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CHAPTER 3.

Productivity of the World Fleet and Supply and Demand in World Shipping

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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 dwt, and the analysis of tonnage oversupply in the main shipping market sectors.

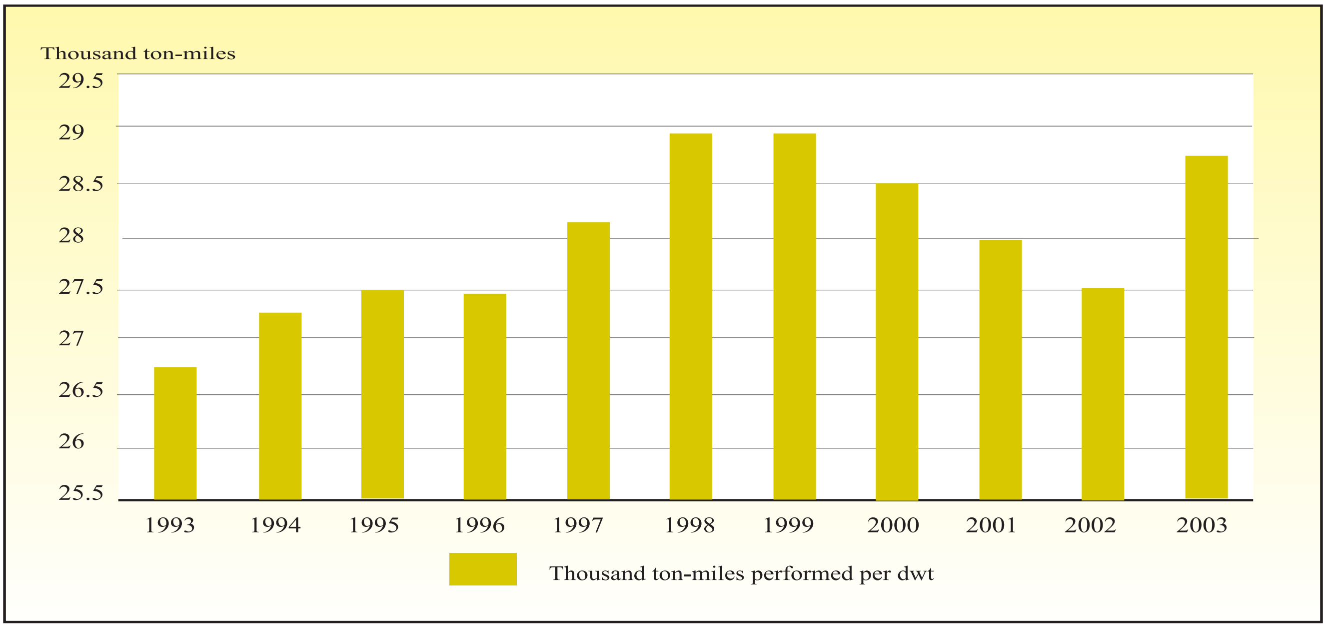
A. OPERATIONAL PRODUCTIVITY

The main indicators of operational productivity for the world fleet in tons and ton-miles per dwt are shown in figure 6 and table 24. Tons of cargo carried per deadweight ton (dwt) in 2003 increased slightly to 7.2, and thousands of ton-miles performed per deadweight ton also increased to 28.7. The increase in productivity measured in tons of cargo carried per deadweight ton (dwt) reflects the faster rate of increase in cargo carried relative to fleet expansion. The increase in productivity measured in ton-miles per deadweight ton results from the enlarged carriage distance of seaborne trade, notably crude oil, and extended sea routes going around western Europe owing to environmental concerns.

Table 25 provides supplementary data on operational productivity in terms of cargo carried per deadweight ton by type of vessel. Productivity in terms of tons carried per deadweight ton for oil tankers was steady at 6.7, while that corresponding to dry bulk and combined carriers increased to 4.9 and 8.6 tons per dwt respectively. The cargo volumes carried per deadweight ton of the residual fleet also increased — to 10.7 tons per dwt.

