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Chapter III
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

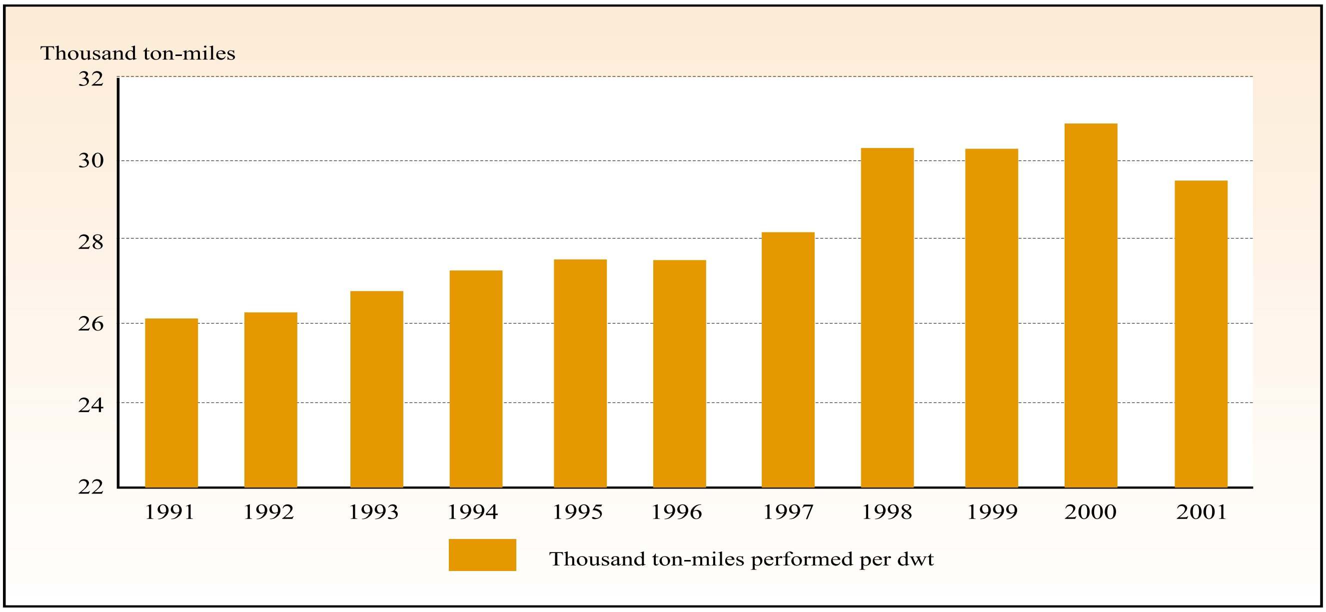
This chapter provides information on the operational productivity of the world fleet and an analysis of the balance between supply and demand for tonnage. Key indicators are the comparison of cargo generation and fleet ownership, tons of cargo carried and ton-miles performed per dwt, and the analysis 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 2001 maintained a level similar to that of 1999 at 7.06, while thousands of ton-miles performed per deadweight ton decreased to 29.48. The decrease in productivity measured in tons of cargo carried per deadweight ton (dwt) reflects the reduction of cargo carried relative to the 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.

Figure 6

Index of ton-miles performed per deadweight ton of total world fleet, 1991–2001



Source: UNCTAD calculations.

Table 24

Cargo carried and ton-miles performed per deadweight ton (dwt) of the total world fleet, 1990–2001

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
1991	683.5	4 120	17 873	6.0	26.1
1992	694.7	4 220	18 235	6.1	26.2
1993	710.6	4 330	18 854	6.1	26.5
1994	719.8	4 485	19 461	6.2	27.0
1995	734.9	4 651	20 188	6.3	27.5
1996	758.2	4 758	20 810	6.3	27.4
1997	775.9	4 953	21 825	6.4	28.1
1998	788.7	5 598	23 822	7.1	30.2
1999	799.0	5 668	24 114	7.1	30.2
2000	808.4	5 890	22 947	7.3	30.9
2001	825.7	5 832	24 338	7.1	29.5

Sources: World fleet: Lloyd's Register – Fairplay (mid-year data for 1990, year-end data for 1992–2000); total cargo carried: UNCTAD secretariat; ton-miles: Fearnley's, *Review*,various issues. Data compiled by the UNCTAD secretariat.

Table 25 provides supplementary data on operational productivity in terms of cargo carried per deadweight ton by type of vessel. The cargo volumes in tons carried per deadweight ton of oil tankers and dry bulk carriers were steady at 7.1 and 4.6 tons per dwt respectively. The cargo volumes carried per deadweight ton of combined carriers increased marginally to 7.9 tons per dwt, and those of the residual fleet decreased to 9.8 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 ton-miles per deadweight ton of oil tankers decreased in 2001 by 4.9 per cent to 32.8, while the ton-miles per deadweight ton of dry bulk carriers, combined carriers and the residual fleet decreased by 1.2, 3.9 and 4.5 per cent to reach 23.6, 37 and 31.9 respectively.

