

Liberalization of Air Cargo Market

Anming Zhang

Sauder School of Business

University of British Columbia

May 8, 2014 @ ICAO Montreal

Multilateral / WTO approach to liberalization

- “Annex on Air Transport Services” under GATS of WTO cover three services:
 - Aircraft repair and maintenance
 - Selling & marketing of air transport services
 - CRS (computer reservation system) services
- Annex excludes “traffic rights”, which are governed by bilateral air services agreements (ASAs)
- The GATS principals:
 - MFN
 - National Treatment

- Extend the Annex of GATS to all-cargo service and express delivery service?
- Debate:
 1. Whether air-cargo rights should be separated from passenger rights?
 2. Whether air cargo be liberalized first – ahead of air passengers – through GATS of WTO (i.e. multilateral approach)?

Regarding 1st question: Different operational needs of cargo and passengers

- Air cargo vs. passengers:
 - Directional inbound/outbound imbalance
 - Circular routing patterns
 - Different sets of preferred traffic rights between air cargo and passengers
 - **On costs: express cargo business exhibits the “economies of size” (which is not the case for passengers business)**
 - Global air-cargo trends
 - Emergence of express carriers and integrators (JIT pressures, e-commerce, etc.)
 - Carriers focus on a few key cargo routes
- Implication for policy: separation of air cargo and passenger traffic rights

Regarding 2nd question: Difficult at WTO level, due to different markets

- **E.g. US air-cargo market is characterized:**
 - Separation of passenger and cargo airlines
 - Extensive road and rail transport networks
 - Air cargo “equals” express cargo
- **By contrast, in Asia ...**
 - Road and rail not applicable
 - Longer journeys
 - Wide-bodied passenger aircraft → “Joint production” of passengers and cargo
- In Asia, passenger carriers won't gift cargo business to dedicated cargo carriers, as in US – **Asian carriers rely too heavily on cargo revenue**

Cargo share of total revenue (%): selected Asian &US passenger carriers

| | <u>1999</u> | <u>2012</u> |
|---------------------------|-------------|--------------|
| Korean Air | 27.2 | 27.4 |
| Singapore Airlines | 23.0 | 22.4 |
| Cathay Pacific | 26.4 | 26.1 |
| China Airlines | 33.7 | 32.0 |
| EVA Air | 39.6 | 34.3 |
| Thai Airways | 16.5 | 13.4 |
| | | |
| United | 5.2 | 3.0* |
| American | 4.0 | 3.0 |
| Northwest | 7.0 | 3.0** |
| Delta | 4.0 | 3.0** |
| Continental | 3.5 | 3.0* |

* United Continental

** merged Delta-Northwest

Source: Annual reports of airlines

Policy implications:

- Air cargo liberalization: More likely to be successful bilaterally/regionally than at WTO level
- 3rd/4th Freedoms: esp. for a few key cargo markets, e.g., Asia-North America
 - Bilateral “open skies” on air cargo → much progress has been made over the last decade
- 5th/7th Freedoms a determining issue for express carriers
 - Some recent bilateral ASAs include 5th/7th Freedoms for air cargo

- Separation of cargo from passenger services: a trend?
 - about 60% on freighters (vs. about 30% in the 1980s)
 - 100% cargo screening for passenger aircraft (but not for freighters) after “9-11”
 - Cargo share of total revenue declining for passenger carriers

If so, this will have a significant impact on policy and air cargo liberalization

My recent study “**Empirical estimation of price and income elasticities of air cargo demand: The case of Hong Kong**” (with W. Lo and S. Wan) 2014

