UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT
Geneva

REVIEW OF MARITIME TRANSPORT 2007

Report by the UNCTAD secretariat

UNITED NATIONS

New York and Geneva, 2007

Chapter 3

PRODUCTIVITY OF THE WORLD FLEET, AND SUPPLY AND DEMAND IN WORLD SHIPPING

This chapter provides information on the operational productivity of the world fleet and an analysis of the balance between supply and demand for tonnage and container carrying capacity. Key indicators are the comparison of cargo generation and fleet ownership, tons of cargo carried and ton-miles performed per deadweight ton, and the analysis of tonnage oversupply in the main shipping market sectors.

The operational productivity of the world fleet decreased slightly during 2006, reaching 7.1 tons carried per dwt and 29.4 thousand ton-miles per dwt. The world surplus tonnage increased to 10.1 million dwt, or 1.0 per cent of the world merchant fleet. As regards the supply and demand in container shipping, in 2006, for the first time since 2001, the growth of the fleet (supply) the growth outstripped of containerized trade (demand).

A. OPERATIONAL PRODUCTIVITY

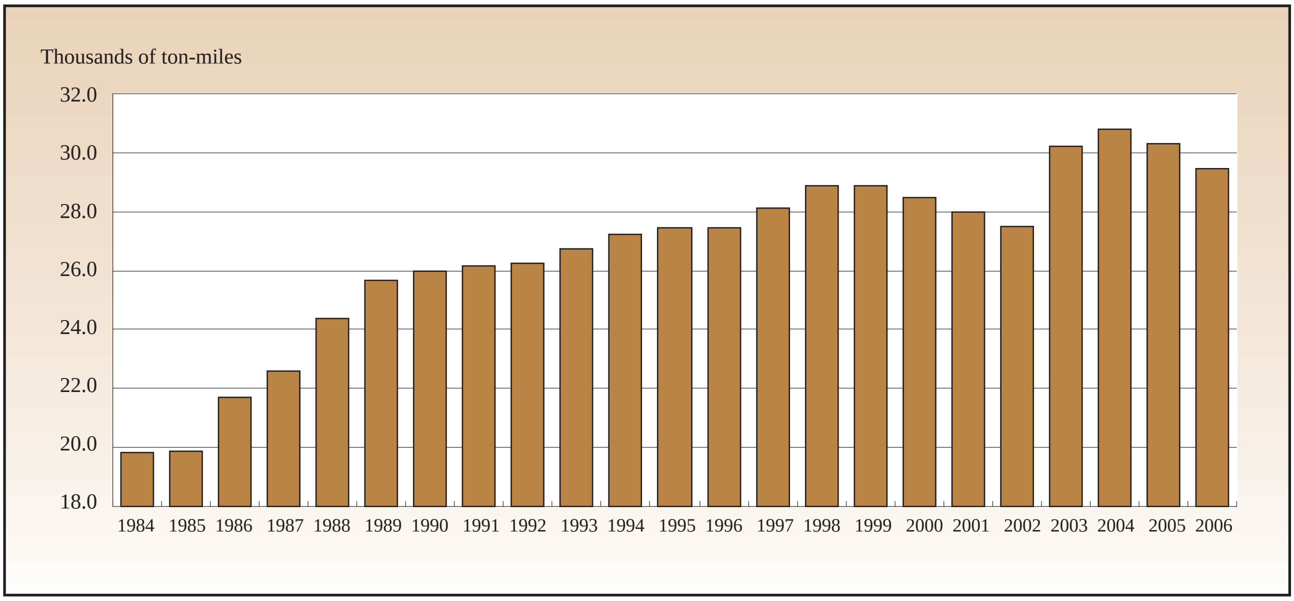
The main indicators of operational productivity for the world fleet in tons and ton-miles per deadweight ton (dwt) are shown in figure 8 and table 24. Tons of cargo carried per deadweight ton (dwt) in 2006 decreased slightly to 7.1, while thousands of ton-miles performed per deadweight ton decreased to 29.4. The marginal decrease in productivity measured in tons of cargo carried per deadweight ton (dwt) reflects the faster rate of fleet expansion relative to the cargo carried. The year-on-year decrease in productivity, measured in ton-miles per dwt, also resulted from fleet expansion, which slightly outweighed growth in seaborne trade and distance travelled. In spite of short-term fluctuations, there is a long-term positive trend as regards fleet productivity, which increased by 50 per cent over two decades (figure 8). Among the main reasons for this long-term positive trend are improved port productivity and shorter waiting times, which increase the proportion of vessel time spent at sea versus vessel time spent in ports.

