



Capturing and Delivering Competitive Advantage in the Japan to Europe and Europe to Japan Air Cargo Markets: The Case of the ANA Cargo and Lufthansa Cargo A.G. Strategic Joint Venture

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Abstract

This paper presents a case study of the ANA Cargo and Lufthansa Cargo strategic joint venture, the global air cargo industry's first strategic joint venture between two of the world's major air cargo-carrying airlines. The data gathered for the study was examined by document analysis. The strategic analysis of the joint venture was underpinned by the use of Porter's Five Forces Model. The study found that the joint venture has provided synergistic benefits to both partners and has allowed the partners to access new markets and to participate in the evolution of the air cargo industry. The joint venture has also enabled both joint venture partners to enhance their competitive position in the Europe to Japan and Japan to Europe air cargo markets through strengthened service offerings and has provided the partners with increased cargo capacities, a larger route network, and greater frequencies within their own route networks. A limitation of the study was that ANA Cargo and Lufthansa Cargo revenues, or freight traffic data was not available. It was, therefore, not possible to analyse the business performance of the joint venture.

Keywords

air cargo; ANA Cargo; case study; competitive advantage; joint venture; Lufthansa Cargo, Porter's Five Forces Model

1. Introduction

The requirement to serve firms with truly global supply chain requirements and distributive infrastructure has helped stimulate the formation of strategic joint ventures within the global air cargo industry [1, 2, 3]. This trend has become more common in recent times due to the growing adoption of logistics and supply chain management by businesses that are located all around the world. Furthermore, this trend has resulted in greater integration and cooperation between actors participating in air cargo supply chains [4]. Air cargo-carrying airlines have started to cooperate through common product/service options, sales and compatible information systems, and through the development of global route networks. Such strategic arrangements are partly intended to combat the challenges posed by regulation in the industry and to compete against the rapid growth of the integrated carriers, such as DHL Express, FedEx and United Parcel Service (UPS), who have captured large market shares in recent times [5]. Most importantly, the strategic joint venture arrangements in the global air cargo industry enable the combination of shipment volumes by the partners and provide them with the ability to offer consistent time scheduled flights to satisfy customer supply chain requirements. The alliances also enable joint profit optimization [6]. In addition, Grönlund and Skoog [7] have observed that no single airline could cover all air cargo customers' requirements of its own accord, cooperation and partnerships, therefore assume great importance for air cargo-carrying airlines.

Despite their growing significance, there are few published papers that have examined strategic joint ventures in the global air cargo industry. The objective of this paper is to examine the development and the progress to date of the strategic joint venture between All Nippon Airways (ANA), Japan's largest airline, and Lufthansa Cargo AG, one of the world's leading air cargo carriers, on routes between Japan and Europe and Europe and Japan. This is the first worldwide cargo joint venture of its kind [8]. An additional aim of the paper is to examine how the joint venture arrangements has enhanced ANA Cargo (the air cargo division of All Nippon Airways) and Lufthansa Cargo AG competitive position in the Japan to Europe and Europe to Japan air cargo markets. A further motivation for selecting the All Nippon Airways (ANA Cargo) and Lufthansa Cargo strategic joint air cargo venture was the readily availability of the relevant documentation in the public domain.

The remainder of the paper is structured as follows: Section 2 sets the contextual setting of the study and presents a brief overview of the role of and the key success factors of joint ventures, and Porter's Five Forces Model. The research method underpinning the study follows in Section 3. The case study is presented in Section 4. Section 5 presents the study's findings.

2. Background

2.1 Joint venture partnerships

According to de Almada [9] (p. 145), joint ventures "are an association of companies, whether permanent or not, intending to explore or conduct a certain business, where each part retains its legal personality". Joint ventures are often separate entities that are owned jointly by two or more firms. JVs normally include a partial combination of the partner's resources [10].

2.2 Rationale for forming joint venture partnerships

According to Baxter and Srisaeng [11], "many reasons have been cited for the extensive use of joint venture partnerships". The key rationales for forming joint ventures include the reduction in risk for the partners, joint sharing of costs, synergistic benefits, access to an enlarged customer base, access to new markets, an increase in market share, and capturing a competitive advantage (Table ??).

2.3 Joint venture success factors

According to the Association of Strategic Alliance Professionals (cited in Chang [20]), there are seven critical success factors for joint ventures:

- Well-defined shared objectives;
- An appropriate scope for the partnership;
- Support of senior management from both the JV partners;
- Devoted champions on both sides of the joint venture partnership;
- Strong relationship management at all levels;
- Cultural compatibility / or respect for diversity; and
- A high level of trust [20].

Other key success factors for joint ventures include the selection of the partner(s). This is a critical issue. There must also be the correct "fit" for the joint venture. For this "fit", the partners should have complementary technical skills and resources, compatible cultures, and performance criteria [19]. Furthermore, both strategic and operational synergies must exist between the partners. As mentioned by Baxter and Srisaeng [11], the expectations of the results of the joint venture should be reasonable.

As the joint venture matures the parent firms must be prepared to address new risks. Also, the partners must be prepared to change the structure of the organization in response to changing operating conditions [21]. A further factor is a favorable past association with the other partner(s) [22, 23, 24].

Table 1. The key factors and rationale for the formation of joint ventures

Factor	Rationale
Reduction in risk [11, 12]	The reduction in risk comes from the combination of resources and expertise of the two firms which reduces the risk to both parties. In addition, the risks can be equally shared between the partners [13]
Joint sharing of costs [14]	JVs enable cost savings through the rationalization of fixed costs or through cost sharing with the joint venture partner(s) capital investment programs [15]. Investment capital can be easier to arrange as financial institutions evaluate the strength of two or more businesses instead of one [16].
Synergistic benefits	The joint use of complementary resources, competencies, and skills possessed by the partners can create synergistic effects [17].
Enlarged customer base	The formation of a JV enables the potential expansion of the joint venture partners customer base as the joint venture can enable a partner to expand the size of its customer base by utilizing its partner's strength in different geographic markets [17].
Access to new markets	Joint ventures can also assist companies in accessing new markets [17, 14]
Increase in market share	Joint ventures can enable the partners to increase their market share [11].
Capturing a competitive advantage	A joint venture may also enable the partners to capture competitive advantage [18].
Other rationale for forming a joint venture	Joint ventures also enable the partners to enhance their competitive position in markets; to diversify company operations; and participate in the industry's evolution [19].

