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Chapter III: Productivity of the World Fleet and Supply and Demand in World Shipping



Chapter III

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

55. The development of main operational productivity indicators for the world fleet is reflected in table 24 and graph 6. Available data reveal that while tons of cargo carried per deadweight ton (dwt) in 1998 rose to a new record high of 6.42, ton-miles performed per deadweight ton fell to 27,165. This points to a considerably lower operational productivity than in 1997, when performance level reached nearly 28,000 ton-miles per dwt. Nevertheless, it remained within the general level of productivity observed in the second half of the 1990s. The decrease in ton-miles as compared to 1997 was attributed mainly to further changing trade structures and consequently more reductions in average transport distances of oil products and some major dry bulk commodities such as coal and grain, thus affecting the ratio of port to productive sea time. These potentially adverse effects were partly offset by recent positive developments such as modernization of vessels, increases in consignment sizes and improved port conditions, which enabled the shipping industry to accommodate increased demand (up by 2.2 per cent in 1998) despite relatively low increases in carrying capacity (up by 1.6 per cent). In 1999 and onwards, world seaborne trade is expected to grow at a rate of 2.5 to 3.5 per cent and the world fleet is expected to expand at 1.5 to 2.5 per cent. On the basis of these preliminary estimates, 1999 and onwards are expected to maintain an average level of operational productivity performed during the period of 1994-1998.

56. Table 25 provides supplementary details about ton-miles performed by oil tankers, dry bulk carriers, combined carriers and the residual fleet. Ton-miles per deadweight ton of oil tankers and dry bulk carriers decreased in 1998 by 0.2 per cent and 8.3 per cent, respectively, as compared with 1997, while ton-miles per deadweight ton of combined carriers and the residual fleet increased by 2.6 per cent and 2.8 per cent, respectively, over the previous year. The total deadweight tonnage of combined carriers declined substantially by 12.5 per cent to 17.7 million dwt in 1998. This type of tonnage is now employed mainly in the tanker trades. The operational flexibility of combined carriers is no longer a criteria for owners to either invest in or even hold on to this comparatively expensive ship type. The decline in combined tonnage available is indicative thereof and could usher in the demise of this vessel type. Ton-miles per deadweight ton of dry bulk carriers continued to decline significantly, falling by 8.3 per cent in 1998. This can be explained by the correlation between supply and demand: the total carrying capacity of dry bulk carriers maintained in 1998 a similar level to that of 1997, while the growth of overall dry bulk commodities declined to 3.7 per cent in 1998, as compared with 5.7 per cent in 1997. As indicated in table 26, these trends are also borne out by the data on operational productivity in terms of cargo carried per deadweight ton. There was an increase in tons carried per deadweight ton by combined carriers and the residual fleet. The performance of dry bulk carriers declined again in terms of tons carried per deadweight ton in 1998, which had ceased to decline in the previous year.

Table 24

Cargo carried and ton-miles performed per deadweight ton (dwt) of the total world fleet, 1989-1998

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
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	20 188	6.33	27 470
1996	758.2	4 758	20 678	6.28	27 272
1997	775.9	4 953	21 672	6.38	27 931
1998	788.7	5 064	21 425	6.42	27 165

Sources: World fleet: Lloyd's Maritime Information Services (London) (mid-year data for 1989-1990, year-end data for 1991-1998); total cargo carried: UNCTAD secretariat; ton-miles: Fearnleys (Oslo), *Review*, various issues. Data compiled by the UNCTAD secretariat.

Graph 6

Index of ton-miles performed per deadweight ton (dwt) of total world fleet, 1989-1998



Source: UNCTAD calculations based on table 24.

Table 25
Estimated productivity of tankers, bulk carriers, combined carriers^a and the residual fleet,^b 1989-1998
(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
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	41 712	5 993	28 350
1997	9 251	34 923	4 660	18 253	955	43 807	6 269	29 063
1998	9 307	34 845	4 464	16 744	944	44 952	6 206	29 880

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

^a Tankers, bulk carriers and combined carriers of 50,000 dwt and above.

