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The virtualization of the airline industry: A strategic process

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Abstract

This paper analyses the virtualization of the airline industry as a strategic response to competitive pressures. Increased competition has driven the associative behavior of airlines, fostered the development of global alliances and the use of codeshare agreements, substantially modifying the structure of the industry. These changes have resulted in greater efficiency and division of labor in the industry, and have caused airlines to significantly modify their operational strategies. The analysis of the evolution of operational and associative strategies in the airline industry during the past decade (2005–2015) shows the growing virtualization of the sector, derived from the use of codeshare agreements and other alliances between companies. The results show that the associative behavior allows airlines to specialize their operational strategy and to focus their resources and capabilities on a certain type of routes or origin-destination (OD) markets, with a wide variety of strategic behaviors in the industry.

Keywords: Airline alliance; Alliance portfolio; Constellations; Codeshare agreements; Virtualization; Strategic behavior

1 Introduction

Over the past few decades, the airline industry has undergone a profound transformation that has recently rapidly accelerated (Pels, 2008). The origin of this process of change lies in the deregulation of this industry, which began in the late 1970s in the United States and led to the entry of new actors and a subsequent increase in competition (Min and Joo, 2016). Among these new actors, low-cost (Pels, 2008) and Gulf-based airlines (Anwar, 2015) (Anwar, 2007) are notable because of their novel and aggressive business models. Because of these changes in the industry, numerous traditional companies have suffered from dramatic crises, which led to the closure of certain iconic airlines and numerous mergers and acquisitions, substantially modifying the structure of the industry (Fan et al., 2001).

Increased competition within the sector and certain exogenous factors, such as political decisions, have prompted companies to adopt different behaviors, evident in their internationalization strategies (Albers et al., 2010), in their growth process (Anwar, 2007) through mergers and acquisitions (Fan et al., 2001), strategic alliances (de Man et al., 2010), and the subcontracting of domestic and secondary routes (Gillen et al., 2015). In addition, a significant trend has emerged regarding the formation of global airlines alliances[1] (Gaggero and Bartolini, 2012). This trend has led to changes in the competition and structure of the industry and these are examined in numerous studies (Alderighi and Gaggero, 2014; Corbo and Shi, 2015; Evans, 2001; Wang, 2014).

Although certain studies have investigated the business strategies of this sector (Anwar, 2007; Gillen et al., 2015), little or no research has analyzed the evolution of these strategies, the role of alliances in the deep-seated transformations within the industry, or the relationship between these two themes. Therefore, insight into the industry's structural changes and companies' strategic behavior and a better understanding of the factors that determine these changes will provide better contextualization for the numerous studies regarding this essential industry within the broader economic system.

Consequently, the primary objective of this study is to illustrate and analyze the evolution of the airline industry over the past decade (2005–2015), based on changes in companies' strategic behavior because prior studies have

demonstrated that major changes have occurred in the industry during this period of time (Min and Joo, 2016). This evolution has generally been analyzed by considering two types of company strategies: operational strategies based on airlines' resources and associative strategies carried out through cooperative agreements with other airlines. We used the theoretical approach of strategic groups to analyze operational strategies (Porter, 1980) and the relational approach to analyze associative strategies (Das and Teng, 2002). To complete our analysis we have also taken elements from the resource dependence theory (Pfeffer and Salancik, 1978) and the institutionalization theory (Barley and Tolbert, 1997).

The analysis and results of this study are based on a sample of 28 airlines, each having different characteristics, to ensure that they reflect, as much as possible, the diversity of companies and strategies within the industry. The results refer to airlines' operational strategies and associative behavior and expound on the relationship between these two strategies.

The study demonstrates that the airline industry has adopted three primary operational strategies: national, global, and regional. Furthermore, the results indicate that while only a few airlines have changed their strategies over time, some of these changes are significant. Additionally, this study highlights the considerable and growing development of associative phenomena within the airline industry, although differences exist between companies. These two areas of company activity should be jointly analyzed because associative behavior is a natural complement to the operational strategies developed by the airlines. The focal airline's network of routes and destinations is complemented by mobilizing the routes and destinations of its partners through codeshare agreements (Casanueva et al., 2014). This process reduces the number and percentage of routes directly operated by an airline and increases the number of routes operated by third parties, which increases the virtualization of the focal airline. The results systematize and document the primary trends observed in the sector, which are evidenced by company strategies but not previously analyzed in a systematic or comprehensive manner. An important contribution of this study derives from its longitudinal character, which allows us to understand the evolution of these strategies.

The results of this study should be of interest to scholars who focus on the airline industry, managers, and public authorities. From an academic perspective, this study is relevant to the airline industry literature in three ways. First, the results present a consistent and systematic overview of the various operational strategies used in the airline industry, which is useful for individuals who need to improve their understanding of company behavior. Second, this study introduces the topic of airline virtualization, a phenomenon that has not yet received much attention in studies regarding the airline industry, but will surely mark the competitive future of this sector. Finally, the results are obtained by adopting two theoretical perspectives not previously combined in prior studies: the relational-social perspective (Das and Teng, 2002) and the strategic groups perspective (Porter, 1980).

From a business practice and public policy perspective, identifying the strategies developed in the industry and their evolution provides information that may be of interest to professionals who make decisions regarding the future of their companies. This study highlights the various operational strategies used in the industry, which evolved individually. In addition, this study emphasizes the importance of the role of codeshare agreements and global alliances in the expansion of an airline's network of routes and destinations. The increase in the number of codeshare agreements and partners also implies challenges for managers because they must manage a broad portfolio of alliances and determine strategies that can take advantage of potential synergies (de Man et al., 2010; Hoffmann, 2005). Finally, the results demonstrate that some of the fastest-growing airlines in recent years are located in different areas, have been supported by their respective governments, and are likely to become the leading companies in the industry.

The paper is structured as follows: The next section provides an overview of prior studies regarding alliances, global alliances, and strategic groups in the airline industry. Section 3 describes the methodology used in this study. Section 4 analyzes the primary operational and associative strategies used in the industry and their evolution and demonstrates how they have led to increased virtualization in the industry. Section 5 presents the conclusions, implications for practitioners and researchers, and limitations of this study and suggestions for future studies.

2 Theoretical background

2.1 Airline alliances and global alliances

The airline industry is a mature industry with a high degree of rivalry and a wide range of competitive practices. Recently, airlines have engaged in intense collaborative activity through strategic alliances. The formation of these alliances has increased considerably because of their many advantages for the airlines. Most importantly, alliances allow airlines to access new routes and destinations and avoid legal or regulatory barriers (Wan et al., 2009). Second, alliances allow airlines to obtain cooperation benefits, due to economies of scale and scope (Weber and Dinwoodie, 2000), as in the cases of sharing sales offices, operational facilities, maintenance costs, and frequent flier plans (Wang, 2014; Wu and Lee, 2014). Third, alliances can induce an increase in the traffic of the airlines, which in turn results, under equal conditions, to an increase in the load factor and operational efficiency of the airlines (Alderighi and Gaggero, 2014; Barros et al., 2013). Finally, alliances involve a number of benefits for the travelers, such as flexible schedules, increased flight frequencies, improved luggage handling services, and shared frequent-flyer programs (Wang, 2014), which result in passenger loyalty for the airlines (Wan et al., 2009). Although many types of strategic alliances exist, such as co-location agreements at airports (Wu and Lee, 2014), frequent-flyer programs (Wang, 2014), and codeshare agreements (Evans, 2001), code-sharing is the most common type of alliance in the industry (Alderighi et al., 2015; Min and Joo, 2016) and largely determines the airlines' cooperative behavior. A codeshare is a commercial agreement between two airlines that allows passengers to use a ticket from one airline to travel on another airline. This type of agreement has increased considerably because it allows an airline to increase its market share while reducing operational costs by benefiting from economies of scale, scope, and density (Adler and Hanany, 2016).

In this industry, destinations are a key resource, whether these are perceived as an element in a network structure or as a market. Wassmer and Dussauge (2012, p. 874) note that "for an airline, one of the critical resources through which to achieve competitive advantage is its route network, that is, access to a wide range of city-pair markets." The mobilization of these partner destinations has led to a broad spectrum of collaborative arrangements, particularly codeshares (Casanueva et al., 2014). However, in addition to these advantages, the growth of this type of alliance raises important strategic questions for the companies, regarding the issue of whether there are some "core resources" that an airline should protect, in the sense of keeping those routes/markets within its own portfolio (Kleymann, 2005).

As a result of the increase in the number of cooperation agreements, many airlines have created a governance structure to manage their alliance portfolio (de Man et al., 2010). This portfolio refers to "a firm's collection of direct alliances with partners" (Lavie, 2007, p. 1188) and managing these portfolios has become a critical activity because it directly affects a firm's competitiveness and financial performance (Hoffmann, 2005).

The creation of alliance portfolios and the subsequent need for portfolio management have also resulted from the formation of global alliances in the late 1980s (Fan et al., 2001). These new organizational forms were initially created because of the increasing importance of global scale (Gomes-Casseres, 1994). A global alliance refers to "a set of firms, linked through alliances that compete in a specific business domain." (Gomes-Casseres, 2003, p. 1) Unlike global alliances formed in other industries, which are temporary and linked to a specific project, global alliances in the airline industry are permanent and general in character (Gudmundsson et al., 2012).

