United Nations Economic Commission for Europe

CONFERENCE

Hinterland Connections of Seaports

The Role of Seaports as a Link between Inland and Maritime Transport

17 - 18 September 2008 - Piraeus, Greece

UNITED NATIONS

The Role of Ports as Potential Bottlenecks in Global Supply Chains

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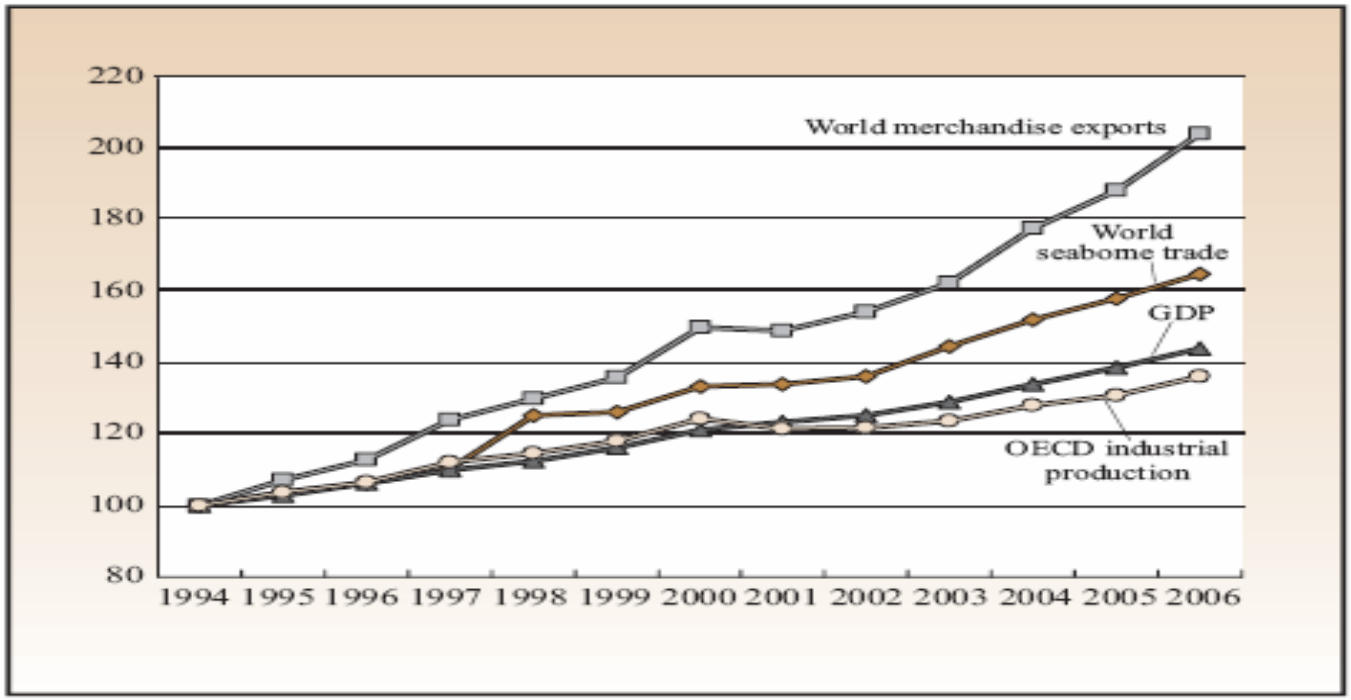
Factors Affecting Seamless Flows in Global Supply Chains

- Increasing international trade and, consequently, port congestion
- Privatisation and the (financial) rationing of port capacity
- Increases in ship sizes and impact on terminal management
- Demand-supply imbalances in land infrastructure
- Environmental laws
- Impact of security measures on seamless trade

Solutions:

- Green Logistics: Impact of logistics on land infrastructure
- Localization vs Globalization: the impact of transport costs
- Short Sea Shipping & Inland Waterways Transport

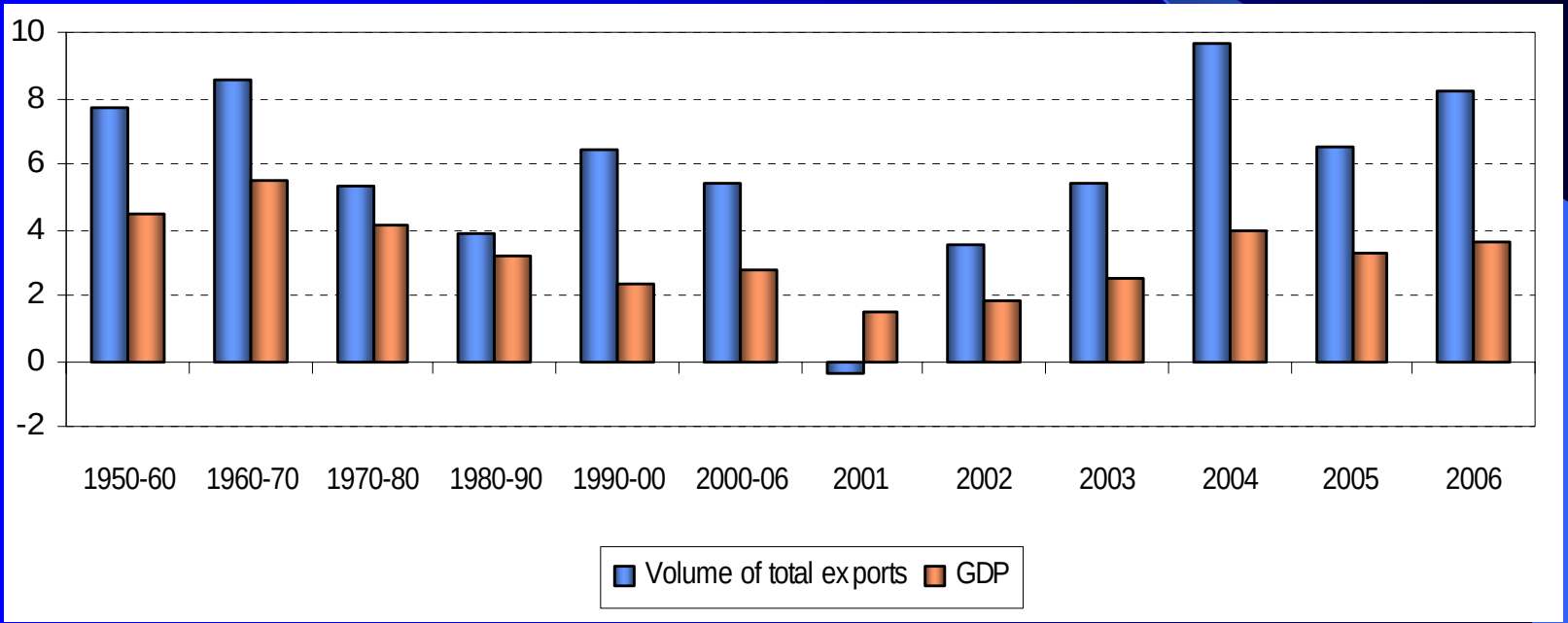
Indices of world economic growth (GDP); OECD industrial production; world merchandise exports (volume); and seaborne trade (volume) 1994-2006



1. World GDP grows faster than OECD industrial production
2. Trade grows twice as fast as output (8% vs 4%)
3. World exports grow faster than seaborne trade

