PORT PRICING ISSUES

Considerations on Economic Principles, Competition and Wishful Thinking

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"Existing pricing structures often suffer from trying to satisfy confliciting objectives – economists, port authorities, governments and port users will have different views on what constitutes an efficient port tariff" (Pettersen-Strandenes and Marlow, 2000)

INTRODUCTION

- **Pricing by ports and operators within ports is historically determined**
- **A complex and untransparant matter**
- **Sometimes perceived as archaic**
- **A strong debate**

CONTENT OF THE PAPER

- **Definition of a port, port services and transhipment**
- **Scientific literature on port pricing**
- **Some empirical aspects**
  - * **Pricing practice**
  - * **Price elasticity**
  - * **Marginal port call costs**

IMPRINT'S OBJECTIVES

"develop recommendations for how to implement transport pricing reform based on the principles of marginal cost pricing"

THE PORT PRODUCT

- A chain of consecutive links, while the port as a whole may itself be seen as a link in a global logistics chain
- Port costs account for only a fraction of the total costs associated with the logistics chain
- The prototypical port does not exist

EVOLUTIONS IN PORT MANAGEMENT

- **Consequence of:**
  - *** technological change**
  - *** socio-economic environment**
- **Continuing trend towards more automation and technological innovation**
- **More capital intensive**

GROWING PORT COMPETITION

- **No longer a competition between individual ports, but between logistics chains**
- **Incentive to cut port dues and to offer financial compensation**
- **Ever-increasing investments in additional capacity**

GREATER EC INTEREST

- **Port access: no abuse of a dominant position**
- **Competition between ports may be restricted neither directly nor indirectly**
- **Avoid excessively high or discriminatory tariffs for handling, pilotage and towage**
- **Investments in infrastructure must be accessible to all users, without discrimination and/or preferential treatment**

CONCLUSION ABOUT 'PORTS'

- **Extremely hetereogeneous environment**
- **Many different market players**
- **Many of whom have conflicting interests**
- **The 'port product' is complex and untransparant**
- **Competition has increased strongly**

PORT PRICING

- Three cost items of a port call
  * Cargo handling
  * Time in ports
  * Port dues and charges
- Pricing principle: tariffs based on the short-run marginal cost
- A need for a detailed study of port pricing

Table 1: Port players and their possible objectives

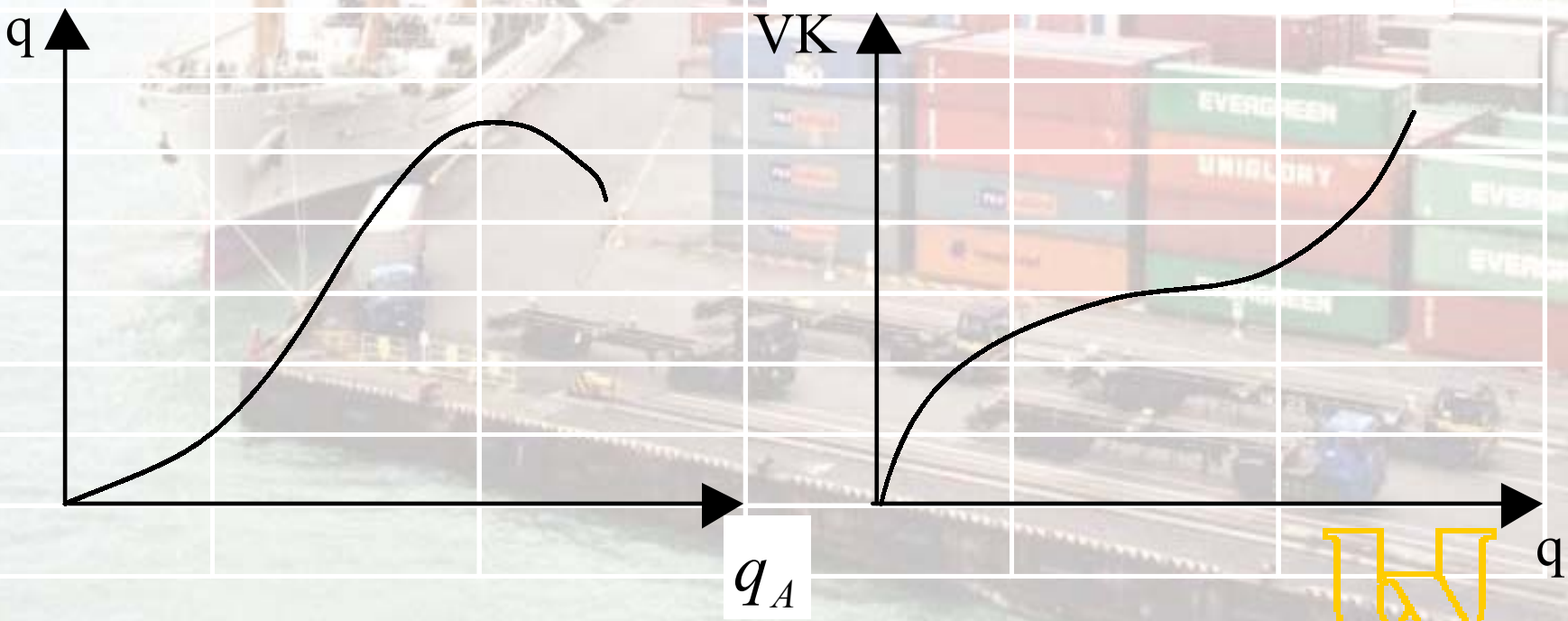
Port Player	Possible Objectives
Government	**Efficient management of assets**
Economists	**Minimising the welfare losses**
Port authorities	**Maximising throughput** **Maximising value added** **Maximising employment**
Users	**Transparency of charges** **Prices should reflect the costs of the services**

