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Chapter III

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

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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

Estimate of tons and ton-miles per dwt

54. The main operational productivity indicators for the world fleet developed favourably in 1997 (see table 24 and graph 7). Tons of cargo carried per dwt in 1997 stood at 6.38, which was a record high. Ton-miles performed per dwt rose in 1997 to 27,598, which was also a new high. These increases in operational productivity are primarily due to such factors as the modernization of vessels, increases in consignment sizes and improved port conditions. These positive developments in operational productivitiy enabled the shipping industry to accommodate increased demand (up by 4.1 per cent) despite relatively moderate increases in carrying capacity (up by 2.3 per cent). In 1998, world seaborne trade is expected to grow at a rate of 2.2 per cent and the world fleet is expected to expand at almost the same rate as in 1997 (2.3 per cent). On the basis of these preliminary estimates, 1998 overall world shipping activities are expected to maintain a level of operational productivity comparable with that in 1997.

55. Table 25 provides supplementary details about ton-miles performed by oil tankers, dry bulk carriers, combined carriers and the residual fleet. Ton-miles per dwt of oil tankers and the residual fleet continued to increase marginally in 1997 by 0.8 per cent and 2.5 per cent respectively as compared with 1996, while ton-miles per dwt of combined carriers increased by 5.0 per cent over the previous year. The total deadweight tonnage of combined carriers declined to 21.8 million dwt in 1997, down 2 per cent from the 1996 level, while their ton-mile performance increased by 3.1 per cent, mainly owing to the transfer of tonnage to the tanker trades. On the other hand, ton-miles per dwt of dry bulk carriers continued to decline marginally, falling by 0.6 per cent in 1997. This can be explained by the correlation between supply and demand: the total carrying capacity of the continuously increasing number of dry bulk carriers (up by 5.6 per cent as compared with 1996, based on a vessel of over 10,000 dwt) slightly exceeded the supply of main dry bulk commodities, particularly for vessels of 10,000 dwt (the supply of such commodities increased by 5.9 per cent as compared to 1996). As indicated in table 26, these trends are also borne out by the data on operational productivity in terms of cargo carried per dwt. There was an increase in tons carried per dwt by all types of vessel. The performance of dry bulk carriers ceased to decline in terms of tons carried per dwt in 1997; rather, it improved by 0.3 per cent as compared with 1996.

B. SUPPLY AND DEMAND IN WORLD SHIPPING

Surplus tonnage

56. A comprehensive summary of the balance of tonnage supply and demand for the 1990-1997 period is provided in table 27. The total surplus tonnage was only 29.0 million dwt (a new record low in terms of deadweight tons) or 3.7 per cent of the 1997 world merchant fleet. This result was largely due to carry-overs of the positive developments in supply and demand in the years since 1994, when surplus tonnage constantly declined. In 1997, the correlation between supply and demand specifically reflected the fact that world seaborne trade grew faster than overall tonnage supply.

Table 24

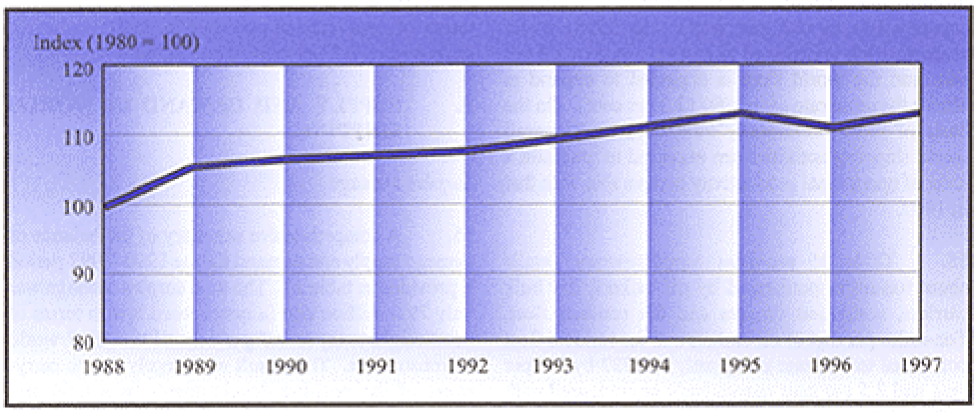
Cargo carried and ton-miles performed per dwt of the total world fleet, 1988-1997

