Recent traffic dynamics in the European container port system

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European container ports find themselves embedded in ever-changing economic and logistics systems. The European container port system cannot be considered as a homogenous set of ports. It features established large ports as well as a whole series of medium-sized to smaller ports each with specific characteristics in terms of transhipment incidence, the hinterland markets served and the location qualities. This unique blend of different container port types and sizes combined with a vast economic hinterland shapes port competition in the region. This contribution discusses recent developments in the European container port system. We are particularly interested in the impact of the crisis on the port hierarchy in Europe. Are new container ports and port regions emerging as challengers of established ports and regions? Are some port regions in Europe gradually losing their significance? How is the balance between north and south evolving? How are new large-scale terminal capacity expansions affecting the competitive balance in the European container port system?

Recovering from 2009 drop but with regional differences

With a total maritime container throughput of an estimated 95.2 million twenty-foot equivalent units (TEU) in 2012, the European container port system ranks among the busiest container port systems in the world. Growth has been particularly strong in the period from 2005 to 2007 with an average annual growth rate of 10.5 percent, compared to 6.8 percent in the period from 1985 to 1995, 8.9 percent in 1995 to 2000 and 7.7 percent in 2000 to 2005. The economic crisis which started to have its full effect in late 2008 brought an end to the steep growth curve. Total container throughput increased from 90.7 million TEU in 2008 to 95.2 million TEU in 2012 or an average annual growth of only 1.26 percent. The year 2009 is at the root of this slow pace given a year on year drop in container volumes of about 14 percent in 2009. Between 2009 and 2012 traffic volumes have recovered at a rate of 6.87 percent each year.

The container ports in the Hamburg-Le Havre range (which includes all ports along the coastline between Le Havre in France and Hamburg in Germany) handle about half of the total European container throughput (see figure 1). The share of the Mediterranean ports grew significantly between the late 1980s and the late 1990s at the expense of the ports in the Hamburg-Le Havre range. The significant improvement of the share of the Mediterranean was mainly the result of the insertion of transhipment hubs in the region since the mid-1990s (Gioia Tauro, Marsaxlokk, Cagliari, Taranto to new but a few). At the start of the new millennium, the position of the northern range gradually improved while the Mediterranean ports and the UK port system lost ground. The crisis seems to have stopped this trend as from 2009 the traffic balance between the Mediterranean and the Hamburg-Le Havre range remained quite stable. However, the position of the UK ports (southeast and south coast only) continued to weaken. The Baltic port region has clearly strengthened its traffic position in the past few years. The strong growth path of European ports in the Black Sea area (Romania and Bulgaria) suddenly stopped in crisis year 2009.

