Containerisation in European ports:
current issues

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Presentation in the framework of PORTNET

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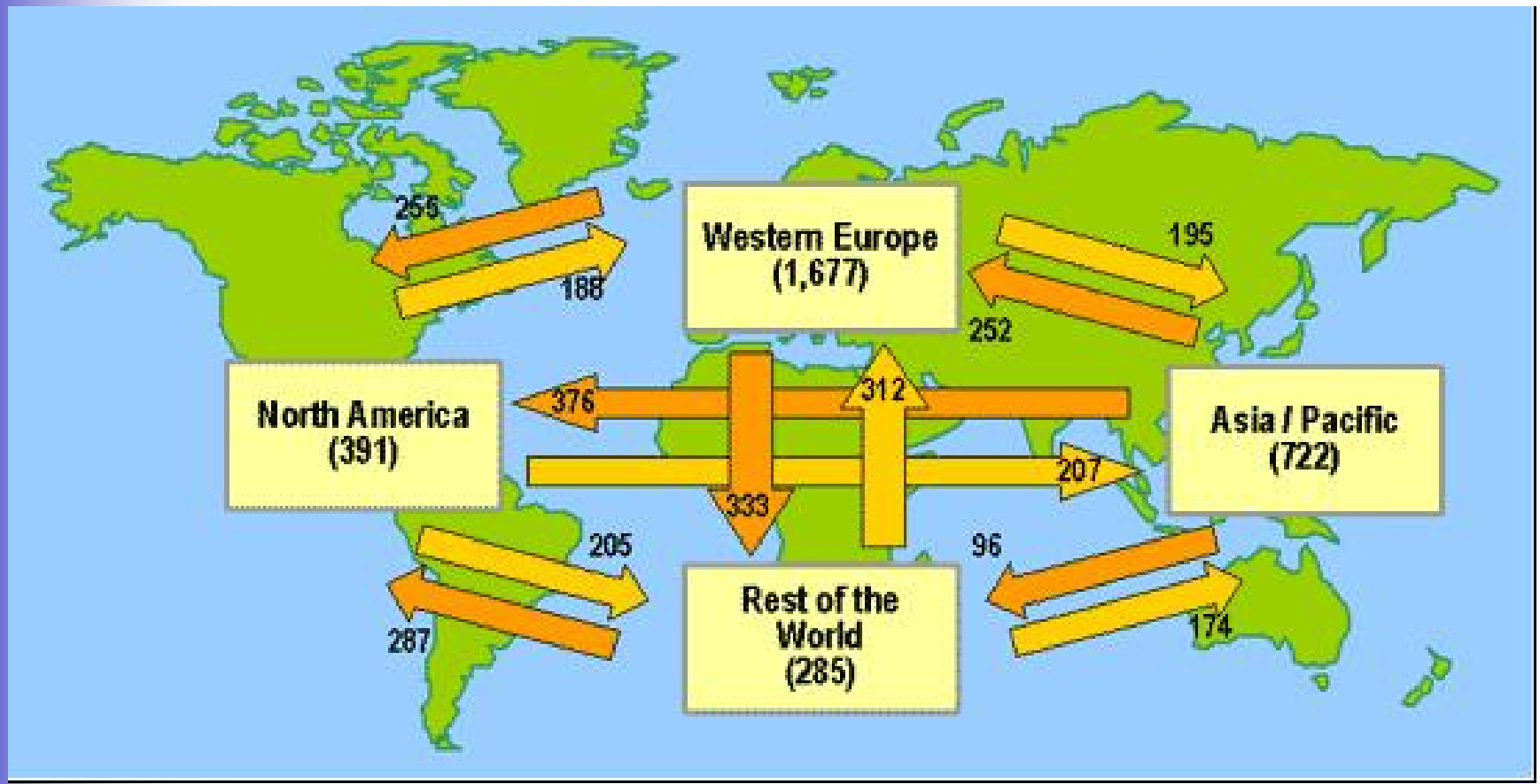
World trade flows in 2001 (billion US$)



Source: based on data World Trade Organisation

Extra EU-15 trade by main trading partners

(relative shares based on FOB-values in € 1000 million)

	IMPORTS					EXPORTS				
	1992	1995	1998	2001	2003	1992	1995	1998	2001	2003
Norway	4,4%	4,7%	4,0%	4,4%	4,9%	3,5%	3,0%	3,4%	2,7%	2,7%
Switzerland	8,1%	7,9%	7,0%	5,9%	5,7%	10,1%	8,9%	7,8%	7,6%	7,0%
Russian Federation	2,3%	3,9%	3,3%	4,6%	5,2%	1,7%	2,8%	2,9%	2,8%	3,4%
United States	19,9%	19,0%	21,4%	19,0%	15,3%	19,1%	18,0%	22,0%	24,4%	22,7%
China (including Hong Kong)	3,9%	4,8%	5,9%	7,4%	9,6%	1,8%	2,6%	2,4%	3,1%	4,1%
Japan	12,1%	10,0%	9,3%	7,4%	6,8%	5,3%	5,7%	4,3%	4,6%	4,1%
Dynamic Asian economies*	9,2%	10,0%	11,0%	9,5%	9,2%	9,0%	11,4%	8,2%	8,3%	7,5%
OPEC-Countries	9,2%	7,0%	5,7%	7,5%	7,2%	10,4%	6,8%	6,4%	6,5%	6,8%
Cotonou agreement**	6,0%	5,1%	4,4%	4,6%	4,4%	5,7%	4,6%	4,5%	4,1%	4,1%
Other	24,8%	27,6%	28,2%	29,6%	31,7%	33,4%	36,0%	38,1%	35,9%	37,5%
Total extra EU-15 (1000 million €)	465,39	545,25	710,54	1028,36	1082,73	415,3	573,28	733,43	982,97	1012,92

* includes Singapore, Thailand, South Korea, Taiwan and Malaysia

** African, Caribbean and Pacific countries, signatories of the Partnership Agreement (Cotonou agreement) - 77 countries

Source: calculations based on Eurostat – External Trade data

Forecast container port demand to 2015

(million TEU, including transhipment)

		2003	2007	2010	2015
East Asia	High	147,31	198,70	240,47	303,44
	Low	147,31	189,17	229,55	284,65
Americas	High	58,62	75,68	90,66	118,80
	Low	58,62	70,39	82,45	111,41
Europe	North Europe – high	36,90	47,73	56,25	73,21
	North Europe – low	36,90	46,19	53,50	68,95
	Med – high	32,25	42,05	49,55	66,25
	Med - low	32,25	40,89	46,88	62,40
Other	High	33,85	47,13	58,19	85,55
	Low	33,85	44,30	52,95	88,26
Total	High	308,93	411,29	495,12	647,25
	Low	308,93	390,94	464,98	615,67

Source: Ocean Shipping Consultants

World container port ranking in 2004

RANK	PORT	COUNTRY	mTEU
1	Hong Kong SAR	**China**	21.93
2	Singapore	Singapore	21.33
3	Shanghai	**China**	14.55
4	Shenzhen	**China**	13.66
5	Busan	South Korea	11.43
6	Kaohsiung	Taiwan	9.71
7	Rotterdam	the Netherlands	8.22
8	Los Angeles	United States	7.32
9	Hamburg	Germany	7.00
10	Dubai	United Arab Emirates	6.42
11	Antwerp	Belgium	6.06
12	Long Beach	United States	5.78
13	Port Kelang	Malaysia	5.24
14	Qingdao	**China**	5.14
15	New York/New Jersey	United States	4.47
16	Tanjung Pelepas	Malaysia	4.02
17	Ningbo	**China**	4.01
18	Tianjin	**China**	3.81
19	Laem Chabang	Thailand	3.62
20	Tokyo	Japan	3.58

Source: Lloyd's List, March 16, 2005

The economic boom of China

- GDP: annual growth of +9% since 1979.
- Exports: annual growth of +30% in last 5 years
- Fear for a 'hard landing' of the economy in 2006/2007 ?
- Top 3 countries in total world orders (Jan 2004-April 2005):

Toys		Home supplies	
China	**56%**	**China**	**40%**
Taiwan	21%	Taiwan	20%
Thailand	4%	India	10%
Transport vehicles		**Textiles**	
China	**37%**	**China**	**32%**
Taiwan	12%	Turkey	11%
Japan	7%	India	9%
Sports equipment		**Medical & Health**	
Pakistan	25%	**China**	**26%**
Taiwan	24%	India	10%
China	**23%**	Pakistan	9%
Electronics		**Machinery**	
China	**44%**	Taiwan	18%
Taiwan	26%	**China**	**17%**
India	5%	India	16%

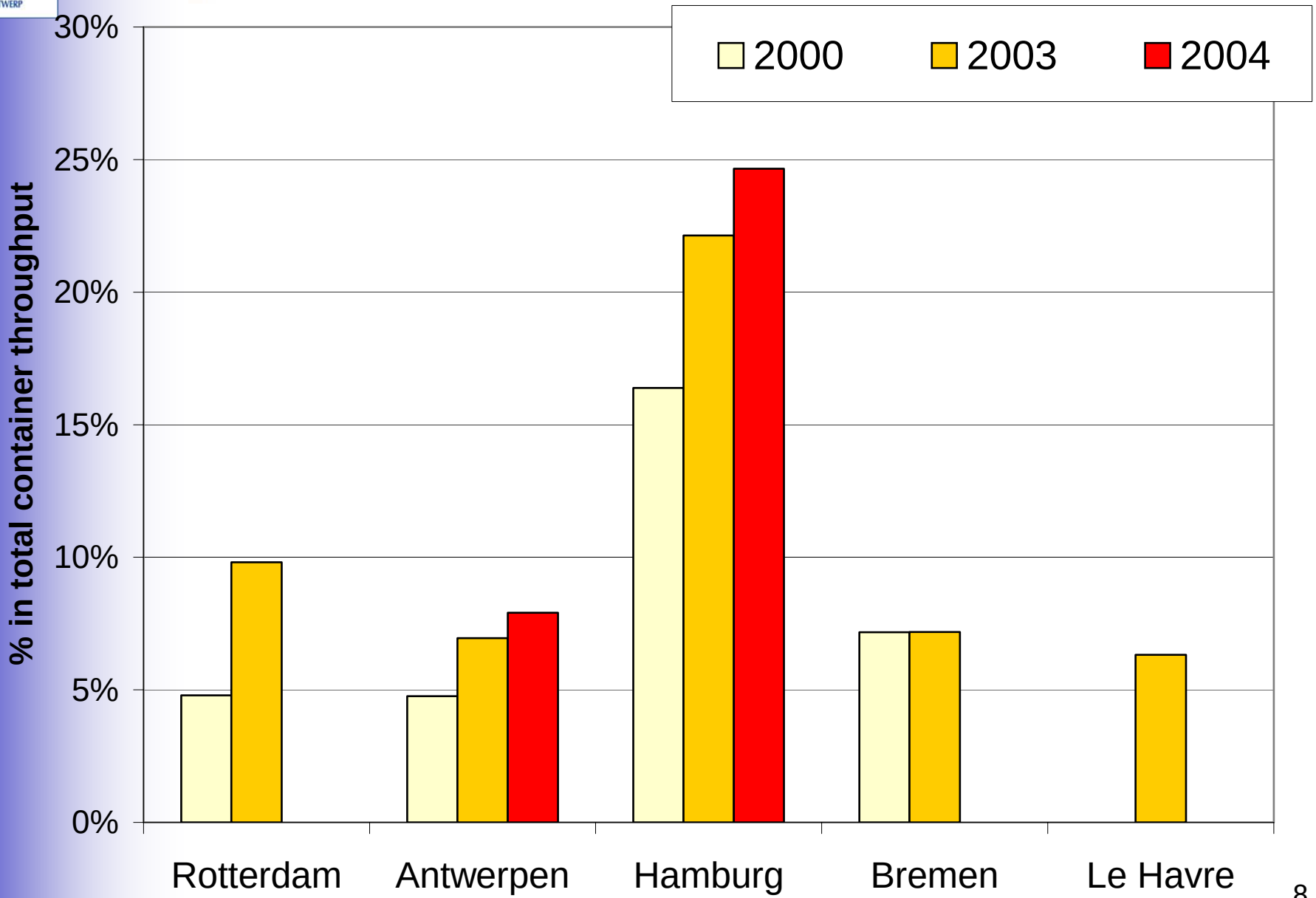
Container throughput in Chinese ports

	1985	1990	1995	1998	2000	2002	2003	2004	est. 2005	Average growth per year 1998-2002	Average growth per year 2002-2004
Mainland China (excluding Hong Kong SAR)											
Shanghai	0.20	0.46	1.53	3.07	5.61	8.61	11.28	14.55	*17.00*	45%	34%
Shenzhen	0.00	0.03	0.37	2.06	3.99	7.61	10.65	13.66	*18.00*	67%	40%
Qingdao	0.00	0.14	0.60	1.21	2.12	3.41	4.24	5.14		45%	25%
Tianjin	0.00	0.29	0.70	1.02	1.71	2.41	3.01	3.81		34%	29%
Guangzhou	0.00	0.08	0.51	0.85	1.43	2.17	2.76	3.31		39%	26%
Ningbo	0.00	0.00	0.16	0.35	0.90	1.86	2.76	4.01		107%	58%
Xiamen	0.00	0.03	0.33	0.65	1.08	1.75	2.33	2.87		42%	32%
Dalian	0.00	0.13	0.37	0.53	1.01	1.35	1.68	2.17		39%	30%
Zhongshan	0.00	0.00	0.00	0.00	n.a.	0.49	0.74	0.92		-	45%
Fuzhou	0.00	0.00	0.00	0.06	0.34	0.48	0.55	0.93		176%	46%

- Annual growth rates of 30 to 50%
- No sea-sea transshipment effect due to hinterland orientation of container flows

Source: Port authorities and Ministry of Communications

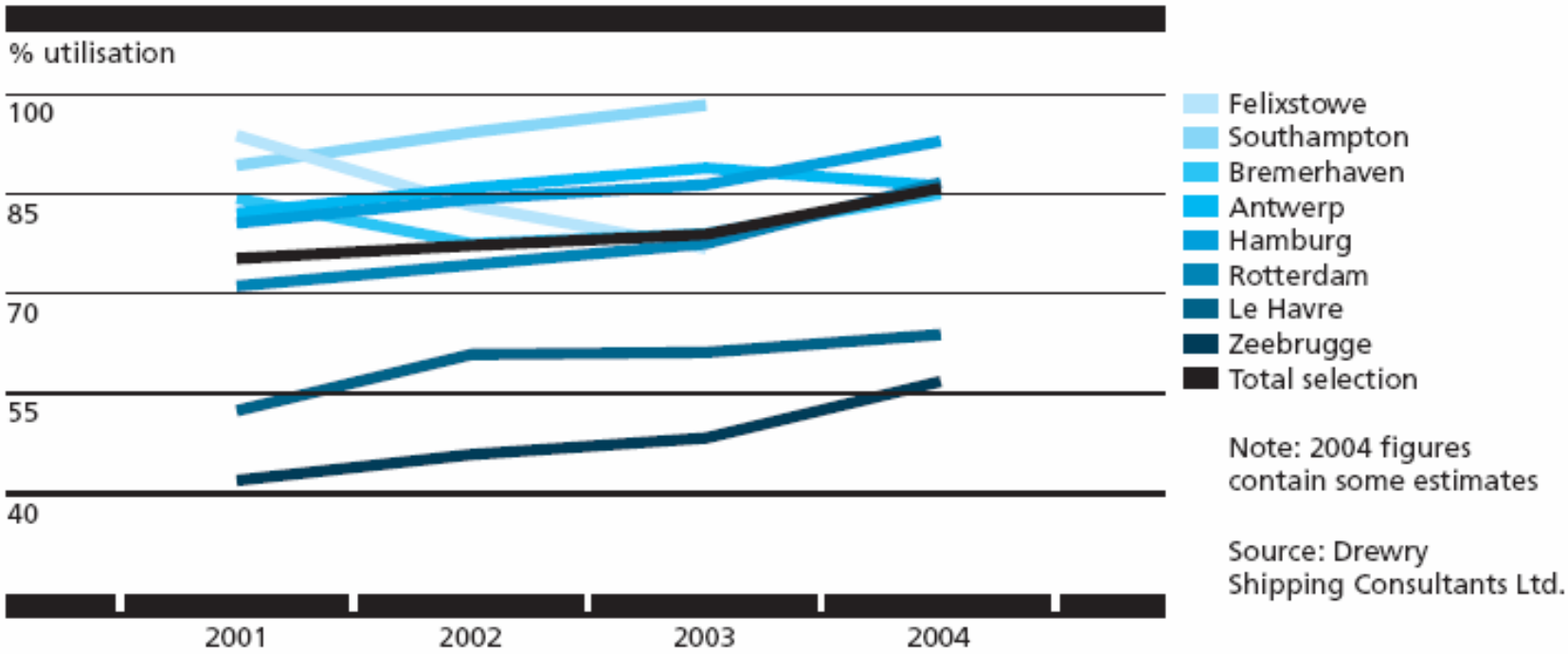
Chinese / HK cargo in selected European ports