Volume of world merchandise exports and gross domestic product, 1950-2006

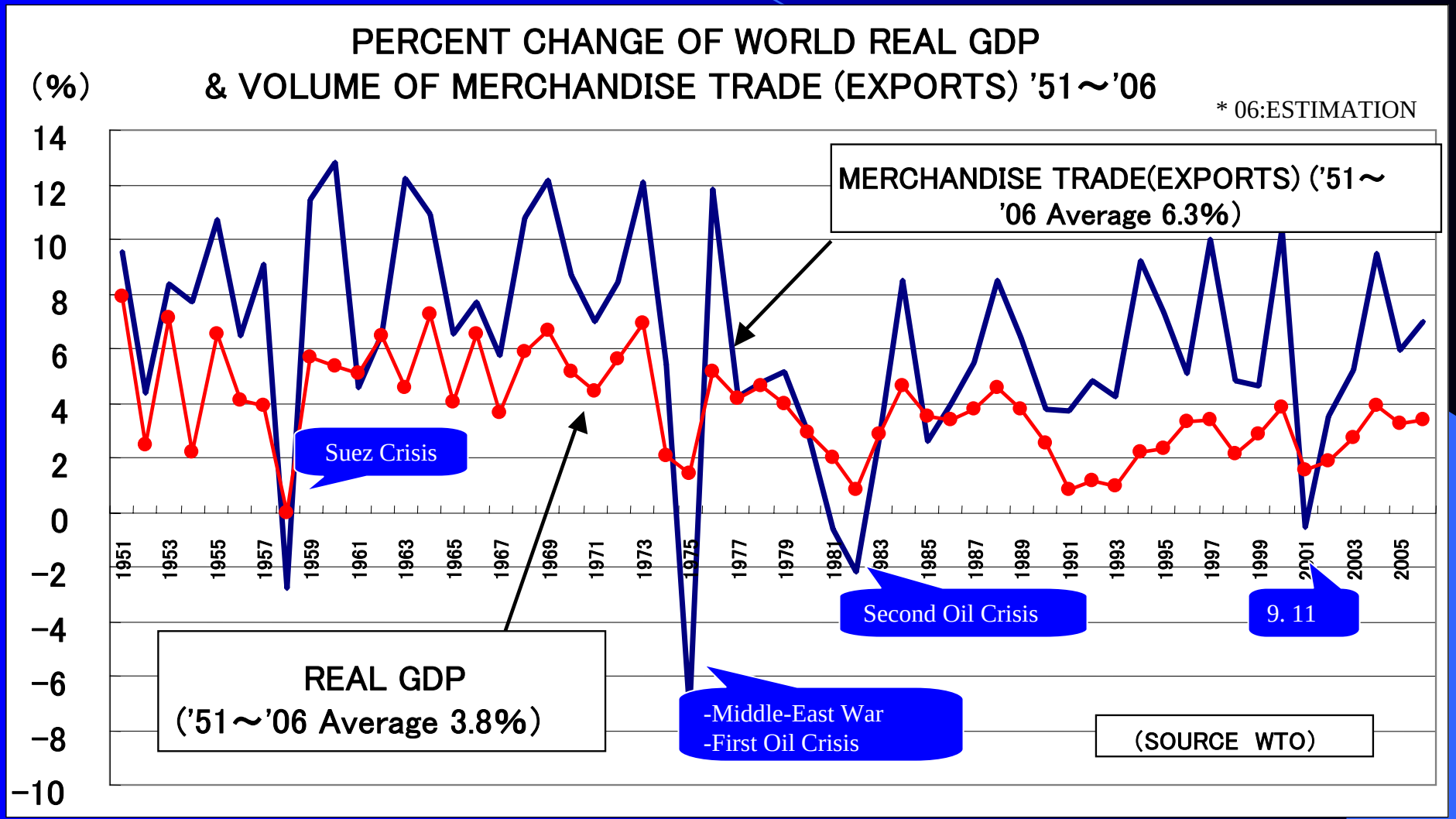
Trade grows twice as fast as output



Source: WTO

GDP and World Trade Development

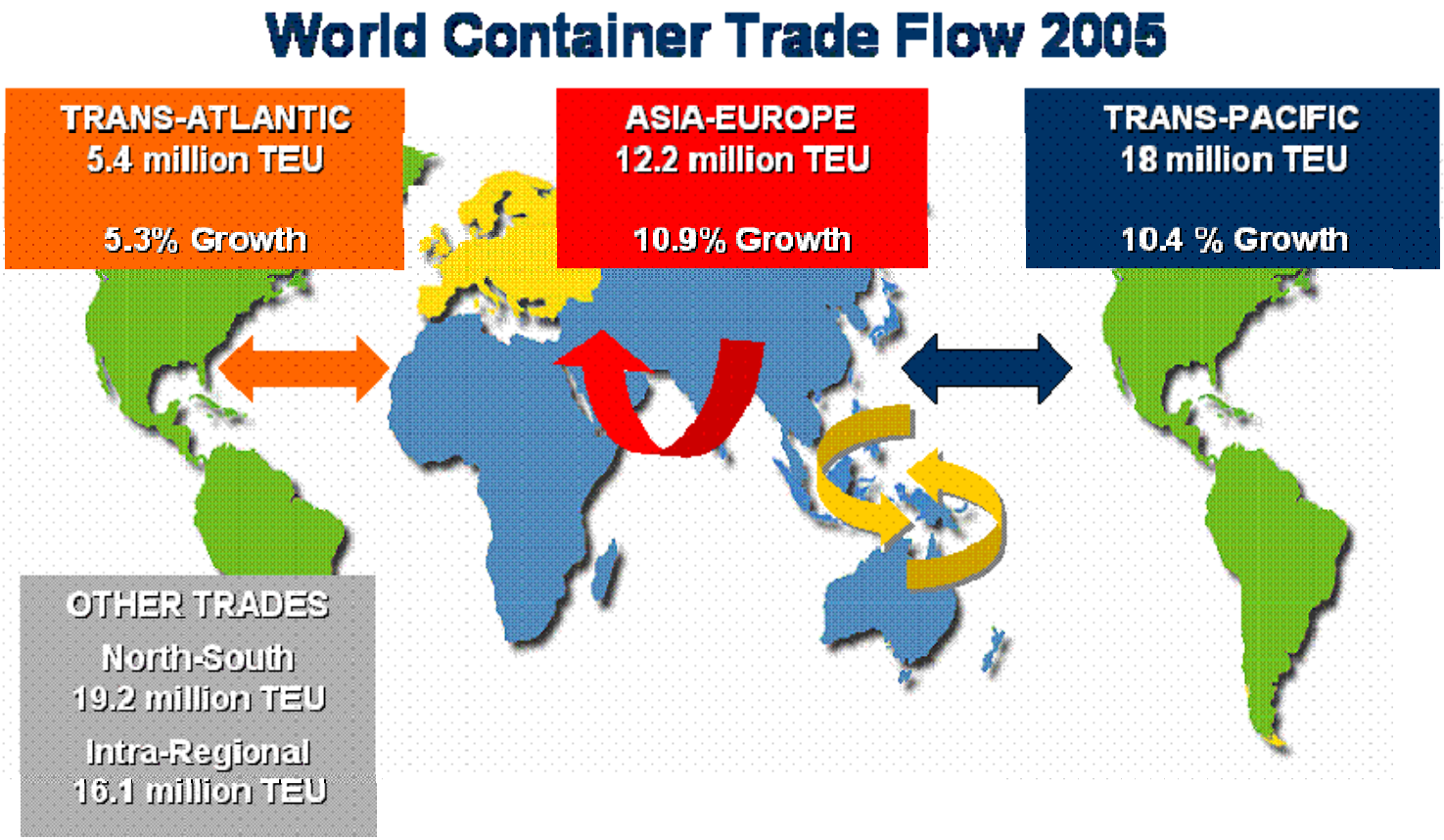
Globalization has Decoupled Trade from Output