Year	World fleet (millions of dwt)	Total cargo carried (millions of tons)	Total ton-miles performed (thousands of millions of ton-miles)	Tons of cargo carried per dwt	Ton-miles performed per dwt
1988	628.0	3 692	15 299	5.88	24 360
1989	638.0	3 891	16 385	6.10	25 680
1990	658.4	4 008	17 121	6.09	26 000
1991	683.5	4 120	17 873	6.03	26 150
1992	694.7	4 220	18 228	6.07	26 240
1993	710.6	4 330	18 994	6.09	26 730
1994	719.8	4 485	19 600	6.23	27 230
1995	734.9	4 651	20 338	6.33	27 675
1996	758.2	4 758	20 545	6.28	27 097
1997	775.9	4 953	21 413	6.38	27 598

Source: World fleet: Lloyd's Maritime Information Services (London) (mid-year data for 1988-1990, year-end data for 1991-1997); total cargo carried: UNCTAD secretariat; ton-miles: Fearnleys (Oslo), *Review*, various issues. Data compiled by the UNCTAD secretariat.

Graph 7

Index of ton-miles performed per dwt of total world fleet, 1988–1997



Source: UNCTAD calculations based on table 24.

Table 25

Estimated productivity of tankers, bulk carriers, combined carriers [a] and the residual fleet,[b] 1988-1997

(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
1988	6 155	26 890	3 475	17 990	1 264	37 510	4 411	25 630
1989	6 960	30 000	3 629	18 560	1 247	37 450	4 566	25 780
1990	7 376	30 810	3 804	18 770	1 164	36 040	4 777	25 960
1991	7 884	30 920	4 035	18 680	1 049	33 620	4 905	26 980
1992	8 190	31 420	4 061	18 770	1 012	32 440	4 965	26 620
1993	8 735	32 900	4 257	19 297	1 012	34 896	4 967	25 524
1994	9 001	34 250	4 435	19 392	908	34 789	5 256	26 007
1995	8 980	34 393	4 500	18 672	925	38 542	5 785	27 706
1996	9 061	34 663	4 442	18 371	926	41712	5 993	28 350
1997	9 251	34 923	4 660	18 253	955	43807	6 269	29 063

Source: Compiled by the UNCTAD secretariat on the basis of Fearnleys (Oslo), *Review*, *World Bulk Trades* and *World Bulk Fleet*, various issues, and other specialized sources.

a As from 1988 the source data for tankers pertain to ships of over 50,000 dwt (previously 60,000 dwt). For bulk carriers the basis is now also ships of over 50,000 dwt (previously 40,000 dwt). Combined carriers have been similarly amended.

b The residual fleet refers to all vessels included in table 15, excluding tankers, bulk carriers and combined bulk carriers of the size range indicated in footnote [a].

Table 26

Estimated productivity of tankers, bulk carriers, combined carriers and the residual fleet, 1988-1997
(tons carried per dwt)

Year	Tons of oil carried by tankers [a] (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 [b] (millions)	Tons carried per dwt of the residual fleet
1988	1 295	5.66	610	3.16	214	6.35	1 556	9.04
1989	1 398	6.02	639	3.27	211	6.34	1 612	9.10
1990	1 427	5.96	667	3.29	203	6.28	1 680	9.13
1991	1 485	5.82	707	3.27	196	6.38	1 722	9.47
1992	1 550	5.95	709	3.28	194	6.22	1 762	9.45
1993	1 665	6.27	744	3.37	192	6.62	1 738	8.89
1994	1 702	6.48	769	3.36	174	6.67	1 861	9.21
1995	1 738	6.66	770	3.20	177	7.38	1 993	9.55
1996	1 785	6.83	765	3.16	177	7.97	2 057	9.71
1997	1 847	6.97	810	3.17	185	8.49	2 152	9.88

Source: Compiled by the UNCTAD secretariat on the basis of Fearnleys (Oslo), *Review*, *World Bulk Trades* and *World Bulk Fleet*, various issues, and other specialized sources.

a Tankers of 50,000 dwt and above as from 1988 (previously 60,000 dwt and above).

b See footnote ***b*** to table 25.

