



Selection of strategic cargo alliance by airlines



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ABSTRACT

This study explored how an airline selects a strategic cargo alliance for membership. Through a review of the related literature and from expert interviews, dimensions and criteria for selecting a strategic cargo alliance were first collected and then screened using the Fuzzy Delphi Method (FDM). Weights of the selected dimensions and criteria were then calculated using the Fuzzy Analytic Hierarchy Process (FAHP). Sorted by weight, the dimensions in descending order are business benefits, resource complementarities, cost effectiveness and brand image. The three criteria considered most important by airlines are 'enhancing flight route and frequency,' 'increasing revenue,' and 'improving load factor'. Finally, a case study on how the Taiwan-based China Airlines (CAL) selected its strategic cargo alliance is presented to provide airlines with a useful reference for future alliance selection.

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1. Introduction

Strategic alliances between airlines are now common in the airline industry. They are agreements between airlines to combine efforts and resources for the pursuit of shared business objectives while remaining separate entities. An important precondition for assessing efficiencies achieved by alliances is understanding the strategic business motivations for entering into them and their key economic effects. Entering an alliance as a strategy allows airlines to expand their networks, attract more passengers, and take advantage of product complementarities while creating cost reduction opportunities in passenger service-related areas, including code sharing, sharing of baggage handling facilities and staff, airport lounges, check-in and boarding desks, and flight attendant swaps (Zhang et al., 2004). Market developments in international air transportation have led to the dominance of three global airline alliances: Star, SkyTeam and Oneworld.

With rapid development in technology and frequent appearance of new electronic products on the market, the past decade has witnessed tremendous growth in international air cargo transport through closely connected global supply chains. According to the Boeing World Air Cargo Forecast (Boeing, 2012), global air cargo traffic will expand at an average annual growth rate of 5.2% over the

next two decades. Factors like fluctuations in global oil prices and the entry of budget airlines increasingly fuel competition in the airline market. To enhance services and increase market shares, airlines are seeking closer cooperation. Driven by international key players, many airlines have embraced strategic alliances to secure greater competitiveness.

The last 10–15 years have seen a substantial increase in the size of airline alliances in international air transportation. An increasing number of airlines have joined one of three global airline alliances—Star, SkyTeam, and Oneworld, which were founded between 1997 and 2000. Over the period of 2000–2014, there has been an increase in the number of member airlines for these alliances, reaching 26 for Star, 20 for SkyTeam, and 15 for Oneworld.¹ Data related to these three alliances are outlined in Table 1. Models or areas of cooperation in these airline alliances include code sharing, rates for passengers with the same alliance, cross-carrier passenger check-in services for smooth connections, shared member rewards programs, sharing of check-in desks and lounges at airports, cooperation on operations and services at airports, coordination of flight schedules, co-marketing, shared revenues, cargo cooperation, and joint procurement.

Currently, there are two major global cargo alliances, namely SkyTeam Cargo and WOW Alliance. SkyTeam Cargo is a global cargo airline alliance founded in September, 2009, with members

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¹ Source: Websites of Star Alliance (www.staralliance.com), SkyTeam (www.skyteam.com) and Oneworld (zh.oneworld.com).

Table 1
Global airline alliances.

Feature	Star alliance	SkyTeam	Oneworld
Founding year	1997	2000	1999
Member airlines	26	20	15
Countries served	193	178	152
Destinations	1269	1064	992
Passengers (million)	637.62	588.00	506.98
Daily departures	18,043	15,723	14,011
Fleet size	4338	2963	3324
Employees	439,232	459,781	391,968

Sources: Star Alliance (2014), SkyTeam (2014), and Oneworld (2014).

including Aeromexico Cargo, Air France-KLM Cargo, Delta Cargo, and Korean Air Cargo. With more airlines joining, it now has 10 member airlines and is the world's largest of its kind, operating over 1000 daily flights across more than 130 countries. WOW Alliance was founded in 2000 with members including SAS Cargo Group, Lufthansa Cargo, and Singapore Airlines Cargo. Japan Airlines Cargo subsequently joined in 2002. WOW Alliance focuses on providing a wide-ranging network and coordinated programs for customers through the seamless delivery of three WOW products: General Cargo, Premium Express, and Dangerous Goods. WOW boasts that its three main cornerstones — seamless, safe, and controlled — enable the alliance to ensure prompt delivery of goods to destinations through seamless services, guaranteed goods safety during shipment with a fully connected system, and overall control of delivery with a common tracking system. In this way, customers can always receive updates on the status of their goods. However, with the withdrawal of Lufthansa and JAL one after the other, the alliance now has only two remaining members: Singapore Airlines Cargo and SAS Cargo Group.

