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***REVIEW OF MARITIME
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Chapter 5

PORT AND MULTIMODAL TRANSPORT DEVELOPMENTS

This chapter covers container port throughput for developing economies, improvements in port performance, institutional change, port development and inland transportation. World container port throughput grew by an estimated 11.7 per cent to reach 485 million TEUs in 2007. Chinese ports accounted for approximately 28.4 per cent of the total world container port throughput. Rail freight traffic for the same period grew by 28 per cent in Saudi Arabia, 12.6 per cent in Viet Nam, 9.4 per cent in India, 7.6 per cent in China, 7.2 per cent in the Russian Federation, and by a mere 1 per cent in both Europe and in the United States.

A. CONTAINER PORT TRAFFIC

With the world container fleet increasing by double-digits for a second consecutive year, the prospects for ports is bright, as more ships literally mean more customers. Some analysts had argued that in recent years there was an excess of ordering driven by cheap lending and an over optimistic view of world trade. Regardless of the reasons, with the advent of high oil prices, ship owners are fortunate to have this spare capacity to hand. These new ships, instead of servicing new routes, are now finding employment on existing routes. The high oil price reported in chapter 4 has resulted in the need for ships to reduce speed with the inevitable consequence that more ships are needed on existing routes if schedules are to be maintained. While more ships do not necessary translate into more cargo volumes being carried, as ships are in some cases simply moving slower, world container port

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throughput volumes are nevertheless increasing. Port revenues, at least by the large international terminal operators, are also increasing. Port revenue does not just consist of charges made from cargo handling but also for services such as towage, mooring, waste removal, etc., which will increase with the number of vessel calls, even if world trade stalls. This factor has not escaped the notice of investors in infrastructure, and thus has helped increase the price of ports as assets over the last few years.

World growth in container port throughput (measured in 20-foot equivalent units (TEUs)) increased by 11.1 per cent in 2006. This is up from 9.6 per cent for the previous year. Preliminary figures for 2007 indicate a similar increase of 11.7 per cent over 2006. In most cases, the port throughput statistics for 2007 are unconfirmed or not reported until the end of the fiscal year; hence, 2006 figures give a more reliable picture.

Table 41 shows the latest figures available on world container port traffic in 62 developing economies with an annual national throughput of over 100,000 TEUs for the period 2005–2007. The figures for 2006 show 434.3 million TEU moves, an annual increase of 43.4 million TEUs over 2005. In 2007, the container throughput growth rate for developing economies was 16.5 per cent, with a throughput of 317 million TEUs; this corresponds to 65 per cent of total world throughput.

There were 34 countries with double-digit growth in 2006 over 2005, of a total of the 62 developing economies listed. The top 10 countries by growth were Panama (43.8 per cent), Pakistan (40.2 per cent), Cuba (36.7 per cent), Lebanon (28.9 per cent), Jamaica (28.6 per cent), Dominican Republic (27.2 per cent), Sri Lanka (25.4 per cent), Mexico (25 per cent) and China (24.5 per cent).

Both Jamaica and Panama also appeared in the top 10 countries by growth the previous year. The growth rate for container port throughput in China increased from approximately 21.7 per cent in 2005 to 24.5 per cent in 2006, giving the country an impressive 84-million TEU throughput. Preliminary figures for 2007 show that Chinese port throughput is around the 101-million TEU mark (excluding Hong Kong, China and Taiwan Province of China). If Taiwan Province of China and Hong Kong, China, are included, then Chinese ports accounted for 139.1 million TEUs in 2007, representing some 28.4 per cent of world container port throughput. Chinese ports grew on average by 17.3 per cent in 2007 over the previous year.

In 2006, container growth rate in developing economies was estimated at 13.8 per cent with a throughput of 276 million TEUs. Preliminary data obtained by UNCTAD show that world container moves grew by around 11.7 per cent and that container throughput reached 485 million TEUs (estimated) in 2006.

Table 42 shows the world's leading 20 container ports for the most recent year, 2007. Container throughput in these ports reached 235.8 million TEUs in 2007, a rise of 13.1 per cent over 2006. The ports listed remain the same as the previous year, with a slight shifting of fortunes for some ports. The list includes 13 ports from developing economies, all from Asia, with the remaining from developed countries located in Europe (4) and the

United States (3). Of the 13 ports in developing economies, 8 are located in China (including Taiwan Province of China and Hong Kong, China). The remaining ports are located in Malaysia (2), the Republic of Korea, the United Arab Emirates and Singapore.

Singapore retained its lead as the world's busiest port in terms of the total number of TEU moves by achieving an impressive 12.7 per cent growth over 2006. However, its long-time rival, Hong Kong, China, lost second position to the rapidly growing port of Shanghai. Shanghai matched its impressive growth of just over 20 per cent achieved in 2006 again in 2007, to bring its total to just over 26 million TEUs and narrowing the gap with Singapore to just 1.7 million TEUs. Early signs for 2008 indicate that Shanghai will grow by 15 per cent, boosted by Yangshan port's third-phase expansion, which is expected to come on-stream and help the port pass the 30 million TEU mark.

Hong Kong (China) slipped down the league table due to a mere 1.5 per cent growth rate over the previous year. Contributing to this decline was the fact that Hong Kong, China and Shenzhen share an overlapping hinterland. The port of Shenzhen, despite increasing throughput by 14 per cent, remained at fourth place. Busan recorded stronger growth in 2007 than the previous year, with an increase of just over 10 per cent, to hold onto fifth place. Rotterdam climbed one place to reach sixth position, with an impressive 11.8 per cent growth. Dubai also climbed one place with an impressive 19.4 per cent growth helping to sustain its annual average growth rate since 2000 at around 20 per cent per annum. Kaohsiung, which experienced timid growth in 2006 from negative growth in 2005, slipped two positions to eighth place. Hamburg maintained its position in ninth place with an impressive 11.7 per cent increase. Qingdao and Ningbo swapped places, the former taking 10th position with a 22.9 per cent increase and the latter 11th place with a 32.4 per cent increase. Guangzhou again moved up three places with a phenomenal growth rate of almost 40 per cent. In tandem, Los Angeles slipped three positions as a result of being the only port in the top 20 to have recorded negative growth. Neighbouring Long Beach also suffered a similar fate after registering a 0.3 per cent growth. Of the five remaining ports, Port Klang, Tianjin and Bremen/Bremerhaven maintained their

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Table 41
 Container port traffic for 62 developing economies, 2005, 2006 and 2007
 (TEUs)