Discussion theme 1:
Container capacity in Europe

Rising port utilisation levels

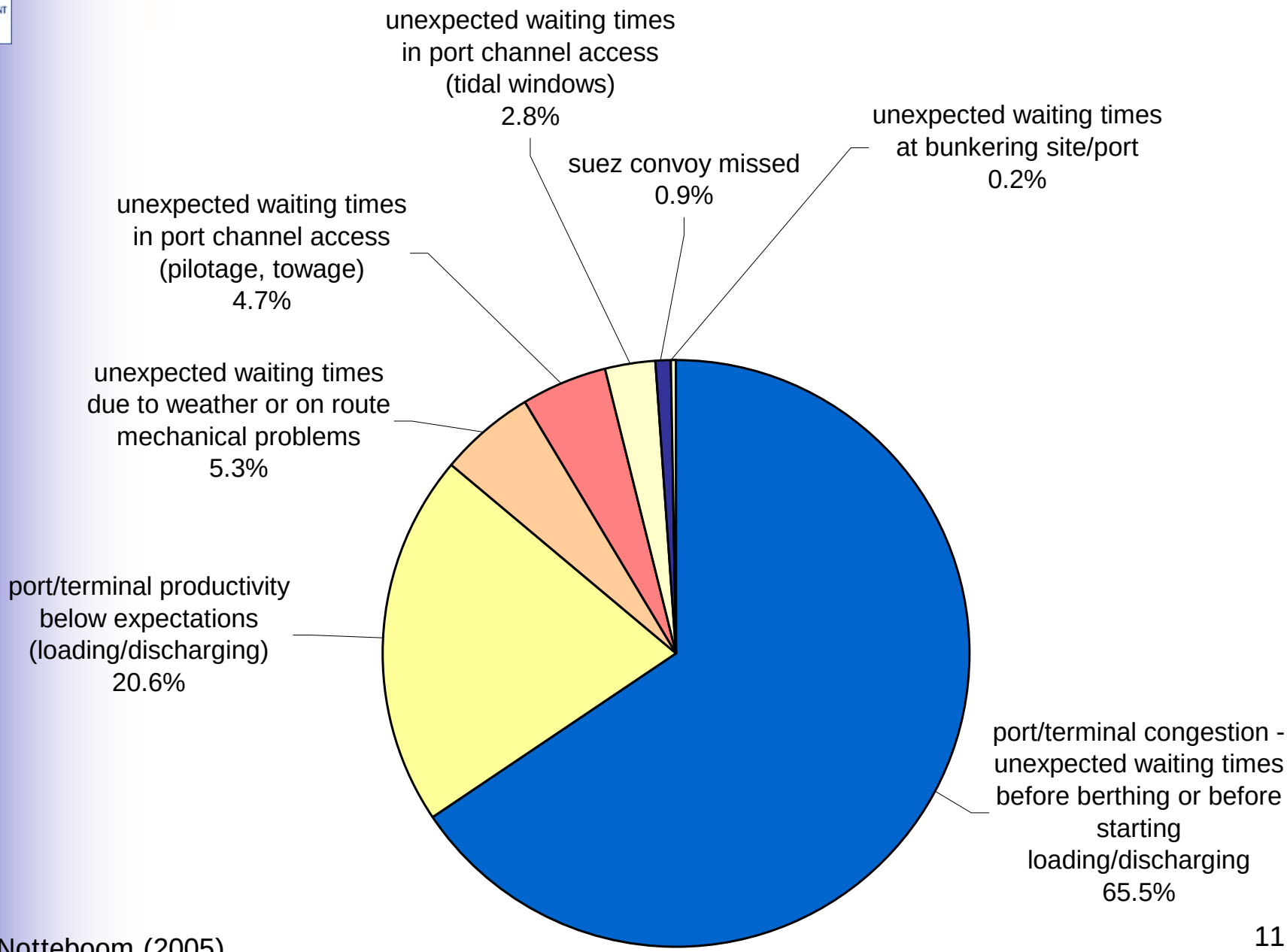
FIGURE 1.4: SELECTED NORTH EUROPEAN PORTS – DEVELOPMENT OF CONTAINER PORT UTILISATION LEVELS, 2001–2004



Note: 2004 figures contain some estimates

Source: Drewry Shipping Consultants Ltd.

Sources of schedule unreliability on the East Asia – Europe route
Fourth quarter of 2004 - based on survey data for 24 loops

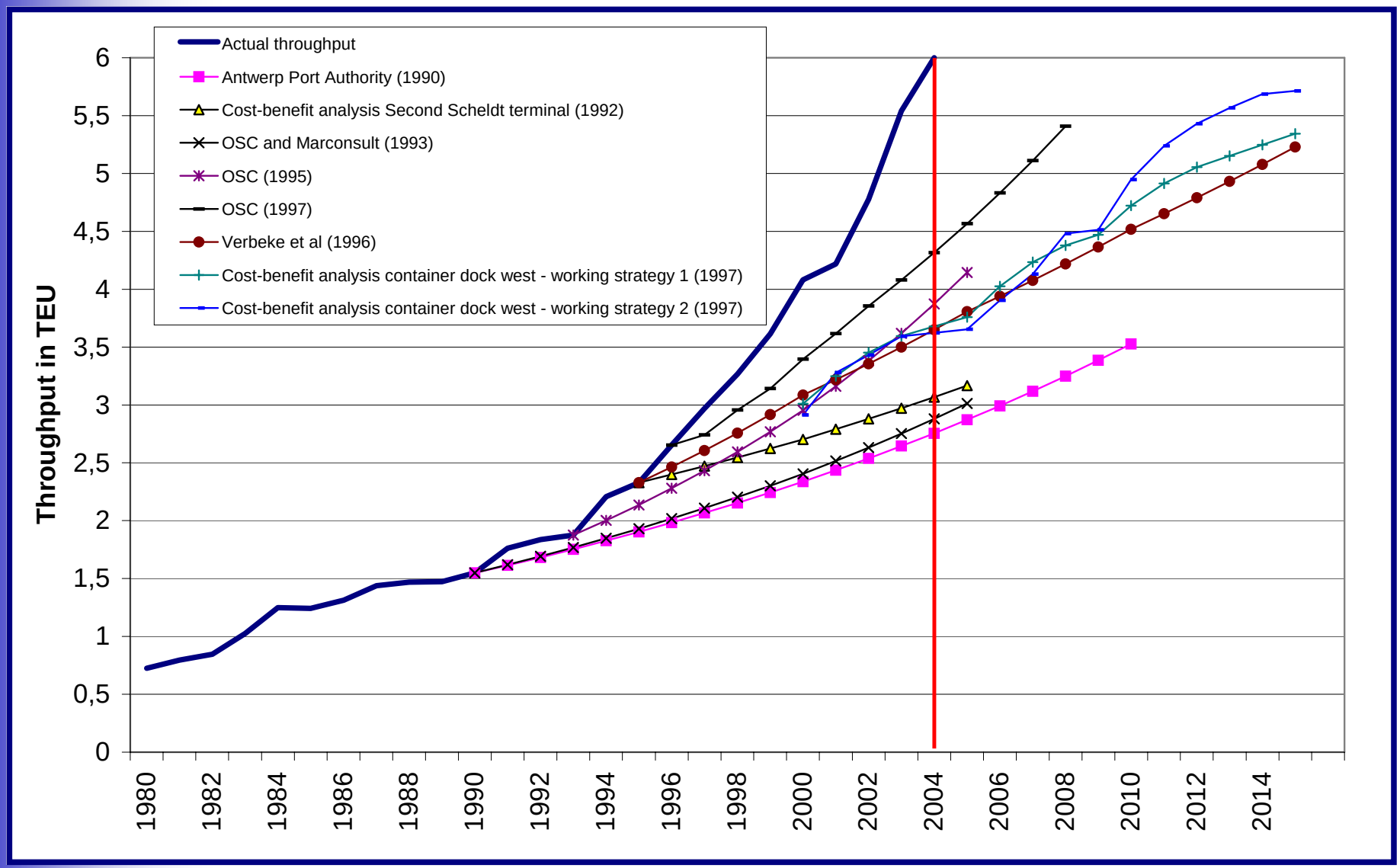


Source: Notteboom (2005)

Sources of capacity problems/congestion

- (Unanticipated) growth in demand (Asian factor)
- Increased focus on limited number of hubs
- Planning of new terminal developments slowed down

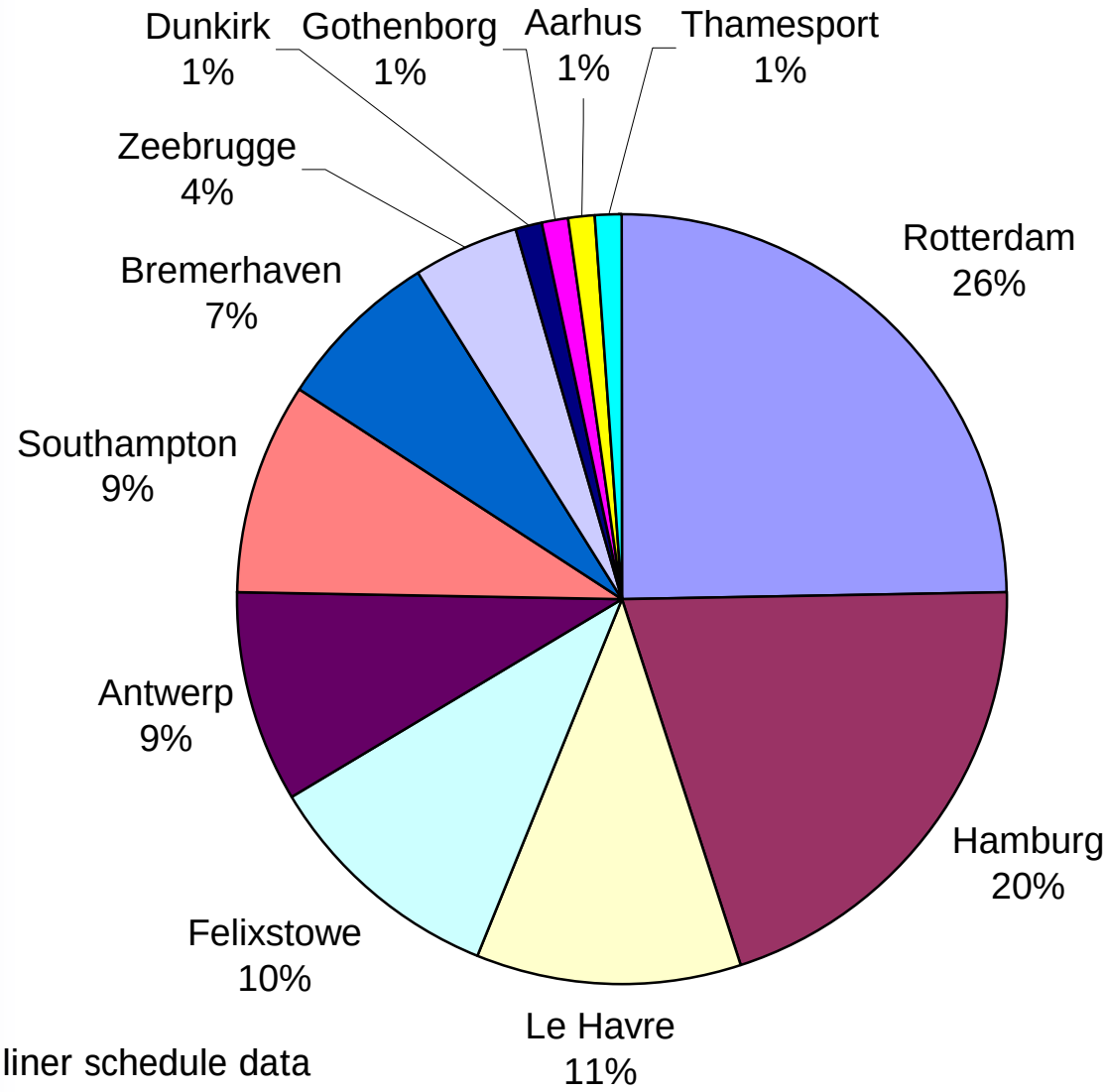
Forecasts versus actual traffic – case Antwerp



Source: ITMMA-UA

Concentration of vessel calls in selected ports

Share of ports in total number of weekly port calls on the North Europe – East-Asia trade



Source: based on liner schedule data

Shipping lines are securing capacity

Shipping line or related company	Terminals	Status
APM Terminals	APM Terminals Rotterdam (100%) North Sea Terminal Bremerhaven (50%) Medcenter - Gioia Tauro (33.3%) Muelle Juan Carlos I - Algeciras (100%) Aarhus (100%) APM Contstanza Terminal (100%) Zeebrugge	In operation since 2000 In operation In operation In operation In operation In operation Concession agreement signed in December 2004
MSC	MSC Home Terminal - Antwerp (joint venture with PSA) Le Havre (joint-venture with Terminaux de Normandie)	Operating since 2003 Upgrading in 2004-2005 Under development
Hapag-Lloyd	Altenwerder Terminal – Hamburg (minority stake of 25.1%)	In operation since 2002
CMA-CGM	Port Synergy (joint venture with P&O Ports) with terminals in Le Havre, Marseille and Marsaxlokk Shareholding in OCHZ Zeebrugge	In operation Negotiations
CMA-CGM Cosco Pacific P&O Nedlloyd	Minority shareholdings in Antwerp Gateway (other shareholders: P&O Ports and Duisport)	Operations start in Summer 2005
P&O Nedlloyd	Euromax Terminal Rotterdam (joint-venture with ECT)	Under development

Source: ITMMA-UA

Realising terminals takes (more) time

- Environmental considerations are prominent in port planning: balancing of economic, social and environmental values
- Emancipation process and local rationality (cf. NIMBY) of pressure groups
- (Pitfalls in) regulations and procedures slow down decision-making process
- Port managers spend a lot of time in embedding the port in local community

Securing port capacity

- Notwithstanding new capacity will come on stream in the coming years, cargo delays due to port congestion could well become a structural problem:

1. Market-based limitations to dwell time reductions
2. Public support for port development is lacking
3. Fetish of rules and procedures
4. Governments' retreat in the funding of ports
5. Weak support for 'port co-opetition'-model
6. EU port policy ?

- The battle for securing port capacity has only just begun

Discussion theme 2: Strategies of shipping lines and terminal operators

Strategic issues to container shipping lines

- Why a pure cost leadership strategy is becoming less feasible ?
- Co-operation, M&A as tools to achieving a hybrid strategy
- Landside logistics as a source of differentiation and cost control
- Differentiation and cost control through liner service network design

Why a pure cost leadership strategy is becoming less feasible ?

- Liner shipping under performs financially
  - Capital-intensive operations
  - High risks associated with revenues
  - Surplus space onboard due to economies of scale tend to push freight rates down

- Rather inelastic demand curves are at the heart of liner strategy:
  - Fill ships at ‘any price’
  - Intense concentration on costs: deploy larger vessels to lower cost per TEU *of capacity*.

Scale increases in vessel size: evolution of the world cellular fleet 1991-2006

	Jan 1991	Shares	Jan 1996	Shares	Jan 2001	Shares	Jan 2006	Shares
>5000 TEU	0	0.0%	30648	1.0%	621855	12.7%	2355033	30.0%
4000/4999 TEU	140032	7.5%	428429	14.4%	766048	15.6%	1339978	17.1%
3000/3999 TEU	325906	17.6%	612377	20.6%	814713	16.6%	892463	11.4%
2000/2999 TEU	538766	29.0%	673074	22.6%	1006006	20.5%	1391216	17.7%
1500/1999 TEU	238495	12.8%	367853	12.3%	604713	12.3%	719631	9.2%
1000/1499 TEU	329578	17.7%	480270	16.1%	567952	11.6%	596047	7.6%
500/999 TEU	191733	10.3%	269339	9.0%	393744	8.0%	438249	5.6%
100/499 TEU	92417	5.0%	117187	3.9%	132472	2.7%	114976	1.5%
TOTAL	1856927	100.0%	2979177	100.0%	4907503	100.0%	7847593	100.0%

Source: BRS Alphaliner Fleet Report, September 2003

Why a pure cost leadership strategy is becoming less feasible ?

