

Approach for a categorization of European ports based on container ship calls in 2020.

Special session : what future for containerisation and globalisation ?

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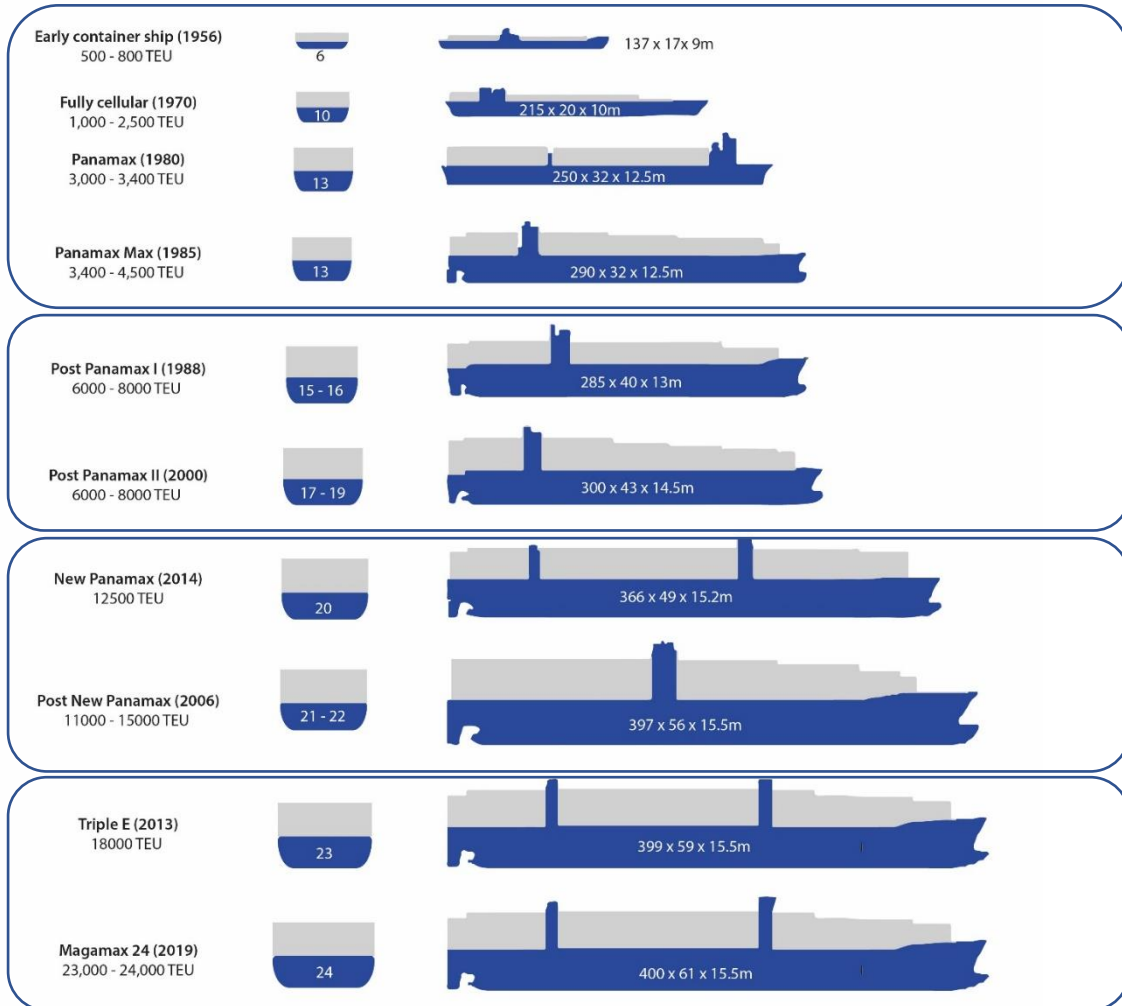
Content of the presentation

- To establish a categorization of European ports
 - Ports with a traffic of more than 300,000 TEU
- Using containerized service offerings in 2020
- Performing a Principal Component Analysis and a Hierarchical ascending classification
- Source of data : IHS maritime 2020