B. SUPPLY AND DEMAND IN WORLD SHIPPING

1. Surplus tonnage

A summary of the balance of tonnage supply and demand for the period 1995–2001 is provided in table 27. The total surplus tonnage in 2001 reversed the trend observed over the last few years and increased by 3.1 million dwt to reach 21.5 million dwt or 2.6 per cent of the world merchant fleet, up from 2.3 per cent in 2000. This balance was largely attributable to the slowdown in cargo volumes, the first after 15 years of steady growth, and 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 increased in 2001 by 0.8 million dwt to 280.2 million dwt as newbuildings delivered outweighed tonnage scrapped or lost (see table 28 and figure 7). This, combined with reduced shipments, increased overcapacity to 17.9 million dwt or 6.4 per cent of the total world tanker fleet. In 2001, the total dry bulk fleet supply increased by 7.6 million dwt to 255.3 million dwt. The steady increase in shipments of the main dry cargoes mentioned in chapter I helped to reduce overtonnage to only 2.9 million dwt, equivalent to 1.1 per cent of the dry bulk fleet. For the conventional general cargo fleet, overcapacity was reduced in 2001, with supply exceeding demand by only 0.7 million dwt or 1.2 per cent for 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, 7.6 million dwt of container ships were added in 2001, an amount similar to that of the previous year, with this fleet reaching 91.2 million dwt. As in previous years, expanding trade for liner shipping have been able to absorb these tonnages, resulting in full employment of the world unitized fleet.

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
1995	1 738	6.6	770	3.2	177	7.38	1993	9.5
1998	1 985	7.1	1 137	4.4	130	7.3	2 379	10.2
1999	1 995	7.1	1 167	4.5	131	7.8	2 375	9.9
2000	2 027	7.1	1 255	4.6	120	7.8	2 487	10.3
2001	2 032	7.1	1 285	4.6	114	7.9	2 402	9.8

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.

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
1995	8 980	34.4	4 500	18.7	925	38.5	5785	27.7
1998	9 465	33.9	5 988	23.2	535	30.2	7 834	33.5
1999	9 600	34.0	6 055	23.3	583	34.9	7 876	32.8
2000	9 840	34.5	6 470	23.9	593	38.5	8 044	33.4
2001	9 354	32.8	6 605	23.6	533	37.0	7 846	31.9

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 1997–2001

(end-of-year figures)

	1990	1997	1998	1999	2000	2001
			Million dwt			
World merchant fleet	658.4	775.9	788.7	799.0	808.4	825.6
Surplus tonnage[a]	63.7	29.0	24.7	23.7	18.4	21.5
Active fleet[b]	594.7	746.9	764.0	775.3	790.0	804.1
			Percentages			
Surplus tonnage as percentage of world merchant fleet	9.7	3.7	3.1	3.0	2.3	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, 1995–2001[a]

(average annual figures in millions of dwt)

	1995	1996	1997	1998	1999	2000	2001[d]
World tanker fleet	277.0	285.1	290.6	291.0	281.8	279.4	280.2
Total tanker fleet surplus[b]	28.8	28.8	17.0	17.3	14.0	13.5	17.9
Share of surplus fleet in world tanker fleet (%)	10.4	10.1	5.8	5.9	5.0	4.8	6.4
World dry bulk fleet	252.9	257.2	260.9	257.1	245.7	247.7	255.3
Dry bulk fleet surplus[b]	17.9	17.2	10.3	5.8	7.9	3.8	2.9
Share of surplus in world dry bulk fleet (%)	7.1	6.7	3.9	2.3	3.2	1.5	1.1
World conventional general cargo fleet	62.0	62.7	62.0	60.5	59.9	59.3	57.8
Conventional general cargo fleet surplus	2.0	1.4	1.7	1.6	1.8	1.1	0.7
Share of surplus in world conventional general cargo fleet (%)	3.2	2.2	2.7	2.6	3.0	1.8	1.2
World unitized fleet[c]	53.4	59.3	65.7	73.1	76.1	83.6	91.2
Surplus of unitized fleet	0.7	0.0	0.0	0.0	0.0	0.0	0.0
Share of surplus in world unitized fleet (%)	1.3	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.

