
UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT

REVIEW OF MARITIME TRANSPORT 2011

Report by the UNCTAD secretariat

Chapter 3

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A. OVERVIEW OF THE DETERMINANTS OF MARITIME TRANSPORT COSTS AND THEIR IMPACT ON TRADE

Transport costs are key determinants of a country's trade competitiveness. Excessive shipping costs are considered a major barrier to trade, often surpassing the cost of customs duties. Several studies conclude that transport costs influence the volume, structure and patterns of trade, as well as the comparative advantage of a country.¹ A doubling of a country's transport costs can slow annual gross domestic product growth by slightly more than one half of one percentage point and lead to lower levels of foreign investment, less access to technology and knowledge, and reduced employment opportunities. Transport costs also influence modal choices, the commodity composition of trade and the organization of production.

Against this background, understanding the determinants of freight rates and transport costs and how such costs influence trade flows, volume, patterns and structure is crucial and can assist policymakers in decision-making. Relevant determinants of freight rates and transport costs include, inter alia, distance, competition in shipping and port services, economies of scale, trade imbalance, capital costs

of infrastructure, and type and value of goods. This chapter provides a general overview of how vessel prices and maritime freight rates evolved in 2010 and early 2011.

B. THE PRICE OF VESSELS

The price of vessels is determined by construction costs and by market pressures derived from the demand for transport services and the supply of vessels, issues that are also discussed in detail in chapters 1 and 2.² Demand for newbuildings is a reflection of how shipowners perceive long-term demand, whereas demand for second-hand vessels may reflect short-term expectations.

Table 3.1 provides the newbuilding prices of all types of vessels that declined in 2010. Shipowners stopped placing new orders, cancelled existing orders and delayed taking delivery of vessels nearing construction; this is commonly referred to as "slippage". Shipyards reacted by lowering their prices to attract new orders, while ensuring that they had enough revenue to cover their operational expenditures. The largest percentage decline in vessel prices was for container vessels of 500 20-foot equivalent units (TEUs). In 2009, the price to build a new 500-TEU container ship cost on average \$28,000 per TEU, whereas a 12,000-TEU vessel cost \$9,500 per TEU: a 500-TEU vessel was almost 3 times more expensive per TEU than a 12,000-TEU

Table 3.1. Representative newbuilding prices, 2003–2010 (millions of dollars, average prices)

Type and size of vessel	2003	2004	2005	2006	2007	2008	2009	2010	Percentage change 2010/2009
Oil tanker – Handy, 50 000 dwt	28	35	42	47	50	52	40	36	-10.0
Oil tanker – Suezmax, 160 000 dwt	47	60	73	76	85	94	70	66	-5.7
Oil tanker – VLCC, 300 000 dwt	67	91	119	125	136	153	116	103	-11.2
Chemical tanker – 12 000 dwt	12	16	18	21	33	34	33	28	-15.2
LPG carrier – 15 000 m ³	28	36	45	49	51	52	46	41	-10.9
LNG carrier – 160 000 m ³	153	173	205	217	237	222	226	208	-8.0
Dry bulk – Handysize, 30 000 dwt	16	19	21	22	33	38	29	25	-13.8
Dry bulk – Panamax, 75 000 dwt	23	32	35	36	47	54	39	35	-10.3
Dry bulk – Capesize, 170 000 dwt	38	55	62	62	84	97	69	58	-15.9
Container – geared, 500 TEUs	13	18	18	16	16	21	14	10	-28.6
Container – gearless, 6 500 TEUs	67	86	101	98	97	108	87	75	-13.8
Container – gearless, 12 000 TEUs	n.a.	n.a.	n.a.	n.a.	154	164	114	107	-6.1

Source: Compiled by the UNCTAD secretariat on the basis of data derived from *Drewry Shipping Insight*.

vessel. In 2010, the 500 TEU vessel price decreased significantly more (a 28.6 per cent decrease) than the price of a 12,000 TEU vessel which registered a 6.1 per cent decrease.

Table 3.2 reveals a mixed result of the prices of second-hand vessels, with some segments performing better than others. Chemical tankers experienced the greatest fall in price, at 35 per cent. Conversely, small container ships of 500 TEUs increased in price by 50 per cent. The 500-TEU container ships, which are proving unpopular as newbuildings, were in demand as second-hand tonnage.

C. FREIGHT RATES

The price that a carrier, that is, a shipowner or charterer, charges for transporting cargo is known as the freight rate. The freight rate depends on many factors, including the cost of operating the vessel (for example, crew wages, fuel, maintenance and insurance); the capital costs of buying the vessel, such as deposit, interest and depreciation; and the cost of the shore-side operation, which covers office personnel, rent and marketing.³ Freight rates are not all-inclusive but a subject to numerous additions, for example, the bunker adjustment factor, the currency adjustment factor, terminal handling charges, war risk premiums, piracy surcharges,⁴ container seal fees,⁵ electronic release of cargo fees,⁶ late fees or

equipment shortage fees.^{7 8} Maersk Line, the largest liner shipping company, lists on its website 107 possible fees and surcharges.⁹ Surcharges may also vary considerably among transport providers and do not necessarily reflect the cost of the service being rendered. For instance, currency adjustment factor rates applied by different carriers varied in June 2011 by as much as 6 percentage points, from 10.3 per cent to 16.7 per cent of the freight.¹⁰

In general, freight rates are affected by the demand for the goods being carried and the supply of available vessels to carry the goods. In addition to the fluctuations in supply and demand, the bargaining power of the service user (the shipper), the number of competitors and the availability of alternative transport modes also affect price.

Most manufactured goods are shipped in containers by container vessels. The rapid growth in containerization over the last 20 years is the result of a combination of factors that includes dedicated purpose-built container vessels, larger vessels capable of achieving increased economies of scale, improved handling facilities in ports, and the increasing amount of components parts being carried in containers. When there is little demand for containerized goods, these container ships cannot carry other cargo (e.g. general cargo, dry bulk cargoes or liquids in an uncontainerized form) because of the specialist nature of the vessel. Lower demand and lack of alternative cargo have led some

Table 3.2. Second-hand prices for five-year-old ships, 2003–2010 (millions of dollars, end-of-year figures)

Type and size of vessel	2003	2004	2005	2006	2007	2008	2009	2010	Percentage change 2010/2009
Oil tanker – Handy, 45 000 dwt, 5 years old	25	35	44	47	40	51	30	26	-13.3
Oil tanker – Suezmax, 150 000 dwt, 5 years old	43	60	72	76	87	95	59	62	5.1
Oil tanker – VLCC, 300 000 dwt, 5 years old	60	91	113	116	124	145	84	86	2.4
Chemical tanker – 12 000 dwt, 10 years old	9	11	12	14	23	23	20	13	-35.0
LPG carrier – 15 000 m³, 10 years old	21	23	30	39	40	39	30	25	-16.7
Dry bulk – Handysize, 28 000 dwt, 10 years old	10	15	20	20	28	31	17	20	17.6
Dry bulk – Panamax, 75 000 dwt, 5 years old	20	35	40	39	83	70	31	25	-19.4
Dry bulk – Capesize, 150 000 dwt, 5 years old	..	..	..	..	..	..	47	54	14.9
Dry bulk – Capesize, 150 000 dwt, 10 years old	23	41	32	44	75	82	32	..	n/a
Container – geared, 500 TEUs, 10 years old	5	7	11	10	9	13	4	6	50.0
Container – geared, 2 500 TEUs, 10 years old	20	29	39	41	24	36	18	23	27.8
Container – gearless, 12 000 TEUs	25	34	43	44	43	45	24	28	16.7

Source: Compiled by the UNCTAD secretariat on the basis of data from *Dewry Shipping Insight*.

liner operators to adopt measures to absorb capacity by reducing vessel speed and taking longer routes or laying up vessels. In 2010, these measures led to relatively stable liner freight rates, compared with other sectors. In the tanker market, ship operators decided to use very large crude carriers (VLCCs) and ultra-large crude carrier (ULCCs) as floating storage facilities. The advantage of laying up tanker vessels is that the cargo can be quickly put into storage by anchoring the vessel at a suitable place. However, as soon as the price of oil rises, the cargo owner sells the cargo, believes the price is near its maximum and the vessel is then returned to the spot market. The ship is unlikely to be used again as floating storage unless an opportunity arises to purchase oil cheaply and the buyer has faith in higher prices. Other markets, such as the liquefied natural gas (LNG) market, have no alternative other than laying up vessels when cargo demand falls.

Freight rates can be obtained through an agent or shipbroker. The shipbroker, whose role is to bring together cargo and vessel owners, may calculate, publish and maintain indices on historical data. The following section covers developments in approximately three quarters of the estimated 90 per cent of world cargo transported by sea.

1. The tanker market

The tanker market is mainly concerned with the transportation of crude oil and petroleum products, which, taken together, represent approximately one third of world seaborne trade by volume. Tanker freight rates and the demand for world trade are inherently linked. Petroleum is a raw ingredient in some 70,000 manufactured products such as medicines, synthetic fabrics, fertilizers, paints and varnishes, acrylics, plastics and cosmetics, and falling demand or shortages in supply of these goods can cause tanker freight rates to fluctuate wildly and abruptly.¹¹ Tanker cargoes, that is, chemical products or crude oil, are often stored to help absorb sudden variations in price caused by stock depletion or renewal.

All tanker sectors

Freight rates for all tanker vessel sizes in 2010 performed better than the previous year, rising from 30 per cent to 50 per cent by the end of the year. This is not surprising, given that 2009 was a particularly bad year for tanker freight rates. However, freight rates in

general still remained depressed, compared with the years immediately preceding the peak of 2008 (see table 3.3 and figure 3.1). The best performing months of 2010 for freight rates were the first and last two months of the year, reflecting seasonal demands in the main energy consumption markets. In the first quarter of 2011, freight rates for all vessel types decreased by around 16 per cent, compared with the same period in 2010, although they remained around 23 per cent higher than the first quarter of 2009. During the course of 2010, 743 new tankers of various types were delivered, the largest numbers being chemical or product tankers (300), product tankers (167) and crude oil tankers (121). In 2011, the order book for new tankers to be delivered over the next three years stands at 611 vessels, totalling 105 million dwt and representing about 27.5 per cent of the existing fleet. Taking this high growth in potential supply into consideration, the outlook for 2011 does not augur well.