Table 25 provides supplementary data on operational productivity in terms of cargo carried per dwt by type of vessel. Productivity in terms of tons carried per dwt for oil tankers decreased slightly from 6.4 in 2005 to 6.1 in 2006, while that for dry bulk remained at 5.1 tons per dwt. The cargo volumes carried per dwt of the residual fleet also decreased marginally from 10.3 to 9.7 tons per dwt.

Indicative data on ton-miles performed by oil tankers, dry bulk carriers and the residual fleet are provided in table 26. The thousands of ton-miles per dwt of oil tankers decreased from 33.2 to 31.7 in 2006, while the corresponding figure for dry bulk carriers decreased marginally from 25.5 to 25.4. The productivity of the residual fleet measured in ton-miles per dwt decreased slightly from 33.6 to 31.5. Apart from short-term fluctuations, the productivity of the residual fleet, which increasingly includes containerships, has experienced a long-term positive trend since 1970, while oil tankers and dry bulk carriers had greater productivity in 1970

Figure 8

Ton-miles performed per deadweight ton (dwt) of total world fleet, 1984–2006



Source: UNCTAD calculations.

Table 24

Cargo carried and ton-miles performed per deadweight ton (dwt) of the total world fleet, selected years

Year	World fleet (million dwt)	Total cargo (million tons)	Total ton-miles performed (thousands of millions of ton-miles)	Tons carried per dwt	Thousands of ton-miles performed per dwt
1990	658	4 008	17 121	6.1	26.0
1995	735	4 651	20 262	6.3	27.6
2000	808	5 871	23 693	7.3	29.3
2004	896	6 846	27 574	7.6	30.8
2005	960	7 109	29 094	7.4	30.3
2006	1 042	7 416	30 686	7.1	29.4

Sources: World fleet: Lloyd's Register – Fairplay (dwt: mid-year data for 1990, year-end data for all other years shown); total cargo carried: UNCTAD secretariat; ton-miles: Fearnleys, *Review*, various issues. Data compiled by the UNCTAD secretariat.

Table 25

Estimated productivity of tankers, bulk carriers, combined carriers and the residual fleet,[a] selected years

(Tons carried per dwt)

Year	Tons of oil carried by tankers of over 50,000 dwt (millions)	Tons carried per dwt of tankers	Tons of dry cargo carried by bulk carriers of over 18,000 dwt (millions)	Tons carried per dwt of bulk carriers	Tons of oil and dry bulk cargo carried by combined carriers of over 18,000 dwt (millions)	Tons carried per dwt of combined carriers	Tons carried by the residual fleet (millions)	Tons carried per dwt of the residual fleet
1970	1 182	8.6	403	8.4	97	6.8	800	6.3
1980	1 564	4.8	396	2.9	282	5.8	1 406	8.3
1990	1 427	6.0	667	3.3	203	6.3	1 680	9.1
2000	2 073	7.3	1 255	4.6	122	7.9	2 533	10.5
2004	2 204	6.6	1 588	5.1	78	8.0	2 690	11.3
2005	2 279	6.4	1 717	5.1	71	9.1	2 666	10.3
2006	2 331	6.1	1 834	5.1	61	10.9	2 818	9.7

Sources: Compiled by the UNCTAD secretariat on the basis of data from Fearnleys, *Review*, various issues; *World Bulk Trades* and *World Bulk Fleet*, various issues; and other specialized sources.

[a] The residual fleet refers to general cargo, container and other vessels included in table 8.