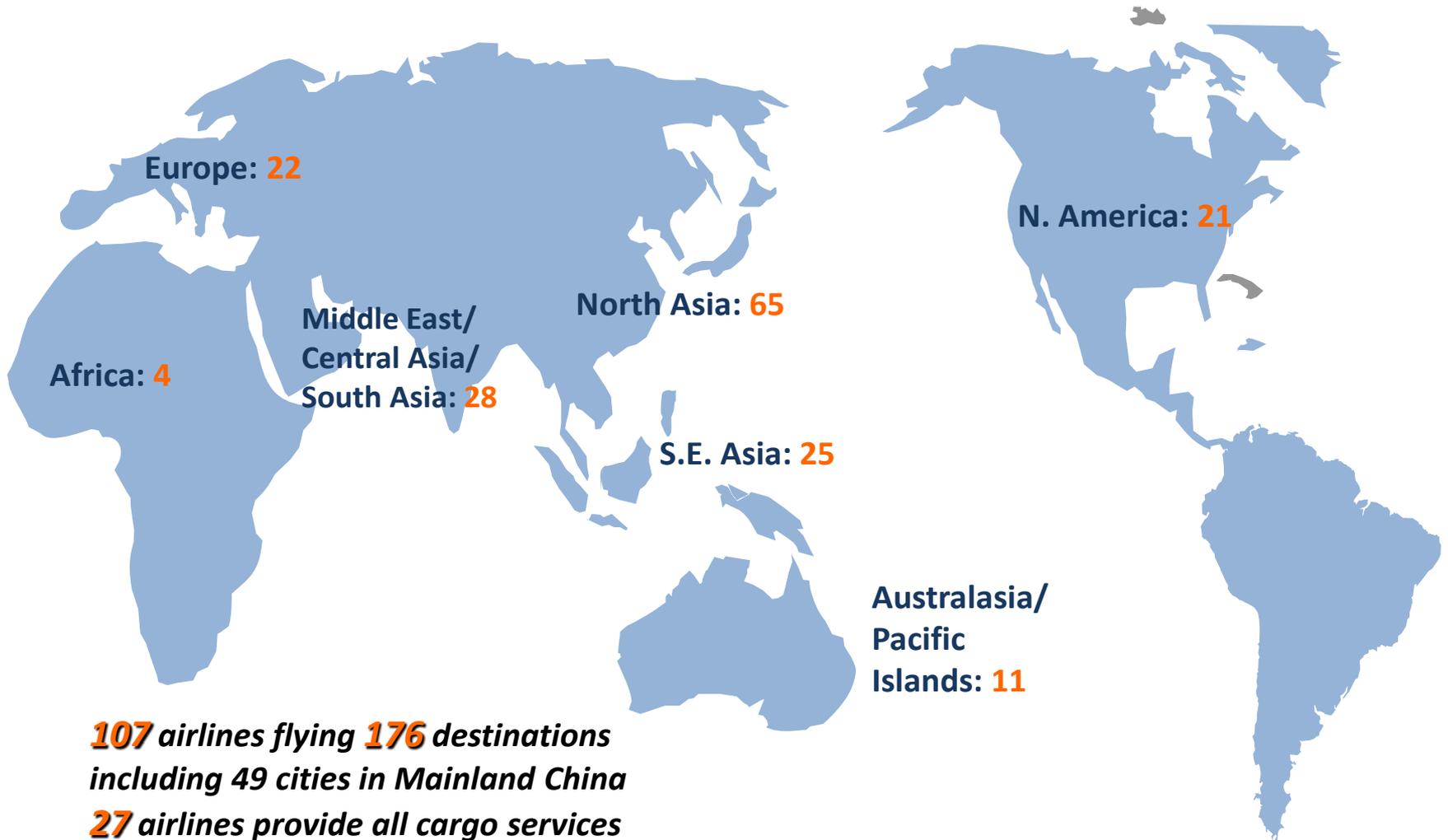
Motivations for the study

1. Hong Kong: the busiest cargo airport with high growth
2. The high growth is connected to mainland China, who has seen liberalization of air cargo market (also interesting by itself)
3. Knowledge on the price and income elasticities has important managerial and policy implications