GDP and World Trade Development

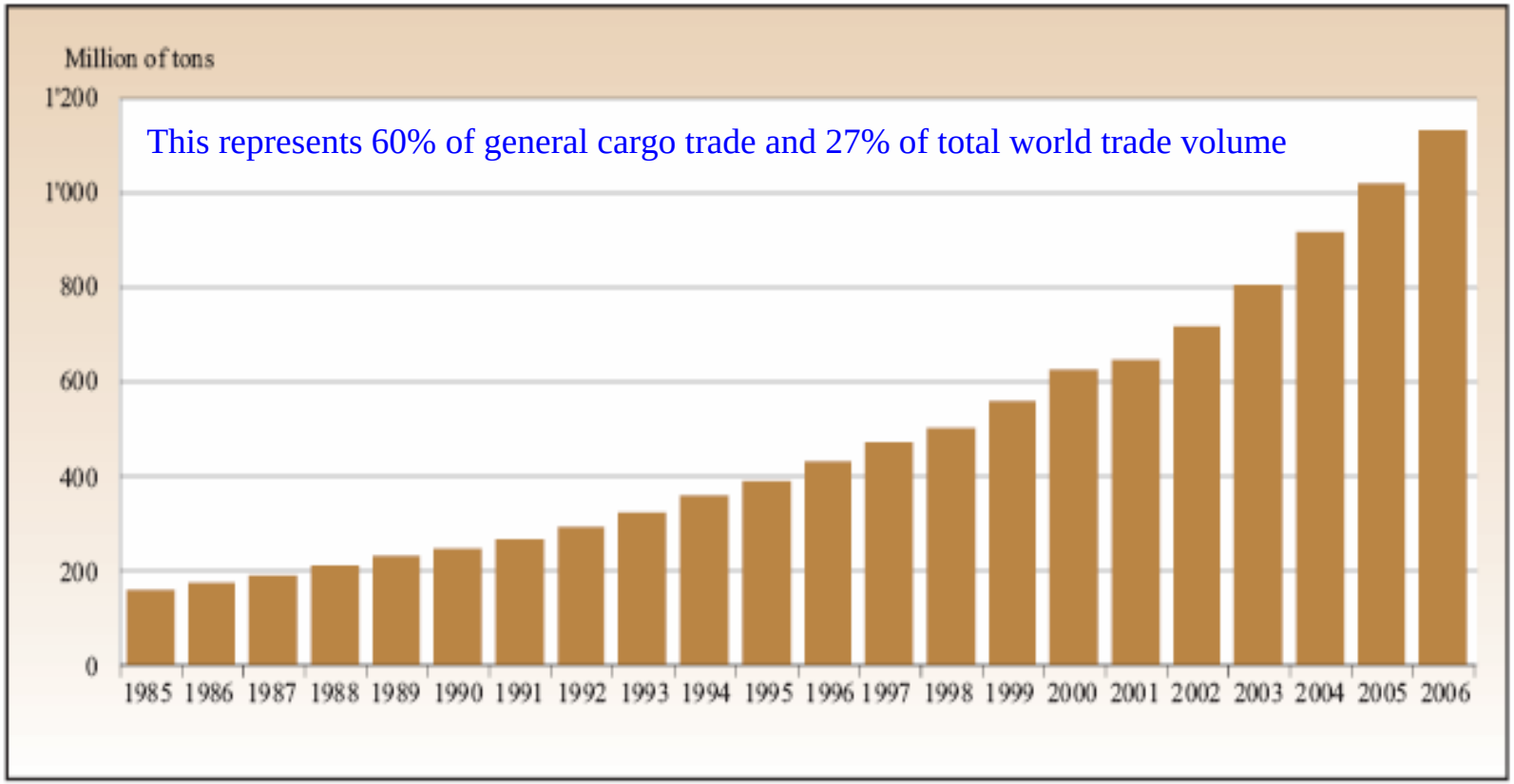
- It is interesting to observe in the previous graph the weak link between production and trade (Japanese steel production is declining but its steel exports are increasing!)
- Trade depends less on output and more on trade facilitation; and here, transport and logistics, together with ICT, are key enablers, facilitating at the same time the deeper integration of developing countries to the global economy

2006 update: Transatlantic 6.2 m TEU; Asia-Europe 18.3 m TEU; Transpacific 18.5 m TEU; North-South 24.8 m TEU; Intra-regional (Asia) 8.1 m TEU



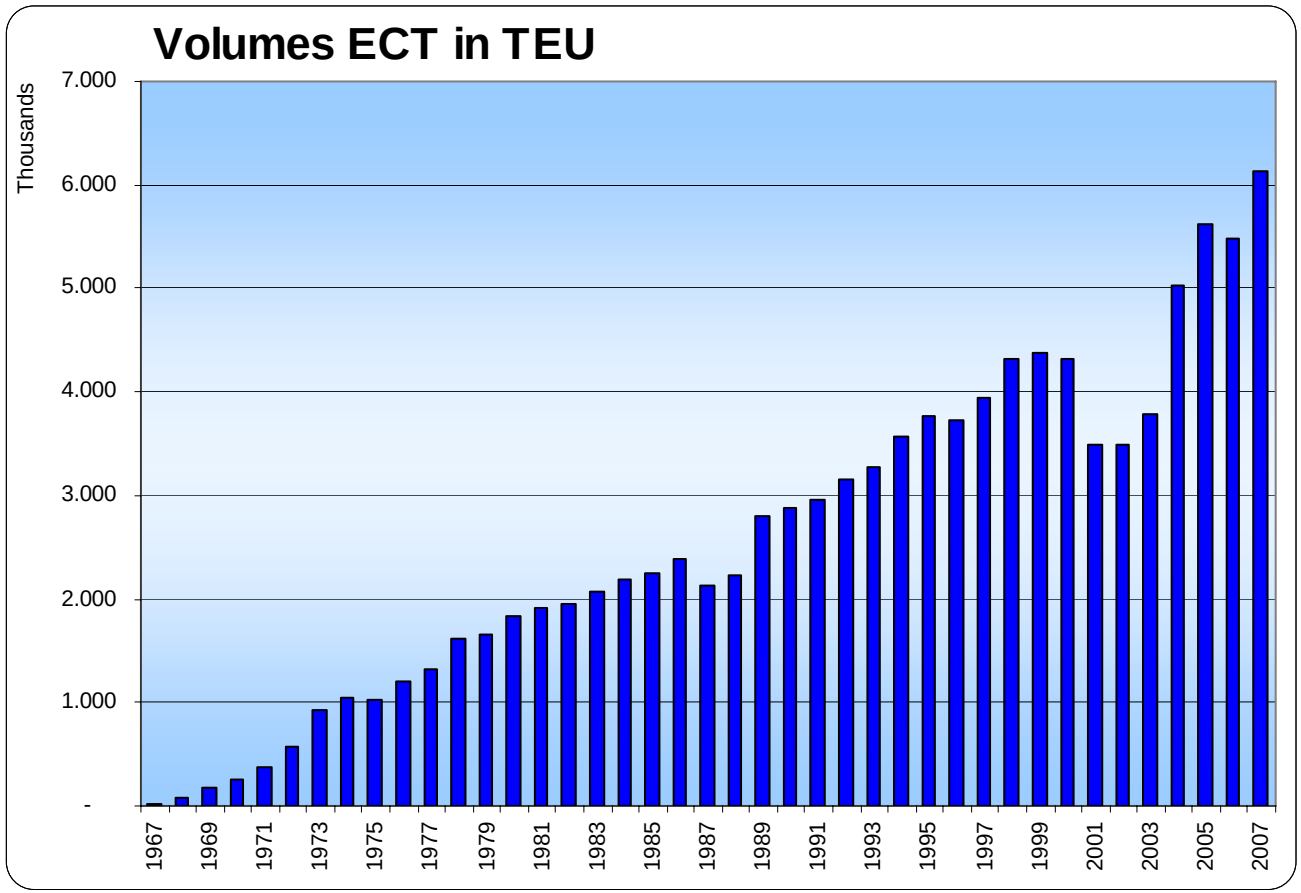
International containerized trade growth, 1985–2006

(Million tons)



Source: Clarkson Research Services, Shipping Review Database, Spring 2007, p. 101.

Rotterdam: Gate to 10% of Europe's external trade
(graph shows volumes of Rotterdam's main terminal operator: ECT)



Source: Hutchison Port Holdings

Bottlenecks are emerging

Concentration among Global Container Terminal Operators

Million TEU	2003	2004	2005	2006	2007	2008	2009	2010	2011
Hutchison	28.6	32	34	30.5	35.5	40.9	46.8	53.6	61.1
PSA	24.8	28.5	32.4	44.5	51.4	59.2	67.9	77.5	88.3
APM Terminals	16.8	20.6	24.1	29.4	37.2	43	49.9	56.1	62.2
DPW	5.8	9.1	9.9	25.7	28.6	33.2	38.2	44.6	51.8
Top 4	76	90.1	100	130	153	176	203	232	263
Share of market	**24%**	**25%**	**25%**	**29%**	**32%**	**34%**	**35%**	**37%**	**39%**

DPW includes P&O Ports volumes

Top - 4 global container terminal operators' portfolio

(concentration of investments doesn't necessarily translate to seamless cargo movements and it may frustrate the development plans of peripheral ports)