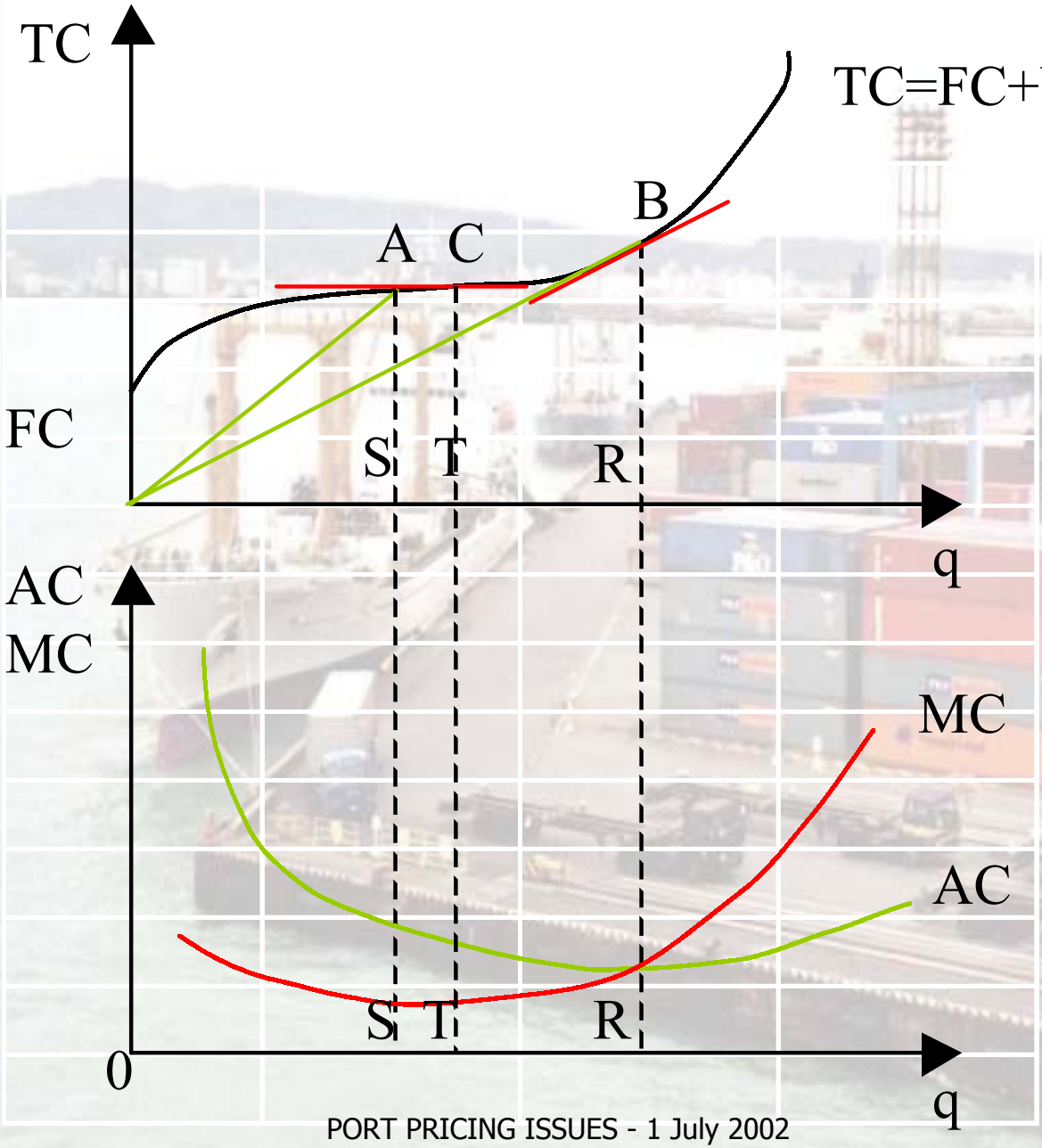
Source: based on Suykens and Van de Voorde (1998) and Pettersen-Strandenes and Marlow (2000).