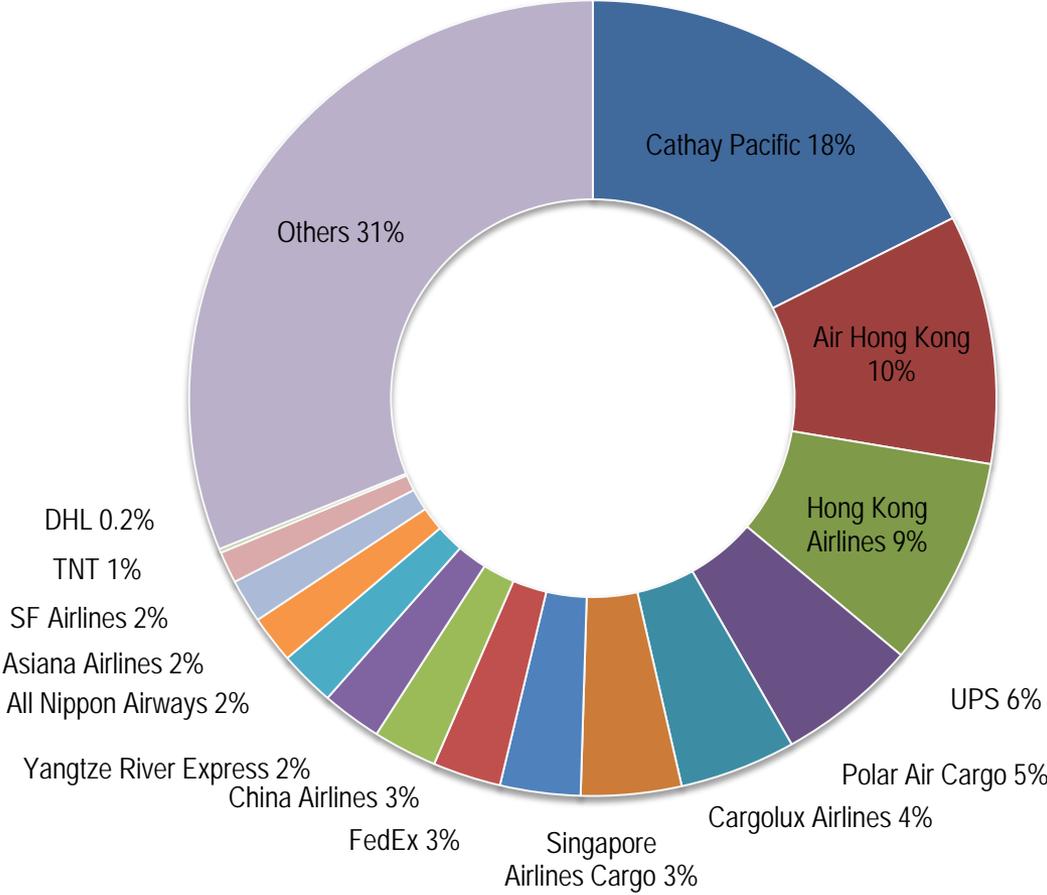
World's busiest cargo airports, 2012

| Airport | Tonnes (million) | % yoy growth | Airport | Tonnes (million) | % yoy growth |
|--------------------|------------------|--------------|----------------------|------------------|--------------|
| 1 Hong Kong (HKG) | 4.06 | 2.2 | 11 Miami (MIA) | 1.93 | 4.9 |
| 2 Memphis (MEM) | 4.02 | 2.5 | 12 Singapore (SIN) | 1.84 | -3.0 |
| 3 Shanghai (PVG) | 2.94 | -5.3 | 13 Beijing (PEK) | 1.79 | 6.0 |
| 4 Incheon (ICN) | 2.46 | -3.3 | 14 Los Angeles (LAX) | 1.77 | 3.7 |
| 5 Anchorage (ANC) | 2.45 | -3.7 | 15 Taipei (TPE) | 1.58 | -3.1 |
| 6 Dubai (DXB) | 2.27 | 3.1 | 16 London (LHR) | 1.56 | -0.7 |
| 7 Louisville (SDF) | 2.17 | -0.9 | 17 Chicago (ORD) | 1.51 | -3.0 |
| 8 Paris (CDG) | 2.15 | -6.5 | 18 Amsterdam (AMS) | 1.51 | -2.4 |
| 9 Frankfurt (FRA) | 2.07 | -6.7 | 19 Bangkok (BKK) | 1.35 | 1.8 |
| 10 Tokyo (NRT) | 2.01 | 3.1 | 20 New York (JFK) | 1.28 | -5.5 |

