UNCTAD/RMT(2000)/1

UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT
Geneva

REVIEW OF MARITIME TRANSPORT 2000

Chapter III

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

UNITED NATIONS
New York and Geneva, 2000

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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

60. The main indicators of operational productivity for the world fleet are shown in table 24 and graph 6. Tons of cargo carried per deadweight ton (dwt) in 1999 maintained the same level as in the previous year at 6.42, which had been a new record high, whilst ton-miles performed per deadweight ton fell substantially to 26,884. This represents the lowest operational productivity below 27,000 since 1993, when it fell to 26,730, thus continuing a downward movement already observed in 1998. The deterioration in ton-miles per dwt was a reflection of the continuing changes in trade structures, particularly in the crude oil trades and some major dry bulk trades such as iron ore (see chapter I, International Seaborne Trade). In 1999, some positive developments such as the enlargement of consignment and vessel sizes, improved port conditions and only marginal growth (1.3 per cent) in vessel supply, were offset by decreasing growth in total demand (to 1.3 per cent from 2.2 per cent in 1998) resulting in stagnating volumes per dwt and lower operational productivity in terms of ton-miles.

Table 24

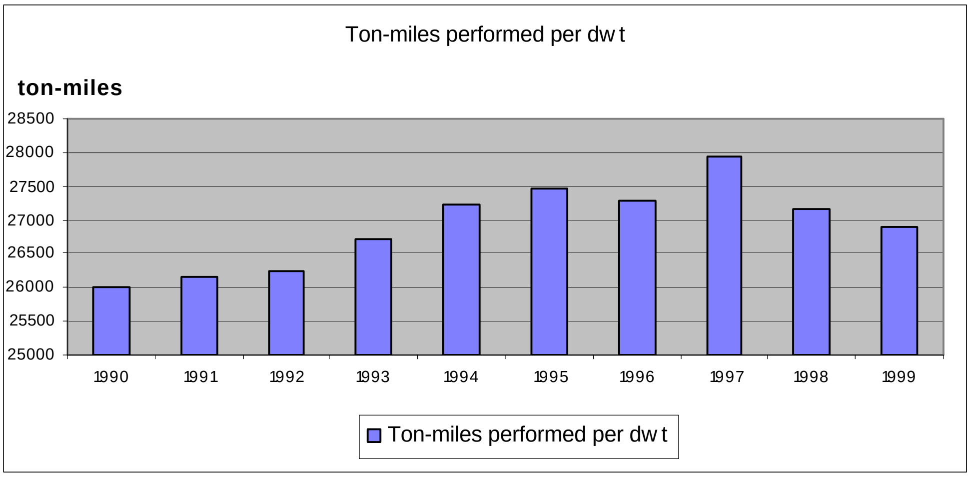
Cargo carried and ton-miles performed per deadweight ton (dwt) of the total world fleet, 1990-1999

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
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
1999	799.0	5 129	21 480	6.42	26 884

Sources: World fleet: Lloyd's Maritime Information Services (London) (mid-year data for 1990, year-end data for 1991-1999); 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 of total world fleet, 1990-1999



Source: UNCTAD calculations.

61. Indicative data on ton-miles performed by oil tankers, dry bulk carriers, combined carriers and the residual fleet are provided in table 25. Ton-miles per deadweight ton of oil tankers continued to decrease in 1999 by 4.6 per cent as compared with 1998, while ton-miles per deadweight ton of dry bulk carriers, combined carriers and the residual fleet increased by 0.7, 3.6 and 1.4 per cent, respectively, over the previous year. The continuously deteriorating performance by oil tankers is attributable mainly to changing regional structures of crude oil trades, which have consequently resulted in less ton-mile performance on the part of the whole oil tanker sector. Imbalance between supply and demand is another factor. The total carrying capacity of oil tankers increased by 1.0 per cent in 1999 while the growth of crude oil and oil products decreased by 1.0 per cent. Dry bulkers' ton-miles per deadweight ton increased nearly 1.0 per cent in 1999, clearly contrasting the negative B8.3 per cent in the previous year and halting the downward trend prevailing since 1994. In 1999 total dry bulk cargo increased by 3.0 per cent as compared with its volume in 1998, while carrying capacity of dry bulkers remained flat with no particular increase. Nevertheless, performance is still considerably below the maximum of over 19,000 ton-miles/dwt observed in 1993/1994. Performance of combined carriers continued to increase as in previous years, reaching 46,500 ton-miles per dwt. The relevance of these data is, however, somewhat reduced by the decreasing size and importance of this type of tonnage that is mainly deployed in oil trades. Total ton-miles performed stand at only 10 per cent of the total for oil tankers.