Table 3.4 illustrates average freight rates measured in Worldscale (WS), a unified measure for establishing spot rates on specific major tanker routes for various sizes of vessels. The table focuses on traditional benchmark routes, and is not intended to be exhaustive; for example, it does not cover the growing trade between many African countries and China. Trade between West Africa and China is expected to divert to the closer European market in 2011 because of disruptions to supply brought about by events in the Mediterranean, most notably in Libya. Another consequence of this is to push up freight rates on other routes servicing China, for example, from the Persian Gulf. The main loading areas indicated in the table are the Persian Gulf, West Africa, the Mediterranean, the Caribbean and Singapore, while the main unloading areas are East Asia, Southern Africa, North-West Europe, the Mediterranean, the Caribbean, and the East Coast of North America. The following sections describe developments by tanker types, in greater detail.

Very large and ultra-large crude carriers

Some of the world's largest ships are VLCCs and ULCCs, which offer the best economies of scale for the transportation of oil where pipelines are non-existent. VLCCs deliver vast quantities of crude oil that power manufacturing plants in many countries. VLCCs and ULCCs accounted for approximately 44 per cent of the world tanker fleet in dwt terms in 2010. Much of the world's oil exports that originate from the Persian

Table 3.3. Tanker freight indices, 2009–2011 (monthly figures)

2009	Lloyd's Shipping Economist				Exchange Baltic Tanker		
	>200	120–200	70–120	25–70	Clean	Dirty Index	Clean Index
October	41	62	76	96	89	557	515
November	47	78	81	100	94	588	439
December	53	77	111	121	124	671	528
Average	47	72	89	106	102	605	494
2010							
January	82	120	133	185	189	1 024	817
February	75	94	117	187	175	1 047	884
March	77	100	128	159	159	889	761
April	83	105	122	168	151	949	703
May	74	118	150	169	144	995	730
June	84	105	115	150	138	938	669
July	58	79	110	151	165	844	798
August	49	79	101	152	152	789	792
September	47	69	85	131	137	708	677
October	44	78	101	140	132	684	622
November	64	89	93	146	138	763	623
December	57	109	138	187	170	896	756
Average	66	95	116	160	154	877	736
2011							
January	52	67	88	154	134	842	635
February	59	76	99	123	136	660	642
March	63	106	135	188	175	965	749
April	48	89	109	178	170	927	836
May	49	84	102	150	177	822	882
June	52	70	98	141	148	750	706

Source: UNCTAD secretariat, based on information in *Lloyd's Shipping Economist* (a trade journal that specializes in maritime-related market data and reports), several issues; and in the *Baltic Tanker*, an index produced by the London Baltic Exchange, in which indices are reported for the first working day of the month.

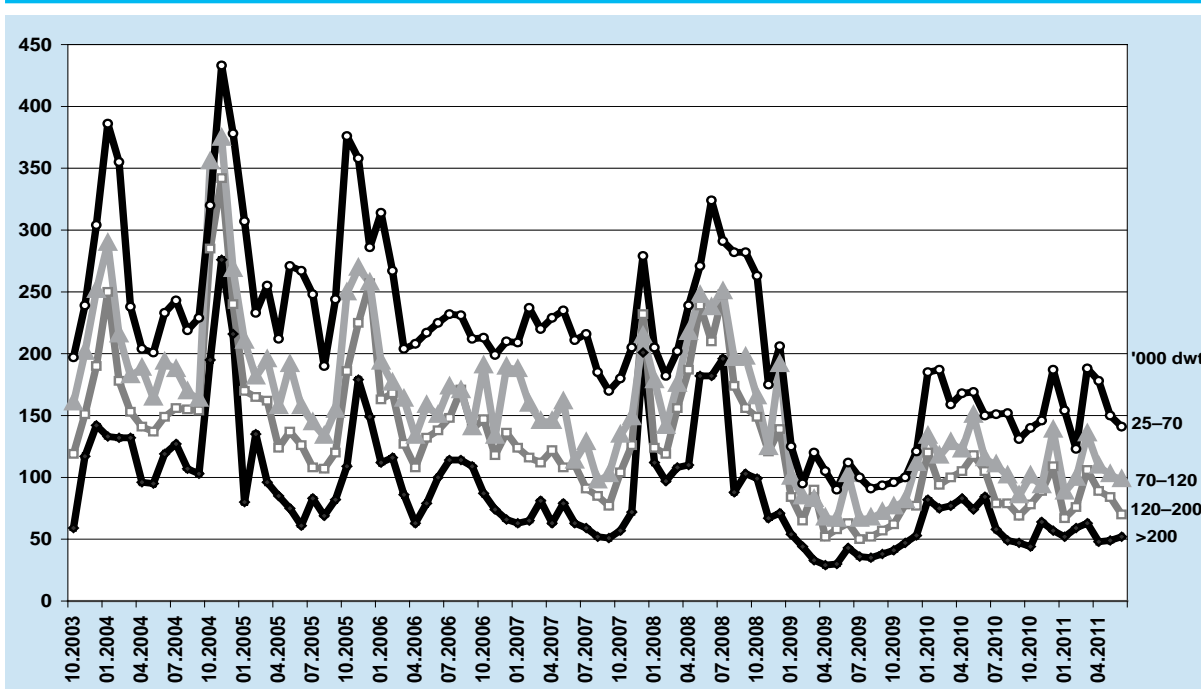
Note: The numbers in the second row, columns 2–5, refer to vessel size expressed in thousands of dwt.

Gulf are destined for the world's largest economies, the United States of America, China, Germany and Japan. Needless to say, freight rates on these sea routes are important indicators for global supply and demand.

The beginning of 2010 marked a yearly high for VLCC freight rates. While they were consistently higher in 2010 when comparing month-on-month figures with 2009, they declined over the course of 2010, diminishing shipowners' hopes of a sustained recovery in freight rates. From December 2009 to December 2010, freight rates from the Persian Gulf to Japan increased by almost 9 per cent to WS 61. However, this figure masks a turbulent ride in freight

rates. In December 2009, the freight rates were at WS 56 points and almost doubled in January 2010 to WS 104 points as a result of increased market sentiment and a high seasonal demand. In June 2010, rates on the same route stood at WS 95 points, but plummeted to 58 points the following month. Thereafter, freight rates continued to go down to a yearly low of WS 47 points in October 2010, before recovering at the end of the year. The falls were largely due to increases in supply of vessels brought about by new deliveries and less vessels ceasing to be used as offshore storage. The decrease in offshore storage occurred as traders seized the opportunity of a rise in oil prices to sell stock held in floating storage. Once they were sold,

Figure 3.1. Tanker freight market summary: various vessel sizes, 2003–2011



Source: UNCTAD secretariat, based on information from *Lloyd's Shipping Economist*, several issues.

Notes: (X = monthly figures; Y = indices)

The Baltic Exchange Tanker indices are reported for the first working day of the month. Ship sizes are expressed in deadweight capacity (in thousands of dwt).

the empty vessels were then returned to the spot market to seek new cargo, thus driving down tanker freight rates. The Persian Gulf–Europe route monthly WS rate increased by 67 per cent from December 2009 to December 2010, whereas that of the Persian Gulf–East Coast United States increased by just 3 per cent.

Average freight rates for VLCCs in 2010 were approximately \$36,083 per day, down slightly from \$38,533 per day in 2009 and significantly so from \$74,663 per day during the highs of 2008. Preliminary figures for 2011 show that freight rates continued to decline to approximately \$29,500 per day. Correspondingly, the price of a five-year-old VLCC in January 2011 declined to around \$79 million, compared with average annual prices of \$85.5 million in 2010 and \$144.7 million in 2008. In addition to declining freight rates, rising fuel prices also put pressure on shipowners' profits. The average monthly price of 380 centistoke fuel oil in Fujairah increased from \$444 per ton in September 2010 to \$623 per ton in February 2011.¹² At this point, freight rates for VLCCs decreased to around \$11,000 per day, forcing many owners to operate at a daily loss.

Suezmax tankers

Suezmax ships were named because they were the maximum-sized tankers that could transit the Suez Canal; their capacity ranges between 125,000 and 200,000 dwt.¹³ There is a significant demand for Suezmax vessels on other routes that do not include the Suez Canal, for example from West Africa to North-West Europe, and to the Caribbean/East Coast of North America, as well as across the Mediterranean. Some 14 sea routes account for around three quarters of total demand for Suezmax cargoes.¹⁴

Freight rates for Suezmax tankers in 2010 fared relatively well from January to May and then declined until September before recovering most of their losses by year's end. The average Suezmax time charter rate was around \$35,800 per day from 1997 to 2008.¹⁵ In 2010, the average time charter earnings for a Suezmax vessel fell to \$25,967 per day, down from \$27,825 per day in 2009, which had already fallen from \$46,917 in 2008. The one-year charter rates for a five-year old Suezmax vessel climbed by 1.7 per cent over the course of 2010 to reach around \$24,000 per day in January 2011, thus faring better than the larger

Table 3.4. Tanker market summary: clean and dirty spot rates, 2009–2011 (Worldscale)