	2005	2006	Preliminary figures for 2007	Percentage change 2005 - 2006	Percentage change 2006- 2007
China	67 499 063	84 017 014	101 963 351	24.47	21.36
Singapore	24 104 200	25 608 400	28 764 000	6.24	12.32
Hong Kong, China	22 601 630	23 538 580	23 881 000	4.15	1.45
Korea, Republic of	14 885 942	15 513 935	17 015 738	4.22	9.68
Malaysia	12 197 750	13 419 053	15 120 974	10.01	12.68
Taiwan Province of China	12 791 429	13 102 015	13 722 312	2.43	4.73
United Arab Emirates	9 851 709	10 967 048	12 826 854	11.32	16.96
Brazil	5 605 440	6 282 766	6 798 200	12.08	8.20
India	4 982 092	6 189 794	7 433 566	24.24	20.09
Thailand	5 115 213	5 574 490	6 200 425	8.98	11.23
Egypt	3 687 933	4 532 202	4 755 879	22.89	4.94
Indonesia	3 803 176	4 042 256	6 112 956	6.29	51.23
Saudi Arabia	3 732 706	3 919 027	4 208 854	4.99	7.40
Turkey	3 174 077	3 647 667	6 350 665	14.92	74.10
Philippines	3 633 559	3 595 279	3 732 872	-1.05	3.83
South Africa	3 111 121	3 552 198	3 781 403	14.18	6.45
Sri Lanka	2 455 297	3 079 132	3 381 693	25.41	9.83
Mexico	2 144 345	2 680 081	3 070 770	24.98	14.58
Oman	2 748 584	2 620 363	2 846 488	-4.66	8.63
Argentina	2 124 619	2 431 886	2 575 252	14.46	5.90
Pakistan	1 686 355	2 363 500	1 826 845	40.15	-22.71
Jamaica	1 671 820	2 150 408	2 193 915	28.63	2.02
Panama	1 483 183	2 133 021	5 291 180	43.81	148.06
Chile	1 799 427	2 122 529	2 417 336	17.96	13.89
Dominican Republic	1 462 889	1 860 872	2 054 433	27.21	10.40
Puerto Rico	1 727 513	1 749 565	1 695 153	1.28	-3.11
Cuba	1 191 081	1 628 138	1 731 003	36.69	6.32
Iran, Islamic Republic of	1 325 643	1 528 518	1 851 396	15.30	21.12
Colombia	1 236 121	1 510 744	1 898 773	22.22	25.68
Bahamas	1 211 500	1 463 000	1 636 000	20.76	11.83
Venezuela, Bolivarian Rep. Of	1 120 492	1 218 066	1 287 517	8.71	5.70
Peru	991 474	1 084 773	1 175 112	9.41	8.33
Bangladesh	808 924	897 937	980 396	11.00	9.18
Guatemala	776 395	800 245	830 936	3.07	3.84
Costa Rica	672 020	765 672	842 903	13.94	10.09
Kuwait	673 472	750 000	804 507	11.36	7.27
Ecuador	632 722	671 087	669 734	6.06	-0.20
Lebanon	461 122	594 603	873 605	28.95	46.92

Table 41(continued)

Port Name	2005	2006	Preliminary figures for 2007	Percentage change 2005 - 2006	Percentage change 2006-2007
Honduras	553 013	593 800	688 314	7.38	15.92
Yemen	542 001	575 394	773 016	6.16	34.35
Viet Nam	474 753	522 347	3 939 759	10.03	654.24
Uruguay	454 531	519 218	596 487	14.23	14.88
Côte d'Ivoire	571 674	507 119	542 617	-11.29	7.00
Kenya	436 671	479 355	585 367	9.77	22.12
Ghana	442 082	476 451	513 204	7.77	7.71
Syrian Arab Republic	422 231	471 970	505 007	11.78	7.00
Trinidad and Tobago	467 712	471 675	521 257	0.85	10.51
Jordan	392 177	406 000	414 000	3.52	1.97
Angola	316 396	377 206	403 610	19.22	7.00
Tanzania, United Republic of	319 548	361 173	13 850	13.03	-96.17
Mauritius	334 931	359 265	413 828	7.27	15.19
Sudan	273 518	326 701	359 537	19.44	10.05
Cambodia	211 141	221 490	236 994	4.90	7.00
Djibouti	193 600	221 330	294 902	14.32	33.24
Bahrain	195 571	215 487	121 351	10.18	-43.69
Cameroon	190 859	200 251	192 715	4.92	-3.76
Guam	150 960	147 972	165 427	-1.98	11.80
El Salvador	103 483	123 329	67 088	19.18	-45.60
Barbados	88 759	98 511	99 623	10.99	1.13
Madagascar	102 000	92 496	112 427	-9.32	21.55
Netherlands Antilles	89 229	90 759	97 271	1.71	7.18
Namibia	77 610	83 263	144 993	7.28	74.14
Subtotal	238 586 488	271 548 426	316 406 638	13.82	16.52
Other reported^a	4 440 655	4 441 266	953 764	0.01	-78.52
Total reported^b	243 027 143	275 989 692	317 360 401	13.56	14.99
World total^c	390 875 566	434 302 152	485 000 000	11.11	11.67

Source: UNCTAD secretariat derived from information contained in *Containerisation International Online* as of May 2008, from various Dynamar B.V. publications and from information obtained by the UNCTAD secretariat directly from terminal and port authorities.

^a Comprises developing economies where fewer than 100,000 TEUs per year were reported or where a substantial lack of data was noted.

^b Certain ports did not respond to the background survey. While they were not among the largest ports, total omissions can be estimated at 5 to 10 per cent.

^c Whilst every effort is made to obtain up-to-date data, figures for 2007 are in some cases estimated. Port throughput figures tend not to be disclosed by ports until a considerable time after the end of the calendar year. In some cases, this is due to the publication of annual accounts at the close of the financial year. Country totals may conceal the fact that minor ports may not be included; therefore, in some cases the actual figures may be higher than those given. The figures for 2006 are generally regarded as more reliable and hence are more often quoted in the accompanying narrative.

positions. Tanjung Pelepas, established in 2001, surpassed New York for the first time and again just outside the top 20 is the port of Laem Chabang. Together, these top 20 ports accounted for around 48 per cent of the world container port traffic in 2007. Figure 19 shows the breakdown of containerized trade by region. The picture remains unchanged from the previous year.

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hardware needs to be upgraded and refinements made to existing soft solutions. Care should always be taken to ensure ports do not become bottlenecks; in some cases, this may require replacing existing paper-based procedures, originally designed to protect revenue collection, with electronic means. The challenge for developing economies remains how to achieve or maintain revenue collection and provide security procedures whilst financing change and reducing bottlenecks.

