analysis of whether the value of a tourist destination conditions to a greater or lesser degree the cooperative behaviour of those airlines.

2.2 Cooperative behaviour within the airline industry

In the development of its routes, an individual airline might opt to include new nodes or airports within its network; both flights with their own resources (planes, flight crews, land-based services, *etc*) and using the resources of other airlines with which they cooperate This cooperation offers them access to the routes of these alliance partners to complete the network of the focal airline through code-share agreements (Casanueva, Gallego, Castro & Sancho, 2014).

From a theoretical point of view, the choices over growth, behaviour and firm strategy have found acceptable explanations through the Resource Based View (RBV) (Barney, 1991; Grant, 1991). Firms can achieve a sustainable competitive advantage through a given endowment of tangible and intangible resources and capabilities with certain (unique, valuable and irreplaceable) characteristics. The logic of the RBV implies that firms must exploit the resources and skills that are in their possession to achieve their objectives. Following this logic, airlines must make their decisions concerning the development of their route networks on the basis of their most relevant and exclusive resources: fleet, network and structure of existing routes, hubs from which they operate, land-based services and maintenance, know-how, specific knowledge on the markets that they supply, *etc*. From this point of view, the behaviour of an airline is purely competitive behaviour and is based on its endowment of its own relevant resources that it must exploit to maximize their value.

However, the Relational View (Dyer & Singh, 1998; Dyer, Singh, & Hesterly, 2018) implies an extension of the RBV, in so far as it proposes strategies and behaviours that take into account resources that are the property of its partners or firm alliances. Cooperative behaviours are therefore developed so that a firm can access and mobilize the resources of its partners or Network Resources (Casanueva et al., 2014; Lavie, 2006). According to this view, other stakeholders with a presence at a destination (*i.e*. a DMO and an airport authority) might contribute to the development of routes when they provide access to the resources that an airline either needs or can exploit to generate valuable services for its clients or that lower its costs (Hvass, 2014).

Moreover, the role of other partner airlines that share seats on their flights in code-sharing agreements is especially important in the development of the route network, permitting the incorporation of new routes, nodes and connections in its network, as well as greater frequency of flight paths. The resources that an airline can employ through such agreements are not its own property, but are the property of its partners. An airline can however use them thanks to its cooperative behaviour. These partner resources include the connections that permit a particular route to be included within its global network, the use of operational resources of the partner (fleet, flight crews, services), the know-how of the partner at new, distant and unknown destinations, and access to stakeholders and service suppliers with which the partner has previously established a relationship, *etc*.

The development of airline routes in the context of a tourist destination by one or various airlines implies a direct benefit for that destination, above all if the percentage of passengers travelling for the purpose of tourism is taken into account (Graham et al., 2008). If that development can be done in a rapid and low-cost manner through cooperative agreements between airlines, because the airline business has no need to generate and to acquire new resources, the tourist destinations might benefit from new flows of direct arrivals and better interconnections that will likewise provoke further arrivals through indirect flows (Hvass, 2014).

The airline industry has been characterized over the past few decades by two trends among its firms that have transformed the sector. The first of these is the emergence of the low-cost strategy (Castillo-Manzano et al., 2011; Min & Joo, 2015). The second is the increase of cooperative agreements and of alliances in the sector (Castiglioni et al., 2018; Zhou & Chen, 2016). Although there are other alternatives to the growth of an airline, such as mergers and acquisitions, commonly found in other sectors, these strategic directions are often limited due to legal and regulatory restrictions at a national level (Duval, 2013; Oum et al., 2001; Pels, 2001; Rhoades & Lush, 1997; Zhou & Chen, 2016). In fact, the successful airlines (having managed to survive the various market crises and economic cycles) have followed one or another strategy in different ways. Although both are not incompatible, it appears that the low-cost model is better adapted to a type of 'point-to-point' network, whilst cooperation broadens and sets up appropriate structures based on the 'hub-and-spoke' network, because it is related to the existence of large alliances that compete at a global level (Hvass, 2014; Zhou & Chen, 2016).

The growth of cooperative alliances between airlines has increased over the past two decades. Besides, its end is not yet in sight (Evans, 2001; Castiglioni et al., 2018; Goetz & Shapiro, 2012): the number of agreements, the number of partners of each company (alliance portfolio), the percentage of routes with code-sharing, and the incorporation of airlines in large-scale alliances, *etc*, have all increased.

Cooperation has been profusely studied as a strategy in the airline sector for some years (Evans, 2001), as it is a pertinent field of study for relevant strategic concepts (Gimeno, 2004; Gomes-Casseres, 1994; Lazzarini, 2007; Wassmer & Dussauge, 2012). Although there may be vertical or diagonal types of cooperation, the two principal types of alliance between airlines (code-share and global alliances) are of a horizontal type, *i.e*. arising between rivals (Casanueva et al. 2014; Zhou & Chen, 2016). Competition between groups and clusters that have then formed global alliances within the airline sector has been singled out as one of various strategic approaches that nowadays define the airline market (Gomes-Casseres, 1994; Lazzarini, 2007). Between 1997 and 2000, three large global alliances were created in the airline sector, which have continued their expansion: Star Alliance (26 partners, among which United Airlines, Lufthansa, and SAS), Oneworld (14 partners that include American Airlines, British Airways, and Qantas), and Sky Team (19 partners that include Delta, Air France and KLM).