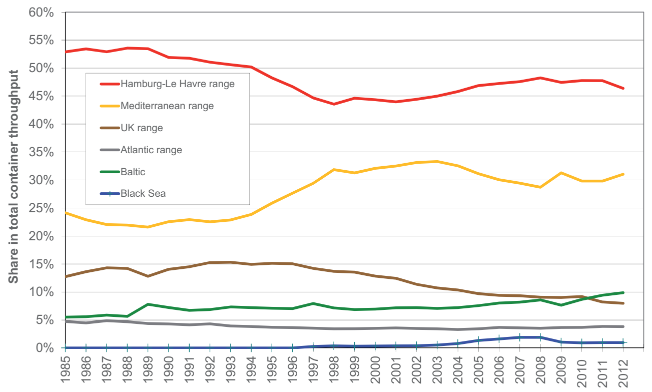


Figure 1: Traffic shares of port ranges in the European container port system

Individual port rankings: few changes at the top

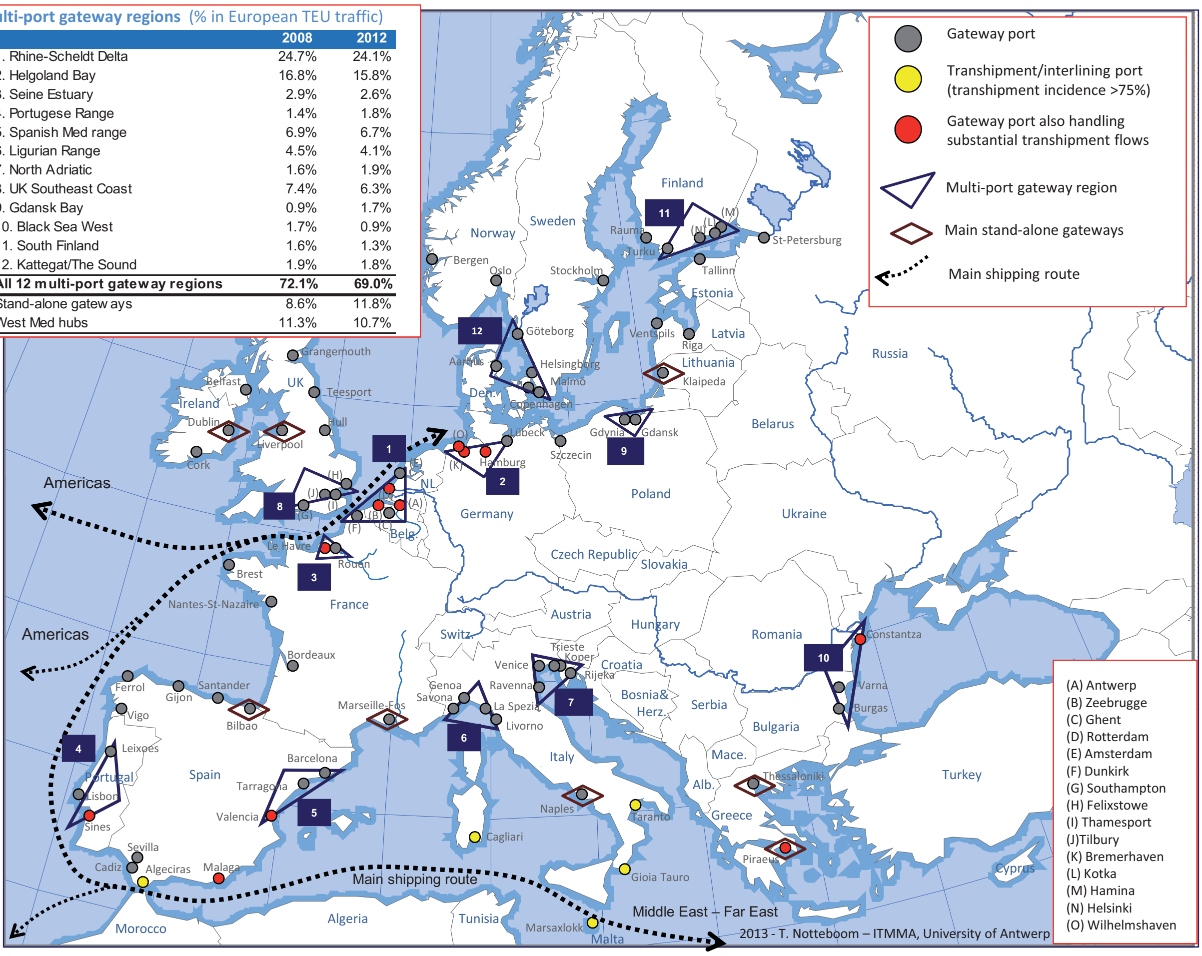
Table 1 provides an overview of the 15 largest container ports in the European Union. Saint-Petersburg, which handled 2.52 million TEU in 2012 and has witnessed strong growth in the past few years is not included in the ranking. A number of the listed ports act as almost pure transhipment hubs with a transhipment incidence of 75 percent or more (ie. Gioia Tauro, Marsaxlokk, Algeciras) while other load centres can be considered as almost pure gateways (e.g. Genoa and Barcelona to name a couple) or a combination of a dominant gateway function with sea to sea transhipment activities (eg. Hamburg, Rotterdam, Le Havre, Antwerp). About 68 percent of the total container throughput in the European port system passes through the top 15 ports, compared to 61 percent in 1985. Since 2008 no major shifts have taken place in the traffic shares of the top three, top 10 and top 15 ports, although the top three ports have lost some ground. Nearly one third of all containers are handled by the top three ports. Worth mentioning is that the dominance of market leader Rotterdam weakened in the late 1990s, but in the past decade the port's position has remained quite stable. Overall, the figures suggest a continued high concentration of cargo in only a dozen large container ports. While the crisis has not significantly altered the rankings, a number of ports lost some position while others gained. For example, the Belgian port of Zeebrugge initially overcame the crisis very well by climbing to the ninth position in 2010 but afterwards booked traffic losses pushing the seaport back to position 13. The Greek port of Piraeus showed the most volatile traffic evolution. Piraeus' volume peaked at 1.6 million TEU in 2003, but strikes and unrest led to a throughput of only 433,000 TEU in 2008. In 2010, the container port started a remarkable recovery path partly pushed by the arrival of Cosco Pacific as operator of the 'Pier 2' facility. Piraeus reappeared in the top 15 ranking in 2011 and last year held position eight with a total volume of 2.7 million TEU.

