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. 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.

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 6 and table 24. Tons of cargo carried per deadweight ton (dwt) in 2005 decreased slightly to 7.4, while thousands of ton-miles performed per deadweight ton decreased to 30.3. 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 decrease in productivity, measured in ton-miles per dwt, also resulted from fleet expansion, which outweighed growth in seaborne trade and distance travelled.

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 stood at 6.7, while that for dry bulk and combined carriers decreased marginally from 5.1 to 5.0 and from 8.8 to 8.4 tons per dwt respectively. The cargo volumes carried per dwt of the residual fleet also decreased from 12.3 to 11.5 tons per dwt.

Indicative data on ton-miles performed by oil tankers, dry bulk carriers, combined carriers and the residual fleet are provided in table 26. The thousands of ton-miles per dwt of oil tankers stood at 32.4 in 2005, while the corresponding figures for dry bulk and combined carrier decreased from 25.7 to 25.2 and from 43.1 to 41.1 respectively. The productivity of the residual fleet measured in ton-miles per dwt also decreased from 34.9 to 33.6.

B. SUPPLY AND DEMAND IN WORLD SHIPPING

1. Surplus tonnage

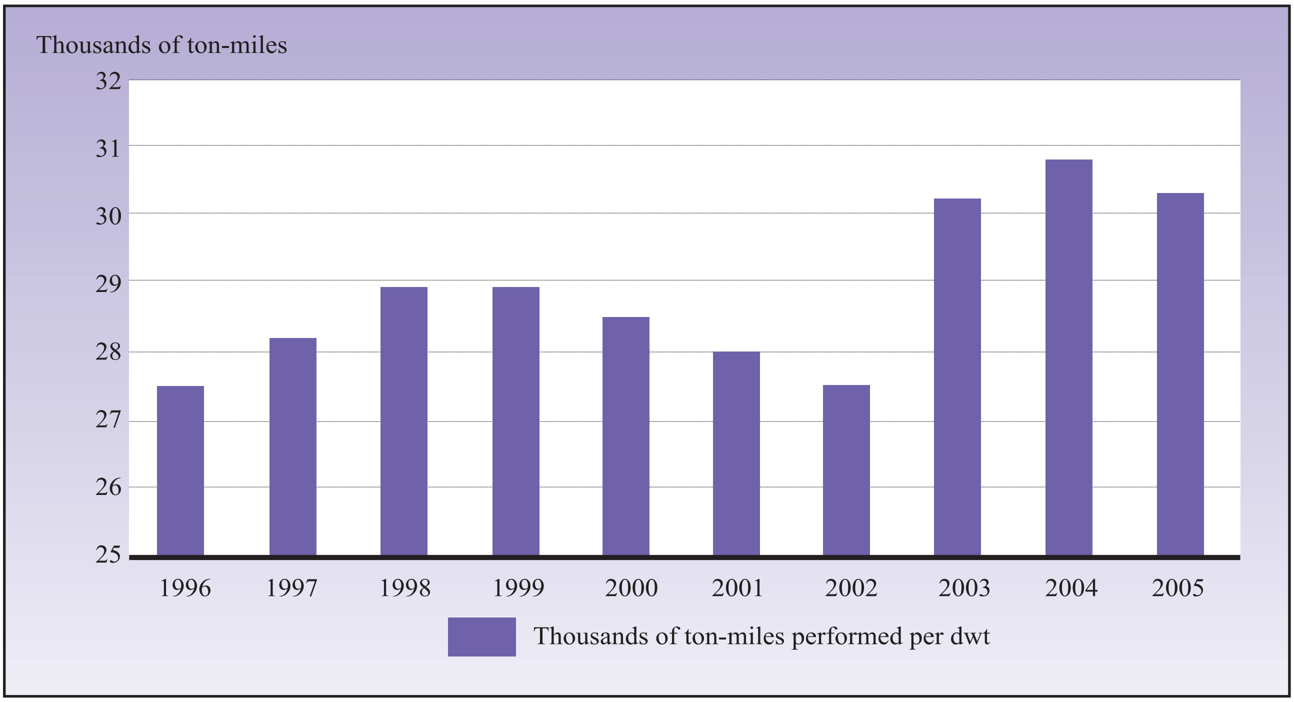
A summary of the balance of tonnage supply and demand for selected years appears in table 27. The total surplus tonnage in 2005 was slightly above that of the previous year — 7.2 million dwt. This was largely due to the high level of vessel commissioning over the last year. The share of surplus tonnage as a percentage of the total world merchant fleet stood at a low of 0.7 per cent.

