ALLIANCE’S INFLUENCE ON THE FOUNDATION OF INTERNATIONAL HUB AIRPORTS IN CHINA

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Abstract: This paper looks at the relationship between airline alliance and building of hub airport and analyzes the strategic effects of airline alliances when alliance members want to build their base airport to a hub. In this paper we introduce the basic concepts and characteristics of airline alliance and some indispensable features of the hub airport, and discuss the key factors for building hub airport. Finally we present a model of air china entry into star alliance, and try to explain the effects of alliance to Beijing capital's international airport. We can conclude that the alliance is of positive factor to the construction of an airport hub. Several major airlines in China will join the international airline alliance, so their bases airports should seize the opportunity to develop.

Keywords: hub airport, airline alliance, hub and spoke networks

1. Introduction of alliance and hub airport

As we look today around us, there are various types of alliances all over the world. Airlines strategic alliances refer to two or more airlines establishing global route networks through code-sharing and other forms as a link, and signed cooperation agreements to form a partnership and then to operate air transport market together.

1.1 Global Alliances: These have global scope and are the most significant strategic alliances in terms of network expansion. The prime purpose here is to achieve all the marketing
benefits of scope and cost economies from any synergies through linking two or more large airlines operating in geographically distinct markets. Global alliances normally involve code sharing on a large number of routes. They may, however, extend to include schedule co-ordination, joint sales offices, ground handling, combined frequent flyer programs, joint maintenance activities as well as some equity stake transfer. The individual members may have a large number of specific routes and a small number of regional alliances.

Alliances that allow the airlines to leverage their maintenance facilities for mutual use fall in such category. Besides, code share agreements, frequent flyer programs and block-space arrangements are all covered under the marketing motives. In the airline industry the following are generally identify as the most common and most important reasons to form strategic alliances:

1.1.1 Reach of Seamless Service Networks: A connection of networks gives the consumers a large choice of destinations to choose from and plan better, connections are eased out and there are increased benefits of Frequent Flyer Programs (they have a broader range of benefits to offer) and lesser possibilities of lost baggage. Also, the alliances’ network comes in handy when operations are to be made in highly competitive, unprofitable and price sensitive market conditions. By connecting the networks, partners are able to expand their routes beyond their country territories.

1.1.2 Enhanced Traffic Feed: With linkage of the airline networks the carriers can increase their load factors with the increased feed. Also, flight frequency can be increased without increasing the size of the fleet.

1.1.3 Cost Reduction: The partners in the alliance can have the benefits of attaining the economies of scale (through joint operations of air and ground services) and scope (through increased reach and efficient connections) and increased traffic density (through network expansion and additional traffic feed).

1.2 Hub Airport:

In order to raise traffic densities, an airline has an incentive to create a large HS network serving many endpoint cities. In doing so, however, the carrier may end up controlling most of the traffic at the hub airport, leading to a dominated hub. The following are three important features of a hub airport:

1.2.1 the runway system
Capacity of the runway system in peak hour is a key airport indicator, and also is the primary factor of the airport operation and the continued development. The runway system, there are two typical features about Hub-and-Spoke Network operation.

1.2.1.1 Flights taking off and landing showed strong imbalance. In one day, there are a number of mutual and alternate flights clusters----arriving onward, taking off rearwards.

1.2.1.2 Heavy, medium and small aircraft all can use the large hub airport at the same time.
These two features are an inevitable requirement for the hub operation.

1.2.2 Terminal
There are some requirements for hub airport about Hub-and-Spoke Network operation.
1.2.2.1 Terminals are big enough for more aircraft to take off and land.
1.2.2.2 Layout of the parking apron is reasonable.
1.2.2.3 Interim flow is concise and smooth, advanced and efficient baggage distributing system can handle a large number of baggage and transiting passengers in a short time.

1.2.3 Ground transportation system
There should have access from hub airport to the urban and the neighboring cities through other very convenient modes of transportation, in order to make hub airport become a passengers and cargo distribution system.