MARGINAL COST PRICING: THEORETICAL ISSUES

- Short term costs: $TC(q) = p_L q_L + p_C \overline{q_C}$

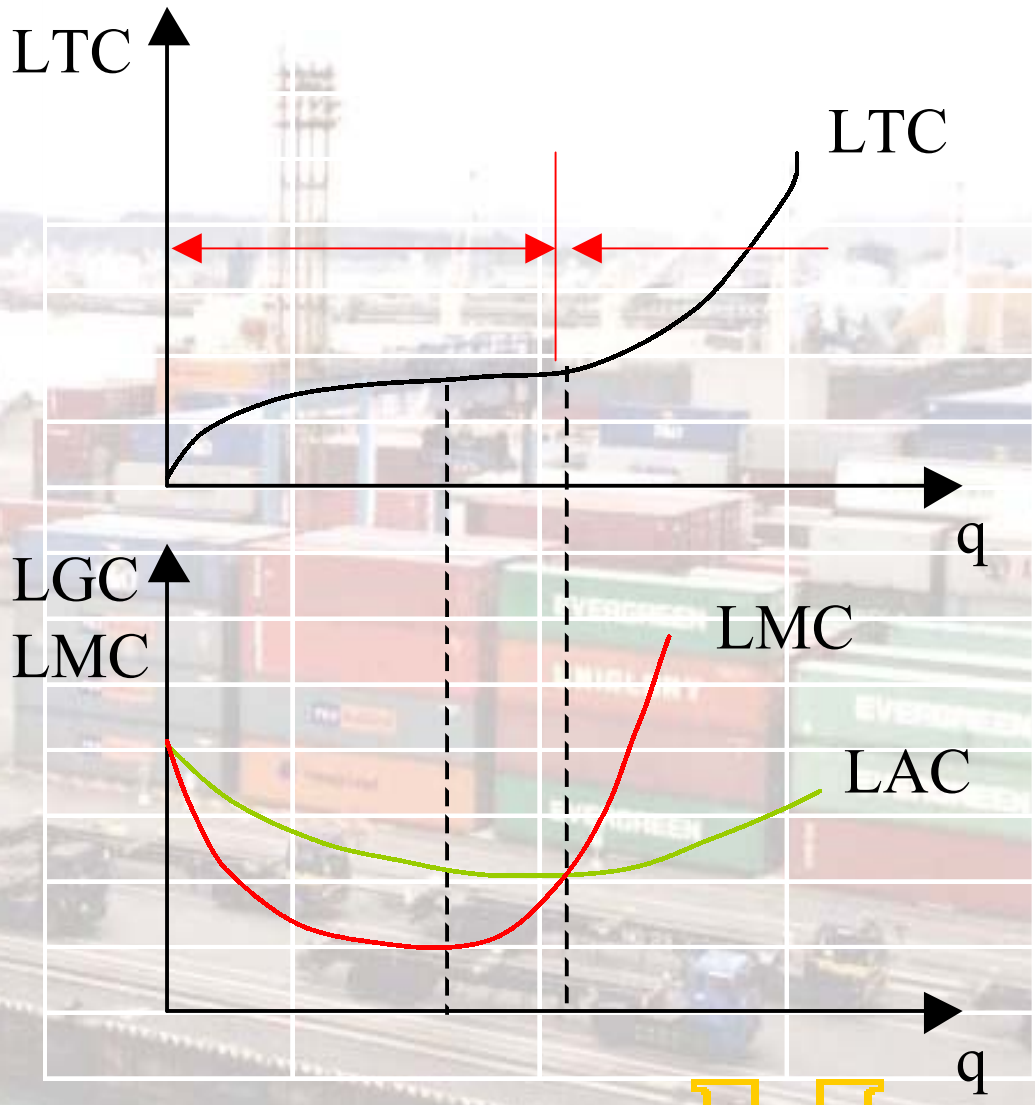
$$TC(q) = FC + VC(q)$$





$$AC(q) = \frac{TC(q)}{q}$$

- Long term costs: LTC



- Optimisation problem:

  produce at q where W(q) maximal

  (W(q)=TR(q)-TC(q))

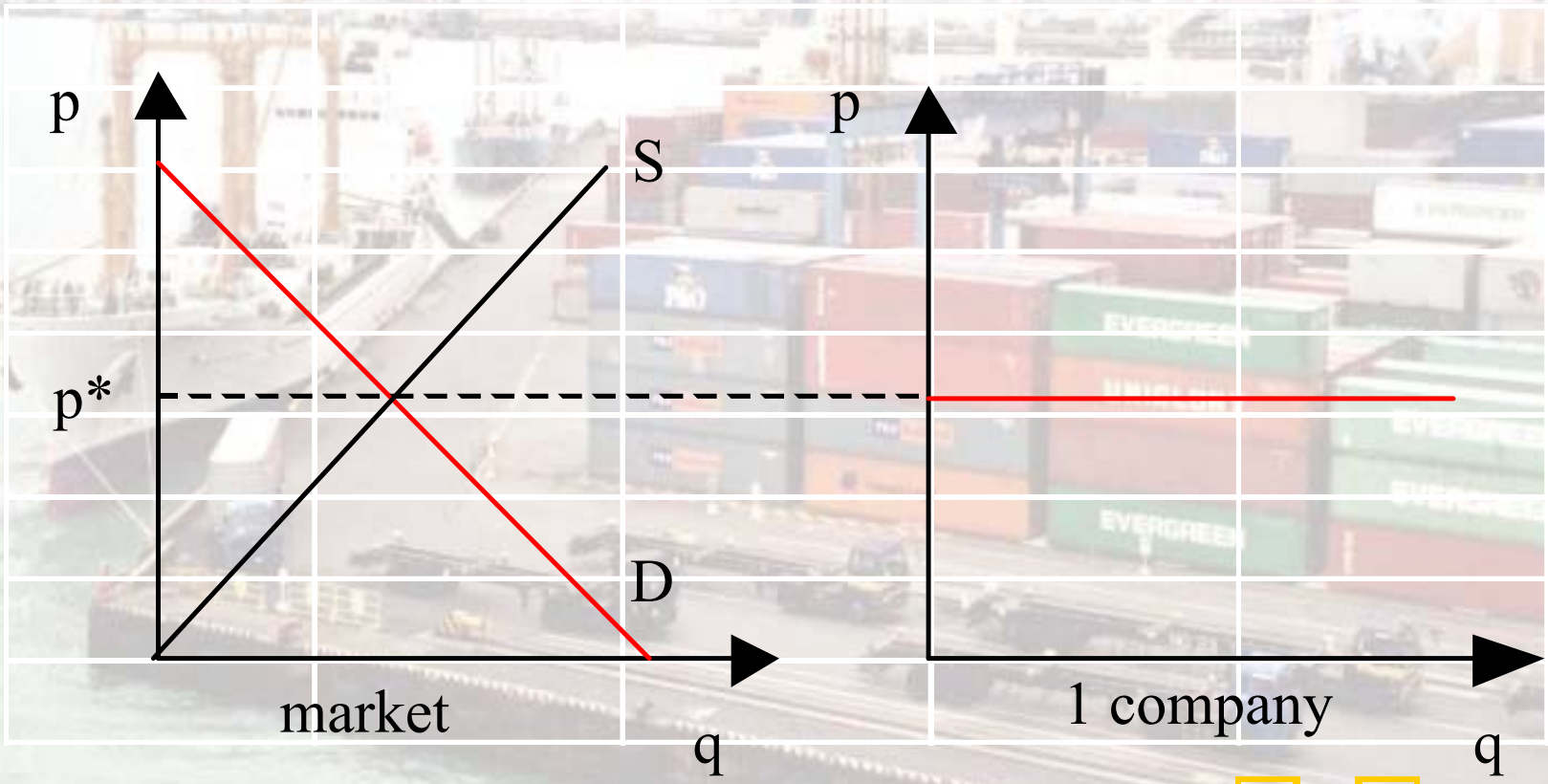
$$MW(q) = \frac{\Delta W(q)}{\Delta q} = \frac{\Delta TR(q)}{\Delta q} - \frac{\Delta TC(q)}{\Delta q} = MR(q) - MC(q)$$