B. IMPROVEMENTS IN PORT PERFORMANCE

Improving port facilities is one way developing economies can benefit from greater connectivity to world markets, improve trade and lower their transport costs. In most cases, to improve port performance,

Ports are facing increasing demands for a quick turnaround of vessels from customers with ever-increasing sizes of ships. Improving turnaround time by increasing port performance is, however, no easy task, for the main bottleneck is in crane handling. Ports

Table 42

Top 20 container terminals and their throughput for 2005, 2006 and 2007

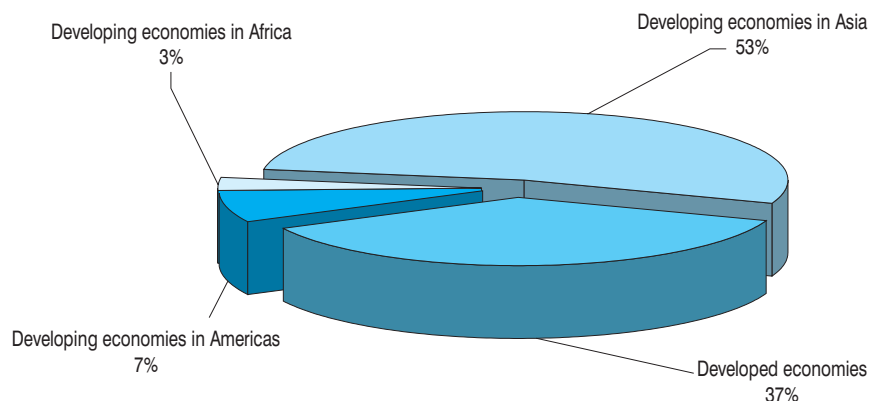
(TEUs and percentage change)

Port name	2005	2006	2007	Percentage change	
				2006-2005	2007-2006
Singapore	23 192 200	24 792 400	27 932 000	6.90	12.66
Shanghai	18 084 000	21 710 000	26 150 000	20.05	20.45
Hong Kong (China)	22 601 630	23 538 580	23 881 000	4.15	1.45
Shenzhen	16 197 173	18 468 900	21 099 000	14.03	14.24
Busan	11 843 151	12 030 000	13 270 000	1.58	10.31
Rotterdam	9 250 985	9 654 508	10 790 604	4.36	11.77
Dubai	7 619 219	8 923 465	10 653 026	17.12	19.38
Kaohsiung	9 471 056	9 774 670	10 256 829	3.21	4.93
Hamburg	8 087 545	8 861 545	9 900 000	9.57	11.72
Qingdao	6 307 000	7 702 000	9 462 000	22.12	22.85
Ningbo	5 208 000	7 068 000	9 360 000	35.71	32.43
Guangzhou	4 685 000	6 600 000	9 200 000	40.88	39.39
Los Angeles	7 484 624	8 469 853	8 355 039	13.16	-1.36
Antwerp	6 482 061	7 018 899	8 176 614	8.28	16.49
Long Beach	6 709 818	7 290 365	7 312 465	8.65	0.30
Port Klang	5 715 855	6 326 294	7 120 000	10.68	12.55
Tianjin	4 801 000	5 950 000	7 103 000	23.93	19.38
Tanjung Pelepas	4 177 121	4 770 000	5 500 000	14.19	15.30
New York/New Jersey	4 792 922	5 092 806	5 400 000	6.26	6.03
Bremen/Bremerhaven	3 735 574	4 428 203	4 892 239	18.54	10.48
Total top 20	186 445 934	208 470 488	235 813 816	11.81	13.12

Source: UNCTAD secretariat *Containerisation International*, May 2008.

Figure 19

Regional breakdown of container throughput for 2007



Source: UNCTAD secretariat.

have not made any significant breakthroughs in container handling, even with the arrival of tandem lift and triple lift cranes. These cranes do not bring double or triple levels of productivity, merely marginal increases, for they cannot complete every move with the optimum carrying capacity, as this would require optimum stowage as well as optimum supply and demand. Neither does there appear to be any new radical solutions on the horizons, which would have to be in a new approach to either container handling or box design.

In the *Review of Maritime Transport 2007*, it was reported that, at the Chiwan Container Terminal in Shenzhen, China, a crane capable of lifting six TEUs or three FEUs (forty-foot equivalent units) came into operation. The terminal has since introduced two additional similar cranes, bringing the total triple-lifts to three. The terminal earlier this year reported an average container handling rate of 64.17 boxes per hour when assisting the vessel *MSC Candice*. Five quay cranes (including four twin-lift 40-footers) were used in discharging (without loading) 2,542 units. One crane operator had apparently moved 132 boxes in one hour. A concept to further improve container handling efficiency has led one crane manufacturer to design, on paper, a crane capable of discharging four FEUs simultaneously. In 2007, Jebel Ali Port (United Arab Emirates) introduced tandem lift gantry cranes capable of handling two FEUs (or four TEUs) simultaneously. In October 2008 the port increased its tandem lift cranes to 16. Also in 2008, Jebel Ali Port introduced the world's first special simulator to train crane operators on the use of these tandem lift cranes.

C. RECENT PORT DEVELOPMENTS

Port developments around the world continue at an uneven pace. The following section gives a brief overview of some of these developments by region. This narrative is meant to be informative rather than exhaustive.

In Europe, A.P. Moller Terminals (APMT) won a concession to build Vado Ligure terminal in Savona, Italy. In Turkey, the outcome of the port privatization process saw the entry of the Port of Singapore Authority (PSA) in the port of Mersin and Hutchison in the port of Izmir. In Ukraine, Odessa Commercial Sea Port announced plans to convert a disused shipyard into a 300,000-TEU terminal, while the neighbouring port of Ilyichevsk plans to increase its facilities to handle 460,000 TEUs. In the Russian Federation, construction started on the long-awaited 1 million-TEU, €300 million container terminal at the port of Lomonosov in the Baltic Sea. The project is financed by the European Bank of Reconstruction and Development and the Swiss-based Mediterranean Shipping Company. Elsewhere in the Russian Federation, the Government announced plans to upgrade Novorossiysk to accommodate 4,000-TEU vessels. The port recently underwent a 20 per cent initial public offering (IPO) raising \$1 billion. International Container Terminal Services Inc. (ICTSI) won a concession to operate a multi-purpose port to include 300,000 TEUs at Batumi, Georgia. Also in Georgia, DP World became involved in a new container terminal project and free trade zone at the port of Poti.