Vessel type	Route	2010												% change 2009/2010	2011						
		Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov		Dec	Jan	Feb	Mar	Apr	May	Jun
VLCC/ULCC (200,000 dwt+)	Persian Gulf–Japan	56	104	71	84	90	72	95	58	51	48	47	75	61	8.9	48	74	63	50	51	54
	Persian Gulf–Republic of Korea	53	88	76	76	91	68	81	55	50	46	56	67	56	5.7	50	55	60	49	49	54
	Persian Gulf–Europe	34	70	..	57	66	52	58	42	42	40	34	42	57	6.8	34	37	..	38	38	43
	Persian Gulf–Caribbean/East Coast of North America	35	65	52	56	58	53	63	48	39	35	30	44	36	2.9	32	37	42	38	37	39
	Persian Gulf–South Africa	..	..	..	89	..	80	..	..	..	..	..	66	..	52	..	..	..	..	..	..
Suezmax (100,000–160,000 dwt)	West Africa–North–West Europe	77	127	100	104	114	125	110	85	78	64	80	95	118	53.2	63	75	107	83	84	..
	West Africa–Caribbean/East Coast of North America	73	114	97	98	112	118	103	73	74	65	78	81	103	41.1	60	72	101	79	81	66
	Mediterranean–Mediterranean	83	127	103	115	110	129	102	96	84	72	97	101	113	36.1	71	82	130	86	80	74
	Aframax (70,000–100,000 dwt)	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Handy size (less than 50,000 dwt)	North–West Europe–North–West Europe	115	137	113	126	116	141	100	108	107	90	103	94	162	40.9	88	97	122	95	99	94
	North–West Europe–Caribbean/East Coast of North America	100	135	117	110	..	153	104	103	115	..	..	85	120	20.0	131	90	135	85	90	84
	Caribbean–Caribbean/East Coast of North America	112	173	146	127	123	167	131	137	115	99	98	127	146	30.4	125	98	125	123	104	98
	Mediterranean–Mediterranean	117	124	95	135	114	160	110	108	107	87	112	92	138	17.9	75	97	122	95	99	94
	Mediterranean–North–West Europe	108	121	92	119	110	151	102	103	105	84	108	94	133	23.1	69	103	135	85	90	84
	Indonesia–East Asia	95	136	118	116	99	127	114	111	98	92	91	102	111	16.8	88	87	110	115	99	98
	Mediterranean–Mediterranean	120	..	164	130	158	173	..	146	139	129	132	126	168	40.0	140	116	134	155	138	130
	Mediterranean–Caribbean/East Coast of North America	111	171	183	139	145	161	145	138	131	119	118	121	146	31.5	134	111	147	139	133	116
	Caribbean–East Coast of North America/Gulf of Mexico"	116	176	181	151	146	163	129	142	138	112	117	119	200	72.4	155	105	174	155	139	128
	All clean tankers	Persian Gulf–Japan	111	140	123	118	106	124	112	124	144	130	101	99	125	12.6	107	98	105	123	129	111
Persian Gulf–Japan		121	151	139	124	126	143	123	128	161	141	110	120	128	5.8	119	111	122	142	145	124
Caribbean–East Coast of North America/Gulf of Mexico"		99	149	139	159	137	119	127	169	135	129	135	133	158	59.6	133	120	190	191	171	152
Singapore–East Asia		158	145	155	144	143	215	240	161	155	..	183	165	193	22.2	139	135	159	185	..	177
..	

Source: UNCTAD secretariat, based on Dewry Shipping Insight, various issues.

Note: Two dots (..) means that no rate was reported. The classification of ship size in this table reflects the source used, and may vary when compared to other parts of this publication.

VLCCs. Average Suezmax freight rates on the West Africa and Caribbean/East Coast of North America route plunged from \$36,000 per day in the first half of 2010 to \$19,000 per day in the second half. This came at a time when the region's biggest oil exporter, Nigeria, began regaining lost ground. Nigeria's oil output, which peaked at 2.47 million barrels per day (mbpd) in early 2006, declined to 1.68 mbpd in July 2009 before increasing to 2.15 mbpd in the third quarter of 2010.¹⁶ In early 2011, output began to fall back towards the 2 mbpd threshold. Around two thirds of Nigeria's oil exports is bound for the United States, with the remainder destined for Europe.

Despite the fluctuating fortunes of the Suezmax market during 2010, the price of a five-year-old Suezmax vessel rose by around 5 per cent over the course of the year to reach \$62 million. This modest increase during a period of uncertainty reflects a positive market mood for the Suezmax segment. During previous economic downturns, Suezmax vessels have been able to reap benefits at the expense of the larger VLCCs, as importers typically demand smaller cargo volumes. Presently, the oversupply of Suezmax vessels is hampering a recovery in freight rates. However, the political turmoil in Libya has led importers to seek alternative sources from further afield, leading to the absorption of more capacity and pushing freight rates higher.

Aframax tankers

Aframax tankers offer a large carrying capacity with lower overheads than those of VLCCs or Suezmax vessels. The term is derived from the maximum-sized vessel (80,000–120,000 dwt) that is permitted under the average freight rate assessment procedure for adjusting long-term oil freight contract rates. They are often deployed for trading within and between the following regions: North-West Europe, the Caribbean, the East Coast of North America, the Mediterranean, Indonesia and East Asia.

In 2010, freight rates for all Aframax vessels generally fared well. From December 2009 to December 2010, all routes climbed between 16 and 40 per cent. The best performing region was Northern Europe. January 2010 was a particularly good month for all sectors and May represented a peak in all Aframax sectors. However, the following month witnessed significant falls as demand fell over mounting concerns about the Greek debt crisis and the dollar strengthened against the Euro. Pessimism over the United States recovery and the Chinese Government's efforts to curb rising

housing costs also added to concerns about the global economy. This pushed crude oil prices to a temporary two-year low before resuming their uphill climb. From \$41.9 million in 2009, the annual average price of a five-year-old Aframax vessel rose 6 per cent in 2010 to \$44.5 million. This increase reflected the preference for mid-sized tankers in an uncertain market. The one-year charter rates for a five-year-old 80,000 dwt tanker climbed by around 2.4 per cent in 2010 to reach around \$16,800 per day in January 2011.

Handysize tankers

Handysize tankers are those of less than 50,000 dwt that have a draft of around 10 metres. These vessels are most suited for calling at destinations with depth and length constraints. Table 3.4 shows the freight rates for these types of ships deployed intra-Mediterranean and from the Mediterranean to the Caribbean and the East Coast of North America, plus trades from the Caribbean to the Gulf of Mexico and the East Coast of North America. Freight rates on all three routes increased between 31 and 72 per cent in 2010, after a particularly bad performance in 2009. Freight rates for Handymax vessels have remained depressed. The Caribbean–East Coast of North America–Gulf of Mexico route, the worst performing route for this segment in 2009, experienced a dramatic rise. A five-year-old 45,000 dwt Handysize vessel, which cost on average \$30 million in 2009, declined by 13 per cent to \$26 million in 2010.

All clean tankers

Product tankers are specialized cargo-carrying vessels that carry various chemicals, such as naphtha, clean condensate, jet fuel, kerosene, gasoline, gas oil, diesel, cycle oil and fuel oil. Unlike crude oil tanker markets, which primarily transport cargo from its origin to the point of refinery, this sector handles the processed cargo that leaves the refinery destined for consumption. The chemical tanker fleet is divided into three specifications established by the International Maritime Organization (IMO). The smallest market, accounting for less than 3 per cent of vessels, is the IMO 1 specification, which trades in the most hazardous cargoes such as chlorosulphonic acid that is used in detergents, pharmaceuticals, pesticides, and dyes, and trichlorobenzene, more commonly known as TCB, a solvent used in herbicides and pesticides.¹⁷ The largest sector, with some two thirds of the fleet, trades primarily in pure chemical cargoes such as styrene, xylene and easychems, and is known as IMO 2. Around one third of chemical tankers are

classified as IMO 3, or double-hull product tankers, trading only in chemicals and vegetable oils.

Freight rates on all four routes shown in table 3.4 increased between 6 per cent and 60 per cent in 2010, with the Caribbean–East Coast of North America/Gulf of Mexico route increasing the most. On the Persian Gulf–Japan route, freight rates oscillated between 100 and 150 WS throughout the year.

While 2009 was a low point for product tanker earnings, matters only slightly improved in 2010. May 2010 marked a bottom point for average time charter equivalent earnings on the Caribbean–East Coast of North America/Gulf of Mexico route at \$7,300 per day. The one-year charter rates for a five-year old 30,000 dwt clean tanker climbed by around 21 per cent in 2010 to reach \$12,800 per day in January 2011. The five-year-old 30,000 dwt clean tankers were the best performing type of tanker in 2010, reflecting a strong demand for small shipments of chemicals.

Liquefied natural gas tankers

Natural gas has many uses, such as generating electricity in large power plants, providing cooking and heating for domestic homes, fuelling vehicles (particularly in Pakistan, Argentina, Brazil, the Islamic Republic of Iran and India) and producing ammonia (with China as the main producer) for fertilizers. Cooling natural gas to minus 162°C turns it into a liquid, thereby making it easier to transport by vessel. A typical LNG tanker can carry around 160,000 cubic metres (cbm) of natural gas on a single voyage. The largest LNG tankers (Q-Max) have a capacity of 266,000 cubic metres, but their size limits which ports they can operate between. Because gasification and re-gasification are expensive, only a few countries are involved in this market. With approximately one quarter of the world's market share of LNG exports, Qatar is the single largest of 19 LNG-exporting countries. In 2010, Peru became the latest country to join this small group of specialized exporters. The number of countries importing LNG stands at 23, with Asia being the largest importing region. However, a lack of pipeline infrastructure linking LNG plants to domestic users limits the demand for gas.¹⁸ The single largest LNG importer is Japan. The tragic nuclear accident at the Fukushima Daiichi nuclear power plant caused by the March 2011 earthquake and tsunami is likely to increase the country's need to import more LNG. Some analysts estimate that an additional 2 million cbm could be needed in order to compensate for the cessation in electricity output

from the affected nuclear power plants.¹⁹ Previously, when the Kashiwazaki-Karima nuclear power plant shut down in 2007 because of another earthquake, LNG spot rates soared.²⁰

The conversion of existing oil tankers into floating re-gasification vessels, at a fraction of the cost of building a dedicated gasification plant, is helping the number of LNG importers to grow. In 2010, Dubai commissioned its first floating re-gasification terminal at Jebel Ali. In Qatar, the RasGas Train-7, with a capacity of 7.8 million tons per year, became operational in February 2010. The BG Group announced that it was considering expanding its LNG facilities at Curtis Island in Queensland, Australia, to a maximum of five trains.

Because of the high investment requirement in building plants and vessels, LNG shipments tend to be negotiated on long-term contract of up to 20 years. For instance, in 2010 the BG Group signed a sales agreement with Tokyo Gas for the supply of 1.2 million tons of LNG a year for 20 years principally from its Queensland Curtis LNG facility, near Gladstone in Queensland, Australia. However, the number of LNG trades on the spot market or short-term contracts in 2010 increased to 727 from 491 in the previous year.²¹ Freight rates for LNG vessels in 2010 remained low, with an average of around \$35,000 per day, down from \$50,000 per day in 2009. By the middle of 2011, the average one-year charter rates for LNG tankers increased to \$100,000 per day. Prices for new LNG tankers fell by 8 per cent in 2010, bringing the price back to near 2005 levels. A limited supply of LNG vessels and an increase in demand is expected to keep freight rates firm for the short-term.

The Capital Link LNG/LPG Index, which tracks the market value of major United States-listed shipping companies (for example, Golar LNG, StealthGas Inc. and Teekay LNG) involved in the LNG/LPG sector increased by 50 per cent in 2010 from 2,088.39 points at the start of the year to 2,992.17 points in December. In April 2011, the index climbed further to 3,461.13 points, indicating a positive outlook for LNG among investors.