Content of the presentation

Containers Across

Lenght x Height x Draft



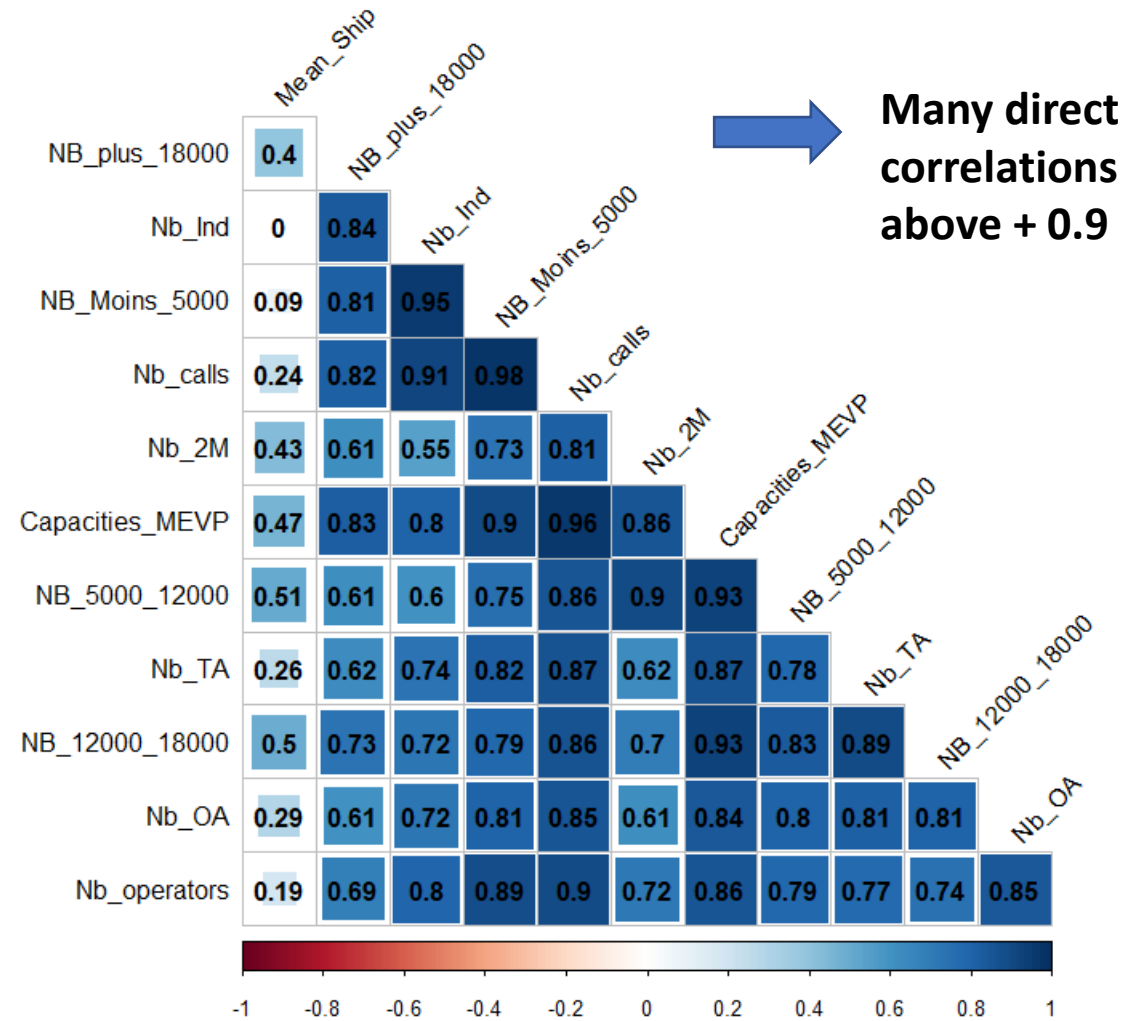
Maritime alliances



List of quantitative variables

- **N_2M** : Number of calls of the 2M Alliance
- **N_inde** : Number of calls of the independent operators
- **N_OA** : Number of calls of the Ocean Alliance
- **N_TA** : Number of calls of The Alliance
- **N_less_5000** : Number of container ship calls of less than 5000 TEU
- **N_5000_12000** : Number of calls by container ships of 5000 and 12000 TEU
- **N_12000_18000** : Number of calls by container ships of 12000 and 18000 TEU
- **N_more_18000** : Number of calls by container ships more than 18000 TEU
- **Nb_calls** : Number of calls of containerships
- **Capacities_TEU** : Total capacity offered in calls in TEU
- **Nb_operators** : Number of operators
- **Mean_ships** : Average size of container ships

