China's freight carriers are experiencing an international traffic boom due to rapidly growing Chinese exports. Outbound load factors and yields are high, and airlines need to acquire large numbers of aircraft to cope with demand. The airlines are not without their problems and face challenges.

The development of China's freight carriers

In 1995 no dedicated freight carrier existed in China and China's total air cargo volume was only 1.01 million tons, of which a third was international freight. China's airlines only operated six freighters between them: one 747-200F and three 747-400Ms by Air China; an MD-11F by China Eastern Airlines; and a 737F by Xiamen Airlines, a subsidiary of China Southern Airlines. China's air freight industry has developed rapidly since.

As of December 2004 total volume reached 5.5 million tons in 2004, nearly 40% of which was international cargo. Mainland China's carriers owned four 747-200Fs, two 747-400Fs, six MD11Fs, one 737-300F, one 737-300SF, and six 737-300QCs.

While most Chinese airlines still use passenger aircraft belly space to transport freight, some now specialise in air cargo. These include China Cargo Airlines, Air China Cargo, Yangtze River Express, China Postal Airlines and Jade Cargo International, which is a freight carrier jointly established by Shenzhen Airlines and Lufthansa Cargo Airlines in late 2004. China Southern Airlines, Shanghai Airlines, Sichuan Airlines and Air Macau have been playing an important role in the market.

China's total air cargo volume reflects the bouyancy of the air freight business. What is behind this development? What are these carriers' designs for future fleet planning and route networks? What are the threats facing them?

Economic momentum

Since China began its well known "reform and opening" policy in 1979, the Chinese economy has been recording an average growth rate of 8%. This prompted China's cargo business to increase at an average annual growth rate of 20%. Chinese airlines could not immediately capitalise on the strong growth, however, and build up their freighter fleet until 1999. One reason was that before the mid 1990s, more than 70% of the cargo volume was domestic and demand could be satisfied with Chinese airlines' passenger aircraft bellyspace. A more important reason was that most foreign investments were in the Pearl River Delta Region, an area neighbouring Hong Kong, whose factories products were mainly exported. China Southern Airlines and Shenzhen Airlines, two carriers based in the Delta, however, could not substantially benefit from the growth of the export business because the products were transported to Europe and North America via Hong Kong by Cathay Pacific, Air Hong Kong, and foreign airlines.

Another reason for China Southern's inability to capitalise on the export boom was the constraint of air traffic rights. In 1997 China Southern had only two international routes: from Guangzhou to Amsterdam and Los Angeles. Air China, which had one 747F and three 747Ms, was unable to get a significant share of the international cargo business because it was based in Northern China, a far less developed area at that time. China Eastern Airlines, which owned one MD-11F, was put in a similar position by the less developed economy in Eastern China.

China Southern might be able to benefit from the growing cargo business in the Pearl River Delta. It leased one 747-200F and one 747-400F from Atlas Air, and ordered another two factory-built 747-400Fs from Boeing. The best timing, however, was missed because China's economic geography had already substantially changed. After the mid 1990s, the spotlight of the Chinese economy was transferred to Shanghai and the Yangtze River Delta.

Economic regions

In 2003, the Yangtze River Delta's GDP was about \$300 billion, while the Pearl River Delta's was about \$150 billion. The value of foreign trade in the Yangtze River Delta was \$277 billion in 2003, 7.5% higher than that in the Pearl River Delta. The growth rate of foreign trade in the Yangtze River Delta was 56%, twice that of the Pearl River Delta. More importantly, the value of investment in fixed assets in the Yangtze River Delta is about three times that in the Pearl River Delta. This higher investment will power the Yangtze River Delta's high growth rate and prosperity for many years.

In 2004 the total cargo handled by Shanghai's two airports reached nearly 1.4 million tons, 40% higher than in 2003 and 70% higher than the total cargo handled by Guangzhou Airport and Shenzhen Airport in the south. Moreover, in 2004 the total cargo handled by the airports within the Yangtze River Delta accounted for 47.3% of all freight handled by China's mainland airports, and was 25.4% higher than that handled by the airports within the Pearl River Delta and its neighbouring provinces.

