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ANALYSIS OF MAINLAND CHINA'S INTERNATIONAL AIR CARGO NETWORK: STATUS QUO AND CHALLENGES

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Abstract

Based on air cargo import and export statistics of China Customs, the international air cargo network structure and its flow characteristics in mainland China were studied in this paper. Overall development trends and flow distribution of international air cargo in mainland China were analysed. The major air cargo import and export countries (regions), the main categories of commodities, and the major customs and hub airports were identified. Through our study, a relatively complete view of international air cargo network in mainland China was constructed, in which the major flight routes linking destinations and sources of international air cargo as well as the categories and amounts of air cargo could be revealed. This paper also includes challenges to the further development of mainland China's international air cargo, and proposals to meet these challenges.

Keywords: Air Cargo, Logistics, Air Freight, Import and Export

Introduction

Air transport has become a major driving force for sustained economic growth due to the advantages of high-speed and being able to save the total transportation costs of supply chains. It is considered as the fastest and reliable way of efficiently linking national and global supply chains as well as long-distance markets. In this new era of rapid turnover in logistics, those countries with sound air cargo connectivity will gain more competitive advantage than others in trade and production [1]. China has the second largest air cargo market only surpassed by United States. China's robust economic growth has provided the largest and best platform for the development of air transport industry.

With rapid growth of China's air cargo, our study has more attention and attraction for researchers and reviewers. Existing studies addressed issues such as China's major aviation hubs and the overall pattern and composition of international air cargo [2], the network structure and flow characteristics of international air cargo [3], the development status and market barriers [4], etc. Though during past several years, the studies on China's air cargo market have been gradually increasing, but they are lacking in deep analysis of China's international air cargo network. For this reason, we exploited the statistical data on air cargo import and export of the year 2006 obtained from China Customs so as to delineate the network structure and flow distribution of China's international air cargo with special focus on statistical analysis on route alignments of main sources and destinations of international air cargo along with cargo categories and amounts.

Traditionally, China Customs treats imports and exports between mainland China with Hong Kong, Taiwan and Macao as international trade, so we define the scope of study within mainland China's international air cargo. The objectives of our study are to build a relatively complete view of mainland China's international air cargo network and grasp its status and characteristics. We also discussed the future challenges anticipated in the development of China's international air cargo and available relevant proposals.

Overall Development and Flow Distribution of International Air Cargo

Air cargo accounts for a very small share of total volume of national cargo. However, the commodities transported by air are generally high-value-added, so the ratio of the value of air cargo to total value of national cargo is still large. Statistics on national imports and exports of 2006 provided by China Customs, it can be seen that total value of air cargo reached nearly 1/5 of the total value of national imports and exports with a very small freight volume. From 2001 to 2006, the total value of air cargo imports and exports increased with an average annual rate of 39%, which was considered as significant but swift increase than other transport modes (see Table 1).

Table 2 shows the distribution of 2006 air cargo imports and exports amount among several continents. Table 2 shows the geographic distribution of both export destinations and import sources revealing a marked concentricity in Asia, Europe and North America. Asia is the foremost origin of imports and destination of exports for mainland China's international air cargo, followed

by Europe and North America. In particular, the total value of imports from Asia is accounted for more than 80% of the total value of all imports. Although China has air cargo business with more than 200 countries/regions around the world, however, the business shares with other continents are still very small.

Table 1 Total value of Customs import and export vs total value of international air cargo

Year	Total value of imports and exports (thousands of dollars)	Total value of air cargo imports and exports (thousands of dollars)	Percentage of air cargo	Growth rate of air cargo	Growth rate of imports and exports
2001	509,651,090	66,636,409	13.1%	---	----
2002	620,766,074	87,727,676	14.1%	31.7%	21.8%
2003	850,987,563	138,770,605	16.3%	58.2%	37.1%
2004	1,154,554,329	208,638,268	18.1%	50.3%	35.7%
2005	1,421,906,172	270,781,944	19.0%	29.8%	23.2%
2006	1,760,686,452	339,029,738	19.3%	25.2	23.8%
Average annual growth rate				39.0%	28.3%