^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, 1989-1998
(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
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
1998	1 848	6.92	797	2.99	184	8.80	2 130	10.06

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

^aSee footnote b to table 25.

B. SUPPLY AND DEMAND IN WORLD SHIPPING

Surplus tonnage

57. A comprehensive summary of the balance of tonnage supply and demand for the 1991-1998 period is provided in table 27. The total surplus tonnage further decreased to a record low of 24.7 million dwt or 3.1 per cent of the 1998 world merchant fleet. This favourable result was due largely to continuously positive trade developments which have characterized shipping markets since the mid-1990s, when surplus tonnage was still around 10 per cent. In 1998, the correlation between supply and demand reflected the fact that world seaborne trade again grew marginally faster than overall tonnage supply.

The supply-and-demand mechanism by type of vessel

58. Carrying capacity in the oil tanker sector increased slightly in 1998 by 0.4 million dwt to 291.0 million dwt (see table 28 and graph 7). As a result, there continues to be an overcapacity of 17.3 million dwt or 5.9 per cent of the total world tanker fleet. This supply/demand gap is comparable to the one prevailing in 1997 (5.8 per cent), but

constitutes a remarkable improvement over 1996 when 10.1 per cent of the total world tanker fleet was surplus. Overcapacity in the dry bulk sector also decreased significantly in 1998 to a new record low of 5.8 million dwt, representing a decline of 4.5 million dwt and accounting for 2.3 per cent of the world dry bulk fleet, a level that can be considered as representing full employment.

59. With regard to conventional general cargo tonnage, the overcapacity situation remained relatively stable in 1998 with supply capacity surpassing demand by approximately 1.6 million dwt or 2.6 per cent of the relevant world fleet. This reflects reduced demand for conventional tonnage that goes hand in hand with disinvestment by owners particularly in developed countries with high labour costs. As far as containerized tonnage is concerned, 1998 saw a considerable amount of newbuilding activities adding some 8 million dwt to the existing fleet, thus increasing supply capacity by approximately 12 per cent. Even though newbuildings delivered in 1998 continued to a large extent to be the result of earlier speculative ordering, particularly by German investors, markets were able to absorb this tonnage, thus generating full employment of the world unitized fleet.

Table 27
Tonnage oversupply in the world merchant fleet, 1991-1998
(*end-year figures*)

	1991	1992	1993	1994	1995	1996	1997	1998
	Million dwt							
World merchant fleet	683.5	694.7	710.6	719.8	734.9	758.2	775.9	788.7
Surplus tonnage^a	64.2	71.7	72.0	63.4	50.8	48.8	29.0	24.7
Active fleet^b	619.3	623.0	638.6	656.4	684.1	709.4	746.9	764.0
	Percentages							
Surplus tonnage as a percentage of the world merchant fleet	9.4	10.3	10.1	8.8	6.9	6.4	3.7	3.1

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

^a 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.

^b World fleet minus surplus tonnage.

Table 28

Analysis of tonnage oversupply by main type of vessel, 1991-1998 ^a
(average yearly figures in millions of dwt)