The existence of two economic growth centres gives Chinese freight carriers two opportunities. The first comes from the 677nm distance between Hong Kong Airport and Shanghai's airports, which significantly weakens Hong Kong-based carriers' threat to Chinese freight carriers. Chinese airlines can correspondingly grow their international cargo business in the Yangtze River Delta.

The second is that, with the two deltas' strong economic growth, the demand for domestic and international cargo business keeps soaring and new opportunities are unfolding.

Air China Cargo accounted for about 38% of the freight carried by all Chinese carriers in 2003. Air China has the advantage of being based near Beijing, being a joint venture between Air China and the Beijing Airport Authority, and being able to monopolise the international air freight market. It may acquire up to 10 747-400Fs over the next five years.

The development of all Chinese freight carriers, and of foreign freight carriers flying to China, is affected by the economy in the region of the two deltas, especially by their proximity to six airports: Shanghai's Hongqiao and Pudong Airports; Guangzhou Airport; Shenzhen Airport; Hong Kong Airport; and Macau Airport.

Chinese freight carriers' interest in international cargo business is also based on three other reasons.

The first is China's continuously flourishing foreign trade, which reached $1 trillion in 2004. The trade surplus keeps increasing, jumping to $21 billion in the first three months of 2005, up from $12.4 billion in the same period in 2004; a 73% increase. During the same three months, China's trade surplus with the seven largest traders in western Europe (Belgium, France, Germany, Italy, the Netherlands, Spain and Britain) rose to $12.3 billion, up from $5 billion in the same period in 2004. China's biggest exports continue to be computers, electronics and other machinery. But its exports of textiles and apparel to the US, Spain, France, Germany jumped by 78%, 92%, 90% and 88% respectively, in the first quarter since global quotas were lifted on 1st January 2005. Most of these carriers therefore target their operation at the routes from China to Europe and the US. The routes from Taiwan to mainland China via Hong Kong or Macau, however, are also busy and are profitable for freight carriers. "Mainland China and Taiwan has formed a complete industry chain, where Taiwan's companies manufacture high technology parts, such as computer chips, and China's factories with their low labour costs manufacture low technology parts, such as screens. These parts are assembled in mainland China and the completed products are exported by air to Europe and North America. This brings Air Macau great business opportunities in transporting these goods across the Taiwan Strait and to the US," explains Heieh Chao Wen, vice president of cargo at Air Macau.

The second reason for China's interest in international freight is the incentive of high profit margins. The average yield for international air freight has remained as high as $0.22 per revenue ton kilometre (RTK). Air China Cargo's average yield even reached $0.24 per RTK in 2004. By comparison, the average yield gained from domestic air cargo service declined to $0.16 per RTK in 2004 from $0.19 in 2001. Yields are about 1.6 times higher on routes from mainland China to Hong Kong and Macau than on international routes.

The third reason for Chinese freight carriers' enthusiasm for international freight is the intensified competition in the domestic cargo market. Over the past five years, more than 100 mainline passenger aircraft have been delivered to Chinese carriers, most of which have been allocated to domestic routes. These aircraft provide sufficient bellyspace to carry domestic freight.

Air China Cargo

Air China Cargo, which is based in Beijing, is a joint venture established by Air China, Beijing Airport Authority, and a third company. Air China holds 51% of the shares. The ownership structure ensures that Air China Cargo gets its freighter fleet and route network from Air China and critical support from Beijing Airport. Air China Cargo owns four 747-200Fs and leases one 747-400F. It also buys Air China's passenger aircraft bellyspace, which accounts for about half of Air China's cargo volume. Air China Cargo's freighters are mainly allocated to international routes from Beijing to Europe and the US, with an average load factor of about 71%.

Air China Cargo accounted for about 38% of the total cargo volume transported by all Chinese carriers in 2003. Air China Cargo's partly derives is advantage over its Chinese rivals from its unique geographic position. North of Beijing, there is no home freight carrier and Air China Cargo monopolises most of the international freight. Also, with the help of Air China's strong domestic route network and large passenger fleet, Air China Cargo is able to collect international cargo from Shanghai, Guangzhou and southwest China and then deliver it overseas. Air China Cargo has the disadvantage of being away from Shanghai, however, so it intends to build up a base there from which to operate flights to Japan, Europe and the US.

