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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.

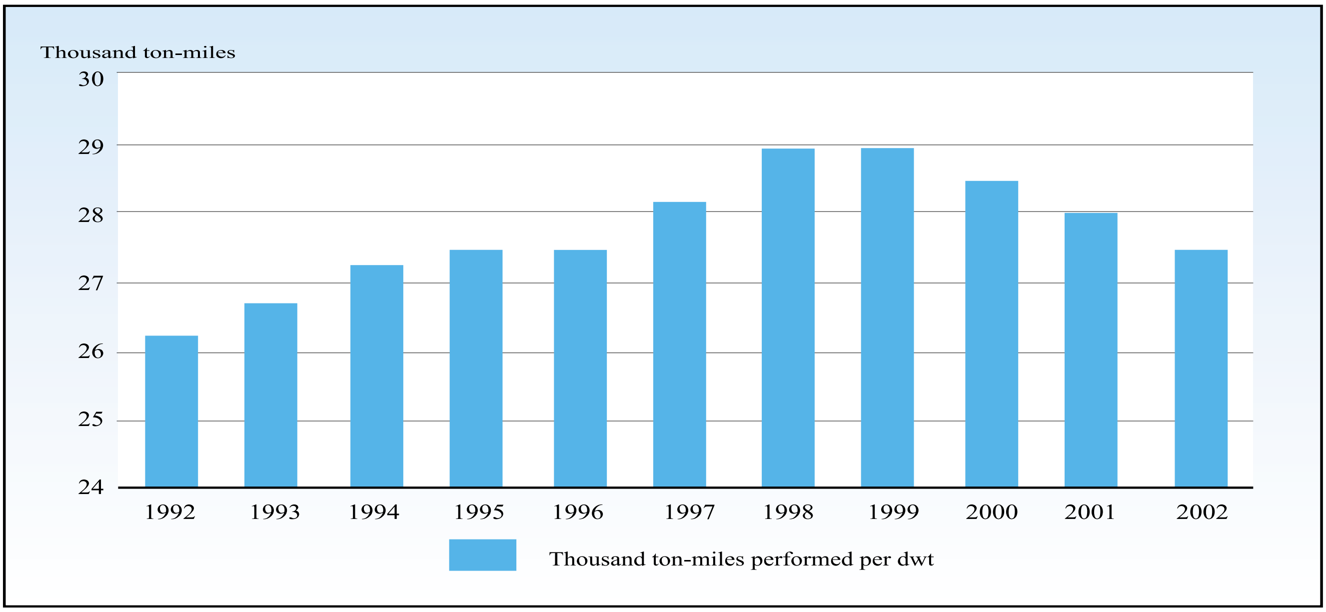
A. OPERATIONAL PRODUCTIVITY

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 2002 dropped slightly to 7.0, and thousands of ton-miles performed per deadweight ton also decreased to 27.5. The decrease in productivity measured in tons of cargo carried per deadweight ton (dwt) reflects the reduction of cargo carried relative to fleet expansion. The decrease in productivity measured in ton-miles per deadweight ton results from the slowdown of seaborne trade from the peak reached in 2000 and the expansion of the world fleet.

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, dry bulk and combined carriers dropped to 6.8, 4.6 and 7.9 tons per dwt respectively. The cargo volumes carried per deadweight ton of the residual fleet increased to 10.0 tons per dwt.

Figure 6

Index of ton-miles performed per deadweight ton of total world fleet, 1992–2002



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
2001	825.7	5 840	23 241	7.1	28.0
2002	844.2	5 888	23 251	7.0	27.5

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
2001	2 072	7.3	1 313	4.7	116	8.1	2 339	9.5
2002	2 059	6.8	1 333	4.6	100	7.9	2 395	10.0

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 ton-miles per deadweight ton of oil tankers decreased in 2002 by 7.6 per cent to 31.4, while the ton-miles per deadweight ton of dry bulk carriers and combined carriers decreased by 1.7 and 2.1 per cent to reach 23.5 and 37.5 respectively. The residual fleet increased its productivity by 5.9 per cent to 26.9 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 1998–2002 is provided in table 27. The total surplus tonnage in 2002 stood at about the same level as that of the previous year at 21.7 million dwt. This stability of the surplus was largely attributable to the increase in cargo volumes being equal to the influx of newbuildings into the world fleet.