Table 27

Tonnage oversupply in the world merchant fleet, 1990-1997 [a]

	1990	1991	1992	1993	1994	1995	1996	1997
	Million dwt							
World merchant fleet	658.4	683.5	694.7	710.6	719.8	734.9	758.2	775.9
Surplus tonnage [b]	63.7	64.2	71.7	72.0	63.4	50.8	48.8	29.0
Active fleet [c]	594.7	619.3	623.0	638.6	656.4	684.1	709.4	746.9
	Percentages							
Surplus tonnage as a percentage of the world merchant fleet	9.7	9.4	10.3	10.1	8.8	6.9	6.4	3.7

Sources: Compiled by the UNCTAD secretariat on the basis of data supplied by Lloyd's Maritime Information Services (London), and *Lloyd's Shipping Economist* (London), various issues.

[a] Mid-year data for 1990, year-end data for 1991-1997.

[b] Estimates of average year figures. Surplus tonnage is defined as tonnage that is not fully utilized owing to slow steaming or lay-up status, or because it is lying idle for other reasons.

[c] World fleet minus surplus tonnage.

The supply-and-demand mechanism by type of vessel

57. Analysis by type of vessel reveals that the carrying capacity in the oil tanker sector increased in 1997 by 1.9 per cent to 290.6 million dwt (see table 28 and graph 8). A total of 17.0 million dwt or 5.8 per cent of the total world tanker fleet was surplus to the demand for seaborne transport of oil. This represents a remarkable improvement over 1996, when 10.1 per cent of the total world tanker fleet was surplus. While tanker newbuildings (7.4 million dwt) substantially exceeded tanker scrappings (3.5 million dwt), increased oil trades (up by 2.1 per cent over 1996) improved the oil tanker market.

58. Overcapacity in the dry bulk sector also decreased significantly in 1997 to 10.3 million dwt, representing a decline of 6.9 million dwt and accounting for 3.9 per cent of the world dry bulk fleet. In 1997, shipowners of conventional general cargo ships continued to concentrate more on demand-driven shipping business with less speculative activities, reducing total supplied tonnage in this category to 62.0 million dwt as compared with 62.7 million dwt in 1996, while the oversupply in this sector increased by 0.3 million dwt to 1.7 million dwt, representing 2.7 per cent of the world's total conventional general cargo fleet (2.2 per cent in 1996). In the unitized sector, a substantial increase in supply in 1997 (to 65.7 million dwt) continued to be completely deployed in the global liner market, although not all vessels were necessarily fully booked on each voyage, especially in the trans-Pacific and Asia-Europe trades. Additional demand continued to be generated in 1997 by expanding container and ro-ro operation not only as feeder services for East-West trunk liner trade routes but also North-South and intraregional services covering the Asian and Latin American regions.

Table 28

Analysis of tonnage oversupply by main type of vessel, 1990-1997 [a]
(average yearly figures in millions of dwt)