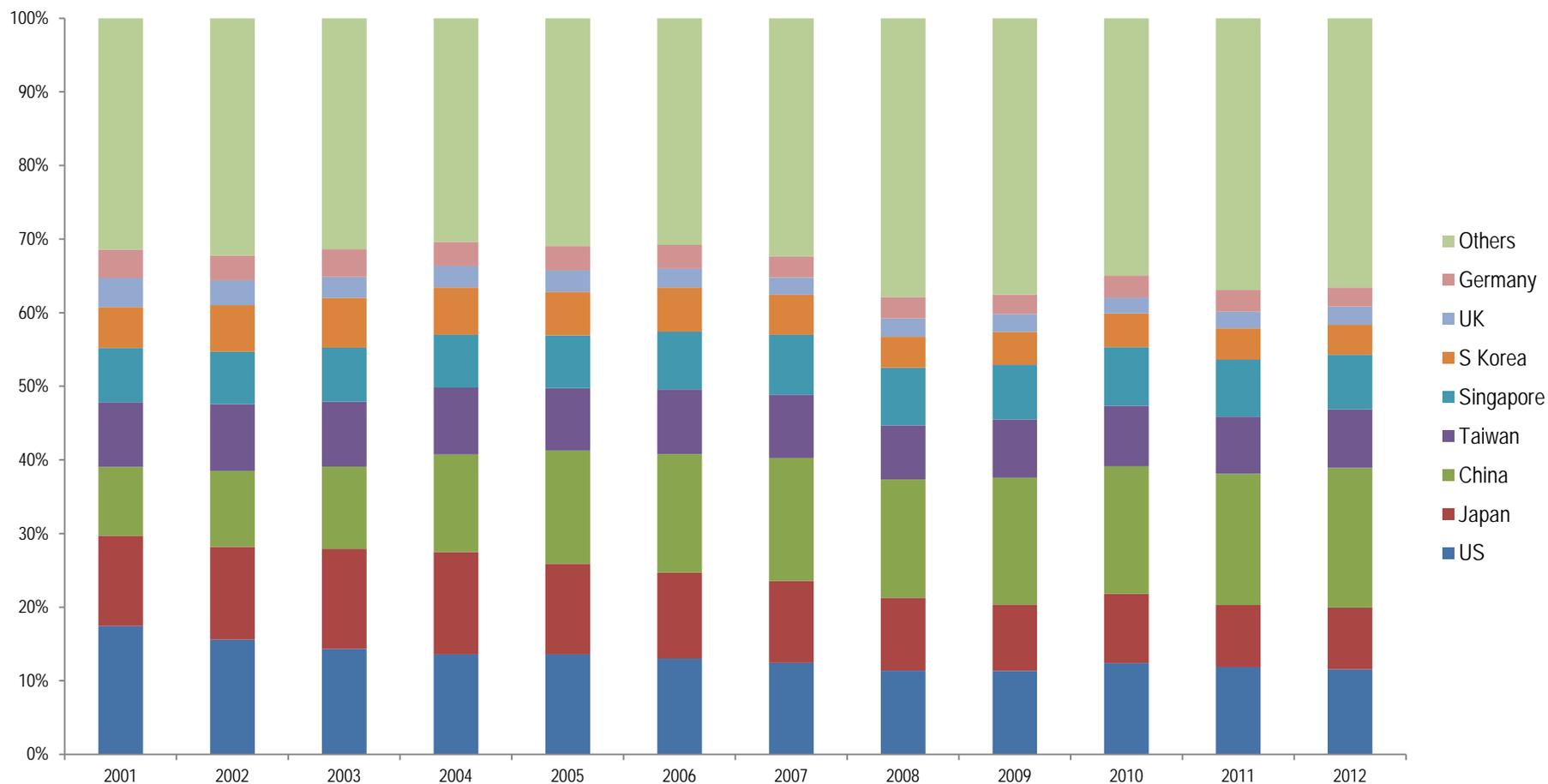
Network coverage in 2013



Cargo schedule departing HKIA by major carrier (as of week 23–29 November 2013)