- A unilateral focus on vessel sizes does not lead to sustainable competitive advantage
  - Cost per TEU *carried* not necessarily lower: requirements of world-embracing liner networks are high
  - Most competitive vessel size not only function of operating costs
  - Carriers have not reaped full benefits of economies of scale at sea

- Consecutive rounds of newbuildings are not helping to reach stability in liner shipping.

Co-operation, M&A to achieving a hybrid strategy

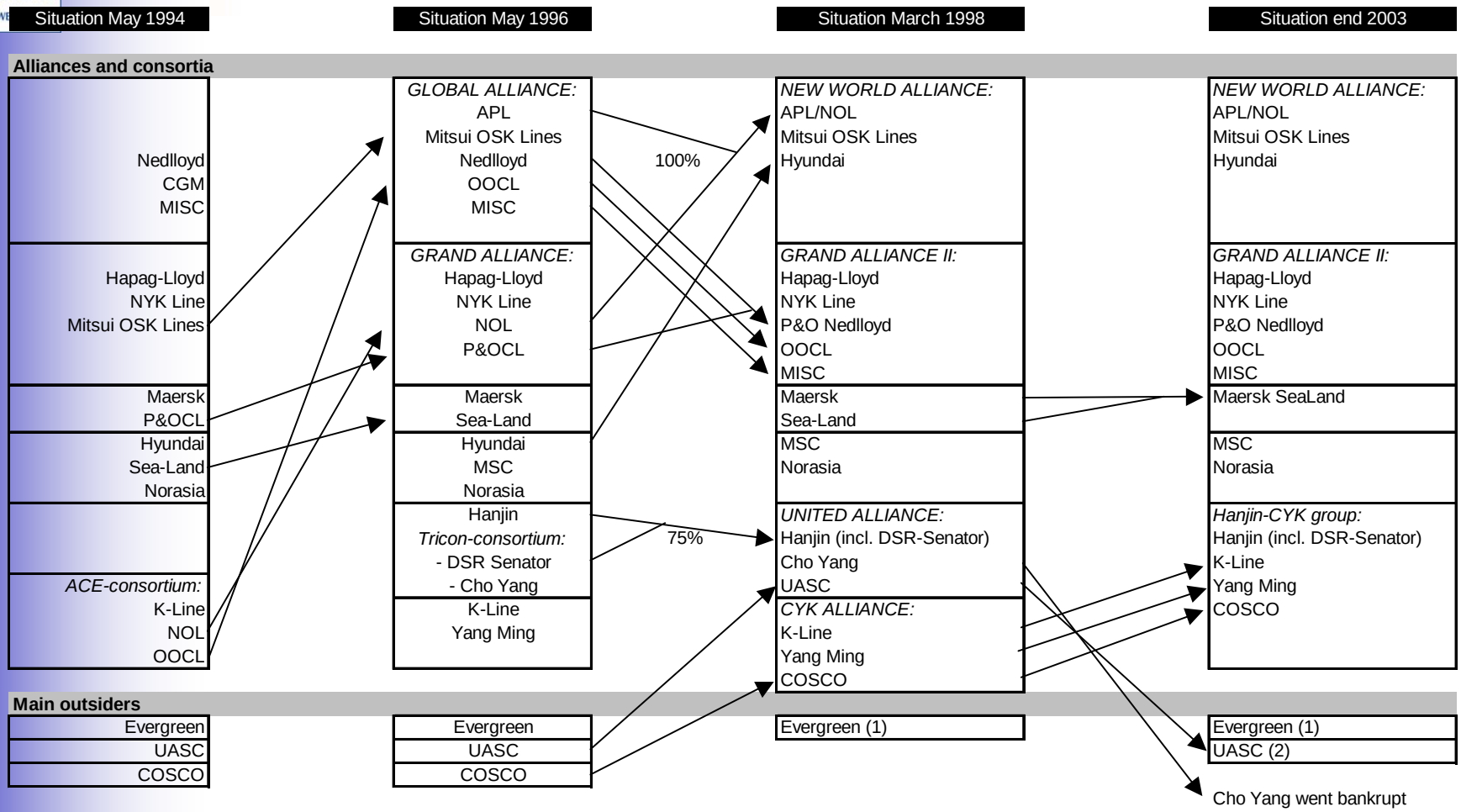
Slot capacity operated by the top twenty carriers

	January 1980		September 1995		January 2000		April 2003	
	Carrier	Slot cap.	Carrier	Slot cap.	Carrier	Slot cap.	Carrier	Slot cap.
1	Sea-Land	70000	Sea-Land	196708	Maersk - SeaLand	620324	Maersk - SeaLand	845614
2	Hapag-Lloyd	41000	Maersk	186040	Evergreen	317292	MSC	470006
3	OCL	31400	Evergreen	181982	P&O Nedlloyd	280794	Evergreen group	427749
4	Maersk	25600	COSCO	169795	Hanjin/DSR Senator	244636	P&O Nedlloyd	410990
5	NYK Line	24000	NYK Line	137018	MSC	224620	Hanjin/DSR Senator	288957
6	Evergreen	23600	Nedlloyd	119599	NOL/APL	207992	NOL/APL	250018
7	OOCL	22800	Mitsui OSK Lines	118208	COSCO	198841	COSCO	243162
8	Zim	21100	P&OCL	98893	NYK Line	166206	CMA/CGM	237115
9	US Line	20900	Hanjin Shipping	92332	CP Ships / Americana	141419	NYK Line	220600
10	APL	20000	MSC	88955	Zim	136075	CP Ships group	196938
11	Mitsui OSK Lines	19800	APL	81547	Mitsui OSK Lines	132618	K-Line	186805
12	Farrell Lines	16400	Zim	79738	CMA/CGM	122848	Mitsui OSK Lines	166635
13	NOL	14800	K-Line	75528	K-Line	112884	Zim	166611
14	Trans Freight Line	13900	DSR-Senator	75497	Hapag-Lloyd	102769	China Shipping	166213
15	CGM	12700	Hapag-Lloyd	71688	Hyundai	102314	OOCL	156173
16	Yang Ming	12700	NOL	63469	OOCL	101044	Hapag Lloyd	152937
17	Nedlloyd	11700	Yang Ming	60034	Yang Ming	93348	Yang Ming	136236
18	Columbas Line	11200	Hyundai	59195	China Shipping	86335	Hyundai	125474
19	Safmarine	11100	OOCL	55811	UASC	74989	CSAV	114189
20	Ben Line	10300	CMA	46026	Wan Hai	70755	Hamburg-Sud	111955
Slot capacity top 20		*435000*		*2058063*		*3538103*		*5074377*
C4-index		*38.6%*		*35.7%*		*41.4%*		*42.5%*
Share top 5 in top 20		*44.1%*		*42.3%*		*47.7%*		*48.2%*
Share top 10 in top 20		*69.1%*		*67.5%*		*71.7%*		*70.8%*

Source: compiled from BRS Alphaliner and Containerisation International

Co-operation, M&A to achieving a hybrid strategy

M&A and strategic alliances on the trade Europe – Far East



Summer of 2005: Major shake up in the industry

Take-over P&O Nedlloyd by Maersk Group, take-over CP Ships by Hapag-Lloyd
take over Delmas by CMA-CGM, China Shipping ? , ..

Co-operation, M&A to achieving a hybrid strategy

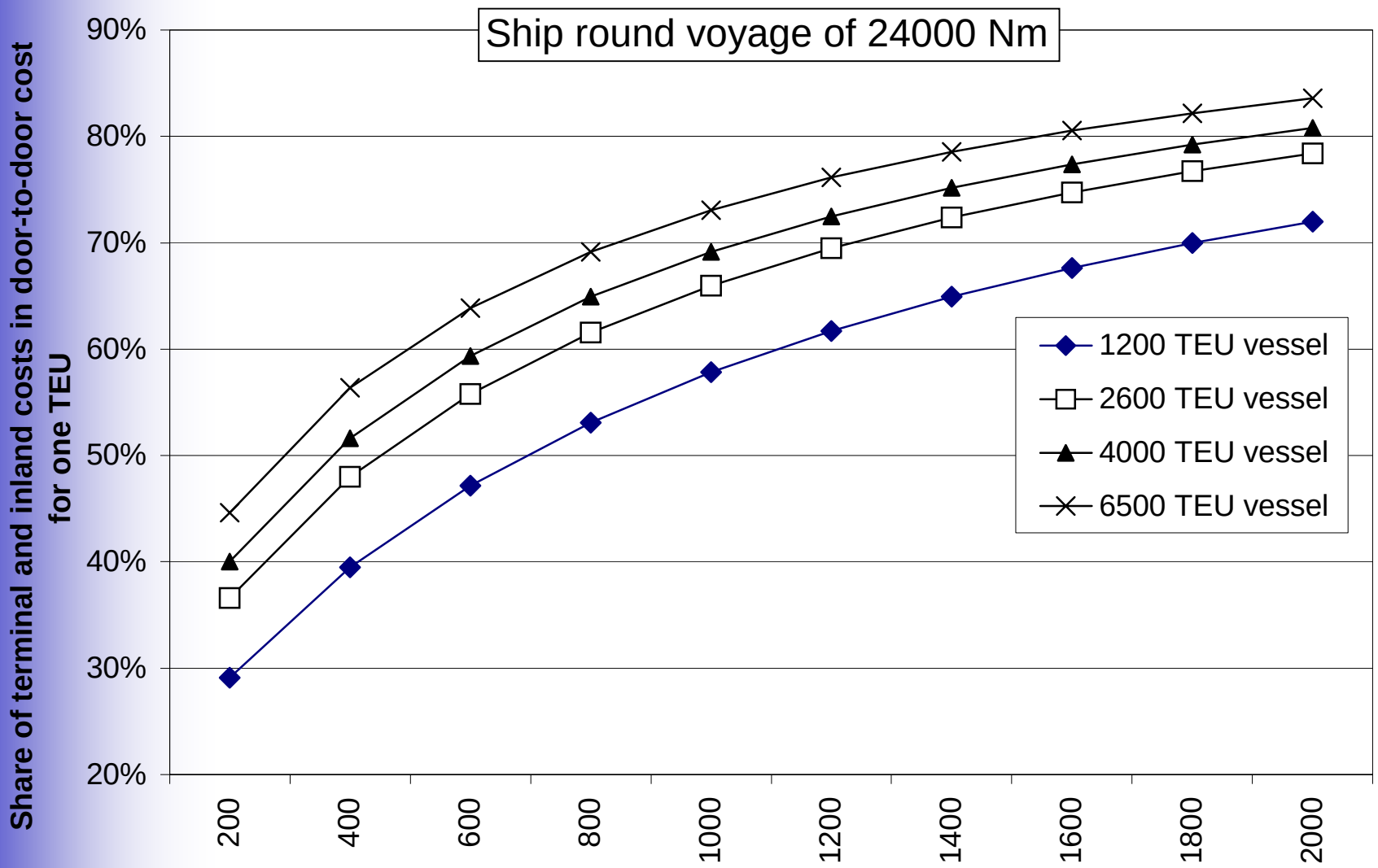
The participation of shipping lines in strategic alliances (early 2003)

liance	Number of ships in the alliance	Total fleet (number)	%	Slot capacity in the alliance (TEU)	Total slot capacity	%
Grand Alliance						
P&O Nedlloyd	39	146	26.7	182 550	386 901	47.2
OOCL	24	50	48.0	119 391	156 016	76.5
Hapag Lloyd	24	38	63.2	115 449	141 717	81.5
NYK	24	67	35.8	96 436	167 001	57.7
MISC	4	32	12.5	16 622	49 808	33.4
Cosco/K-Line/Yangming Alliance						
Cosco	38	104	36.5	154 892	219 324	70.6
K-Line	31	58	53.4	135 205	174 945	77.3
Yangming	16	40	40.0	72 867	119 695	60.9
New World Alliance						
APL	39	76	51.3	177 100	240 237	73.7
Hyundai	18	31	58.1	99 158	121 890	81.4
Mitsui OSK	16	48	33.3	77 410	130 090	59.5
United Alliance						
Hanjin	32	52	61.5	139 205	201 005	69.3
Senator	28	32	87.5	97 566	104 895	93.0

Source: on the basis of Containerisation International and carrier information

Landside logistics as a source of differentiation and cost control

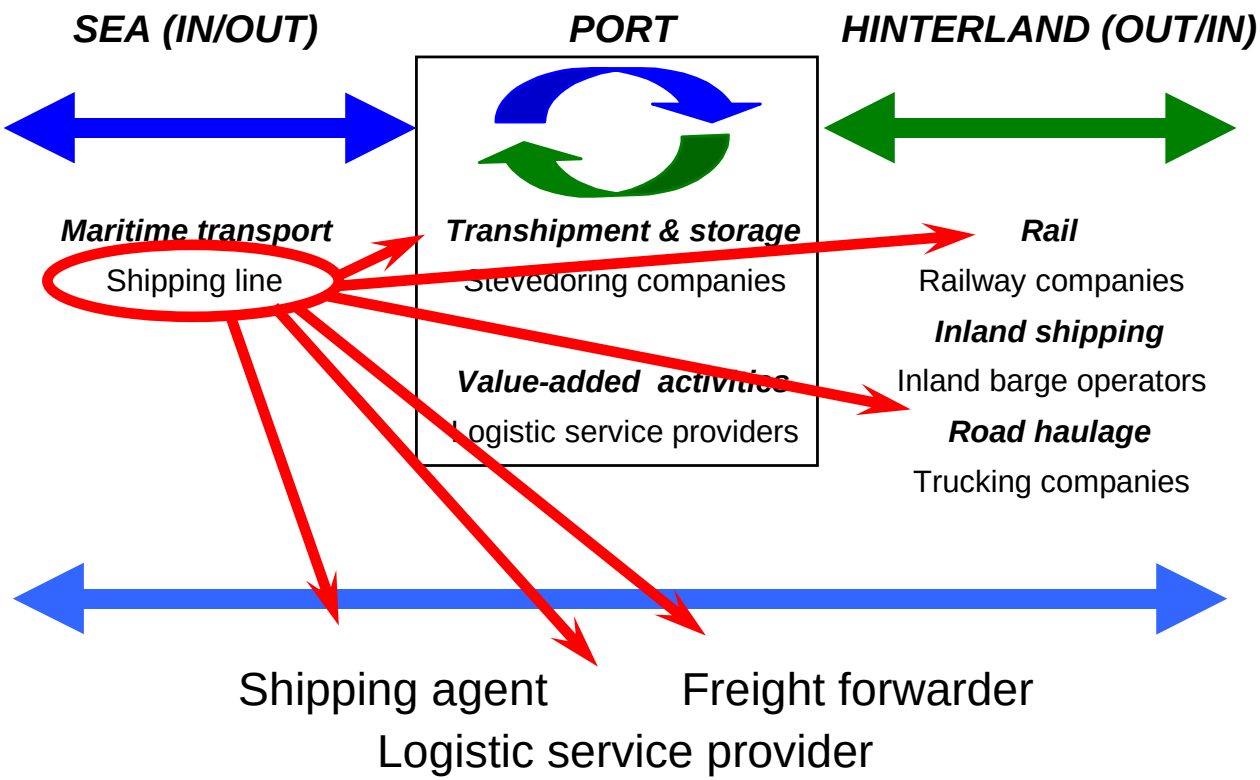
The share of landside costs in door-to-door cost per TEU



Source: Notteboom (2002)