Air China Cargo will acquire one 747-400F and two Tu-204s in 2005, and one 747-400F and one Tu-204 in 2006. It may acquire up to 10 747-400Fs over the next five years.

China Cargo Airlines

China Cargo Airlines, a carrier based in Shanghai, is a joint venture formed by China Eastern and COSCO, a company focusing on shipping, in 1999. China Eastern holds 70% of this carrier's equity interest and China Cargo Airlines buys China Eastern's passenger aircraft bellyspace on flights from Shanghai to Tokyo, Paris and Los Angeles.

The collaboration of China Eastern and COSCO to establish China Cargo Airlines has allowed it to build up a strong presence in Shanghai. This carrier owns six MD-11Fs, which mainly fly to the US, Japan, Korea and Hong Kong. The average utilisation is about 12 hours per day. China Cargo Airlines also wet leased a 747-200F in September 2004 to fly the US routes.

In 2004, China Cargo Airlines' revenues accounted for 21.1% of China Eastern's transportation revenues. China Cargo Airlines' revenues increased by 39% from $0.36 billion in 2003 to $0.5 billion in 2004. Cargo and mail traffic

CHINA'S FREIGHT AIRLINES TRAFFIC STATISTICS & FLEET CHARACTERISTICS

Airline	Load factor	Yield ($/RTK)	Traffic growth rate	Current fleet
Air China Cargo	53.5%	0.24	20.2%	4 X 747-200F 1 X 747-400F
China Cargo	57.6%	0.29	44.6%	6 X MD-11F 1 X 747-200F
China Southern Cargo	N/A	0.22	17.5%	2 X 747-400F 2 X 737-300QC
Air Macau	N/A	N/A	240%	1 X 727F 2 X A300B4F
Shanghai Airlines	N/A	N/A	24.7%	1 X 737-300F 1 X 747-200F
Sichuan Airlines Cargo	N/A	N/A	40%	21 X A320 (pax)

increased by 44.6% from 1,297 million RTKs in 2003 to 1,875 RTKs in 2004.

In contrast to the strong traffic growth, cargo yields decreased by 4.07% from $0.30 per RTK in 2003 to $0.29 per RTK in 2004. International cargo volumes increased by 60.2% from 0.19 million tons in 2003 to 0.31 million tons in 2004, while international yields dropped by 5.32% from $0.32 per RTK in 2003 to $0.30 per RTK in 2004. Despite this decrease, yields remained 250% higher than domestic cargo yields.

Probably constrained by its ownership structure, China Cargo Airlines cannot acquire more aircraft quickly to accommodate strong growth. Hence, China Eastern Cargo acquired one A300F last year to provide an international cargo service on the routes from Shanghai to Hong Kong and Bangkok. China Eastern Cargo plans to convert its A300s and lease another two A300Fs.

China Southern Cargo

So far China Southern has owned two 747-400Fs based at Shenzhen Airport, which fly to Chicago and Belgium via Shanghai. China Southern also uses passenger aircraft bellyspace to transport cargo. Although China Southern's cargo volume reached 0.54 million tons in 2004, 17.5% higher than that in 2003, its international cargo and cargo transported to Hong Kong only accounted for 19% of its total freight volume.

China Southern's freight revenue was only $0.23 billion in 2004, equal to 50% of China Cargo Airlines' revenue and 40% of Air China Cargo's revenue in the same period. China Southern still has to resolve three issues.

The first is when to establish an independent cargo airline. Air cargo business is fundamentally different from passenger business. As a rule, when an airline's cargo business reaches a certain volume and it is operating some freighters, it should separate the business and build an independent cargo airline. China Southern has been considering doing this, although the decision was delayed by the SARS crisis in 2003.

