

The Economics of Freight transport

EE 382

- Freight transport has been operating in one of a world of continually rising real incomes and increasing levels of globalization
 - This section examines the impact that these and other factors have had upon the main modes of freight transport
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- Road haulage
 - Rail freight
 - Air freight
 - Maritime shipping
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Road haulage

- Market segments
 - Cost structures
 - Economies of density
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Market segments

- **Truck load**
 - is characterized by a very high number of small firms that operate local haulage services or point-to-point carriage over longer distance
 - The market sector tends to be dominated by small companies with a high proportion of one person owner-driver operations
 - **Less than truck load (LTL)**
 - Operates at an international level
 - A large part of the LTL sector is the parcels or small packet market
 - requires a nationwide network of depots and local collection/delivery services
 - Loads for longer distance carriage are assembled at the depot and made up into full consignments
 - Then sent to the depots in other parts of the country where they broken into local loads and added to other longer-distance loads coming from other parts of the country
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Cost structures

- The main fixed costs are license fees for vehicles, property taxes, management salaries and the cost of terminals, which is the highest capital cost related to the vehicle
 - Comparison to other modes such as the railways or air freight the cost is relatively low
 - Variable costs include wages, depreciation, maintenance, fuel, lubricants and some marketing costs
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Economies of density

- Density relates to the size of the vehicle
 - Due to the high proportion of variable costs in the operation of road haulage, the MC of operating a larger lorry will be relatively small in terms of the additional operating and capital costs
 - Cost per ton carried – if larger trucks are operated the cost per vehicle km will increase; however if fully laden the cost per ton carried should fall
 - Reduce average costs through economies of density
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Rail freight

- Barriers to entry
 - Cost structures
 - Economies of scale and scope
 - High break-even point
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Cost structures

- High level of capital costs
 - Variable and MC tends to be relatively low
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Economies of scale and scope

- Significant economies of scale in railway operation due to the high level of fixed costs
 - Economies of scope
 - the unit cost is reduced due to common costs being spread across two or more outputs
 - Passenger and freight trains can share the same track, which spreads the fixed costs of the track across both types of operations
 - As a consequence a lower unit costs for each type of service is achieved than if either one was operated on its own
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High break-even point

- If fixed costs are very high then it follows that a large volume of output (freight services) must be sold before any profit is made at all
 - This may suggest that a profit can only be achieved if there is only one firm in the market – natural monopoly
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Advantages

- Environmental impact
 - Distance
 - Capacity
 - Power costs
 - Weather constraints
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Disadvantages

- Accessibility
 - Shipment size
 - Security
 - Frequency
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Key issues facing rail freight

- The industry has been facing falling or stagnate freight tonnage
- Passenger oriented rail networks
- Lack of harmonization of standards, regulations and standards in the EU
- Structure economic change

Air freight

- Structure of air freight industry
- Market shares
- Air freight key economic characteristics

Structure of the air freight industry

- Line haul operators
 - Only move cargo from airport to airport, relying on third parties in the form of freight forwarders and consolidators to deal directly with customers and cater for their overall requirements
- All cargo operators
- Combination passenger and cargo operators
- Passenger only operators
- Integrated operators
 - Door-to-door consignment market
 - UPS, Federal Express, DHL
- Niche operators

Market shares

10 Largest air freight carriers, revenue ton kilometers, 2001 and 2004

Operator	2001	2004
FedEx Express	11	14.6
Korean Air	5.6	8.3
Lufthansa Cargo	7.1	8
United Parcel Service (UPS)	5.9	7.4
Singapore Airlines Cargo	4.9	7.1
Cathay Pacific	n/a	5.8
China Airlines	n/a	5.6
EVA Airways	n/a	5.5
Air France	5.1	5.4
Japan Airlines	4.2	4.9

Source: Cowie J. (2010). Compiled from IATA statistics

Air freight –key economic characteristics

- Goods in joint supply
- Barriers to entry
- Firm size
- Price and non price competition
- Yield management
 - Uncertain capacity
 - Three dimensional capacity
 - Itinerary control
 - Allotments

Advantages

- Shorter journey times
- Faster journey times
- Can be used in an emergency
- Lower the costs of storage and distribution in the country of sale

Disadvantages

- High charges
- Limitation on capacity
- Congestion around airports
- Per ton kilometer transported air freight has the highest detrimental impact on the environment

Maritime shipping

- Market segments
 - The international organization of shipping
 - Economies of scale
 - The shipping business cycle and the shipping risk
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Market segments

- Inland shipping
 - Coastal shipping
 - Short sea shipping
 - Deep sea shipping
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The international organization of shipping

- International Maritime Organization (IMO)
 - Provide the machinery for the co-ordination and co-operation of government regulations in international shipping with the aim of achieving the highest standards possible in terms of safety and efficiency in navigation
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Economies of scale in shipping

- Economies in manufacturing – associated capital costs of vessels
 - The operation of vessels – where operating costs do not rise proportionally with the size of the vessel
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Reference

Cowie J. (2010). The Economics of Transport. Routledge.