Inland logistics as a vital area still left to cut costs

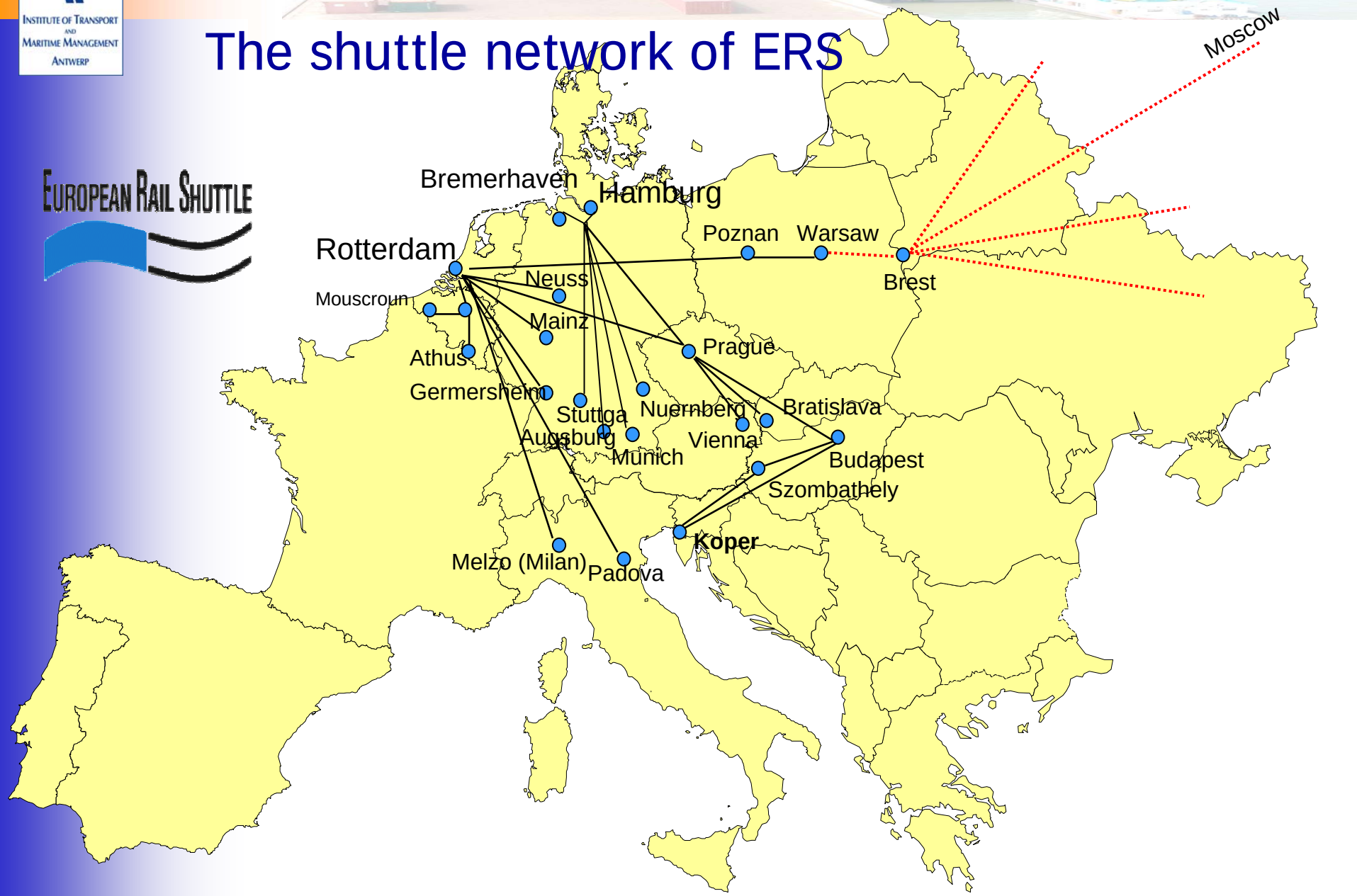
- Smarter management of inland and container logistics can secure an important cost advantage.
- Because this is difficult to do, it is likely to be a sustainable way of differentiating business from rivals



Tackling inland logistics costs

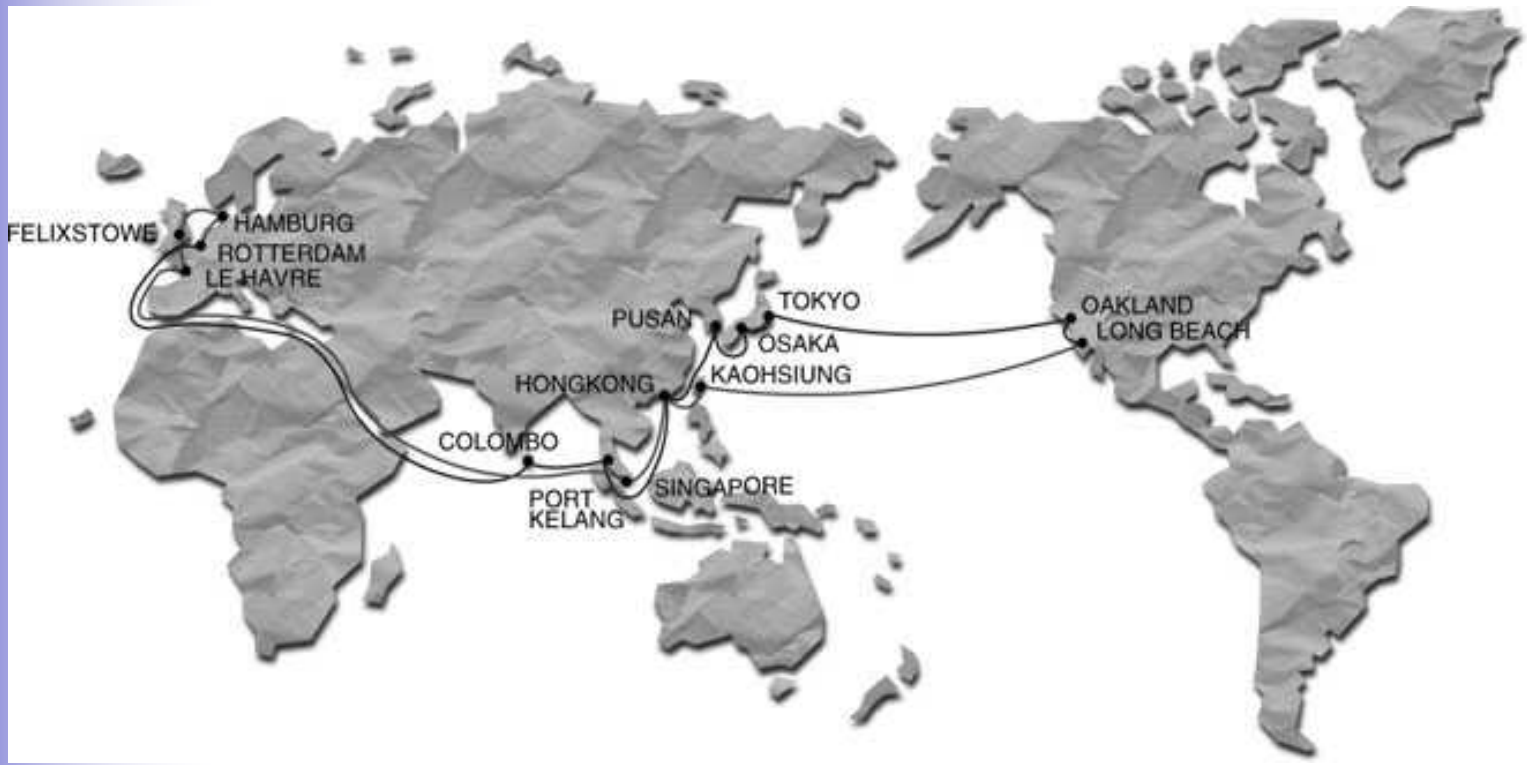
- Modal choice and control
  - US: double-stack technology
  - Carrier rail networks (cf. ERS)
  - Use of cheaper/slower modes where possible (cf. barge)
- IT solutions to increase transparancy of inland operations and flows
- Tackle equipment surpluses/deficits through container cabotage, inter-line equipment interchanges, chassis pools and master leases
- Alliances: increased purchasing power when negotiating for inland rail and trucking services

The shuttle network of ERS



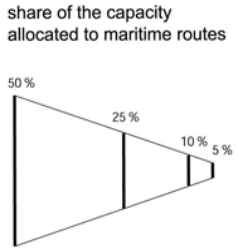
Bron: Van Slobbe – P&O Nedlloyd

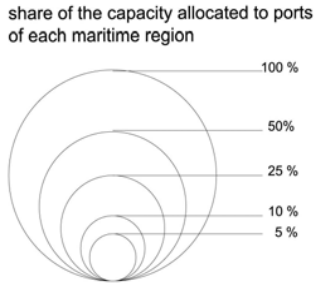
Differentiation and cost control through liner service network design
Limits to the hub-and-spoke principle

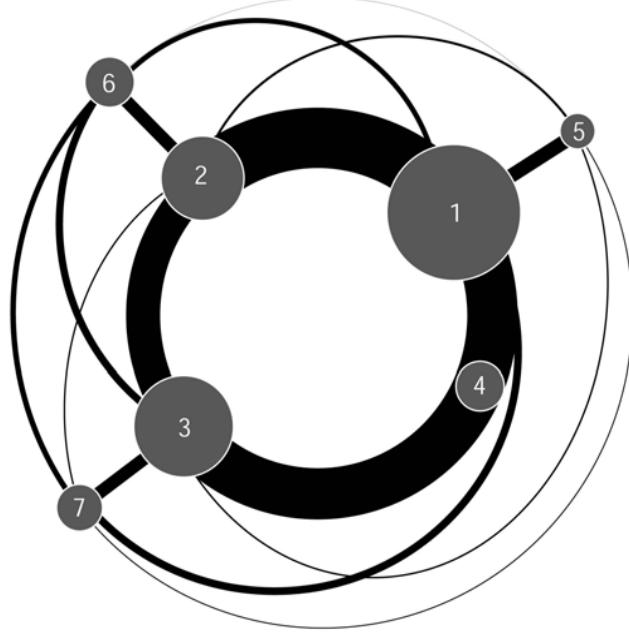


- Growing importance of relay/transhipment flows, but volatile and risky business
- Liner service design: from a pure cost-driven excercise to a more customer-oriented differentiation exercise (shippers' needs and willingness to pay)

Carriers' geographical distribution of weekly vessel slot capacities

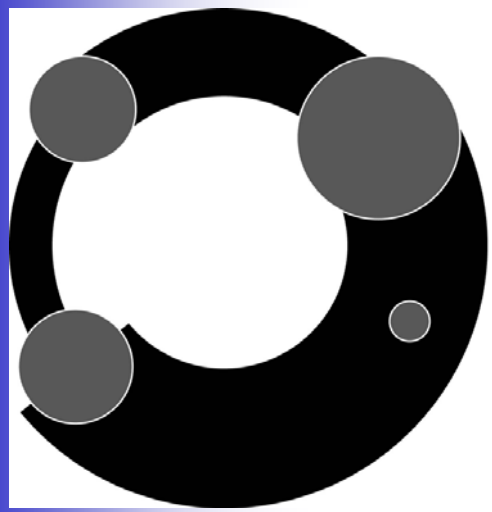




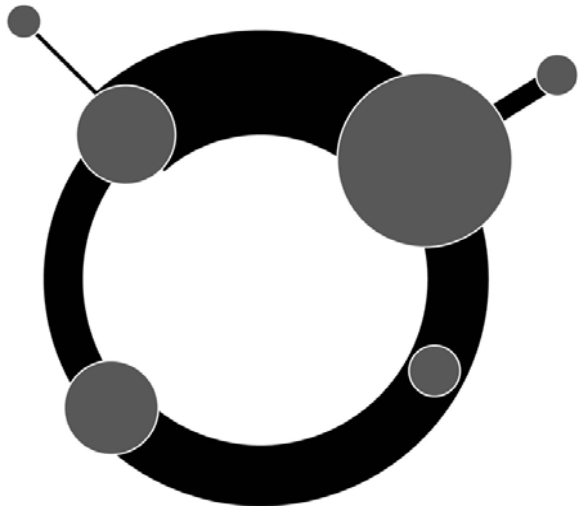


1 - Far East, 2 - North America, 3 - Europe, 4 - South Asia, 5 - Pacific, 6 - South America, 7 - Africa

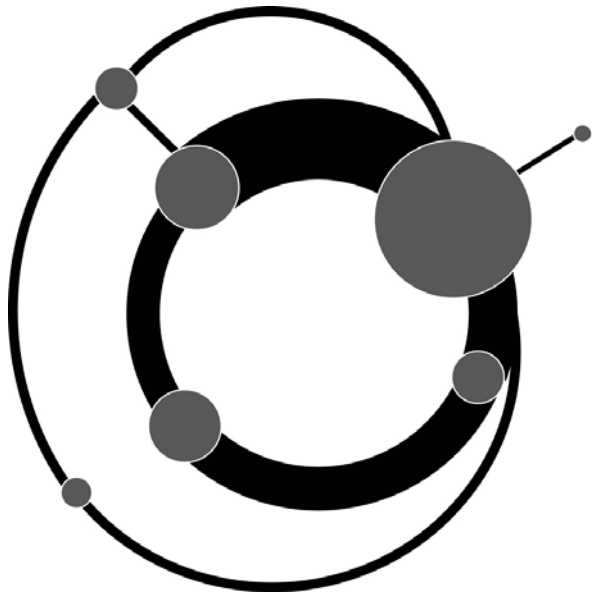
Grand Alliance



Hanjin



Evergreen



Source: Frémont & Soppé (2003)

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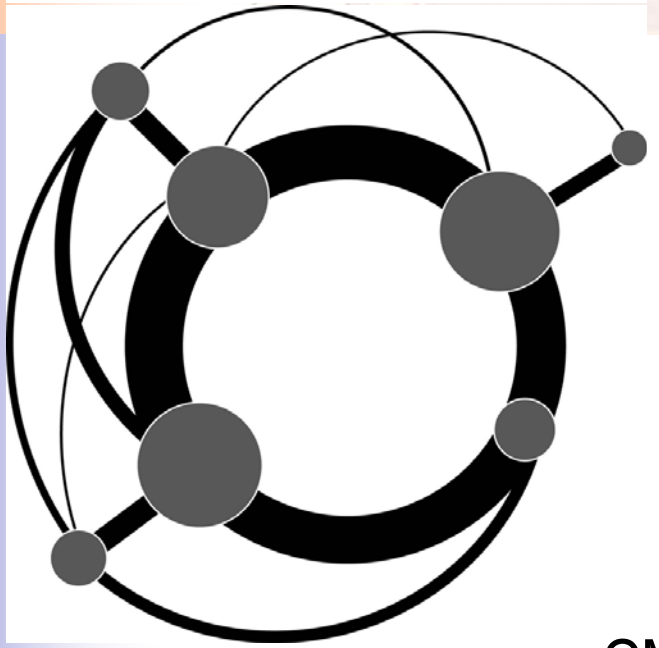
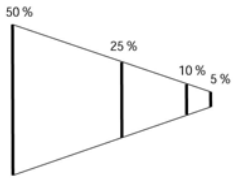
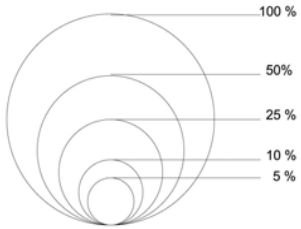
Maersk Sealand

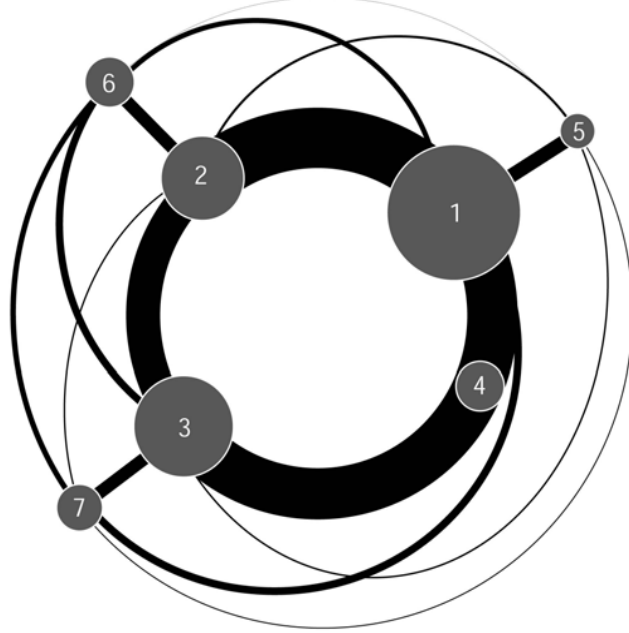


share of the capacity allocated to maritime routes



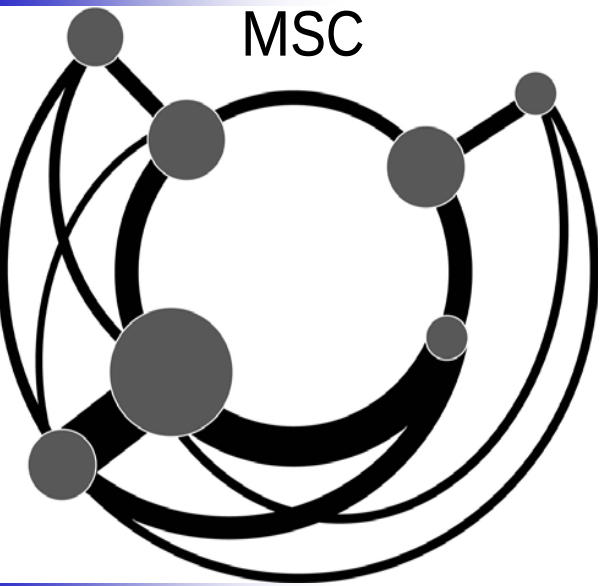
share of the capacity allocated to ports of each maritime region