62. Table 26 provides supplementary data on operational productivity in terms of cargo carried per deadweight ton. Cargo volumes in tons carried per deadweight ton of oil tankers continued to decrease by 3.9 per cent in 1999 over the previous year. Those cargo volumes carried per deadweight ton of dry bulk carriers, combined carriers and the residual fleet increased by 1.3, 3.4 and 1.9 per cent respectively compared with those in 1998. This analysis indicates that the same trends as those in terms of ton-miles per deadweight ton prevailed in 1999.

Table 25

Estimated productivity of tankers, bulk carriers, combined carriers [a] and the residual fleet,[b] 1990-1999

(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
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
1999	9 065	33 242	4 486	16 858	931	46 550	6 423	30 297

Source: UNCTAD secretariat on the basis of data from 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, 1990-1999
(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
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
1999	1 813	6.65	807	3.03	182	9.10	2 192	10.25

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

[a] See footnote b to table 25.

The supply and demand mechanism by type of vessel

63. Tonnage supply in the oil tanker sector decreased substantially in 1999 by 9.2 million dwt to 281.8 million dwt. This indicates that oil tanker newbuildings delivered in 1999 stood at 6.5 million dwt while deleted tonnage reached nearly 16 million dwt. As a result overcapacity was reduced to 14.0 million dwt or 5.0 per cent of the total world tanker fleet, while seaborne trade for oil tankers declined by 1.0 per cent in 1999 compared with the previous year (see table 27 and graph 7). In 1999, nearly 1.0 million dwt of dry bulker newbuildings were delivered while tonnages of nearly 12.5 million dwt were deleted from shipping industries. Thus the total dry bulk fleet supply was reduced substantially by 11.4 million dwt. On the other hand, main dry bulk commodities increased by 2.8 per cent in 1999 over the previous year. Despite some favourable factors, overcapacity in the dry bulk sector increased significantly in 1999 to 7.9 million dwt, representing an increase of 2.1 million dwt and accounting for 3.2 per cent of the world dry bulk fleet. In actual fact the tonnage deleted in 1999 decreased by approximately 25 per cent over the previous year's figure. This means that further deletion of aged uneconomical dry bulkers should be promoted in order to bring the supply and demand mechanism into better balance. In the sector of the general cargo fleet, overcapacity remained relatively stable in 1999 with supply capacity exceeding demand by 1.8 million dwt or 3.0 per cent for the world fleet of this sector. The surplus tonnage of general cargo vessels has followed a downward trend since the early 1990s. In the unitized fleet sector, 3.0 million dwt of containership newbuildings were delivered in 1999, topping up the 8 million dwt tonnage delivered in the previous year. Although newbuildings of this sector have been increasing, liner shipping industry markets have been able to absorb these tonnages, thus resulting in full employment of the world unitized fleet.

Table 27

Analysis of tonnage oversupply by main type of vessel, 1992-1999 [a]

(average yearly figures in millions of dwt)

	1992	1993	1994	1995	1996	1997	1998	1999
Supply of world tanker fleet	283.4	284.6	282.9	277.0	285.1	290.6	291.0	281.8
Total tanker fleet surplus [b]	41.8	43.5	39.0	28.8	28.8	17.0	17.3	14.0
Share of surplus fleet in the world tanker fleet (per cent)	14.7	15.3	13.8	10.4	10.1	5.8	5.9	5.0
Supply of world dry bulk fleet	237.3	238.6	242.6	252.9	257.2	260.9	257.1	245.7
Dry bulk fleet surplus [b]	25.1	23.6	20.3	17.9	17.2	10.3	5.8	7.9
Share of surplus in the world dry bulk fleet (per cent)	10.6	9.9	8.4	7.1	6.7	3.9	2.3	3.2
Supply of world conventional general cargo fleet	63.0	62.1	61.9	62.0	62.7	62.0	60.5	59.9
Conventional general cargo fleet surplus	2.7	2.8	2.2	2.0	1.4	1.7	1.6	1.8
Share of surplus in the world conventional general cargo fleet (per cent)	4.3	4.5	3.6	3.2	2.2	2.7	2.6	3.0
Supply of world unitized fleet [c]	43.0	45.7	49.8	53.4	59.3	65.7	73.1	76.1
Surplus of unitized fleet	0.7	0.7	0.5	0.7	0	0	0	0
Share of surplus in the world unitized fleet (per cent)	1.6	1.5	1.0	1.3	0.0	0.0	0.0	0.0