1.3 Airline alliances facilitate to build hub airports
The emergence of airline alliance and hub airports are all primarily to achieve economies of scale and scope. Hub-and-spoke network is a typical route network in airline alliance. Through hub-and-spoke networks operation, the airline can reduce transportation costs and increase passenger destinations. And hub airport is a necessary condition for the hub-and-spoke networks operation.

So, strategic alliances can promote to construct the hub airport. Of course, the hub airport will be conducive to play the advantages of strategic alliances

2. Conditions for building hub airport

A hypothetical China airline is assumed to consider several alternatives (airports) as potential locations of a new hub. The airline is assumed to try to evaluate their convenience by defining a set of attributes (criteria) which reflect their relevant performance. In general, these attributes (criteria) are summarized as follows:

- The strength of a candidate airport to generate air transport demand;
- The operational and economic characteristics of a candidate airport;
- The airline operating costs;
- The environmental constraints at a candidate airport.

2.1 The strength of a candidate airport to generate air transport demand
It includes the socioeconomic indicators of the airport catchment area such as GDP, or combined Population and PCI (Per Capita Income). In addition, some surrogates such as attractiveness of the region (country) and/or a city (or cities) in terms of business and tourism may also be taken into account. Gross Domestic Product is shown to be the main driving force of aviation growth in many countries and regions including those served by the airport concerned. In such a context, growth of GDP is always expected to generate growth of air transport demand, and vice versa. Population traditionally reflects the inherent strength of a region as a source of potential air
transport demand. In general, regions with higher PCI are always considered more lucrative air transport markets independent of the structure of activity and the type of preferred trips.

2.2 The operational and economic characteristics of a candidate airport
they include attributes such as the airport size, the quality of surface access, the quality of service of the airport landside and airside areas, and the cost of airport service.

The airport size reflects the importance of an airport at a local (regional), national, and global (international) scale. Generally, a larger airport always looks more attractive and more promising for starting a new airline business than a smaller one, since it always looks more likely to provide prospective commercially feasible demand, either through competition or co-operation with already established airlines.

2.3 The environmental constraints at particular airports include constraints aircraft noise, air pollution and land-take. The environmental constraints may work as a ‘deterring factor’ when considering an airport as a candidate for a new hub in several ways. Firstly, they could significantly affect the intended volume of operations. Secondly, they may be completely unacceptable for airlines using ‘old-technology’ aircraft in terms of noise and air pollution burdens. And lastly, congested airports without prospective options for expansion due to land-take constraints are always considered less attractive locations for launching a prospective airline business. In general, airports with smaller numbers of less strict environmental constraints are always preferable.

2.4 Consequently, the following twelve performance attributes (criteria) can be identified as relevant for the location of a new hub:

- Population;
- Per Capita Income;
- Airport size;
- Generalized surface access cost;
- Quality of passenger service in the airport terminal;
- The airline costs of operating the ‘renovated’ air route network;
- The average cost of airport service;
- Airport capacity;
- The incumbent’s market share;
- Utilization of airport capacity;
- The airport-induced delay;
- The environmental constraints.

Generally, some of the above attributes (criteria) may be dependent on each other. And when we want to choose an airport as a new hub, we must consider the above twelve performances. If we are going to build one or more hubs in China, we should make a comprehensive evaluation of the candidate airports and select the airport with high-value targets to develop.
3. Airline alliance will improve the construction of hub airport in China

Which effects will alliance play? Next we will discuss this problem. Currently, in China the leading airlines have selected their major bases as their hub airport, Air China select Capital Airport, China Southern select Guangzhou Baiyun Airport, China Eastern select Shanghai Pudong Airport as their hub. CAAC and Local government also hope building them to become international hub. Now we analyze the possibility of these airports becoming international gate.