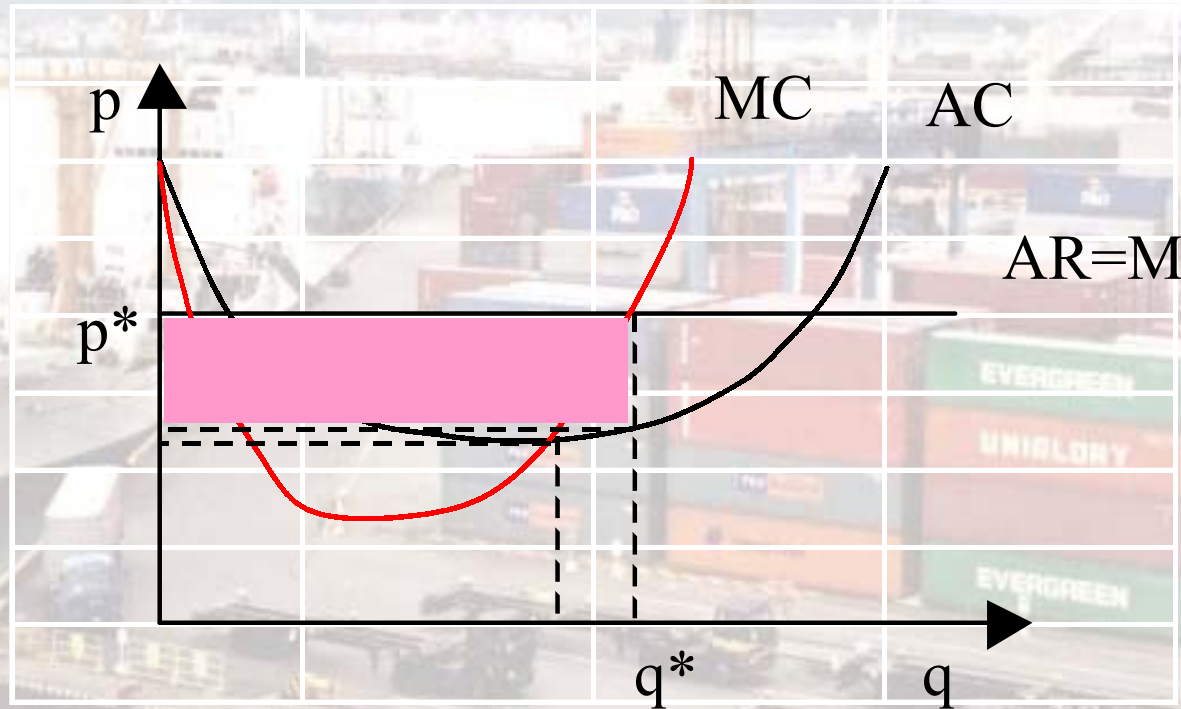
$$MW(q) = 0 \Leftrightarrow MR(q) = MC(q)$$

$$MR(q) > MC(q) \rightarrow production.\exp ansion$$

$$MR(q) < MC(q) \rightarrow production.reduction$$

- Perfect competition:

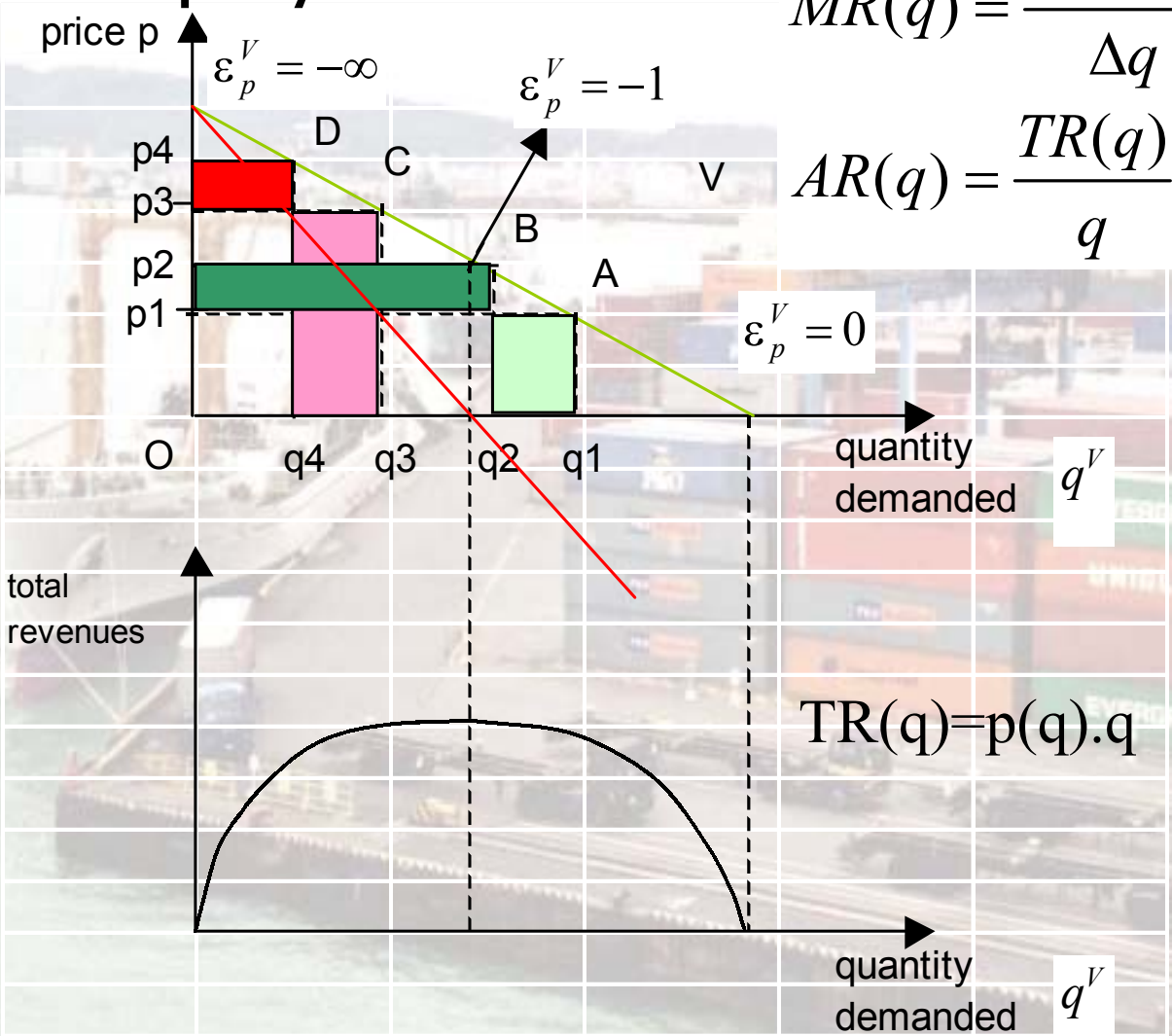


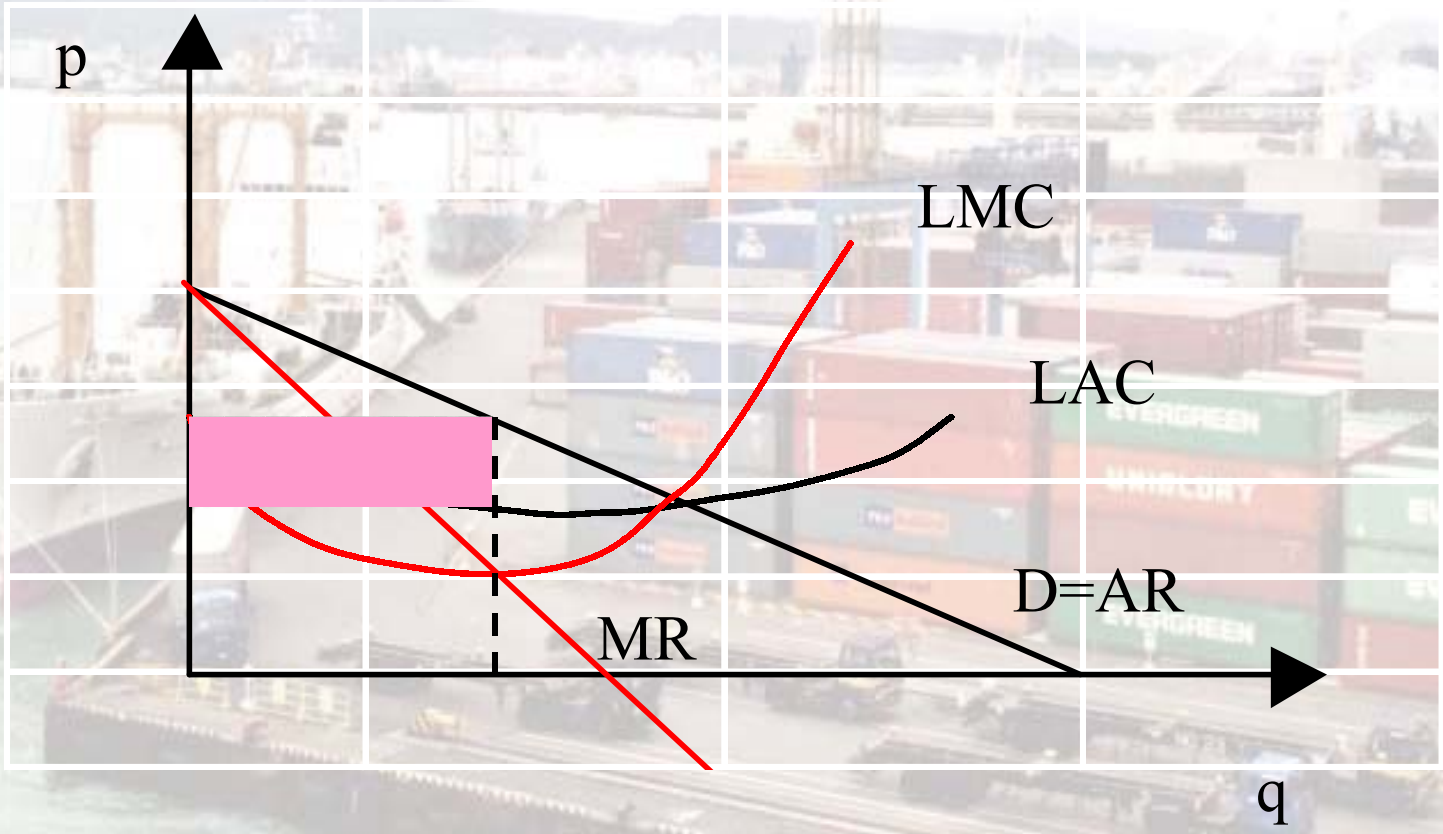

p
MC
AC
AR=MR
p*
q*
q

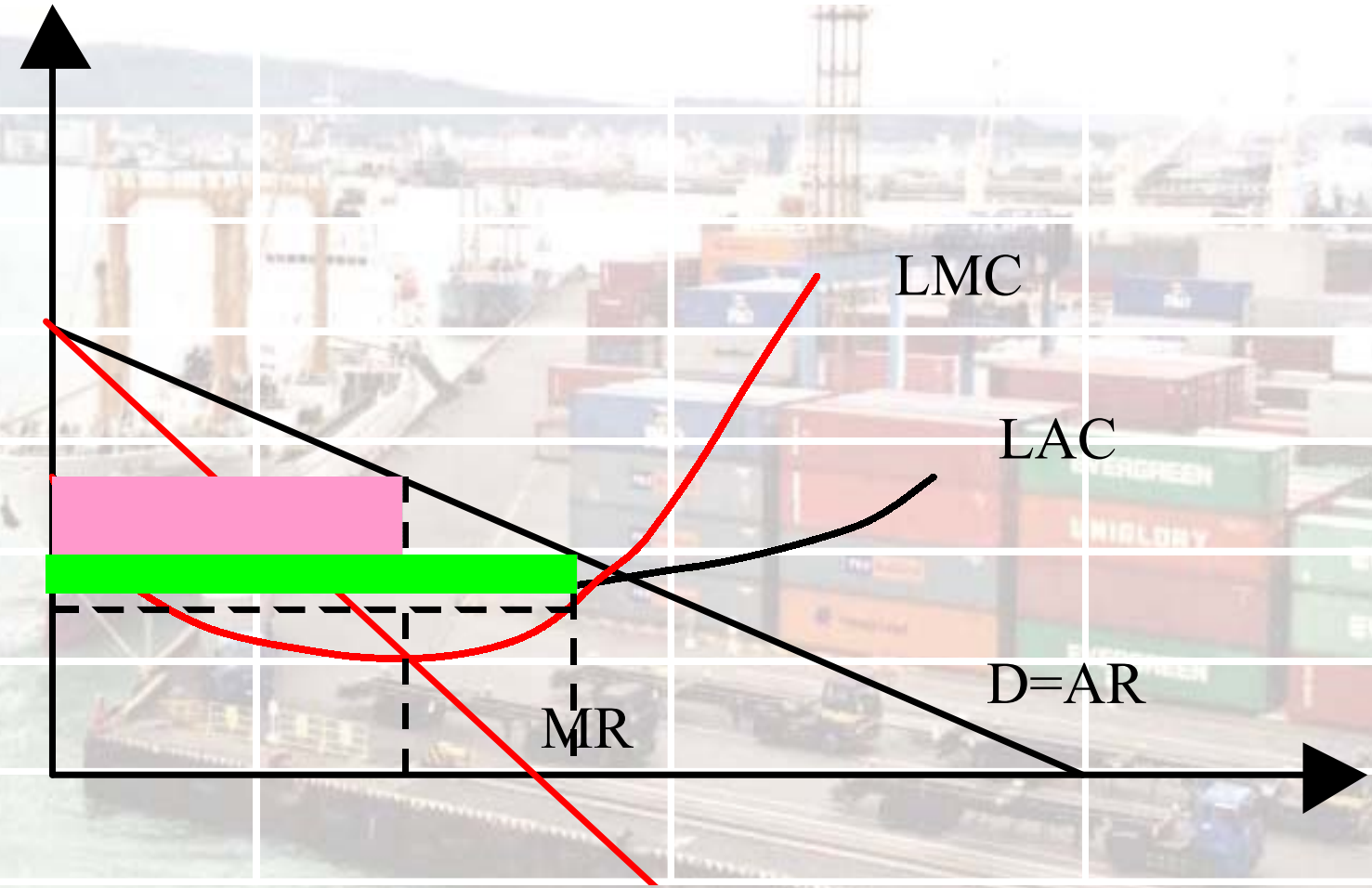