2.4 Competitive advantage: a background note

According to Ma [25] (p. 259), “competitive advantage arises from the differential among firms along any dimension of firm attributes and characteristics that allows one firm to better create customer value than do others”. Competitive advantages are conditions that enable a firm or country to produce a good or service of equal value at a lower price or in a more desirable fashion. These conditions enable the productive entity to generate more sales or superior margins when compared to its competitors in the market. Competitive advantages are attributed to a variety of factors: cost structure, branding, the quality of product offerings, the firm's distribution network, intellectual property, and the level of customer provided. Competitive advantages produce greater value for a business and its shareholders because of certain strengths or conditions. The greater the sustainability of the competitive advantage, the more difficult it is for rivals to neutralize the advantage [26].

2.5 Joint ventures in the global air cargo industry

Joint ventures (JVs) are increasingly being embraced as a popular strategy in the global airline industry [27]. In the air cargo industry, examples of recent joint ventures include

the United Airlines (UAL) and Lufthansa Cargo joint venture agreement for extensive cargo cooperation on routes between the United States and Europe. This agreement was signed in April 2017 [28].

In September 2015, China Southern Airlines Cargo and Air France KLM Martinair Cargo (AFKLMP Cargo) signed a memorandum of understanding (MoU) which focused on strategic cooperation between the two parties. The airlines shared the ambition to link their respective route networks, thus enabling them to offer expanded cargo services to their respective customers. Under the terms of the MOU, the partners planned to expand their existing cooperation and build on mutual experience to connect the cargo business in China, Europe and beyond markets. This enabled them to continue to use their membership of the SkyTeam Cargo Alliance to its maximum advantage. The airlines also agreed to connect China Southern Airlines strong market position in China and Asia Pacific region with AFKLMP's strong position in Europe, Africa and the Trans-Atlantic area. This aim was to be achieved through the joint sharing of air cargo capacity and block space agreements (BSA), possibly by sharing capacity and space agreements. The partners also agreed to combine China Southern Airlines and AFKLMP Cargo networks (pas-

senger aircraft belly-hold space and freighter aircraft main deck product) in order to offer high frequency services via their respective hubs at Guangzhou, Shanghai, Paris Charles de Gaulle and Amsterdam Schiphol airports. Also, the partners planned to provide easy access to each other's air cargo capacity within the combined network cooperation as well as exploring each other's ground service facilities at home base hubs, which might support quick interline transfers (one roof concept). The strategic agreement also aimed to increase the postal mail and express business opportunities between China, Europe and the USA. It was envisaged that ultimately this could lead to an integrated commercial and operational cargo cooperation model (Joint Venture) between Europe and China [29].

On June 6, 2018, China-based Alibaba's logistics arm, Cainiao, signed a new partnership agreement whereby Dubai would be established as one of the six new hubs that Alibaba would establish around the world. The partnership agreement with Emirates SkyCargo, the air cargo division of Emirates Airline, will support Cainiao's e-commerce air cargo requirements [30]. On June 11, 2018, Turkish Cargo entered into an agreement with China-based ZTO Express and freight forwarder PAL Air to create a joint venture logistics service to serve the Chinese e-commerce market [31]. In September 2018, Turkish Cargo established a new cargo unit that would further underpin the joint venture's delivery services [30, 32].

In mid-December 2018, Brazil's postal service Correios and local passenger airline Azul received the anti-trust approval for the development of their joint venture to create a logistics platform to serve Brazil's e-commerce sector [33].

There are a variety of factors that are leading to the formation of joint ventures in the global air cargo:

- JVs provide the strategic means for international airlines to obtain access to new markets, whilst also being able to offer new services [34];
- JVs enable partners to overcome possible ownership restrictions;
- Joint ventures and alliance agreements also enable partner airlines to increase efficiency, reduce their costs by cutting back on fixed costs and eliminating redundant operations;
- Through the coordination aircraft and flight schedules, the partner airlines can reduce their fleet requirements or take greater advantage of the capacity that is offered. This is because operating a larger aircraft is more suitable for matching the aircraft size with the demand of a specific route; and
- Other JV benefits include the shared use of ground handling arrangements and airport facilities and staff, joint procurement of fuel and amenities, and cooperative advertising and promotional campaigns [11, 35].

2.6 Porter's Five Forces Model

Porter's Five Forces Model is a framework for analyzing the level of competition within an industry. The model also assists with the development of a firm's business strategy. Porter's model draws upon industrial organization (IO) economics to derive five forces that determine the competitive intensity, and thus, the attractiveness of an industry. Attractiveness in this context refers to the overall level of profitability in an industry [36]. Figure 1 presents a summary of Porter's Five Forces Model.

2.6.1 Risk of entry by potential competitors

According to Porter [38] (p. 13), "new entrants to an industry bring new capacity, the desire to gain market share, and often substantial resources". In some industries there are high barriers to market entry whereas in other industry's entry may be quite easy [39]. The six key barriers to market entry include economies of scale, product differentiation, capital requirements, cost disadvantages independent of size, access to distribution channels, and government policy [38] (pp.14-15).

2.6.2 Threat of substitutes

The presence of substitute products can lower the potential of an industry [38] as well profitability because they restrict price levels. Uçmak and Arslan [39] have noted that the threat of substitutes is dependent upon the buyers' willingness to substitute products, the relative price, and performance of the substitute product, and the switching costs to substitutes.