Competition at a global level, with intense rivalry for mainstream long haul and/or international routes that generate significant traffic and higher margins, has emerged between the three largest groups of airlines. In an extraordinary way, this pattern determines the route networks of the individual companies and the connectivity between the network of global alliances, in such a way that any traveller can easily travel between two points on the planet along the itineraries proposed by one or more of those three groups.

However, the code-sharing agreements are the most prevalent type of alliance in the sector (Zhou & Chen, 2016). They imply that a passenger from one airline can travel on a flight that is operated by another airline. One airline can therefore share the routes and destinations of its partners. An arrangement that increases and structures its own network of routes (Lordan, Sallan & Simon, 2014). Global alliances are linked and have contributed to the expansion of code-share agreements and both processes have advanced hand in hand (Castiglioni et al., 2018).

The motives for which code-share agreements are established between airlines are very varied: risk sharing, accessing new markets, access to and mobilization of partner resources, the generation of economies of scale, the reduction of operational running costs, globally competitive services, the generation of more efficient markets that the passengers can exploit, the consolidation of passenger services and their coordination, the generation of marketing incentives and customer fidelity programs, limitations on rivalry, the expansion of the operational network of the airline and flight schedules, *etc*. (Casanueva et al., 2014; Evans, 2001; Goetz & Shapiro, 2012; Ito & Lee, 2007; Min & Joo, 2015; Pels, 2001; Zhou & Chen, 2016).

2.3 The value of tourist destinations on decisions to cooperate

The features of a tourist destination, its geographic situation, its attractions and the quality of its services determine the average expenditure of tourists, and the function that it plays within the global structure of tourism, among other aspects. The differences with regard to flows of tourism within tourist destinations mean that some destinations are more appreciated than others for tourism firms that wish to establish themselves in those places.

Air transport is a paradigmatic case here. An airline business will consider the characteristics of the network nodes, constituted in great measure by tourist destinations, when planning its network of routes (Graham et al., 2008), in such a way that it will prefer routes that have tourist destinations of higher value. The routes will be valuable because they imply a competitive advantage or can generate higher income. Some routes are of a strategic character, because of their importance in the network or because of their competitive value (Hvass, 2014; Lederer & Nambimadom, 1998). The flow of tourists through a destination can condition the behaviour of the airlines. In this sense, the tourist destination will also have a specific value, because of its position in the global network of the airline company, whether as a point of departure or destination, hub or gateway (Lohmann et al., 2009).

The decision over cooperation with another airline, in order to arrive at a specific tourist destination, has three different forms: the airline can fly to that destination with its own fleet and crew; it can operate the flight under a code-sharing agreement with another airline (sharing seats on its flights with a partner or occupying those of one of its partner's flights); or it can follow both paths simultaneously (programming flights with and without code-sharing).

According to the RBV, if a destination is high value, the firm will probably operate the routes to that destination without cooperating, in order to exploit the maximum value. If an airline has the necessary resources and the capacity to operate a valuable route or to fly to a valuable tourist destination, it will not need the resources of any partner and it will not need to share part of the income that it generates with that partner.

However, according to the Relational View and the studies on Network Resources, if an airline has no resources (such as land-based services and maintenance, slots, market knowledge, political influence, *etc*) to operate a route or to fly from a strategic destination and can neither access nor buy such resources, then it will have to cooperate with partner airlines and in doing so will access and use their resources. This cooperation has a cost both in economic (it has to compensate the use of resources from other firms) and in competitive terms (dependency on a third party, no exploitation of the competitive advantage, concession of other routes, *etc*).

2.4 Types of routes, value of the tourist destination and cooperative behaviour

The inclusion of a valuable tourist destination among the routes of an airline adds value to that airline. The greater the perceived value of the destination by the airline, the greater its propensity to exploit the route with its own resources and to cooperate in cases where it has no such resources. Nevertheless, the features of the route in itself will condition both the value that is added to the airline (regardless of the value of the tourist destination that is on the route), and the volume of resources needed to operate at those destinations. For example, the flagship airlines usually have their own hubs, their own maintenance services, land-based services, market knowledge and familiarity with local regulations and legislation, relations with local suppliers and a consolidated network structure. Higher income will ensue when an airline initiates internationalization processes and operates long-haul routes, but it is unlikely to possess the aforementioned resources.

It may therefore be expected that the different types of routes can in some way influence the relation between the perceived value of a tourist destination and the decision to cooperate or otherwise in a route to that destination.