Source: Import and export statistics of China Customs

Table 2 Distribution of air cargo imports and exports amount on continents

Continent	Export		Import	
	Amount (thousands of dollars)	Percentage	Amount (thousands of dollars)	Percentage
Asia	65,551,953	42.0%	127,259,231	81.6%
Europe	44,116,604	28.3%	28,885,873	18.5%
North America	40,329,775	25.9%	24,259,906	15.6%
Latin America	2,956,179	1.9%	1,638,148	1.1%
Oceania	2,109,050	1.4%	279,915	0.2%
Africa	907,284	0.6%	735,276	0.5%
Total value of air cargo imports and exports	155,970,844	100.0%	183,058,350	100.0%

Source: 2006 air cargo import and export statistics of China Customs

The economic ties of China with countries/territories in North America, EU, ASEAN, South Korea, and Japan are improving year by year. The continuous increase in China's foreign trade depicts that the international air cargo market will have a prospect for future. However, recent development shows that two regional markets namely North America and EU, especially the U.S. market, obviously take on one-way characteristics due to the imbalances in China's foreign trade such as, almost full-loaded cargo departure from China while very low return load. In recent years, the ratio of export to import amount of mainland China's air cargo is 3:1. However, there exists unidirectionality in China's international air cargo market which will decline gradually in long term as China's foreign trade turning into balance. Therefore, expanding international routes, especially the routes of China - North America, China - Japan, and China – Europe, will be beneficial for China's air cargo business to gain more shares in international market [5]. At present the routes of China - North America and China-Europe are still major international air cargo routes. Their average annual growth rate in terms of air cargo amounts will reach 11.6% and 10.4% in 2015 respectively [6].

Major Sources and Destinations of International Air Cargo

Through the statistical analysis on international air cargo amount, we find the major import and export countries or regions are U.S, Hong Kong, Japan, Germany, Singapore, Netherlands, South Korea, Taiwan, Malaysia, UK, Philippine, and France. Among these countries, U.S is the major destination accounting for a quarter of the total export amount followed by Hong Kong and Japan (see Table 3). The top ten destination countries (regions) of air cargo exports cover 76% of the total export amount.

Table 3 Major destinations of air cargo exports

	Country (region)	Amount (thousands of dollars)	Percentage
1	U.S	38,446,230	24.6%
2	Hong Kong	18,428,259	11.8%
3	Japan	13,697,499	8.8%
4	Germany	13,173,372	8.4%
5	Singapore	8,082,271	5.2%
6	Netherlands	6,770,540	4.3%
7	South Korea	6,323,066	4.1%
8	Taiwan	5,331,630	3.4%
9	Malaysia	4,733,784	3.0%
10	UK	3,689,997	2.4%

Top-10 accumulative	118,676,648	76.1%
Total export amount	155,970,844	100.0%

Japan is the major source of air cargo imports, who accounted for 15% of the total import amount followed by Taiwan and U.S. The top ten origin countries (regions) occupied 85% of the total import amount (see Table 4). These major source and destination countries (regions) are concentrated in Asia, Europe and North America.

Table 4 Major origins of air cargo imports

	Country (region)	Amount (thousands of dollars)	Percentage
1	Japan	27,183,778	14.8%
2	Taiwan	25,078,268	13.7%
3	U.S	23,510,670	12.8%
4	South Korea	21,737,172	11.9%
5	China	16,619,484	9.1%
6	Philippine	10,557,203	5.8%
7	Germany	9,616,080	5.3%
8	Malaysia	9,208,126	5.0%
9	Singapore	6,866,346	3.8%
10	France	5,484,028	3.0%
Top-10 accumulative		155,861,156	85.1%
Total import amount		183,058,350	100.0%

Major Commodities of Air Cargo

Chinese economy has shown a strong growth due to large amount of foreign investments and competitive labor cost. Because of these factors, China has become the world's manufacturing center. Many important industries in China provide a wide range of products, including computer, telecommunication equipment and apparel. Air transport has become the preferred transport mode for these products. Since most of these products are for export causing a rapid growth in Chinese international air cargo business. Large quantities of air cargo are exported to Asia, Europe and North America, which greatly promotes China's air cargo market. The rapid development of China's international air cargo is facilitated by the growth of exporting high value-added products, which is closely related to the transformation of China's electronics industry from component production to final assembly and integrated production. The export of high-tech products is much higher than other products in terms of import and export amount.

Customs statistics of 2006 air cargo imports and exports shows that electronic product and machinery equipment are the most principal export commodities, which amounted over 80% of the total export (see Table 5). Table 6 lists the major destination countries (regions) of principal export commodities, in which U.S, Hong Kong, Germany, Japan, and Netherlands, etc. are included.