Summary of tanker freight rates

In sum, the tanker freight rates rebounded from the effects of the global financial crisis, albeit in most cases only slightly. Tanker freight rates, excluding LNG, remain depressed in comparison with their long-term average. Additions to the tanker fleet continue to

have an effect on destabilizing prices, while demand remains uncertain. The immediate effects of the global economic crisis have been reflected in the falling price of newbuildings for all tanker vessel types. Because the tanker sector is providing the fuel to drive industrial centres, and is a key component of many manufactured goods, it is heavily dependent on the global economic outlook and the demand for those goods. While increasing vessel supply may hamper short-term growth, the future for this market segment looks more positive with the increased demand that will come from a growing global population enjoying a higher disposable income that will be used to consume more products and travel services.

2. The main dry bulk shipping market

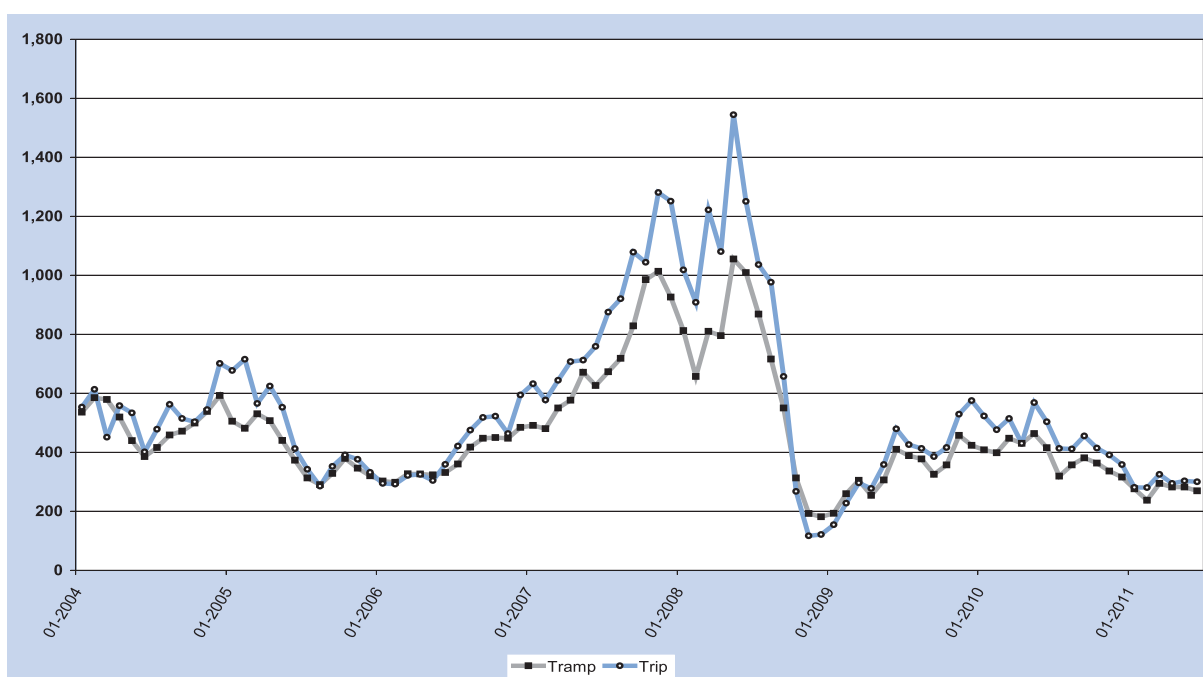
The main dry bulk shipping market consists primarily of five cargo types: iron ore, grain, coal, bauxite/alumina and phosphate. Many of the major cargo types are raw ingredients such as coal that are used either to generate power or to drive manufacturing activities. The main dry bulk sector accounts for just over one quarter of the total volume of cargo transported by sea. The demand for major dry bulk cargoes increased by around 11 per cent in 2010 but freight rates undulated.

Dry bulk freight rates

The dry bulk sector improved in 2010 over the previous year, with freight rates up 12 per cent on the tramp time and 16 per cent on the tramp trip. Dry cargo tramp time charter refers to vessels chartered for a period of time and dry cargo tramp trip charter refers to a charter for a specific voyage. Freight rates for dry bulk vessels were still down by around one third, compared with their 2007 and 2008 levels (see figure 3.2 and table 3.5). Freight rates for dry bulk vessels, which were buoyant during the first half of 2010, declined on average by a quarter for the second half of the year.

Freight rates for Capesize vessels chartered on the Far East–Europe route were \$57,587 per day in January 2010 and declined to \$17,358 per day in early 2011. In the opposite direction, from Europe to Asia, freight rates fell from \$20,664 per day in January 2010 to minus \$3,371 per day, as shipowners subsidized charterers' repositioning costs. Other factors have limited cargo availability, such as events in the world's number one iron ore exporting country, Australia (flooding in the coal-producing regions, followed by cyclones in the iron-ore exporting regions), and in the world's number three iron ore exporter, India, where Chhattisgarh and Orissa States have imposed a ban on ore exports.²²

Figure 3.2. Dry cargo freight indices, 2004–2011



Source: UNCTAD secretariat, based on various issues of *Shipping Statistics* and *Market Review*, produced by the Institute of Shipping Economics and Logistics.

Table 3.5. Dry cargo freight indices, 2007–2011

Period	Dry cargo tramp time charter (1972 = 100)					Dry cargo tramp trip charter (1985 = 100)				
	2007	2008	2009	2010	2011	2007	2008	2009	2010	2011
January	491	812	193	408	276	632	1 018	154	523	281
February	480	657	259	398	237	577	908	227	476	280
March	550	810	305	447	294	644	1 221	296	514	325
April	576	795	254	430	282	707	1 080	277	430	294
May	671	1 055	306	463	282	712	1 544	358	568	303
June	626	1 009	410	415	269	759	1 250	479	503	300
July	673	868	388	319		875	1 036	426	413	
August	718	716	377	357		920	976	413	411	
September	828	550	325	381		1 078	657	385	455	
October	985	313	357	363		1 044	267	416	414	
November	1 013	192	457	336		1 280	117	529	391	
December	926	181	423	316		1 251	121	575	358	
Annual average	711	663	338	386	273	873	850	378	455	297

Source: UNCTAD secretariat, based on various issues of *Shipping Statistics and Market Review* produced by the Institute of Shipping Economics and Logistics.

Note: All indices have been rounded to the nearest whole number.

Chinese imports of iron ore represent around 63 per cent of the iron ore market transported by sea, which makes this market a major employer of Capesize vessels.²³ Iron ore freight rates from Brazil to China started 2010 at \$29.83 per ton – more than double the January 2009 figure of \$13.90 per ton – but still half the \$64.05 per ton in 2008. In 2010, rates on this route declined by around 40 per cent. Also iron ore freight rates declined at a similar percentage on the Western Australia–China route rates. The falling freight rates for dry bulk carriers helped boost Chinese demand for foreign iron ore by 8 per cent per annum in 2010; demand in 2011 is estimated at 652.1 million tons.

The time charter earnings of a Capsize vessel in 2010 averaged \$40,308 per day, up from \$35,283 in 2009. By February 2011, the corresponding figure had fallen to \$17,500 per day. During 2008, the average earning for a Capesize vessel was \$116,175 per day and at one point, rates surpassed \$300,000 per day. At a time of record profits for the biggest mining companies on the back of rising commodity prices, shipowners are experiencing some of the lowest freight rates since 2002.

Dry bulk time charter

In 2008, 45 per cent of charters were for short-term contracts of less than six months. This rose to 52 per cent in 2009 and 60 per cent in 2010. Whereas 18 per cent of charters were for long-term contracts of more than 24 months in 2008, this declined to between 8

and 9 per cent in 2009 and 2010. This may show that shipowners generally perceived the market as volatile, while expecting that rates would increase, or at least, remain higher than operating costs. Estimated rates for 12-month period charters (prompt delivery) were relatively stable for most of 2010, but in the last two months of 2010, rates began to slide. Capesize ships of 200,000 dwt aged five years fetched \$39,700 per day at the start of 2010, compared with \$19,700 per day for the same period in 2009; by the end of the year, the figure stood at \$26,000 per day. By February 2011, the rate had fallen further to \$18,000 per day. The best-performing sector was Handysize vessels of 28,000 dwt aged 10 years, which experienced a decrease of 14.8 per cent in rates between December 2009 and December 2010.²⁴

Declining freight rates affected the price of vessels, but not dramatically. A five-year-old Capesize vessel which cost an average \$123.2 million in 2008 and \$47.3 million in 2009, rose 15 per cent to \$54 million in 2010. By February 2011, the price had fallen back to 2009 levels, at \$48 million. Given the high rate of delivery of newbuildings in 2011, the price is likely to slide further.

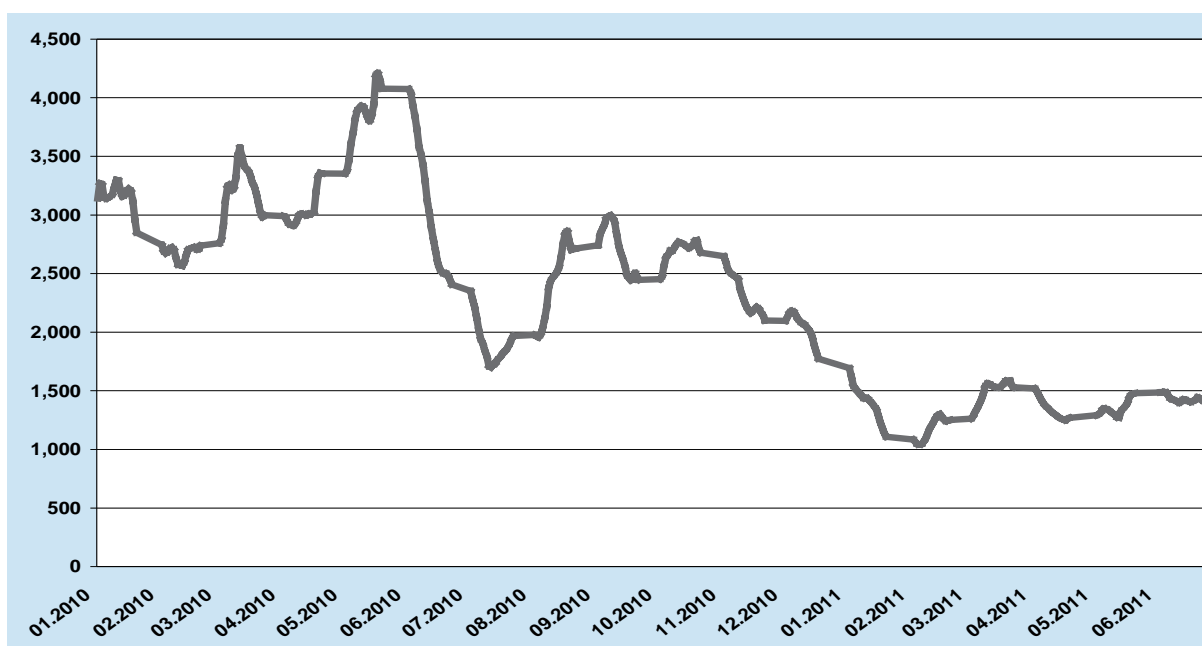
Dry cargo freight rates, which suffered a disastrous collapse in 2008, made a significant recovery by the end of 2009. However, it was short-lived and by June 2010, had petered out. To illustrate this, the BDI), which measures freight rates for dry bulk transported on selected maritime routes, started 2010 at 3,140