Various classifications of routes may be found in the literature. Hvass (2014) distinguished between strategic routes, feeder routes and point-to-point routes. It is common to distinguish between domestic routes as opposed to international routes (Goetz & Shapiro, 2012; Ito & Lee, 2007; Pitfield, 2007). However, distance has been the most common classification criterion for the study of routes (Bhadra & Hogan, 2008; Chu, 2014). Distance determines the quantity of fuel that a plane must carry, air-crew flight time, the amount of additional time required from the crew, *etc*. All these factors influence the costs of operating a route, and they therefore influence company performance.

Nevertheless, these classifications of the routes according to such criteria (distance, overland or overwater, international or domestic) are overly simplified, if we are to reach an understanding of everything that a route implies for the operational network of an airline. Therefore, an acceptable classification of the routes must be based on a multidimensional perspective. In other words, it must simultaneously take account of the different motives for grouping the routes. Four relevant criteria have previously been pointed out: distance, type of plane, domestic or international flight, and whether any of the nodes between the ties are classed as hubs.

Distance is a defining factor of a route (Chu, 2014), because one of the most important running costs is fuel, a cost that is dependent on distance. Hence, Lederer & Nambimadom (1998) considered that fuel was a basic element for the design of routes and networks. Routes can be classified in terms of distance travelled in various ways. The most common ones distinguish between short, medium, and long-haul flights and are set by different organizations or by the airlines themselves that apply their own parameters to set the limits (Miyoshi & Mason, 2009).

The type of aircraft is related to the type of route. The number of seats is an initial factor to consider, because it affects the level of investment and the possibility of generating economies of scale, as well as having a relation with the capacity of a route and with the load factor (Babic & Kalic, 2018; Niehaus, Ruehle & Knigge, 2009). The cost of each type of airplane will determine the choice of both route and itinerary and flights will have implications both for the flight crew and for relevant maintenance costs (Bhadra & Hogan, 2008; Lederer & Nambimadom, 1998; Niehaus et al., 2009). Miyoshi and Mason (2009) linked types of routes and types of airplanes to the study of their C02 emissions. Organizations such as ICAO and IATA have the most common classifications based on weight and take-off time, which distinguish between Light, Medium, and Heavy.

Both national and international destinations were also studied in various works (Goetz & Shapiro, 2012; Pitfield, 2007). Routes with destinations in other countries are subject to legal and market-related constraints that differ from domestic routes (Oum et al. 2001).

Finally, whether the point of departure and/or the destination of the route is a hub will also be of relevance to the airline. The majority of airlines have a network structure based on the hub-and-spoke system, in which those central points on the routes are of fundamental importance (Babic & Kalic, 2018; Lederer & Nambimadom, 1998; Lohmann et al., 2009). It is also important to highlight that important resources and essential operational services for the airlines (offices, maintenance, *etc*) are located at the hub.

The type of route can be a moderating influence or at least have some influence on the above arguments. For example, if it is a principal route for connecting with a tourist destination, the airline will be prepared to occupy a position in it by any means (and cooperation through code-sharing is relatively simple), rather than forego that route. The same happens if corresponding with radial connections that provide access to a relevant tourist destination following arrival at a hub. In fact, each dimension that can characterize a certain type of route can justify the conclusion of agreements and alliances, because of their influence on its value and because they imply a greater or lesser need for resources.

These agreements will permit more efficient cost sharing, depending on the length of the route (fuel, crew flight time), and will improve the service that is offered to clients (single sale, luggage management, loyalty programs) (Goetz & Shapiro, 2012; Ito & Lee, 2007). An important aspect in the success of airline operations is the degree to which total flight capacity is used, which therefore makes the use of code-sharing advisable. In addition, the cost per seat and air mile in smaller planes is greater, so the search for efficiency once again incentivizes the use of code-sharing (Lederer & Nambimadom, 1998). Besides, evidence of the advantages of code-sharing for domestic routes (Ito & Lee, 2007) and for international routes (Pitfield, 2007) has also been found. In some cases, the motives are similar and in others they differ (legislation, culture, access to resources in other countries). Finally, the position of the hub will generate a special value for a specific destination (Goetz & Shapiro, 2012; Lohmann et al., 2009). The presence of a hub at the departure point and at the end of the route can be seen in combination with the hub-and-spoke structure itself, the development and the expansion of which has in great measure been due to the increased number of code-shares and has permitted airlines to arrive at and to compete in many markets (Chen & Ren, 2007; Goetz & Shapiro, 2012).

3. Methods

Five different datasets were consulted to conduct our empirical study. On the one hand, (1) the principal global tourist destinations of greatest value were identified on the basis of the Top 100 city destinations as ranked in the International Euromonitor market research reports (2012 - 2017 edition), which detail the number of international arrivals that spend a minimum of twenty-four hours and a maximum of one year in a city, staying in collective or private accommodation. On the other hand, all the routes at a global level were studied at a given point in time. The dataset of routes was obtained from (2) the Routes dataset, (3) the Airline database, (4) the Airport database, all of them provided by Openflight, and (5) the ICAO (International Civil Aviation Organization) Aircraft Types and Designators database.