2.6.3 Bargaining power of buyers

Buyers may be individuals or firms that purchase the output of an industry [39]. A buyer group is considered as powerful when it is concentrated or when a buyer purchases in large quantities, products are standardized, it earns low profits, the industry's product is regarded as unimportant to the quality of the buyers' product or services, the product(s) produced by the industry do not save the buyer money, and buyers threaten to integrate backwards into an industry [38] (pp. 17-18).

2.6.4 Bargaining power of suppliers

Suppliers are firms that supply materials and other products into an industry. The cost of items purchased from a supplier may have a substantial impact on the firm's profitability. In cases where suppliers possess high bargaining power over a buyer, then in theory, the firm's industry is less attractive. The bargaining power of suppliers will be high when there are many buyers and few dominant suppliers, there are undifferentiated, highly valued products, suppliers pose a credible threat of integrating into the industry, and the industry is not a customer of the supplier group [38].

2.6.5 Intensity of rivalry among established firms

The rivalry of the firms competing in an existing industry can also influence industry profitability levels [38]. Incumbents competing in the industry use tactics including price competition, product introduction, advertising campaigns, and higher levels of customer service. The intensity of rivalry is greatest in the presence of the following conditions:

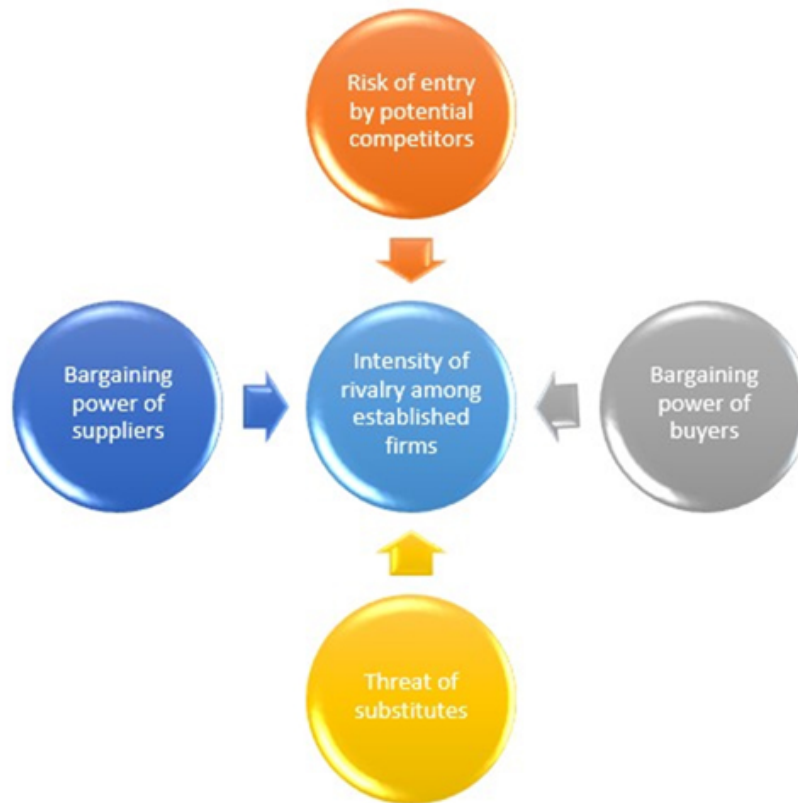


Figure 1. Porter's Five Forces Model. Source: adapted from [37] (p. 378).

- Numerous competitors or equally powerful competitors competing in the industry;
- Slow industry growth levels;
- There are high fixed but marginal costs;
- Lack of differentiation or switching costs;
- Capacity is typically introduced in large increments; and
- High market exit barriers [40] (p. 150).

3. Research Methodology

3.1 Research approach

The study used an instrumental case study research approach [41, 42, 43]. An instrumental case study is the study of a case, for example, a firm or firms, that provides insights into a specific issue, redraws generalizations, or builds theory [43]. The present study was designed around the established theory of Porter's Five Forces Model. The key issues examined in the present study were twofold. Firstly, the objective of this paper was to examine the development and the progress to date of the strategic joint venture between All Nippon Airways (ANA Cargo) and Lufthansa Cargo AG on routes between Japan and Europe and Europe to Japan. The second objective of

the study was to examine how the joint venture arrangements have enhanced ANA Cargo and Lufthansa Cargo AG competitive position in the Europe to Japan and Japan to Europe air cargo markets. Thus, as previously noted, ANA Cargo and Lufthansa Cargo are the case firms examined in the study. The research undertaken in the present study used a qualitative case study research design [44, 45, 46]. The goal of this approach is to expand and build theories rather than perform statistical analysis to test a study's specific hypothesis [47].

3.2 Data collection

Data for the study was obtained from a range of documents, ANA Cargo and Lufthansa Cargo AG company materials available on the internet, air cargo industry press articles, and media releases. These documents provided the sources of case evidence. The documents collected and examined in the study included the ANA Cargo and Lufthansa Cargo AG company brochures, media releases, and the airline's websites. An exhaustive source of the leading air transport and air cargo-related magazines was conducted (Table ??). A search of the SCOPUS and Google Scholar databases was also conducted.