In the Middle East, APMT was granted a 25-year concession at the Bahrain Gateway terminal in the Port of Khalifa Bin Salman. The port has a depth of 15 metres, enabling it to cater for the newest generation of container vessels. In Oman, the International Container Terminal at Sohar opened for business. In the United Arab Emirates, DP World was awarded the concession to operate the new Khalifa port at Abu Dhabi.

In Pakistan, plans were announced to dredge the Port Qasim to 10.5 metres while HPH was to build a new container terminal in Karachi. In India, the State of Bhubaneswar is reportedly looking into a study suggesting the need to develop 15 to 20 more ports along its coast.⁹³ On the west coast of India, the State of Karnataka is also looking at developing three new ports.⁹⁴ The Thai Government and DP World are considering the 2.6 billion Baht (\$80 million) deep sea port project at Pak Bara. In the Republic of Korea, Donghae Port, which has a capacity of 100,000 TEUs per annum, received its first container ship, the 9,991-TEU *Golden Gat*. In Busan, both old and new ports will be dredged from 15 to 16 metres to accommodate the growing number of vessels over 10,000 TEUs.

In the Americas (see chapter 7 for a more detailed account), HPH launched a new \$244 million facility at the Port of Lazaro Cardenas, Mexico.

In Africa, Morocco is to build a \$1.2 billion port near Tangier in addition to the recently completed Tangiers–Med Port. DP World is reportedly looking at a \$250 million port project in Djen-Djen in Algeria, after having won a 25-year concession to operate existing facilities and build new berths in Dakar, Senegal. In Equatorial Guinea, Lonrho Africa is to expand its \$30 million (R209 million) investment into Luba Freeport to capture more of the region's growing oil and gas sector. In Gabon, the Singapore-based international terminal operator Portek won two 25-year concessions at the ports of Owendo and Port Gentil. In South Africa, the Port of Ngqura, the county's third-deepest harbour, is to see the development of a 3 million-TEU facility which will be capable of accommodating vessels of up to 80,000 dwt and a draught of up to 23 metres. Ngqura is midway between the ports of Durban and Cape Town and the first two berths should be completed in 2009. The total project is expected to amount to R8 billion (\$1 billion) to bring the terminal into operation. This

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includes R4.7 billion for building four berths, about R1.4 billion for equipping two berths and the balance for upgrades to rail connections between the port and Gauteng. International terminal operator Cosco is reported to be interested in the project. In 2007, APMT began operations of facilities in the ports of Luanda (Angola), Xiamen, Tianjin, Guangzhou (China), Tema (Ghana) and Tangier (Morocco).

D. INSTITUTIONAL CHANGE

Governments trying to bring their ports into the twenty-first century may find that the costs can be prohibitively expensive and the port difficult to manage without sophisticated software management programmes. However, the globalization of ports and the creation of port transnational corporations (TNCs) have brought with them many opportunities for developing economies, such as the sharing of knowledge and expertise in the areas of management and operational techniques, infrastructure planning, methods of international finance, the adoption of tried and tested computer software systems, the replication of success factors and fine tuning of new equipment tested in other locations.⁹⁵

In 1993, 42 per cent of world container throughput passed through State-owned terminals, but by 2006 this figure was down to 19 per cent. The share of State throughput varies by region: in Northern Europe it is 6 per cent, in South-East Asia, 42 per cent, Eastern Europe 24 per cent and Africa 68 per cent.⁹⁶ Today, the majority of the top 100 container ports, which represent over 80 per cent of total world container port throughput, have some form of private participation. For example, the Port of Tanjung Pelepas in

Malaysia is 30 per cent owned by the shipping line Maersk Sealand, whereas the adjacent Port of Singapore remains one of the few ports still owned by its national Government, albeit in a form of corporatization.

The plethora of port concessions worldwide has created many individual terminal operating companies. Some companies have expanded through winning new concessions in other countries or, more recently, through a spate of mergers and acquisitions which have transformed some terminal operators into TNCs, so that some control more than 50 terminals and others are present in more than 30 countries. At the other end of

the scale are small individual port operators who, having matured in their own market, have sought out new opportunities abroad.

In late 2007, the Hamburger Hafen und Logistik AG (HHLA) terminal operator underwent an IPO on the Frankfurt and Hamburg stock exchanges. Shares were offered at €53 (\$76.80) and soon climbed to above €60 per share. HHLA workers were offered shares at a 50 per cent discount. The IPO was oversubscribed 10-fold and raised around €1.17 billion. HHLA is still 70 per cent owned by the State of Hamburg.

In China, Qingdao and Ningbo, the country's third- and fourth-busiest container ports, are planning an IPO to raise funds. Previously, in 2006 Dalian Port raised HK\$2.37 billion (\$303.8 million) in an IPO in Hong Kong, China. The proceeds were to finance the construction of four container berths at Dayao Bay and 12 crude oil storage tanks at Xingang, as well as the supply of equipment including tugs. The port is now considering building 12 more crude oil storage tanks with a total capacity of 1 million–1.2 million tons. The project is expected to cost about Yuan 1 billion over 2008 and 2009, financed through a second IPO.

Previous Chinese port companies have received an overwhelming response from investors in the

Hong Kong, China stock market. Dalian Port saw its share price surge 68 per cent on the first trading day and Tianjin Port Development Holdings shares were nearly 1,700 times over-subscribed, resulting in an increase of 26 per cent upon its launch.

The global port industry remains highly fragmented. From table 43, it can be seen that the Herfindahl Hirschmann Index, an indicator of market concentration, is at 548,⁹⁷ where 1,000 indicates concentrated and 1,800 highly concentrated. The recent purchases of ports by financial institutions in some cases will most likely translate into re-sales after some asset stripping and reorganization. Ports are capital-intensive industries by nature and revenue streams may take decades to repay current investments. The question remains whether these financial institutions will still hold onto these assets when the next round of major investment is required. Port expansion, especially in old established ports, has become constrained by the encroachment of cities. Busan and Shanghai are classic examples. The expansion of the city has resulted in the need to build new port facilities at distant locations.

Drewry's 2008 edition of the "Annual Review of Global Container Terminal Operators" placed PSA in the lead over Hutchison by virtue of its 20 per cent stake in the latter. Drewry puts the top five port operators and their

Table 43

Global terminal operators' percentage share of world container throughput
(Percentages)

Global terminal operators	2005	2006	2007	HHI
HPH	13	13	14	187.69
PSA International	11	12	11	127.69
APM Terminals	10	10	12	153.76
DP World^a	9	10	9	79.21
Cosco Pacific	7	7	8	
Eurogate	3	3	3	
SSA Marine	3	3	3	
Total share of world throughput	56	58	60	
World throughput (in millions of TEUs)	387.7	434.3	485.0	548.35

Source: UNCTAD secretariat from information obtained by Dynamar B.V.