The initial data on active routes at a global level comprised almost 61,200 routes with 2012 data sourced from Openflight with information on flight itineraries, on whether they operate code-sharing, on the names and codes of the airline that commercializes the flight (marketer), and on the type of airplane in use. Data were obtained from the same source on the airports present in the earlier routes with their codes and positions and the categories of Light, Medium, and Heavy aircraft in use on its routes were obtained from the ICAO. The integration of all of these databases concluded with a final sample comprising 49,590 routes, as not all the necessary data were available for 11,612 routes.

3.1 Variables:

- Strategic route: A strategic route was defined as having one of the most important global tourist destinations at either its point of departure and/or its destination. In a similar way to Assaf and Dwyer (2013), the Euromonitor International database, specifically the Top 100 City Destinations Ranking was used to locate the strategic routes. Thus, we identified the most frequently requested cities at a global level in that year. This ranking changed slightly from year to year, however the strategic decisions were taken in both the short and long term. The composition of that ranking up until 2017 was therefore taken into account to test which destinations had stayed in those positions in the long-term. Only 80 cities had stayed in the ranking over those years. Thus, those routes with departure points from and destinations to one of the cities that had remained in the ranking over that period were identified. This dummy variable took a value of 1, if the point of departure and/or the destination of the route was a top city and 0, if otherwise.
- Routes with code-sharing: The routes in which the operating carrier was not the airline commercializing the routes were classified as code-share routes (Goetz & Shapiro, 2012). Where a particular route had code-share flights and flights that were directly operated by the company itself, the route was only analysed once as a code-share route. From among the 49,590 routes under analysis, 15,500 were operated under code-share agreements and 34,090 were operated with no code-shares.
- Route distance: The distance of a route can be established with information on the airport of origin and destination. This difference between the location of the point of departure and the destination was expressed in degrees, to avoid the bias of considering the Earth as a perfect circumference. Once the distance had been

calculated in degrees, it was converted into kilometres, considering one degree to be: 40,075.1612 / 360= 111.319 kilometres. Thus, in a similar way to Chu (2014), we measured distance as a function of kilometres between the departure and the destination airport. Even though airline networks are classified by distance, the disparity of the cut-off points meant that distance can be used here as a continuous variable.

- Type of airplane: The routing database generally refers to the specific airplane that operates on the route. The standard ICAO classification system applied to airplane codes (Equipment Code) - L (Light), M (Medium) and H (Heavy) - similar to the one used by IATA (International Air Transport Association), was chosen, in order to classify the different models of airplane, in view of the slight differences with seat allocations (number of priority seats, leg room, *etc*.) and other specifications such as flight autonomy.
- Hub: A dummy variable was employed to indicate whether the departure point and/or destination of a route was a hub for the airline that commercialized the route (value 1). The sample of 49,590 routes included 227 airlines that were cross-referenced with the information available on the hubs of each airline.
- Domestic or international nature of the route: A dummy variable was used when comparing the countries of the departure and the destination airport where the value 1 corresponded to international routes (departure and destination not in the same country) and 0, if otherwise.

3.2 Analysis

Data analysis was conducted in two phases: (i) the analysis examined whether the value of the route (strategic routes) had some relation with the form (code-share or no code-share) of operating the flight; and (ii) the features of the routes were included in the data, then an analysis of the cooperative behaviour within each cluster was developed.

The preliminary analysis examined whether there was a relation between the strategic routes (which contained some top tourist destinations) and the decision to operate the route within a code-sharing agreement. To do so, the chi-squared test was applied to the contingency tables, to test whether the value distribution of one categorical variable was related with the values of another categorical variable. The null hypothesis was the independence of the categorical variables in relation to each other and the alternative hypothesis was that the categorical variables will show some sort of relation. If the null hypothesis is rejected (at a p-value lower than 0.05) then the distributions of both variables are related.

A two-step cluster sampling analysis was applied to determine the types of routes present in the sample, because it permits the analysis of very large data-sets and the combination of categorical and continuous variables. In addition, the algorithm that employs this procedure automatically selects the optimum number of clusters through the comparison of values for different clustering solutions. The variables included in our cluster analysis were route distance, aircraft type in use on the route, if the airline has a hub on this itinerary and if it is an international or a domestic route. Two-step cluster analysis can be used to reveal the natural groups or clusters within a dataset that might otherwise be difficult to detect. Besides, the procedure meant that the various clusters of each route could be included in the database. As cluster analysis can depend on the order of the cases, the items were randomly reordered and then the results were compared to identify the stability of each cluster. This classification was completed by taking into account the routes with code-share agreements and the routes with no code-shares were then assigned to each cluster in accordance with their characterization.

It was therefore evaluated, in the first place, whether there was a relation between the strategic routes (that serve to a high-value tourist destination) and the decision to operate the route within a code-sharing agreement. Second, it was assessed whether the relation changed when considering the type of route. In other words, the analysis examined whether a relation could be found, on the one hand, between the strategic routes (which contain some top tourist destination) and, on the other hand, between the types of routes that were operated within a code-sharing agreement. To do so, the chi-squared test was repeated for each cluster that was identified, in order to establish whether the cooperative agreements depended on the type of route.