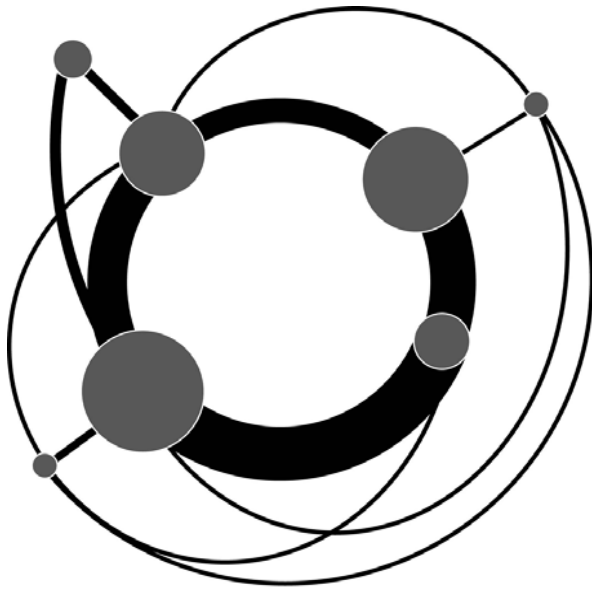


1 - Far East, 2 - North America, 3 - Europe, 4 - South Asia, 5 - Pacific, 6 - South America, 7 - Africa

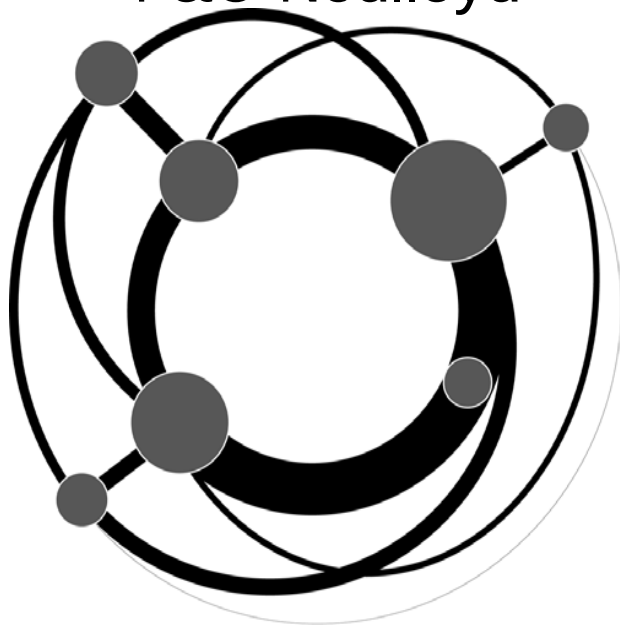
MSC



CMA-CGM



P&O Nedlloyd



Source: Frémont & Soppé (2003)

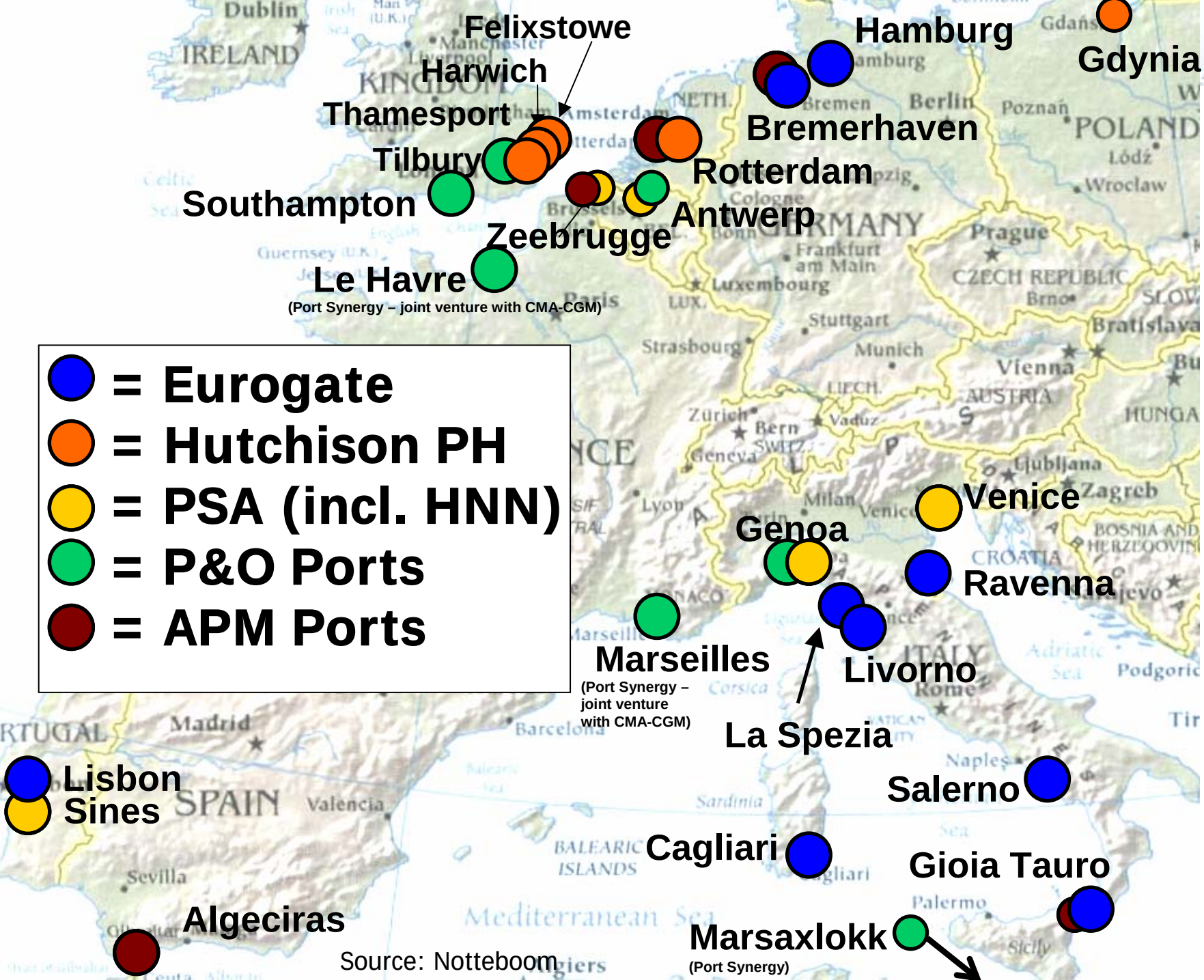
Strategic issues to container terminal operators

- Challenges faced by terminal operators
- The emergence of international terminal networks
- Vertical integration as a source of differentiation and cost control

Strategic issues to container terminal operators
Challenges faced by terminal operators

- Loyalty of client can not be taken for granted.
- High investment needs
- Competition from new entrants

=> Revision of strategy is needed.


Felixstowe
Harwich
Thamesport
Tilbury
Southampton
Zeebrugge
Le Havre
(Port Synergy – joint venture with CMA-CGM)
Hamburg
Gdynia
Bremerhaven
Rotterdam
Antwerp
= Eurogate
= Hutchison PH
= PSA (incl. HNN)
= P&O Ports
= APM Ports
Venice
Genoa
Ravenna
Marseilles
(Port Synergy – joint venture with CMA-CGM)
Livorno
La Spezia
Lisbon
Sines
Salerno
Cagliari
Gioia Tauro
Algeciras
Marsaxlokk
(Port Synergy)
Source: Notteboom

Carrier-based terminal operators in the global operators throughput league

Global operators throughput league table, 2002
(Million teu / % share of world container port throughput)

Rank	Operator	Million teu	% Share	Rank	Operator	Million teu	% Share
1	HPH	36.7	13.3%	13	NYK Line	3.5	1.3%
2	PSA	26.2	9.5%		*Ceres – stevedoring operations*	*1.3*	*0.5%*
3	APM Terminals	17.2	6.2%	14	OOCL	3.0	1.1%
4	P&O Ports	12.8	4.6%	15	CSXWT	2.7	1.0%
5	Eurogate	9.5	3.5%	16	MOL	2.7	1.0%
6	Evergreen	5.7	2.1%	17	K Line	2.2	0.8%
7	DPA	5.3	1.9%	18	Dragados	2.3	0.8%
8	Cosco	4.7	1.7%	19	TCB	2.2	0.8%
9	Hanjin	4.7	1.7%	20	MSC	2.2	0.8%
10	SSA Marine	4.4	1.6%	21	Yang Ming	1.3	0.5%
11	APL	4.3	1.6%	22	ICTSI	1.3	0.5%
12	HHLA	4.0	1.4%	23	Hyundai	1.1	0.4%
	Global operators total:					**160.0**	**58.0%**

Notes

Figures include full year throughput for all terminals in which non-minority shareholdings were held as at 31st Dec 2002; due to the method of calculation some figures vary from terminal operators' publicly announced results.

Source: Drewry Shipping Consultants Ltd.

The emergence of international terminal networks

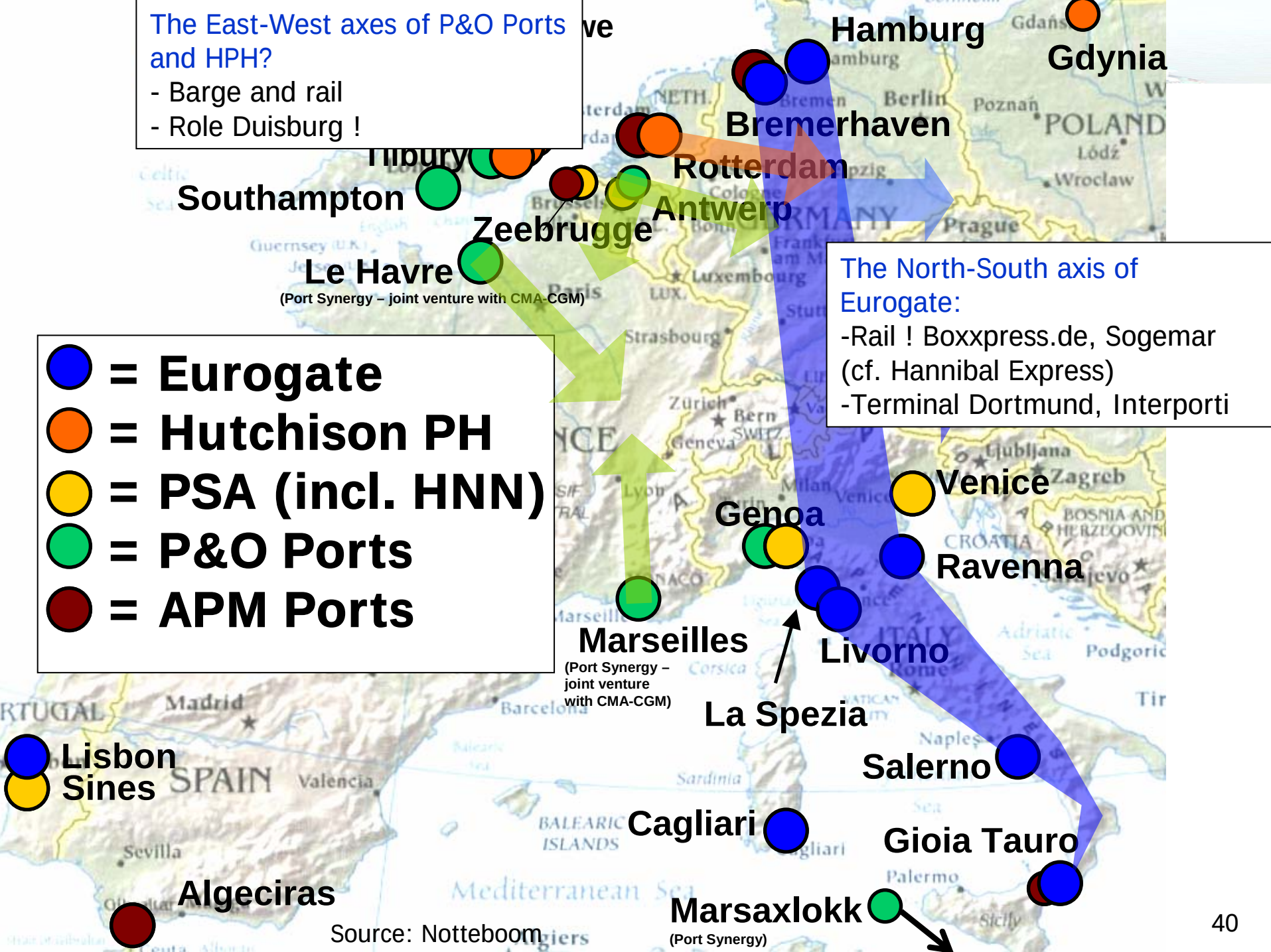
- Facilitated by:
  - Privatisation of port activities
  - Move towards transparent and open concession procedures

- Key issues to global operators:
  - Ability to take firm control
  - High level of indigenous cargo
  - Stable political and economic outlook

The emergence of international terminal networks
Strategy aspects

- Source of competitive advantage:
  - Entry barriers (deep pockets, know how)
  - Building strongholds in selected ports
  - Deep pockets (successful bidding + organic growth)
- Smaller operators avoid direct competition (niche markets)
- Fears:
  - Monopolies
  - Deep pockets
  - Lack of transparancy
  - Weak cultural attachment
- Global terminal operators ‘respond’ to strategic moves of shipping lines

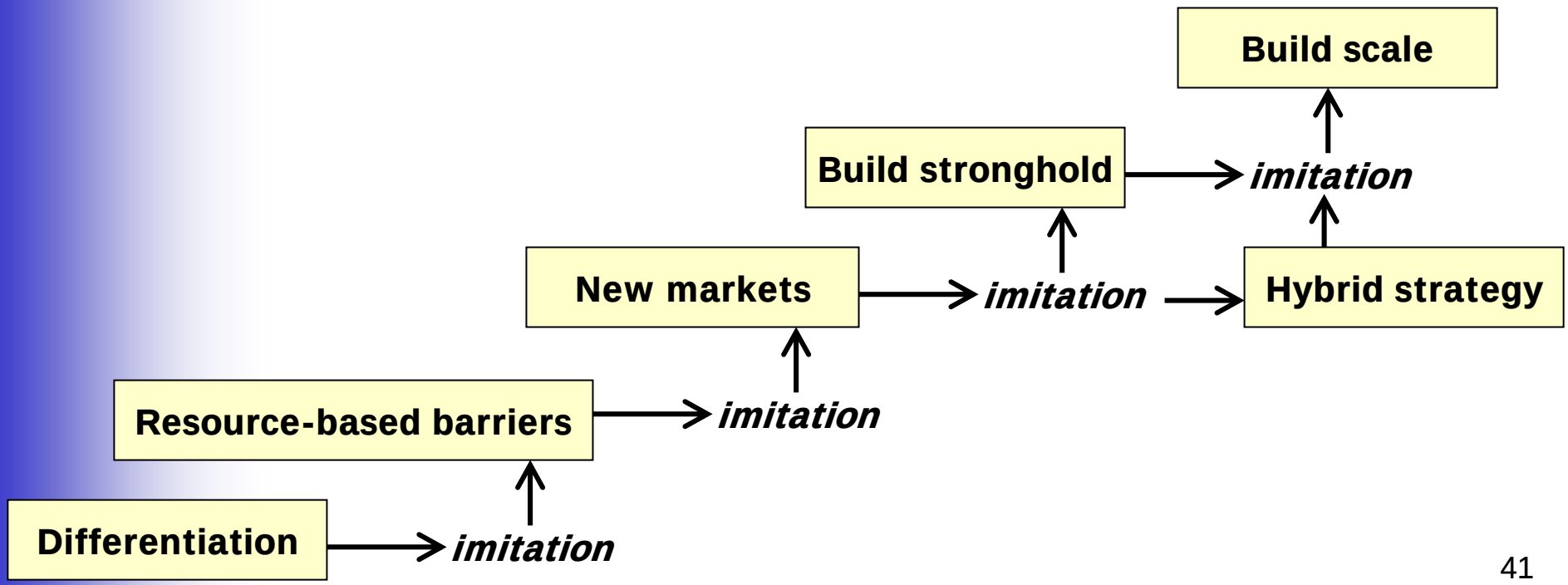
Vertical integration as a source of differentiation and cost control