The primary objective of airline global alliances is to contribute to the profitability and development of airlines in the long term, far beyond what any airline could achieve individually or bilaterally (Corbo and Shi, 2015). This objective is achieved through measures that facilitate integration between companies and include the development of joint IT systems, frequent-flyer benefits, and linking markets, or through measures that reduce costs, such as airport co-location and joint procurement (Gomes-Casseres, 2003). Therefore, benefits of the economies of scope and density incentivize new airlines to join global alliances (Gaggero and Bartolini, 2012).

For an airline, participation in global alliances involves a greater commitment than the formation of a bilateral airline alliance because these organizations evaluate potential new members in terms of security requirements, network compatibility, and potential growth. Being part of an alliance requires an airline to assume a certain role within it (Huettinger, 2014); in these alliances some airlines are specialists in certain markets, while others tend to position themselves as link providers, connecting the different markets (Kleymann, 2005).

Furthermore, participation in global alliances affects an airline's ability to join other alliances because these organizations prevent or limit the formation of alliances with airlines that are members of competing global alliances (Corbo and Shi, 2015).

Consequently, global alliances have changed the competitive paradigm in the airline industry (Lazzarini, 2007), moving from competition between airlines to competition between groups of airlines (Gomes-Casseres, 1994), which in turn has led to the unceasing growth of their members in the past decade.

2.2 Strategic groups

The concept of strategic groups was introduced by Hunt (1972) with the aim of reconciling the paradigm of industrial economics with that of strategic management. The paradigm of industrial economics asserts that the structure of an industry ultimately determines the performance of a company, whereas the paradigm of strategic management postulates that performance is primarily determined by a company's resources and capabilities (Murthi et al., 2013).

According to Porter (1980, p. 129), "a strategic group is the group of firms in an industry following the same or a similar strategy along the strategic dimensions." This concept highlights the influence of the industry on individual companies and the importance of the companies' individual characteristics.

The use of this theoretical approach allows us to identify the primary strategies utilized in the industry by analyzing a series of variables and dimensions (McGee and Thomas, 1986). Identifying companies' strategic configuration is important and useful because it "represents a way to meaningfully capture the complexity of organizational reality" (Ketchen and Shook, 1996, p. 441) and allows us to understand better the structure and evolution of an industry. Furthermore, strategic group analysis is particularly relevant because of its usefulness for identifying possible barriers to mobility and the different strategies developed within that industry (Mehra and Floyd, 1998). Therefore, this theoretical approach is appropriate for developing a panoramic perspective of an industry, which is very useful for an exploratory study such as this one. Current studies have not provided a general overview of the existing strategies in the airline industry, but rather have focused on specific airline profiles, such as regional airlines (Gillen et al., 2015) or airlines located in specific geographical areas, such as Gulf airlines (Anwar, 2007) or US airlines (Murthi et al., 2013).

In the context of the airline industry, several studies have used the strategic groups approach, although they use a variety of methods to identify the different groups (Bailey and Williams, 1988; Cosmas et al., 2013; Kling and Smith, 1995; Magalhães et al., 2015; Murthi et al., 2013). These studies show "the existence of strategic groups by demonstrating that there are group effects independent from the firm effects and the industry effects" (Murthi et al., 2013 p. 60).

However, there may be a number of origins for these groups, since they may be the result of path dependency, coordinated interactions, and mimetic processes (Murthi et al., 2013).

Furthermore, the adoption of this theoretical approach is useful for an analysis of the airline industry for two reasons. First, this approach provides evidence of the different operational strategies utilized in the airline industry and indicates how they evolved, which improves our knowledge of the industry. Second, this theoretical approach clearly complements the relational approach promoted by studies regarding alliance networks and global alliances (Das and Teng, 2002; Gomes-Casseres, 1994, 2003; Lazzarini, 2007). Although the formation of alliance networks and global alliances in an industry suggests a transition from competition between companies to competition between groups (Gomes-Casseres, 1994), we must not forget that associative behavior represents a complement to and an improvement in a company's operational strategy.

The results of our study empirically confirm the previous literature on the airline industry, in which it is stated that members of the same global alliances adopt different operational strategies. This strategic variety is due to the fact that global alliances have become multilevel specialized hierarchical organizations in which each airline assumes a specific operational role (Kleymann, 2005; Kleymann and Seristö, 2001). Additionally, the results show the diversity of associative strategies, even among members of the same strategic group. This diversity is due to the fact that the associative strategies represent a relatively flexible complement to the operational strategy of the airlines. An operational strategy plays a fundamental role in ensuring the development of an airline and in leveraging the opportunities that arise from participation in global alliances. Participation in a global alliance does not necessarily guarantee an airline's success, as demonstrated by airline closures (e.g., Malev in 2012 and Mexicana in 2010) and airlines that have been absorbed by other airlines (e.g., Canadian Airlines in 2000 and Austrian Airlines in 2009). Despite the importance of associative activities, airlines' individual strategies play a fundamental role in their development and survival.

In addition, the strategic groups theoretical approach is appropriate for studying the airline industry because of the large number of airlines that still do not belong to a global alliance and continue to operate independently. However, these companies do use codeshare agreements, and generally, their strategies are similar to the strategies utilized by members of global alliances. Currently, the three leading global alliances (Star Alliance, SkyTeam and Oneworld) include 74 members and other affiliated airlines and have a passenger volume that is nearly 60% of the entire industry (Wang, 2014).

3 Methodology

3.1 Sample and data collection

To represent the diversity of the airline industry, the sample includes 28 airlines[2] that have different profiles. A theoretical sampling technique (non-random intentional sampling) was used to select the airlines (Charmaz, 2006; Lincoln and Guba, 1985). Initially, 23 airlines were selected, but after the existing strategies in the sector had been identified using strategic groups analysis, additional companies were included to account for possible changes within the groups. Therefore, theoretical saturation was reached (Brown et al., 2002; Locke, 2001; Strauss and Corbin, 1998).

Competition in the airline sector occurs between global alliances (Lazzarini, 2007), which include an increasing number of companies. These alliances have become essential for developing strategies and creating value (Douglas and Tan, 2017; Wassmer and Meschi, 2011). However, the majority of independent operators continue to exhibit notable differences in their strategic behavior compared to airlines affiliated with global alliances. For this reason, the selection was based on the following criteria: (1) airlines in the three major global alliances (Star Alliance, Oneworld and SkyTeam) and independent airlines, (2) airlines that have joined the three major global alliances at various points in time (before and after 2005), (3) airlines located in different geographical areas, (4) traditional and newly created flag airlines, and (5) publicly and privately owned airlines. Low-cost companies were excluded from the sample, although they represent a strategic type and business model that is representative of the industry (Pels, 2008) because they rarely use alliances in their strategies and associative behavior is the primary focus of this study.

We collected information on a wide range of variables for each airline during 2005–2015. The time period was chosen because the use of codeshare agreements and the development of global alliances have accelerated in the past ten years. Once the data had been obtained, we analyzed two relevant aspects of strategic behavior: the operational strategies of the airlines, which are based on each airline's network of routes and destinations, and the associative strategies of the airlines, which are based on each airline's network of alliances.

As regards to airline operations, a vast amount of information was synthesized into 11 variables intended to capture the airlines' strategic operational behavior; these include the following: number of hubs; fleet size; number of routes; percentage of international routes; percentage of other routes[3]; number of destinations; percentage of international destinations; number of countries served by the airline; number of areas served by the airline[4]; average aircraft size; and average flight distance. Together with these variables, we developed a profile for each airline using qualitative and institutional information collected from the companies' web pages, the Flightglobal database and other sources available on the Internet. For each airline we established its origin and evolution, its major milestones (e.g. entry into foreign markets) and development, its ownership structure (public or private), and its senior management teams. We also identified the characteristics of the company's country of origin and its main market. From these profiles we were able to analyze and interpret the strategic groups identified through the analysis of the operational variables.

We used operational data to identify the strategic groups because this is a global industry in which "there are likely to be specific characteristics which are widespread among organizations" (Huettinger, 2014 p. 92). Since all

airlines face the same pressures, because they participate in a global industry and share specific characteristics, it is appropriate to use operational data to analyze the sector. This is because operational data represent the airlines' visible response to the pressures of their environment.

As regards alliances, this study analyzes two types of cooperation agreements: agreements related to one of the three leading global alliances and codeshare agreements between airlines. Furthermore, each airline's alliance portfolio was determined for each year of the analysis (Lavie, 2007). These data allow us to determine the identity of the partners, number of codeshare routes with each partner, whether the partner belongs to one of the three major global alliances, and "relevant partners" in the portfolio (partners with a percentage of codeshare routes that exceeds 20% of all codeshare routes).

The data in this study were obtained from three different sources. Data regarding flights, routes, destinations, codeshare agreements, and other operational variables were obtained from the Official Airline Guide (OAG) (2016), the fleet size for each airline was obtained from Flight Airline Business (2016), and finally, the number of hubs was determined by analyzing the airlines' web pages and corporate information.

The OAG database provided data for 2005–2015 on two different types of routes: 1) routes published and operated by the focal airline, and 2) routes published by the focal airlines but operated by third party airlines, namely, codeshare routes benefiting the focal airline. The first type of route was employed to determine the network of routes and destinations of the focal airline and the partners that accessed it. The second type of routes was used to determine the routes to which a focal airline had access through its partners and their identity.

These two sets of data were integrated with information on all the currently operating airports in the world, extracted from OAG analyzer (2016) to establish the type of routes, destinations and countries in which the airlines operate.