in 1000 TEU

R		1985		1995		2000		2005		2008		2009		2010		2011		2012	R
1	Rotterdam	2655	Rotterdam	4787	Rotterdam	6275	Rotterdam	9287	Rotterdam	10784	Rotterdam	9743	Rotterdam	11147	Rotterdam	11877	Rotterdam	11900	1
2	Antwerp	1243	Hamburg	2890	Hamburg	4248	Hamburg	8088	Hamburg	9737	Antwerp	7310	Antwerp	8468	Hamburg	9014	Hamburg	8864	2
3	Hamburg	1159	Antwerp	2329	Antwerp	4082	Antwerp	6488	Antwerp	8664	Hamburg	7008	Hamburg	7896	Antwerp	8664	Antwerp	8635	3
4	Bremen	986	Felixstowe	1924	Felixstowe	2793	Bremen	3736	Bremen	5448	Bremen	4565	Bremen	4888	Bremen	5915	Bremen	6115	4
5	Felixstowe	726	Bremen	1518	Bremen	2752	Gioia Tauro	3161	Valencia	3597	Valencia	3654	Valencia	4207	Valencia	4327	Valencia	4470	5
6	Le Havre	566	Algeciras	1155	Gioia Tauro	2653	Algeciras	2937	Gioia Tauro	3468	Algeciras	3043	Felixstowe	3415	Algeciras	3603	Algeciras	4071	6
7	Marseille	488	Le Havre	970	Algeciras	2009	Felixstowe	2700	Algeciras	3324	Felixstowe (*)	3021	Gioia Tauro	2851	Felixstowe	3249	Felixstowe (*)	3200	7
8	Leghorn	475	La spezia	965	Genoa	1501	Le Havre	2287	Felixstowe (*)	3200	Gioia Tauro	2857	Algeciras	2807	Marsaxlokk	2360	Piraeus	2734	8
9	Tilbury	387	Barcelona	689	Le Havre	1465	Valencia	2100	Barcelona	2569	Marsaxlokk	2330	Zeebrugge	2499	Gioia Tauro	2338	Gioia Tauro	2721	9
10	Barcelona	353	Southampton	683	Barcelona	1388	Barcelona	2096	Le Havre	2502	Zeebrugge	2328	Marsaxlokk	2370	Le Havre	2215	Marsaxlokk	2540	10
11	Algeciras	351	Valencia	672	Valencia	1310	Genoa	1625	Marsaxlokk	2337	Le Havre	2234	Le Havre	2358	Zeebrugge	2207	Le Havre	2304	11
12	Genoa	324	Genoa	615	Piraeus	1161	Piraeus	1450	Zeebrugge	2210	Barcelona	1801	Barcelona	1931	Barcelona	2014	Genoa	2065	12
13	Valencia	305	Piraeus	600	Southampton	1064	Marsaxlokk	1408	Genoa	1767	Southampton (*)	1600	Genoa	1759	Genoa	1847	Zeebrugge	1953	13
14	Zeebrugge	218	Zeebrugge	528	Marsaxlokk	1033	Southampton	1395	Southampton (*)	1710	Genoa	1534	Southampton	1566	Piraeus	1680	Barcelona	1750	14
15	Southhampton	214	Marsaxlokk	515	Zeebrugge	965	Zeebrugge	1309	Constanza	1380	La spezia	1046	La spezia	1285	Southamption	1588	Southamption (*)	1600	15
	TOP 15	10450	TOP 15	20841	TOP 15	34698	TOP 15	50067	TOP 15	62697	TOP 15	54072	TOP 15	59447	TOP 15	62898	TOP 15	64922	
	TOTAL Europe	17172	TOTAL Europe	33280	TOTAL Europe	51000	TOTAL Europe	73729	TOTAL Europe	90710	TOTAL Europe	78011	TOTAL Europe	86485	TOTAL Europe	92677	TOTAL Europe (est.)	95220	
	Share R'dam	*15.5%*	*Share R'dam*	*14.4%*	*Share R'dam*	*12.3%*	*Share R'dam*	*12.6%*	*Share R'dam*	*11.9%*	*Share R'dam*	*12.5%*	*Share R'dam*	*12.9%*	*Share R'dam*	*12.8%*	*Share R'dam*	*12.5%*	
	Share top 3	*29.4%*	*Share top 3*	*30.1%*	*Share top 3*	*28.6%*	*Share top 3*	*32.4%*	*Share top 3*	*32.2%*	*Share top 3*	*30.8%*	*Share top 3*	*31.8%*	*Share top 3*	*31.9%*	*Share top 3*	*30.9%*	
	Share top 10	*52.6%*	*Share top 10*	*53.8%*	*Share top 10*	*57.2%*	*Share top 10*	*58.2%*	*Share top 10*	*58.8%*	*Share top 10*	*58.8%*	*Share top 10*	*58.4%*	*Share top 10*	*57.8%*	*Share top 10*	*58.0%*	
	Share top 15	*60.9%*	*Share top 15*	*62.6%*	*Share top 15*	*68.0%*	*Share top 15*	*67.9%*	*Share top 15*	*69.1%*	*Share top 15*	*69.3%*	*Share top 15*	*68.7%*	*Share top 15*	*67.9%*	*Share top 15*	*68.2%*	

