



Chapter 8 Air Transportation

Book: International Logistics: Global Supply
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Outline

- Air transportation
- Airplanes and aviation equipment
- Air cargo operations
- Aviation economics
- Aviation regulation
- Managing air carriers



1. Air Transportation

- Maritime industry is noted for its long history and tradition, the air transport industry is recognized for its newness and innovation.
- 34% of world trade, by value, is moving by air.
- Cargo characteristics: high value, low density, get somewhere fast



1. Air Transportation

○ Brief history

- 1903 the Wright brothers invent the first plane at Kitty Hawk
- 1909 first international flight - across the English Channel
- 1918 first regular airmail route – New York City/Washington DC
- 1944 Chicago Convention: International Civil Aviation Organization (ICAO) established
- 1946 Bermuda Conference: International Air Transportation Association (IATA) established



1. Air Transportation

- TIACA (The International Air Cargo Association)
- Reason for the growth in air cargo
 - Deregulation and liberalization of the air cargo industry
 - Global interdependence helped by world trade agreements
 - International production and sales of goods and services
 - New inventory management concepts such as JIT and Zero stocks
 - New air-eligible commodities
 - The vast development of high value and limited time-consumable commodities



1. Air Transportation

- Air transportation for business was first developed for mail service
- The industry then evolved into passenger service with air cargo as only a sideline
- Unlike ocean shipping, there is considerable mixing between passenger transport and cargo transport
- Air cargo industry vs. air logistics industry
 - Air cargo only refers to the air portion of the journey
 - Air logistics manages the door to door delivery



2. Airplanes and Aviation Equipment

- Airplanes used in air cargo are essentially the same as for passenger traffic
- Planes cost billions of dollars to research, design, and build. The technical demands of flight also limit the possibilities of what a plan can do, whereas ships come in a wide variety of designs.



2. Airplanes and Aviation Equipment

- “air cargo” is carried in a few ways, not always by air
 - Bellyspace
 - Flexbelly
 - Freighter
 - Truck



2. Airplanes and Aviation Equipment

- Air transport characteristics
 - Quicker and smoother than land or sea travel
 - Less transport-related stresses
 - Less packaging is needed (save expense)
 - Less insurance expense
- Airplane manufacturing is one of the most concentrated industries in the world.
 - Only two major companies for large planes: Boeing, Airbus
 - Only couple more for smaller planes: Fokker
- Trend in aircraft manufacturing industry
 - Little incentive for faster planes
 - Asking for fuel-efficient, reduce labor costs, operate more quietly



3. Air Cargo Operations

- Two types of carriers
 - Airlines carry cargo as a sideline
 - Dedicated air cargo carriers
- Four major air cargo markets (3/4 of total)
 - North Atlantic
 - Transpacific
 - Europe-Far East
 - US domestic



3. Air Cargo Operations

- Air cargo carriers have evolved into three forms
 - Integrated carriers: FedEx, UPS
 - Scheduled carriers
 - Charter carrier



3. Air Cargo Operations

- Cargo and passengers have different characteristics
 - People do not follow the same paths as cargo
 - Passenger seasonal traffic have very little correlation to cargo traffic seasons
 - Traffic balance is entirely different for passengers as cargo



3. Air Cargo Operations

- Air cargo containers
 - Very different from that used for other modes of transport
 - Intermodal container is tough, designed for bad weather and rough handling
 - Air cargo containers, need to be lighter
 - Intermodal-size containers for air cargo are only used on freighters.



3. Air Cargo Operations

- Four distinct markets in air cargo
 - Mail
 - normally the monopoly market of the official postal service in a given country
 - defined by the size of the letter.
 - Express transportation
 - defined by FedEx
 - emphasis on speed
 - The package is promised to be delivered at a certain time
 - Courier
 - An extension of air express
 - Courier service means either same day service or next flight out
 - The package requires that someone fly with it
 - Freight
 - Covers every thing else that moves air cargo
 - Is mostly the larger package that would be too expensive to be sent air express



3. Air Cargo Operations

- An air cargo company needs to set up its operations one way for international service, yet customers on both sides can have very different expectations
- An air express carrier can only provide international service by organizing its operations to meet the needs of one market or the other
- Tailoring its service to both can be difficult and inefficient



3. Air Cargo Operations

○ Security

- Is a major concern
- Luggage can be associated with a specific passenger, cargo flies without anybody
- Concept of “Known Shipper”
 - A person that can be held responsible for their shipment
- Hazardous cargo
 - Highly restricted if it moves by air
 - Rules concerning the transport of hazardous goods are developed by the ICAO, but need to be controlled and enforced by national law