3.2 Data analysis

Using an exploratory factor analysis, the 11 variables were reduced to three factors that represent significant aspects of airlines' characteristics and strategic behavior. The first factor is related to size (number of destinations, fleet size, number of routes, and number of hubs). The second factor refers to airlines' internationalization (served countries, served areas, percentage of international destinations, percentage of international routes, and percentage of other routes). The final factor includes the type of flights that the airlines operate (average distance of flights and average size of aircraft). Factor analysis was performed using the *main component analysis* extraction method, with *oblimin rotation* and *Kaiser normalization*. The three factors accounted for more than 85% of the sample variance in each of the years and the result of the Kaiser-Meyer-Olkin test was higher than 0.56 (above the required level of 0.5) for all three time intervals.

The strategic groups were determined from these three factors for the three selected points in time (2005, 2010 and 2015) by conducting a cluster analysis. This statistical technique is commonly used in a variety of disciplines for classifying subjects (Hagen et al., 2012), while in the airline literature this technique has been used by Cosmas et al. (2013), Magalhães et al. (2015), Smith et al. (1997) and Wen and Chen (2011).

In applying the cluster analysis, we incorporated the methodological recommendations proposed in the literature (Ketchen and Shook, 1996). We applied a two-stage procedure by means of a hierarchical cluster and a k-means cluster (non-hierarchical), which is the most commonly used cluster protocol. The hierarchical cluster procedure based on the squared Euclidean distance and on the Ward method was used to determine the optimum number of clusters. After that, the significance (F = 26.38, p < 0005) of the cluster differences was confirmed by employing a MANOVA scheme used by Morrison and Roth (1992), among others. These clusters are therefore posited as representing distinct strategic types.

Once the candidate numbers of clusters were determined, the k-means cluster procedure was used to assign the different cases in the sample to the most appropriate group. For each time period, five clusters were identified. These will be described in detail and analyzed in the next section.

4 Results

4.1 Strategies and changes in the airline sector

Airline strategies are analyzed in this section by exclusively considering the variables determined by the resources of each airline, namely, their routes, fleets and hubs. Following this analysis, several strategic groups were identified within the sector, which helped with identifying their most viable strategies (Porter, 1980). By analyzing the evolution of these groups, we can track changes in a company's operational strategy over time (Mehra and Floyd, 1998).

The operational strategies that were identified, together with the associative strategy, make up the airline's overall strategy. The two strategies complement each other and are influenced by a series of factors that are both internal and external to the industry (Huettinger, 2014). Internal factors are compounded by the presence of low-cost airlines, the formation of global alliances and the influence of national culture, while external factors are the

increasing liberalization of markets and the influence of states on the industry (Huettinger, 2014).

As mentioned above, we obtained five strategic groups for each year of the analysis (2005, 2010 and 2015), although their members occasionally changed.

The analysis of the results includes two related aspects: (1) the groups identified in 2015 and their evolution between 2005 and 2015 and (2) the operational strategies utilized by the airlines during the study period.

4.1.1 Identification and evolution of the strategic groups

The first group includes five European airlines: Air France, KLM, Lufthansa, British Airways, and Austrian Airlines. With the exception of Austrian Airlines, the other airlines can be labeled as *major global carriers* and are characterized by the global reach of their operations because they serve a large number of countries and geographical areas. Therefore, their routes and destinations extend to all continents, thereby reducing their percentage of domestic routes. The presence of Austrian Airlines in this group may be surprising, given that the features of this airline are apparently very different from the rest of the group. However, despite the divergence in size, its internationalization profile is quite similar to that of the other airlines in the group. It could be argued, following the ideas of Reger and Huff (1993), that Austrian Airlines is a secondary group member (a firm that implements the strategic group recipe less consistently than core firms), and that, following its absorption by Lufthansa, it is quite likely to change strategic group in the future, depending on the strategy of its parent company.

The second strategic group, which is referred to as *large national carriers*, includes the three largest American airlines: American Airlines, Delta Airlines, and United Airlines. This group is characterized by the size of its members and their focus on domestic markets.

The third strategic group, which is referred to as *new global carriers*, includes the three Gulf airlines: Emirates, Etihad Airways, and Qatar Airways. These airlines are based in the same geographical area, can be considered young airlines, and have experienced very rapid growth in the past ten years compared to all other airlines. These companies utilize an operational strategy similar to that of the first group of airlines (*major global carriers*), but have smaller fleets, which affects all the variables relevant to international presence and the size of the airlines.

The fourth strategic group exclusively includes former flag airlines (Aeroflot, Air Canada, Alitalia, China Southern, Iberia, Korean Air, Royal Jordanian, Scandinavian Airlines, and Tap Portugal). These are characterized by their medium size, a moderate degree of internationalization, and a strategy that focuses on specific markets. This group is referred to as *regional carriers*.

Finally, the fifth group includes Qantas, All Nippon, Japan Airlines, Alaska Airlines, JetBlue, Air Europa, Air China, and Air Astana. These are relatively small, except Air China, and are characterized by a primary focus on their domestic market and on a limited number of countries generally adjacent to their country of origin. This group is referred to as *zonal carriers*.

The following table (Table 1) summarizes the primary features of the airlines in the various strategic groups using the final time period (2015) as a reference.

Table 1 Strategic groups (2015): general characteristics.

alt-text: Table 1

	Major global carriers	Large national carriers	New global carriers	Regional carriers	Zonal carriers
Fleet size	~~Big~~Large	Very ~~big~~large	Medium	Small	Small
Average	191.40	822.33	169.0	154.89	153.50
SD.	(91.284)	(130.51)	(61.39)	(135.77)	(95.14)
Number of Routes	~~Big~~Large	Very ~~big~~large	Small	Medium	Small
Average	480.20	2242.33	247.00	555.00	376.75
SD.	(184.86)	(1143.58)	(59.30)	(461.46)	(188.59)
Number of destinations	~~Big~~Large	Very ~~big~~large	Medium	Medium	Small
Average	175.80	369.33	118.33	135.00	89.50
SD	(39.23)	(98.77)	(24.583)	(50.24)	(37.91)
% of international routes	~~Big~~Large	Small	Very ~~big~~large	~~Big~~Large	Small

Average	73.88%	25.4%	91.77%	67.16%	32.30%
SD	(11,26%)	(6.16%)	(4.34%)	(19.71%)	(16.92%)
No of served countries	Very ~~big~~large	~~Big~~Large	~~Big~~Large	Medium	Small
Average	75.80	63.67	68.00	43,89	19.88
SD	(16.72)	(11.02)	(12.49)	(6.13)	(8.32)
No of served areas	Very ~~big~~large	~~Big~~Large	Very ~~Big~~large	Medium	Small
Average	14.40	11.67	13.33	9.67	6.63
SD	(3.05)	(4.04)	(0.58)	(1.80)	(2.39)

The strategic groups that we identified have not remained static; their members have changed throughout the study period as indicated in Fig. 1 below. It is possible to identify two types of connecting lines: continuous and discontinuous. Continuous lines indicate the natural evolution of the strategic groups throughout the different time periods, whereas discontinuous lines represent the changes in the strategic groups. The main driver that explains the evolution of the strategic groups is the airlines' operational growth. The origin of this operational growth may have been internal or external (mergers and acquisitions and state aid). Once the airlines have consolidated their internal operational profile, they begin to strengthen their associative strategies, thus accelerating their virtualization process.
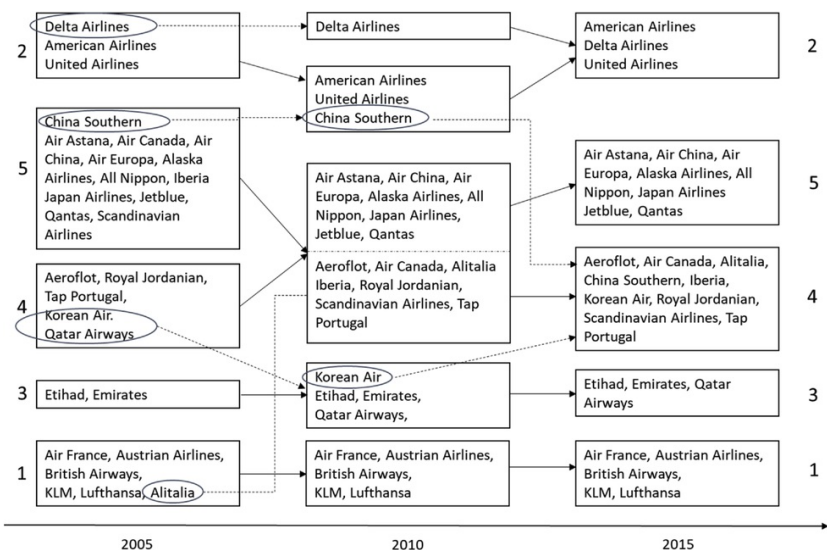
Fig. 1 Evolution of the strategic groups between 2005 and 2015.

alt-text: Fig. 1

As regards the evolution of each group, Table 2 illustrates the variation of certain operational variables including fleet size, served countries, and the number of routes and destinations, which reflect the different growth strategies utilized by the airlines in the different groups.