- Monopoly:

$$MR(q) = \frac{\Delta TR(q)}{\Delta q}$$

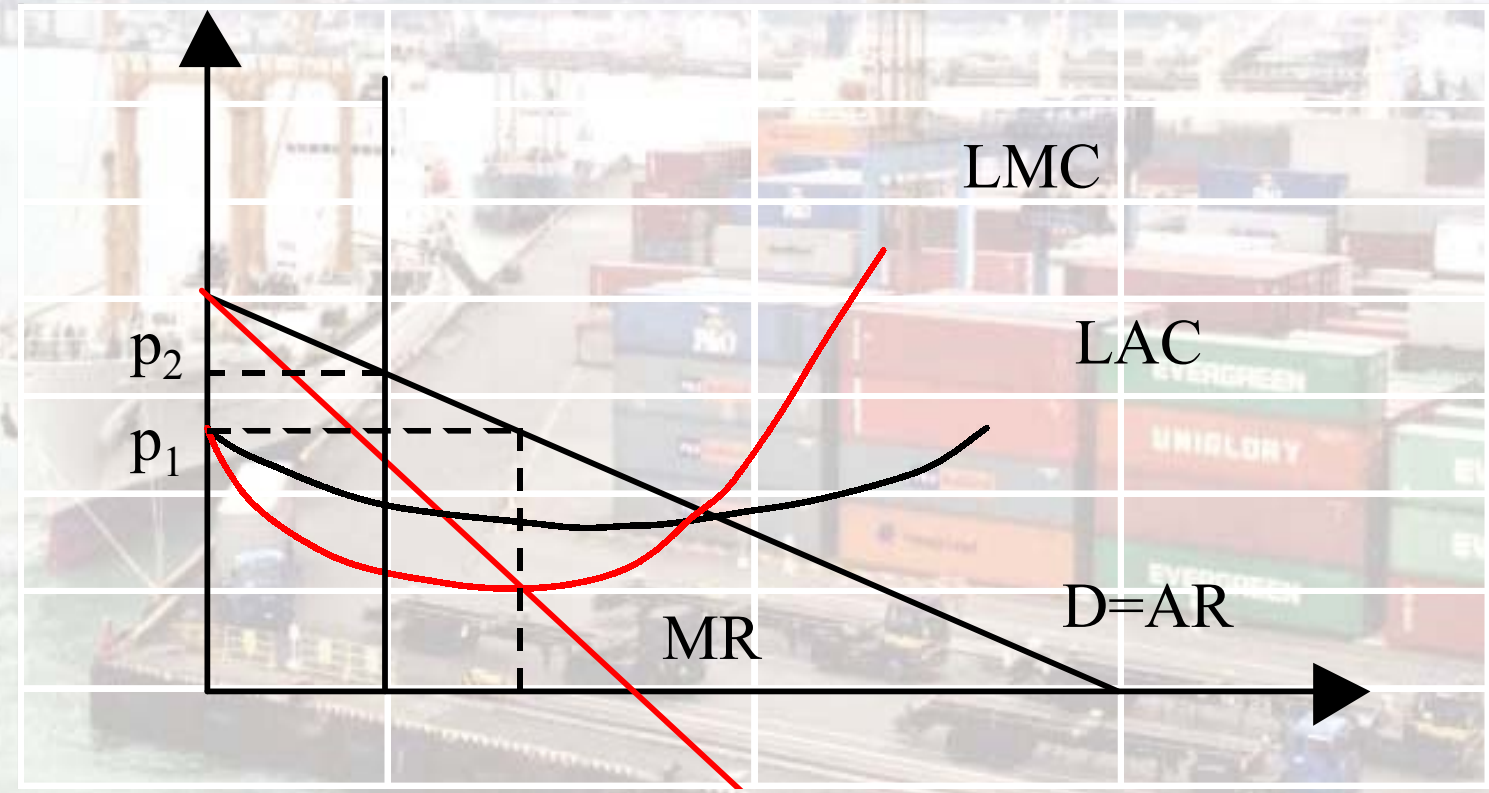
$$AR(q) = \frac{TR(q)}{q} = \frac{p(q).q}{q} = p(q)$$