4. Results

The descriptive analysis of the variables and the correlations between the variables are shown in Table 1 and Table 2, respectively. All the variables show a negative correlation with code-share routes, while positive correlations are shown between all the other variables.

(Insert Table 1 & 2 about here)

We considered that the strategic behaviour of the airlines might vary by strategic value of the route. In other words, the probability of operating under a code-share agreement will depend on whether the route has at least one top tourist destination. The results of the contingency table (Table 3) and the chi-squared test led to the rejection of the null hypothesis of the independence of both variables (p-value<0.05). The percentage of non-strategic routes from the general sample that operated under code-share agreements (32.1%) was higher than the percentage of strategic routes that operated under code-sharing (30.3%). Therefore, the type of strategic route and the choice of code-sharing are related in such a way that, if the route is strategic (includes some of the main global tourist destinations), code-shares will tend not to be used. In addition, no boxes from the contingency tables had insufficient data. The chi-squared test may be interpreted, if the percentage of boxes in the contingency tables with lower-than-expected counts is under 20%. The percentage was zero in all the cases under analysis. Furthermore, if the minimum expected count is low, then the test values must be treated with caution. In all the cases under analysis, the minimum expected count was not low (see Tables 3, 6, 7 and 8).

(Insert Table 3 about here)

A two-step cluster was developed to identify the types of route. The analysis of the two-step cluster analysis required a series of preliminary analyses. The chi-squared test for categorical variables (hub, international route, type of airplane) showed a multinomial distribution as may be assumed from the model. The Kolmogorov-Smirnov test was employed to test the normality of the continuous variable with the correction of minimization of Lilliefors, which determined the non-normality of the continuous variable (Distance). Nevertheless, the two-step cluster analysis proved robust against violations of assumptions of variable distributions. Finally, an analysis of measures between each one of the categorical variables was performed to test the independence of the variables. The results showed that the variables were independent between each other. The eta-squared values were all very low, except for the variables Distance and Type of Airplane (ETA=0.786). Nevertheless, the two-step clustering procedure proved robust against the violation of independence between the variables. The cluster analysis showed a good measure of cluster cohesion and separation (0.8), which indicated that the data reflected solid evidence of a cluster structure, in accordance with the Kaufman and Rousseeuw valuation (1990). All the cases were closer to the centre of their own clusters than to their nearest clusters. In addition, all the predictive variables had a relative importance of 1 in the composition of the cluster.

(Insert Table 4 & 5 about here)

From the cluster analysis, six clear clusters were identified that are ordered as a function of size in Table 4 and the explanatory variables are listed in accordance with their importance for the definition of each cluster. The description of the cluster appears in Table 5. The analysis distinguished between short-distance routes (2 clusters), medium-distance routes (3 clusters) and only one cluster with long-distance routes. Besides, there were three clusters on domestic routes and three clusters with international routes, two clusters with hub, one cluster with L-type airplanes, one with H-type airplanes, and 4 clusters with M-type planes. Cluster 1, referred to as 'Long Intercontinental Routes', comprised routes that were operated without a hub and using very large airplanes. Cluster 2 grouped together 'Peripheral Medium-haul Routes', which were also operated without a hub and used smaller and lighter airplanes. Cluster 3, 'Central International Routes', comprised international medium-haul flights, and was central, because the airline has at least a hub at the departure or the destination node. 'Central short-haul routes' were grouped under Cluster 4 that only included national routes. Cluster 5 grouped together 'Peripheral International Routes', comprising medium-haul flights with no hub. Finally, Cluster 6, labelled 'Peripheral Short-haul Routes', grouped together national short-haul routes that did not pass through a hub.

Once the routes in each of the six clusters had been classified, strategic cooperation within each cluster was analysed. Table 6 presents the results of the two short-distance clusters. Among the clusters of the 'Central short-haul routes', the percentage of code-share routes was higher when the routes were not strategic (36.1% > 25.3%). On the contrary, the strategic routes had a higher percentage of code-share flights (44.1%) than the non-strategic ones (40.3%) within the cluster of 'Peripheral Short-Haul

Routes'. The chi-square test was significant for both clusters, therefore the type of route was related with the strategic agreements between the airlines, although with a negative sign in the case of the routes characterized by shorter distances that operated outside the main hub of the airline (Cluster 6).