points and ended the year at 1,773 points (see figure 3.3).²⁵ From the end of May 2010 to the middle of July 2010, the BDI lost more than half its value as concern over the recovery of the global economy mounted. A partial rally occurred in August 2010 before the Index continued its downward trajectory. Between May 2010 and May 2011 the BDI declined by around two thirds. The most significant recent development in the dry bulk sector was the filing for bankruptcy protection in January 2011 of the second-largest shipping company in the Republic of Korea, Korea Line. With an owned fleet of 42 ships, over 100 vessels chartered in and three on order, the impact of the company's failure on other shipowners will be significant. Shipowners Eagle Bulk Shipping and Navios Maritime Partners were two companies whose chartering portfolios with Korea Line represented about 25 and 13 per cent of their business, respectively.

Freight rates for Capesize vessels on the major routes suffered a poor 2010, primarily because this sector is experiencing the strongest vessel oversupply of all the dry bulk sectors.²⁶ In 2011, an estimated 200 Capesize vessels, spanning some 35 miles end to end, will leave shipyards to join the existing 1,100-strong fleet.²⁷ As reported in chapter 2, the world's largest ore carrier, the 402,347 dwt Vale Brasil, was expected for delivery in 2011. Thus, not only are the numbers of ships increasing, but also their size.

Shipping companies are not the only ones to suffer. There is presently an oversupply of shipyards. If they are to survive, many of these shipyards need to diversify into higher-end production, for example, that of special-use vessels – multi-purpose vessels, cruise ships or specialized vessels carrying single cargoes such as LNG – or move into other manufacturing areas. However, there is no guarantee that diversification is the answer, since the higher-end shipyards in Odense, Denmark, and Mitsubishi Heavy Industries in Kobe, Japan, are both due to close in 2012.²⁸ ²⁹ While the closure of a shipping company will result in the loss of jobs at the company's headquarters and in various other locations, including where it takes its seafarers (see chapter 6 for more details on which countries man the world's fleet), the closure of a shipyard will likely have a bigger impact on a single community, as shipyards tend to employ large workforces and buy local services. For example in Tuzla, Turkey, some 48 shipyards and various subcontracting firms employed around 30,000–35,000 workers in 2008; since then, the number has fallen to 8,000 workers (2011).³⁰ The number of shipyards in operation declined by 60 per cent from 2008 to 2011. Torgem Shipyard, for example, is reportedly operating at 20 per cent capacity owing to a series of cancelled orders, lowering employment levels at the shipyards from 270 to a mere 29.³¹

Figure 3.3. Baltic Exchange Dry Bulk Index, 2010–2011 (index base year 1985, 1000 points)



Source: UNCTAD, based on London Baltic Exchange data.

Despite the cancelled orders for newbuildings and dire predictions for shipyards in 2010, there was an average of 69 dry bulk vessels totalling 6.2 million dwt being delivered every month, compared with an average of 16 vessels of 1.6 million dwt over the decade beginning in 2000.³² Surprisingly, orders for new vessels have not completely dried up, with around 55 new orders for dry bulk carriers being placed each month and 1,510 ships of 123 million dwt – approximately 23 per cent of the present fleet in dwt terms – expected to be delivered in 2011.

Reasons for the continued new orders could include renewed confidence in the world economy, lower vessels prices or attractive terms being offered by shipyards. Dry bulk vessels are one of the least complicated types to build, and new shipyards, which sprang up in the boom years of high commodity prices, entered this market and kept the prices of vessels low.

Summary of dry bulk freight rates

Demand for major dry bulk services rose about 11 per cent in 2010, with increased demand for raw materials from developing countries, most notably China. Further, in 2010 there was strong growth in steel, forest products, coke and potash. Fine weather also contributed to a good growing season for agricultural products, which also helped the sector. In particular, global imports of sugar increased 10 per cent, and rice, 6 per cent.³³ However, the carrying capacity of vessels servicing this market grew by 16 per cent, resulting in falling freight rates. The oversupply of vessels is the main cause of lower dry bulk freight rates, brought about by overordering during the boom years. The oversupply of shipyards is likely to continue to drive down the price of newbuildings and in particular, dry bulk vessels. Some shipowners will be attracted by the lower prices and will take the opportunity to modernize their fleet. However, unless their old vessels are sold for scrap, there will still be too many vessels, which will mean freight rates will continue to remain low.

3. The liner shipping market

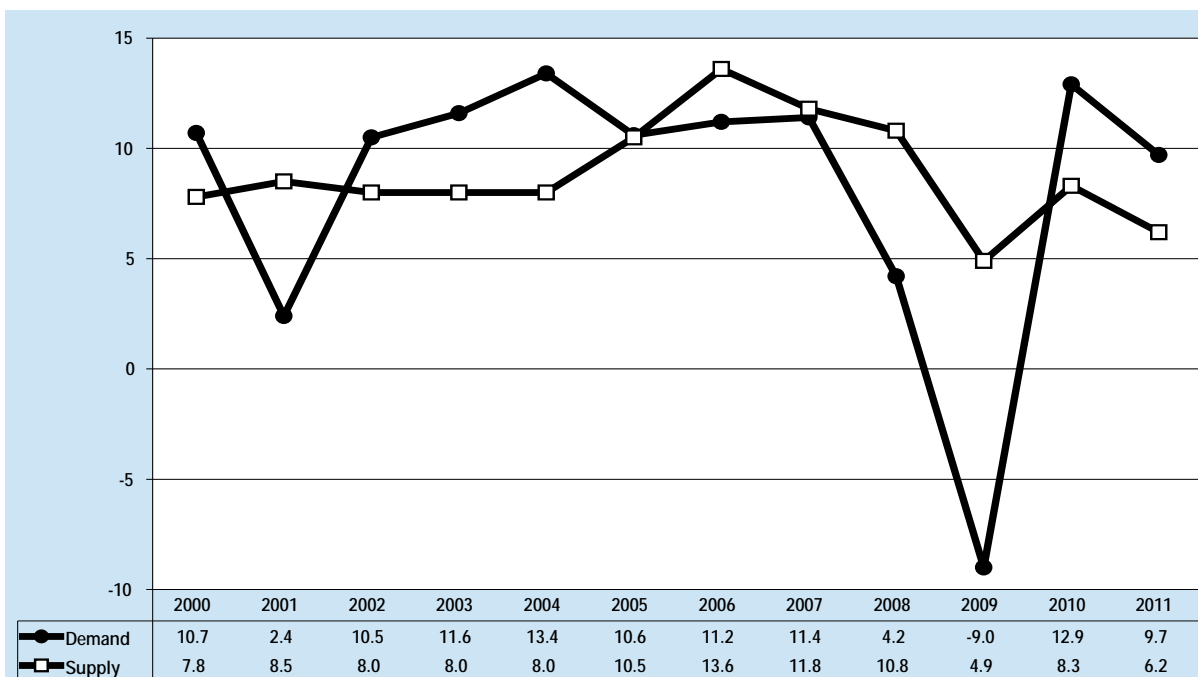
Liner shipping services operate vessels between fixed ports on a strict timetable. Liner services can be operated by one company or by a group of companies known as an alliance or a consortium.

Costs and revenues are shared in accordance with each company's contribution. Liner shipping companies primarily operate container ships, which carry containerized cargo. In 2010, total world containerized trade was estimated at 1.4 billion tons – an increase of around 17.6 per cent over the previous year. Container trade volumes amounted to an estimated 140 million TEUs in 2010, an increase of around 12.9 per cent from the 124 million TEUs recorded in 2009. Approximately 17 per cent of world seaborne trade in volume terms (tons) is transported in containers (see chapter 1 for more details). The following sections examine developments in the liner shipping market and freight rates.

The rapid growth in containerization over the last 20 years is due to a combination of factors such as dedicated purpose-built container vessels, larger vessels capable of achieving larger economies of scale, improved handling facilities in ports and increasing amounts of components parts being carried in containers. Although 39 per cent of newbuilding orders were not delivered, the world's fleet of container ships increased by 14.7 million dwt in 2010, or 8.7 per cent, to reach 184 million dwt, approximately 13.2 per cent of the total world fleet. In all likelihood, these vessels will be built, but delivery will be delayed. At the beginning of 2011, there were 4,868 container ships, with a total capacity of 14.1 million TEUs (see chapter 2 for more details on the container fleet).

Developments in the liner trade

In 2009, the top 30 liner carriers reported their worst financial performance ever, with an estimated collective loss of \$19.4 billion from a reported \$5 billion profit the year before.³⁴ In 2010, the same liners are estimated to have earned a combined \$17 billion, whereas profits are forecast to be about \$8 billion in 2011.³⁵ The turnaround is attributable to the following factors: methods adopted by the carriers, which absorbed capacity (for example, they removed some vessels by laying them up and added other vessels to existing routes with orders to sail at a lower speed); a fall in fuel prices, in some cases by as much as 30 per cent; and most importantly, an increase in demand from merchandise trade. Figure 3.4 illustrates trends in container shipping supply and demand in recent years. The growth in demand for liner shipping has rebounded significantly from the gloom of 2009, when concern about the global economic crisis pulled apart

Figure 3.4. Growth of demand and supply in container shipping, 2000–2011 (annual growth rates)


Source: Compiled by the UNCTAD secretariat on the basis of data from *Clarkson Container Intelligence Monthly*, various issues.

Note: Data refer to total container-carrying fleet, including multi-purpose vessels and other vessels with some container-carrying capacity. The data for 2011 are forecasted figures.

supply and demand to their widest point. For the first time since 2005, growth in demand for liner services has outstripped the growth in supply. Estimates for 2010 show that the difference between the growth in supply and demand reached its widest point at 4.6 percentage points. The forecast for 2011 is that the gap between these two will narrow to 3.5 percentage points, with supply and demand growth being in line with and more stable freight rates.