A good strategic partnership can further enhance the quality of connecting services between partners through adjustment of arrivals and departures, which can minimize waiting time between flights while providing sufficient time for connections. Ineffective strategic alliances, on the other hand, can lead to loss of core competencies and capabilities, unexpected risk exposure, and even business failures. Therefore, issues to consider when selecting an alliance, as well as assessing and identifying the right alliance to join are important issues for airlines in their future development.

The Delphi Method has been widely applied for the selection of performance indicators in many fields. It requires multiple investigations to achieve consistency among expert opinions, thus necessitating modifications of opinions so that the mean value of all expert opinions can be met. On the other hand, the Fuzzy Delphi Method (FDM), proposed by Ishikawa et al. (1993), combines the traditional Delphi technique with fuzzy set theory. It requires only a small number of samples to produce objective and reasonable results. Hence, not only does FDM save time and costs required for collecting expert opinions, it also sufficiently expresses expert opinions without distortion (Hsu and Yang, 2000; Kuo and Chen, 2008). When selecting strategic cargo alliance, airlines have to take into account many considerations. Nevertheless, past studies have not come up with a comprehensive list of criteria for systematic evaluation. To overcome such deficiency, this study adopted the FDM to derive the criteria and screen them according to their importance.

Although the Analytical Hierarchy Process (AHP) is commonly preferred for solving multi-criteria decision-making problems in real situations, it is insufficient to explain uncertain conditions, especially in the pairwise comparison stage. Most human judgments cannot be represented as exact numbers. Since some of the evaluation criteria are subjective and qualitative in nature, it is very

difficult for a decision-maker to express preferences using exact numerical values and to provide exact pairwise comparison judgments (Chan and Kumar, 2007). Fuzzy evaluations are very useful in the decision-making process and can overcome the above-mentioned drawback of AHP. Hence, the Fuzzy Analytic Hierarchy Process (FAHP) was chosen owing to its use of linguistic variables and triangular fuzzy numbers in a pairwise comparison scale for deriving priority weights for different selection attributes and sub-attributes, which were subsequently combined to determine priority weights of alternative strategic partners.

The selection of a strategic cargo alliance by airlines is a complex decision problem. By using the FAHP, such complex problems can be decomposed into several sub-problems of different hierarchical levels, where each level represents a set of criteria relative to each sub-problem. The FAHP is a multicriteria method of analysis that involves an additive weighting process, in which several relevant criteria are represented by their relative importance. In view of the above, this study utilizes FAHP to evaluate the preference weights of criteria for cargo alliance selection.

This study first provides an overview of the current development of strategic airline alliances, followed by a review of past research on the topic and a summary of dimensions and criteria adopted by airlines in selecting a cargo alliance. Opinions collected from a group of experts and specialists in the first-round expert survey were screened using the FDM to identify dimensions and criteria for cargo alliance selection. Next, priority weights of the selected dimensions and criteria were calculated using the FAHP according to the results from the second-round expert survey, which may provide airlines with useful references for their selection of a cargo alliance. Finally, a case study of Taiwan's China Airlines (CAL) was conducted to assess how the airline made its decision on whether to join the SkyTeam Cargo or WOW Alliance.

The remainder of this paper is organized as follows. Section 2 reviews studies on strategic alliances. Section 3 introduces the methodology of FDM and FAHP. Section 4 presents results and discussion. Section 5 details an empirical analysis of how China Airlines selected its cargo alliance. The final section presents the conclusions of this study and offers suggestions for future research.

2. Literature review

The formation of strategic alliances has become widespread across many industries. A strategic alliance is defined as any voluntary partnership that represents neither a simple transactional relationship nor a significant structural merging of the entities. Complementary alliances refer to cases in which two airlines link their existing networks and build a new network providing interline services to their passengers, whereas parallel alliances are cases of collaboration between two firms competing on the same route. Complementary alliances allow carriers to extend their networks since they can rely on partners to serve destinations where they lack route freedom. In order to reduce some of the inconveniences of interline trips, complementary alliances attempt to offer passengers seamless service by coordinating flight schedules, ensuring gate proximity, and merging frequent flyer programs (Flores-Fillol and Moner-Colonques, 2007). Jiang et al. (2015) proposed a game theoretic model for analyzing the partnership formation for two competing local airlines and two global airline alliances. They found that multiple equilibrium outcomes may exist if these four players are involved in a simultaneous game.

The stated goals of such arrangements are typically to reduce transaction costs, share risks, integrate networks, or otherwise mutually add value or reduce costs (Hennart, 1988; Parkhe, 1993). In recent years, airlines have seen significant cost reductions driven

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