Table 5 Major air cargo export commodities

	Chapter No.	Category of commodity	Amount (thousands of dollars)	Percentage
1	Chapter 85	Motors, electrical equipments and parts; sound recorders and reproducers, television image and sound recorders and reproducers, and their parts and accessories	77,970,710	50.0%
2	Chapter 84	Nuclear reactors, boilers, machinery appliances and parts	49,832,591	31.9%
3	Chapter 90	Optical, photographic, cinematographic, measuring, testing, medical or surgical instruments and equipments, precision instruments and equipments	7,586,708	4.9%
4	Chapter 62	Non-knitted or non-crocheted apparels and clothing accessories	3,375,104	2.2%
5	Chapter 61	Knitted or Crocheted apparels and clothing accessories	2,557,117	1.6%
6	Chapter 71	Natural or cultured pearls, precious or semi-precious stones, precious metals; imitation jewelry; coins	2,055,809	1.3%
7	Chapter 29	Organic chemicals	1,737,010	1.1%
8	Chapter 27	Mineral fuels, mineral oils and their distillation products; bituminous substances; mineral wax	1,483,056	1.0%
9	Chapter 98	Special transaction and unclassified commodities	1,224,062	0.8%
10	Chapter 88	Aircraft, spacecraft and parts thereof	1,096,909	0.7%
Top-10 accumulative			148,919,075	95.5%
Total export value of air cargo			155,970,948	100.0%

Table 6 Major destinations of air cargo exports

Chapter No.	Major export destination countries (regions)
Chapter 85	U.S, Hong Kong, Germany, Japan, Singapore, South Korea, Taiwan, Netherlands, Malaysia, Finland

Chapter 84	U.S, Germany, Netherlands, Japan, Hong Kong, Luxembourg, Malaysia, Singapore, France, UK
Chapter 90	Japan, U.S, Hong Kong, Malaysia, Taiwan, Germany, South Korea, Singapore, Ireland, UK
Chapter 62	Japan, U.S, Germany, Italy, France, UK, Australia, Spain, Canada, Netherlands
Chapter 61	Japan, U.S, Azerbaijan, Italy, Germany, France, Australia, UK, Canada, Spain
Chapter 71	Belgium, Hong Kong, U.S, South Korea, Thailand, Japan, Singapore, Switzerland, UK, Germany
Chapter 29	India, U.S, Germany, Japan, Italy, Switzerland, South Korea, Spain, Brazil, Netherlands
Chapter 27	U.S, Hong Kong, Germany, France, Netherlands, UK, Singapore, Russia, Canada, the United Arab Emirates
Chapter 98	Japan, Hong Kong, Singapore, Taiwan, Iran, Bangladesh, U.S, Pakistan, Egypt, UK
Chapter 88	Hong Kong, Japan, U.S, Singapore, France, Germany, South Korea, Laos, India, Zambia

As shown in Table 7, high-tech products, machinery parts and industrial consumables are the most important import commodities, accounting for 85% of the total amount of air cargo imports. The principal sources of top-10 import commodities are given in Table 8, which include Taiwan, U.S, Germany, Japan, South Korea etc.

Table 7 Major import commodities of air cargo

	Chapter No.	Category of commodity	Amount (thousands of dollar)	Percentage
1	Chapter 85	Motors, electrical equipments and parts; sound recorders and reproducers, television image and sound recorders and reproducers, and their parts and accessories	107,219,938	58.6%
2	Chapter 84	Nuclear reactors, boilers, machinery appliances and parts	27,312,173	14.9%
3	Chapter 90	Optical, photographic, cinematographic, measuring, testing, medical or surgical instruments and equipments, precision instruments and equipments	20,365,951	11.1%
4	Chapter 88	Aircraft, spacecraft and parts thereof	10,468,028	5.7%
5	Chapter 71	Natural or cultured pearls, precious or semi-precious stones, precious metals; imitation jewelry; coins	2,476,753	1.4%
6	Chapter 38	Miscellaneous chemical products	1,835,403	1.0%
7	Chapter 39	Plastics and articles thereof	1,606,506	0.9%
8	Chapter 30	Drugs	1,599,848	0.9%
9	Chapter 73	Iron and steel articles	842,306	0.5%
10	Chapter 29	Organic chemicals	816,952	0.4%
Top-10 accumulative			174,543,857	95.3%
Total import value of air cargo			183,058,779	100.0%