The idleness of the container fleet, which was around 11.7 per cent, representing some 600 vessels at the start of 2010, declined to 1.9 per cent at the beginning of 2011. Container trade grew by an estimated 12.1 per cent in 2010 after its first-ever contraction in 2009. North–South trade lanes grew about 12.2 per cent because of a growing intra-Asian trade. Freight rates for containers reached an all-time high in early 2010. Freight rates from Shanghai to Europe were \$2,164 per TEU in March 2010 and ended the year at \$1,401 per TEU.³⁶

Container freight rates

Container freight rates in 2010 witnessed a major transformation brought about by an upward trend in exports and measures introduced by operators to

constrain vessel supply. Table 3.6 shows the average yearly rates provided since 2001 by the Hamburg Shipbrokers' Association, also known by its German acronym, VHSS. The table also includes the monthly charter rates for container ships in 2010.³⁷ It is clear that the average yearly freight rates in the liner market segments performed significantly better in 2010 than 2009, but were still very much below pre-crisis levels. Freight rates climbed steadily in 2010. The smallest container ships, 200–299 TEUs, ended the year up 29 per cent, whereas the largest ships in the table, 1,600–1,999 TEUs, ended the year up 130 per cent. These rises also continued well into 2011.

Figure 3.5 shows the New ConTex Index, which is made up of combined rate freight rates for various container trades.³⁸ The index shows the dramatic two-thirds decline in container charter rates from mid-2008 to April 2009 and its subsequent rebound to near three quarters of the 2008 level.

Ownership of liner vessels is dominated by German shipowners, who control about two thirds of the container charter market and one third of the total available capacity.³⁹ Table 3.7 shows the development of liner freight rates on cargoes loaded or discharged by German-owned container vessels for the period

Table 3.6. Container ship time charter rates (dollars per 14-ton slot/day)

Ship type (TEUs)	Yearly averages											
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	
Gearless												
200–299	15.7	16.9	19.6	25.0	31.7	26.7	27.2	26.0	12.5	12.4	14.6	
300–500	14.7	15.1	17.5	21.7	28.3	21.7	22.3	20.0	8.8	9.9	12.9	
Gearless/gearless												
2 000–2 299	8.0	4.9	9.8	13.8	16.4	10.5	11.7	10.0	2.7	4.8	7.4	
2 300–3 400 ^a		6.0	9.3	13.2	13.0	10.2	10.7	10.7	4.9	4.7	8.5	
Gearless/gearless												
200–299	17.8	17.0	18.9	27.0	35.4	28.0	29.8	32.1	16.7	18.3	22.5	
300–500	14.9	13.4	15.6	22.2	28.8	22.0	21.3	21.4	9.8	11.7	16.5	
600–799 ^b		9.3	12.3	19.6	23.7	16.6	16.1	15.6	6.6	8.4	12.1	
700–999 ^c		9.1	12.1	18.4	22.0	16.7	16.9	15.4	6.0	8.5	13.0	
800–999 ^d									4.9	6.3	11.9	
1 000–1 260	8.8	6.9	11.6	19.1	22.6	14.3	13.7	12.2	4.0	5.9	9.1	
1 261–1 350 ^e									3.7	4.9	8.5	
1 600–1 999	8.0	5.7	10.0	16.1	15.8	11.8	12.8	10.8	3.5	5.0	7.5	
Monthly averages for 2010												
Ship type (TEUs)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Gearless												
200–299	10.4	11.7	13.0	10.4	12.7	11.9	10.8	14.9	10.9	14.7	14.3	13.5
300–500	9.1	8.1	8.3	8.5	9.3	9.6	10.0	10.9	11.3	11.1	11.8	11.4
Gearless/gearless												
2 000–2 299	2.6	2.4	2.5	2.8	3.2	5.2	6.2	6.9	8.1	6.6	5.9	5.4
2 300–3 400 ^a	2.1	2.6	3.0	5.2	5.5	7.2	7.7					
Gearless/gearless												
200–299	16.6	15.2	15.6	15.6	17.4	20.2	17.5	20.3	18.2	21.9	19.6	21.7
300–500	8.8	9.4	9.7	11.6	9.7	9.8	12.6	14.2	13.0	14.9	14.7	12.2
600–799 ^b	6.1	5.9	7.4	6.2	7.2	8.5	8.5	10.0	9.9	9.8	11.4	10.3
700–799 ^c	6.6	6.2	6.3	6.6	6.9	8.2	9.5	9.3	10.1	10.4	10.8	11.2
800–999 ^d	6.4	6.1	5.2	5.3	6.1	7.0	8.3					
1 000–1 260	4.0	3.8	4.0	4.3	4.8	6.2	6.5	7.3	7.6	7.6	7.4	7.3
1 261–1 350 ^e				3.8	4.2	5.3	6.3					
1 600–1 999	3.0	3.3	3.0	4.5	3.4	5.0	5.9	6.8	7.0	6.4	5.5	6.8

Table 3.6. Container ship time charter rates (dollars per 14-ton slot/day) (concluded)

Ship type (TEUs)	Monthly averages for 2011					
	Jan	Feb	Mar	Apr	May	Jun
Gearless						
200–299	13.3	14.4	14.9	15.6	15.7	13.8
300–500	11.3	12.3	13.4	14.4	14.3	14.1
Gearled/gearless						
2 000–2 299	6.6	7.3	7.4	8.2	7.6	7.9
2 300–3 400 ^a	7.6	8.5	9.1	8.6	8.7	8.1
Gearled/gearless						
200–299	22.1	22.9	22.5		27.2	24.7
300–500	17.2	16.1	17.2	15.5	15.3	18.2
600–799 ^b	10.4	12.9	12.6	12.4	13.4	12.7
700–999 ^c	11.9	12.7	13.4	13.8	13.5	13.3
800–999 ^d	10.3	12.7	12.2	12.3	12.4	12.1
1 000–1 260	7.5	8.7	9.9	10.1	10.4	10.3
1 261–1 350 ^e	7.6	8.0	8.9	9.4	9.5	9.6
1 600–1 999	6.7	7.5	7.9	7.8	8.0	8.0

Source: Compiled by the UNCTAD secretariat, from the Hamburg Index produced by the Hamburg Shipbrokers' Association, available at <http://www.vhss.de>; and from *Shipping Statistics and Market Review*, vol. 52, no. 1/2 2010: 54–55, produced by the Institute of Shipping Economics and Logistics.

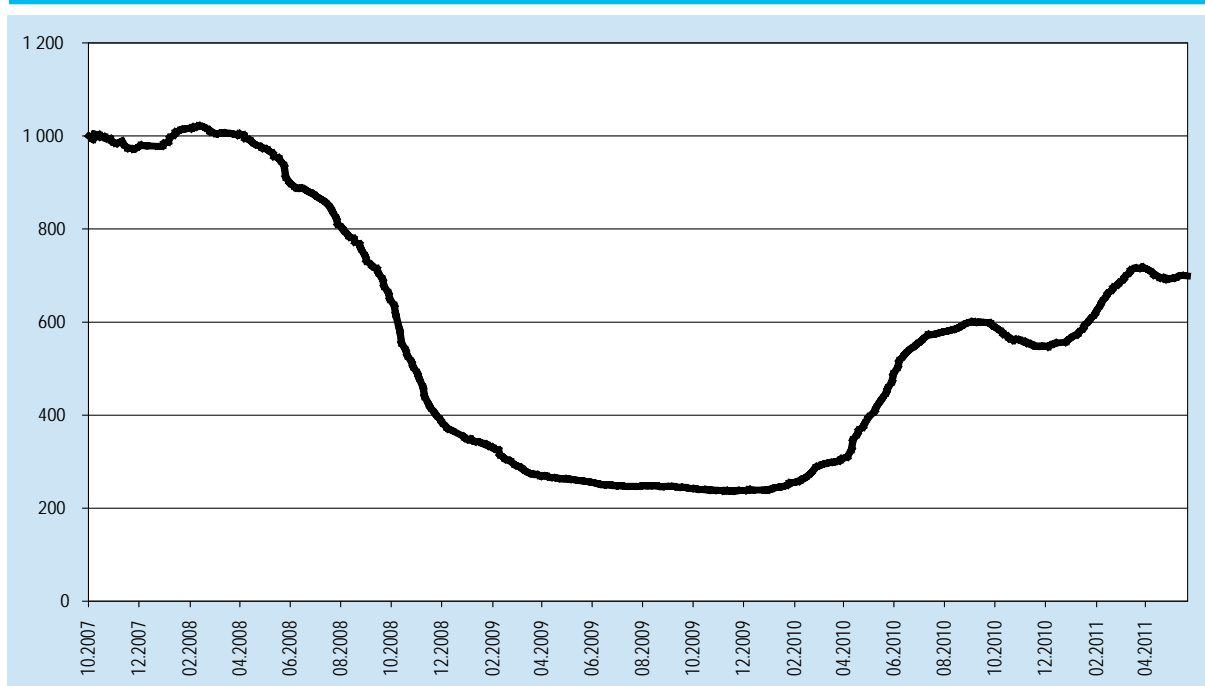
^a This category was created in 2002. The data for the first half of the year correspond to cellular ships in the 2,300–3,900 TEU range, sailing at 22 knots minimum.

^b Sailings at 17–17.9 knots.

^c Sailings at 18 knots minimum.

^d This category was created in 2009 by splitting the 700–999 category.

^e This category was created in 2009 by splitting the 1,000–1,350 category.

Figure 3.5. New ConTex 2007–2011 (indices base: 1,000 – October 2007)

Source: Compiled by the UNCTAD secretariat, using the ConTex Index produced by the Hamburg Shipbrokers' Association. See <http://www.vhss.de>.