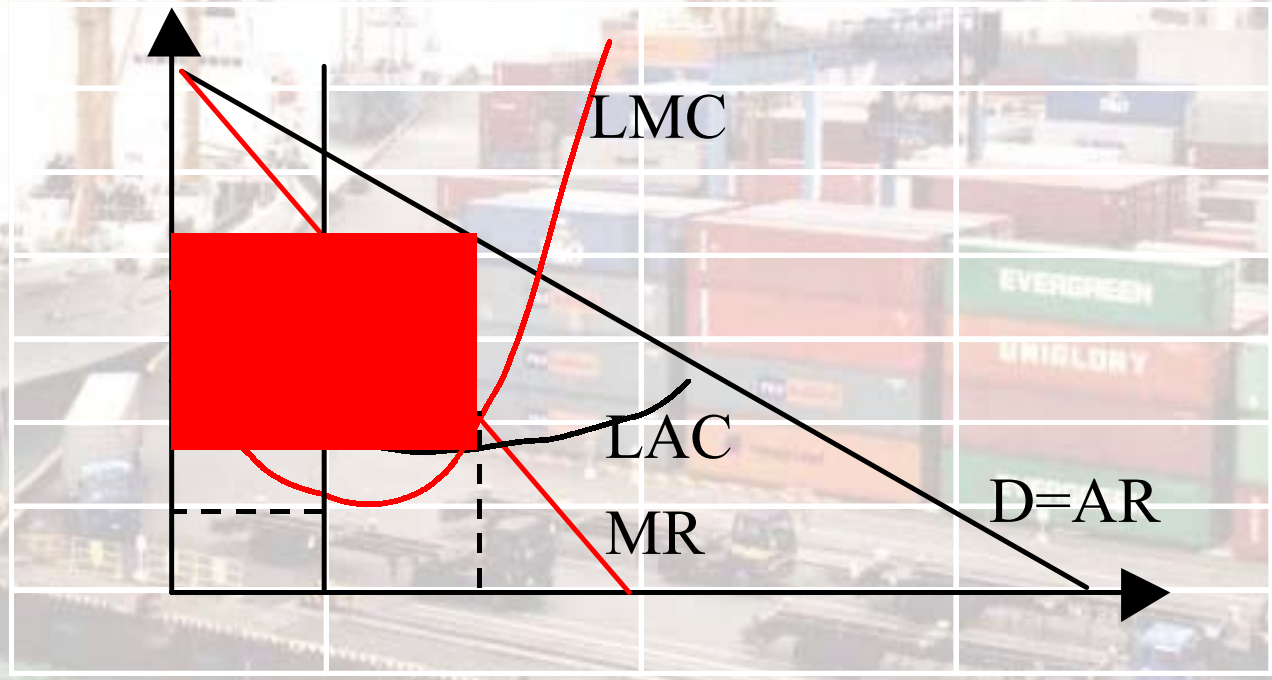

p
LMC
LAC
D=AR
MR
q


LMC
LAC
D=AR
MR

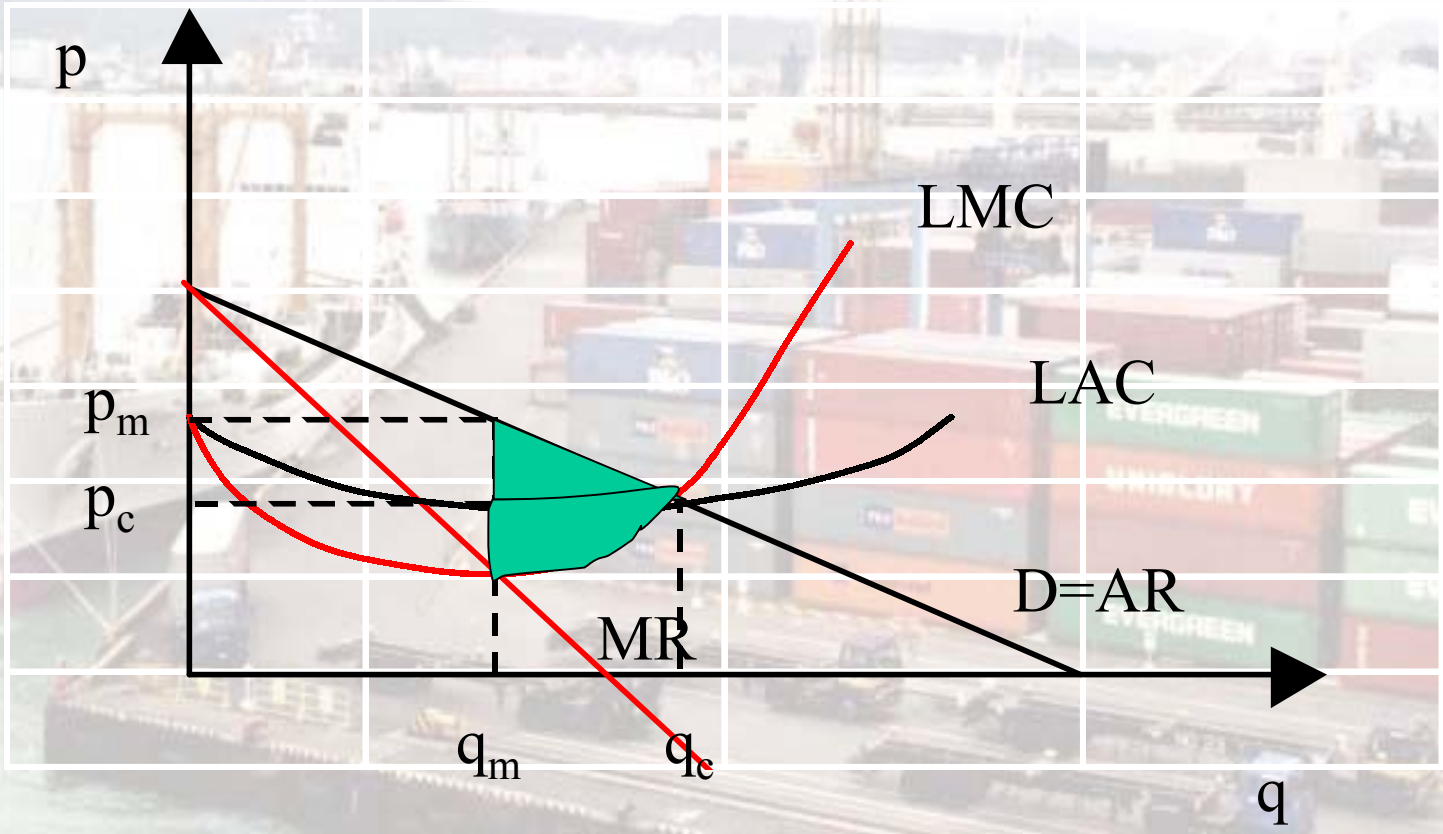
- Peak load pricing:



- MC>AC:



- Monopoly losses:



PRICING PRINCIPLES APPLIED (PORT LITERATURE)

- **Cost-based pricing**
- **Methods for cost recovery**
- **Congestion pricing**
- **Strategic port pricing**
- **Commercial port pricing**

PRICING CONCEPTS AND IMPLEMENTATION

- **REMAINING QUESTIONS**

- **How important is port pricing in relation to the total cost?**
- **Congestion problems versus overcapacity**
- **Insight is urgently required into the real cost structure of a port call**

Table 3: Price elasticities for selected North Range container ports
(10% price increase, simulation results)

Port	Elasticity
Hamburg	3,1
Bremen Ports	4,4
Rotterdam	1,5
Antwerp	4,1
Le Havre	1,1

Source: Haralambides et al. (2001, p. 948)

INTERPRETING THE ATENCO-STUDY

- A very substantial divergence of the elasticities among the various ports
- The price elasticities diverge strongly across the different goods categories
- A new pricing scheme based on the principle of overall cost recovery per individual port may result in cross-subsidising

THE ATENCO CASE-STUDY

"A best practice formula for pricing in the real world does not exist, not even in ports pursuing full cost recovery as a primary objective"

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THE ATENCO CASE-STUDY

"…in contrast to the widely held belief that UK and Irish ports engage in conventional full cost recovery, the study found that users in fact do not pay for past capital investments in terms of their replacement value"

THE PRACTICE OF PRICING: SOME CONCLUSIONS