Table 8 Major origins of air cargo imports

Chapter No.	Major import source countries (regions)
Chapter 85	Taiwan, Japan, South Korea, China, Philippine, U.S, Malaysia, Singapore, Germany, Hong Kong
Chapter 84	U.S, China, Thailand, Japan, South Korea, Germany, Philippine, Taiwan, Singapore, Malaysia
Chapter 90	Taiwan, Japan, U.S, South Korea, Germany, China, Netherlands, UK, France, Singapore
Chapter 88	U.S, France, Germany, UK, Brazil, Japan, Singapore, Netherlands, Canada, Italy
Chapter 71	Belgium, South Africa, UK, Japan, Germany, U.S, Switzerland, India, South Korea, Israel
Chapter 38	Japan, U.S, Taiwan, Germany, South Korea, UK, Singapore, Malaysia, Hong Kong, France
Chapter 39	Japan, U.S, Taiwan, South Korea, Germany, Singapore, China, Hong Kong, France, UK
Chapter 30	U.S, UK, Germany, Switzerland, France, Italy, Ireland, Belgium, Japan, Sweden
Chapter 73	U.S, Japan, Germany, Taiwan, Italy, France, Singapore, South Korea, UK, Switzerland
Chapter 29	Japan, Ireland, Switzerland, Belgium, U.S, France, Sweden, India, Italy, Singapore

Hub Ports of International Air Cargo

According to China Customs statistical data of 2006 air cargo imports and exports, the top ten customs for air cargo exports and imports are

shown in Table 9 and Table 10 respectively. Since air cargo must pass through the custom clearance whereas these custom facilities are only located at major airports. These airports are so-called hubs underlying the international air cargo network. The accumulative amount of air cargo imports and exports through these hub ports amounted more than 96% of the total of national air cargo imports and exports as shown in Table 9 and Table 10.

Table 9 Major Customs for air cargo exports

S.No	Customs	Amount (thousand of dollar)	Percentage	Economic zone
1	Shanghai Customs	78,983,682	50.6%	Yangtze River Delta
2	Nanjing Customs	29,811,914	19.1%	Yangtze River Delta
3	Beijing Customs	23,160,650	14.8%	Bohai Rim
4	Tianjin Customs	5,643,449	3.6%	Bohai Rim
5	Qingdao Customs	3,233,430	2.1%	Pan-pearl Rive Delta
6	Xiamen Customs	2,419,616	1.6%	Pan-pearl Rive Delta
7	Hangzhou Customs	2,343,155	1.5%	Yangtze River Delta
8	Shenzhen Customs	2,059,570	1.3%	Bohai Rim
9	Guangzhou Customs	2,004,079	1.3%	Pan-pearl Rive Delta
10	Dalian Customs	1,546,263	1.0%	Bohai Rim
Top-ten accumulative		151,205,809	96.9%	
Total export amount		155,970,948	100.0%	

Note: Shanghai Customs has two airports namely Pudong airport and Hongqiao airport

Table 10 Major Customs for air cargo imports

	Customs	Amount (thousand of dollar)	Percentage	Economic zone
1	Shanghai Customs	74,039,541	40.4%	Yangtze River Delta
2	Nanjing Customs	45,256,166	24.7%	Yangtze River Delta
3	Beijing Customs	27,390,176	15.0%	Bohai Rim
4	Tianjin Customs	9,743,728	5.3%	Bohai Rim ea
5	Guangzhou Customs	4,437,796	2.4%	Pan-pearl Rive Delta
6	Xiamen Customs	4,148,693	2.3%	Pan-pearl Rive Delta
7	Hangzhou Customs	3,918,004	2.1%	Yangtze River Delta
8	Qingdao Customs	3,062,225	1.7%	Bohai Rim
9	Chengdu Customs	2,007,401	1.1%	Pan-pearl Rive Delta
10	Dalian Customs	1,905,311	1.0%	Bohai Rim
Top-ten accumulative		175,909,041	96.1%	
Total import amount		183,058,790	100.0%	

Both air cargo imports and exports from Shanghai are ranked first, with an export amounting half of the total amount of national air cargo exports, and import amounting 40% of the total of national air cargo imports. Nanjing airport is ranked second, followed by Beijing airport.