The second issue is the number and type of freighters. Air freight relies on flight frequency to deliver reliable and punctual service. A freight carrier cannot sustain its service without the necessary capacity and frequency. China Southern obviously needs to acquire more 747-400Fs to constitute necessary frequency. China Southern Cargo wants to have 10 747-400Fs in the foreseeable future, but China Southern's finances cannot provide them. The specific number also concerns the type of freighters. China Southern has two options: one a factory-built 747-400F; and the other converted 747-400SFs. Some insiders argue that, although the investment in purchasing factory-built 747-400Fs is too big for this carrier, new –400Fs can serve longer and provide higher reliability than –400SFs, which will provide a long-term benefit. Others maintain that, considering this company's financial strength, it should select 747-400SFs.

Besides 747-400Fs, China Southern would like to convert its MD-82s to freighter to meet the demand for domestic and regional freight, even though most domestic freight is carried by passenger aircraft.

The third issue is when and how to build a base in Shanghai. So far China Southern's freighters fly from Shenzhen and stop at Shanghai airport to collect cargo before flying to Europe and the US. The cost of flying freight on the first flight leg is higher than that of passenger aircraft bellyspace. The best choice for China Southern's 747-400Fs is to fly directly from Shanghai to its overseas destination. China Southern also needs to build a base at one of Shanghai's airports to take a stake from the Yangtze River Delta's booming cargo business. It must also improve its weak maintenance capacity at Shanghai's airports before it can allocate its freighters there.

Air Macau Cargo

Air Macau began its own cargo business in April 2004. Before this the business was outsourced to an outside company, although in October 2002 it leased one 727F. Surging freight demand in the Pearl River Delta and the Yangtze River Delta, especially on the route from Shanghai to Taiwan via Macau or Hong Kong, stimulated Air Macau to re-think its competitive advantage and re-evaluate the business.

Air Macau's unique competitive edge over other freight carriers is the policy that allows it to fly directly from mainland China to Taiwan via Macau. The conditions for these de facto direct flights across the Taiwan Strait are that the flights must stop at Macau and use different flight numbers in mainland China and Taiwan. This favourable treatment means its customers can save considerable transfer time at Macau.

Another advantage comes from Air Macau's special status as the only home carrier in Macau. It has been granted traffic rights to more than 20 countries, besides 10 routes to mainland China and two routes to Taiwan. These competitive advantages justify Air Macau operating its own air cargo service.

The first strategic measure Air Macau took was to invite Hsieh Chao Wen, an air cargo veteran who has worked with China Airlines for many years, to join it as vice president of cargo. The significance of Hsieh joining Air Macau is that he provides it with the expertise and necessary network covering manufacturers in China and Taiwan.

The second measure was to lease two A300B4s to enlarge its freighter fleet. These measures increased freight volume by 240% from 5,500 tons in March 2004 to 12,300 tons in March 2005. The revenue from cargo business accounted for 20% of Air Macau's total revenue in 2004, rising from 3% in 2003.

Air Macau's next step includes acquiring one 747-400SF and enlarging its route network. The 747-400SF will join Air Macau in August and the 727F will be returned to the lessor. This carrier plans to operate freighter service from Macau to the US west coast, India, Vietnam, and Guangzhou in the near future. The flight from Guangzhou to

China Cargo Airlines is a joint venture between China Eastern and COSCO. China Cargo Airlines has six MD-11Fs which are used to fly to the US, Japan, Korea, and Hong Kong. It experienced a growth rate of 45% in in 2004, but its ownership structure constrains it from acquire more aircraft quickly.

Macau takes 40 minutes and there will be two flights per week. Meanwhile, Air Macau will use trucks to transport cargo from and to the Pearl River Delta. Since the trucks' operating cost is only one quarter of the aircraft's, the purpose of these flights is not only to collect cargo from Guangzhou Airport, but also to maintain this carrier's traffic rights from Macau to Guangzhou and firm up its presence in the south China cargo market. "When our business reaches a certain scale, we will acquire some smaller freighters to feed our mainline business," says Hsieh. Since Air Macau relies heavily on the routes from mainland China to Taiwan, a concern is whether, when direct freight flights are approved by the government on both sides of the Taiwan Strait, Air Macau Cargo can sustain its favourable status. "Direct freight flights will certainly lead more carriers to this market, but our competitive advantage will remain because both governments will require these flights to go via the Hong Kong flight information zone, rather than directly across the strait to their destinations. The itinerary is to ensure both sides' safety and avoid a sudden military assault. So these direct flights cannot significantly save the flight hours and our competitive advantage is still there," says Hsieh. It is hard to predict when the direct flights will be allowed, but the earlier Air Macau strengthens its presence, the better for it to meet the upcoming challenge.