Figure 6

Ton-miles performed per deadweight ton of total world fleet, 1993–2003



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	4 008	17 121	6.1	26.0
1995	734.9	4 651	20 188	6.3	27.5
2000	808.4	5 871	23 016	7.3	28.5
2002	844.2	5 888	23 251	7.0	27.5
2003	857.0	6 168	24 589	7.2	28.7

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: Fearnley's, *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[a] (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	2 077	7.3	1 255	4.6	122	7.9	2 415	10.0
2002	2 059	6.8	1 333	4.6	100	7.9	2 395	10.0
2003	2 119	6.7	1 455	4.9	104	8.6	2 490	10.7

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

[a] Tankers, bulk carriers and combined carriers indicated in table 6.

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

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 deadweight ton of oil tankers increased in 2003 by 1.6 per cent to 31.8, while the ton-miles per deadweight ton of dry bulk carriers and combined carriers increased by 5.1 and 10.7 per cent to reach 24.8 and 41.4 respectively. The residual fleet increased its productivity by 7.1 per cent to 28.8 ton-miles per dwt.

B. SUPPLY AND DEMAND IN WORLD SHIPPING

1. Surplus tonnage

A summary of the balance of tonnage supply and demand for 1990 and the period 1999–2003 is provided in table 27. The total surplus tonnage in 2003 was about half that of the previous year — 10.3 million dwt. This was largely attributable to the high level of vessel scrapping over the last few years and increased employment of ships.

2. The supply and demand mechanism by type of vessel

Tonnage supply in the oil tanker sector increased in 2003 by 18.3 million dwt to 286.0 million dwt as newbuildings delivered outweighed the tonnage scrapped, laid up or lost (see table 28 and figure 7). This, combined with increased shipments and extended haulage, brought down overcapacity to 6.0 million dwt or 2.1 per cent of the total world tanker fleet. In 2003, the total dry bulk fleet supply increased by 38.7 million dwt to 297.5 million dwt. Overtonnage for this type of vessel reached 3.6 million dwt, equivalent to 1.2 per cent of the dry bulk fleet. For the conventional general cargo fleet, overcapacity marginally increased in 2003, 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 1.0 million dwt for the last three years.

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	6 159	25.5
2002	9 572	31.4	6 766	23.5	473	37.5	6 452	26.9
2003	10 087	31.8	7 326	24.8	501	41.4	6 687	28.8

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

[a] Tankers, bulk carriers and combined carriers 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, 1990 and 1999–2003
(end-of-year figures)

	1990	1999	2000	2001	2002	2003
			Million dwt			
World merchant fleet	658.4	799.0	808.4	825.6	844.2	857.0
Surplus tonnage [a]	63.7	23.7	18.4	21.5	21.7	10.3
Active fleet [b]	594.7	775.3	790.0	804.1	822.5	846.7
			Percentages			
Surplus tonnage as percentage of world merchant fleet	9.7	3.0	2.3	2.6	2.6	1.2

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] Estimates of average year figures. 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, 1997–2003 [a]
(average annual figures in millions of dwt)

	1997	1998	1999	2000	2001	2002	2003 [b]
World tanker fleet	290.6	291.0	281.8	279.4	280.2	267.7	286.0
Total tanker fleet surplus [c]	17.0	17.3	14.0	13.5	17.9	19.1	6.0
Share of surplus fleet in world tanker fleet (%)	5.8	5.9	5.0	4.8	6.4	7.1	2.1
World dry bulk fleet	260.9	257.1	245.7	247.7	255.3	258.8	297.5
Dry bulk fleet surplus [c]	10.3	5.8	7.9	3.8	2.9	2.2	3.6
Share of surplus in world dry bulk fleet (%)	3.9	2.3	3.2	1.5	1.1	0.9	1.2
World conventional general cargo fleet	62.0	60.5	59.9	59.3	57.8	57.3	43.4
Conventional general cargo fleet surplus	1.7	1.6	1.8	1.1	0.7	0.4	0.7
Share of surplus in world conventional general cargo fleet (%)	2.7	2.6	3.0	1.8	1.2	0.7	1.6
World unitized fleet [d]	65.7	73.1	76.1	83.6	91.2	98.6	-
Surplus of unitized fleet	0.0	0.0	0.0	0.0	0.0	0.0	-
Share of surplus in world unitized fleet (%)	0.0	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.