Table 2 Evolution of the main operating variables of the different strategic groups.

alt-text: Table 2

	2005–2010	2010–2015

	Fleet		Routes	Countries		Destinations	Fleet		Routes	Countries		Destinations
	Average size	Variation	Annual Variation	Average number	Variation	Annual Variation	Average size	Variation	Annual Variation	Average number	Variation	Annual Variation
Major global carriers SD	176.3 (98.4)	+9	−1.6%	76.5 (11.3)	−6	−1.1%	190.2 (102.0)	+18	−1.9%	76.1 (15.1)	+3	+1.3
Large national carriers SD	525.4 (126.7)	+30	+4.2%	49.2 (14.3)	+10	+3.6%	736.4 (76.9)	+413	+10.6%[a]	60.0 (10.1)	+10	+5.9%
New global carriers SD	72.4 (41.0)	+58	+6.7%	46.5 (11.6)	+15	+9.1%	141.4 (58.2)	+91	+7.9%	61.5 (9.9)	+15	+8.4%
Regional carriers SD	131.6 (76.9)	+18	+2.2%	38.8 (7.6)	+2	+2.3%	148.5 (114.8)	+26	+3.9%	42.4 (7.5)	+3	+4.1%
Zonal carriers SD	125.1 (68.5)	+2	+4.0%	15.4 (8.1)	+5	+4.6%	143.9 (85.7)	+34	+3.7%	18.2 (7.9)	+3	+2.6%

[a] Due to mergers between American airlines.

4.1.2 The main operational strategies in the airline industry

An analysis of the strategic groups identified three types of operational strategies in the airline industry: national strategy, global and regional. These are based on the airline's own network of routes operated directly or through its subsidiaries or subcontractor airlines (Wassmer and Meschi, 2011). The approach that each airline utilizes roughly approximates to one of these three strategies.

The national strategy is applied when an airline devotes the vast majority of its efforts and resources to its domestic market. However, this orientation does not necessarily imply a lack of attention to or interest in international markets. The *large national carriers* (American Airlines, Delta Airlines, and United Airlines) and the Chinese airlines (China Southern and Air China) have adopted this strategy. Although these airlines have many international and intercontinental routes and operate in a large number of countries (between 33 and 71), they primarily focus on their domestic markets, which consist of 67.9% of their routes and 86.1% of their flights. Similarly, most of their destinations (between 59.4% and 66.1%) are domestic. Despite having numerous international routes, these airlines operate a very low percentage of other routes (between 0.3% and 4.1%), which indicates that their international routes simply connect their country of origin to destinations abroad and primarily provide a service to passengers entering and leaving their country. The airlines' national orientation depends on a number of factors; however, one of the most influential is the size and future evolution of the domestic passenger market (IATA, 2016). Geographically, the United States and China are two very large countries with large populations, but most importantly, they have extremely large domestic passenger markets. Data regarding passenger volume provided by IATA indicate that by 2015 the United States and China were the two leading global and domestic markets for passengers and were considerably surpassing other countries. Furthermore, the domestic market represents approximately 70% of the volume of passengers in the United States and approximately 90% in China.

The global strategy is applied when an airline develops its network of routes in a way in which its country of origin is connected to a very large number of foreign countries. Generally, these airlines form an international network less centered than those of national operators. This strategy characterizes the major global carriers (Air France, KLM, Lufthansa, and British Airways) and the new global carriers (Emirates, Etihad, and Qatar Airways). The high internationalization of these airlines is reflected in the percentage of their intercontinental routes (between 26.1% and 55.6%), international destinations (between 86.9% and 99.3%), and other routes (between 3.4% and 43.5%), which all show high levels of international diversification.

A regional strategy is developed when an airline concentrates its operations in a specific geographical area, either in a particular country, as is the case for certain US regional airlines, or in countries that border the airline's country of origin. This strategy is used by *regional carriers* (Aeroflot, Air Canada, Alitalia, Iberia, Royal Jordanian, Scandinavian Airlines, and Tap Portugal) and *zonal carriers* (Qantas, All Nippon, Japan Airlines, JetBlue, Air Europa, and Air Astana). These airlines are smaller than the companies that adopt the first two strategies and experienced a lower growth during the study period. Although their activity is concentrated in a specific geographical area, these companies can fly long-haul or intercontinental routes to connect the airline's country with the primary world passenger markets, even though they operate only a small number of such routes.

Logically, the choice of a particular operational strategy determines the type of routes that an airline operates, the frequency of flights, and the type of aircraft included in its fleet. A national strategy generally consists of short and medium-haul routes, a high frequency of flights, and fleets that include medium and small aircraft. A global strategy generally consists of long-haul routes, a low frequency of flights, and fleets that include large aircraft. The most binding parameter for the medium and long term strategies is the type of aircraft included in an airline's fleet because this represents a sunk cost (Gaggero and Bartolini, 2012), namely, a cost that has already been incurred and cannot easily be recovered.

Inevitably, competition occurs in all markets between all airlines because this rivalry manifests at the individual route level (Gimeno, 2004); therefore, companies within the various groups compete against each other for certain routes. However, a

company's partnership policy substantially alters this competition, which will be discussed in the following section.

4.2 The associative strategy in the airline industry

Although the strategies we analyzed above represent the basis of an airline's operation, the associative behavior of companies increasingly affects their actions and results. An analysis of the companies in the sample confirms this increase in associative behavior, which is manifested by two major trends in the industry: an increase in the number of airlines that are affiliated with global alliances and an increase in the use of code-sharing. These have resulted in significant modifications to airline alliance portfolios and an increase in the virtualization of airlines.

4.2.1 Global alliances

The three leading global alliances are increasingly dominating the industry's structure and competition (Fan et al., 2001). These global alliances were formed between 1997 and 2000, but have experienced most of their expansion between 2005 and 2015, when membership grew from 34 to 62 associated airlines. In addition to their members, numerous affiliated airlines[5] can also be identified, which creates a multilevel alliance structure (Kleymann and Seristö, 2001). This configuration has led to the establishment of essentially global geographic coverage and a passenger volume reaching 60% of the total industry and 77% of the world airline capacity (ASKs) in 2013 (Wang, 2014). This increase in the number of partners has been accompanied by improved relationships between the global alliance's member airlines (Corbo and Shi, 2015) and the formation of stronger links between these airlines, such as joint ventures, which also strengthen the competitive position of the global alliances. An example of this phenomenon is British Airways. In 2005, 58.5% of the routes it accessed through its partners were operated by its own alliance (Oneworld); this increased to 83.6% in 2013. An additional indicator of the importance and global reach of global alliances is that member airlines of these organizations are located on all the continents. The formation and growth of these organizations is changing the competitive paradigm of the airline sector, moving from competition between airlines to competition between groups (Gomes-Casseres, 1994). This transformation has triggered the formation of new global alliances: Vanilla Alliance (2015), U-FLY Alliance (2016), and Value Alliance (2016). However, certain globally significant airlines, such as Virgin Atlantic, Emirates, and Etihad Airways, have remained independent, at least for the time being, because of the high costs and limitations of participating in a global alliance. In 2015, Etihad Airways created its own network of associated airlines by acquiring shares in the airlines (Etihad, 2016), de facto creating a global alliance that governs and directs itself.

At the beginning of the study period, 16 of the 28 airlines belonged to one of the three major global alliances. In 2005, seven of the remaining 12 independent airlines joined one of these organizations. Therefore, it is important to analyze the changes in their associative behavior.

The results of this study confirm that global alliances impose strict conditions on their partners' associative behavior (Corbo and Shi, 2015). In 2005, prior to joining one of the major global alliances, none of the seven independent airlines demonstrated any specific associative patterns; each airline had a mixed variety of partners. In 2015, the membership profiles of these airlines changed dramatically; 62.5% of their partners belonged to the same global alliance as the airline, and 19.1% of their partners were independent members. Consequently, an airline's ability to access the network of routes and destinations offered by companies from competing global alliances is very limited. This restriction does not apply when the potential partner is independent. In addition to these limitations in alliance policies, the similarities of the global coverage of the three global alliances make it possible for an airline member to expand its network of routes and destinations by primarily using the global alliances' resources or alternatively, the resources of independent airlines.

4.2.2 Strategic alliances through codeshare

The second industry trend is an increase in the use of codeshare agreements, a common type of strategic alliance among airlines. A codeshare allows an airline to access the routes and destinations of its partners (Casanueva et al., 2014). Thus, this type of agreement provides numerous benefits linked to competition (Goetz and Shapiro, 2012; Lin, 2008), efficiency (Wan et al., 2009), and expansion of networks of routes, particularly international routes, thereby avoiding or overcoming legal and regulatory barriers (Oum et al., 2001).

As regards codeshares, we need to distinguish between *complementary* and *parallel* codeshare agreements (Adler and Hanany, 2016). Complementary codeshares provide access to routes other than those offered by the focal airline and therefore, extend its route network. Parallel codeshares are used to provide access to routes already offered by the focal airline and consequently, increase the frequency of flights on those routes. Complementary codeshares extend the offerings of an airline by mobilizing the resources of its partners (Casanueva et al., 2014) without having to increase the fleet and with no additional costs other than coordination with its partners. A company that wishes to meet these two needs uses this type of codeshare to increase its internationalization, which refers to the number of served countries. In addition, this type of codeshare improves an airline's exposure in domestic markets. Conversely, parallel codeshares increase the utility for passengers by increasing the frequency of flights on certain routes (Hansen, 1990). Our analysis indicates that the vast majority of codeshares are complementary codeshare agreements, which represent an alternative strategy for airlines with limited financial resources or airlines unwilling to bear the risks associated with expanding their fleet (Gaggero and Bartolini, 2012).