^a DP World includes CSX World Terminals and P&O Ports for all three years.

2007 TEU throughput as follows: PSA (47.5 million TEUs), Hutchison (33.6 million), APM Terminals (31.6 million), DP World (28.9 million) and Cosco (9.8 million). The top 20 global terminal operators handled some 349 million TEU, an increase of 13 per cent over the previous year.

In terms of fiscal results, DP World reported a 52 per cent growth in profits in the year ending 2007, but total throughput volumes increased by a marginal 3 per cent. China Merchants Holding International (CMHI), a significant port player in China, increased its profits to \$515 million in 2007, up by around 40 per cent. ICTSI achieved a net profit of Php2.79 billion (\$67.9 million) up 27 per cent in 2007. APMT posted a 22 per cent growth in revenue in 2007 to reach \$2.52 billion. HPH saw profits rise by 13 percent to HK\$12.8 billion (\$1.65 billion) in 2007.

CMHI handled some 47 million TEUs in 2007, more than DP World, which ranks fourth in terms of the global terminal operators. However, apart from a small stake in a terminal in Zeebrugge, and pending the operation of a project in Viet Nam, CMHI's portfolio of ports are located in China.

The world's major ports are located on the main shipping routes on an East–West axis. This axis has historically been where ports have sought to expand internationally. Interesting along this route are numerous countries where port TNCs are not located (e.g. from east to west – Cambodia, Myanmar, Bangladesh, Yemen, Somalia, Eritrea, Sudan, Libyan Arab Jamahiriya and Tunisia). Of these countries, Yemen, Somali, Eritrea, Sudan, Libyan Arab Jamahiriya and Tunisia are the least distant from international shipping lanes, making them in principle candidates that port TNCs may wish to investigate further. Obviously, factors other than location to shipping routes need to be considered, e.g. water depth, and existing facilities, social, political, legal and economic constraints.

In Yemen, the Aden Container Terminal was handed back to the Government in 2002. The issue included security concerns in the wake of the 2000 terrorist attack on the USS Cole. Since then, no port TNC has been involved in the country.

In Somalia, there are deepwater ports at Berbera, Mogadishu and Kismaayo, plus a minor port at Maydh. A port modernization programme in the 1980s improved cargo handling capabilities at Kismaayo and increased

the number of berths and deepened the harbour at Berbera. Situated at the mouth of the Red Sea in the Gulf of Aden, Berbera is 100 miles, or four hours, south of the main international shipping route.

In Eritrea, the main ports are Assab in the south-east and Massawa in the central eastern part of the country. Assab is located on the main international shipping route and has a draft of between 5 and 10 metres, sufficient for all but the most modern container ships. However, quay length and facilities are limited. In Massawa, slightly further away from the main shipping route, the depth ranges from 5 to 9 metres.

Port Sudan is the main port for Sudan, with a depth of around 8 to 12 metres, and is located around 100 miles west of the main international shipping route.

In the Libyan Arab Jamahiriya, the main ports are, from east to west, Bennghazi, Az Zuwaytinah, Marsa al Burayqah, Ra's Lanuf, As Sidrah, Misurata El-Khoms and Tripoli. The Libyan port industry has been targeting by the Government for reform.

In Tunisia, the Government is looking at developing a deep water port at Enfidha, 60 miles to the south of the capital Tunis. Closer to the capital, the port of Rades has a depth of between 7 and 9 metres, and is the site of a new logistics zone facility. It is not yet clear whether any port TNCs have been invited to tender.

Ports are increasingly attracting the interest of investors, and so for developing economies the main issue is no longer how to finance new infrastructure projects but which partner to choose. At an UNCTAD meeting on globalization of port logistics in 2007, APMT said that port opportunities in developing economies could contribute to further expanding their portfolio, but the process was by no means cheap. Poor existing facilities and inadequate inland connections make developing countries' ports capital-intensive. Developing economies, especially those in Africa, have some of the world's worst internationally-connected countries.

At the above mentioned-meeting, terminal operators present listed, besides macro risks such as economic and political, the following factors which Governments need to address in attracting port TNCs (see box 1).

Historically, the hardest change for many Governments to implement is that of the labour reforms, such as the abolition of controls originally established to protect the

Box 1

Prerequisites for attracting port TNCs

- A clean and transparent bidding process
- Quality and Capacity landside connections multimodal and port infrastructure;
- No government cap on profits
- Good safety and security requirements
- A training and retrenchment of labour plan
- A clear role for the port authority (e.g. landlord model)
- Smooth customs procedures
- Absence of corruption

Source: UNCTAD meeting on Globalization of Port Logistics: Opportunities and Challenges for Developing Countries, December 2007, Geneva.

employment rights of port workers. Baird and Valentine (2006) state that, in the United Kingdom, it was not until the abolition of the National Dock Labour Scheme in 1989 that port privatization really received momentum despite the first port privatizations six year previously.

Juhel and Pollock (1999) quote from an unnamed study which states that 79 per cent of the former registered dockworkers became redundant, of which 19 per cent wished to remain active but could not find work. While 55 per cent found employment elsewhere, 25 per cent re-entered the port industry. Labour reforms can be a thorny issue for Governments, as traditionally ports tend to over-employ. For example, in the port of Buenos Aires, Argentina, the suspension of the labour agreements led to a 50 per cent reduction of the number of workers. Port reforms in Australia, France, and the United Kingdom cut employment levels by 40 to 60 per cent (International Labour Organization, 1996). Finding other jobs for these people will initially be a challenge; however, in the long run, as the economies develop, more jobs will be created. The time lag in returning workers to the labour market and retraining costs will remain an issue. Often new port concessions are awarded with

.. the hardest change for many Governments to implement is that of the labour reforms ..

gradual reduction in workforce limits set over a defined period. These allow people to be retrained and adjust to the fact that their old job is redundant. For example, in 1993, the Mexican Government passed a law that reformed Mexico's ports which included transforming employment rights from a national collective bargaining position into a firm-level bargaining position by the new private operators. As a result, the number of port workers employed by the public sector was reduced, but total port employment by private firms is rising because of an increase in the activity of ports. For example, the port of Manzanillo had 2,100 workers before the reform, and at the end of 1997 the number had doubled. In Veracruz, the initial number of 6,647 employees increased to 8,260 (Estache and Trujillo, 2001). As a means of managing port TNC involvement in port concessions, the International Transport Workers' Federation (ITF) announced in 2007 that it was establishing a database to monitor the situation (ITF, 2007).