3.1 Beijing is the capital of China; Beijing also is Chinese political, economic and cultural center. Therefore, the potential to become international gate is very great. Population of Beijing is over 12 million. There is an industrial circle around Beijing——jing, jin, tang industrial circle. And a relatively developed economy, GDP in this distract is relatively high. Air China has signed letter of intent to join the Union with star alliance and may join Star Alliance at the end of 2006. This matter has a great impact on the route network to Air China. Star Alliance includes the following major airlines, Air Canada, Air New Zealand, Asiana Airlines, ANA, Lufthansa, South African Airways, Singapore Airlines, Scandinavian Airlines, LOT Polish Airlines, bmi, Spanair, Swiss International AirLines, TAP Portugal, Thai Airways, United Airlines, US Airways, VARIG Brazilian Airlines. Alliance will strengthen route linkages from Beijing to every member’s Base. We take an example about market from china to the U.S., Such an alliance is represented in Figure 1. The figure shows a linkage between the airlines operating hubs $H_1$ and $H_2$. In this case, $H_1$ could be china beijing hub while $H_2$ could be USA Los Angeles hub. The carriers serve a number of cities out of their hubs, and they both serve the route between the hub airports. The advantage of the alliance arises because the two networks have little overlap. As a result, the alliance can initiate seamless service between, say, cities $C_k$ and $C_n$, which were not previously connected by a single carrier. Passengers from $C_k$ might travel along carrier1’s spoke routes as far as $H_2$, where they then switch to carrier 2’s flight to city $C_n$. Coordination of schedules minimizes the layover at $H_2$, and the fare for the trip is chosen by the carriers in order to maximize their joint profit.

![Figure 1. Two HS Networks Linked by an Airline Alliance](image)

Joint profit maximization leads to a lower fare in this city-pair market than would be charged under non-cooperative pricing of a traditional interline trip. By reducing fares, cooperation...
thus stimulates travel in this and other city-pair markets served by the alliance. The result is greater traffic densities and lower costs per passenger within both HS networks, which allows more-competitive pricing of the single-airline trips that occur within each network. We can see that this can attract more passengers to travel through Beijing transit. This will depend on the Capital Airport to provide efficient transit service. It is said that Air China will make great efforts to build Beijing base.

Therefore, we think alliance may bring the below profits:

3.1.1 Cooperation among members
In the process of collection and distribution passengers through hub airport, the alliance members will carry massive passengers transiting hub airport. This can brings high incomes to the airport, also promotes the construction of hub airport without doubt

3.1.2 Expand their networks
The alliance will urge the members to adjust its routes network, in order to form the hub-and-spoke networks to operate. The hub airport will provide the operating conditions to airlines; it is undoubted that the base airline will support the construction of hub airport.

3.2 Shanghai is the base of China Eastern, it hoped to build Pudong Airport as Chinese international gate. Shanghai is China's economic center, with a population of over 10 million, the economy of this distract along Yangtze river is very strong, and World Exposition will be held at Shanghai in 2010, which laid a foundation for shanghai becoming an international hub. If China Eastern joins an alliance, it can enjoy the Union benefits. Through international operations, it is large potential for Shanghai to become an international gate.

3.3 China Southern is based on Guangzhou, the economy of this distract along Zhujiang river is also very strong. Southeast Asian countries have more investment in this region, and investment from Europe and the U.S. is relatively small. But Guangzhou face competition of Pudong Airport, the center government did not plan to make Guangzhou into an international metropolis, but to some extent Shanghai has become an international metropolis. China Southern signed letter with skyteam of intent to join alliance, but complementarities between China Southern and the skyteam alliance is not strong. Therefore, Guangzhou is fit to be built as a hub facing Southeast Asia.

4. Conclusion
China's three major airlines choose Beijing, Shanghai, Guangzhou as a hub bases candidate, which maybe is an appropriate choice. With the development of Chinese civil aviation industry, the three major airports have great potential to become international hubs. From the strategic alliance model, it became clear that the alliance is a catalyst for strengthening the building of the airport; the hub airport is the necessary infrastructure for achieving the advantages of an alliance. Moreover, the choice of hub airports in several major standards, three major airports are preferred. In this paper's analysis, construction of the Capital Airport, Shanghai Pudong Airport, and Guangzhou Baiyun Airport will be improved through airline
alliances.

References