The following table (Table 3) illustrates the recent trend of increased code-. This trend can be analyzed from two perspectives. First, it is possible to observe the greater openness of airlines because of the codeshare routes that they directly operate. Second, there is an observable increase in the access to routes operated by partner airlines. In addition, the table highlights that airlines prefer complementary codeshares to parallel codeshares.[6]

Table 3 Comparison of codeshare use between 2005 and 2015.

alt-text: Table 3

Airlines	2005					2015			
	Airline Routes		Partner Routes	Complementary Routes	Total Routes	Airline Routes		Partner Routes	Complementary Routes	Total Routes
	Total	Offer CS				Total	Offer CS			
Mean	459.4	41.9%	516.3	77.3%	926.8	660.9	59.1%	1135	89.34%	1684.9
Aeroflot	189	21.2%	88	47.7%	231	551	29.8%	367	87.7%	873
Air Astana	82	2.4%	2	100.0%	84	135	8.9%	20	50.0%	145
Air Canada	640	37.5%	734	95.1%	1338	748	48.9%	1491	97.5%	2201
Air China	521	21.7%	390	80.0%	833	859	85.9%	1733	83.0%	2298
Air Europa	208	38.5%	159	88.7%	349	331	21.8%	263	96.6%	585
Air France	671	61.1%	941	91.4%	1531	472	83.1%	2778	96.7%	3158
Alaska Airlines	354	81.1%	538	95.4%	867	492	57.9%	509	92.3%	962
Alitalia	371	56.6%	673	85.9%	949	369	62.9%	1244	92.5%	1520
All Nippon	344	31.1%	267	83.9%	568	409	55.0%	1204	88.0%	1468
American Airlines	1327	50.9%	896	95.0%	2178	1965	68.6%	2055	55.4%	3103
Austrian Airlines	322	70.5%	415	78.8%	649	293	55.6%	402	88.3%	648
British Airways	741	39.3%	485	92.6%	1190	538	69.5%	1477	97.6%	1980
China Southern	924	11.1%	93	51.6%	972	1701	72.1%	1295	65.9%	2554
Delta Airlines	1481	59.1%	1826	95.8%	3231	2074	79.0%	1562	90.6%	3489
Emirates	184	35.3%	24	29.2%	191	290	60.7%	693	95.7%	953
Etihad Airways	43	16.3%	3	0.0%	43	197	88.8%	1942	97.0%	2081
Iberia	567	29.8%	405	80.5%	893	427	49.4%	1841	96.4%	2202
Japan Airlines	369	34.1%	377	85.7%	692	266	64.3%	965	93.3%	1166
Jetblue	116	0.0%	0	0.0%	116	470	42.1%	133	95.5%	597
Klm	269	86.2%	1671	98.1%	1909	284	94.0%	2661	98.1%	2895
Korean Air	239	42.7%	224	92.4%	446	298	60.7%	447	80.3%	657
Lufthansa	736	80.8%	1280	90.5%	1895	663	79.5%	1518	92.6%	2068
Qantas	342	26.9%	315	75.6%	580	299	88.3%	918	89.8%	1123
Qatar Airways	159	21.4%	51	80.4%	200	292	42.5%	766	98.4%	1046
Royal Jordanian	146	38.4%	55	70.9%	185	121	40.5%	243	97.1%	357
Scandinavian Airlines	409	35.2%	696	94.3%	1065	549	35.3%	745	95.2%	1258

| Tap Portugal | 143 | 60.1% | 390 | 90.3% | 495 | 236 | 69.9% | 799 | 96.0% | 1003 |
| United Airlines | 965 | 82.8% | 1457 | 95.3% | 2354 | 3177 | 41.1% | 1709 | 94.1% | 4786 |

4.2.3 Alliance portfolios

An important trend in the industry is a direct result of the increase in the number of airlines associated with global alliances and the proliferation of codeshare agreements: an increase in the size of airlines' alliance portfolios.

Data for the airlines analyzed in this study demonstrate that over the study period, the portfolios of airline alliances have increased from an average of 25.6 partners to 42.9. An increase in size results in a more complex management of the alliances portfolio (Hoffmann, 2005; Wassmer, 2010), which can lead to the development of different functions within the airlines for its management (Kale et al., 2002).

We compiled data regarding code-sharing and analyzed the partners that access the routes of a focal airline and partners' routes accessed by the focal airline. Our analysis identified three types of partners: (1) partners that only access/use the route network of the focal airline, (2) partners that only lend their routes to the focal airline, and (3) partners that use the focal airline's route network and also lend their routes. Furthermore, for each year of the study period, we determined whether the partners within the portfolio of focal airlines were members of one of the three major global alliances. In addition, we identified the "relevant partners" for each airline, including partners that represent a significant percentage of the total codeshare routes of the airline (over 10%). All of this information is summarized in Table 4, which highlights the primary indicators of the alliance portfolios of the airlines included in the sample in addition to their evolution across various time intervals. These indicators include the following: alliance portfolio size, percentage of partners that use the focal airline's route network and also lend their routes (PUL), percentage of partners in the same alliance and independents (PSAI), and percentage of "relevant partners" that belong to the same alliances as the focal airline (RPSA).

Table 4 Evolution of the main indicators of the alliance portfolios between 2005 and 2015.

alt-text: Table 4

	2005				2010				2015			
	Portfolio Size	PUL	PSAI	RPSA	Portfolio Size	PUL	PSAI	RPSA	Portfolio Size	PUL	PSAI	RPSA
Air Canada	29	55.2%	96.6%	81.8%	41	53.7%	97.6%	75.0%	49	51.0%	93.9%	70.0%
Air China*	25	48.0%	76.0%	*71.4%	35	60.0%	88.6%	66.7%	50	58.0%	90.0%	75.0%
All Nippon	24	45.8%	100.0%	100.0%	45	48.9%	100.0%	71.4%	55	47.3%	96.4%	84.6%
Austrian Airlines	63	50.8%	92.1%	100.0%	69	39.1%	95.7%	87.5%	59	39.0%	93.2%	88.9%
Lufthansa	51	52.9%	100.0%	93.3%	73	43.8%	95.9%	92.9%	64	39.1%	93.8%	87.5%
Scandinavian Airlines	24	41.7%	100.0%	100.0%	53	39.6%	98.1%	91.7%	48	41.7%	87.5%	86.7%
Tap Portugal	20	75.0%	85.0%	72.7%	38	57.9%	94.7%	80.0%	57	45.6%	87.7%	90.0%
United Airlines	38	36.8%	100.0%	90.9%	57	49.1%	100.0%	78.6%	66	31.8%	98.5%	100.0%
Mean Star Alliance	34.3	50.8%	93.7%	88.8%	51.4	49.0%	96.3%	80.5%	56	44.2%		85.3%
Aeroflot*	26	50.0%	73.1%	*50.0%	30	60.0%*	80.0%	57.1%	38	63.2%	92.1%	85.7%
Air Europa*	16	56.3%	87.5%	*55.6%	8	75.0%	87.5%	77.8%	19	73.7%	94.7%	92.3%
Air France	47	63.8%	80.9%	100.0%	64	51.6%	82.8%	50.0%	74	51.4%	90.5%	77.8%
Alitalia	29	58.6%	79.3%	83.3%	32	68.8%	87.5%	77.8%	53	50.9%	83.0%	87.5%
China Southern*	12	66.7%	66.7%	*75.0%	18	72.2%	83.3%	100.0%	22	77.3%	81.8%	100.0%
Delta Airlines	30	50.0%	96.7%	63.6%	37	37.8%	89.2%	60.0%	43	48.8%	90.7%	100.0%
Klm	40	27.5%	90.0%	70.0%	47	38.3%	93.6%	69.2%	59	44.1%	93.2%	90.0%

Korean Air	22	63.6%	81.8%	75.0%	33	63.6%	81.8%	37.5%	46	56.5%	87.0%	57.1%
Mean SkyTeam	27.8	54.6%	82.0%	71.6%	33.6	58.4%	85.7%	66.2%	44.3	58.2%	89.1%	86.3%
American Airlines	36	52.8%	91.7%	28.6%	38	50.0%	89.5%	72.7%	57	45.6%	96.5%	86.7%
British Airways	20	45.0%	90.0%	85.7%	29	37.9%	93.1%	100.0%	40	40.0%	97.5%	88.9%
Iberia	31	48.4%	87.1%	37.5%	29	58.6%	89.7%	62.5%	38	39.5%	86.8%	90.0%
Japan Airlines*	27	63.0%	66.7%	*33.3%	26	61.5%	53.8%	66.7%	48	41.7%	83.3%	100.0%
Qantas	32	37.5%	87.5%	66.7%	29	48.3%	79.3%	44.4%	40	40.0%	85.0%	60.0%
Qatar Airways*	18	27.8%	–	–	10	50.0%	–	–	26	38.5%	92.3%	100.0%
Royal Jordanian*	10	60.0%	60.0%	*11.1%	11	63.6%	81.8%	63.6%	15	46.7%	80.0%	100.0%
Mean Oneworld	25.2	48.6%	80.7%	47.8%	25.7	53.6%	81.8%	68.0%	37.7	41.7%	88.8%	89.0%
Air Astana	2	0.0%	–	–	4	25.0%	–	–	6	50.0%	–	–
Alaska Airlines	15	33.3%	–	–	25	12.0%	–	–	23	13.0%	–	–
Emirates	12	41.7%	–	–	14	42.9%	–	–	19	36.8%	–	–
Etihad Airways	1	0.0%	–	–	33	57.6%	–	–	75	58.7%	–	–
Jetblue	0	–	–	–	2	0.0%	–	–	14	21.4	–	–

* = these airlines in 2005 were not official member of such alliances, but joined between 2006 and 2007: their membership of the alliance was under negotiation at the time.