Matrix of correlation



Method Pearson

Principal Component Analysis (PCA)

	eigenvalue	percentage of variance	cumulative percentage of variance
Dim.1	9,096	75,804	75,804
Dim.2	1,292	10,763	86,567
Dim.3	0,593	4,938	91,505
Dim.4	0,481	4,010	95,516
Dim.5	0,266	2,219	97,735
Dim.6	0,113	0,943	98,678

 **Capacities and Calls Illustrative variables**

 **Rotterdam and Antwerp Illustrative individus**

Contribution of the variables to the factorial axes

	Dim.1	Dim.2
Nb_2M	7,444	4,998
Nb_Ind	8,084	14,340
Nb_OA	8,511	0,166
Nb_TA	8,641	0,255
Capacities_MEVP	10,778	1,027
NB_Moins_5000	9,735	7,305
NB_5000_12000	8,915	6,100
NB_12000_18000	9,224	2,154
NB_plus_18000	7,507	0,050
Nb_calls	10,678	1,471
Nb_operators	8,927	2,231
Mean_Ship	1,554	59,905

Contribution of the individuals to the factorial axes

	Dim.1	Dim.2
Felixstowe	0,094	9,706
Gdansk	0,546	0,265
Gioia Tauro	0,015	5,538
ANTWERP	16,310	0,867
Hamburg	8,695	0,213
ALGECIRAS	1,524	0,281
Marsaxlokk	0,012	1,296
Southampton	0,013	4,011
Rotterdam	38,474	10,338
...

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➔ Illustrative Variables

Principal Component Analysis (PCA)

	eigenvalue	percentage of variance	cumulative percentage of variance
Dim.1	6,044	60,439	60,439
Dim.2	1,577	15,773	76,212
Dim.3	0,933	9,330	85,542
Dim.4	0,711	7,107	92,648
Dim.5	0,357	3,573	96,221
Dim.6	0,129	1,288	97,509

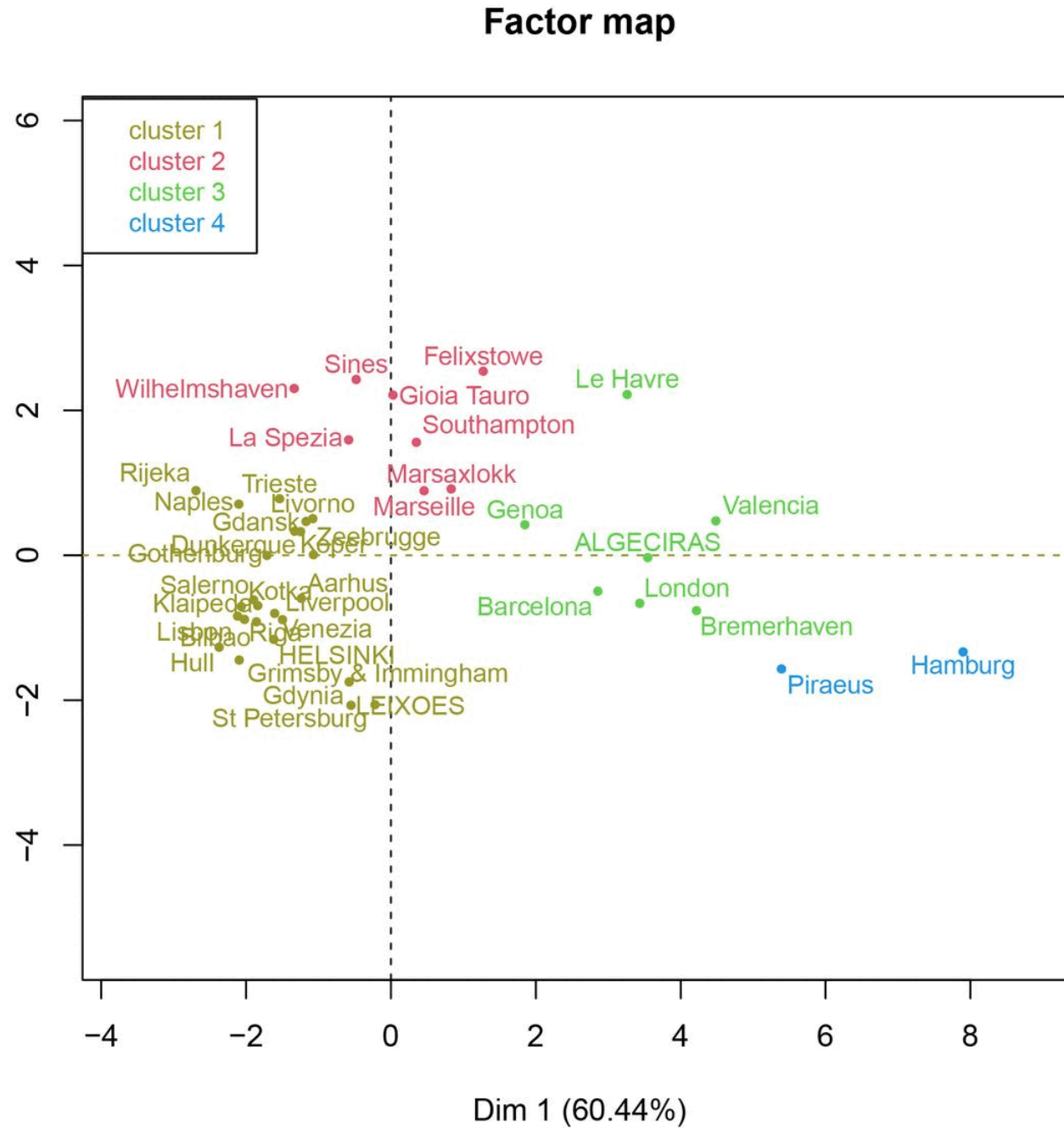
Contribution of the variables to the factorial axes