(*) Estimate

Table 1: The top 15 European container ports (1985-2009, in 1000 TEU)



Multi-port gateway regions (% in European TEU traffic)	2008	2012
1. Rhine-Scheldt Delta	24.7%	24.1%
2. Helgoland Bay	16.8%	15.8%
3. Seine Estuary	2.9%	2.6%
4. Portugese Range	1.4%	1.8%
5. Spanish Med range	6.9%	6.7%
6. Ligurian Range	4.5%	4.1%
7. North Adriatic	1.6%	1.9%
8. UK Southeast Coast	7.4%	6.3%
9. Gdansk Bay	0.9%	1.7%
10. Black Sea West	1.7%	0.9%
11. South Finland	1.6%	1.3%
12. Kattegat/The Sound	1.9%	1.8%
All 12 multi-port gateway regions	**72.1%**	**69.0%**
Stand-alone gateways	8.6%	11.8%
West Med hubs	11.3%	10.7%

Figure 2: Multi-port gateway regions in the European container port system

Looking at the position of seaport groups

In this section we group seaports within the same gateway region together to form so-called multi-port gateway regions. The locational relationship to nearby identical traffic hinterlands is one of the criteria that can be used to cluster adjacent seaports. In cases where there is no coordination between the ports concerned, the hinterland is highly contestable as several neighbouring gateways are vying for the same cargo flows. The relevance of the multi-port gateway level is supported by the liner shipping networks as developed by shipping lines and the communality in hinterland connectivity issues among ports of the same multi-port gateway region.