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

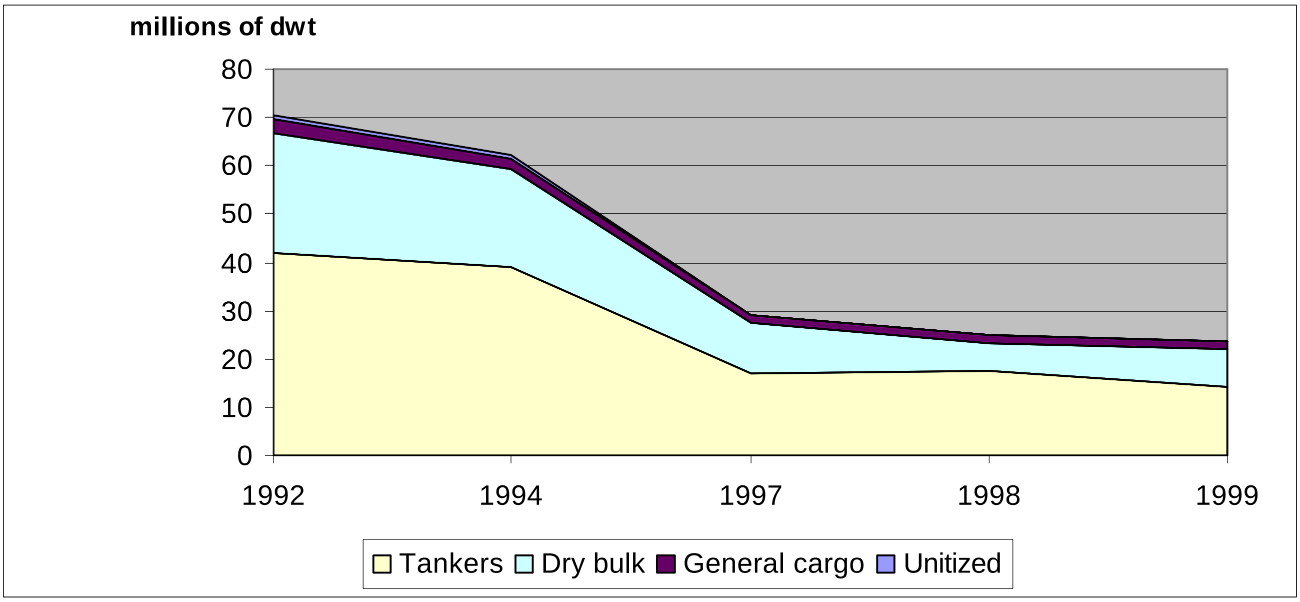
[a] Aggregates for all sectors shown in this table are averages for the years indicated and therefore differ from the world figures in table 28. This table excludes tankers and dry bulk carriers of less than 10,000 dwt and conventional general cargo/unitized vessels of less than 5,000 dwt.

[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.

Graph 7

Trends in surplus capacity by main vessel type in selected years



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

B. SUPPLY AND DEMAND IN WORLD SHIPPING

Surplus tonnage

64. An indicative summary of the balance of tonnage supply and demand for the 1992-1999 period is provided in table 28. The total surplus tonnage in 1999 continued to decrease by 1.0 million dwt to a new record of 23.7 million dwt or 3.0 per cent of the world merchant fleet from 3.1 per cent in 1998. This improved balance was largely attributable to the continuously increasing trade volume, specifically since 1997, which reached nearly 5.0 billion tons, when surplus tonnage was halved to 3.7 per cent as compared to the level of 6.4 to 10.3 per cent for the previous years (1991-1996). In 1999, growth of tonnage supply and demand was evenly balanced.

C. COMPARISON OF CARGO TURNOVER AND FLEET OWNERSHIP

65. 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 55 cent of world seaborne trade in 1999 compared with about 54 per cent in 1980. The tonnage share of developed market-economy countries has been significantly reduced from nearly 80 per cent in 1980 to 57 per cent in 1999. Their ownership either under national flag (25 per cent of the world total in 1999) or foreign flags (32 per cent of the world total in 1999) is maintained to support their trade position. The share of developing countries in world cargo turnover has remained at a level of slightly less than 40 per cent. Their tonnage owned under national flags had increased from 10 per cent of the world fleet in the 1980s to nearly 20 per cent in the 1990s, while beneficially owned tonnage has expanded to nearly one third of the total beneficially-registered tonnage or 16 per cent of the world fleet as owners in developing countries have also been resorting to open-registry facilities. The share of world cargo turnover generated by the countries of Central and Eastern Europe remained at 3.4 per cent in 1999, unchanged from the 1998 level, but significantly less than 4.7 per cent in 1980. Their fleet position also declined from 5.5 per cent to 2.3 per cent in 1999. The socialist countries of Asia