2. The supply and demand mechanism by type of vessel

Tonnage supply in the oil tanker sector decreased in 2002 by 12.5 million dwt to 267.7 million dwt as newbuildings delivered were outweighed by tonnage scrapped, laid-up or lost (see table 28 and figure 7). This, combined with reduced shipments, increased overcapacity to 19.1 million dwt or 7.1 per cent of the total world tanker fleet. In 2002, the total dry bulk fleet supply increased by 3.5 million dwt to 258.8 million dwt. The steady increase in shipments of the main dry cargoes mentioned in chapter 1 helped to reduce overtonnage to only 2.2 million dwt, equivalent to 0.9 per cent of the dry bulk fleet. For the conventional general cargo fleet, overcapacity was reduced in 2002, with supply exceeding demand by only 0.4 million dwt or 0.7 per cent of the world fleet of this sector. The surplus tonnage of general cargo vessels has continued to follow a downward trend since the early 1990s. In the unitized fleet sector, 7.4 million dwt of container ships were added in 2002, an amount similar to that of the previous

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
2001	9 721	34.0	6 688	23.9	552	38.3	6 236	25.4
2002	9 572	31.4	6 766	23.5	473	37.5	6 452	26.9

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 1998–2002

(end-of-year figures)

	1990	1998	1999	2000	2001	2002
			Million dwt			
World merchant fleet	658.4	788.7	799.0	808.4	825.6	844.2
Surplus tonnage[a]	63.7	24.7	23.7	18.4	21.5	21.7
Active fleet[b]	594.7	764.0	775.3	790.0	804.1	822.5
			Percentages			
Surplus tonnage as percentage of world merchant fleet	9.7	3.1	3.0	2.3	2.6	2.6

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, 1996–2002[a]

(average annual figures in millions of dwt)

	1996	1997	1998	1999	2000	2001	2002[d]
World tanker fleet	285.1	290.6	291.0	281.8	279.4	280.2	267.7
Total tanker fleet surplus[b]	28.8	17.0	17.3	14.0	13.5	17.9	19.1
Share of surplus fleet in world tanker fleet (%)	10.1	5.8	5.9	5.0	4.8	6.4	7.1
World dry bulk fleet	257.2	260.9	257.1	245.7	247.7	255.3	258.8
Dry bulk fleet surplus[b]	17.2	10.3	5.8	7.9	3.8	2.9	2.2
Share of surplus in world dry bulk fleet (%)	6.7	3.9	2.3	3.2	1.5	1.1	0.9
World conventional general cargo fleet	62.7	62.0	60.5	59.9	59.3	57.8	57.3
Conventional general cargo fleet surplus	1.4	1.7	1.6	1.8	1.1	0.7	0.4
Share of surplus in world conventional general cargo fleet (%)	2.2	2.7	2.6	3.0	1.8	1.2	0.7
World unitized fleet[c]	59.3	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	0.0
Share of surplus in world unitized fleet (%)	0.0	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.

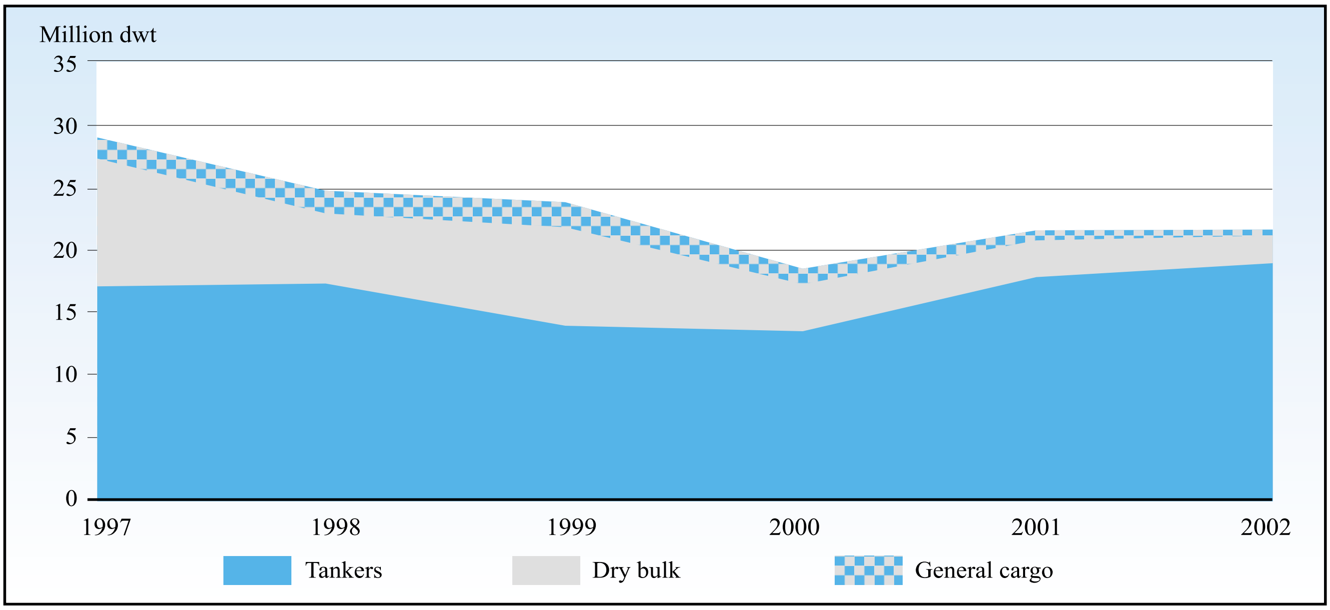
[b] Including 50 per cent of combined ore/bulk/oil carriers.