Shanghai Airlines Cargo

Shanghai Airlines Cargo is the freight division of Shanghai Airlines. Shanghai Airlines Cargo owns a 737-300F and operates a leased 747-200F. These freighters mainly fly the routes from Shanghai to Vladivostok, Ho Chi Minh City, Macau, Shenzhen, and Dalian and other cities in China.

The most important route is from Shanghai to Macau, which connects EVA Air's routes from Macau to Taiwan. Shanghai Airlines also has the traffic rights to fly from Shanghai to Munich and will launch the service in June 2005. Air Macau will also operate freighter services from Shanghai to Hong Kong in June 2005. Shanghai Airlines also uses its passenger aircraft bellyspace to transport cargo.

In 2004, the volume of cargo and mail transported by Air Macau reached 0.19 million tons, 24.7% higher than in 2003. Shanghai Airlines will take two strategic measures to achieve traffic growth. The first is to increase its capacity by converting its 12 757-200s to freighters.

The second measure is to establish a joint cargo airline with EVA Air. These two carriers have a long-term co-operation on the Shanghai-Taiwan via Macau route. So far the two carriers have not been allowed to enter each other's home market, due to the political dispute between mainland China and Taiwan. The cargo demand on this route is so strong and profitable that the two carriers, which cannot share Air Macau's favourable status, need to collaborate and gain a competitive advantage over other rivals on this route. EVA's other attraction to Shanghai is its strong international route network. Depending on the established network, Shanghai Airlines has no need to develop its own. Thus, establishing a joint freight operation is the best choice for both carriers.

Sichuan Airlines Cargo

Sichuan Airlines, an airline based in Southwest China, has owned 21 A320s and one EMB-145, but no dedicated freighters. Constrained by its geographic position, where the economy is much less developed than in the two deltas, the airline has not launched its own international passenger and freight service. Growth in its domestic route network and passenger fleet has increased has increased Sichuan Airlines's cargo volume by 40% from 55,000 tons in 2003 to 75,000 tons in 2004. Two developments present this carrier a bright future.

The first is Sinoair's purchase of a 49% stake in Sichuan Airline Group. Sinoair, owned by Sinotrans, is a freight forwarder. "Sinoair has had a large cargo business and a strong forwarding network, but no air transport partner," says Huitao Wang, general manager, cargo, at Sichuan Airlines. "We have strong air transport capacity and a reliable domestic route network. What we need is a reliable forwarder to constitute a synergy. Now Sinoair will provide us with a strong network covering air transport and ground forwarding. No other Chinese freight carrier has such an advantage. We expect this to be a win-win situation.

"Our first step is developing the business is to redesign our air and ground route network and build a distribution centre in the Yangtze River Delta or northern China," continues Wang. "We will transport the domestic air cargo and are looking for a foreign freight carrier to transport the international cargo from there. Once our business has proven to be successful, we will consider acquiring dedicated freighters."

The second development to power Sichuan Airlines' future cargo business is its fleet planning. Sichuan's passenger numbers increased by 60% from 2.2 million in 2003 to 3.6 million in 2004. The strong growth means it will acquire more passenger aircraft, which will reach 50 A320 family aircraft within the next five years. The rapid growth of bellyspace capacity will bring Sichuan's cargo business to a new height.

The Chinese Yuan is expected to appreciate by about 5% in the near future, and this is could impact China's exports, but also increase its imports.

Small freight operators

Besides the major airlines described, China has small freight operators. These include China Postal Airlines, Yangtze River Express and Jade Air Cargo.

China Postal Airlines is a joint venture between China Southern Airlines and the China Post Office, which hold 49% and 51% of the shares in this company respectively.