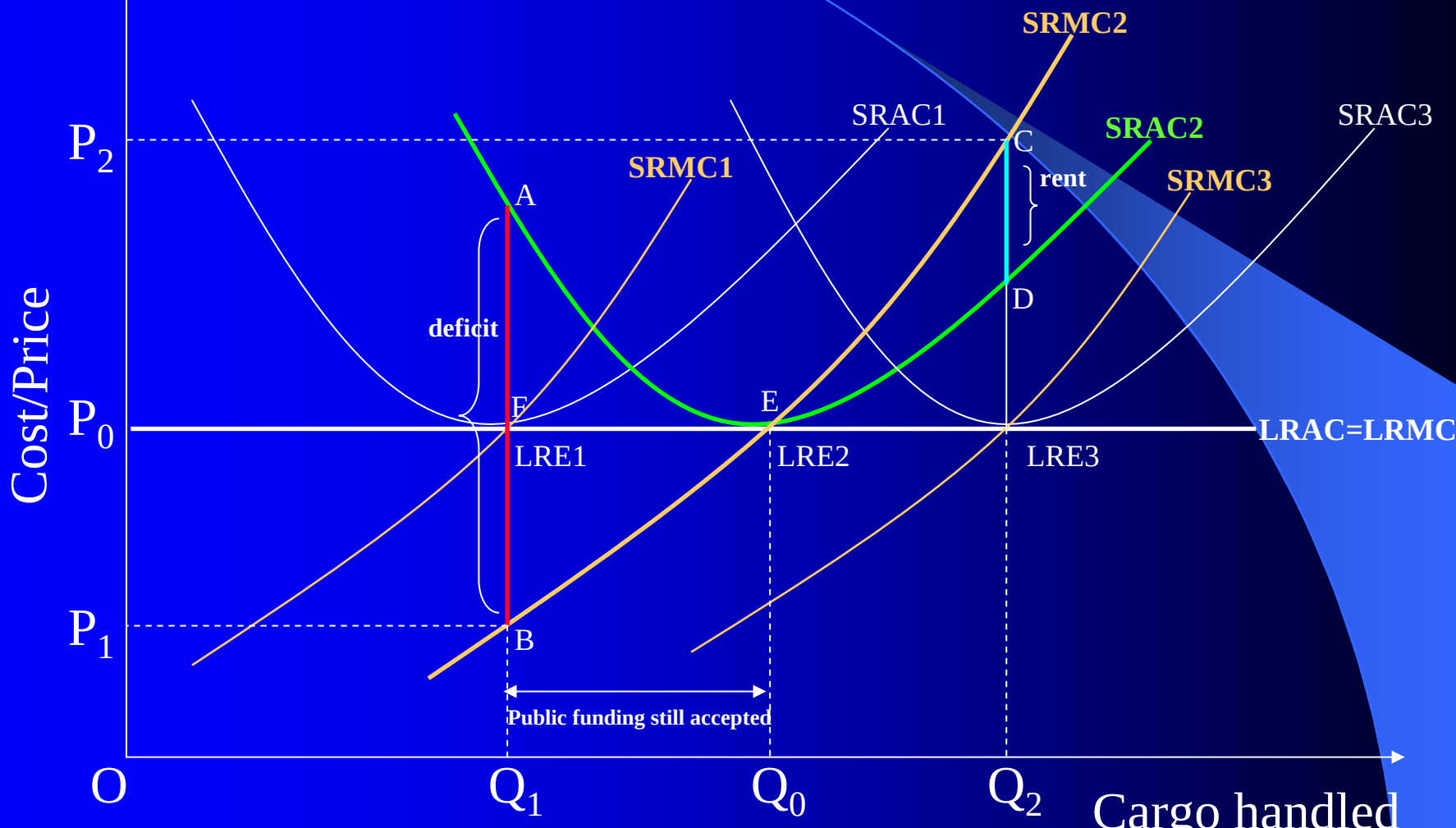
Port Development: The Past

In the past, due to inadequate land transport infrastructure, national borders, tariffs and other barriers to trade, ports were largely **insulated from competition**, each serving its own **captive hinterland**. At the same time, ports were seen by governments as '**growth poles**' and '**pivots of regional development**' (good examples being the MIDAs of Rotterdam and Antwerp), generators of employment, value added, and economic activity by and large. With the exception of some developing countries, port infrastructure was thus invariably developed **ahead of existing demand** -on the part of the industry, agriculture and commerce- in the hope that the latter activities will expand in the wake of the former (infrastructure). Port development was thus considered as '**public investment**', even nowadays the **prerogative of the State**, and investment costs did not have to be recovered, being financed by the general taxpayer through the general budget. In addition, port dues were kept purposely low to facilitate international trade.

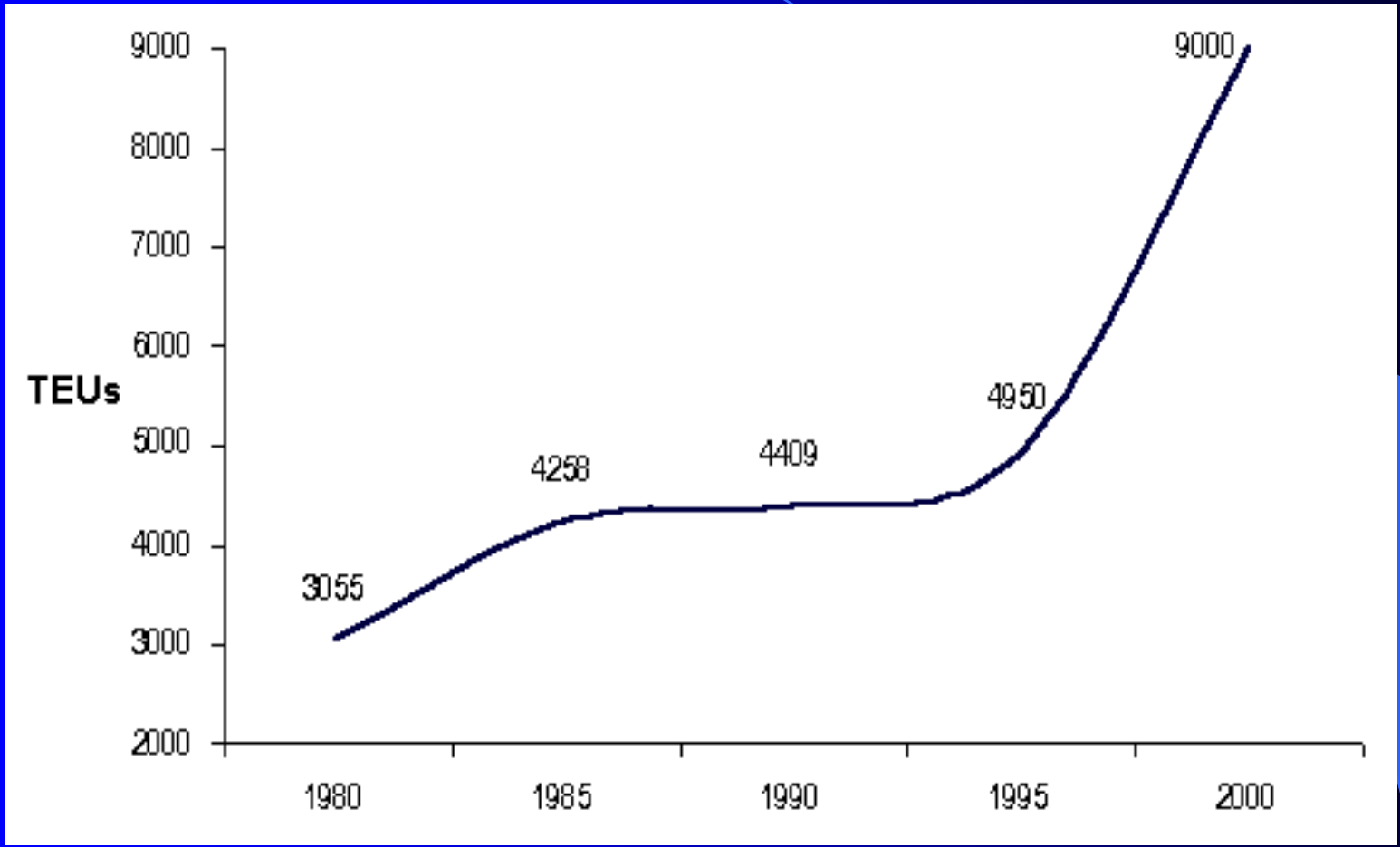
Port Development: The Future

Globalisation, trade liberalisation, regional integration and infrastructure development in general have all helped in changing the early picture drastically. **Hinterlands have been expanded** (and ceased to be captive) and ports tend to operate in an **increasingly competitive environment** where each port's development, financing and pricing decisions can have **marked effects on its neighbours**, nationally and –most important- internationally. Often, this raises strong voices for **market driven investments**, a more **harmonised approach** in the financing of port infrastructure, as well as pricing policies that will have to allow for **full cost recovery**. In addition, ports are losing their '**public good**' character and are becoming **increasingly commercial** (at least container terminals). This calls for financing and pricing policies with the '**user**' in mind rather than the '**general taxpayer**'.