(Insert Table 6 about here)

In tables 7 and 8, the results of the clusters with medium-distance and long-distance routes are shown, respectively. In the cluster of 'Peripheral Medium-Haul Routes', the percentage of code-share routes was higher when the routes were not strategic (65.1%>52.2%). The chi-squared test was significant, confirming a relation between the strategic value of routes and code-share agreements. The percentage value of the contingency table indicated that the higher the value of the routes, the fewer the cooperative agreements. Among the clusters of 'Peripheral International Routes' (table 7) and the cluster of 'Long Intercontinental Routes' (table 8), the percentages of code-share routes were higher when the route was strategic (44.4% in cluster 5 and 31.4% in cluster 1) than when the route was not strategic (20.2% in cluster 5 and 23.7% in cluster 1). The chi-squared test was significant in both clusters, indicating the presence of a relation between the strategic value of the route and the tendency to operate within a code-share agreement. These results were contrary to our expectations. The statistic was not significant for the cluster of 'Central International Routes', so a relation could not be confirmed between the value of the route and strategic cooperation within that cluster.

5. Discussion and Conclusions

First, the results have shown that the most valuable routes for the airlines, those which include as departure point or destination one of the 80 most important global tourist destinations, tended to be operated with the own resources of the airline, outside of any code-share agreements.

Second, the results varied when differences between the types of routes were introduced. The tendency not to cooperate and to operate the route with own resources changes in three types of routes. The three types of routes shared a greater need for resources for their establishment. These needs either arise from the international type of the route (which requires physical resources within another country and, above all, knowledge on that country) or that no node of the route is a hub of the airline (which is the point where most of the airline resources are concentrated).

In particular, the airlines decide to cooperate with others on the two types of routes that had greater needs for resources, because they were international, and that had no airline hub, when the routes included a valuable tourist destination. This happened for the 'Long-Haul Intercontinental Routes' (Cluster 1) and the 'Peripheral International Routes' (Cluster 5). In addition, the features of the routes added an additional value in both cases besides including a strategic tourist destination, because they were international and because they covered either long-haul or medium-haul distances. Cooperation was preferred on the 'Peripheral Short-Haul Routes' (Cluster 6), when the route included a strategic tourist destination. These routes are national flights that include no airline hubs, a fact that might explain why the airlines preferred cooperation rather than not operating the route, in order to exploit the added value of the most strategic tourist destinations.

The general tendency not to cooperate was maintained on another two types of routes. On the one hand, the 'Central Short-Haul Routes' (Cluster 4), in which the airlines operate in national markets and pass through one of their central points or hubs. It appears to be a logical situation, because it is a very favourable situation that the firm can operate with its own resources. The same was also true for the 'Medium-Haul Routes' (Cluster 2), although some international routes can also be found in this cluster, the majority were national routes, with light airplanes and on the whole with relatively short-to-medium distances. In addition, almost one third of these routes included an airline hub. The conditions therefore appear to be in place (market and legislation knowledge, contact with stakeholders, *etc*.), so that many additional resources for the airline business are unnecessary.

The results were not significative in the case of 'Central International Routes' (Cluster 3) as a function of the strategic value of the route. These are routes in which high value arising from the features of the (international and long haul) routes are mixed with the need for knowledge to access international markets, but with the other argument that the point of departure and the destination of that route is an airline hub, *i.e*. a point at which the airline resources are concentrated. Perhaps for that reason the tendency not to cooperate arises, regardless of the value of the tourist destinations on that route. However, nothing in that regard may be confirmed from the statistical analysis.

The principal contribution of this study has been its in-depth examination of whether the value of a tourist destination is related with the strategic behaviour of an airline. The results have shown that the overall relation is negative when all the routes at an international level are considered together with the 80 principal global destinations. However, this relation was conditioned by the type of route that is developed. On some types of routes such as 'Peripheral International Routes' on which the airlines have no hub, a preference is shown towards cooperation, as well as on 'Peripheral Short-Haul Routes' on which they have no hub either. If the importance of the hub is considered in the network structure of the airlines, it may be affirmed that the airlines will follow a strategy of cooperation, in so far as they need to reach the destinations where they have no management resources of their own or the destinations that are not core to their route network. This idea is consistent with those proposed for the completion of code-shares for access to and mobilization of partner resources (Casanueva et al., 2014; Wassmer & Dussauge, 2012).

At a theoretical level, the predictions of the Resource Based View (RBV) were that the strategic routes either included valuable tourist destinations or were international or long-distance routes that should be operated with the resources that belong to the airline. The Relational View, which extends and complements the RBV, predicts that if an airline possesses insufficient resources (as happens for international routes or when they have no airline hub), there will be a tendency to cooperate with other companies.

Partial support is lent to the arguments of the RBV, in so far as the results have confirmed that the airline-sector firms tended to exploit and to make use of their own resources, in so far as those resources were of greater value to them, because they can contribute to competitive advantage (Barney, 1991; 1997). The results have likewise highlighted that in cases where the most important resources for the operations of the firm are not usually within it, that firm will adopt cooperative strategic behaviour to exploit the resources that its partners can make available to it, which enters into the logic of the Relational View and the Network Resources perspective (Niehaus *et al.*, 2009; Casanueva et al., 2014).