The key words used in the database searches included "ANA Cargo and Lufthansa Cargo joint venture", "synergistic benefits of the ANA Cargo and Lufthansa Cargo", "joint venture partner airline route networks", "joint sharing of costs and revenues", "competitive position of ANA Cargo

Table 2. The study's key publications, publication period, and sources

Publication	Publication Period	Source
Air Cargo World	2014-2018	EBSCO Host
Air Transport World	2014-2018	Proquest Central
Airline Business	2014-2018	Proquest Central
Aviation Week & Space Technology	2014-2018	Aviation Week & Space Technology
Cargo Airports & Services	2014-2018	Cargo Airports & Services
Flight International	2014-2018	Proquest Central
Journal of Commerce	2014-2018	Journal of Commerce
Payload Asia	2014-2018	Payload Asia

and Lufthansa Cargo joint venture”, “airline joint venture route network development”, “competitive advantage captured and delivered by the ANA Cargo and Lufthansa Cargo joint venture”, “ANA Cargo and Lufthansa Cargo joint venture”, “rivalry in the global air cargo industry”, “buyer power in the global air cargo industry”, “supplier power in the global air cargo industry” and “threat of substitutes in the global air cargo industry”.

The study used secondary data. The study followed the three principles of data collection as suggested by Yin [48]: the use of multiple sources of case evidence, creation of a database on the subject and the establishment of a chain of evidence.

3.3 Data analysis process

The empirical data gathered for the case study was examined using document analysis [11, 49]. Document analysis is quite frequently used in case studies and focuses on the information and data from formal documents and company records that were collected in the study [50, 51]. The documents collected for the present study were examined by four key criteria: authenticity, credibility, representativeness and meaning [50, 52].

The document analysis process in the study was undertaken in six distinct phases which followed the recommendations of O’Leary [53].

- Phase 1: This phase involved planning the types and required documentation and their availability;
- Phase 2: The data collection involved gathering the documents and developing and implementing a scheme for the document management;
- Phase 3: Documents were reviewed to assess their authenticity, credibility and to identify any potential bias;
- Phase 4: The content of the collected documents was interrogated, and the key themes and issues were identified;
- Phase 5: This phase involved the reflection and refinement to identify and difficulties associated with the documents, reviewing sources, as well as exploring the documents content; and

- Phase 6: The analysis of the data was completed in this final phase of the study [54] (p. 179).

Following the guidance of Yin [48] all the collected documents were downloaded and stored in a case study database. The documents collected for the study were all in English. Each document was carefully read, and key themes were coded and recorded. This study also followed the recommendation of van Schoor [55] (p. 94), who has noted that in order to avoid bias in a study, documents from different sources should also be carefully analyzed in the study. In addition, triangulation was utilized to add discipline to the study. This was achieved by collecting documents from multiple sources. This approach helped verify the themes that were detected in the documents gathered in the study [56].

4. Results

4.1 A brief overview of ANA Cargo and Lufthansa Cargo A.G.

4.1.1 An overview of ANA Cargo

All Nippon Airways was formed in March 1958 through the merger of the Japan Helicopter & Airplane Transport Co Limited (JHATC), formed in late 1952, and Far East Airlines. Far East Airlines was a small domestic airline that commenced operations in May 1953 flying routes radiating from Osaka to points in southern Japan [57]. The new airline was called Japan Helicopter & Airplane Transport Co Limited (JHATC). JHATC changed its name to All Nippon Airways in December 1957, and in March 1958 merged with Kyokuto Airlines, a domestic airline that was formed in March 1953. All Nippon Airways grew rapidly and in November 1963 All Nippon Airways absorbed Fujita Airlines, following with Central Japan Airlines in 1965 and Nagasaki Airways during 1967 [58].

Today, All Nippon Airways (ANA) has become Japan’s largest airlines as well as being one of the most significant airlines in Asia, operating 78 international routes and 118 domestic routes. ANA offers a dual hub model which enables passengers to travel to Tokyo and connect through the two airports in the metropolitan Tokyo Narita International Airport and Haneda Airport, to various destinations throughout Japan. The airline also offers same day connections between various North American, Asian and Chinese cities [59]. ANA Cargo is All Nippon Airways air cargo division.

Figure 1 shows ANA Cargo total (domestic/international/freighter) enplaned air cargo tonnage and total annual revenue ton kilometres (RTKs) for the period 2008 to 2018. As can be observed in Figure 1, ANA Cargo annual enplaned tonnage and RTKs has grown consistently from 2008 to 2018, with a slight decline in air cargo demand being experienced in 2016 (Figure 2).

4.1.2 An overview of Lufthansa Cargo A.G.

In 1926, the newly-formed German airline Deutsche Luft Hansa carried its first air cargo consignment, thereby making it one of the world's earliest air cargo-carrying airlines. On 1 January 1995, Lufthansa Cargo Airlines, the airline's air cargo operation, was established as a totally autonomous public limited company, Lufthansa Cargo A.G. [60]. Lufthansa Cargo now ranks among the world's leading air cargo-carrying carriers. In the 2017 fiscal year, the airline transported around 1.6 million tonnes of freight and mail and sold 8.9 billion revenue tonne-kilometres (RTKs) [61]. Lufthansa Cargo total revenues in 2017 were 2,52 billion € [62]. At the time of the present study, the company employed around 4,500 people throughout the world. Lufthansa Cargo focuses on the airport-to-airport transportation business.

Lufthansa Cargo serves around 300 destinations in more than 100 countries with its own fleet of freighter aircraft, the belly capacities of passenger aircraft operated by Lufthansa, Austrian Airlines and Eurowings, and an extensive road feeder service (RFS) network [61]. Lufthansa Cargo operates a fleet of 12 Boeing MD11 and five Boeing 777-200LR freighter aircraft [62]. The bulk of the company's air cargo business is routed through Frankfurt Airport. Lufthansa Cargo is a wholly owned Lufthansa subsidiary of Deutsche Lufthansa AG. Other hubs include Munich, and Vienna Airports [63]. Following Lufthansa's acquisition of Austrian Airlines, Lufthansa Cargo and Austrian Airlines created a joint subsidiary in 2010 to market the whole air cargo capacity of both airlines in Austria and the expansion of Vienna Airport into a hub for Lufthansa Cargo [64].