Marginal Cost Pricing in Ports (what is the right size of a port?)

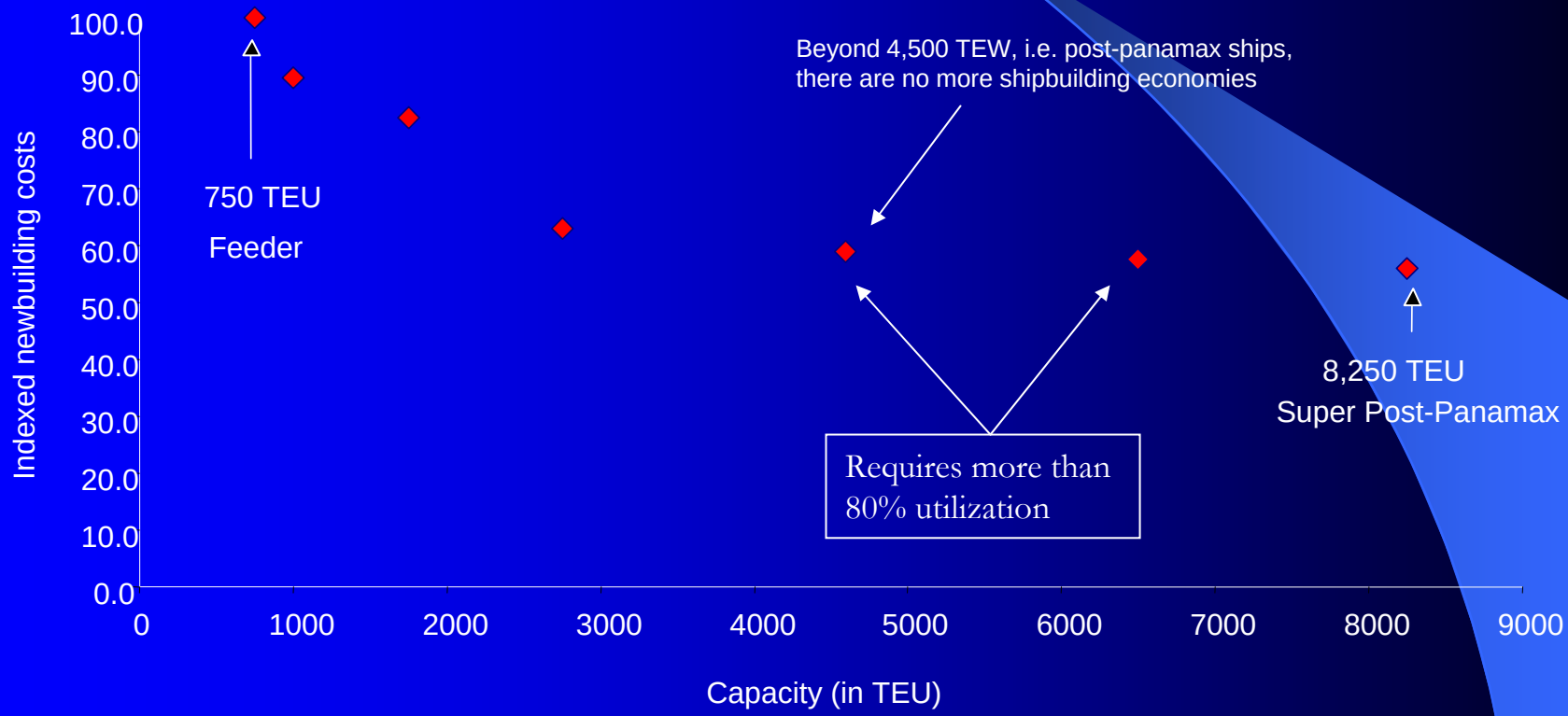


Developments in Maximum Size of Containerships



Indexed newbuilding costs per slot

750 TEU Feeder = 100



Source: MEL

Emma Maersk–World's largest container vessel

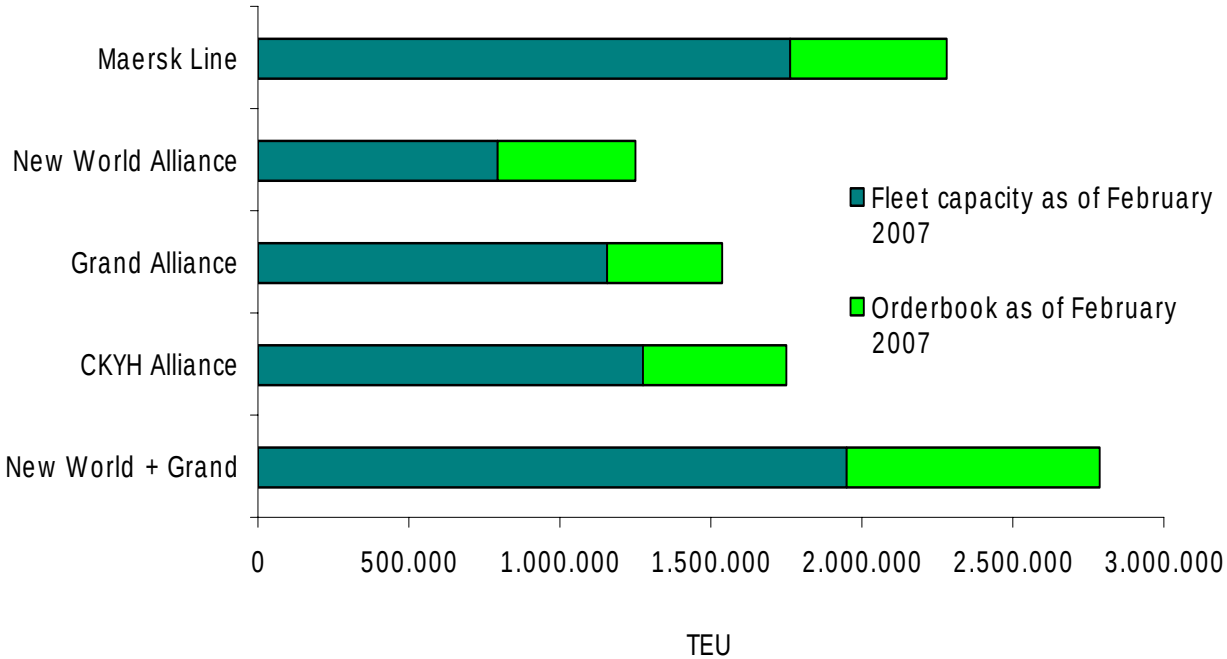
Specifications:

- length 397 m.
- width 56 m.
- tonnage 123,000 d.w.
- engine 108,000 bhp.

- engine 108,000 bhp
- capacity 11.000 TEU
- 1,000 reefers (40')

Cooperation within Alliances has Facilitated Growth in Ship Sizes

Relative fleet size for Alliances February 2007



Members of the alliances:

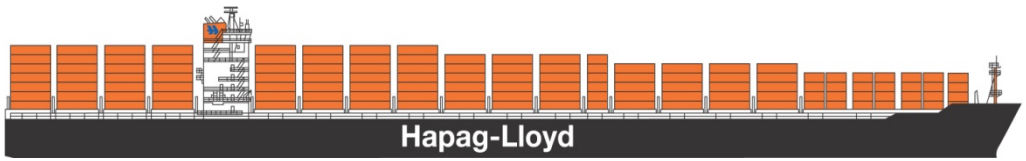
New World Alliance: APL, Hyundai, MOL

Grand Alliance: NYK, OOCL, Hapag-Lloyd, MISC, CP Ships

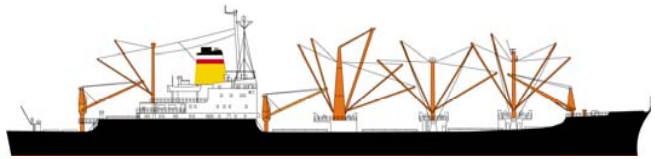
CKYH Alliance: Cosco, K Line, Yangming, Hanjin

Source: BRS Alphaliner 02/07

One of the reasons for the success of the container can be seen in the increase of vessel productivity and a reduction of cargo handling times