variables	Dim.1	Dim.2
Nb_2M	9,4	4,3
Nb_Ind	9,6	20,3
Nb_OA	10,3	0,1
Nb_TA	10,7	0,8
NB_Moins_5000	12,7	11,6
NB_5000_12000	11,9	6,7
NB_12000_18000	11,4	4,8
NB_plus_18000	8,2	0,9
Nb_operators	12,5	5,0
Mean_Ship	3,4	45,5

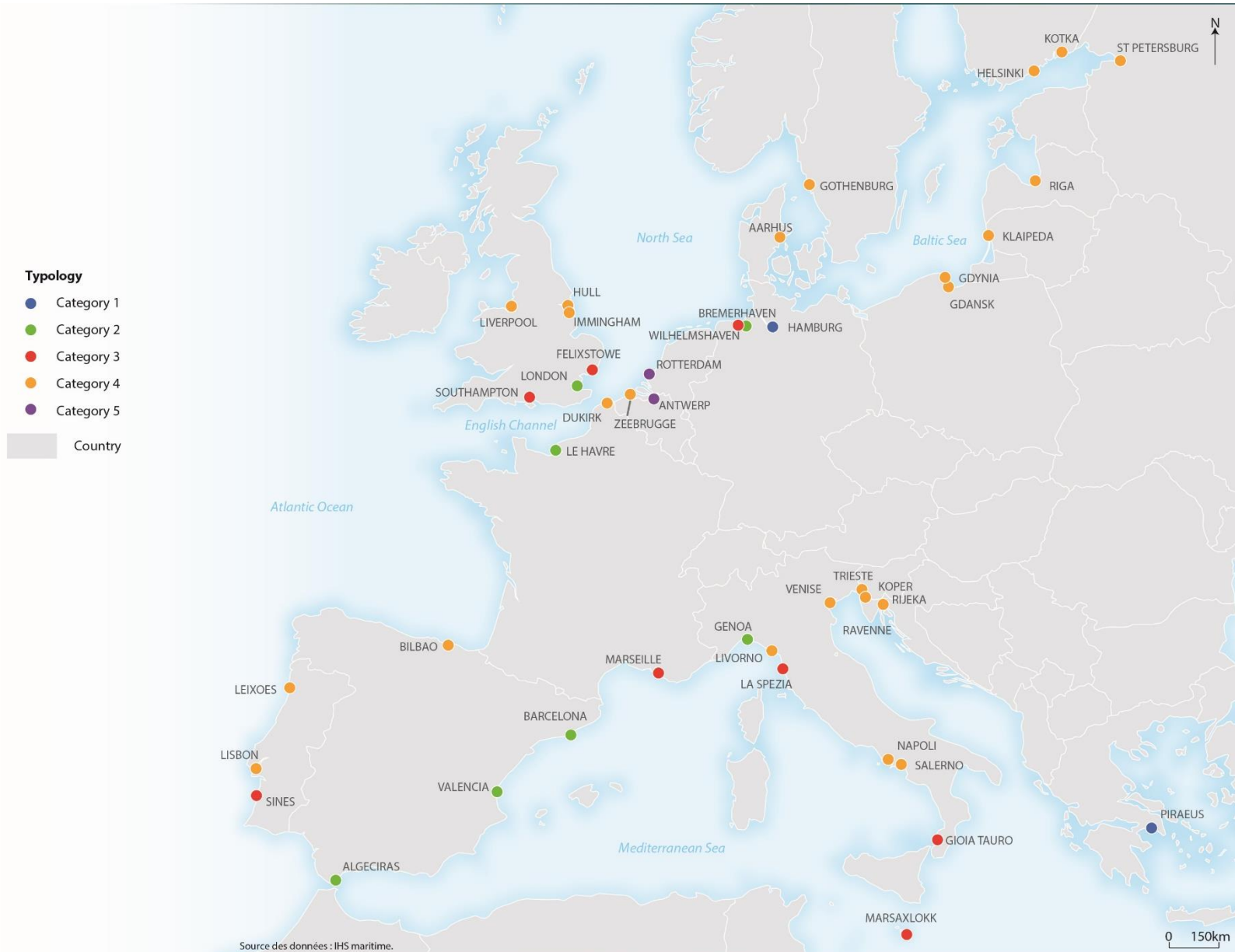
Contribution of the individuals to the factorial axes