Figure 2 provides an overview of the main multi-port gateway regions in Europe as well as transhipment hubs and stand-alone gateways. Stand-alone gateways are somewhat isolated in the broader port system, as they have less strong functional interactions with adjacent ports than ports of the same multi-port gateway region. In the next sections we will draw some conclusions based on the changing positions of the port regions between 2008 and 2012.

Largest European container port region with ample capacity

The Rhine-Scheldt Delta and the Helgoland Bay ports, both part of the Le Havre-Hamburg range, together represent some 40 percent of the total European container throughput in 2012. The market share of the Rhine-Scheldt Delta shows moderate fluctuations since 2008 with 24.7 percent in 2008, 25.5 percent in 2009, 26 percent in 2010, 25 percent in 2011 and 24.1

percent in 2012. The Rhine-Scheldt Delta port region has one of the largest terminal capacity reserves in Europe. The massive Deurganck dock in the port of Antwerp, which opened in 2005, provides ample room for traffic growth. The PSA terminal and the Antwerp Gateway Terminal at the dock together handled less than two million TEU in 2012 while the design capacity of the dock amounts to some nine million TEU. A deepening programme of the river Scheldt was completed a few years ago in view of guaranteeing access to the largest container vessels within an acceptable tidal window. The current Maasvlakte 2 developments in Rotterdam include the construction of two large scale container facilities, each with a capacity of between four and five million TEU: a terminal for APM terminals and the Rotterdam World Gateway which will be operated by a consortium led by DP World. The first phases of both terminals will come on stream in late 2013/early 2014. ECT, part of Hong Kong based Hutchison Port Holdings, has room for further capacity growth by extending the current 1.5 kilometre quay of its Euromax terminal. The terminal capacity in Zeebrugge includes PSA's new and still unused Zeebrugge International Port (ZIP) facility and spare capacity at the APM Terminals facility in the outer harbour. The strong hinterland ambitions of the Rhine-Scheldt Delta ports are supported by a range of hinterland concepts and products such as a strong orientation on barge transport, a growing momentum for rail shuttles into the distant hinterland, ECT's European Gateway Services network and similar efforts by DP World, and a dense network of inland terminals and European distribution zones in, or in the vicinity of, the ports. To secure growth in the future, the ports are actively targeting transhipment markets in the Baltic, the UK and southern Europe and hinterland areas in southern Germany, Italy, South France (Lyon area) and Eastern and Central Europe, next to a continued focus on their cargo rich core service areas (the Benelux, western Germany and northern France).

German ports recover after a dramatic 2009

The North-German ports in the Helgoland bay gained traffic share in Europe from 13 percent in the late 1990s to 16.8 percent in 2008. Bremerhaven's volume surge and Hamburg's pivotal role in feeder flows to the Baltic and rail-based flows to the developing economies in East and Central Europe were the main causes. However, sharp volume drops in 2009, ie. down 28 percent in Hamburg mainly due to a loss of transhipment flows to Rotterdam and down 16 percent in Bremerhaven, brought the traffic share below 15 percent. In the past three years their position recovered to 15.8 percent. The region welcomed newcomer Wilhelmshaven in 2012 when the Jadeweserport was opened for business. With a volume of about 24,000 TEU in 2012, the new large-scale terminal facility clearly has to make its mark. Short-term prospects to attract new business remain weak as shipping lines still massively opt for Hamburg and Bremerhaven. The deepening of the Elbe River is high on the agenda in Hamburg as the port is currently facing some restrictions to accommodate the largest container vessels.

'Renaissance' of the Seine Estuary

The Seine Estuary, the third region in the Le Havre-Hamburg range, suffered from a gradual decline in its market share from 5.5 percent in 1989 to 2.9 percent in 2008. The 'Port 2000' terminals in Le Havre, a new hinterland strategy, the completed port reform process and the HAROPA initiative aimed at closer cooperation between Le Havre, Rouen and the inland port of Paris should support a 'renaissance' of Le Havre. These initiatives did not have their full effect in 2012 as the region's share in European container traffic declined further to 2.6 percent. However, the year 2013 promises to reverse this trend as several shipping lines (such as MSC) and shippers have committed new volumes to this port area.