6 round voyages
Annually = approx. 800,000 t



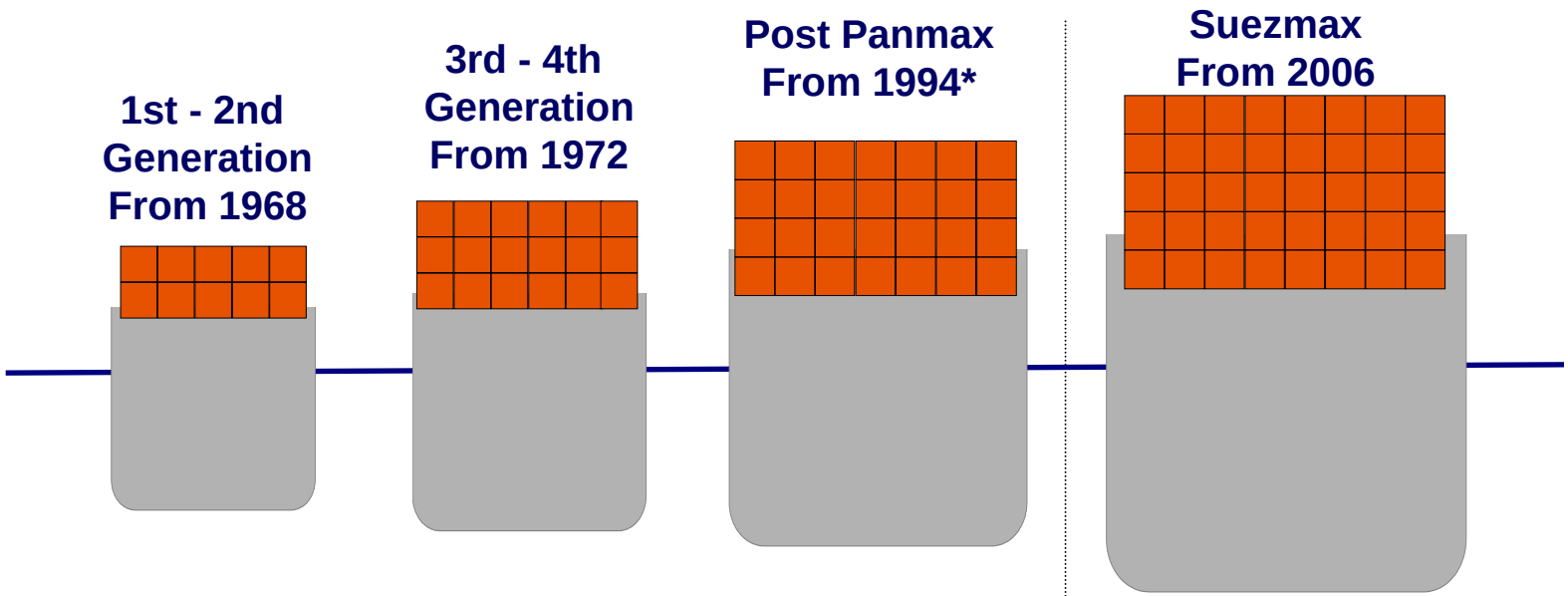
4 round voyages
Annually = approx. 80,000 t

Capacity Comparison Europe-Asia Trade

	Length	Breadth	Capacity (tdw)	Speed	Engine	Crew
Containership	320 m	43 m	100,000 t	25 kn	68,640 kw	22
Freighter	160 m	22 m	13,000 t	21 kn	18,400 kw	42

Containerships have more than doubled their capacity over the past decade

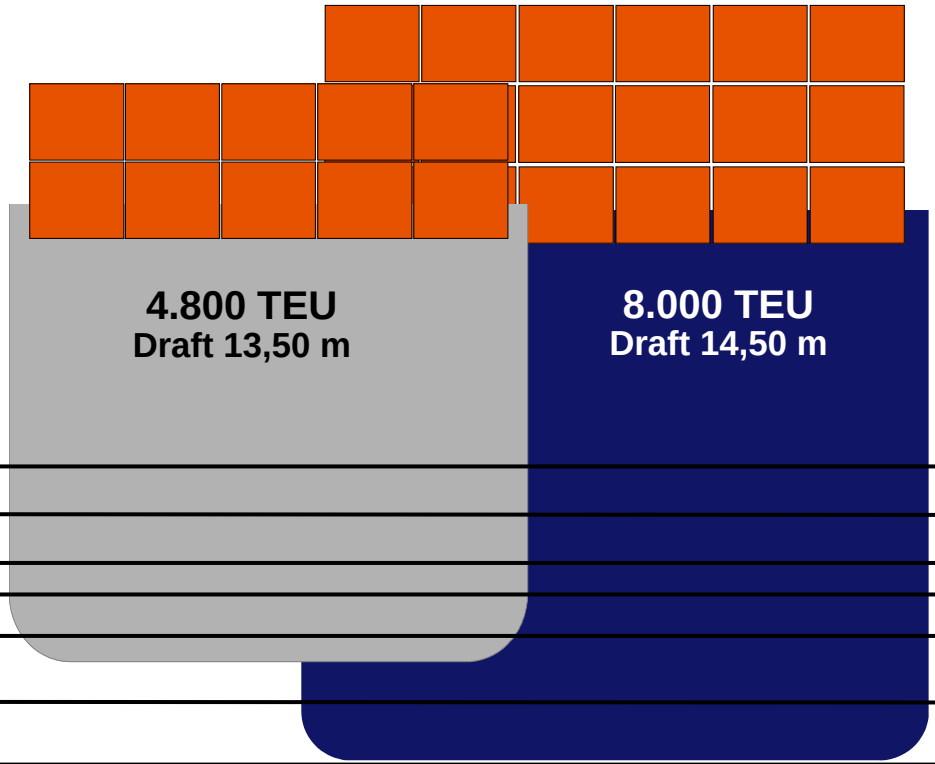
Development of Container Vessel Size



TEU	1,000 – 2,000	3,000 - 4,700	4,700 – 9,000	~ 12,000 – 13,000
DRAFT	10 - 11.5 m	12.5 m	13.5 – 14.5 m	16 m
WIDTH	28 m	32 m	39 - 43 m	58 m