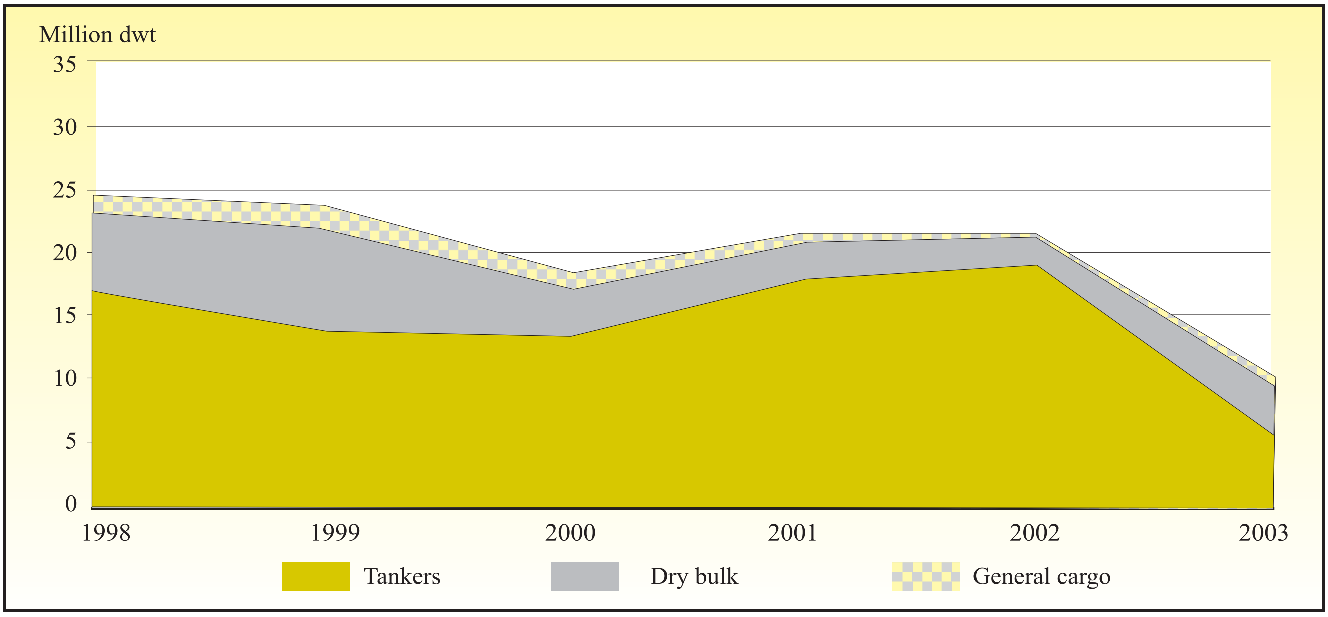
[b] Data for 2003 correspond to figures up to October 2003 as compiled in December 2003.

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

[d] Unitized fleet includes here 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.

C. COMPARISON OF CARGO TURN-OVER 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 51.1 per cent of world seaborne trade in 2003, 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 per cent in 1980 to about 27 per cent in 2003. However, in addition to tonnage under national flags, there is also the tonnage of vessels owned by nationals of a particular country but registered under foreign flags, and the two together bring the share of developed market-economy countries to 65 per cent. 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 about 21 per cent at the beginning of 2004. Tonnage beneficially owned by developing countries has expanded to nearly one third of the total beneficially registered tonnage, bringing the total tonnage owned by developing countries to about 36 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 2003, unchanged from the levels of previous years, but significantly less than the 4.7 per cent level of 1980. These countries' fleet position also declined from 5.5 per cent to less than 2 per cent in 2003. The socialist countries in Asia increased their share in world trade to almost 7 per cent in 2003, while they improved their share in world tonnage from 1.6 per cent in 1980 to 3.5 per cent in 2003. In addition, these countries have a small share of their fleet registered in the open registries.