2. The supply and demand mechanism by type of vessel

Tonnage supply in the oil tanker sector increased in 2005 by 14.6 million dwt to 312.9 million dwt as newbuildings delivered outweighed tonnage scrapped, laid up or lost (see table 28 and figure 7). Overcapacity increased marginally to 4.5 million dwt or 1.4 per cent of the total

Figure 6

Ton-miles performed per deadweight ton (dwt) of total world fleet, 1996–2005



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	20 188	6.3	27.5
2000	808	5 871	23 016	7.3	28.5
2004	896	6 846	27 635	7.6	30.8
2005	960	7 109	29 045	7.4	30.3

Sources: World fleet: Lloyd's Register – Fairplay (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[a] and the residual fleet,[b] 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	2 248	6.7	1 571	5.1	85	8.8	2 941	12.3
2005	2 373	6.7	1 684	5.0	65	8.4	2 986	11.5

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] Tankers, bulk carriers and combined carriers (ore/bulk/oil) indicated in table 6.

[b] The residual fleet refers to general cargo, container and other vessels included in table 6.

Table 26

Estimated productivity of tankers, bulk carriers, combined carriers[a] and the residual fleet,[b] 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	10 898	32.4	7 984	25.7	418	43.1	8 349	34.9
2005	11 471	32.4	8 524	25.2	320	41.1	8 730	33.6

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] Tankers, bulk carriers and combined carriers (ore/bulk oil) indicated in table 6.

[b] The residual fleet refers to general cargo, container and other vessels included in table 6.

Table 27

Tonnage oversupply in the world merchant fleet, selected years
(End-of-year figures)

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

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. 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] World fleet minus surplus tonnage.

Table 28

Analysis of tonnage surplus by main type of vessel, selected years[a]
(Average annual figures in millions of dwt)

	1990	2000	2002	2003	2004	2005 [b]
World tanker fleet	266.2	279.4	267.7	286.0	298.3	312.9
Total tanker fleet surplus [c]	40.9	13.5	19.1	6.0	3.4	4.5
Share of surplus fleet in world tanker fleet (%)	15.4	4.8	7.1	2.1	1.1	1.4
World dry bulk fleet	228.7	247.7	258.8	297.5	325.1	340.0
Dry bulk fleet surplus [d]	19.4	3.8	2.2	3.6	2.1	2.0
Share of surplus fleet in world dry bulk fleet (%)	8.2	1.5	0.9	1.2	0.6	0.6
World conventional general cargo fleet	63.6	59.3	57.3	43.4	43.6	45.0
Conventional general cargo fleet surplus	2.1	1.1	0.4	0.7	0.7	0.7
Share of surplus fleet in world conventional general cargo fleet (%)	3.3	1.8	0.7	1.6	1.6	1.6
World unitized fleet	37.5	83.6	98.6	120.9	131.0	136.9
World unitized fleet surplus	0.5	0.0	0.0	0.0	0.0	0.0
Share of surplus fleet in world unitized fleet (%)	1.3	0.0	0.0	0.0	0.0	0.0

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 and therefore differ from the world figures in table 27. 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.