Table 26

Estimated productivity of tankers, bulk carriers, combined carriers and the residual fleet,[a] selected years

(Thousands of ton-miles performed per dwt)

Year	Ton-miles of oil by tankers (thousands of millions)	Ton-miles per dwt of tankers	Ton-miles of dry bulk cargo by dry bulk carriers (thousands of millions)	Ton-miles per dwt of bulk carriers	Ton-miles of oil and dry bulk cargo by combined carriers (thousands of millions)	Ton-miles per dwt of combined carriers	Ton-miles of the residual fleet (thousands of millions)	Ton-miles per dwt of the residual fleet
1970	6 039	43.8	1 891	39.4	745	52.5	1 979	15.7
1980	9 007	27.6	2 009	14.5	1 569	32.4	4 192	24.8
1990	7 376	30.8	3 804	18.8	1 164	36.0	4 777	26.0
2000	9 840	34.5	6 470	23.9	593	38.5	6 837	28.3
2004	11 100	33.0	8 139	26.2	418	43.1	8 335	34.9
2005	11 749	33.2	8 615	25.5	320	41.0	8 730	33.6
2006	12 151	31.7	9 341	25.4	n.a.	n.a.	9 195	31.5

Sources: Compiled by the UNCTAD secretariat on the basis of data from Fearnleys, *Review*, various issues; *World Bulk Trades* and *World Bulk Fleet*, various issues; and other specialized sources.

[a] The residual fleet refers to general cargo, container and other vessels included in table 8.

than today; compared with the situation in 1980, however, oil tankers and dry bulk carriers have also seen their productivity increase.

B. SUPPLY AND DEMAND IN WORLD SHIPPING

A summary of the balance of tonnage supply and demand for selected years appears in table 27. The surplus tonnage of oil tankers, dry bulk carriers and general cargo ships in 2006 stood at 10.1 million dwt, slightly above that of the previous year. The share of surplus tonnage as a percentage of the total world merchant fleet stood at a low of 0.7 per cent in 2005 and increased to 1.0 per cent in 2006. Tonnage supply in the oil tanker sector in 2006 reached 367.4 million dwt as newbuildings delivered outweighed tonnage scrapped, laid up or lost (see table 28 and figure 9). Overcapacity increased to 6.1 million dwt, or 1.7 per cent of the total world tanker fleet. In 2006, the total dry bulk fleet supply increased by 21.8 million dwt to 361.8 million dwt. Overtonnage for this type of vessel reached 3.4 million dwt, equivalent to 0.9 per cent of the dry bulk fleet. For the conventional general cargo fleet, overcapacity stood marginally below the level of the previous year, with supply exceeding demand by only 0.64 million dwt, or 1.4 per cent of the world fleet of this sector. The surplus tonnage of general cargo vessels has been under 1 million dwt for the last few years.

As regards the growth of supply and demand in container shipping, table 29 provides a comparison of the annual change in containerized trade (TEU) and the year-on-year growth of the container carrying capacity of the world fleet (TEU). In 2006, for the first time since 2001, the growth of the fleet again outstripped the growth of containerized trade. With an increase in the fleet of almost 1.4 million TEU, capacity grew by 13.5 per cent in 2006; this was 2.5 percentage points higher than the growth of containerized trade, which reached 11 per cent in the same year. For 2007, it is estimated that the world container carrying capacity has grown at an annual rate of 13.4 per cent, which is 2.4 per cent higher than the estimated growth in demand. The order book of containerships in September 2007 stood at 6.2 million TEUs, representing 60 per cent of the existing fleet.

Table 27

Tonnage oversupply in the world merchant fleet, selected years

(End-of-year figures)

	1990	2000	2002	2003	2004	2005	2006
				Million dwt			
World merchant fleet	658.4	808.4	844.2	857.0	895.8	960.0	1 042.3
Surplus tonnage [a]	63.7	18.4	21.7	10.3	6.2	7.2	10.1
Active fleet [b]	594.7	790.0	822.5	846.7	889.6	952.8	1 032.2
				Percentages			
Surplus tonnage as percentage of world merchant fleet	9.7	2.3	2.6	1.2	0.7	0.7	1.0

Sources: Compiled by the UNCTAD secretariat on the basis of data supplied by Lloyd's Register – Fairplay and *Lloyd's Shipping Economist*, various issues.

[a] Average annual estimates of tankers, dry bulk carriers and general cargo ships. Surplus tonnage is defined as tonnage that is not fully utilized because of slow steaming or lay-up status, or because it is lying idle for other reasons.