Lufthansa Cargo A.G. has operational equity stakes in:

- Handling counts GmbH (100%)
- Jettainer GmbH (100%)
- Time:matters GmbH (100%)
- AeroLogic GmbH (50%)
- Lufthansa Cargo Servicios Logísticos de Mexico, S.A. DE C.V. (100%)
- Shenzhen Airport Int'l Cargo Terminal (ICCS) (50%)
- Airmail Center Frankfurt GmbH (40%)
- Shanghai, China-based Shanghai Pudong International Airport Cargo Terminal Co. Ltd. (PACTL) (29%) [62].

4.2 The evolution of the ANA Cargo and Lufthansa Cargo AG strategic joint venture

On 3 September 2014, All Nippon Airways (ANA) and Lufthansa Cargo AG announced the formation of a strategic joint venture on routes linking Japan with Europe and Europe to Japan. This was the first worldwide venture of its kind. ANA received anti-trust immunity, that is, approval for the joint venture from the Japanese Ministry of Land, Infrastructure and Transport after filing for approval in Spring 2014. In addition, the strategic joint venture between the two partners had been positively assessed by the external counsel for compliance with relevant European Union (EU) antitrust regulations. Following these regulatory approvals ANA Cargo and Lufthansa Cargo were permitted to jointly manage activities covered by the joint venture including route network planning, air cargo pricing, sales and handling on all routes between Japan and Europe and vice versa. The two airlines aimed to introduce the joint approach on air cargo consignments originating in Japan to Europe in the 2014/2015 Northern Winter flight schedule period and for shipments from Europe to Japan in mid-2015 [66, 67].

The initial shipment, comprising three pieces of general cargo booked by Lufthansa Cargo, was flown by ANA to London on 2 December 2014. A Lufthansa Cargo freighter aircraft carried the first consignment, weighing 1.8 metric tons, in the opposite direction from Frankfurt to Tokyo on the same day. The two partners commenced joint sales on flights from Japan to Europe at the beginning of December 2014 and planned to expand their cooperation in the other direction in mid-2015 [67]. The two airlines moved to a common handling agent at major stations, such as Tokyo's Narita International Airport and Nagoya in Japan and Dusseldorf and Frankfurt in Germany, so customers could use the services of both airlines at a single location [68, 69].

On 3 August 2015, ANA Cargo and Lufthansa Cargo expanded their strategic joint freight venture to include air cargo consignments from Europe to Japan. As a result, European-based customers had access to the two carriers route network which was made up of 90 weekly direct flights between Europe and Japan. In the first stage, customers located in Austria, France, Germany and the United Kingdom would participate in the partnership. In the subsequent stage, all other European countries would follow step-by-step. The Lufthansa Cargo and ANA flights connected Frankfurt, Munich, Düsseldorf, London Heathrow, Paris Charles de Gaulle and Vienna with Tokyo's Narita International Airport, Tokyo's Haneda Airport, Nagoya and Osaka's Kansai International Airport [69].

In December 2015, ANA Cargo and Lufthansa Cargo once again expanded their joint venture partnership by connecting further destinations in Japan. The first city added was Fukuoka on the main island of Kyushu and this was followed by Sapporo located on the island of Hokkaido. Commencing from December 2015, ANA flights from Tokyo Haneda Airport to Fukuoka Airport could be booked via both partners' air cargo booking systems [70].

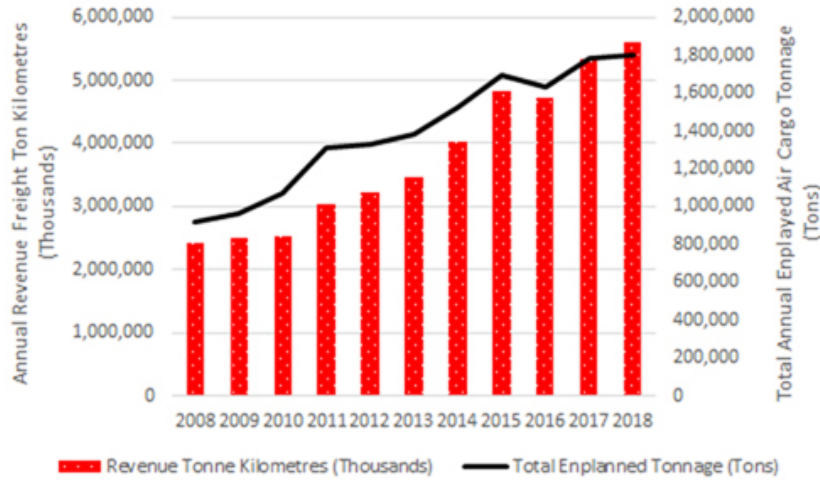


Figure 2. ANA Cargo total annual enplaned air cargo tonnage and revenue ton kilometres (RTKs) performed: 2008-2018. Source: Data derived from [49].

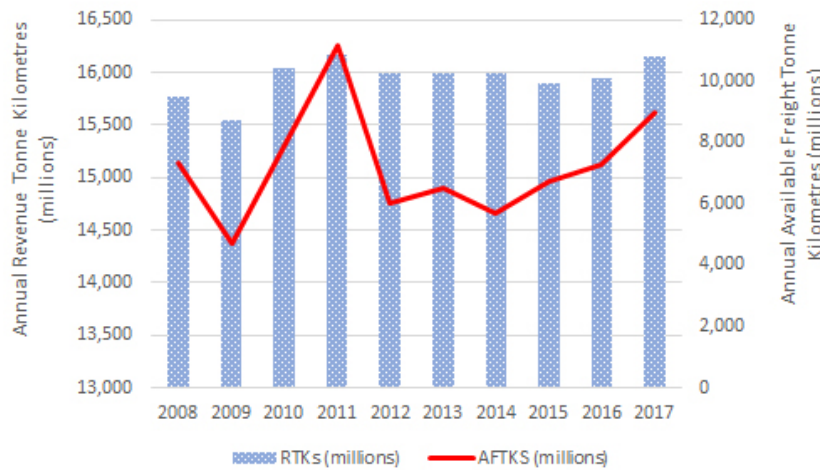


Figure 3. Lufthansa Cargo total annual available freight tonne kilometres and revenue ton kilometres performed: 2008-2017. Source: Data derived from [65].