The East-West axes of P&O Ports and HPH?
- Barge and rail
- Role Duisburg !
Hamburg
Gdynia
Bremerhaven
Rotterdam
Antwerp
Zeebrugge
Southampton
Le Havre
(Port Synergy – joint venture with CMA-CGM)
The North-South axis of Eurogate:
-Rail ! Boxxpress.de, Sogemar (cf. Hannibal Express)
-Terminal Dortmund, Interporti
= Eurogate
= Hutchison PH
= PSA (incl. HNN)
= P&O Ports
= APM Ports
Venice
Genoa
Ravenna
Livorno
Marseilles
(Port Synergy – joint venture with CMA-CGM)
La Spezia
Salerno
Cagliari
Gioia Tauro
Marsaxlokk
(Port Synergy)
Lisbon
Sines
Algeciras
Source: Notteboom

Conclusion: strategy dynamics in the highly competitive container market

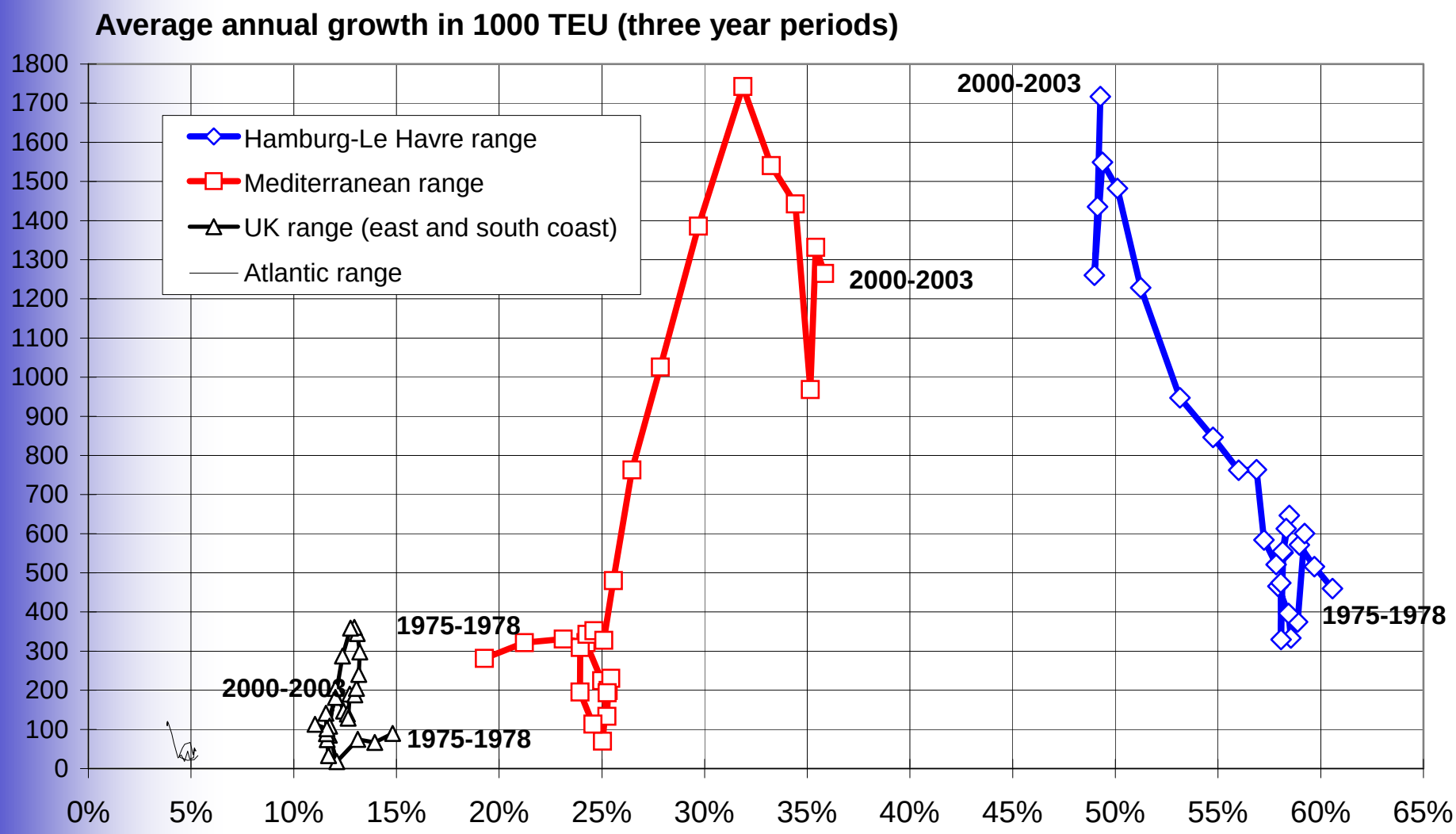
- Individual terminal operators and shipping lines tend to walk different strategy paths and more than once they change paths.

- Erosion of bases of competitive advantage is likely.



Discussion theme 3:
Port hierarchy in Europe

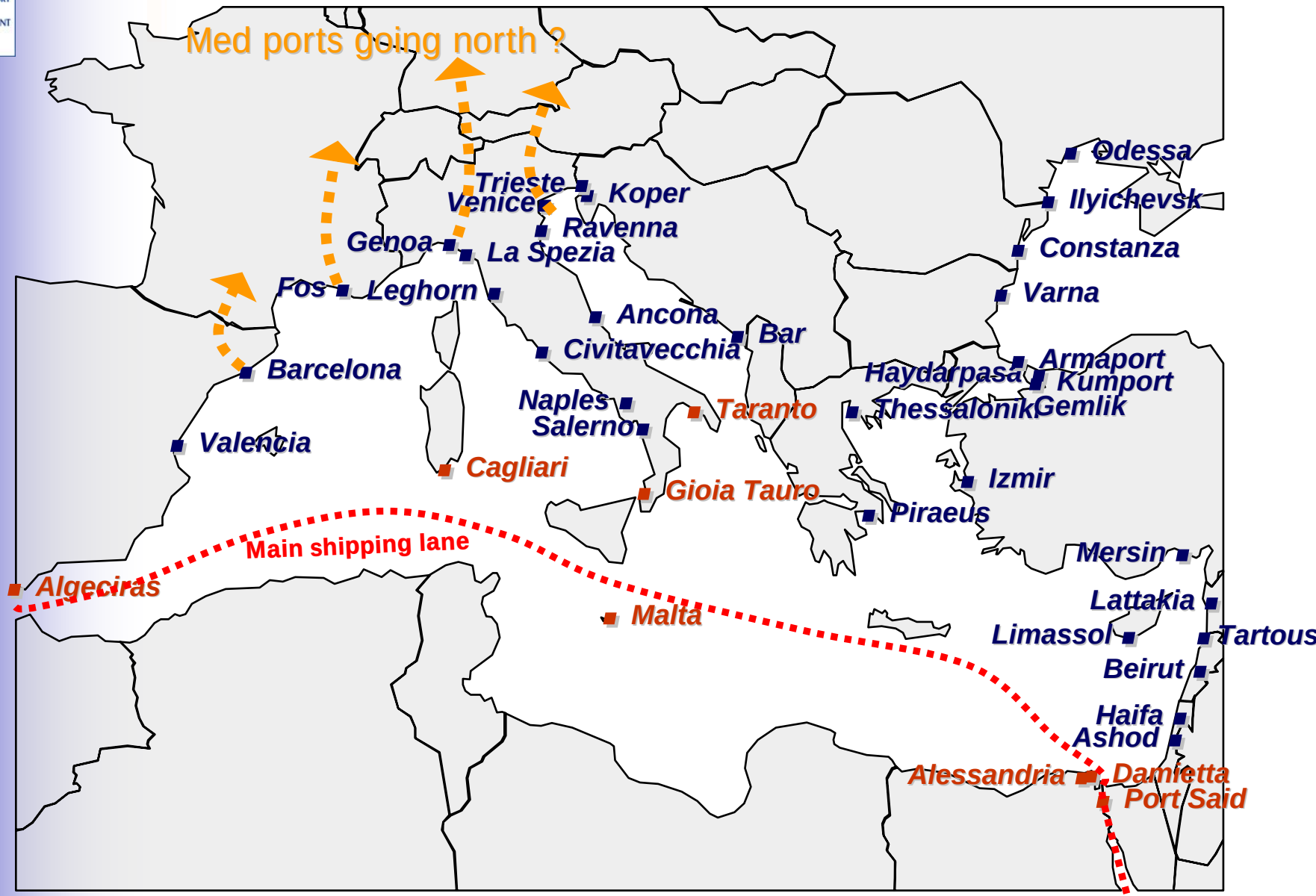
Increased competition among port ranges in Europe



The ‘blue banana’ in transition

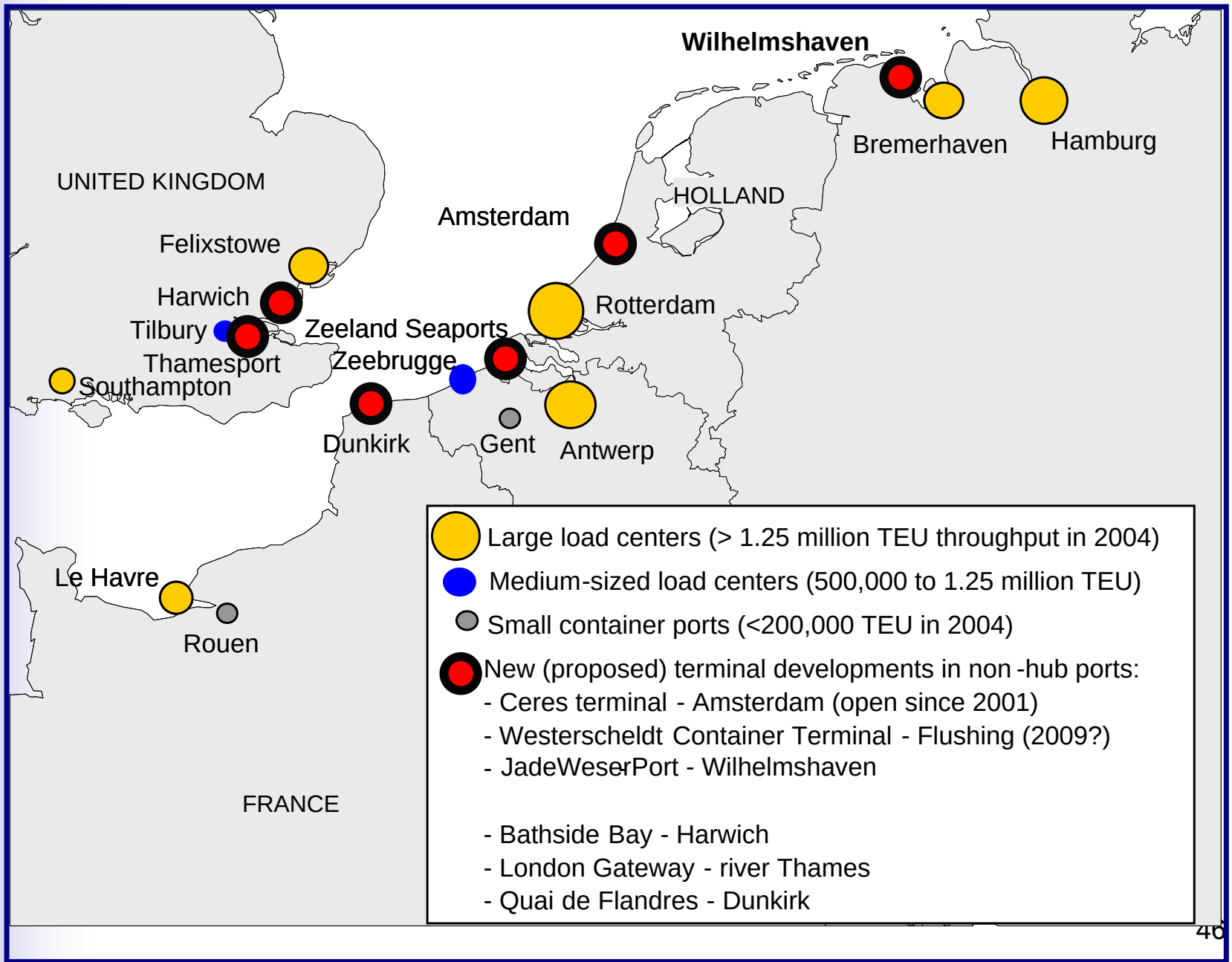
Source: Cushman & Wakefield, Healey & Baker

Port dynamics in the Med



45

Existing and planned container ports in northern Europe



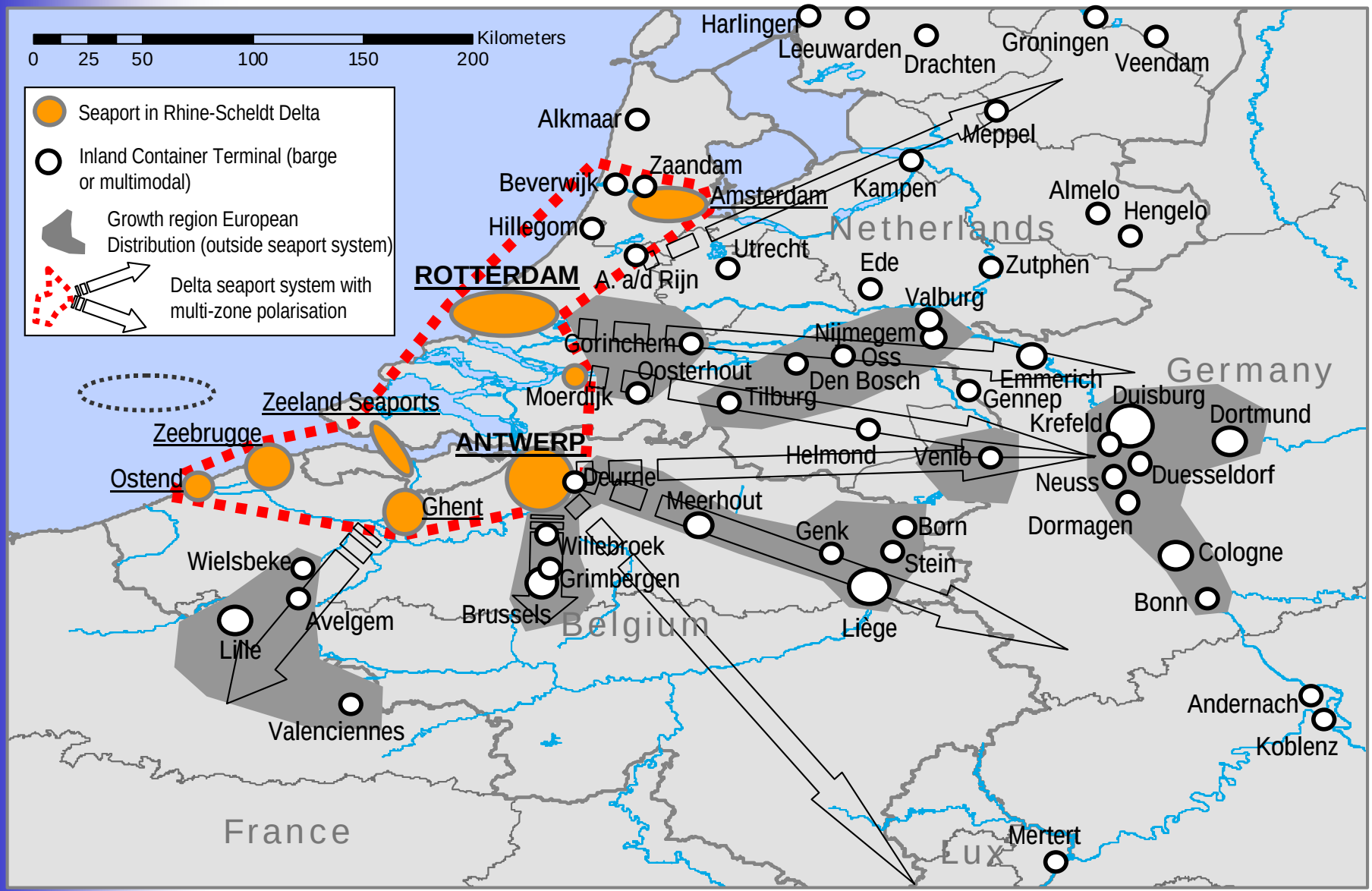
Towards a new port hierarchy in Europe ?