	1990	1991	1992	1993	1994	1995	1996	1997
Supply of world tanker fleet [b]	266.2	273.5	283.4	284.6	282.9	277.0	285.1	290.6
Total tanker fleet surplus [c]	40.9	39.8	41.8	43.5	39.0	28.8	28.8	17.0
Share of surplus fleet in the world tanker fleet (per cent)	15.4	14.6	14.7	15.3	13.8	10.4	10.1	5.8
Supply of world dry bulk fleet [b]	228.7	235.0	237.3	238.6	242.6	252.9	257.2	260.9
Dry bulk fleet surplus [c]	19.4	20.7	25.1	23.6	20.3	17.9	17.2	10.3
Share of surplus in the world dry bulk fleet (per cent)	8.5	8.8	10.6	9.9	8.4	7.1	6.7	3.9
Supply of world conventional general cargo fleet	63.6	63.5	63.0	62.1	61.9	62.0	62.7	62.0
Conventional general cargo fleet surplus	2.1	2.2	2.7	2.8	2.2	2.0	1.4	1.7
Share of surplus in the world conventional general cargo fleet (per cent)	3.3	3.5	4.3	4.5	3.6	3.2	2.2	2.7
Supply of world unitized fleet [d]	37.5	40.3	43.0	45.7	49.8	53.4	59.3	65.7
Surplus of unitized fleet	0.5	0.4	0.7	0.7	0.5	0.7	0	0
Share of surplus in the world unitized fleet (per cent)	1.3	1.0	1.6	1.5	1.0	1.3	0.0	0.0

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

a Aggregates for all sectors as shown in this table are averages for the years shown and therefore differ from the world figures in table 27, which indicate estimates at mid-year. 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.

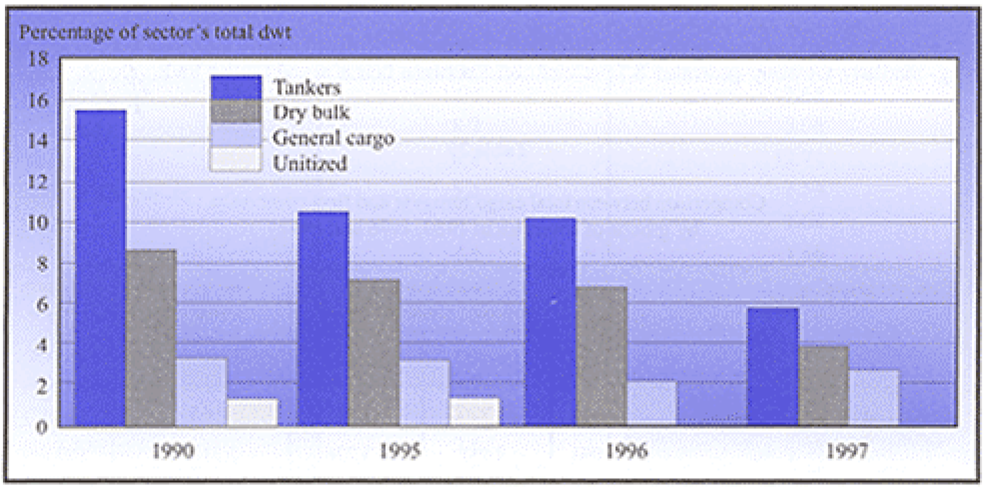
b Including combined ore/bulk/oil carriers on the basis of actual supply (for 1997 a total of 19.2 million dwt, of which 6.9 million dwt was for tankers and 12.3 million dwt was for dry bulkers).

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

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

Graph 8

Trends in surplus capacity by main vessel type in 1990 and 1995–1997



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

C. COMPARISON OF CARGO TURNOVER AND FLEET OWNERSHIP

59. The correlation between cargo volume generated by different country groups and their fleet ownership in 1980, 1996 and 1997 is summarized in table 29. In recent years, developed market-economy countries, either directly or through open or international registries, controlled nearly 60 per cent of the world fleet in deadweight tons, while they generated 55 per cent of world seaborne trade. The share of developing countries in the world cargo turnover has stagnated over the last two decades at slightly less than 40 per cent, while their merchant fleet, including tonnage beneficially owned in open or international registries, accounted for about one-third of the world fleet, although the difference has been narrowing substantially between the share of developed market-economy countries and that of developing countries. The share of goods loaded and unloaded in 1997 was almost unchanged from that in 1980 for both groups. On the other hand, developed market-economy countries' controlled fleet declined significantly from 80 per cent of the world total in 1980 to nearly 60 per cent in 1997, while developing countries substantially improved their share to one-third in 1997 from around 10 per cent registered in 1980.