3. Air Cargo Operations

- Trucks for an air cargo carrier
 - Bring the cargo from the shipper to the airport
 - Bring the cargo from the plane to the ultimate destination
 - Air carriers may choose to place cargo on a truck for a trips under 500 miles
 - Most common is to use trucks to deliver cargo to the consolidation airport



3. Air Cargo Operations

- Interline agreements
 - Air cargo companies can provide service into a market it does not fly to
 - May need partnership



4. Aviation Economics

- Two major factors influence the growth of the air cargo market
 - Economic conditions
 - Rate levels
- Yield management
 - The way an air carrier gets the maximum amount of revenue from each unit (passenger or cargo) carried



4. Aviation Economics

- Air cargo rates are determined by the following factors
 - Volume of traffic
 - Direction of traffic
 - Characteristics of the traffic
 - Value of the service
 - Competition



4. Aviation Economics

- Types of rates
 - Specific commodity rates
 - Usually lower than standard rates
 - Exception rates
 - Usually higher than standard rates
 - Priority reserved rates
 - Usually higher than standard rates
 - Speed package rates
 - Usually higher than standard rates
 - Container rates
 - may or may not be adjusted depending on the commodity



4. Aviation Economics

- Dimensional weights
 - Consider both weight and density
- Stacking losses
 - The problem of irregular shapes
 - Means space is being wasted

4. Aviation Economics

○ Top 20 air freight carriers

Carrier	Tons (000s)	Carrier	Tons (000s)
1. FedEx	2,796	11. Singapore	467
2. UPS	997	12. Delta	459
3. Lufthansa	794	13. Emery Worldwide	454
4. Japan Air Lines	710	14. British Airways	442
5. Korean	649	15. Burlington Air	430
6. American	604	16. Airborne	397
7. Air France	571	17. Cathay Pacific	395
8. United	536	18. All Nippon	390
9. Northwest	495	19. Air Canada	344
10. KLM	478	20. DHL	301



5. Aviation Regulation

- International Air Transport Association (IATA)
 - Represents the airlines. Its members are only carriers
 - Used to fix prices up until US deregulation
 - No longer involved in price management
- International Civil Aeronautics Organization (ICAO)
 - UN agency, deals with civil aviation issues
 - Agency that brings government representatives together to organize a common set of regulation
 - Mostly include technical standards, safety standards, and to a lesser degree business standards



5. Aviation Regulation

○ Bilateral

- Every scheduled flight (passenger and cargo) that moves between two countries needs to be agreed upon in advance in a treaty between the two countries
- A treaty between two countries, not between any airlines
- A bilateral is a very long and detailed agreement on what rights each country gives each other in regards to airline service



5. Aviation Regulation

- Freedoms of the air
 - Five Freedoms agreement
 - First freedom, overflight
 - Second freedom, service stops
 - Third freedom, passenger deliver
 - Fourth freedom, repatriation
 - Fifth freedom, oncarriage
 - Several other "freedoms" have been added, although they are not officially recognized under international treaty
 - Sixth freedom, cabotage
 - Seventh freedom, cargo



5. Aviation Regulation

- Mirror effect
 - When new routes are agreed upon. That route goes from having no service to two airlines at the same time
 - There is a big jump from no capacity to two airlines
- Charter flights
 - A charter is a one-time flight and not part of a routine schedule
 - It needed to be for an affinity group



5. Aviation Regulation

- Airline Deregulation Act, 1978, US
 - Allow airlines to operate whatever routes (domestically) they wanted, and charge whatever they wanted
- Open Skies Agreements
 - Bilaterals that were very liberal to promote competition in international flights
 - Asia have been remarkably liberal in their competition policies
 - The worse cases for liberalization is China, has most dangerous airlines in the world
 - North Korea has also not embraced the open skies approach



6. Managing Air Carriers

- Rapidly growing in air cargo for a few reasons
 - Increased demand for premium service
 - Increased service
 - More competitive service
 - Carrier integration



6. Managing Air Carriers

- Competition among the different modes of transport
 - between air and sea
 - The competition is not very strong
 - a very large difference in the cost and service provided by the two
 - between air and trucking
 - More competition
 - Air cargo is sometimes trucked if the distance is not too great
 - Between non-transportation industries
 - Fax and internet
 - Main threat to air express, mail, and courier services



6. Managing Air Carriers

- Alliance

- A trend in the passenger airlines toward alliances
- The biggest one is the Star Alliance
- Alliances improve service by increasing the number of destinations while dealing with only one carrier
- Air cargo does not seem to have benefited from these alliances
 - Maybe that cargo moves mostly point to point, so the interline agreements that passengers enjoy are of no value to the cargo shipper