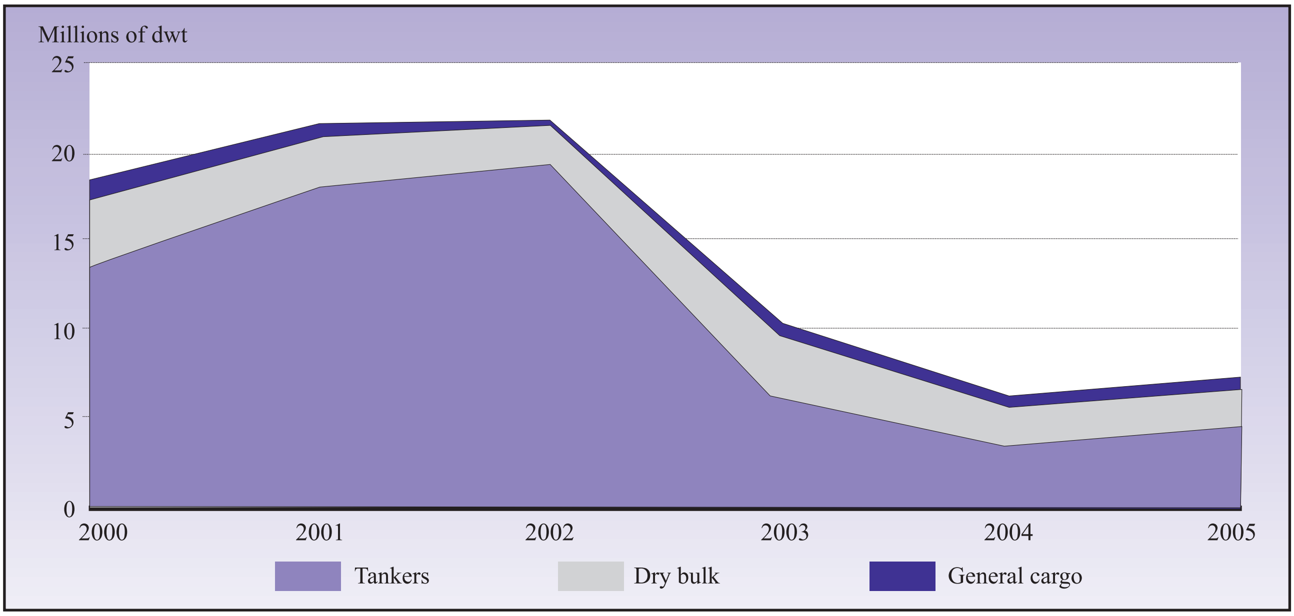
[b] Data for 2005 correspond to figures up to October 2005 as compiled in December 2005.

[c] Including 50 per cent of combined ore/bulk/oil carriers.

[d] Unitized fleet here includes fully cellular container ships, partly cellular container ships, ro-ro ships and barge carriers.

Figure 7

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.

world tanker fleet. In 2005, the total dry bulk fleet supply increased by 14.9 million dwt to 340 million dwt. Overtonnage for this type of vessel reached 2.0 million dwt, equivalent to 0.6 per cent of the dry bulk fleet. For the conventional general cargo fleet, overcapacity stood at the same level as in the previous year, with supply exceeding demand by only 0.7 million dwt or 1.6 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.

C. COMPARISON OF CARGO TURNOVER AND FLEET OWNERSHIP

The correlation between cargo volume generated by different country groups and their fleet ownership is summarized in table 29. Developed market-economy countries generated 48.7 per cent of world seaborne trade in 2005, compared with 53.7 per cent in 1980. Over the same period, the tonnage share of the fleet of developed market-economy countries fell, from about 51.3 per cent in 1980 to about 26.9 per cent in 2005. However, in addition to tonnage under national flags, there is the tonnage of vessels owned by nationals of particular countries but registered under foreign flags, and the two together bring the share of developed market-economy countries to about 60 per cent of the world fleet. The share of developing countries in world cargo turnover has remained at about 40 per cent. Their tonnage owned and registered under national flags increased from 10 per cent of the world fleet in 1980 to 22.7 per cent at the beginning of 2005. Tonnage beneficially owned by developing countries has expanded to nearly one fifth of the total beneficially registered tonnage, with the total tonnage owned by developing countries thus rising to about 30 per cent of the world fleet. The share of world cargo turnover generated by the countries of Central and Eastern Europe remained at about 3 per cent in 2005, unchanged from the levels of previous years but significantly less than the 4.7 per cent of 1980. These countries' fleet position also declined from 5.5 per cent to less than 2 per cent in 2005. The socialist countries in Asia increased their share in world trade to 8.9 per cent in 2005, while they improved their share in world tonnage from 1.6 per cent in 1980 to 3.9 per cent in 2005. In addition, these countries have a small share of their fleet registered in the open registries and the two together bring the share of this group of countries to about 8 per cent of the world fleet.