On 12 July 2016, ANA Cargo and Lufthansa Cargo once again extended their joint venture arrangements to include all of Lufthansa Cargo’s European road feeder networks. At the time of this new initiative, ANA and Lufthansa Cargo were operating more than 90 weekly direct connections between Europe and four Japanese Airports, Nagoya, Osaka’s Kansai International Airport, Tokyo Haneda, and Tokyo Narita International Airport [71, 72, 73].

At the time of the present study, the joint venture partnership between ANA Cargo and Lufthansa Cargo remained in effect.

4.3 The application of Porter’s Five Forces Model to the ANA Cargo and Lufthansa Cargo strategic joint venture

The attractiveness of the global air cargo market is determined by five essential competitive forces. These are the rivalry amongst the incumbent competitors (central driving force),

threat of new entrants into the industry (limitations to market entry), bargaining power of buyers, bargaining power of suppliers, and the threat of substitute products or services [11, 74].

4.3.1 Intensity of rivalry among established firms in the global air cargo market

In the global air cargo industry, air cargo capacity is provided by combination passenger airlines, that is, airlines that carry passengers on the main deck and air cargo in their passenger aircraft lower lobe belly-holds and by dedicated all-cargo carriers, as well as the integrators, for example, FedEx and United Parcel Service (UPS) [75]. All-cargo services are operated by dedicated freighter airlines with all the available capacity dedicated to air cargo transportation [76]. The intensity of competition between the incumbents in the global air cargo is extremely high [11, 74]. This intensity in competition is due to a range of factors:

- There are many alike competitors actively competing in the Europe to Japan and Japan to Europe air markets. These airlines operate virtually the identical aircraft types and their business models are comparable at the global level [74]. Both the combination passenger airlines and the dedicated all-cargo airlines principally provide airport-to-airport services, and they source their traffic from air freight forwarders and global logistics providers [11]. ANA Cargo and Lufthansa Cargo confront strong competition from other major air cargo-carrying airlines, for example, Air France/KLM, British Airways, Cathay Pacific Airways, Emirates Airline, Qatar Airways as well as by the dedicated all-cargo carriers – AirBridge Cargo, Cargolux Airlines International, and Nippon Cargo Airlines, and the integrated carriers, for instance, FedEx and United Parcel Service (UPS).
- Air cargo capacity can only be introduced in rather large increments [74]. In the Europe to Japan and Japan to Europe air cargo markets, the addition of new passenger services with the latest, state-of-the-art passenger aircraft, such as the Airbus A350-900XWB or the Boeing 787-9 aircraft, results in a significant amount of additional cargo space due to the excellent air cargo-carrying abilities of the new modern passenger aircraft types. Furthermore, these markets are also served by dedicated all-cargo airlines, such as Cargolux Airlines International and Nippon Cargo Airlines (NCA). These airlines operate the Boeing 747-400 and the Boeing 747-8 freighter aircraft. These aircraft have a commercial payload of around 121.9 and 132.6 tonnes, respectively [77, 78]. ANA Cargo operates a fleet of Boeing B767-300 freighter aircraft on some domestic Japan sectors as well as to key markets located throughout Asia. Lufthansa Cargo operates a fleet of 12 Boeing MD11 and 5 Boeing B777-200LRF freighter aircraft, which has a commercial payload of 103.7 tons [79]. Thus, the addition of a new freighter service results in quite a large increment of air cargo payload being offered in the market. Consequently, the introduction of new passenger and freighter services in key markets often leads to greater air cargo capacities.
- The fixed assets that are required by firms competing in the global air cargo industry, such as aircraft, air cargo terminals, and office buildings, can usually only grow in large and fixed steps [74]. All Nippon Airways (ANA), ANA Cargo, Lufthansa and Lufthansa Cargo have been very prudent with their fleet deployment and carefully match the deployed aircraft types to market demand. In addition, both the combination and dedicated all-cargo airlines contract their cargo handling services to dedicated cargo handling companies [3] and, thus, adequate and efficient facilities are required to accommodate future growth and sustain the airline desired cargo service

quality standards. As previously noted, ANA Cargo and Lufthansa Cargo have moved to a common handling agent at major stations, such as Tokyo's Narita International Airport and Nagoya in Japan and Düsseldorf and Frankfurt in Germany.

- According to Oedekoven [74], “the barriers to market exit in the air cargo industry are high due to the specialized means of production (aircraft), high fixed costs associated with the retirement of aircraft, and other government barriers” [74]. Both ANA Cargo and Lufthansa Cargo are strategically committed to serving the air cargo market, so this factor did not apply at the time of the present study.

4.3.2 Barriers to market entry in the global air cargo market

Oedekoven [74] has noted that “the presence of market entry barriers limits the number of firms competing in the global air cargo industry and, thus, influences the rivalry amongst the incumbent carriers”. There are four discrete types of legal entry barriers applicable in the airline industry, that is, airline ownership, airline operating licenses, route-specific air services rights, and perimeter rules at airports [54]. Furthermore, if new passenger or dedicated all-cargo airlines enter the air cargo market, the competitive advantages of the incumbent carriers are impacted immediately. This is because the new market entrant provides new additional air cargo capacities in the existing market. This additional air cargo capacity normally results with a dilution of the profit margins for all the airlines competing in the market [74]. When the barriers to market entry are low, there is a greater threat to the incumbent airlines [54].