The outlook for the port industry depends significantly on whether the global terminal operator is derived from

an ocean carrier or an international terminal operator (ITO) as the drivers and motives will be different. Ocean carriers are largely driven by the need to control supply chains. Supply chains involve managing the raw material that go into the manufacture of a particular product as well as the processes involved. This includes all the process – from the initial stages of a product’s formation, its transportation to the market for sale, until its final point of consumption by the consumer. This chain is complicated but, once created, is difficult for new entrants to compete against. The motivation here is guaranteed income through managing the logistics processes. On the other hand, an ITO will be motivated by guaranteeing income through market share of the terminal operating business. The ITO TNC company will be looking to replicate the efficiencies achieved in one port in other locations. Its business will be highly focused but diversified globally to offset any regional imbalances in trade. An ITO port company will thus look for a globally diversified portfolio (e.g. Dubai Ports World). An ocean carrier TNC will conversely look for terminal management where its shipping line has the best advantage (i.e. fewer competitors and larger market share). However, due to the trend of ocean carriers TNC to distance themselves from the parent shipping line, ocean carrier TNC are less common. A TNC whose concentration is upon market share is more prominent, especially in the ports with higher throughput volumes.

E. INLAND TRANSPORT DEVELOPMENTS

(1) *Inland waterway transport*

In the absence of rivers, transport would be impossible to many remote areas in the world. Inland waterways play a vital role in connecting goods and passengers in remote areas to other more developed regions. Another important factor which is contributing to the growth of inland waterway transport is that many developed regions also see inland waterway transport as a means to relieving road congestion while protecting the environment through lower vehicle emissions.

In 2007, in Europe, inland waterway transport accounted for around 500 million tons of goods, an estimated 4 per cent increase compared to 2006. In the United States the figure for 2007 was around 800m tons. In China, strong transport volumes along the Yangtze River helped push the country’s total inland waterway traffic up to between 1.2 – 1.3bn tons in 2007.

(2) *Railway transport*

(a) Market development

In 2007, the International Union of Railways reported a boost in rail traffic worldwide, in particular in several of the BRIC countries, caused by demographical development and globalization of trade.

In European rail freight, growth was recorded at 1 per cent in 2007, after a 4 per cent increase in 2006: The growth in cross-border rail freight traffic was particularly strong, growing by 3.5 per cent. The total rail freight production in Europe 2007 was 412 billion tons-kilometres.

The railways in the Russian Federation experienced a continued strong growth in rail freight in 2007, up 7.2 per cent from 2006, bringing the total rail freight production above 2 trillion ton-kilometres.

Likewise, in Asia the Chinese and Indian Railways in 2007 experienced healthy growth figures of 7.6 and 9.4 per cent respectively, compared to 2006. The total rail freight production in 2007 was recorded in China 2.2 trillion tons-kilometres and in India at 481 billion tons-kilometres.

In the United States in 2007, rail freight traffic decreased by 1 per cent on the previous year’s levels of 3 per cent. The total rail freight production by United States railroads in 2007 was 2,800 tons-kilometres.

Of other reported rail freight market developments in 2007 compared to 2006, Chile saw a growth of 8 per cent, the Islamic Republic of Iran 9.4 per cent, Saudi Arabia 28 per cent and Viet Nam 12.6 per cent. Congo and Cameroon have experienced a decrease in the rail freight in 2007 compared to 2006 of around 5 per cent.

A particularly interesting development in intercontinental rail freight was the maiden journey in January 2008 of the so-called “Beijing–Hamburg Container Express”, which left the Chinese capital and covered the distance of 10,000 kilometers (6,200 miles) in 15 days before arriving in the German Port of Hamburg. The comparable journey by sea takes around 30 days. The “Container Express” made its way from China to Germany through Mongolia, the Russian Federation, Belarus and Poland.

(b) Infrastructure development

Rail infrastructure developments took place in many of the world's regions in 2007. It is in particular worth noting that the African Union (AU) has over the recent years taken a role on linking infrastructures of its member countries into a comprehensive Pan-African transport infrastructure. In 2008, the AU published a report on "State of Transport Sector Development in Africa" for the consideration of the African Transport Ministers. Table 44 clearly shows that the African rail infrastructure is less dense compared to rail infrastructure density in other parts of the world, which is only natural given that the population density in Africa is generally lower.

Table 44

Comparative railway densities

Region	Total network (route km) ²	Density (km/1,000 km ²)
North Africa	16 012	2.3
Eastern Africa	9 341	2.2
Southern Africa	33 291	5.6
Central Africa	6 414	1.2
Western Africa	9 715	1.9
Africa	74 775	2.5
World Average	-	23.1

Source: UNCTAD secretariat based on African Union, State of Transport Sector Development in Africa.

The African Union also has identified a number of missing links in African railway system based on the overall Railways Master Plan. The missing links are rail network interconnections, where their construction has not yet been started or completed (see table 45).

In conclusion, the African Union Ministers of Transport have defined that the following challenges need to be overcome:

Systematic programmes for replacement of old locomotives, wagons and communication systems need to be developed;

Inadequate railway lines and structures need to be rehabilitated and upgraded;

Market-driven and customer-responsive services to attract customers need to be initiated;

The role of the private sector needs to be increased;

Intra-modal or inter-modal transport competition to gain efficiency in cargo handling at terminals needs to be enhanced; and

Carrying out railway interconnections where feasible should be considered.

(3) Road transport

(a) Market development

Freight transport by road is a very un-consolidated and immature market, largely dominated by small and medium-sized companies. This is perhaps a reflection of the low barrier of entry into this market in many countries, and as such there are no pure road transport companies with a global reach. Only a few logistics companies with affiliated trucking and road transport activities can be considered to have global activities.

A comparative analysis of various national markets in the road transport industry,⁹⁸ concludes that the United States market is the largest when measured by total sales, and that the Chinese market is the largest when measured by number of establishments and the number of employees (see table 46).

(b) Infrastructure development

A 2008 study of the AU shows that Africa has about 2.09 million km of roads, of which 21 per cent is paved. The quality of the roads and their density are still low. The continent's roads accounts for about 90 per cent of inter-urban traffic. The density of the road network is 7.59 km per 100 sq. km. These ratios indicate a great inadequacy and are still too low to provide an acceptable degree of access by disadvantaged populations to the benefits of road transport.