[b] UNCTAD secretariat estimate. World fleet minus surplus tonnage of tankers, dry bulk carriers and general cargo ships.

Table 28

Analysis of tonnage surplus by main type of vessel, selected years[a]

(Average annual figures in millions of dwt)

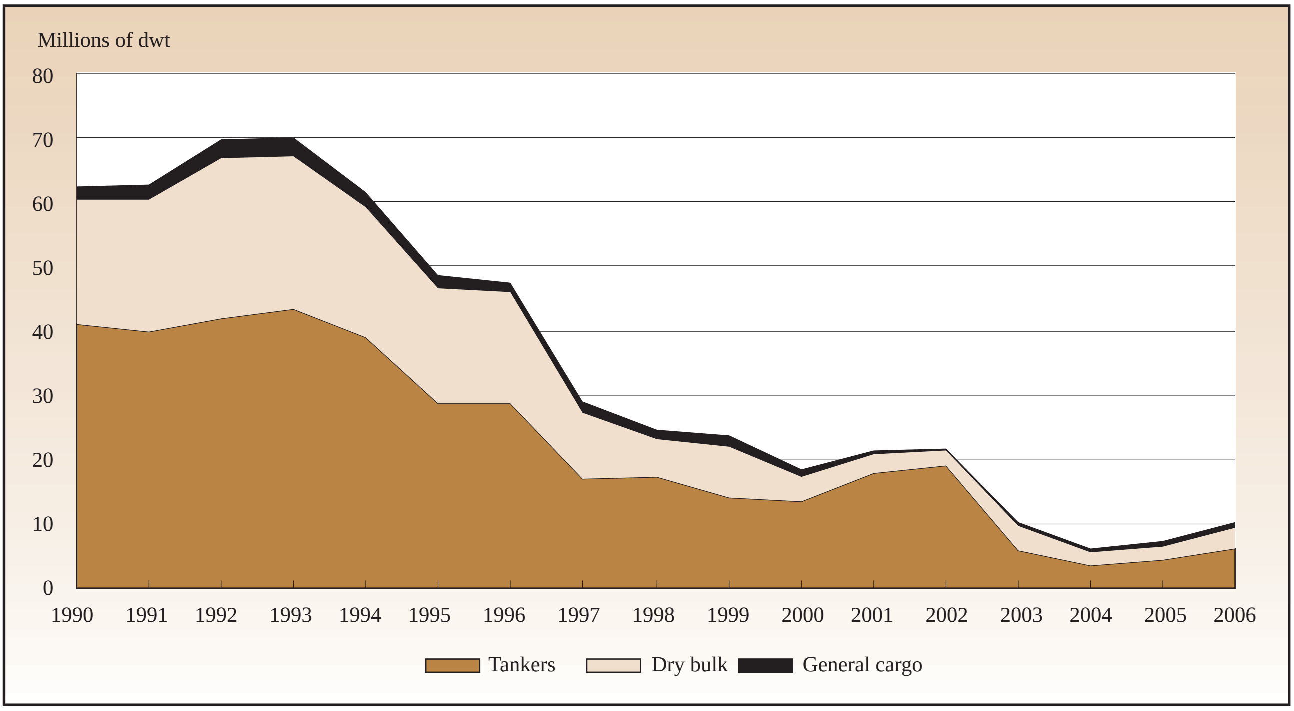
	1990	2000	2003	2004	2005	2006
World tanker fleet	266.2	279.4	286.0	298.3	312.9	367.4
Total tanker fleet surplus	40.9	13.5	6.0	3.4	4.5	6.1
Share of surplus fleet in world tanker fleet (%)	15.4	4.8	2.1	1.1	1.4	1.7
World dry bulk fleet	228.7	247.7	297.5	325.1	340.0	361.8
Dry bulk fleet surplus	19.4	3.8	3.6	2.1	2.0	3.4
Share of surplus fleet in world dry bulk fleet (%)	8.2	1.5	1.2	0.6	0.6	0.9
World conventional general cargo fleet	63.6	59.3	43.4	43.6	45.0	44.7
Conventional general cargo fleet surplus	2.1	1.1	0.7	0.7	0.7	0.6
Share of surplus fleet in world conventional general cargo fleet (%)	3.3	1.8	1.6	1.6	1.6	1.4

Source: Compiled by the UNCTAD secretariat on the basis of data from *Lloyd's Shipping Economist*, various issues.