- Competition between port ranges
- Competition between established ports and new/smaller ports
- Baltic and Atlantic ports have found their place in the evolving port hierarchy ?
- Smaller ports: successful in following a niche market strategy.

= > extensive container port networks and a renewed hierarchy in the European port system as a response to the requirements of modern logistics systems.

Discussion theme 4: Hinterland access

Seaports are key nodes in logistics poles
Case Rhine-Scheldt Delta ports

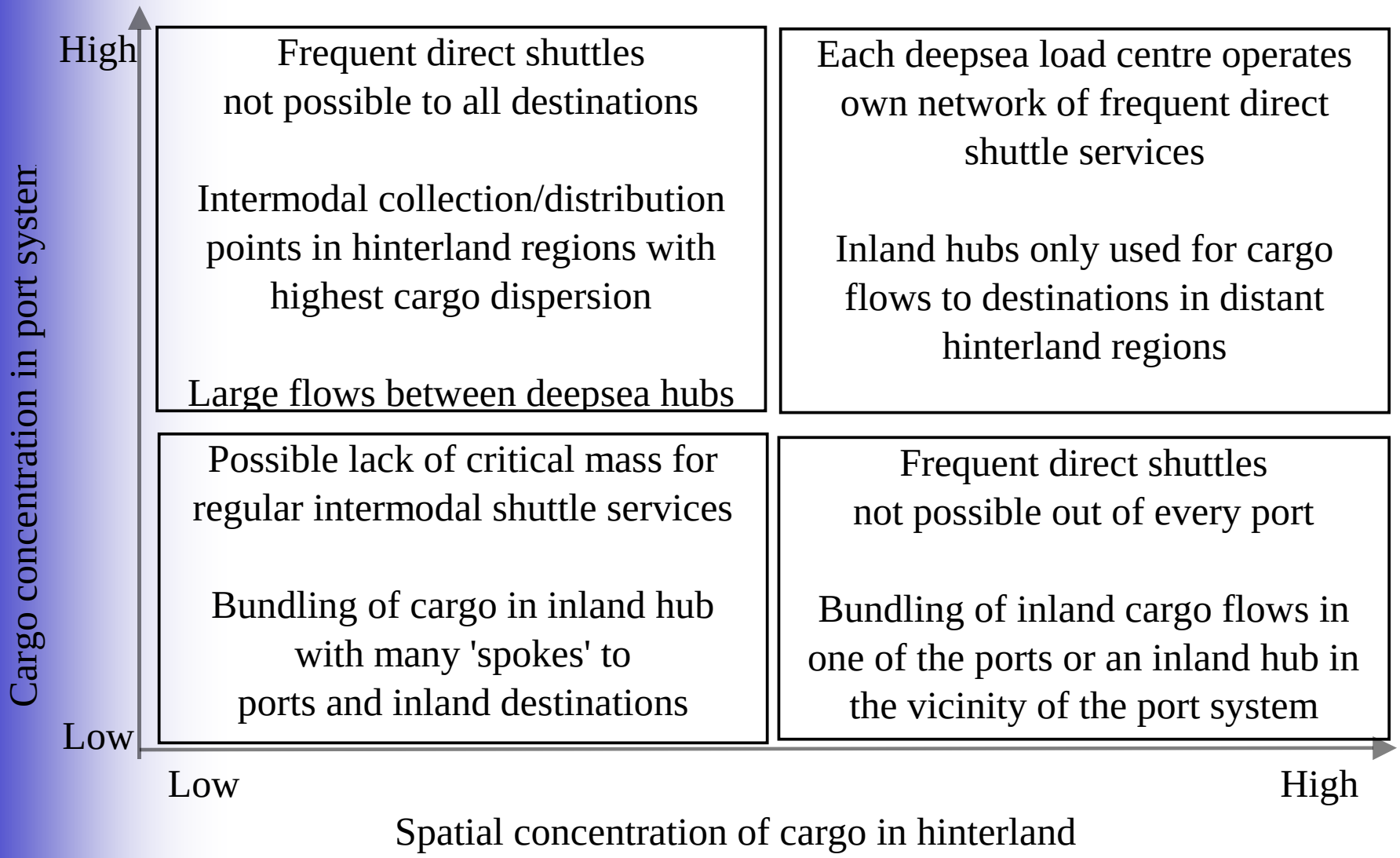


Bron: Notteboom & Rodrigue (2004)

Modal split in some north-European mainports

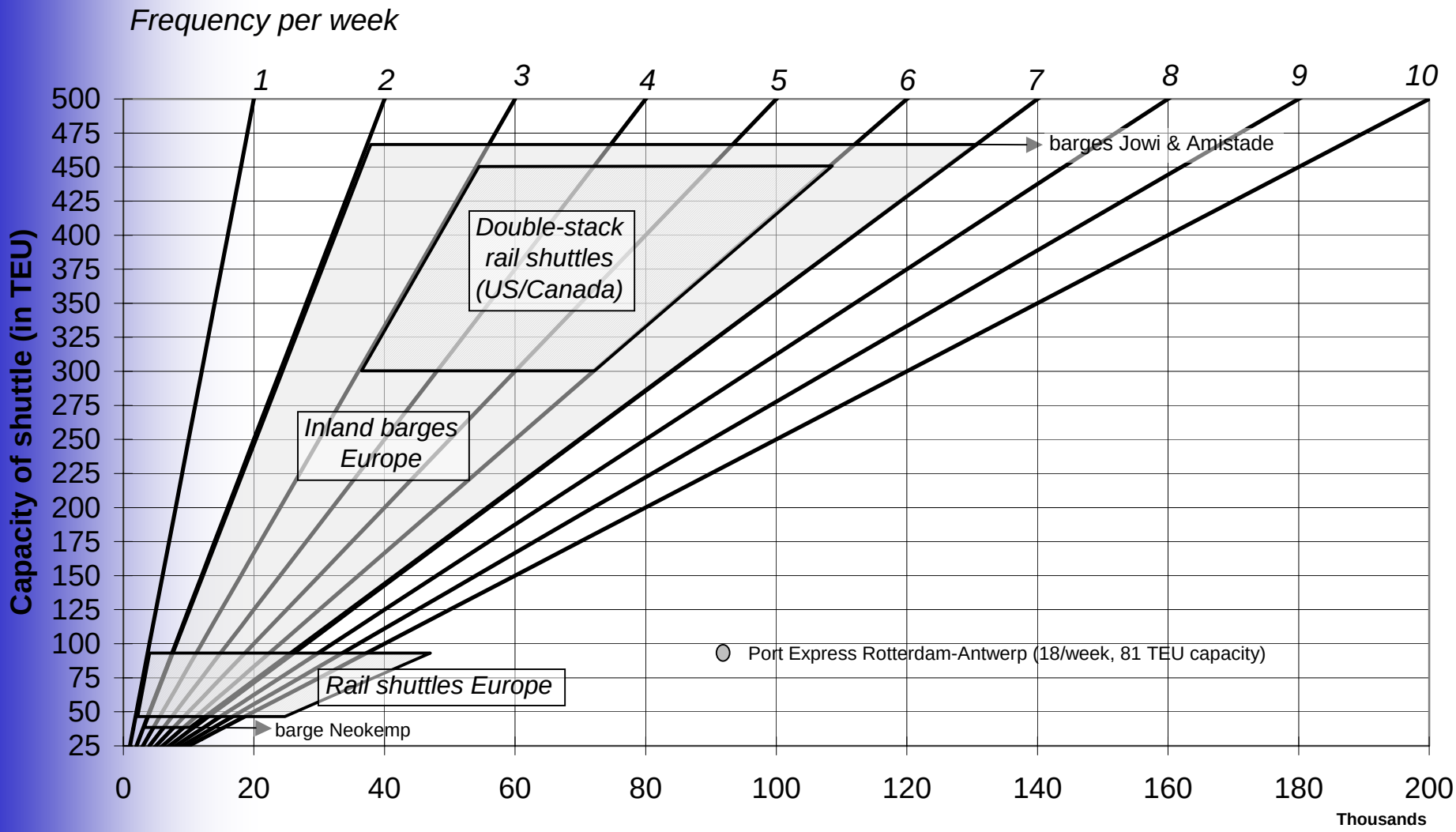
	Rail			Road			Barge		
	1998	2001	2003	1998	2001	2003	1998	2001	2003
Rotterdam	14.5%	13.0%	10.0%	51.3%	48.7%	50.0%	34.2%	39.0%	40.0%
Antwerp	7.8%	8.8%	9.5%	64.5%	61.3%	59.5%	27.7%	29.9%	31.0%
Le Havre	14.3%	11.4%	12.4%	84.6%	85.3%	82.8%	1.3%	3.1%	4.8%
Zeebrugge	34.4%	41.9%	40.2%	50.6%	48.8%	55.1%	15.1%	9.2%	4.7%
Dunkirk	9.0%	13.5%	20.5%	90.0%	82.5%	76.7%	1.0%	4.0%	2.7%
Hamburg	29.7%	28.7%	28.7%	70.1%	69.9%	69.8%	0.2%	1.4%	1.7%
Bremerhaven	33.1%	36.0%	30.6%	65.0%	62.0%	67.3%	1.9%	2.0%	2.0%

Inland service configuration as a function of the level of cargo concentration in port systems and in the hinterland



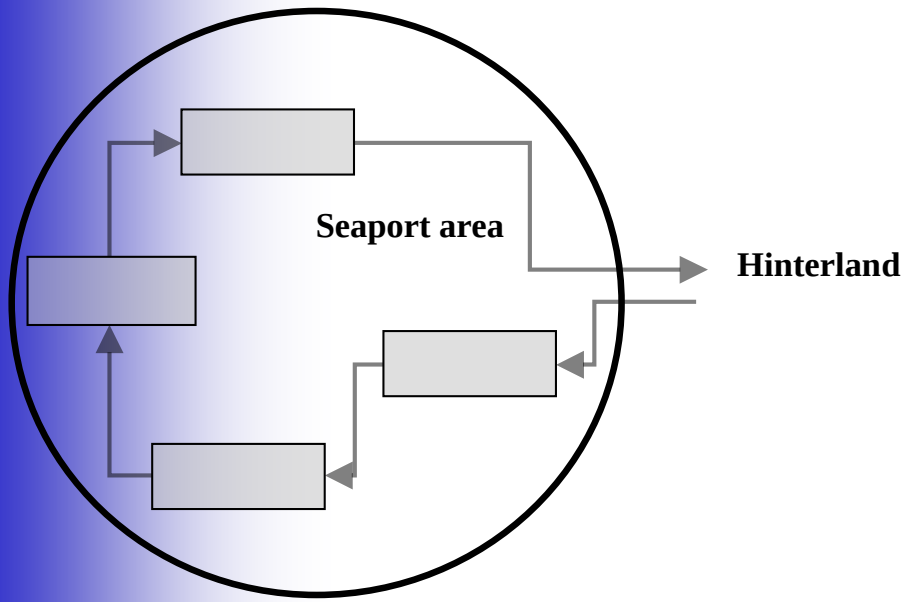
Inland transport

Relation between service frequency, unit capacity and annual transported volume (80% utilization of shuttle)

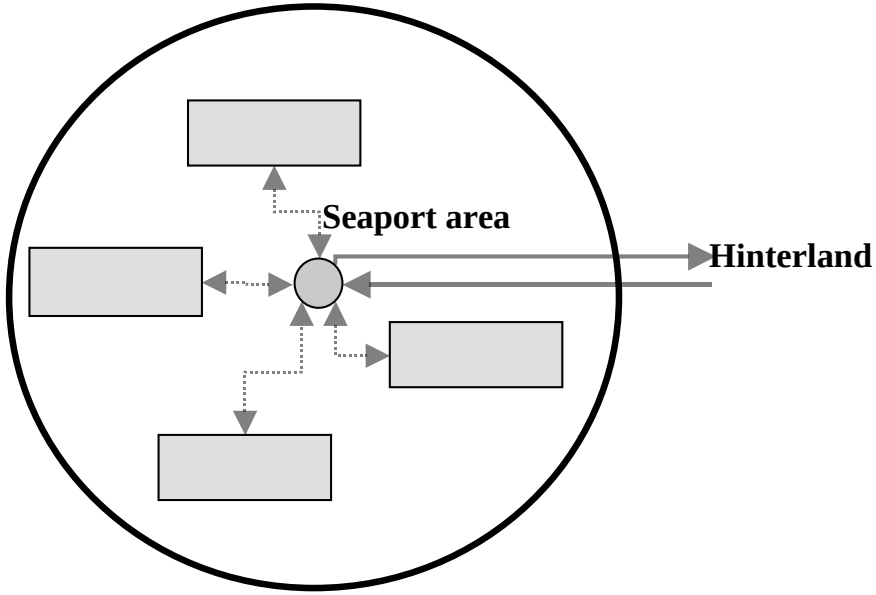


Container bundling concepts in multi-terminal container ports

Intra-port line bundling



Intra-port hub for inland services



= deepsea container terminal

= collection/distribution terminal for inland services rail or barge

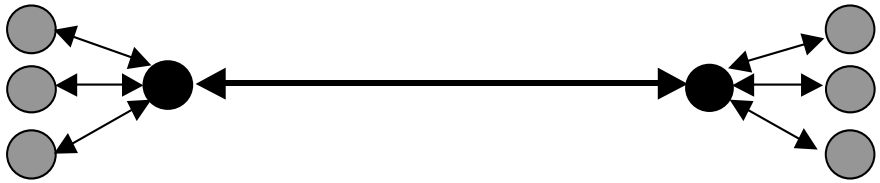
= mainline inland shuttle

= intra-port shuttles services by truck, barge or rail

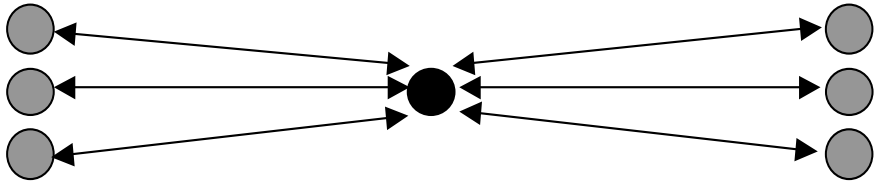
Inland transport
The consolidation of containers in intermodal shuttles : bundling concepts