As two of the most important gateways to China, Shanghai and Beijing, have naturally become the preferred airports for international air cargo. However, in the last few years, with the construction of new airport in Guangzhou and opening of fifth freedom rights in Xiamen, Nanjing and other cities, rapid development of logistics industry in general and especially in Shenzhen has caused more airlines to pay much attention to the huge freight market in South-East China. They tend to operate the international air cargo by direct departure from Guangzhou or Shenzhen directly, or transfer through Xiamen.

The main air cargo hub ports are located in China's three big economic zones, namely, Yangtze River Delta economic zone, Bohai Rim economic zone and Pan-Pearl River Delta economic zone. Yangtze River Delta economic zone which includes Shanghai, Nanjing and Hangzhou, has a nearly 3/4 of the total amount of national air cargo imports and exports, followed by Bohai Rim economic zone which includes Beijing, Tianjin, Qingdao and Dalian. The last is Pan-Pearl River Delta economic zone which contains Guangzhou, Xiamen, Shenzhen, and Chengdu.

Challenges to International Air Cargo and Proposals

The Expansion of International Air Cargo Market

The biggest impetus of sustained and rapid development of China's civil aviation comes from the continuous growth of Chinese economy. It will be very difficult for China to maintain a double-digit GDP annual growth rate in future as the base number of GDP increases. However, China’s airlines still have a strong desire to expand. Moreover, the role as an important bargaining chip in balancing international trade by purchasing aircraft will remain unchanged in the short term. To break the deadlock, China's airlines should improve their international

competitiveness; meanwhile, look for new growth points from the broad market of sixth freedom rights, so as to be able to exploit invisible trade to replace visible trade featured with ever-increasing frictions. Since internationalization is in fact a double-edged sword, with the opening of international air traffic rights, the controversies over decline in international freight market share possessed by China's airlines have been increasing [7].

The current cargo routes of China's airlines are limited to traditional routes. In future, China's cargo airlines must enhance competitiveness by opening up potential market and improving the route network structure. The Middle East, South America, South Africa and other places are potential cargo markets. China's airlines could consider entering these potential markets by a cooperative manner, such as joint ventures with other companies, finding sales agent, and class exchange, etc.

The cities in Western China as a potential market for airlines, are also need attention. China is implementing the strategy for developing the western region in order to solve the problem of uneven economic developments in East and West. With continuous and focus attention to develop Western part of China, and implementation of preferential policies tailored for the Western region, the demand on air cargo in the Western region will show an upward trend. Although at present there is no enough air cargo demand in Western region, its development prospect is optimistic. China's airlines could put their capacity into the Western region in phases. Once conditions are ripe, airlines could further increase their capacity [8].

Obsession with Unidirectional International Air Cargo

The structural imbalance of China's imports and exports is relatively obvious. Large trade surplus of China means export goods are more than import goods, coupled with weak marketing capabilities of domestic airlines in international market, all these factors render China's airlines to operate with low international cargo and mail load factor of less than 60% in recent years.

It is well known that the major problem existing in Sino-US air transport market is the imbalance of freight. This imbalance is not just concerns over import and export volumes, but also over price, product structure and other aspects. The difference in Sino-US industrial structure and the nature of import and export trade, leads to this phenomenon which will always exist for a long period of time. In past decade, the imbalance of freight volume in Sino-US air cargo market has been gradually decreasing. According to Department of Transportation of U.S, the ratio of Sino-US air cargo outbound to inbound volume has dropped from 7:1 in 1995 to 5:1 in 2005. However, the air transport price per kilogram of import goods from U.S. equals to only one third of the price of export goods to U.S. As more and more airlines of China and U.S enter Sino-US air cargo market, the price competition will also be intensified.

Inadequate Cargo Capacity and Imperfect Infrastructure

The market loss due to lack in cargo capacity results embarrassing situation faced by China's airlines. Unfortunately, there is no Chinese airline with more than 10 all-cargo aircraft. At the end of March 2006, all domestic airlines had only a total of 33 all-cargo aircraft, with total of 7, 700 tonnages capacity on all available passenger and cargo aircraft. On contrary, two companies namely UPS and FedEx have more than 1000 all-cargo aircraft in operations in U.S. The belly capacity of passenger cargo aircraft is still a major component of the entire cargo capacity resource in future. At present, cargo aircraft is still main large-size cargo aircraft, which is considered unfavorable to air cargo hub construction being unable to build up an effective air cargo route network. This is because building air cargo hub must rely on small and medium size aircraft to connect between non-hub and hub airports, and possess large size aircraft to connect amongst hub airports. Due to lack of air cargo hub, airlines are unable to effectively exploit the powerful ground-based service capabilities, maintenance support capability, and enlarge share in freight market that is already occupied by a hub, to expand their influence, attract inflow of goods around airports, and build up a network through transfer services [9].