The Portuguese port system aims for hub status

Portuguese ports Lisbon, Leixoes and Sines are trying very hard to expand business by developing a transhipment role as well as tapping into the Spanish market (particularly the Madrid area) through rail corridor formation and dry port development. After a long period of declining market shares, the Portuguese port system succeeded to lift its European share to 1.8 percent in 2012. The port of Sines recorded the strongest traffic growth mainly due to increasing volume commitments of MSC and a further extension of the PSA/MSC operated terminal facility. Sines more than doubled throughput since 2008 to reach 553,063 TEU in 2012. The three ports now have a rather similar cargo base of around 500,000 to 600,000 TEU.

Spanish Mediterranean ports show a diverging growth path

Among the major winners before the crisis, we find the Spanish Mediterranean ports with a growth of the European share from 4 percent in 1993 to 6.9 percent in 2008. While the share remained rather stable the past few years, the growth path of the individual ports is quite different. Barcelona was hit hard by the crisis with a volume drop from 2.57 million TEU in 2008 to 1.8 million TEU in 2009. Container activities (particularly sea to sea transhipment) did not recover after 2009 and the Catalan port closed 2012 at 1.75 million TEU. At the other extreme, Valencia recorded a spectacular and consistent growth (also during 2009) from 3.6 million TEU in 2008 to 4.47 million TEU in 2012. MSC's choice to use the port as a hub for the region boosted transhipment volumes and consolidated the port's fifth position in the European ranking. While Tarragona remains a smaller player in the region, the port saw strong growth in 2008 when DP World and ZIM Lines took over the Contarsa terminal. Since then, throughput amounts to some 200,000 to 250,000 TEU.

Ligurian ports challenged to outgrow the Italian hinterland

The Ligurian ports have difficulties in keeping up with other regions in Europe. The ports jointly represent some 4.5 percent of the total European port volume, a decline compared to six to seven percent throughout the 1980s and 1990s. The Ligurian ports rely heavily on the cargo rich economic centres in northern Italy. While they also aim at attracting business from the Alpine region, the southeast of France and southern Germany, success in these areas has been limited so far partly because of intense competition from northern ports supported by a strong multimodal offer in terms of rail and barge shuttles.

North Adriatic ports determined to become southern gateway to Europe

Just like the Ligurian ports, the North-Adriatic ports have been facing lower than average growth rates. However, since the crisis year of 2009 the tide seems to have turned. The recent cooperation agreement of the North Adriatic Ports Association (NAPA) underlines the ambition of the region to develop a gateway function to Eastern and Central Europe and the Alpine region. The strategy should also enable the region to develop larger-scale container operations. The NAPA ports are determined to lure trade from northern ports via upgraded rail links and shorter transit times from Asia. For example, Trieste has a harbour that's 18 metres deep and able to handle the largest container ships at full load. The Italian port offers shuttle train services to destinations in Germany, Austria, Hungary, Slovakia and the Czech Republic, and is targeting countries as distant as Poland, one of the main markets for Hamburg. Still the Adriatic ports are facing scale differences with the northern hub ports which affect the possibilities to develop a vast intermodal hinterland network. With only 1.8 million TEU in 2012 the Adriatic ports only handle a fraction of the volumes of the two leading multi-port gateway regions of the Hamburg-Le Havre range (ie. 22.9 million TEU in the Rhine-Scheldt Delta and 15.1 million TEU in northern Germany).