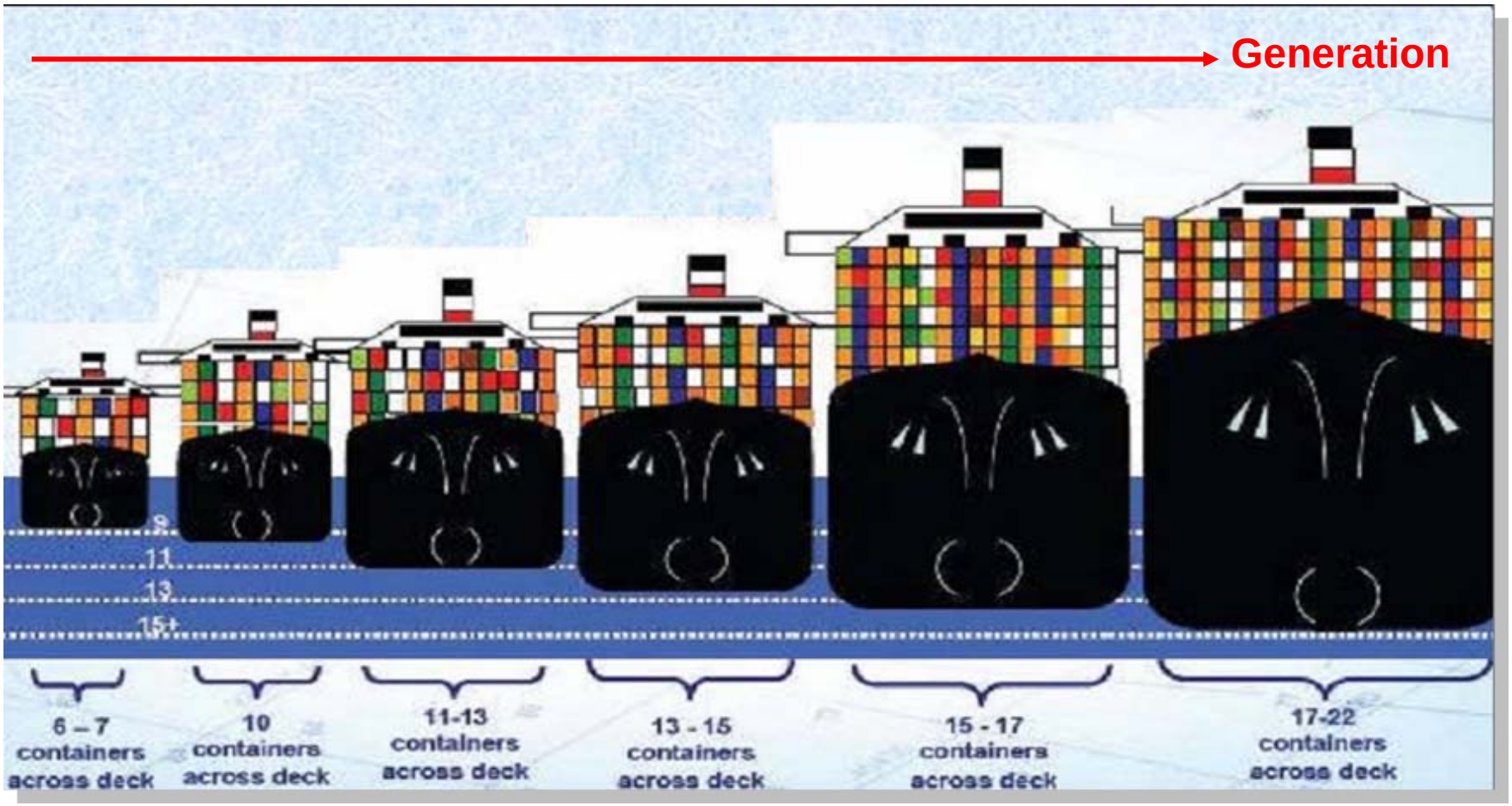
Physical restrictions of mega ships

Draft Restrictions in certain Ports

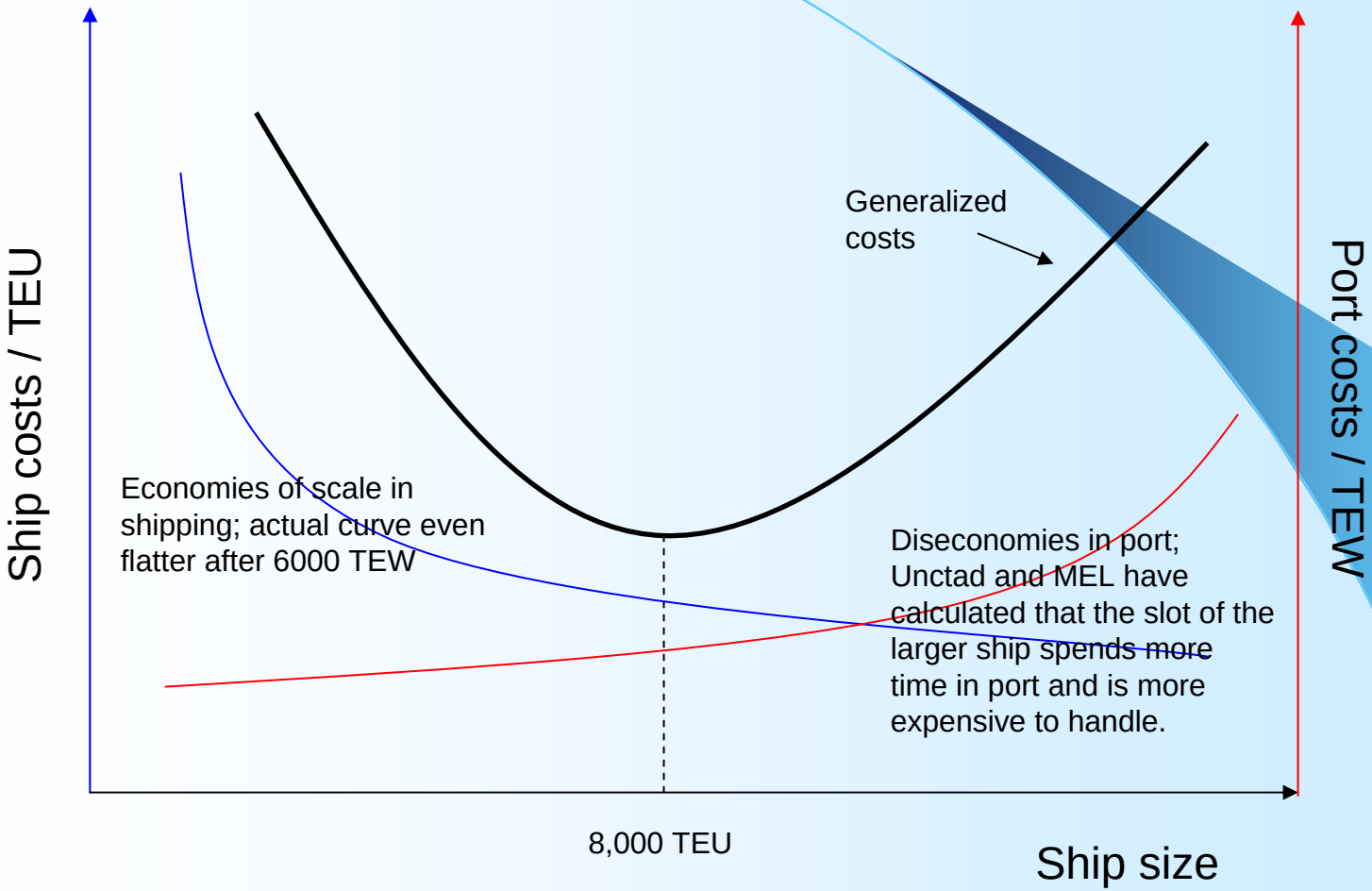


New York	10.90 m
Savannah	11.60 m
Bremerhaven	12.50 m
Southampton	12.60 m
Hamburg	12.80 m
Amsterdam	13.70 m
Le Havre	14.50 m
Hong Kong Singapore	15.00 m
Rotterdam	16.60 m

Water draft of different generations of container vessels



Optimum Containership Size
(the need for joint optimization)



Demand-Supply Imbalance of Land Transport Infrastructure

The transport demand of an expanded Europe cannot be sustained any longer without a different infrastructure pricing model

- Yearly Death Toll: 55,000 Persons (1.5 Million Injured)
- Every Day, 4,000 Km of Community Motorways Totally Congested
- Yearly Congestion Costs: 120 Billion ECU (2% of Community GDP)
- External Costs of Accidents, Air & Noise Pollution: 130 Billion ECU/year
- Total Cost of Transport Externalities: 4% of Community GDP

Environmental Regulations

Environmental awareness and strict environmental laws and lobbies are today the greatest hindrance in allowing the timely match of port capacity to ever-increasing port demand.

Better port policies are needed in Europe to reconcile environmental concerns and quality of life with economic welfare, development and competitiveness.

Impact of security measures on seamless trade

Potential security threats are often over-emphasized, at least in many parts of the world

Security measures, often over-blown, pose significant challenges on seamless goods flows, as well as additional transport costs that hinder economic welfare and may cause transport bottlenecks