The airport infrastructure and customs restrictions become important factors constraining direct departure of international air cargo from mainland China. As compared to perfect hub airport construction and network layout in neighboring countries, China has only Beijing and Shanghai cities which can barely compete with them. The long-standing emphasis on passenger transport instead of cargo transport is because of the number of airports being far less than the requirements of airlines and shippers in respect of infrastructure, freight operational efficiency and other aspects. Moreover, the procedure and system for logistics and transport operations adopted by mainland China's customs have low cargo processing speed.

We therefore propose that domestic airlines being more all-cargo aircraft can be used to expand fleet size gradually and optimize the route network, and eventually realize the cargo operational mode of "all-cargo aircraft as principal, supplemented with belly compartment of passenger aircraft". In the meantime, domestic airlines should strengthen the hub construction at base airports; spread out air cargo

network and expand market scope through hub airport; expand and improve the ground-based distribution network by various ways so that air transport and ground transport can achieve a seamless interface.

Lack of Competitiveness in International Air Cargo Market

China's air cargo companies are still very young, whose management experience remains inadequate as compared to many large international shipping companies. This makes China's airlines very hard to gain a foothold in international cargo market. For domestic airlines, one feasible way of obtaining management expertise is to build strategic alliances with leading foreign airlines [10].

The service awareness of domestic air cargo companies is relatively weak. They only care whether goods have been shipped to destinations, while rarely consider such service innovations as how to accelerate carriage speed, ensure cargo security, and provide customized products, and so on.

The price factor and service environment of domestic airlines still need to improve. Under the circumstances of different airlines having similar flight routes and time windows, price becomes one of the major factor affecting the choice of airline. Compared to China's airlines, the cost advantage of foreign airlines allows them to lower price on the premise of maintaining certain profit, thus take away a large number of freight sources. In this case, competing on price blindly with foreign airlines will only result in loss.. For China's airlines, the preferred option is to adjust the product structure and sales strategy, increase the proportion of high value-added products, and improve the cargo and mail load factor [11].

China's airlines must first strive to complete high-quality basic services, such as improving the speed of goods flow, and ensuring cargo security. In addition, China's airlines should provide value-added products through service innovation. Service innovation is to provide the service that other airlines can not offer, but is needed by customer or customer is willing to receive. If an airline creates new services for customer beyond the core product of airport-to-airport transport, such as air transport and logistics advisory service, special warehouse management service, personalized services for high-end customers, and so on, then its products will be infinitely extended.

Furthermore, domestic airlines may choose to join a suitable air cargo alliance. By cooperating with other members of the alliance, airlines can enhance the whole competitiveness of the alliance; expand air cargo network more rapidly at a lower cost. In addition, gradually introducing freight products that meet the alliance's service standards, airlines can benefit by improving management level for freight products and thus increasing flight revenue. Again, cost can be reduced through joint procurement of alliance.

Conclusions

The rapid growth of China's economy along with unceasing expansion of China's foreign trade, have greatly promoted China's air cargo industry, especially the international air cargo industry. Based on the statistical data of 2006 air cargo imports and exports obtained from China Customs, this paper describes the basic structure and flow distribution of mainland China's international air cargo network. The study shows that the ratio of total amount of imports and exports by air to that of all imports and exports has been increasing. The origin and destination countries (regions) of mainland China's air cargo imports and exports are concentrated in Asia, North America and Europe, while Asia is the foremost origin and destination. Electronic, mechanical and high value-added products are main commodities of mainland China's air cargo imports and exports. The top ten hub airports of air cargo imports and exports in mainland China are located in three economic zones, where Shanghai, Nanjing and Hangzhou airports belonging to Yangtze River Delta economic zone own nearly 75% of the total amount of air cargo imports and exports. Shanghai is the biggest hub in mainland China, accounting for almost half of the total amount of national air cargo imports and exports. The further development of mainland China's international air cargo has to deal with following challenges: expansion of international air cargo market, obsession with unidirectionality of international air cargo for a long time, inadequate cargo capacity and imperfect infrastructure, as well as lack of international competitiveness of domestic airlines.

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