- **Confusion**
- **Difficult to outline a typology into which all ports will fit**
- **Some form of covert subsidising**

MARGINAL COSTS IN PORT OPERATIONS

- Costs for provision of infrastructure
- Costs associated with use of the transport mode
- Costs for supplying port services
- External costs

Table 4: Overview of Cost Element Subdivision

Infrastructure:
- Capital
- Running

Transport User:
- Time
- Reliability

Supplier / Operator:
- Vessel:
  - Running
  - Time
  - Reliability
- Service:
  - Running
  - Reliability
- Superstructure:
  - Running
  - Time
  - Reliability

External:
- Accident:
  - Material
  - Human
- Noise:
  - Amenity
  - Human
- Air Pollution:
  - Natural Environment
  - Human

Source: TRL Ltd et al., 2001

MARGINAL INFRASTRUCTURE COSTS

- **Costs of replacement and maintenance of locks**
- **One supplementary vessel calling at the port accounts for 242 EURO, irrespective of the cargo**

THE USE OF THE MARITIME TRANSPORT MODE

- **Marginal costs centre on time used and reliability of service (in terms of overtime and loss of customers)**
- **Amount is largely dependent on the type of commodity transported and the volume handled**

COSTS FOR SUPPLY AND OPERATION OF HANDLING SERVICES

- **Can be subdivided into costs related to vessels, the superstructure and the actual service**

EXTERNAL COSTS

- **Accident costs**
- **Noice costs**
- **Air pollution costs**

CONCLUSION

- **Pricing by ports and operators within ports has developed historically**
- **Outlining a typology of port pricing schemes is more or less impossible**
- **Research into pricing behaviour within ports has some way to go**