Trade value by air of Hong Kong (by trading partner) 2001-2012



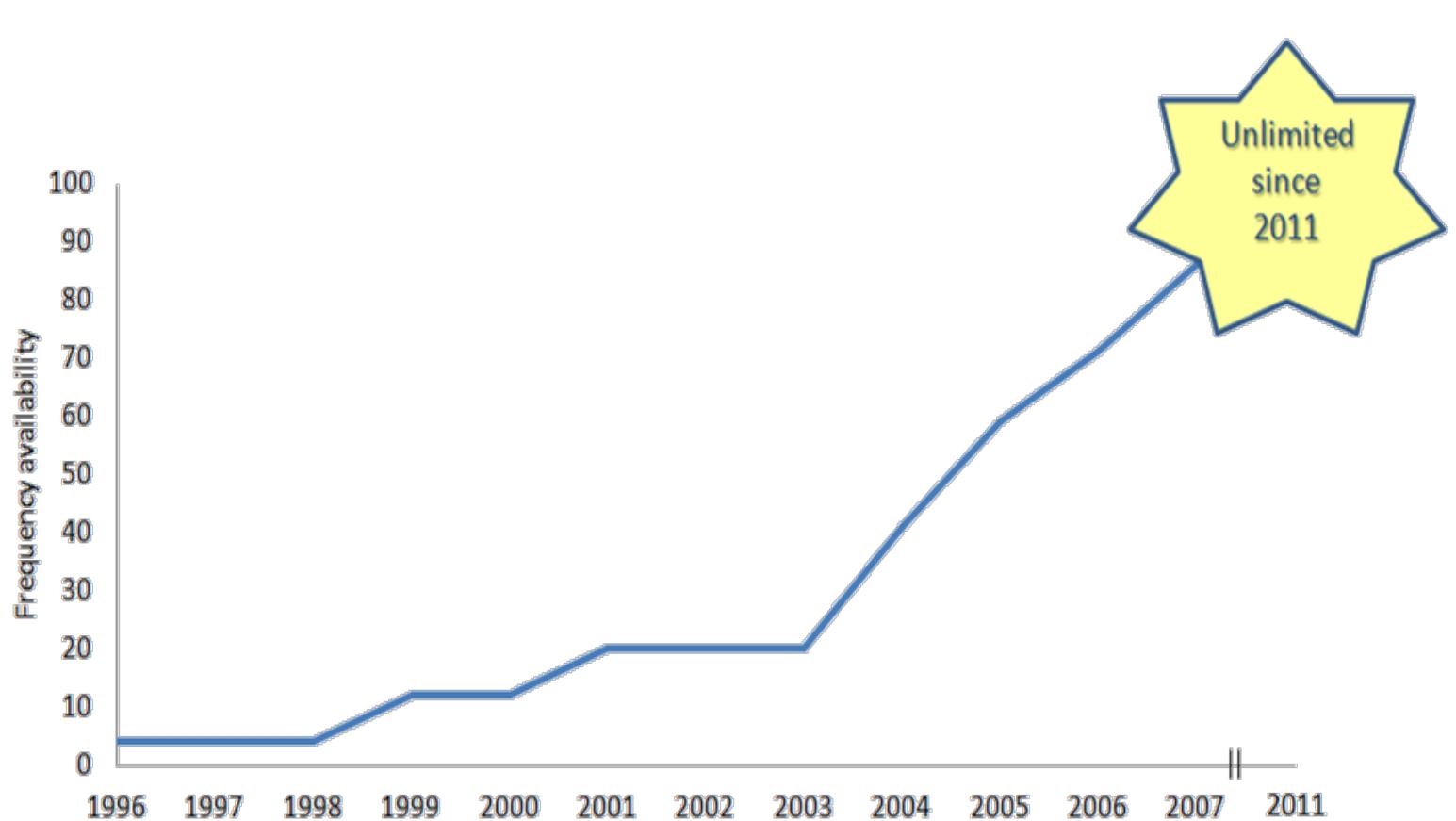
Mainland China

- China's market has progressively opened to Hong Kong, since the Mainland and Hong Kong signed "Closer Economic Partnership Arrangement" (CEPA) in mid-2003
- Trade value by air between two sides have recorded double-digit growth for five consecutive years
- The contribution of China to Hong Kong's trade by air grows from 9% in 2001 to 19% in 2012
(while the contribution of Hong Kong's other two major trading partners, US and Japan, has been decreasing, esp. after the 2008 financial crisis)