The ownership structure guarantees the cheap and efficient acquisition by China Postal of aircraft from China Southern, allowing the latter to retire its old aircraft. China Postal Airlines operates Chinese domestic mail and express package services, as well as services to Osaka in Japan with two 737-300QCs and two 737-300SFs. These are aircraft converted by Pemco and leased from GECAS.

The –300QCs are operated by China Southern Airlines as passenger aircraft during the day and used by China Postal at night as freighters.

Partly due to the lack of aircraft to provide sufficient frequencies and develop a route network, China Postal cannot gain a competitive advantage over its rivals and reported a loss of $4.4 million in 2004. To restore its viability, it will enlarge its fleet, part of which will come from China Southern Airlines' current 737-300s. It has selected Israel Aircraft industries (IAI) to convert these aircraft to freighters. The first will be delivered to IAI's new partner, Guangzhou Aircraft Maintenance Engineering (GAMECO), in late 2005 and will be delivered to China Postal four to five months later.

Yangtze River Express, a subsidiary of Hainan Airlines, is located in Shanghai and operates four 737-300QCs and one 737-300SF. It also uses Hainan Airlines' passenger aircraft bellyspace to transport cargo. Besides its own business, Yangtze River Express has signed an agreement with UPS to transport the latter's express packages in China, because UPS cannot provide air services in China. Yangtze River Express's co-operation with UPS led Transair to select Sichuan Airlines to form a joint venture, which was disappointing for Yangtze River Express.

Despite the frustration, Yangtze River Express is developing its business by itself. Its latest achievement was the launching of one international route in April from Shanghai to the Philippines, which was regarded as a milestone, and might bring considerable profit. To meet the strong cargo demand, this carrier intends to acquire another 737-300F later this year.

Jade Air Cargo is a joint venture formed by Shenzhen Airlines and Lufthansa Cargo in late 2004, and is located in Shenzhen, a city neighbouring Hong Kong. Shenzhen Airlines holds 51% of Jade's shares and Lufthansa the remainder. Jade's fleet is expected to be four 747-400Fs, although its route network has yet to be disclosed.

Challenges ahead

The first uncertainty is the impact of the Chinese currency's appreciation on the air cargo business. China's currency, the Yuan, has been pegged to the US Dollar at Rmb8.27 to $1.00 for 10 years. The US Dollar has depreciated by about 30% over the past five years and the Chinese Yuan has therefore depreciated substantially, which has made commodities manufactured in China more competitive in the international market.

The strong growth of international air cargo for the above carriers can be partly attributed to the depreciation. The exchange rate and pegging policy, however, are widely expected to change in the near future and the Chinese Yuan would appreciate by about 5%. The overall impact on China's exports is unclear, but some manufacturers will be driven out of business as their profit margins shrink. Chinese freight carriers' cargo volumes might therefore fall.

On the other hand, the Yuan's appreciation may reduce import commodities' cost and stimulate imports. These carriers might carry more cargo on return flights. They are facing challenges as well as opportunities derived from the fluctuations in the exchange rate.

The second is the dramatic increase in freight airlines and freight aircraft capacity. China's airlines will acquire 50 freighters, most of which will be widebodies for international services or routes to Hong Kong and Macau.

UPS has established a distribution centre in Shanghai and Fedex is based in Guangzhou. DHL has bought a 60% stake in Air Hong Kong to develop Hong Kong as its hub. Lufthansa Cargo, Polar, Northwest and other international incumbent carriers continue to increase freight flights to China. Shanghai, Xiamen and Hainan Provinces have opened their skies to foreign carriers. Recent years have seen Chinese freight carriers' average load factor and yield decline. Can the market sustain so many players?

The third challenge is the imbalance of freight load factor on the international routes. Due to the lack of an overseas forwarding network, Chinese carriers have been suffering from the imbalance of load factor for years. The average load factor of the flights originating from China could be higher than 80%, but no more than 40% on the return flights. For example, in 2004 China Eastern's average freight load factor on the international routes was only 57.6%. Other Chinese freight carriers' load factors were at a similar level. As a benchmark, Cathay Pacific's was 68.7% and Dragonair's was 76.2% due to their large forwarding network. With international freight flights increasing, this problem will further undermine these carriers' profit margins and could stifle their long-term development. AC