The table illustrates three trends in airline alliance portfolios that are simply noted here but will require a more comprehensive analysis in the future. The first trend involves the increasing rigidity and conditions that global alliances impose on their members (Corbo and Shi, 2015) because there are fewer codeshares between airlines in different global alliances. The alliance portfolio of an airline associated with a global alliance is almost entirely formed of members of the same global alliance and independent partners. Clearly, independent airlines do not experience these limitations when forming alliances.

The second trend is that "relevant partners" of airlines in global alliances belong to the same alliance. These first two trends reinforce each other and strengthen the concept that competition in the airline industry is changing from inter-airline competition to competition between global alliances (Gomes-Casseres, 1994).

The third trend is related to the three previously identified types of partners. Partners that only access the focal airline's route network and partners that only provide routes to the focal airline are usually relatively small airlines that occupy a peripheral position in the industry. However, these partners can be very useful for an airline: partners that access routes from the focal airline increase the load factor of its flights, which subsequently increases its efficiency. Similarly, airlines that lend their routes to the focal airline facilitate its geographical exposure.

4.3 Virtualization of airlines

We previously discussed how a specific operational strategy determines the type of routes that an airline operates, the frequency of its flights, and the type of aircraft included in its fleet. Of these three parameters, the first two are closely linked to the number and type of aircraft included in the airline's fleet. Further, we noted that another method used by airlines to access new destinations is through codeshare agreements, which increases the exposure of an airline without having to increase its routes or fleet size.

Access to the routes of third-party airlines through codeshare agreements has allowed the progressive virtualization of the airline industry. Virtualization is not a process that is exclusive to this industry, but is a general process in many industries (Markus et al., 2000). In the context of the airline industry, 'virtualization' refers to a reduction in the percentage of routes operated directly by the focal airline as part of its total offering of routes. The data show that the percentage of routes operated by the companies in the sample decreased from 49.2% in 2005 to 39.2% in 2015, illustrating the importance and speed of this process in the airline industry.

The process is the airlines' strategic response to two competitive pressures facing the industry. First, the participation of airlines in global alliances requires the assumption of a certain role within the alliance (Huettinger, 2014). The assumption of a particular role, such as link provider or market specialist (Kleymann, 2005), forces the airline to specialize in certain types of routes, and this increased specialization is compensated by gaining access to the routes operated by the other alliance members. Second, the presence of low-cost airlines increases the competition on certain types – usually short-haul (Pels, 2008) –of route. The airline can respond to this greater competition in three ways: by lowering its fares; abandoning routes; or outsourcing routes to its partners or subsidiaries.

It is therefore possible to state that, although it is the result of a series of decisions related to the operational strategy and the associative strategy, the virtualization process is made possible by the airlines' interorganizational relationships, which allow for the division of labor between airlines (Buckley and Prashantham, 2016). This division of labor can occur at three different levels that normally co-exist. At the first level, the focal airline may outsource its routes to its wholly-owned subsidiaries operating under a different brand name. Examples of this include Lufthansa, with Eurowings/Germanwings, and Air France, with Hop!. At the second level, the focal airline can access the routes operated by third-party airlines or their subsidiaries, using codeshare agreements. The third level is a form of cooperation that combines element from both forms of labor division; the Joint Venture (JV). A JV is a type of agreement in which two or more airlines share resources and split revenue over a defined route network with the objective of optimizing profitability (Redpath et al., 2017). In essence, a JV could be considered a merger that applies only to certain defined routes (Lufthansa Group, 2017). By coordinating key areas and virtually bundling resources, airlines can make better use of their available capacity, thus reducing the economic risk of their routes or making new routes available. Examples of this includes the A++ transatlantic JV between Lufthansa, United Airlines and Air Canada or the J+ bilateral Europe/Japan JV between All Nippon Airways (ANA) and Lufthansa.

It is worth noting that if a focal airline only maintains relations with its subsidiaries, this would not be considered as an example of virtualization, but rather it would be seen as the internal distribution of routes within a business group. This distribution of routes between airlines within the same business group depends on other strategic dynamics, such as market specialization or customer segmentation.

The virtualization process is also absent in airlines that do not form codeshare agreements with third parties, such as some low-cost airlines, where all the routes are published and operated by the focal airline. An example of this is Ryanair, a low-cost airline that does not have codeshare agreements with other airlines and maintains strict control of its routes.

In spite of the generality of this process, it is important to emphasize that not all companies engage in virtualization with the same intensity or speed. The following two cases serve to illustrate the different processes that can influence the virtualization process. In 2005, Air France offered its passengers 1531 routes, of which 671 were operated directly by the company, and 61.4% were virtual, namely, operated by third party airlines. In 2015, Air France had a total of 3158 routes, but only 472 were directly operated by Air France, which implies that 85.0% of the routes were virtual. This case illustrates two processes that act in the same direction and subsequently accelerate virtualization: a significant increase in the use of codeshare agreements and a reduction in the number of routes directly operated by Air France.

The second case is Air Canada. In 2005, the Canadian airline offered its passengers 1338 routes of which 640 were directly operated routes and 52.2% were operated by other airlines. By 2015, Air Canada offered 2201 routes (an increase of 64.5%); their directly owned routes had increased to 748 (an increase of 16.9%) and 66.0% were virtual. In this case the increase in the number of directly operated routes has been more than compensated by the increase of third-party routes, thus increasing Air Canada's virtualization.

This progressive process of virtualization represents both an opportunity and a challenge for the focal airline. One of the main advantages of the virtualization process for the focal airline is the possibility of specializing in a certain typology of routes or in certain OD markets. Another benefit that virtualization brings to a focal airline comes from the greater attention it can devote to one of its key resources: its customer base. By concentrating its resources and activities on certain routes or OD markets, the focal airline can direct more resources towards caring for and retaining its customer base. At the same time, the virtualization process allows the focal airline to offer a greater number of routes (and greater flight frequency) through its network of partners, thus increasing customer satisfaction. The final benefit of virtualization for the focal airline comes from the increase in its network of routes and destinations. This increase is a comparative advantage over airlines that by their nature or through company policy cannot expand their network through cooperative agreements. Nevertheless, we must point out that the virtualization process is not free for an airline, since in order to access the network of routes and destinations of third parties, the focal airline must be able to offer something in return to its counterparts: routes, bases, maintenance services, etc. For this reason, an airline has to develop its internal resources, in terms of routes, destinations, and bases, in order to establish cooperation agreements that allow it to mobilize the resources of its partners.

The virtualization process is not entirely beneficial for the company. One of the main problems for the focal airline is the coordination costs of virtualization: the expansion in the number of routes, destinations and third-party carriers that it has to manage will increase the need for coordination and adaptation capabilities to enable it to cope in such a competitive environment (Alderighi and Gaggero, 2014). The airline also has to adapt and connect its network and operations to those of its partners. Another possible source of problems for the focal airline lies in the selection of the most appropriate global alliance. As we have noted above, global alliances impose strict conditions on their partners' associative behavior (Corbo and Shi, 2015). Finally, a potential problem of the virtualization of the focal airline might be its heavy dependence on external resources or the focal airline's excessive specialization that results from the virtualization process. Both situations might jeopardize the continuity of the airline if there were to be a change in environmental conditions.

5 Conclusions

This study provides a deeper understanding of the operational and associative strategies utilized in the airline industry during 2005–2015. In addition, it highlights how associative behavior represents a fundamental complement to these strategies. By conducting a strategic group analysis, we identified three primary operational strategies: national, global, and regional. Companies that utilize a national strategy devote the vast majority of their efforts and resources to serving their domestic market. Nevertheless, these airlines may retain a significant international presence that results in a global network centered on their country of origin. Companies that utilize a global strategy connect their routes to a large number of countries, which results in a less centered network, although numerous countries are connected to their country of origin. Finally, companies that adopt a regional strategy concentrate their operations in a very specific area within a country and at most extend to bordering countries or to a small number of countries. In the study period, airlines have moved toward one of these three strategies, which highlights the differentiating characteristics that define the airlines.

This study emphasizes the increased associative behavior of airlines by determining that a large number of airlines have joined global alliances and increasingly use codeshare agreements. These two tendencies have significantly increased the size of airlines' alliance portfolios, which results in certain challenges for the airlines because of the need to manage alliances in a coherent and coordinated way (Lavie, 2007). This process has resulted in the creation of specific organizational functions within companies (de Man et al., 2010). We have generalized the growth in the airlines' alliance portfolios for this sector; however, this growth occurs at different levels of intensity among airlines, which indicates a relationship between operational and associative strategies.

The results demonstrate the close connection between airlines' network of routes and destinations and their network of alliances because one of the primary purposes of an alliance is to increase and complement these routes and destinations. This relationship is reflected in the growing virtualization of airlines, which provides access to a greater number of routes through the alliances airlines establish with their partners, without needing to invest their own resources. However, there is a limit to this virtualization, as companies must manage their own routes to offer exchange possibilities to their partners, although it is possible to identify diverse associative behaviors, reciprocal or unilateral, depending on the airline's strategy and business profile.

The study of airline alliance portfolios opens up interesting possibilities for future research. Four areas are appropriate for future analysis. One topic is an analysis of the relationship between an airline's membership in a global alliance and the formation of new alliances. The second is the relationship between the composition of an alliance portfolio and an airline's internationalization process. The third topic is an analysis of the different types of partners within a portfolio (partners that only use the focal airline's route network, that only provide routes to the focal carrier, and ones that use the focal carrier's route network and concurrently provide routes to the focal carrier) and their strategic role for the airline. The last topic is an analysis of the consequences of the virtualization process from the perspective of marketing and strategy.