A. Point-to-point network

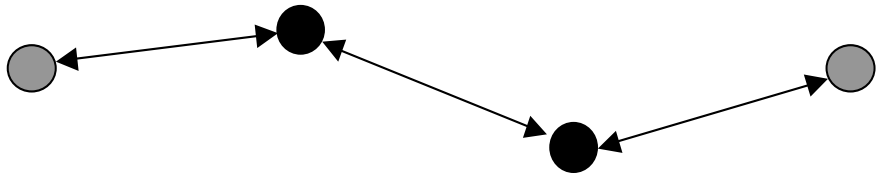
B. Collection-distribution network



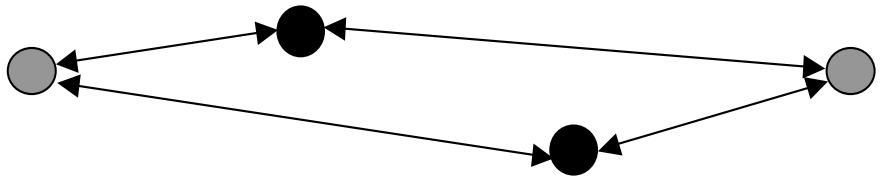
C. Hub-and-spoke network



D. Line bundling network (symmetric*)



E. Line bundling network (asymmetric**)



Source: Kreutzberger and Bontekoning

Development of the European barging network

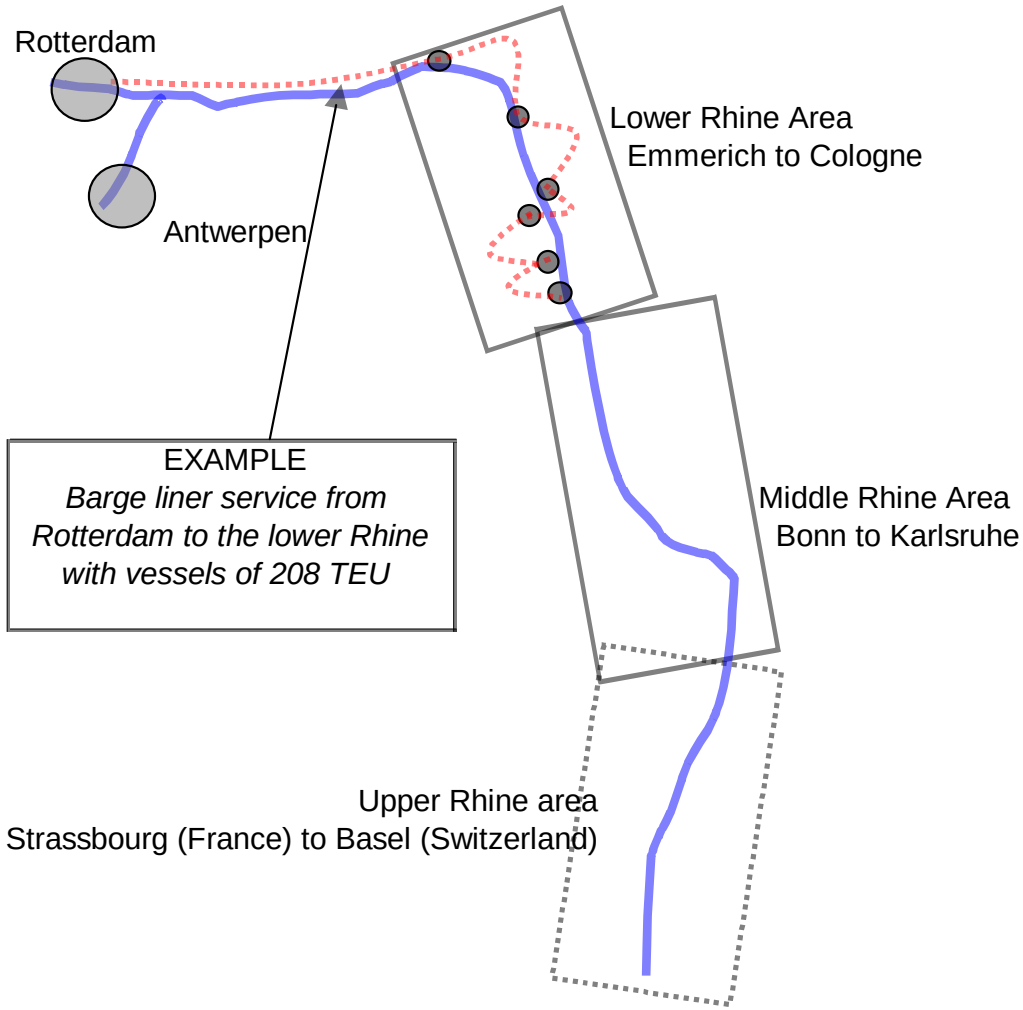
Barge services

Carriers are concentrating river freight volumes in just a few terminals

Introduction of large barge units (cf. Jowi 398 TEU)

Smaller units outside Rhine basin

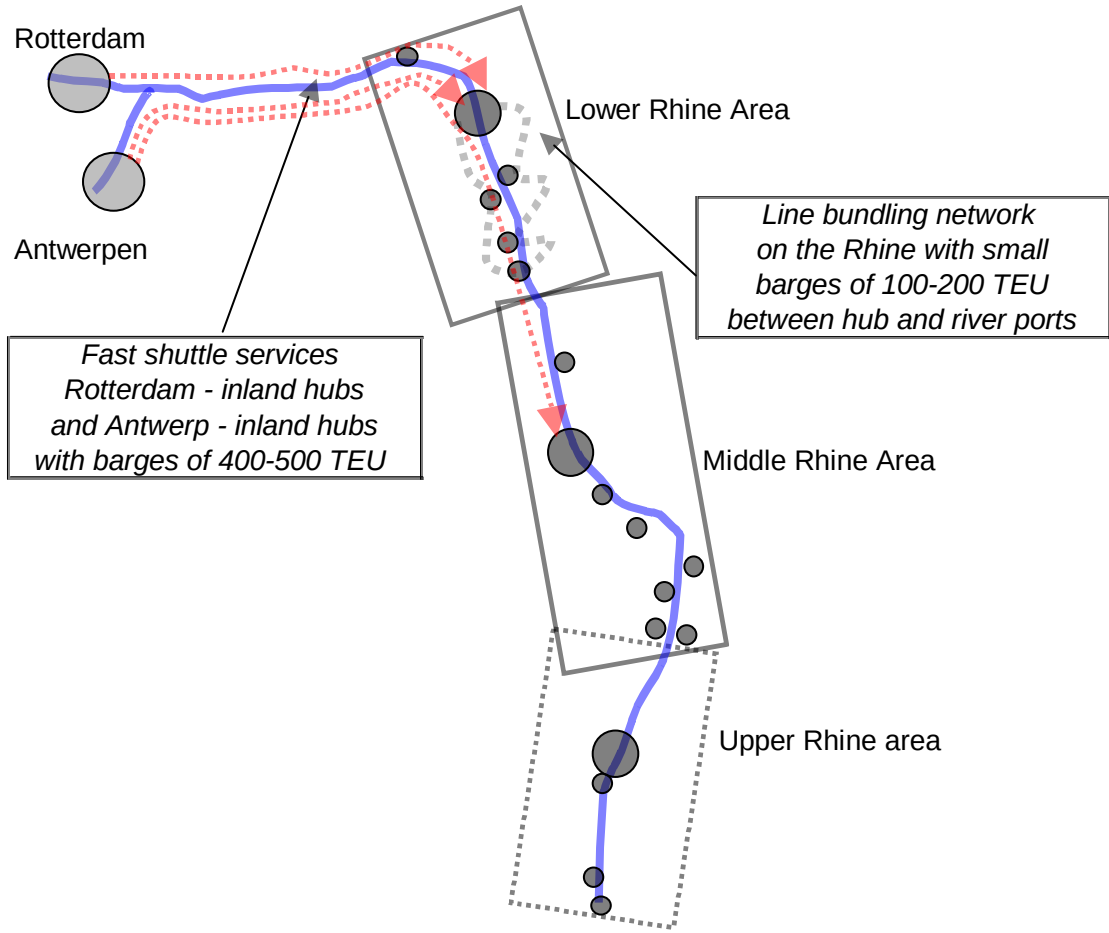
No liner services connecting the various terminals outside the Rhine basin



Scenarios for revised network operations in the Rhine basin

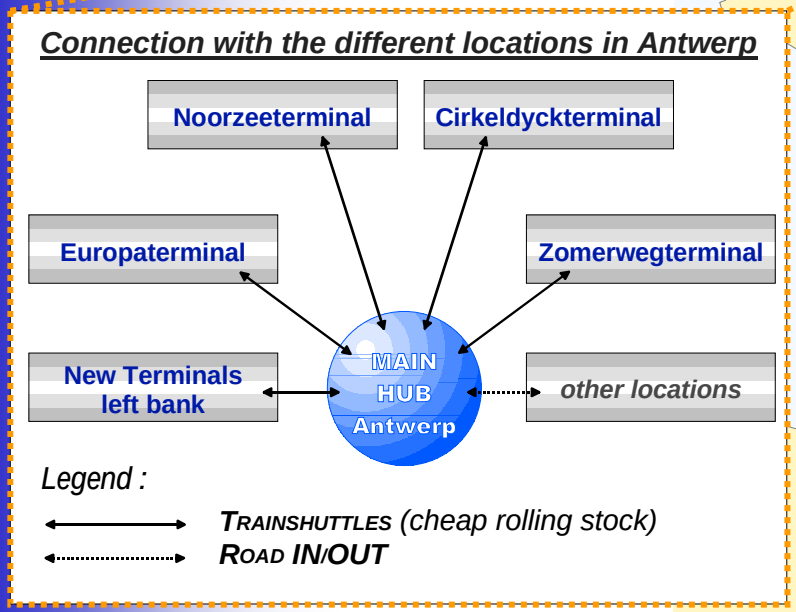
Trunk-feeder services

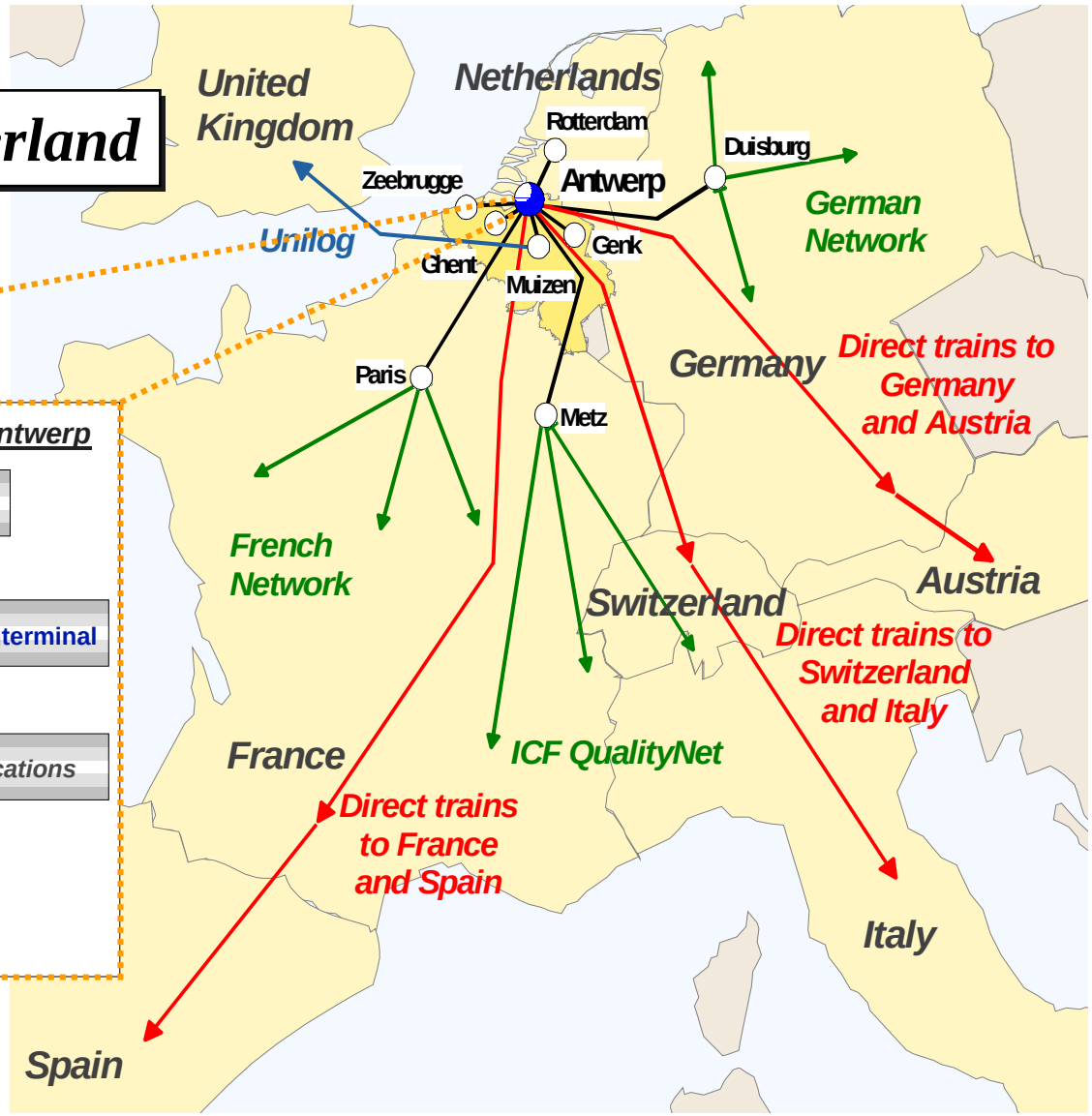
- Important driving force: waterway constraints
- Benefits:
  - Lower costs and/or higher frequency on trunk route
  - Lower costs on the feeder route
  - Benefits to some extent absorbed by transhipment in inland hub
- Critical elements:
  - Transhipment costs
  - Synchronisation of time schedules
  - Distance seaport-inland hub-regional terminals
- Pilot project: Rotterdam/Antwerp – Duisburg - Dortmund



Rail transport
Main HUB Antwerp

Connection with hinterland



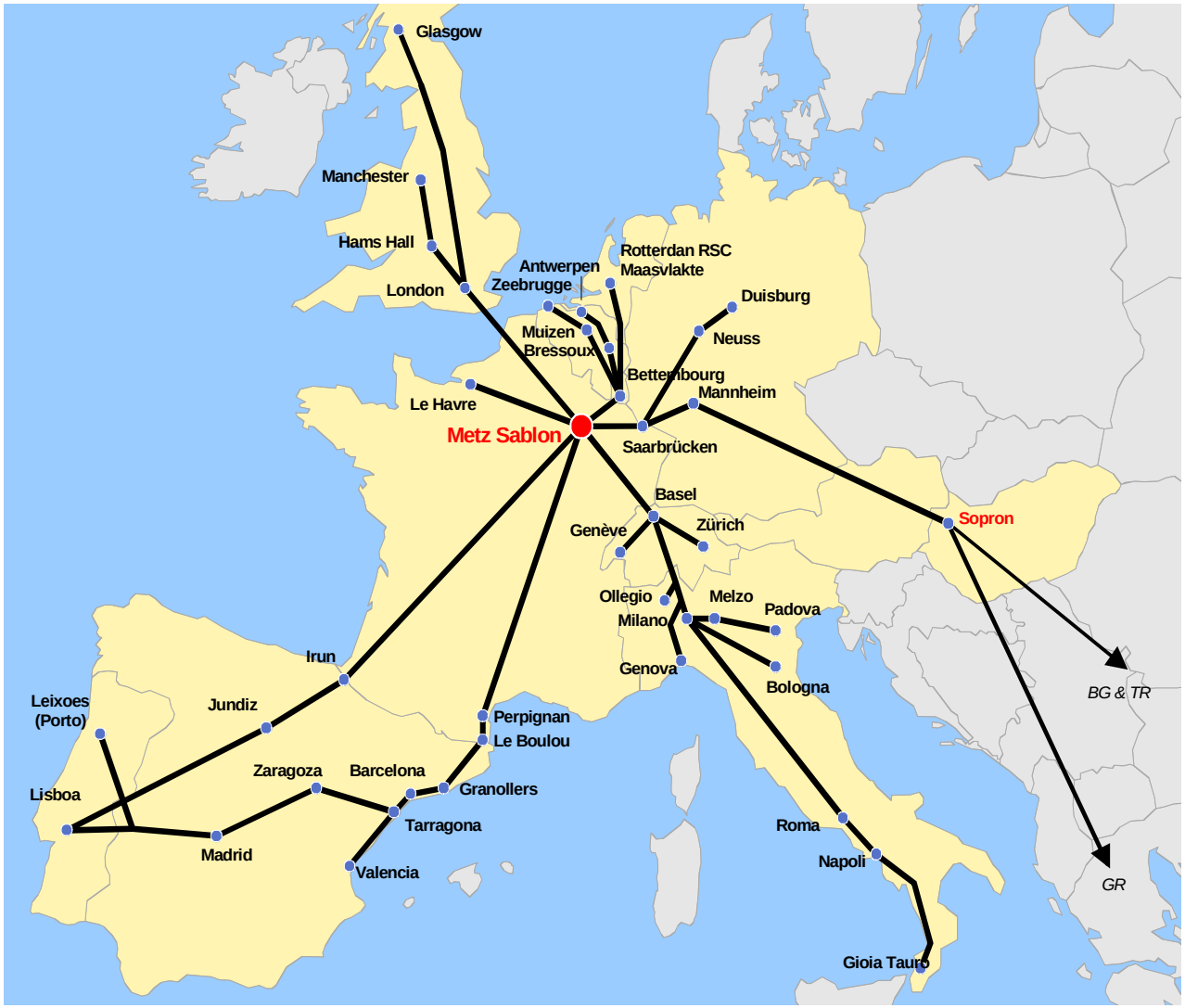


Source: Koen Kerckaert - NMBS

Rail transport
ICF QUALITYNET till 12 December 2004
Network with inland hub at Metz Sablon

HUB

Terminal of haven



Rail transport
New strategy ICF launched on 12 December 2004
=> more direct shuttles and blocktrains

- Intermodal traffic via "Qualitynet" hub in Metz will now be handled by direct shuttles and block trains.

- For East- and Southeast Europe: existing services via hub in Sopron (Hungary) are extended.

=> Problem for smaller ports: the vicious cycle of lack of volume

Hinterland access

- Inland logistics is considered as one of the most vital areas still left to cut costs:
  - Shipping lines
  - Terminal operators
  - Port authorities ?

- Who will take the lead in the further optimization of hinterland networks in Europe ?

=> The battle for the hinterland has only just begun.