Entry barriers on **China's air-cargo industry** have been progressively relaxed since her 2001 WTO entry:

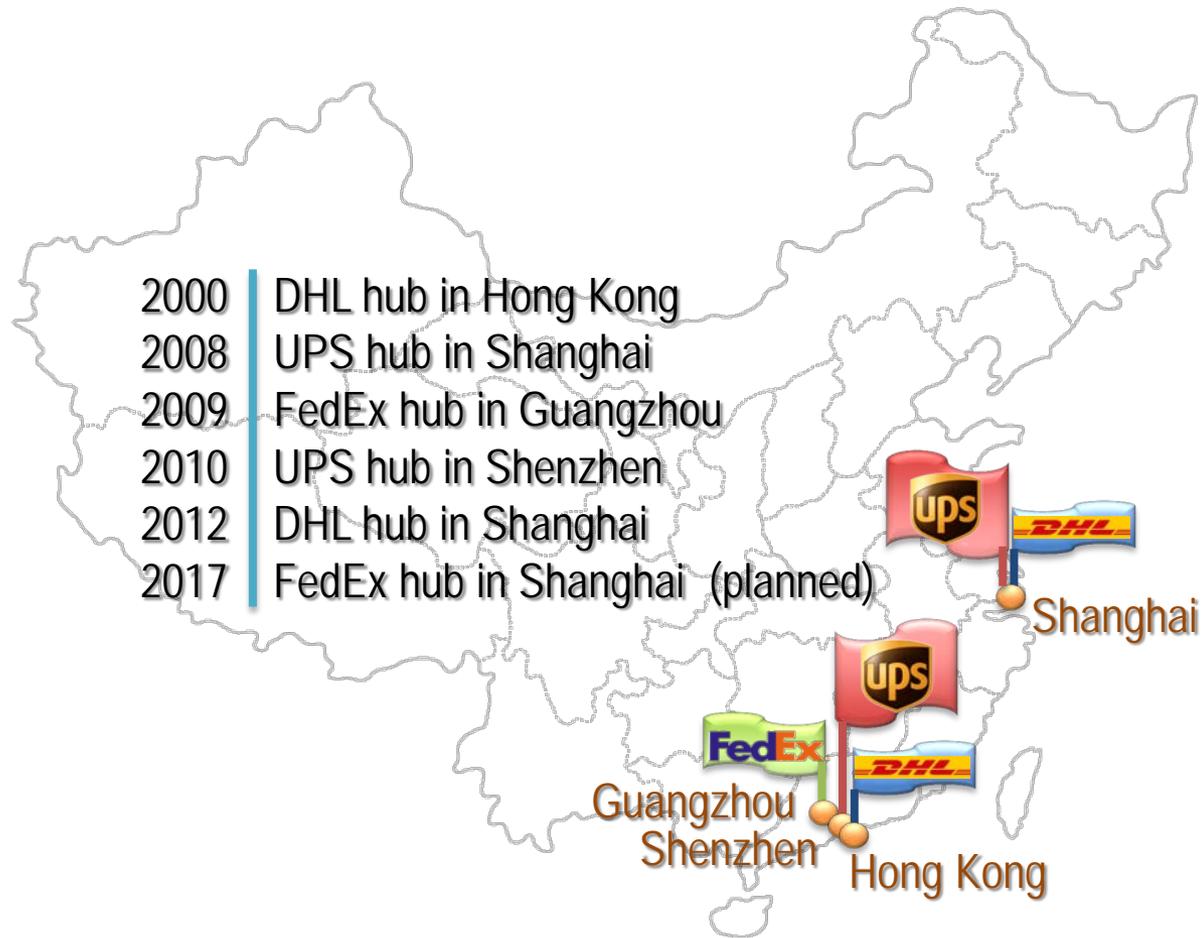
- First, according to the 2002 regulation, foreign investors have been allowed up to a 49% stake in a Chinese company (vs. 35% in 2002). Foreign investment on ground transportation handling has been allowed
- Second, China has expanded ASA with overseas counterparts. **China and US signed ASA** in 2004, which stipulated a phased increase in weekly frequencies and the number of airline operators through 2010. In 2007, the two countries signed another ASA to eliminate all limits on cargo flights and cargo carriers by 2011