Airport “slots” are also a classic barrier to market entry [80, 81, 82]. In the global airline industry, an airport slot is required for every aircraft take-off and every landing [83]. At the time of the current study, ANA operated services from one of its hubs at Tokyo Haneda Airport, which is a slot constrained airport [84]. Also, around 120 of the worldwide slots coordinated airports are in the European Union (EU) and in the neighboring countries [85]. Airport curfews can also have a major impact on airline operations, particularly for freighter operators, who like to operate their services. Frankfurt, Lufthansa's primary hub has a night curfew.

Governmental policy is also a barrier to market entry [86]. There are stringent security regulations that can pose a barrier to market entry due to the associated costs in the global airline passenger and air cargo markets [11]. ANA Cargo and Lufthansa Cargo, like the combination full service network carriers (FSNCs), the dedicated all-cargo airlines, and the integrated carriers, must comply with all government regulations.

4.3.3 Bargaining power of suppliers

Suppliers to the air cargo industry can pose a threat by raising their prices. Consequently, powerful suppliers could potentially reduce the profitability of firms competing in the air

cargo industry, if the airlines are unable to recoup cost increases through an increase in their pricing. The aircraft manufacturers and aviation fuel companies are powerful as these sectors are dominated by just a few firms, for example, Airbus and Boeing Commercial Airplanes, and they are more concentrated than the airlines. Furthermore, their products delivered are vital for the consuming air cargo sector as the airlines would clearly be unable to compete in the absence of these products and services [74].

Also, Baxter and Srisaeng [11] have noted that “in the airline industry there are suppliers who either actually or potentially possess monopoly power”. Examples of these firms include air traffic control (ATC) and airport services, with many airlines having to pay whatever ATC and airport services charges are levied upon them [81].

All Nippon Airways (ANA), ANA Cargo, Lufthansa and Lufthansa Cargo are very well established and successful firms that are highly regarded. Boeing and Lufthansa share a strong partnership of innovation and a tradition of launching new aircraft programs together [87]. All Nippon Airways also have a close business relationship, for example, ANA was the launch customer for the Boeing 787-8 aircraft [88]. Both ANA and Lufthansa work closely together with the relevant airport authorities. Thus, ANA Cargo and Lufthansa Cargo appear to be in relatively strong positions vis-à-vis their suppliers.

4.3.4 Bargaining power of buyers

Customers who possess a high level of market power in the air cargo industry can place downward pressure on air cargo rates. These powerful customers also often demand higher quality or the extension of an airline’s existing product/service range [74]. As previously noted, around 90% of world air cargo traffic is provided by freight forwarders [82]. The freight forwarders and global logistics suppliers are powerful because they are often purchasing standardized or undifferentiated services. In addition, the switching costs associated with changing airlines is low, as the products/services provided by airlines are often easily exchanged or substituted [74].

Today, there is a relatively small number of international freight forwarders, such as DHL Global Forwarding, Expeditors International, Nippon Express, Panalpina, and DB Schenker, who account for a major portion of the industry revenues and employees [89, 90]. Given the large volumes of air cargo traffic that these large firms control, they can have considerable influence over an airline’s routing decisions, and they are using that influence to develop cargo hubs at airports that they want to serve from [91] (p. 140). Some freight forwarders are now offering shippers their own dedicated freighter services. DHL Global Forwarding, for example, currently has Boeing B747-400 freighters, operated exclusively on its behalf by Atlas Air, operating between Shanghai (IATA Airport Code: PVG) and Cincinnati (IATA Airport Code: CVG) airports [92].

At the time of the present study, Lufthansa Cargo had a global partnership program comprising 11 freight forwarders, for example, DB Schenker, DHL Express and DHL Global

Forwarding. The company also had 8 premium partners [93]. ANA Cargo also works closely with its forwarder partners located throughout Asia, Japan, and Europe.

4.3.5 Threat of substitute products

Oedekoven [74] (p. 320) has observed that “substitution in the air cargo industry depends upon the specific market segment. Substitution is typically higher if the air cargo services being provided can be relatively easily switched from the original product/service to a substitute (low product loyalty)”. The possibility of purchasers making a substitution are higher if the incurred buyer switching costs are relatively low and if the air cargo rates are relatively high compared to the performance of the substitute product, which is considered acceptable to the buyer at the lower price [74].

Generally, air cargo transport confronts competition from the surface-based transport modes, but particularly from the road and maritime (shipping) transport modes. The surface-based transport modes may be direct substitutes because they often compete with the air cargo mode for transport contracts [94]. Furthermore, improved trucking reliability and service quality, for example, the ability of customers to track their consignments in real time, lower theft/damage/pilferage rates, coupled with rates lower than airlines can offer, has placed trucking in a position where it both competes with, and complements, air services [91] (p. 143).

In recent times rail services have emerged as a new competitive threat to the air cargo industry. This is especially so between China and Europe [95]. Thus, the surface transport modes can pose a competitive threat to air cargo-carrying airlines. The threat of the substitution of ground-based surface transport modes applies to both the combination airlines, such as ANA and Lufthansa Cargo, and the dedicated all-cargo carriers.

4.4 The strategic benefits for ANA Cargo and Lufthansa Cargo AG from their strategic joint venture

As previously noted, joint ventures are formed for various strategic reasons. Table ?? provides a summary of the strategic benefits that the joint venture partnership between ANA Cargo and Lufthansa Cargo has delivered to the two partners to date.

The joint venture benefits customers by generating a greater selection of flight routings and a wider range of service options. Customers profit from a larger and faster route network with more direct flights, more destinations and more flight frequencies. By moving to a single handling agent at major stations, such as the airports Narita and Nagoya in Japan and Düsseldorf and Frankfurt in Germany, customers enjoy the services of both airlines at a single location [66, 96].