Table 3.7. Liner freight indices, 2007–2011 (monthly figures: 1995 = 100)

Month	Overall index					Homebound index					Outbound index				
	2007	2008	2009	2010	2011	2007	2008	2009	2010	2011	2007	2008	2009	2010	2011
January	89	98	62	98	114	98	116	68	138	152	81	83	58	65	82
February	88	95	59	104	108	98	114	64	149	141	80	80	55	67	81
March	86	92	57	111	106	96	110	60	163	136	78	77	55	68	80
April	87	88	56	115	102	100	106	61	161	130	77	74	52	77	80
May	88	89	53	119	103	101	107	58	166	130	76	75	49	82	81
June	92	89	53	125	103	105	106	59	170	129	81	75	48	88	82
July	94	89	60	127		114	104	71	174		80	76	51	88	
August	95	93	65	120		118	107	80	162		81	81	53	86	
September	98	97	69	117		121	113	87	158		84	85	54	83	
October	97	90	75	109		119	105	98	146		84	77	57	79	
November	97	86	75	109		115	101	97	146		86	74	56	79	
December	100	73	84	111		118	83	111	146		88	65	63	83	
Annual average	93	90	64	114		109	106	76	157		81	77	54	79	

Source: Compiled by the UNCTAD secretariat, on the basis of information in various issues of *Shipping Statistics and Market Review*, published by the Institute of Shipping Economics and Logistics.

2007–2011. The average overall index for 2010 increased by 50 points from the 2009 level, to reach 114 points, a rise of 78 per cent. The year 2010 took off with a significant increase, especially on the homebound index (imports into Europe). The annual average figure on the homebound index was up by over 100 per cent in 2010, whereas the outbound index increased by 45 per cent.

At present (2011), freight rates between Asia and Europe are declining. Their average all-inclusive freight rate for dry cargo from Asia to northern Europe fell by 10 per cent in April. Freight rates from Asia to the Western Mediterranean/Northern Africa declined by 7.4 per cent and Eastern Mediterranean/Black Sea regions dropped 9 per cent.⁴⁰ The average bunker adjustment factor had risen by approximately \$135 per TEU in April 2011, compared with the average for the fourth quarter of 2010. By June 2011, the figure was \$250 per TEU. On the Shanghai–Mediterranean route, the bunker adjustment factor was an additional \$700 in April 2011 based on a freight rate of around \$960 per TEU. At around the same time, all-inclusive freight rates from Shanghai to the United States West Coast were around \$1,650–\$1,850 per 40-foot equivalent unit (FEU), while prices to the East Coast were \$2,980–\$3,200 per FEU.^{41 42}

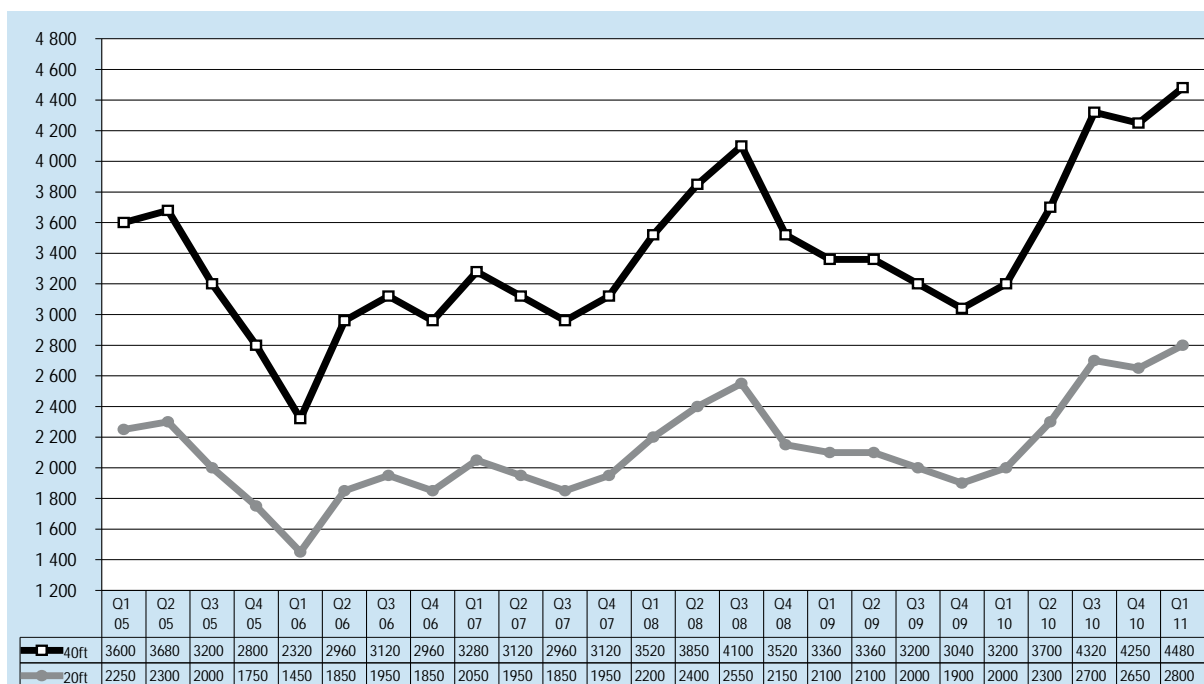
Container prices

Figure 3.6 shows how the purchase prices of containers have evolved over the past few years. During 2010 and into 2011 they continued to climb. At the end of 2009, a standard TEU cost \$1,900. By the first quarter of 2011 it had risen to \$2,800, an increase of almost 50 per cent. Helping to boost the demand for containers is the increase in container fleet size. While the ratio of container per vessel has declined in recent years, the overall number of containers in circulation has grown (see chapter 2 for more details on the container fleet).

4. Freight cost as a percentage of value of imports

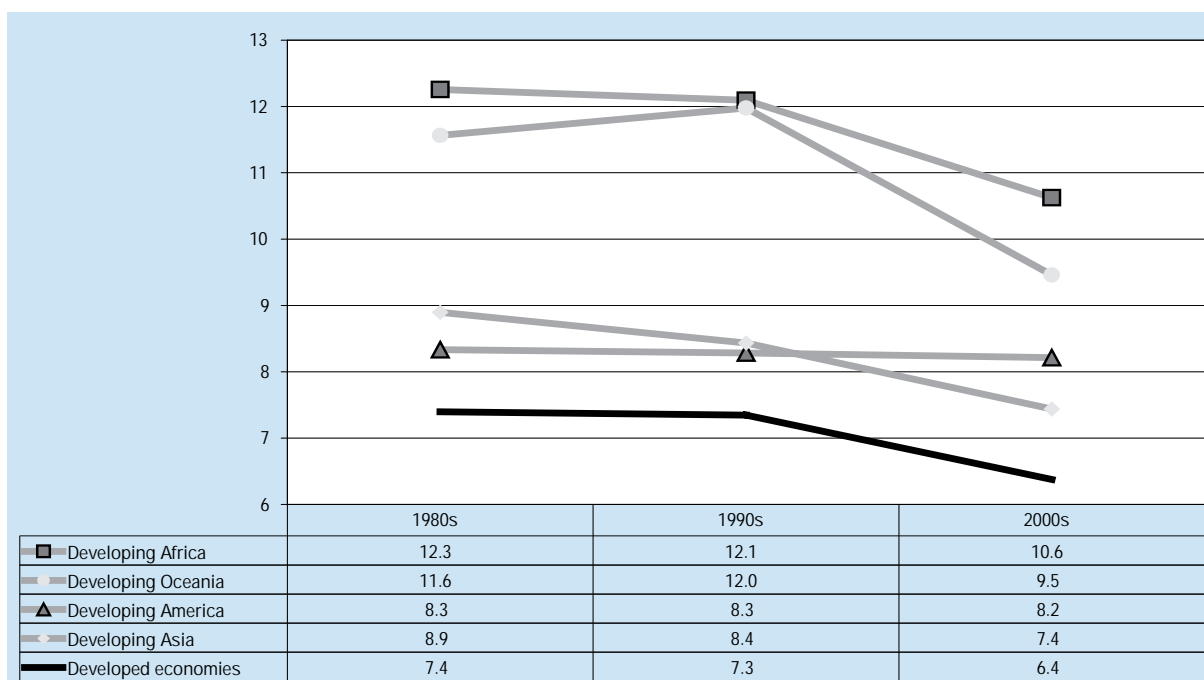
Figure 3.7 illustrates how costs as a percentage of the value of imports have averaged over the last three decades by region. Over the last two decades, maritime freight rates have fallen in all regions. The most significant observation is that transport costs as a percentage of imports for developing countries in the Americas have remained the same, whereas all other areas witnessed a reduction in costs. Transport costs in Africa remain

Figure 3.6. Container prices (2005–2011) (quarterly averages, in dollars)



Source: Compiled by the UNCTAD secretariat based on data from *Containerisation International Magazine*, various issues.

Figure 3.7. Freight cost as a percentage of value of imports: long-term trend (1980–89, 1990–99 and 2000–09) (average percentages for decades)



Source: UNCTAD secretariat.

the highest in the world. Freight costs for African countries constitute a higher proportion of total import value than those of other regions. The data suggest that it costs more to ship to Africa than to developed countries, on average 10.6 per cent of the price of final goods for Africa, as opposed to 6.4 per cent on average for developed countries.⁴³

The drop in shipping costs has been influenced by the global transformation of maritime transport spurred by globalization over the past two decades. Several factors have contributed to this decline, including: the growing market of container traffic, which has been the fastest-growing segment of maritime transport. As a result, and in order to benefit from economies of scale, container ships have been growing in size surpassing 10,000 TEUs per vessel, compared with the late 1990s, when the largest vessels had a capacity of 4,400 TEUs – Panamax.⁴⁴ Moreover, developments in cargo handling, new technologies and reduced crew sizes have had an impact on the operational costs and per-unit cost of ocean cargo transport. Port reforms and increased investment in information and communication technology, innovation and new technologies have also led to greater efficiency and productivity at the port level, reducing the time of cargo handling, and in turn affecting terminal charges and reducing overall cargo prices.

Outlook for vessel prices and freight rates

Tables 3.8 and 3.9, and figure 3.8 describe world fleet performance. Table 3.8 reveals that the world ratio of world fleet to volume carried was at 1:6, meaning that over the course of the year, each vessel carried on average six times its maximum capacity – six full journeys a year – to produce the total volume of cargo carried by sea. This figure is below 6.6, which was achieved in 2009, and down from the 2006 ratio of 1:8. The increase in the world total of cargo moved by maritime transport shows the expansion of the world fleet with significantly more ships and ship capacity chasing only slightly more cargo.

Table 3.9 and figure 3.8, derived from the same data, provide a breakdown of table 3.8 by general vessel type. For instance, it reveals that the productivity

Table 3.8. Cargo carried per deadweight ton of the total world fleet, selected years

Year	World fleet (millions of dwt, beginning of year)	Total cargo (millions of tons)	Tons carried per dwt
1970	326	2 566	7.9
1980	683	3 704	5.4
1990	658	4 008	6.1
2000	799	5 984	7.5
2006	960	7 700	8.0
2007	1 042	8 034	7.7
2008	1 118	8 229	7.4
2009	1 192	7 858	6.6
2010	1 395	8 408	6.0

Source: Calculated by the UNCTAD secretariat, on the basis of UNCTAD data on seaborne trade (in tons) and IHS Fairplay data on the world fleet (in dwt).