China-US air cargo flight frequency availability for each country



- Cargo liberalization ahead of passenger liberalization: Grant 5th/7th freedoms and hence transshipment hub, provided the hub carrier maintain sufficient number of flights: e.g.
 - e.g., relocation of FedEx's Asian hub from Subic to Guangzhou

Hubs of global integrators in China



Source:

<http://www.pressroom.ups.com/Fact+Sheets/UPS+China+Fact+Sheet;>

http://info.hktdc.com/shippers/vol31_5/vol31_5_AIR03.htm;

<http://news.van.fedex.com/fedex-asia-pacific-hub-guangzhou-china;>

<http://www.aircargoworld.com/Air-Cargo-News/2012/10/fedex-express-to-build-100m-shanghai-hub/2510322> &

http://www.dhl.com/en/press/releases/releases_2012/express/071212.html

China's air cargo market

- 15% annual growth in cargo since 1978
- In 2008, while world's air cargo traffic fell, Chinese cargo saw positive growth
- Development of air cargo services across the interior of China was slow in developing, but has become non-negligible businesses
- Foreign joint ventures (JVs) to set up all-cargo carriers encouraged: e.g. Air China/Cathay Pacific cargo JV in 2010 (earlier JVs: Jade; Yangtze)
- Chinese carriers' share of international cargo fell:
 - 44% in 2000
 - 18% in 2007
 - 10% in 2012

Revisit: Demand elasticities for air cargo transport

| Literature | Price elasticity [#] | Income elasticity [#] | Methodology | Data |
|--------------------------|--|--------------------------------|--|---|
| Wang et. al. (1981) | -2.40* – -0.84 | 1.35* – 2.74* | Box-Cox transformation procedure | Domestic air cargo demand in the US (1950 – 1977) |
| Oum, et al. (1990) | -1.60 to ^{***} – -0.82 ^{***} | - | Literature review | - |
| Jiang, et al. (2003) | - | 1.536 ^{***} | Trend analysis | Air cargo carried by Chinese airlines (1990 – 2002) |
| Hwang and Shiao (2011) | -0.26 ^{**} – -0.21 ^{**} | -0.22 ^{**} | Fixed effect models | Selected air cargo routes in Taipei (2004 – 2007) |
| Chi and Baek (2012b) | -5.60* | 9.35 | Fully-modified ordinary least square model | Domestic air cargo demand in the US (1996 – 2010) |
| Yao and Yang (2012) | - | 0.77 – 1.12 ^{**} | Generalized error correction method | Air cargo demand in 31 provinces in China (1995 – 2006) |
| Lo, Wan and Zhang (2014) | -0.57* – -0.36 ^{**} | 0.39* – 1.16* | Demand-supply eq'm structure estimation | Air cargo demand in Hong Kong (2001Q1 – 2013Q2) |

* Significance at the 0.05 level; ** Significance at the 0.01 level; *** Not specific significant level

Results on price and income elasticities of air cargo demand

- Not very price sensitive: transit time and reliability are also important to shippers
- A “pro-cyclical” pattern
- Post-2008 crisis: (absolute) values become larger in magnitude for both the price and income elasticities

Implications: Challenges

- Future air traffic growth, while uncertain, may not be as robust as expected a few years ago
- Intra-regional trade and production relocation activities may see a decelerated trend, so-called “reverse global manufacturing” (re-shoring, on-shoring)
- Combined with more elastic price → pressure on yield
- A “pro-cyclical” demand pattern → Challenges to the industry

Liberalization strategies for air cargo

- Simplify customs procedures while satisfying security and safety requirements
 - e.g., documentation & procedures for transit cargo
- Remove customs & administrative barriers: e.g.
 - Regulatory barriers in ancillary areas
 - Open ground handling rights
- Liberalize 5th/7th Freedoms in air-cargo traffic right
- Consider multi-sector approach: e.g.
 - Tie air-cargo liberalization with free-trade agreement
 - Make connections with maritime and intermodal transport liberalization