The strategic cooperation between ANA Cargo and Lufthansa Cargo is characterized by a high level of integration of systems and processes, combined route network, and joint distribution, as well as the colocation of handling operations at many stations. The strategic joint venture provides customers with substantial value such as the extended route network, a very significant number of flight combinations, greater flexibility,

and aligned service standards. At the time of the present study, the cooperation between the partners covers both express and standard air cargo products. The two partners have indicated that the inclusion of further products is planned in the future.

A key success factor for the joint venture is the metal neutrality involved [97]. Airlines have introduced joint ventures where the airlines share the profits and losses of their international joint operations, which are subject to an agreed formula, irrespective of which airline is the operating carrier. Walulik [98] (p. 121), notes that “such arrangements are described as ‘metal neutral’ because it is irrelevant which alliance partner’s aircraft provides the service”. No matter whether air cargo consignments are booked on an ANA or Lufthansa flight, they go into the joint venture result and are divided between the two partners according to a pre-determined pattern [96]. The joint venture has enabled both carriers to access space and payload inventory of each other’s flights under the harmonized pricing structure [71].

Additional and faster connections, greater air cargo capacity, and time-savings are other benefits offered to customers of the ANA Cargo and Lufthansa Cargo joint venture partnership agreement. The time-saving gains come from joint handling at many of the cities served by the two carriers. The strategic joint venture has provided the partners with higher cargo load factors, an enlarged market access, and increased shipment volumes [99].

Furthermore, in recent times, Lufthansa Cargo has been seeking partnership agreements in a bid to reduce costs and better compete with the State-owned Middle East carriers, such as Emirates Airline, Etihad Cargo, and Qatar Airways, which have been rapidly growing their freighter fleets and heavily marketing the belly-hold cargo capacities of their rapidly expanding passenger fleets [73]. Thus, the joint venture with ANA Cargo has helped to enhance Lufthansa’s position in the Europe to Japan and vice versa air cargo markets.

To date, the joint venture partnership between ANA Cargo and Lufthansa Cargo appears to have been most successful and is underpinned by a very collaborative business relationship. As can be observed in Table ??, the joint venture has provided both carriers with a range of strategic benefits that has underscored their ability to compete in the general cargo and express air cargo market segments. The two partners have clearly defined objectives and performance criteria for the joint venture. The joint venture has provided both parties with both strategic and operational synergies (Table ??), and the results have been positive, that is, the joint venture has enabled both partners to achieve their strategic objectives and to develop their business relationship.

5. Conclusion

This paper has examined, for the first time, the joint venture between ANA Cargo and Lufthansa Cargo AG in the Japan to Europe and vice versa air cargo markets. This was the first joint venture between two of the global air cargo industry’s largest air cargo carrying airlines. Despite the increasing

trend in joint ventures in the global air cargo industry, there has been very limited research undertaken on such initiatives. Thus, this study adds some valuable insights to the literature. The study was underpinned by a case study protocol and re-search framework that followed the recommendations of Yin [48] and applied Porter’s Five Forces Model for the first time in assessing an air cargo joint venture between two of the world’s largest air cargo carrying airlines. The case study has highlighted the strategic benefits that a joint venture can offer to the partners. The study found that the ANA Cargo and Lufthansa Cargo joint venture has evolved over time, initially starting in Japan and then throughout Europe to both online and offline destinations. The joint venture has enhanced both partners position in the highly competitive air cargo market and has allowed them to deliver and capture competitive advantage. The competitive advantages include a greater route network opportunity, and highly valued products, which are marketed using harmonized pricing. The use of a common handling arrangements enhances service recovery which adds to the overall service quality.

A limitation of the current study was that key business performance metrics, such as revenue and freight tonne kilometres (FTKs) were not available in the public domain. Should these data become available then a future study could compare the business performance of the joint venture between ANA Cargo and Lufthansa Cargo.

Future work will use a cross-sectional study to investigate the competitive position of Lufthansa Cargo’s joint air cargo venture with United Airlines and the joint venture with Cathay Pacific Cargo in the air cargo industry.

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Table 3. The ANA Cargo and Lufthansa Cargo strategic joint venture benefits

Joint Venture Benefit	ANA Cargo and Lufthansa Joint Venture
Sharing of risk	By combining their route networks and air cargo sales, the two joint venture partners are optimizing the carriage of air cargo on their respective services. At the same time, they are reducing the risk of un-availed payload on their services from Japan to Europe and vice versa.
Synergistic benefits	Higher air cargo load-factors, enhanced market presence, and greater shipment volumes.
Joint sharing of costs	No details of this were available at the time of the present study
Joint sharing of revenues/metal neutrality	Irrespective of which airline carried the cargo, the revenue is split between both partners using a pre-determined formula.
Accessing new markets	The joint venture has enabled ANA Cargo to access all of Lufthansa online and offline destinations. Lufthansa Cargo has gained access to Fukuoka, which is served from Tokyo Haneda Airport by ANA.
Participate in the industry's evolution	Both ANA Cargo and Lufthansa Cargo have been able to participate in the rapidly expanding express freight market segment.
Enhancing the competitive position in a market	Both ANA Cargo and Lufthansa Cargo have enhanced their position in the air cargo market through their strategic joint venture.
Overcome ownership restrictions	This was not applicable as the strategic joint venture relationship is jointly managed by ANA Cargo and Lufthansa Cargo
Increase efficiency	Service recovery of air cargo consignments has been enhanced using a single handling agent throughout the carrier's networks
Take advantage of offered capacity	Both carriers have achieved higher air cargo load-factors, and shipment volumes, which enable them to optimize their air cargo capacities.
Shared use of knowledge, competencies and resources	Both partners offer complementary technical skills, in-depth air cargo market knowledge and resources and there is a very high degree of cooperation between the partners
Joint procurement of fuel and amenities	No details of this were available at the time of the present study
Capturing competitive advantage	Greater network opportunities and enhanced uplift capability being offered to freight forwarders and shippers have enabled both airlines to gain an enlarged market access, improved load-factors, and increased shipment volumes.

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