Information on the fleet ownership of the major trading nations appears in table 30. The major trading nations

Table 29

Comparison between total cargo turnover and fleet ownership, by country group, in 1970, 1980, 1990, 2000 and 2004–2005

Country grouping	Year	Total of goods loaded and unloaded (million tons)	Percentage of world total	Merchant fleet (million dwt)	Percentage of world total
Developed market-economy countries	1970	2 812	54.8	282.2	86.5
	1980	3 965	53.7	350.1	51.3
	1990	4 529	55.7	219.0	33.3
	2000	6 391	52.1	203.2	25.1
	2004	6 731	49.1	241.7	27.0
	2005	6 890	48.7	258.4	26.9
Major open-registry countries	1970	a	a	70.3	21.6
	1980	a	a	212.6	31.1
	1990	a	a	224.6	34.1
	2000	a	a	384.7	47.6
	2004	a	a	404.0	45.1
	2005	a	a	431.9	45.0
Developing countries	1970	2 075	40.4	20.5	6.3
	1980	2 926	39.6	68.4	10.0
	1990	3 065	37.7	139.7	21.2
	2000	4 834	39.4	157.0	19.4
	2004	5 426	39.6	202.3	22.6
	2005	5 577	39.4	218.3	22.7
Countries of Central and Eastern Europe (including former USSR)	1970	264	4.8	21.7	6.7
	1980	346	4.7	37.8	5.5
	1990	236	2.9	44.3	6.7
	2000	377	3.1	16.3	2.0
	2004	428	3.1	14.5	1.6
	2005	439	3.1	14.4	1.5
Socialist countries of Asia	1970	44	0.9	1.2	0.4
	1980	146	2.0	10.9	1.6
	1990	168	2.1	22.1	3.4
	2000	654	5.3	26.1	3.2
	2004	1 127	8.2	33.5	3.7
	2005	1 254	8.9	37.0	3.9
World total [b]	1970	5 134	100.0	326.1	100.0
	1980	7 383	100.0	682.8	100.0
	1990	8 133	98.3	658.4	100.0
	2000	12 257	100.0	808.4	100.0
	2004	13 711	100.0	896.0	100.0
	2005	14 160	100.0	960.0	100.0

Source: As per annexes II and III(b).

[a] All goods loaded and unloaded are included in the volume of developing countries.

[b] Including unallocated tonnage indicated in annex III(b).

Table 30

Maritime engagement of 25 major trading nations
(As at the beginning of 2006)

Country/territory	Percentage share of world trade generated, in terms of value	Percentage share of world fleet in terms of dwt
United States	12.5	10.1
Germany	8.3	7.5
China	6.7	7.1
Japan	5.3	14.1
France	4.5	1.0
United Kingdom	4.2	3.9
Netherlands	3.6	1.2
Italy	3.5	1.7
Canada	3.2	0.7
Belgium	3.1	1.3
Hong Kong (China)	2.8	7.9
Republic of Korea	2.6	3.3
Spain	2.2	0.6
Mexico	2.1	0.1
Singapore	2.0	5.9
Taiwan Province of China	1.8	2.5
Russian Federation	1.8	1.9
Malaysia	1.2	1.2
Austria	1.2	0.0
Switzerland	1.2	1.2
Sweden	1.1	0.7
Australia	1.1	0.4
Thailand	1.1	0.5
India	1.0	1.5
Brazil	0.9	0.6
Total	78.9	76.9

Source: Compiled by the UNCTAD secretariat on the basis of data supplied by the World Trade Organization.

are also major owners of tonnage; this reflects the fact that maritime transport serves as a trade enabler and is taken into account when trade promotion policies are being devised. Maritime capabilities and ownership of substantial tonnage, in particular, are instrumental in the growth of national trade. The table also highlights the similarities and differences among the shipping services of the leading trading nations. Major trading countries such as Japan, China (including Hong Kong), the Republic of Korea and Singapore are outstanding among the nations with maritime services for cross trades. Other major trading nations are major importers or users of shipping services while maintaining a relevant ownership position and, to a lesser extent, a national flag position. The United States, Germany, France and the United Kingdom fall into this group. In 2005 the United States generated 12.5 per cent of world trade while owning 10.1 per cent of world tonnage, with only about one fourth of such tonnage flying the national flag. Similarly, France generated over 4 per cent per cent of world trade as compared with a tonnage ownership position of 1 per cent, with the national flag having a share of one half of this percentage.