[a] Aggregates for all sectors shown in this table are averages for the years indicated. This table excludes tankers and dry bulk carriers of less than 10,000 dwt and conventional general cargo/unitized vessels of less than 5,000 dwt.

Figure 9

Trends in surplus capacity by main vessel types, selected years



Source: Compiled by the UNCTAD secretariat on the basis of data from *Lloyd's Shipping Economist*, various issues.

Table 29

Growth of supply and demand in container shipping, 2000–2007[a]

(Annual growth rates)

	2000	2001	2002	2003	2004	2005	2006	2007
Growth in containerized trade (TEU)	11.0	2.0	11.0	11.0	13.0	11.0	11.0	11.0
Growth in container carrying fleet (TEU)	7.8	7.8	8.5	8.0	8.0	10.5	13.5	13.4
Balance	3.2	-5.8	2.5	3.0	5.0	0.5	-2.5	-2.4

Source: Compiled by the UNCTAD secretariat on the basis of data from *Clarkson Container Intelligence Monthly*, various issues.

[a] Container carrying fleet: end-of-year figures. 2007 data: estimate.

C. COMPARISON OF CARGO TURNOVER AND FLEET OWNERSHIP

Information on the trade, fleet ownership and nationally flagged fleets of the major trading nations appears in table 30. The table highlights the similarities and differences among the shipping services of the leading trading nations. In 2006 the United States generated 12.2 per cent of world trade while owning 4.9 per cent of world tonnage. Germany, China and Japan are among the top four trading nations, accounting for 8.5, 7.3 and 5.1 per cent of world trade respectively; all three countries also have important shares in the controlled fleet, while only a minor proportion of the controlled fleet flies the national flag. The United Kingdom and France account for 4.3 and 4.2 per cent of world trade respectively; the United Kingdom has a 2.7 per cent share in the nationally controlled fleet, while France, with a similar share in world trade, has a much smaller share in the controlled fleet (0.6 per cent).

Together with China, Hong Kong (China), the Republic of Korea and Singapore are among the Asian developing economies with the highest share in world trade, accounting for 2.7, 2.6 and 2.1 per cent respectively. The Republic of Korea controls 3.3 per cent of the fleet as regards ownership. The only Latin American country among the major trading nations is Mexico, with a 2.1 per cent share of world trade, but only a very minor interest in vessel owning.

As regards country groups, at the beginning of 2007, developing countries controlled approximately 31.2 per cent of the world dwt while generating 61.1 per cent of world exports (tonnes). Developed countries controlled about 65.9 per cent of the world dwt while generating 36.2 per cent of global exports. Economies in transition controlled the remaining 2.9 per cent of dwt while generating 2.7 per cent of global exports.

Table 30

Maritime engagement of 25 major trading nations

(As at the beginning of 2007)

Country/territory	Percentage share of world trade generated, in terms of value	Percentage share of world fleet (control) in terms of dwt
United States	12.19	4.93
Germany	8.47	8.69
China	7.29	7.19
Japan	5.06	15.07
United Kingdom	4.34	2.73
France	4.23	0.61
Netherlands	3.63	0.89
Italy	3.50	1.63
Canada	3.15	0.61
Belgium	2.99	1.28
Hong Kong (China)	2.72	4.60
Republic of Korea	2.63	3.30
Spain	2.15	0.45
Singapore	2.10	2.63
Mexico	2.09	0.14
Russian Federation	1.82	1.85
Taiwan Province of China	1.77	2.54
Malaysia	1.21	0.68
India	1.20	1.51
Austria	1.16	1.28
Switzerland	1.13	1.28
Sweden	1.13	0.66
Saudi Arabia	1.11	1.21
United Arab Emirates	1.09	0.71
Australia	1.06	0.29
Total	79.24	66.78

Source: Compiled by the UNCTAD secretariat on the basis of data supplied by *UNCTAD Handbook of Statistics* (trade) and Lloyds Register – Fairplay (fleet ownership).