60. Table 30 provides information on fleet ownership of the major trading nations. It may be noted that, with the exception of Greece, a country with a long and distinctive tradition as an exporter of shipping services, the major trading nations are also major beneficial owners of world tonnage. This is no coincidence, but rather reflects the generally prevailing policies for exploiting trade complementarities in maritime transport. In most countries, maritime capabilities and the ownership of substantial tonnage are considered to be essential components of trade support and promotion.

61. Table 30 shows not only many similarities but also differences in the shipping balances of the leading trading nations. Countries such as China (including Hong Kong), Denmark, Japan and Norway figure among the most important cross-trading nations, i.e. they are important net exporters of maritime transport services. Other major trading nations, while maintaining an important ownership position and, to a

lesser extent, flag position, are major importers of shipping services. The United States and Germany figure prominently among this group. While in 1997 the United States generated more than 14 per cent of world trade, they owned 7.7 per cent of world tonnage with only 1.7 per cent of world tonnage flying the United States flag. Similarly, Germany generated 8.7 per cent of world trade as compared to a tonnage ownership position of 3.1 per cent and a flag share of 1 per cent. While the large differences in ownership and flag shares reflect cost considerations and are an indication of the competitiveness of fleets registered under national flags, the important shares in tonnage beneficially owned clearly indicate a desired linkage between fleet size and foreign trade volume.

Table 29

Comparison between total cargo turnover and fleet ownership
by groups of countries in 1980, 1996 and 1997

Country grouping	Year	Goods loaded and unloaded (millions of tons)		Total of goods loaded and unloaded (millions of tons)	Merchant fleet (millions of dwt)
		Loaded	Unloaded		
Developed market-economy countries	1980	1 370	2 595	3 965	350.1
	1996	2 037	3 276	5 313	203.0
	1997	2 135	3 352	5 487	202.5
Major open-registry countries	1980	[b]	[b]	[b]	212.6
	1996	[b]	[b]	[b]	339.5
	1997	[b]	[b]	[b]	361.0
Developing countries	1980	2 087	839	2 926	68.4
	1996	2 441	1 286	3 727	147.5
	1997	2 538	1 396	3 934	149.9
Countries of Central and Eastern Europe (including the former USSR)	1980	201	145	346	37.8
	1996	179	148	327	29.0
	1997	186	155	341	24.3
Socialist countries of Asia	1980	46	100	146	10.9
	1996	101	105	206	27.1
	1997	94	134	228	26.0
World total [a]	1980	3 704	3 679	7 383	682.8
	1996	4 758	4 815	9 573	758.2
	1997	4 953	5 037	9 990	775.9

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

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

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

Table 30

Maritime engagement of 30 major trading nations
(as at the end of 1997)

Country/territory	Share of world trade generated in terms of value	Share of world fleet beneficially owned in terms of dwt
United States	14.4	7.65
Germany	8.7	3.08
Japan	6.8	12.71
United Kingdom	5.3	3.54
France	5.1	1.08
Italy	4.0	1.68
Canada	3.8	0.14
Hong Kong, China	3.6	5.06
Netherlands	3.4	0.77
Belgium-Luxembourg	3.0	0.60
China	2.9	5.41
Republic of Korea	2.6	3.54
Singapore	2.4	2.25
Spain	2.1	0.49
Taiwan Province of China	2.1	2.29
Mexico	2.0	0.21
Malaysia	1.4	0.65
Sweden	1.4	2.73
Switzerland	1.4	0.87
Thailand	1.2	0.52
Australia	1.2	0.46
Austria	1.1	0.02
Brazil	1.1	1.39
Russian Federation	1.1	2.11
Ireland	0.9	0.03
Saudi Arabia	0.8	1.60
Indonesia	0.8	0.60
Denmark	0.8	1.73
Norway	0.8	7.65
Turkey	0.8	1.34
Total	87.0	72.20

Source: Data on world trade based on the World Trade Organization (WTO) Press Release, PRESS/98 of 19 March 1998; data on fleet ownership, table 16.