Information on the fleet ownership of the major trading nations is provided in table 30. It will be noted that the major trading nations are also major owners of tonnage, which reflects an aspect of trade-supporting policies involving exploiting maritime transport as a complement to trade. It is generally considered that maritime capabilities, specifically the ownership of substantial tonnage, are essential for a country's trade support and promotion. The table also highlights the similarities and differences in the shipping services of the leading trading nations. Major trading countries such as Japan, China (including Hong Kong), the Republic of Korea, Denmark and Sweden 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 and France come into this group. In 2003 the United States generated about 13.0 per cent of world trade while it owned 5.9 per cent of world tonnage, with only about one fourth of such tonnage flying the national flag. Similarly, France generated 5.0 per cent of world trade as compared with a tonnage ownership position of 0.6 per cent, with the national flag having a share of one half of this percentage.

Table 29

Comparison between total cargo turnover and fleet ownership, by country groups, in 1970, 1980, 1990 and 2000–2003

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	2 812.1	54.8	282.2	86.5
	1980	3 965.0	53.7	350.1	51.3
	1990	4 529.0	55.7	219.0	33.3
	2000	6 285.1	51.9	203.2	25.1
	2001	6 186.8	51.3	207.5	25.1
	2002	6 210.8	50.8	217.1	25.7
	2003	6 455.3	51.1	230.4	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
	2001	[a]	[a]	402.4	48.7
	2002	[a]	[a]	398.5	47.2
	2003	[a]	[a]	399.5	46.6
Developing countries	1970	2 074.9	40.4	20.5	6.3
	1980	2 926.0	39.6	68.4	10.0
	1990	3 065.0	37.7	139.7	21.2
	2000	4 804.0	39.6	157.0	19.4
	2001	4 806.9	39.9	159.0	19.3
	2002	4 840.8	39.6	171.3	20.3
	2003	4 891.7	38.7	181.4	21.2
Countries of Central and Eastern Europe (including former USSR)	1970	202.8	4.0	20.5	6.3
	1980	346.0	4.7	37.8	5.5
	1990	235.9	2.9	44.3	6.7
	2000	377.5	3.1	16.3	2.0
	2001	372.7	3.1	15.4	1.9
	2002	387.1	3.2	15.9	1.9
	2003	417.3	3.3	15.7	1.8

Table 29 (continued)

Country grouping	Year	Total of goods loaded and unloaded (million tons)	Percentage of world total	Merchant fleet (million dwt)	Percentage of world total
Socialist countries of Asia	1970	43.6	0.9	1.2	0.4
	1980	146.0	2.0	10.9	1.6
	1990	167.7	2.1	22.1	3.4
	2000	654.4	5.4	26.1	3.2
	2001	691.8	5.7	26.5	3.2
	2002	785.8	6.4	28.3	3.4
	2003	863.5	6.8	29.9	3.5
World total [b]	1970	5 134.4	100.0	326.1	100.0
	1980	7 383.0	100.0	682.8	100.0
	1990	8 133.3	98.3	658.4	100.0
	2000	12 121.0	100.0	808.4	100.0
	2001	12 058.2	100.0	825.6	100.0
	2002	12 224.5	100.0	844.2	100.0
	2003	12 627.8	100.0	856.9	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 of the end of 2003)

Country/territory	Percentage share of world trade generated, in terms of value	Percentage share of world fleet in terms of dwt
United States	13.0	5.9
Germany	8.7	6.3
Japan	5.5	14.2
China	5.5	6.1
France	5.0	0.6
United Kingdom	4.4	2.5
Italy	3.7	1.6
Netherlands	3.6	0.9
Canada	3.3	0.8
Belgium	3.1	0.8
Hong Kong (China)	2.9	4.0
Republic of Korea	2.4	3.3
Spain	2.3	0.6
Mexico	2.2	0.0
Taiwan Province of China	1.8	3.0
Singapore	1.7	3.0
Russian Federation	1.3	2.2
Switzerland	1.3	1.1
Malaysia	1.2	1.3
Sweden	1.2	0.8
Austria	1.2	0.0
Thailand	1.0	0.3
Australia	1.0	0.4
Brazil	0.8	0.7
Denmark	0.8	2.1
Total	78.8	62.3

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