At a practical level, the findings can serve to guide actors other than the airlines towards more active participation in the development of routes. The interests and the approach of these actors differ. The airports seek greater benefit, seek to attract new routes from new or existing airlines, to promote changes in those routes and longer stays of the passengers at their installations and to prioritize their best performing routes. The DMO and the tourism authorities will have an interest in increasing the number of passengers arriving at or in transit through their destinations (even converting a communications hub into a tourist destination). Furthermore, they will prioritize the routes that increase the number of new tourist arrivals. Other public authorities and organizations in charge of economic development at a local, regional or national level, together with other private stakeholders with the same ends, will have an approach linked more to increasing connectivity for business travelers and for the local population. Despite these differences, either the separate or the joint activity of these actors to influence the development of airline routes can be fundamental for the growth and transformation of tourist destination. The airports (and other stakeholders, at times jointly) offer financial incentives to the airlines in their route development processes. However, the non-financial incentives have an increasingly important role. Among those incentives is the provision of regulatory and market-related information to airlines, as well as the provision and the promotion of contacts with feeder airlines and other agents. Along these lines, this investigation has shown that, in certain circumstances, it can be beneficial for the tourist destination to facilitate cooperative behavior between airlines for the development of code-sharing agreements.

In particular, the airlines show greater willingness to cooperate between each other when operating at tourism destinations that are not relevant or when the routes are strategic, but they lack their own resources (such as knowledge and infrastructure) to access them. Airports and destinations can identify these situations and promote meetings between complementary airlines in these contexts, proposing the development of code-share agreements as a complement to increasing new flights. In this way, the airports will attract higher volumes of traffic and connectivity; the tourist destinations will have accessed routes and clients of airlines from which a higher number of tourists will ensue either directly or indirectly and they will have gained greater visibility; and the airlines will win with regard to costs, the development of their route network and the use of their capability. Thus, one additional line of non-financial action is introduced, so that airports and DMO can influence the airlines. However, the willingness and the capability to bring that influence to a successful conclusion will depend on various kinds of factors such as the attractiveness of the tourist destination, the area of influence of an airport and its demographic characteristics, the airport services, the size of the airport, its possibility for growth, its form of management, the nature of the routes (international or intercontinental) and their distance, the type of airlines involved, the resource endowment of the airlines, *etc* (Halpern & Graham, 2015). Moreover, our work can help airlines guide their strategy. In the first place, if they possess sufficient resources, it appears that the most logical approach is to exploit the markets in solitary and the positioning at the tourist destinations, to a greater extent, if those are more valuable or strategic. In second place, they would be better advised to follow a strategy of cooperation whenever the necessary resources are not in their possession, which will permit access to partner resources and their mobilization.

This research has some limitations. In the first place, secondary data that are publicly available were used in the study, which means that the analysis was determined by the reliability and the appropriateness of the data that were employed. In second place, the cluster patterns were derived from the aforementioned data at a specific point in time and could vary if the data had been taken at a different point in time. Finally, the distances were considered in kms. between the point of departure and the destination airport (Chu, 2014). However, in the absence of any relevant information, we have therefore not analysed the effect of the real distance (over water, hub-and-spoke networks, and direct) that is travelled, which can affect the costs (Lederer & Nambimadom, 1998) and the design of the routes.

The analysis opens the way towards future investigations. In the first place, the results call for a more exhaustive study of the implications of cooperative strategies on certain routes and specific types of airlines. It would also be interesting to inquire into what happens on each route and type of route with regard to the cooperative agreements that exist alongside each other. Finally, theoretical models could be proposed that could provide global explanations for the connections and interrelations between airlines strategies and the management of tourist destinations.

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Table 1: Descriptive statistics

		Frequency	Percentage	Valid Percentage	Accumulated Percentage
Code-Share	0	34090	68.7	68.7	68.7
	1	15500	31.3	31.3	100.0
	Total	49590	100.0	100.0	
Plane	H	8405	16.9	16.9	19.2
	L	567	1.1	1.1	20.4
	M	40618	81.9	81.9	100.0
	Total	49590	100.0	100.0	
International	0	22577	45.5	45.5	45.5
	1	27010	54.5	54.5	100.0
	Total	49590	100.0	100.0	
Hub	.00	21786	43.9	43.9	43.9
	1.00	27804	56.1	56.1	100.0
	Total	49590	100.0	100.0	
Strategic routes	.00	23383	47.2	47.2	47.2
	1.00	26207	52.8	52.8	100.0
	Total	49590	100.0	100.0	
		Minimum	Maximum	Average	Standard Deviation
Distance (Km)		10.3	15353.6	1962.7	2151.6

Table 2: Correlations Matrix

	1	2	3	4	5	6
1.Code-Share	1					
2.Plane	-.046**	1				
3.Hub	-.177**	.104**	1			
4.International	-.110**	.337**	.049**	1		
5.Distance (Km)	-.045**	.696**	.130**	.403**	1	
6.Strategic Route	-.017**	.280**	.203**	.306**	.314**	1