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

[d] Data for 2002 correspond to figures up to October 2002 as compiled in December 2002.

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.

year, with this fleet reaching 98.6 million dwt. As in previous years, expanding trade for liner shipping has been able to absorb these tonnages, resulting in full employment of the world unitized fleet. In the medium term, overcapacity may be possible, as large orders have been placed by carriers, notably the MSC order for 20 vessels with capacities between 5,000 and 8,000 TEU for delivery in 2005.

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 50.5 per cent of world seaborne trade in 2002, compared with 53.7 per cent in 1980. Over the same period, the tonnage share of the fleet of developed market-economy countries fell by half, from about 51 per cent in 1980 to about 26 per cent in 2002. 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 nearly 20 per cent at the beginning of 2003. 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 2002, 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 about 2 per cent in 2002. The socialist countries in Asia increased their share in world trade to 6 per cent in 2002, while they improved their share in world tonnage from 1.6 per cent in 1980 to 3.3 per cent in 2002. 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 may 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

Table 29

Comparison between total cargo turnover and fleet ownership, by country groups, in 1970, 1980, 1990 and 2000–2002

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	2 832.0	55.1	211.9	65.0
	1980	3 965.0	53.7	350.1	51.3
	1990	4 574.7	56.2	219.0	33.3
	2000	6 285.0	51.9	203.4	25.2
	2001	6 110.0	54.7	207.5	25.1
	2002	6 079.0	50.5	217.1	25.7
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	48.1
	2001	[a]	[a]	402.4	48.7
	2002	[a]	[a]	398.5	47.2
Developing countries	1970	2 056.0	40.0	20.5	6.3
	1980	2 926.0	39.6	68.4	10.0
	1990	3 095.0	38.0	139.7	21.2
	2000	4 796.0	39.5	157.0	19.4
	2001	4 787.0	42.8	159.0	19.3
	2002	4 836.0	40.2	171.3	20.3
Countries of Central and Eastern Europe (including former USSR)	1970	204.0	4.0	20.5	6.2
	1980	346.0	4.7	37.8	5.5
	1990	275.9	3.4	44.3	6.7
	2000	377.0	3.1	16.3	2.0
	2001	373.0	3.3	15.4	1.9
	2002	387.0	3.2	15.9	1.9
Socialist countries of Asia	1970	43.0	0.8	1.2	0.4
	1980	146.0	2.0	10.9	1.6
	1990	187.7	2.4	22.1	3.4
	2000	654.0	5.4	26.1	3.2
	2001	692.0	6.2	26.5	3.2
	2002	723.0	6.0	28.3	3.3
World total[b]	1970	5 135.0	100.0	326.1	100.0
	1980	7 383.0	100.0	682.8	100.0
	1990	8 133.3	100.0	658.4	100.0
	2000	12 113.0	100.0	808.4	100.0
	2001	11 161.0	100.0	825.6	100.0
	2002	12 025.0	100.0	844.2	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 2002)

Country/territory	Percentage share of world trade generated, in terms of value	Percentage share of world fleet in terms of dwt
United States	14.5	5.0
Germany	8.4	4.8
Japan	5.7	12.4
France	5.0	0.7
United Kingdom	4.7	2.1
China	4.7	5.3
Italy	3.8	1.5
Canada	3.7	0.7
Netherlands	3.5	0.9
Hong Kong (China)	3.1	4.5
Belgium-Luxembourg	3.1	1.1
Republic of Korea	2.4	3.1
Spain	2.1	0.5
Taiwan Province of China	1.9	2.6
Singapore	1.8	2.3
Russian Federation	1.3	1.9
Switzerland	1.3	0.8
Malaysia	1.3	0.8
Russian Federation	1.3	1.9
Thailand	1.0	0.3
Sweden	1.1	0.8
Australia	1.1	0.3
Brazil	0.8	0.8
Saudi Arabia	0.8	1.3
Denmark	0.8	2.0
Norway	0.7	6.9
Total	78.6	73.3

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

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, Sweden and Norway 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 2002 the United States generated about 14.5 per cent of world trade while it owned 5.0 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 to a tonnage ownership position of 0.7 per cent, with the national flag having a share of one-half of this percentage.