This study contributes to the alliance literature by showing how associative behavior can complement the operational strategies within an industry, leading to a process of virtualization in which companies rely increasingly on the resources of partners in order to compete. In a highly competitive industry, the use of alliances allows companies to outsource part of their activities, increasing the division of labor (Buckley and Prashantham, 2016) and driving the progressive virtualization of the industry. The virtualization process allows companies to simplify their internal organizational structure, enabling them to focus their resources and capabilities on the key elements of their business model. This trend creates new challenges for airlines, relating to the protection of their basic resources, especially their routes, and the greater demands on management in terms of their coordination and relationships with their partners.

Finally, the virtualization of the sector raises interesting research questions from the perspective of marketing and strategy, to the extent that the airline's different routes could be viewed as separate markets in which it competes (Gimeno and Woo, 1996).[7] Among the many research questions related to virtualization we will briefly outline the most interesting and promising. From a marketing perspective it would be interesting to study the branding strategies of the airlines in the various markets in which they compete. These strategies are possible thanks to the use of third-party or subsidiary airlines. From a strategic perspective it could be interesting to investigate the focal airline's potential loss of operating autonomy in a tightly-knit alliance or, adopting a resource-dependence perspective, the question of whether there are any "core resources" that an airline should protect, in the sense of keeping those routes/markets within its own portfolio (Kleymann, 2005, makes some suggestions around the topic of 'standalone capability').

In addition to its theoretical contributions, this study has practical implications. First, identifying strategic groups makes it easier for companies to determine their position within the industry and the competitive movements that are underway, both from the perspective of their own routes and in partnership with other airlines. Identifying airlines' strategies and their evolution provides relevant information for professionals who make decisions regarding the future of their companies. Second, this study highlights the importance of codeshare agreements for an airline to overcome numerous mobility barriers (Mehra and Floyd, 1998) currently present in the industry. Third, the results demonstrate that the growth of alliances, both global alliances and codeshares, creates a dichotomy for airlines. This growth in alliances suggests a greater degree of openness between airlines but also causes polarization in the formation of alliances as a result because membership in a specific constellation restricts an airline's potential partners although this has some nuances. Therefore, entering into a global alliance is an extremely important strategic decision for an airline. The option to remain independent requires an operational strategy consistent with that choice and the resources available to the airline. Finally, the results of this study demonstrate that some of the fastest-growing airlines in recent years have been able to define alternative and novel development strategies compared to those pursued in the industry because of the support from their governments. Ultimately, these strategies help airlines achieve dominant positions as industry players.

This is an exploratory study that was conducted with the sole purpose of presenting a strategic overview of the sector; however, the sampling of airlines is linked to one of the primary weaknesses of the study. It is possible that other strategies could be identified within the industry, although both the selection of the sample and the consistency of the results appear to indicate that any new strategy would merely be a modification of the ones identified in this study. Another limitation involves the data used in the analysis because only the routes offered by the airlines are considered, with no information on flight frequency. However, because this is an exploratory study, we consider that this choice, although a limitation, is appropriate because the number of routes indicates the size and evolution of the airlines. However, future studies more focused on specific topics should avoid this omission because a joint analysis of routes and frequencies would offer an enhanced understanding of airlines' operational strategies and their associative behaviors.

Finally, we would point out that the present study is largely based on quantitative variables, due to the type of analysis carried out. In spite of this, we have tried to confirm the consistency and reliability of the companies' strategies by analyzing qualitative variables, to allow us to understand and interpret the results obtained.

Acknowledgments

References

Adler N. and Hanany E., Regulating inter-firm agreements: the case of airline codesharing in parallel networks, *Transp. Res. Part B Methodol.* **84**, 2016, 31–54, https://doi.org/10.1016/j.trb.2015.12.002.

Albers S., Heuermann C. and Koch B., Internationalization strategies of EU and Asia-Pacific low fare airlines, *J. Air Transp. Manag.* **16**, 2010, 244–250, https://doi.org/10.1016/j.jairtraman.2009.12.001.

Alderighi M. and Gaggero A.A., The effects of global alliances on international flight frequencies: some evidence from Italy, *J. Air Transp. Manag.* **39**, 2014, 30–33, https://doi.org/10.1016/j.jairtraman.2014.03.002.

Alderighi M., Gaggero A.A. and Piga C.A., The effect of code-share agreements on the temporal profile of airline fares, *Transp. Res. Part A Policy Pract.* **79**, 2015, 42–54, https://doi.org/10.1016/j.tra.2015.03.023.

Anwar S.T., Super-connectors: a new model of internationalization from the MENA region, *Thunderbird Int. Bus. Rev.* **~~49~~57**, 20~~07~~15, ~~630~~163–~~631~~180, ~~https://doi.org/10.1002/tie~~. (The doi link does not work. Also, the link that appears in the article does not work.)

Barros C.P., Liang, Bin Q. and Peypoch N., The technical efficiency of US Airlines, *Transp. Res. Part A Policy Pract.* **50**, 2013, 139–148, https://doi.org/10.1016/j.tra.2013.01.019.

Bailey E.E. and Williams J.R., Sources of economic rent in the deregulated airline industry, *J. Law Econ.* **31**, 1988, 173, https://doi.org/10.1086/467153.

Barley S.R. and Tolbert P.S., Institutionalization and structuration: studying the links between action and institution, *Organ. Stud.* **18**, 1997, 93–117, https://doi.org/10.1177/017084069701800106.

Brown S.C., Stevens R. a., Troiano P.F. and Schneider M.K., Exploring complex phenomena: grounded theory in student affairs research, *J. Coll. Stud. Dev.* **43**, 2002, 173–183.

Buckley P.J. and Prashantham S., Global interfirm networks: the division of entrepreneurial labor between MNEs and SMEs, *Acad. Manag. Perspect.* **30**, 2016, 40–58, https://doi.org/10.5465/amp.2013.0144.

Casanueva C., Gallego Á., Castro I. and Sancho M., Airline alliances: mobilizing network resources, *Tour. Manag.* **44**, 2014, 88–98 https://doi.org/10.1016/j.tourman.2014.02.011.

Charmaz K., Constructing Grounded Theory: a Practical Guide through Qualitative Analysis, 2006, SAGE Publications Ltd https://doi.org/10.1016/j.lisr.2007.11.003.

Corbo L. and Shi W.S., Origins and evolution of alliance constellations, In: Das T.K., (Ed), *Research in Strategic Alliances Series: Managing Multipartner Strategic Alliances,* 2015, Information Age Publishing; USA, 89–114.

Cosmas A., Love R., Rajiwade S. and Linz M., Market clustering and performance of U.S. OD markets, *J. Air Transp. Manag.* **28**, 2013, 20–25, https://doi.org/10.1016/j.jairtraman.2012.12.006.

Das T.K. and Teng B.S., Alliance constellations: a social exchange perspective, *Acad. Manag. Rev.* **27**, 2002, 445–456, https://doi.org/10.2307/4134389.

de Man A.-P., Roijakkers N. and de Graauw H., Managing dynamics through robust alliance governance structures: the case of KLM and Northwest airlines, *Eur. Manag. J.* **28**, 2010, 171–181.

Douglas I. and Tan D., Global airline alliances and profitability: a difference-in-difference analysis, *Transp. Res. Part A Policy Pract.* 2017, https://doi.org/10.1016/j.tra.2017.05.024.

Etihad, Corporate Website, 2016, Retrieved from: http://www.etihad.com/en-gb/about-us/etihad-airways-partners/.

Evans N., Collaborative strategy: an analysis of the changing world of international airline alliances, *Tour. Manag.* **22**, 2001, 229–243.

Fan T., Vigeant-Langlois L., Geissler C., Bosler B. and Wilmking J., Evolution of global airline strategic alliance and consolidation in the twenty-first century, *J. Air Transp. Manag.* **7**, 2001, 349–360.

Flight Airline Business, 2016. Retrieved from https://www.flightglobal.com/products/airline-business/.

Gaggero A.A. and Bartolini D., The determinants of airline alliances, *J. Transp. Econ. Policy* **46**, 2012, 399–414.

Gillen D., Hasheminia H. and Jiang C., Strategic considerations behind the network-regional airline tie ups - a theoretical and empirical study, *Transp. Res. Part B Methodol.* **72**, 2015, 93–111, https://doi.org/10.1016/j.trb.2014.09.001.

Gimeno J., Competition within and between networks: the contingent effect of competitive embeddedness on alliance formation, *Acad. Manag. J.* **47**, 2004, 820–842, https://doi.org/10.2307/20159625.

Gimeno J. and Woo C.Y., Hypercompetition in a multimarket environment: the role of strategic similarity and multimarket contact in competitive de-escalation, *Organ. Sci.* **7**, 1996, 322–341, https://doi.org/10.1287/orsc.7.3.322.

Goetz C.F. and Shapiro A.H., Strategic alliance as a response to the threat of entry: evidence from airline codesharing, *Int. J. Ind. Organ* **30**, 2012, 735–747, https://doi.org/10.1016/j.ijindorg.2012.08.003.

Gomes-Casseres B., Constellation strategy: managing alliance groups, *Ivey Bus. J.* 2003, 1–7.

Gomes-Casseres B., Group versus group: how alliance networks compete, *Harv. Bus. Rev.* **72**, 1994, 62–74.

Gudmundsson S.V., Lechner C. and van Kranenburg H., Multilevel embeddedness in multilateral alliances: a conceptual framework, In: Das T.K., (Ed), *Research in Strategic Alliances Series: Interpartner Dynamics in Strategic Alliances,* 2012, Information Age Publishing; USA, 131–147.