increased their share in world trade to 2.8 per cent in 1999, while they improved their share in world tonnage from 1.6 per cent in 1980 to 3.2 per cent in 1999. The short-term analysis indicates a different aspect in that these countries increased their share in world trade from 2.2 per cent in 1996 to 2.8 per cent in 1999, while their share of national flags in world tonnage decreased from 3.8 per cent in 1996 to 3.2 per cent in 1999. On the other hand, China increased its tonnage under foreign flags to 43.5 per cent of its total fleet in 1999 from 36.12 per cent in 1996.

Table 28

Tonnage oversupply in the world merchant fleet, 1992-1999
(end-year figures)

	1992	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**
	Million dwt							
World merchant fleet	694.7	710.6	719.8	734.9	758.2	775.9	788.7	799.0
Surplus tonnage [a]	71.7	72.0	63.4	50.8	48.8	29.0	24.7	23.7
Active fleet [b]	623.0	638.6	656.4	684.1	709.4	746.9	764.0	775.3
	Percentages							
Surplus tonnage as a percentage of the world merchant fleet	10.3	10.1	8.8	6.9	6.4	3.7	3.1	3.0

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 29

Comparison between total cargo turnover and fleet ownership by groups of countries in 1980, 1998 and 1999

Country grouping	Year	Total of goods loaded and unloaded (millions of tons)	Percentage of world total	Merchant fleet (millions of dwt)	Percentag e of world total
Developed market-economy countries	1980	3 965	53.7	350.1	51.3
	1998	5 601	54.8	202.6	25.7
	1999	5 677	54.8	203.2	25.4
Major open-registry countries	1980	[b]	[b]	212.6	31.1
	1998	[b]	[b]	376.8	47.8
	1999	[b]	[b]	384.7	48.1
Developing countries	1980	2 926	39.6	68.4	10.0
	1998	4 007	39.2	150.8	19.1
	1999	4 045	39.0	153.6	19.2
Countries of Central and Eastern Europe (including the former USSR)	1980	346	4.7	37.8	5.5
	1998	351	3.4	20.7	2.6
	1999	356	3.4	18.3	2.3
Socialist countries of Asia	1980	146	2.0	10.9	1.6
	1998	254	2.5	26.0	3.3
	1999	287	2.8	25.8	3.2
World total [a]	1980	7 383	100.0	682.8	100.0
	1998	10 213	100.0	788.7	100.0
	1999	10 365	100.0	799.0	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.

66. Information on 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. This reflects an aspect of trade-supporting policies for exploiting maritime transport as a trade complement. It is generally considered that maritime capabilities, specifically the ownership of substantial tonnage, are essential for the country's trade support and promotion. The table also shows many similarities as well as differences in the shipping services of the leading trading nations. Major trading countries such as Japan, China (including Hong Kong), Republic of Korea, the United Kingdom, 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 they maintain a relevant ownership position and, to a lesser extent, national flag position. The United States, France and Canada come into this group. In 1999 the United States generated more than 15.3 per cent of world trade while it owned 6.7 per cent of world tonnage with only 1.6 per cent of such tonnage flying the national flag. Similarly, France and Canada generated 5.1 and 4.0 per cent respectively of world trade as compared to a tonnage ownership position of 0.7 and 0.4 per cent, and a national flag share of 0.3 and 0.1 per cent respectively.

Table 30

Maritime engagement of 25 major trading nations
(as at the end of 1999)

Country/territory	Percentage share of world trade generated, in terms of value	Percentage share of world fleet in terms of dwt
United States	15.3	6.67
Germany	8.8	4.00
Japan	6.4	12.76
United Kingdom	5.1	2.60
France	5.1	0.74
Italy	3.9	1.85
Canada	4.0	0.43
Hong Kong, China	3.1	4.31
Netherlands	3.4	0.83
Belgium-Luxembourg	3.1	1.04
China	3.1	5.39
Republic of Korea	2.3	3.44
Singapore	2.0	2.56
Spain	2.2	0.51
Taiwan Province of China	2.0	2.69
Malaysia	1.3	0.88
Sweden	1.3	2.07
Switzerland	1.4	0.83
Thailand	0.9	0.39
Australia	1.1	0.43
Brazil	0.9	1.21
Russian Federation	1.0	2.18
Saudi Arabia	0.8	1.51
Denmark	0.8	2.20
Norway	0.8	7.64
Total	80.1	

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