The Trans-African Highway concept (see table 47) was originally formulated in the early 1970s. The 2008 AU study shows the missing links in the highway:

The AU has concluded that the existing gaps in the roads and road transport subsector reveal low network connectivity leading to high transport costs, as well as poor quality of services compared to the best practices in other regions of the world. The AU is proposing the following actions to close the gaps:

Table 45
Railway missing links by subregions in kilometres and percentages

Regions	Existing links (km)	Planned lines in the master plan -1979 missing link (km)	Total length of lines (existing and planned) (km)	Per cent of railway missing links
North Africa	16 012	6 484	22 496	29
Eastern Africa	9 341	2 299	11 640	20
Southern Africa	33 291	4 034	37 325	11
Central Africa	6 414	4 574	10 988	42
Western Africa	9 715	8 971	18 686	48
Total Africa	74 775	26 362	101 137	26

Source: UNCTAD secretariat based upon African Union, State of Transport Sector Development in Africa.

Table 46
Road transport markets: country comparisons

	Total establishments	%	Total employment	%	Total sales (million \$)	%
Brazil	27 140	66.8	527 383	61.2	12 093	8.5
China	214 759	528.5	4 173 177	484.6	35 355	24.8
France	9 027	22.2	175 408	20.4	23 813	16.7
Germany	12 620	31.1	245 239	28.5	33 384	23.4
India	149 414	367.7	2 903 391	337.2	9 903	6.9
Japan	20 492	50.4	398 195	46.2	49 556	34.7
Russian Federation	23 897	58.8	464 354	53.9	12 793	9.0
South Africa	5 320	13.1	103 372	12.0	2 687	1.9
United Kingdom	9 246	22.8	179 675	20.9	25 854	18.1
United States	40 634	100.0	861 124	100.0	142 677	100.0

Source: UNCTAD secretariat based upon Barnes Reports, Worldwide Freight Trucking Long Distance Industry, 2008.

Table 47

Trans-African Highway missing links by subregions in kilometres and percentages

Region	Total TAH network (kms)	Paved sections (kms)	Per cent of missing links
Northern Africa	13 292	13 195	1%
Eastern Africa	9 932	8 201	17%
Southern Africa	7 988	6 817	15%
Central Africa	11 246	3 891	65%
Western Africa	11 662	10 581	9%
Total Africa	54 120	42 665	21%

Source: UNCTAD secretariat based upon African Union, State of Transport Sector Development in Africa.

Implementation of common border post systems;

Mobilization of public and private resources for maintenance and construction;

Undertaking all the necessary legal reforms;

Improvement of road transport facilitation and transit time improvements; and

Paying special attention to construct and/or pave the critical inter-state links that connect main cities and business centres.

(c) Global contract logistics⁹⁹

Consolidation in the global logistics industry continues to influence the market structure. Over the past 10 years, most industry sectors have experienced major mergers and acquisitions, and even the biggest companies are not immune from potential takeover. This trend also holds true for the logistics industry, where the major logistics providers increasingly have seen it as necessary to provide more capacity and larger global networks in order to match the increased cargo volumes and globalized supply chains of their clients. Another major factor that drives the consolidation of the logistics market is the increasing outsourcing of various transportation, warehousing, logistics and supply chain management activities by global industrial companies that wish to

focus on their core manufacturing and sales competencies.

One of the areas of the logistics industry that has experienced the largest growth rates over recent years – and where the biggest growth potential is estimated – is in the area of contract logistics. Contract logistics can be defined as follows: planning, implementation, and control of a logistics system provided through a third party under a contract.¹⁰⁰

The global contract logistics market accounts for just a small part of what is spent overall by manufacturers, retailers and other logistics service users (see figure 20). However the proportion for which it accounts is growing, as an increasing number of clients outsource their logistics functions, and contract logistics players continue to win business from less value adding providers.

The global contract logistics market grew by 10 per cent in 2006 to reach €129 billion (see table 48). The market was driven by growth in the Asia Pacific region (13.1 per cent) and supported by higher levels of growth in other developing markets such as the Middle East and Africa. The European market held back overall development with a below-average 7.2 per cent. North America, however, held up well, with growth of 10.2 per cent.

Table 48

Global contract logistics market size
(€ million)

	2004	2005	2006
Global	105 961	116 913	128 590

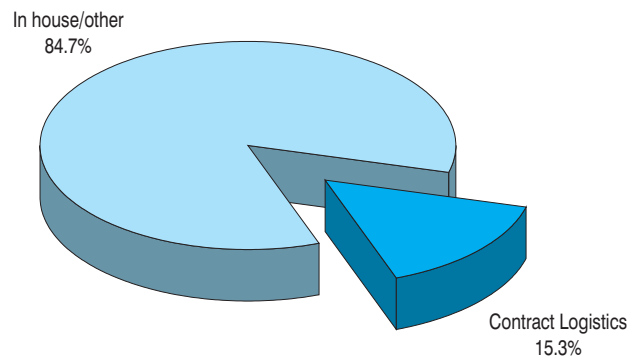
Source: Transport Intelligence, *Global Freight Forwarding 2007*.

Forecasts show that growth will continue over the next five years (see table 49). The projected downturn in the United States market as a result of the 2008 “credit crisis” and development in China, one of the key engines of growth in this market segment, are some of the key determining factors for the development of the market segment. Confidence in the industry remains high.

Europe is the largest market for contract logistics in the world, with a share just under 40 per cent. It is followed by North America (30 per cent) and Asia Pacific (27 per

Figure 20

Global contract logistics market penetration (2006)



Source: UNCTAD secretariat based upon Transport Intelligence, *Global Freight Forwarding 2007*.

Table 49

Global contract logistics market forecast
(€ million)

	2006	2010
Global	128 590	187 310
Growth rate		9.9

Source: Transport Intelligence, *Global Freight Forwarding 2007*.

cent). The markets in the Middle East, South America and Africa are tiny in comparison, each accounting for around 1–1.5 per cent.

(4) UNCTAD *Liner Shipping Connectivity Index 2008*

Access to world markets strongly depends on the availability of regular and efficient transport connectivity, especially as regards regular shipping services. UNCTAD's Liner Shipping Connectivity Index (LSCI) aims at capturing a country's level of integration into the existing liner shipping network through measuring the liner shipping connectivity. The LSCI was first introduced and explained in the *UNCTAD Transport Newsletter* No. 27 (1st quarter 2005), as an indicator of

The best-connected countries in Africa are Egypt (ranked 17) and South Africa (35), while the best-connected countries in Latin America are Mexico, Brazil and Panama (26, 27 and 28, respectively).

liner shipping connectivity for 162 countries. The ships which are deployed to provide liner shipping services to a country's port(s) form the basis of the five components which constitute the index: (a) number of ships; (b) the container carrying capacity in TEU of those ships; (c) maximum ship size; (d) number of services; and (e) number of companies. The underlying data is derived by UNCTAD from *Containerisation International Online*.