Table 3: Chi-squared tests of variable independence for the complete sample

			CODE-SHARE		Total
			0	1	
Strategic Route	.00	Count	15883	7499	23382
		% Inside SR	67.9%	32.1%	100.0%
	1.00	Count	18206	8001	26207
		% inside SR	69.5%	30.5%	100.0%
Total		Count	34089	15500	49589
		% inside SR	68.7%	31.3%	100.0%
Pearson's Chi-squared test			**13.668a***		
a. 0 boxes (.0%) count < 5. Minimum expected recount = 7308.50					

Table 4: Two-step cluster analysis

CLUSTER

Importance of inputs

1 | 0.8 | 0.6 | 0.4 | 0.2 | 0.0

Cluster	**6**	**4**	**5**	**1**	**3**	**2**
Size	26,10% 4090	22,60% 3537	17,50% 2739	14,60% 2283	12,90% 2014	6,30% 992
Inputs	With hub 0(100%)	With hub 1(100%)	With hub 0(100%)	Distance(Km) 6,198.24	With hub 1(100%)	Plane L(46.9%)
	Distance(Km) 894.25	Distance(Km) 776.96	InternationalR 1 (100%)	InternationalR 1 (100%)	InternationalR 1 (100%)	InternationalR 0 (82.4%)
	InternationalR 0 (100%)	InternationalR 0 (100%)	Plane M(100%)	Plane H(100%)	Plane M(100%)	Distance(Km) 1,278.18
	Plane M(100%)	Plane M(100%)	Distance(Km) 1,359.55	With hub 0(67.5%)	Distance(Km) 1,388.36	With hub 0(65.7%)

Table 5: Descriptions of Route Typologies

	Distance	Flight	Plane	Hub	Name
Cluster 1	Long	International	Heavy	-	Long intercontinental routes
Cluster 2	Medium	National	Light	-	Peripheral medium-haul routes
Cluster 3	Medium	International	Medium	Yes	Central International routes
Cluster 4	Short	National	Medium	Yes	Central short-haul routes
Cluster 5	Medium	International	Medium	-	Peripheral international routes
Cluster 6	Short	National	Medium	-	Peripheral short-haul routes

Table 6: Chi-squared test of variable independence for Clusters of Short Distance Routes

			CLUSTER 4 Central short-haul r.			**CLUSTER 6 Peripheral short-haul r.**		
			Code-Share			Code-Share		
			0	1	Total	0	1	Total
StrategicR	.00	Count	4046	2281	6327	4215	2850	7065
		% inside SR	63.9%	36.1%	100.0%	59.7%	40.3%	100.0%
	1.00	Count	3530	1198	4728	1453	1146	2599
		% inside SR	74.7%	25.3%	100.0%	55.9%	44.1%	100.0%
Total		Count	7576	3479	11055	5668	3996	9664
		% inside SR	68.5%	31.5%	100.0%	58.7%	41.3%	100.0%
Pearson's Chi-squared test			144.011a***			11.042b***		
Boxes with a count < 5			a. 0 boxes (.0%)			a. 0 boxes (.0%)		
Minimum expected count			1487.9			1074.67		

Table 7: Chi-squared independence of variables test for Clusters of Medium Distance Routes

			CLUSTER 2 Peripheral Medium-haul r.			CLUSTER 3 Central International r.			CLUSTER 5 Peripheral International r.		
			Code-Share			Code-Share			Code-Share		
			0	1	Total	0	1	Total	0	1	Total
StrategicR	,00	Count	300	560	860	2515	630	3145	3505	889	4394
		% inside SR	34.9%	65.1%	100.0%	80.0%	20.0%	100.0%	79.8%	20.2%	100.0%
	1,00	Count	418	457	875	5675	1378	7053	2302	1836	4138
		% inside SR	47.8%	52.2%	100.0%	80.5%	19.5%	100.0%	55.6%	44.4%	100.0%
Total		Count	5262	718	1017	1735	2008	10198	5807	2725	8532
		% inside SR	69.8%	41.4%	58.6%	100.0%	19.7%	100.0%	68.1%	31.9%	100.0%
Pearson’s Chi-squared test			29.697a***			0.336a			571.155a***		
Boxes with a count < 5			a. 0 boxes (.0%)			a. 0 boxes (.0%)			a. 0 boxes (.0%)		
Minimum expected count			355.9			619.25			1321.62		

Table 8: Chi-squared independence of variables test for Clusters Long Distance Routes

			CLUSTER 1 Long Intercontinental routes		
			Code-Share		Total
			0	1	
StrategicR	,00	Count	928	289	1217
		% inside SR	76.3%	23.7%	100.0%
	1,00	Count	4334	1986	6320
		% inside SR	68.6%	31.4%	100.0%
Total		Count	5262	2275	7537
		% inside SR	69.8%	30.2%	100.0%
Pearson's Chi-squared test			**13.668a***		
Boxes with a count < 5			a. 0 boxes (.0%)		
Minimum expected count			**367.34.**		

Credit author statement

Marta Domínguez-CC: Methodology, data curation, writing original draft, investigation, formal analysis, reviewing and editing

Cristóbal Casanueva: Conceptualization, supervision, writing, reviewing and editing.

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