	1991	1992	1993	1994	1995	1996	1997	1998
Supply of world tanker fleet	273.5	283.4	284.6	282.9	277.0	285.1	290.6	291.0
Total tanker fleet surplus ^b	39.8	41.8	43.5	39.0	28.8	28.8	17.0	17.3
Share of surplus fleet in the world tanker fleet (per cent)	14.6	14.7	15.3	13.8	10.4	10.1	5.8	5.9
Supply of world dry bulk fleet	235.0	237.3	238.6	242.6	252.9	257.2	260.9	257.1
Dry bulk fleet surplus ^b	20.7	25.1	23.6	20.3	17.9	17.2	10.3	5.8
Share of surplus in the world dry bulk fleet (per cent)	8.8	10.6	9.9	8.4	7.1	6.7	3.9	2.3
Supply of world conventional general cargo fleet	63.5	63.0	62.1	61.9	62.0	62.7	62.0	60.5
Conventional general cargo fleet surplus	2.2	2.7	2.8	2.2	2.0	1.4	1.7	1.6
Share of surplus in the world conventional general cargo fleet (per cent)	3.5	4.3	4.5	3.6	3.2	2.2	2.7	2.6
Supply of world unitized fleet ^c	40.3	43.0	45.7	49.8	53.4	59.3	65.7	73.1
Surplus of unitized fleet	0.4	0.7	0.7	0.5	0.7	0	0	0
Share of surplus in the world unitized fleet (per cent)	1.0	1.6	1.5	1.0	1.3	0.0	0.0	0.0

Source: 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. 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.

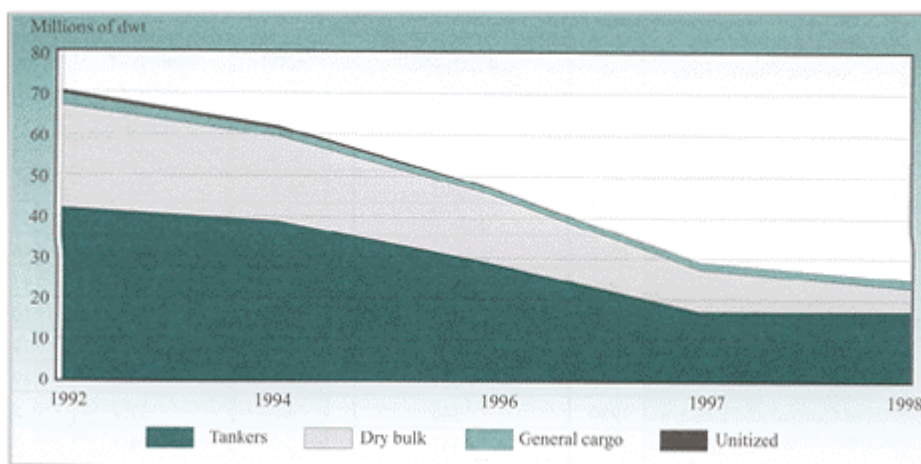
C. COMPARISON OF CARGO TURNOVER AND FLEET OWNERSHIP

1. The correlation between cargo volume generated by different country groups and their fleet ownership is summarized in tables 29 and 30. Data contained in table 29, together with the analysis of beneficial ownership of fleets under open registry flags, reveal that the share of developed market-economy countries in world tonnage has gradually receded from nearly 80 per cent in 1980 to around 55 per cent in 1999 which would reflect their share in world trade. Thus, while the flag position of developed market-economy countries has been dramatically reduced, ownership either under national or foreign flags is maintained at a level considered necessary to support their trade position. The share of developing countries in the world cargo turnover has stagnated over the last two decades at slightly less than 40 per cent (39.6 per cent in 1980; 39.4 and 39.2 per cent in 1997 and 1998, respectively). Tonnage owned under national flags had increased

in the 1980s from 10 to nearly 20 per cent of the world fleet, but has stagnated ever since. Beneficially owned tonnage, however, has developed more positively from around 10 per cent in 1980 to approximately 35 per cent in 1998 as owners in developing countries are also resorting increasingly to open-registry facilities. The share of world trade generated by the countries of Central and Eastern Europe remained at 3.4 per cent, thus considerably short of the share of 4.7 per cent obtained in 1980. Similarly, the flag position of these countries declined from 5.5 per cent in 1980 to a mere 2.6 per cent in 1998. The socialist countries of Asia increased their share in world trade to 2.5 per cent, while at the same time improving their share in world tonnage from 1.6 per cent in 1980 to 3.3 per cent in 1998. Despite these long-term improvements, the short-term analysis shows that between 1997 and 1998 these countries were not in a position to increase their share in world trade, while their share in world tonnage decreased marginally from 3.4 to 3.3 per cent over the same time period.