Hagen B., Zucchella A., Cerchiello P. and De Giovanni N., International strategy and performance-Clustering strategic types of SMEs, *Int. Bus. Rev.* **21**, 2012, 369–382, https://doi.org/10.1016/j.ibusrev.2011.04.002.

Hansen M., Airline competition in a hub-dominated environment: an application of noncooperative game theory, *Transp. Res. Part B* **24**, 1990, 27–43.

Hoffmann W.H., How to manage a portfolio of alliances, *Long. Range Plann* **38**, 2005, 121–143, https://doi.org/10.1016/j.Jrp.2005.03.001.

Huettinger M., What determines the business activities in the airline industry? A theoretical framework, *Balt. J. Manag.* **9**, 2014, 71–90, https://doi.org/10.1108/BJM-04-2013-0053.

Hunt M.S., Competition in the Major Home Appliance Industry: 1960-1970, Unpublished doctoral dissertation1972, Harvard University.

IATA, Passenger Forecast - Global Report, 2016.

Kale P., Dyer J.H. and Singh H., Alliance capability, stock market response, and long term alliance success: the role of the alliance function, *Strateg. Manag. J.* **23**, 2002, 747–767, https://doi.org/10.1002/smj.248.

Ketchen D. and Shook C., The application of cluster analysis in strategic management research: an analysis and critique, *Strateg. Manag. J.* **17**, 1996, 441–458.

Kleymann B., The dynamics of multilateral allying: a process perspective on airline alliances, *J. Air Transp. Manag.* **11**, 2005, 135–147, https://doi.org/10.1016/j.jairtraman.2004.08.002.

Kleymann B. and Seristö H., Levels of airline alliance membership: balancing risks and benefits, *J. Air Transp. Manag.* **7**, 2001, 303–310.

Kling J.A. and Smith K.A., Identifying strategic groups in the U.S. Airline industry: an application of the porter model, *Transp. J.* **35**, 1995, 26–34.

Lavie D., Alliance portfolios and firm performance: a study of value creation and appropriation in the U.S. software industry, *Strateg. Manag. J.* **28**, 2007, 1187–1212, https://doi.org/10.1002/smj.

Lazzarini S.G., The impact of membership in competing alliance constellations: evidence on the operational performance of global airlines, *Strateg. Manag. J.* **28**, 2007, 345–367, https://doi.org/10.1002/smj.

Lin M.H., Airline alliances and entry deterrence, *Transp. Res. Part E Logist. Transp. Rev.* **44**, 2008, 637–652, https://doi.org/10.1016/j.tre.2007.05.003.

Lincoln Y.S. and Guba E.G., Naturalistic Inquiry (Vol. 75), 1985, Sage.

Locke K., Grounded Theory in Management Research, 2001, Sage Publications.

Lufthansa Group, 2017. Retrieved from https://www.lufthansagroup.com/en/company/alliances/joint-ventures.html.

Magalhães L., Reis V. and Macário R., Can flexibility make the difference to an airport's productivity? An assessment using cluster analysis, *J. Air Transp. Manag.* **47**, 2015, 90–101, https://doi.org/10.1016/j.jairtraman.2015.05.003.

Markus M.L., Manville B. and Agres C.E., What makes a virtual organization work?, *MIT Sloan Manag. Rev.* **42**, 2000, 13–26.

McGee J. and Thomas H., Strategic groups: theory, research and taxonomy, *Strateg. Manag. J.* **7**, 1986, 141–160, https://doi.org/10.1002/smj.4250070204.

Mehra A. and Floyd S.W., Product market heterogeneity, resource imitability and sfrategic group formation, *J. Manage* **24**, 1998, 511–531.

Min H. and Joo S.-J., A comparative performance analysis of airline strategic alliances using data envelopment analysis, *J. Air Transp. Manag.* **52**, 2016, 99–110.

Morrison A.J. and Roth K., A taxonomy of business-level strategies in global industries, *Strateg. Manag. J.* **13**, 1992, 399–417, https://doi.org/10.1002/smj.4250130602.

Murthi B.P.S., Rasheed A.A. and Goll I., An empirical analysis of strategic groups in the airline industry using latent class regressions, *Manag. Decis. Econ.* **34**, 2013, 59–73.

OAG analyzer, 2016. Retrieved from www.oag.com.

Oum T.H., Yu C. and Zhang A., Global airline alliances: international regulatory issues, *J. Air Transp. Manag.* **7**, 2001, 57-62.

Pels E., Airline network competition: full-service airlines, low-cost airlines and long-haul markets, *Res. Transp. Econ.* **24**, 2008, 68–74, https://doi.org/10.1016/j.retrec.2009.01.009.

Pfeffer J. and Salancik G., The External Control of Organizations, 1978, Harper & Row; New York.

Porter M.E., Competitive Strategy: Techniques for Analyzing Industries and Companies, New York, 1980https://doi.org/10.1002/smj.4250020110.

Redpath N., O'Connell J.F. and Warnock-Smith D., The strategic impact of airline group diversification: the cases of Emirates and Lufthansa, *J. Air Transp. Manag.* **64**, 2017, 121–138, https://doi.org/10.1016/j.jairtraman.2016.08.009.

Reger R. and Huff A., Strategic groups: a cognitive perspective, *Strateg. Manag. J.* **14**, 1993, 103–123, https://doi.org/10.2307/2486539.

Smith, K. G., Grimm, C. M., Wally, S., and Young, G., Strategic groups and rivalrous firm behavior: Towards a reconciliation. *Strateg. Manag. J*, **18**, 1997, 149-157. (I couldn't to separate the reference "Smith et al, 1997" from the following one.)Strauss A. and Corbin J., Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory, second ed., 1998, SAGE Publications, Inc.

U-FLY Alliance, Corporate Website, 2016, Retrieved from: http://www.uflyalliance.com/about.

Value Alliance, Corporate Website, 2016, Retrieved from: http://www.valuealliance.com/#!about/c1enr.

Vanilla Alliance, 2015. Retrieved from: http://www.ch-aviation.com/portal/news/40422-vanilla-alliance-agreements-signed-in-antananarivo.

Wan X., Zou L. and Dresner M., Assessing the price effects of airline alliances on parallel routes, *Transp. Res. Part E Logist. Transp. Rev.* **45**, 2009, 627–641, https://doi.org/10.1016/j.tre.2009.01.003.

Wang S.W., Do global airline alliances influence the passenger's purchase decision?, *J. Air Transp. Manag.* **37**, 2014, 53-59, https://doi.org/10.1016/j.jairtraman.2014.02.003.

Wassmer U., Alliance portfolios: a review and research agenda, *J. Manage* **36**, 2010, 141–171, https://doi.org/10.1177/0149206308328484.

Wassmer U. and Dussauge P., Network resource stocks and flows: how do alliance portfolios affect the value of new alliance formations?, *Strateg. Manag. J.* **33**, 2012, 871–883, https://doi.org/10.1002/smj.

Wassmer U. and Meschi P.X., The effect of code-sharing alliance formations and terminations on firm value: the role of co-specialization and scope extension, *J. Air Transp. Manag.* **17**, 2011, 305–308, https://doi.org/10.1016/j.jairtraman.2011.03.005.

Weber M. and Dinwoodie J., Fifth freedoms and airline alliances. The role of fifth freedom traffic in an understanding of airline alliances, *J. Air Transp. Manag.* **6**, 2000, 51–60.

Wen C.H. and Chen W.Y., Using multiple correspondence cluster analysis to map the competitive position of airlines, *J. Air Transp. Manag.* **17**, 2011, 302–304, https://doi.org/10.1016/j.jairtraman.2011.03.006.

Wu C.L. and Lee A., The impact of airline alliance terminal co-location on airport operations and terminal development, *J. Air Transp. Manag.* **36**, 2014, 69–77, https://doi.org/10.1016/j.jairtraman.2013.12.006.

Footnotes

[1]The term "global alliances", refers to multilateral agreements with a governing superstructure, such as Oneworld, SkyTeam, etc.

[2]Aeroflot, Air Astana, Air Canada, Air China, Air Europa, Air France, Alaska Airlines, Alitalia, All Nippon, American Airlines, Austrian Airlines, British Airways, China Southern, Delta Airlines, Emirates, Etihad Airways, Iberia, Japan Airlines, JetBlue, KLM, Korean Air, Lufthansa, Qantas, Qatar Airways, Royal Jordanian, Scandinavian Airlines, Tap Portugal, and United Airlines.

[3]This variable measures the percentage of routes that do not originate or land in the airline's country of origin. Generally, most routes originate or land in the airline's country of origin; this variable helps us evaluate the diversification of airlines.

[4]The OAG database divides the 239 countries and territories of the world into 18 macro areas, although one of these areas only includes Antarctica.

[5]Generally, affiliated airlines are regional airlines that are owned by or have a strong business relationship with a member airline.

[6]The percentages of parallel codeshare agreements are not provided in the table; however, these percentages are calculated as 100% minus the percentage of complementary codeshare agreements.

[7]We would like to thank an anonymous reviewer for suggesting this line of research.

Highlights

- Operational strategies and their evolution in the airline sector are analyzed.

- Increasing importance of global alliances for industry competition.

- Airlines' associative strategies complement their operational strategies.

- Associative activities pose new challenges for managers, such as the management of alliance portfolios.

- Airline strategies lead to a process of airline virtualization.

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