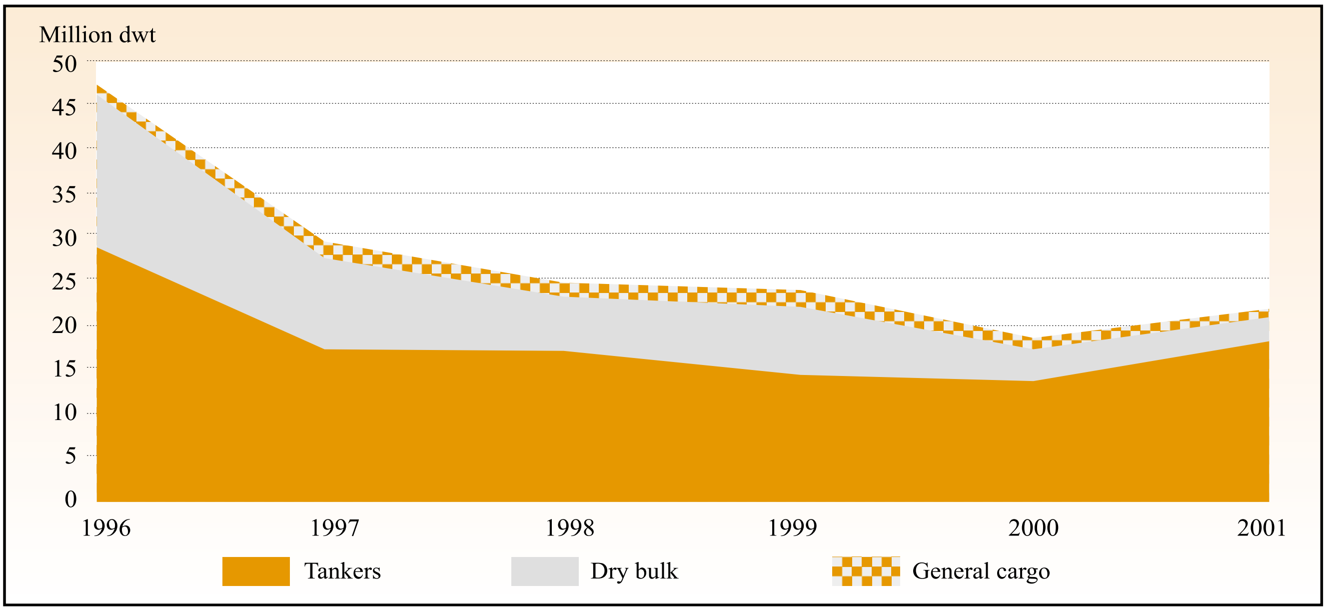
[b] Including 50 per cent of combined ore/bulk/oil carriers.

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

[d] Data for 2001 correspond to figures up to October 2001 as compiled in December 2001.

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 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 nearly 51.2 per cent of world seaborne trade in 2001, compared with 53.7 per cent in 1980. The tonnage share of the fleet of developed market-economy countries fell by half, from about 51 per cent in 1980 to 25 per cent in 2001. However, to the tonnage under national flags must be added the tonnage of vessels owned by nationals of a particular country, but registered under foreign flags, which brings the share to 66.9 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 2002. 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 2001, 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 2001. The socialist countries in Asia increased their share in world trade to 5.5 per cent in 2001, while they improved their share in world tonnage from 1.6 per cent in 1980 to 3.2 per cent in 2001. 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 for 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, 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 2001 the United States generated about 15.2 per cent of world trade while it owned 5.1 per cent of world tonnage, with only about one fourth of such tonnage flying the national flag. Similarly, France generated 5.1 per cent of world trade as compared to a tonnage ownership position of 0.8 per cent, and 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 1999–2001

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
	1999	6 042.9	52.6	203.2	25.4
	2000	6 240.9	51.8	203.4	25.2
	2001	6 109.7	51.2	207.5	25.1
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
	1999	[a]	[a]	376.8	47.8
	2000	[a]	[a]	384.7	48.1
	2001	[a]	[a]	402.4	48.7
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
	1999	4 626.6	40.2	153.6	19.2
	2000	4 821.9	40.0	157.0	19.4
	2001	4 826.4	40.4	159.0	19.3
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
	1999	328.0	2.9	18.3	2.3
	2000	346.7	2.9	16.3	2.0
	2001	351.9	2.9	15.4	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
	1999	500.3	4.4	25.8	3.2
	2000	643.3	5.3	26.1	3.2
	2001	650.9	5.5	26.5	3.2
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
	1999	11 498.8	100.0	799.0	100.0
	2000	12 052.8	100.0	808.4	100.0
	2001	11 938.9	100.0	825.6	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 2001)

Country/territory	Percentage share of world trade generated, in terms of value	Percentage share of world fleet in terms of dwt
United States	15.2	5.11
Germany	8.4	4.63
Japan	6.0	12.89
United Kingdom	4.8	2.32
France	5.1	0.76
Italy	3.8	1.78
Canada	3.9	0.51
Hong Kong (China)	3.1	4.40
Netherlands	3.5	0.91
Belgium-Luxembourg	2.8	1.18
China	4.0	5.08
Republic of Korea	2.3	3.11
Singapore	1.9	2.37
Spain	2.0	0.47
Taiwan Province of China	1.8	2.86
Malaysia	1.3	0.88
Sweden	1.1	0.97
Switzerland	1.3	0.82
Thailand	1.0	0.33
Australia	1.0	0.44
Brazil	0.9	0.98
Russian Federation	1.2	1.87
Saudi Arabia	0.8	1.23
Denmark	0.8	2.13
Norway	0.7	7.91
Total	78.8	65.94

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