Graph 7

Trends in surplus capacity by main vessel type



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

Table 29

**Comparison between total cargo turnover and fleet ownership
by groups of countries in 1980, 1997 and 1998**

Country grouping	Year	Total of goods loaded and unloaded (millions of tons)	Percentage of world total	Merchant fleet (millions of dwt)	Percentage of world total
Developed market-economy countries	1980	3 965	53.7	350.1	51.3
	1997	5 487	54.9	202.5	26.1
	1998	5 601	54.8	202.6	25.7
Major open-registry countries	1980	b	b	212.6	31.1
	1997	b	b	361.0	46.5
	1998	b	b	376.8	47.8
Developing countries	1980	2 926	39.6	68.4	10.0
	1997	3 934	39.4	149.9	19.3
	1998	4 007	39.2	150.8	19.1
Countries of Central and Eastern Europe (including the former USSR)	1980	346	4.7	37.8	5.5
	1997	341	3.4	24.3	3.1
	1998	351	3.4	20.7	2.6
Socialist countries of Asia	1980	146	2.0	10.9	1.6
	1997	248	2.5	26.0	3.4
	1998	254	2.5	26.0	3.3
World total ^a	1980	7 383	100.0	682.8	100.0
	1997	9 990	100.0	775.9	100.0
	1998	10 213	100.0	788.7	100.0

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.

61. Table 30 provides data on the shipping engagement of the leading trading nations. While data clearly indicate positions of countries as net importers or exporters of shipping services, it is also evident that all major trading nations pursue policies aimed at maintaining minimum control over shipping as major trade support service. Thus, countries such as China (including Hong Kong), Japan, Denmark and Norway are net suppliers of maritime services and are prominent among the most important cross-trading nations. Many of the 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, Germany and France figure among this group. While in 1998 the United States generated nearly 15 per cent of world trade, it owned 6.3 per cent of world tonnage with only 1.6 per cent of world tonnage flying the United States flag. Similarly, Germany and France generated 9.2 per cent and 5.4 per cent of world trade,

respectively, as compared to a tonnage ownership position of 3.7 per cent and 0.6 per cent and a flag share of 1.3 per cent and 0.3 per cent, respectively. While the large differences in ownership and flag shares reflect cost considerations and the competitiveness of fleets registered under national flags, the important shares in tonnage beneficially owned indicate clearly a desired linkage between fleet size and foreign trade volume.

Table 30

Maritime engagement of 30 major trading nations
(as at the end of 1998)

Country/territory	Share of world trade generated, in terms of value	Share of world fleet beneficially owned, in terms of dwt
United States	14.9	6.29
Germany	9.2	3.72
Japan	6.1	13.07
United Kingdom	5.4	2.74
France	5.4	0.64
Italy	4.2	1.65
Canada	3.8	0.14
Hong Kong, China	3.3	4.50
Netherlands	3.5	0.75
Belgium-Luxembourg	3.0	1.06
China	3.0	5.29
Republic of Korea	2.1	3.47
Singapore	1.9	2.63
Spain	2.2	0.50
Taiwan Province of China	2.0	2.48
Mexico	2.3	0.21
Malaysia	1.2	0.85
Sweden	1.4	2.87
Switzerland	1.5	0.86
Thailand	0.9	0.52
Australia	1.1	0.47
Austria	1.2	0.02
Brazil	1.0	1.19
Russian Federation	0.9	2.20
Ireland	1.0	0.03
Saudi Arabia	0.8	1.55
Indonesia	0.8	0.60
Denmark	0.8	1.89
Norway	0.7	7.46
Turkey	0.8	1.28
Total	86.4	70.93

Source: UNCTAD secretariat based on data supplied by the World Trade Organization (WTO).