The UK's direct call versus feeder challenge

The UK ports witnessed a rather significant decrease in market share. Many of the load centres along the southeast coast of the United Kingdom faced capacity shortages in the early 2000s while new capacity became available only gradually. Quite a number of shipping lines opted for the transhipment of UK flows in mainland European ports (mainly Rhine-Scheldt Delta and Le Havre) instead of calling at UK ports directly. With the prospect of new capacity getting on stream there is hope for more direct calls and potentially an increase in market share. The large scale London Gateway terminal of DP World can be regarded as the embodiment of the UK ambitions to attract more direct calls. The terminal is being developed on an old Shell site along the Thames and should be open for business in late 2013. The port will add 3.5 million TEU to the UK's port capacity and will help to meet the demand for extra capacity in the UK. The full impact of London Gateway on competitive dynamics between mainland European ports and UK ports will become clear in the coming years. It remains to be seen how DP World is going to balance its many stakes in large scale terminals across the region. The company is investing heavily in the Rotterdam World Gateway facility on Maasvlakte 2 and has a vested interest in filling the Antwerp Gateway terminal.

Attracting direct deep-sea calls in the Baltic

In the last couple of years, the ports in the Bay of Gdansk have been witnessing a healthy growth and an increasing traffic share in Europe (now 1.7 percent compared to 0.9 percent in 2008 and 0.5 percent in 2004). For a long time, the Polish load centres were bound by their feeder port status, competing with main port Hamburg for the Polish hinterland. However, in the last decade the Polish port reform process gave impetus to the development of new container handling facilities. While Gdynia has benefited from volume gains, Gdansk attracted most attention as volumes increased from 163,704 TEU in 2008 to 928,905 TEU in 2012. Growth remained very strong in early 2013. The DCT facility in Gdansk serves as a port of call on one of the main Europe-Far East services of Maersk Line. Emma Maersk class vessels with a capacity of 15,500 TEU not only bring Asian cargo, but also pick up North American container flows via other European ports of call before heading to Gdansk. The announced Triple 'E' vessels of Maersk Line are expected to call DCT. The Gdansk case provides empirical evidence that deep-sea calls in the Baltic can be viable despite the existence of competitive hub-feeder networks linked to Hamburg and other major northern ports. The port is determined to become a hub for central and eastern Europe and Russia. Earlier this year, an agreement was reached on the development of DCT 2 which should increase the port's capacity to 4 million TEU by 2016.

The rise and fall of European Black Sea ports

The Black Sea ports, Constantza in particular, were on the rise in the early 2000s from virtually no traffic to a European share of 1.7 percent in 2008. Constantza attracted terminal investments given its potential to serve as a gateway to eastern Europe and a transhipment hub for the Black Sea area. The crisis abruptly ended this unfolding success story and Constantza's container throughput fell sharply from 1.38 million TEU in 2008 to 594,299 TEU in 2009. In the following years the port could only present a modest growth to reach 684,059 TEU in 2012. The Bulgarian ports of Varna and Burgas remain small players in the container market. The traffic decline in Black Sea ports is in sharp contrast to strong growth witnessed by Piraeus and Turkish deep-sea ports near the Sea of Marmara. This development demonstrates shipping lines for the time being prefer a hub-feeder model in the Med to service the Black Sea area instead of direct deep-sea calls in the Black Sea.

Scandinavian ports

The ports at the entrance of the Baltic and South Finland show a moderate growth path, both losing some ground in a European context. However, the relative decline in their European shares is smaller than in the five years prior to the start of the economic crisis. Scandinavian ports remain highly dynamic players in the market and are European pioneers in far-reaching port cooperation schemes. The ports of Malmo in Sweden and Copenhagen in Denmark were merged in 2001 to form a single company, Copenhagen Malmö Port. It still serves as a successful case in cross-border mergers of two ports. In 2011, the City Councils in Kotka and Hamina on Finland's south coast approved a port merger. The port of Gothenburg in Sweden serves as a good practice in intermodal network development: half of the port's container volume is transported inland via an extensive domestic rail network of container shuttles. The rail network also extends to Norway.

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ABOUT THE ORGANISATION

PortEconomics is a web-based initiative aiming at generating and disseminating knowledge about seaports. It is developed and empowered by the members of the PortEconomics group, who are actively involved in academic and contract research in port economics, management, and policy. Since October 2012, Port Technology International and PortEconomics are engaged in a partnership. Visit www.porteconomics.eu for further details.

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