Security threats must be seen rationally and in perspective

Green Logistics

Logistics and distribution pose heavy demands on our transport infrastructure

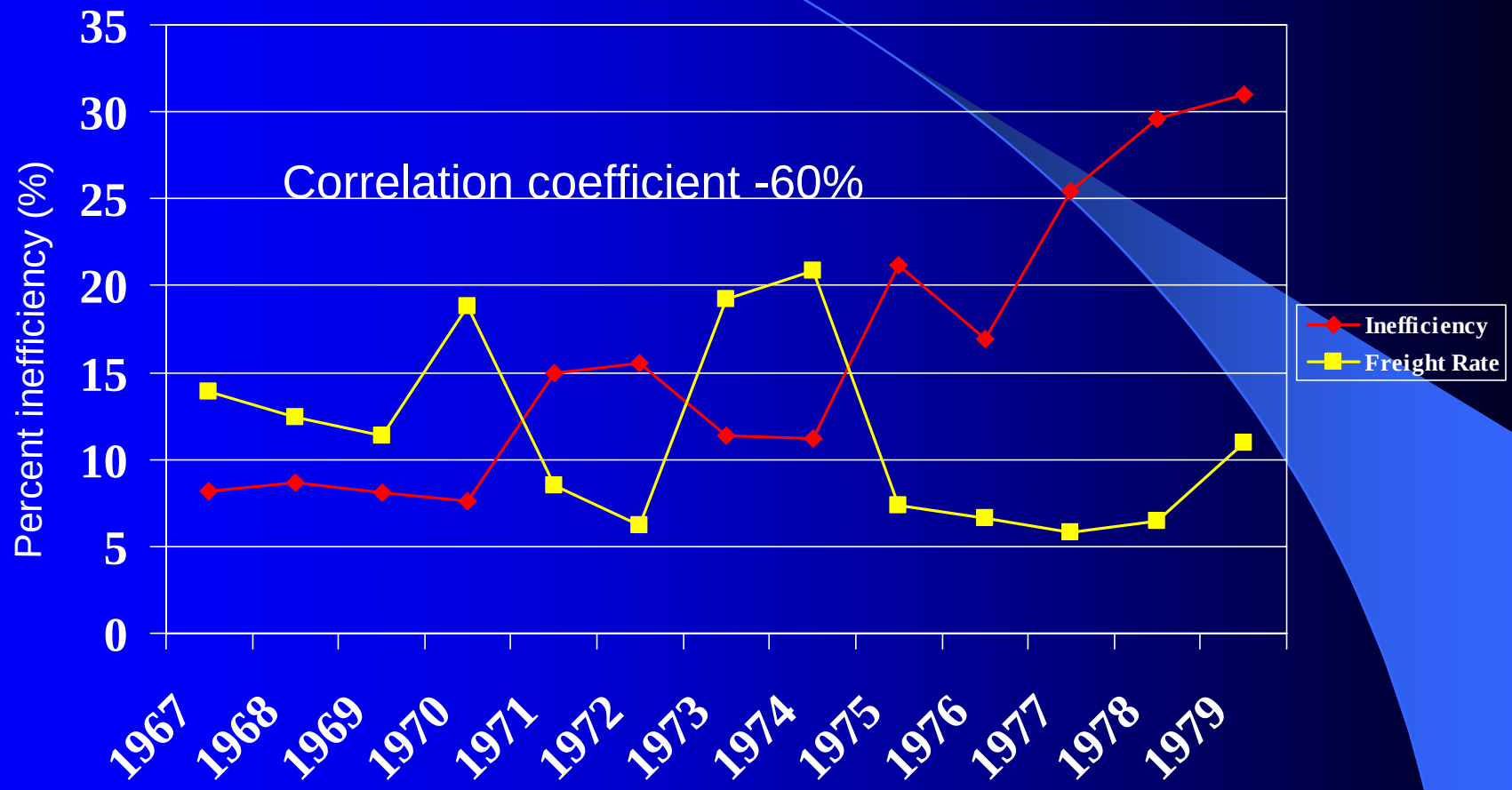
In 2006, 150m containers were exported in the world and 450m containers were handled by world ports, not counting empty moves and hinterland transhipment

Logistics and distribution (particularly in metropolitan areas) in small quantities and transport means of low utilization pose excessive demands on infrastructure whose use has now to be priced by internalizing transport **externalities**

New global cargo systems are required that minimize transport distances and environmental impacts of transport

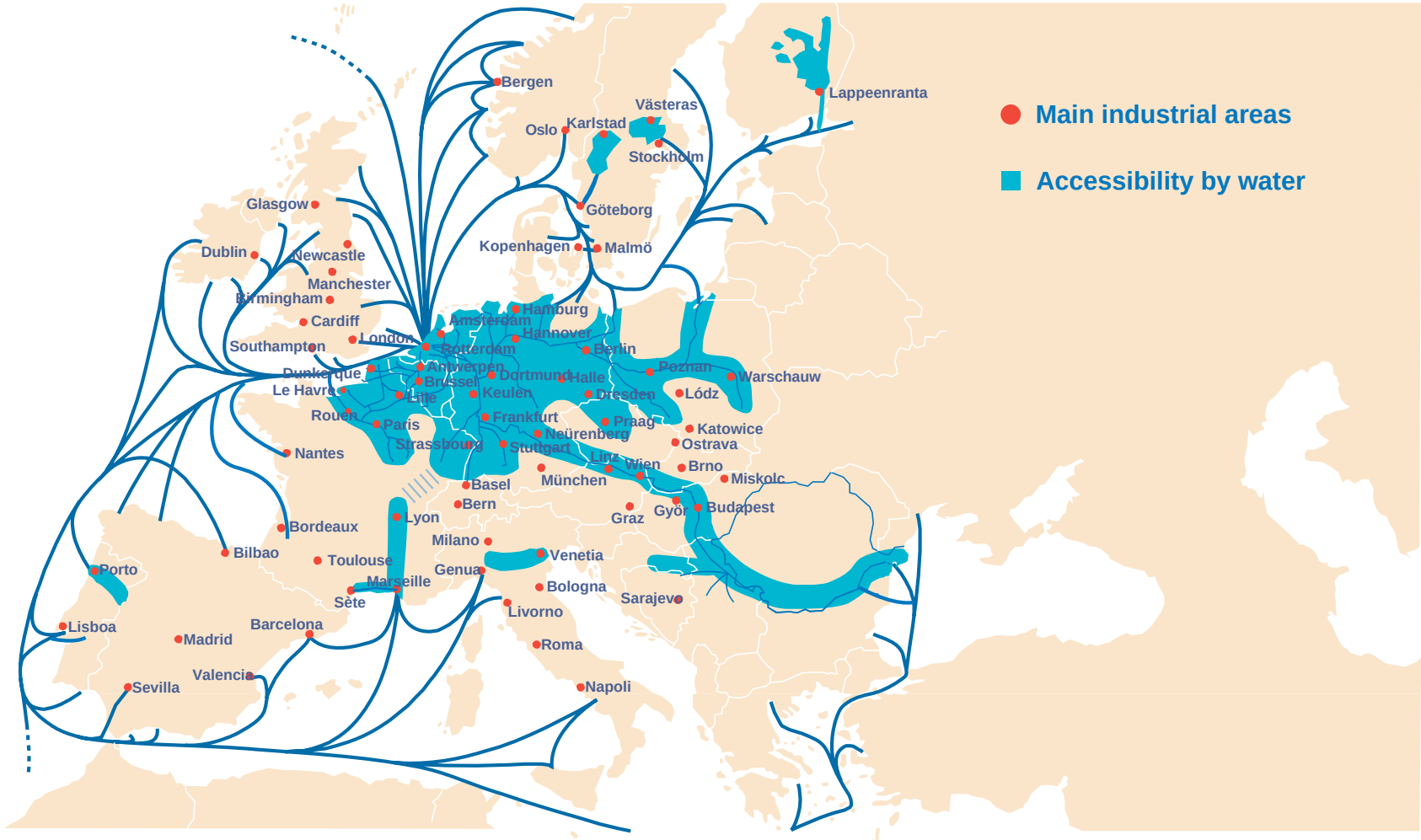
Localization vs Globalization: the impact of transport costs

(high transport costs re-define global production and sourcing, giving preference to shorter distances and more localized activities)



Source: NHH

Short Sea Shipping in Europe



Short Sea Shipping in Europe

Advantages of Short Sea Shipping

- The Most Economic Mode in Terms of Energy Consumption per ton-km
- The Most Appropriate Mode to Serve Peripheral Europe (35,000 Km of Coastline with more than 600 Ports)
- The Mode with the Least Requirements for Infrastructure Investments
- The Environmental-Friendly Mode *Par Excellence*
- The Type of Shipping most likely to Stimulate European Shipbuilding
- The Type of Shipping with the most Favourable Labour/Capital Ratio

Disadvantages of Short Sea Shipping

- High Terminal Costs (Costs of Ship's Time in Ports)
- Less Adaptable to Door-to Door Transport & Logistical Requirements
- Inadequate Hinterland Infrastructure and Interconnections in many Member States
- Inadequate Information, Advertising & Reliable Statistics for Users
- Bureaucratic Administrative Procedures and Restrictive Labour Practices
- Expensive Cargo Handling, Warehousing and other Port Services

Significance of SSS & IWT in Europe

- Better integration of transport systems and manufacturing supply chains
- Shift cargo from road to sea
- Sustainable and balanced development in Europe
- Increase intra-European trade
- Benefits to consumers from lower prices
- Promote SMEs
- Environment
- Employment
- Maritime know-how