As of July 2008, China continued to lead the overall LSCI ranking (see annex 4), followed by Hong Kong (China), Singapore, Germany and the Netherlands. The best-connected countries in Africa are Egypt (ranked 17) and South Africa (35), while the best-connected countries in Latin America are Mexico, Brazil and Panama (26, 27 and 28, respectively).

The data for 2008 confirms a growing connectivity divide, i.e. the gap between the best and worst connected countries is widening. As a trend, it can be observed that those countries that were best connected in July 2004 were also more likely to further improve their connectivity over the subsequent four years. Thus, the 20 highest -ranked countries in 2004 were, with the exception of Canada, still the highest-ranked countries in 2008, and China has led the ranking since 2004.

Countries at the bottom of the index include small island States which rely on small feeder service connections to a regional hub, such as Tuvalu and Dominica, and landlocked countries which have only inland waterways connections serviced by small ships, such as Paraguay and Switzerland. Also countries facing difficult political situations, such as Iraq, Haiti and Somalia are amongst the worst connected countries.

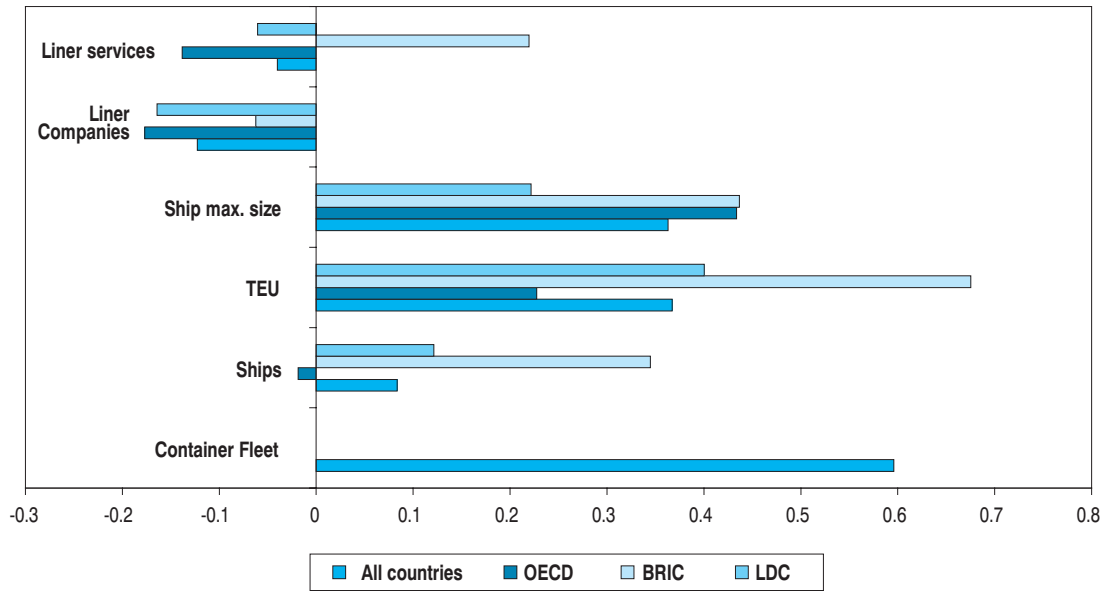
The composition of the worst connected countries changes more frequently than the top connected countries, as the overall numbers of companies and services are very low. A withdrawal of one service provider or one service can therefore strongly impact the overall ranking, as was the case in Paraguay which in 2006 and 2007 had two liner companies providing services including one with max ship size of 2,233 TEU, but in 2008 fell back to 2004 level of one company servicing Paraguay with three ships of max ship size of 162 TEU. Grenada and Virgin Islands (U.S.) are two small islands which steadily improved their ranking since 2005. Cambodia and Haiti, however, have seen the strongest decline in their index since 2005 and in 2008 are amongst the 20 worst-connected countries.

It is worth noting that some countries have experienced exceptional improvements in the past four years; Morocco and Lebanon, medium-ranked countries in 2004, have seen significant growth (217.2 per cent and 173.6 per cent, respectively) in the index and significantly improved their position in the ranking (Morocco from 78 to 33, and Lebanon from 67 to 34). Conversely, Yemen experienced one of the strongest declines in the index (- 24.8 per cent) and its position in the ranking decreased from 38 to 66; this may be attributable to the political situation, surcharges on war-risk premiums and the withdrawal of PSA from Aden port in 2003.

As regards the five components of the LSCI, it can be observed that the total number of ships, TEU capacity deployed and maximum ship size have all increased since 2004 (see figure 21). In comparison, liner services and companies have decreased. The liner services contracted in all countries except for BRIC countries. The number of liner shipping companies per country has contracted by 7.7 per cent. The highest concentration of liner companies is found in Europe, China and Singapore. This trend may raise concerns, especially for countries with low connectivity, where a further decline in the number of service providers may give rise to oligopolistic market structures.

The major change in maximum ship size has been observed in the OECD and BRIC countries. Indeed, in July 2008, there were eight countries that received ships with a TEU carrying capacity of more than 10,000 TEUs, notably Belgium, China, Germany, Hong Kong (China), the Netherlands, Singapore, Spain and the United Kingdom. The number of ships deployed has increased, particularly in the BRIC countries, with China once again leading the group. As of July 2008, 1,705 vessels from the world container fleet, approximately 4,300 vessels,¹⁰¹ include at least one Chinese port in their liner services. The parallel increase of the maximum ship size and number of ships further explains the strong growth of TEU capacity deployed to BRIC countries. In comparison, OECD countries have experienced a decline in number of ships, but a growth in ship size. While LDCs have seen an improvement in the TEU capacity, the difference in TEU capacity between LDC and OECD or BRIC countries remains very high. LDCs with the biggest TEU capacity are Senegal and Angola, with 128,496 and 100,000 TEU respectively, while the comparative figure for countries such as China, Germany, the United Kingdom and Singapore is of more than 1,000,000 TEUs.

Figure 21
Changes in the LSCI between 2004 and 2008



Source: UNCTAD secretariat.