Individual	Dim.1	Dim.2
Felixstowe	0,7	10,0
Gdansk	0,6	0,3
Gioia Tauro	0,0	7,6
Hamburg	25,2	2,8
ALGECIRAS	5,1	0,0
Marsaxlokk	0,3	1,3
Southampton	0,0	3,8
Valencia	8,1	0,3
Sines	0,1	9,1
Piraeus	11,7	3,8
Wilhelmshaven	0,7	8,2
Bremerhaven	7,2	0,9
Naples	1,8	0,8
La Spezia	0,1	3,9
Gothenburg	1,2	0,0
Koper	0,7	0,2
Marseille	0,1	1,2
St Petersburg	0,0	6,6
Genoa	1,4	0,3
Barcelona	3,3	0,4
Klaipeda	1,4	0,7
Le Havre	4,3	7,6
Trieste	1,0	0,9
Kotka	1,7	0,8
Liverpool	0,9	1,2
London	4,8	0,7
Zeebrugge	0,5	0,0
Livorno	0,5	0,4
Rijeka	2,9	1,2
Dunkerque	0,6	0,2
Riga	1,6	1,2
Bilbao	1,4	1,3
Gdynia	0,1	4,7
Venezia	1,0	1,0
Lisbon	1,8	1,1
HELSINKI	1,1	2,1
Aarhus	0,6	0,5
Salerno	1,4	0,6
LEIXOES	0,1	6,6
Grimsby & Immingham	1,8	3,2
Hull	2,3	2,5

Factor map and Hierarchical ascending classification



Port categorization based on container ships calls in 2020



Analyze of the categorization

Category 1: Pivot port → High volume traffic. Important transshipment and hinterland traffic.

Category 2: Principal port → Ports served mainly by alliance operators. High average size of container ships.

Category 3: Alliance port → Ports served by one alliance. Independent operators are not present.

Category 4: Secondary ports → Ports served mainly by independent operators and small container ships (less than 5000 TEU). Alliances are not very present. Ports in the “cul de sac” sea.

Category 5: Major world ports → Ports of Rotterdam and Antwerp

Development

- Work in progress
- Add news variables (network ?)
- Add others European ports
- Develop the sequential aspect, order of calls
- Focus on the strategy of an alliance or an operator
- Combine with a qualitative study (interview ?).

Thank you for your attention

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