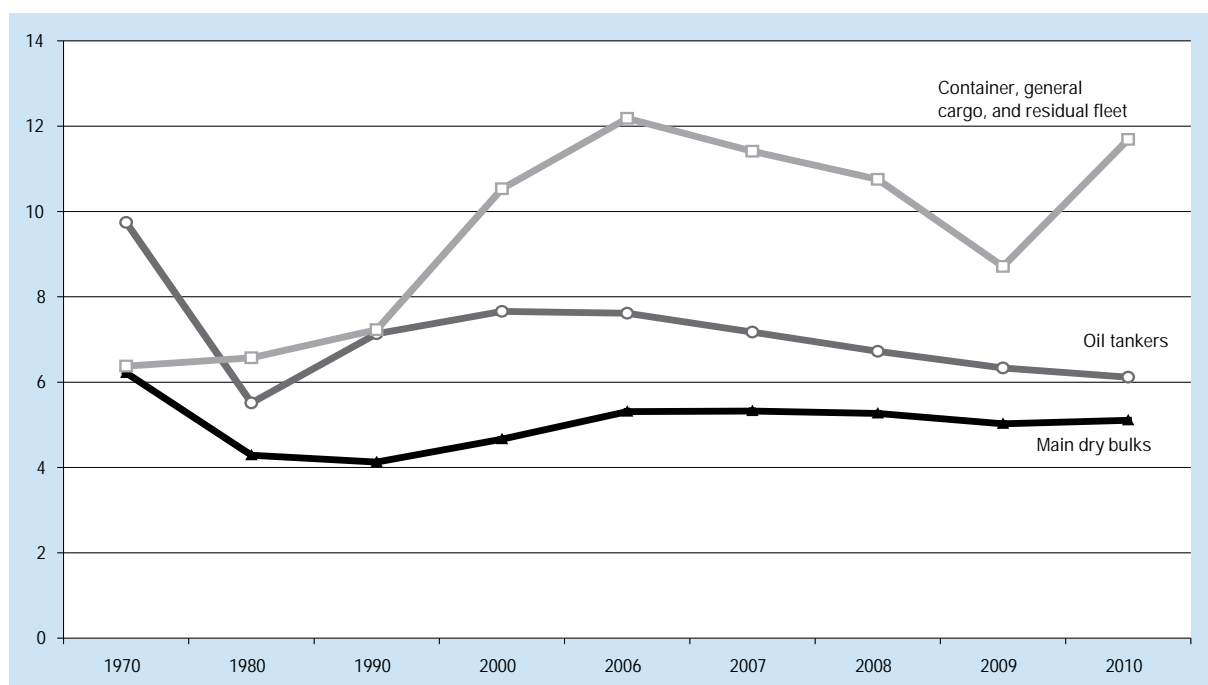
of the tanker and dry bulk sectors has decreased considerably over time. Tankers that used to carry 9.74 tons per dwt in 1970 carried only 6.12 tons in 2010. For the dry bulk sector, the corresponding figures are 6.21 tons per dwt in 1970 to 5.11 tons per dwt in 2010. However, fleet productivity relating to dry cargo almost doubled from the 6.38 tons per dwt that were carried in 1970, to the 11.69 tons per dwt that were carried in 2010. One explanation for the high productivity rate of container ships is that container shipping can often benefit from return cargoes, whereas oil and bulk vessels tend to move cargo from extraction to consumption points and return in ballast. With an increased number of production centres, the distances between source and consumption have grown, resulting in a lower measured tanker fleet productivity. In 2010, tanker fleet productivity declined, whereas the productivity of dry bulk and containers fleets increased. The year 2010 was the most productive for the container fleet since 2006, suggesting that the container fleet might need to expand.

Table 3.9. Estimated productivity of tankers, bulk carriers and the residual fleet,^a selected years

Year	Oil cargo (millions of tons)	Tanker fleet (millions of dwt, beginning of year)	Tons carried per dwt of tankers	Main dry bulks (millions of tons)	Dry bulk fleet (millions of dwt, beginning of year)	Tons carried per dwt of bulk carriers	All other dry cargoes (millions of tons)	Residual fleet ^a (millions of dwt, beginning of year)	Tons carried per dwt of the residual fleet ^a
1970	1 442	148	9.74	448	72	6.21	676	106	6.38
1980	1 871	339	5.51	796	186	4.29	1 037	158	6.57
1990	1 755	246	7.14	968	235	4.13	1 285	178	7.23
2000	2 163	282	7.66	1 288	276	4.67	2 532	240	10.53
2006	2 698	354	7.62	1 836	346	5.31	3 166	260	12.19
2007	2 747	383	7.17	1 957	368	5.32	3 330	292	11.41
2008	2 742	408	6.72	2 059	391	5.26	3 428	319	10.75
2009	2 642	418	6.32	2 094	418	5.01	3 122	355	8.80
2010	2 752	450	6.12	2 333	457	5.11	3 323	284	11.69

Source: Calculated by the UNCTAD secretariat, based on UNCTAD data on seaborne trade (in tons), and IHS Fairplay data on the world fleet (in dwt).

^a The residual fleet refers to general cargo, container ships and other vessels included in annex III (b).

Figure 3.8. Tons carried per deadweight ton (dwt) of the world fleet, selected years

Source: UNCTAD secretariat.

ENDNOTES

- ¹ See for example, Radelet S and Sachs J (1998), *Shipping Costs, Manufactured Exports, and Economic Growth*, presented at the Annual Meeting of the American Economics Association, Chicago, 3–5 January; Hummels D, (1999), *Towards a Geography of Trade Costs*, University of Chicago; Limao N and Venables AJ (2001), Infrastructure, geographical disadvantage and transport costs, *World Bank Economic Review*, No. 15; UNCTAD Transport Newsletter (2006), Trade, liner shipping supply, and maritime freight rates, No. 33, September; Hummels D, (2007), Transportation costs and international trade in the second era of globalization, *Journal of Economic Perspectives*, 21(3):131–154; UNCTAD Transport Newsletter (2008), The modal split of international goods transport, No. 38, March; Kumar S and Hoffmann J (2010), Globalization: The maritime nexus, in: *the Handbook of Maritime Economics and Business, second edition*.
- ² Other factors, such as competition between shipyards and the residual value of a vessel, will also affect its price.
- ³ Around 40 per cent of the operating costs of a 10-year-old bulk carrier in 2005 were capital costs, according to Stopford M (2009). *Maritime Economics*. Third edition. Routledge. London.
- ⁴ In February 2009, the United Arab Shipping Company introduced a \$22 piracy surcharge for containers moving through the port of Aden, Yemen. See <http://www.seatradeasia-online.com/News/3728.html>.
- ⁵ In April 2011 Hapag-Lloyd was charging a container seal fee of ₩ 5,000 (\$4.6) on all exported containers from the Republic of Korea, whereas in China the fee was RMB 44 (\$6.8) on exports from Ningbo.
- ⁶ In January 2011, Maersk Line was charging \$16 per container for electronic cargo release.
- ⁷ As freight rates are rarely all-inclusive, it is often difficult for shippers to estimate the final transport cost. Therefore, there is growing pressure to change the billing process. In 2008, the European Union repealed the block exemption previously granted to liner conferences to collectively set freight rates, which meant that liner companies would have to set prices independently. A study of THCs in some 44 ports across Europe showed that the level of those charges increased after the ending of liner conferences, and that there was a high degree of averaging of charges applied. This has led to complaints from shippers that terminal handling charges (a) are not a reflection of the actual costs incurred by terminal operators and (b) are used as a mechanism to compensate for lower freight rates. See Competition reports (2009). *Terminal Handling Charges During and After the Liner Conference Era*. October. European Commission. Brussels.
- ⁸ In July 2010, COSCO announced an “emergency equipment surcharge” of \$400 per FEU on its transpacific route because of container shortages brought about by a surge in shipping demand amid the global economic revival. Bloomberg (2010). China shipping container adds surcharges on cargo-box shortage, 25 June.
- ⁹ While Maersk Line lists 107 surcharges on the following link, http://www.maerskline.com/link/?page=brochure&path=/our_services/Related%20services/VAS/ALL (date accessed: 17 June 2011) consultancy firm Seaintel quotes an unnamed carrier with 541 surcharges <http://www.seaintel.com/>.
- ¹⁰ Lloyd’s List (2011). Box carriers display independence on currency surcharges, 1 June.
- ¹¹ See <http://www.strategicnine.com/LNG-gas-market.htm>.
- ¹² *Tanker Operator Magazine* (2011). High cost of bunkers impacts on earnings. March, p. 4.
- ¹³ The expansion of the Suez Canal in recent years has meant that some smaller VLCCs can now transit the canal.
- ¹⁴ *Sea Rates* (2010). DVB bank: Suezmax tanker market outlook newsletter. 25 August. Available online from <http://www.searates.com/news/11236/> (accessed 22 June 2011).
- ¹⁵ *Tanker Operator*. November/December 2010.
- ¹⁶ See <http://c0182999.cdn1.cloudfiles.rackspacecloud.com/TOJanFeb2011web.pdf>.
- ¹⁷ Lloyd’s List (2009). About the fleet, 1 April.
- ¹⁸ Unlike in Europe, where an extensive network of pipelines feeds gas directly into many homes, thereby creating many sources of demand.
- ¹⁹ Lloyd’s List (2011). LNG spot market boost as few ships to come off charter, 11 May.
- ²⁰ Lloyd’s List (2011). How high can LNG rates go? 21 May.
- ²¹ Platts (2011). Global spot, short-term LNG trades in 2010 up 40% on year to 727 cargoes, 10 May.
- ²² Orissa State, which alone accounts for a quarter of India’s annual exports of around 100 million tons of iron ore, has banned exports since July 2010.
- ²³ Clarkson (2011). *Dry Bulk Trade Outlook*. 17(6):5. June.
- ²⁴ Handysize and Handymax vessels are smaller bulk carriers, ranging from 10,000 dwt to 35,000 dwt and 35,000 dwt to 55,000 dwt, respectively. They are preferred because of their flexibility, as they can carry reasonable cargo sizes to almost any port.
- ²⁵ The BDI is made up of various vessel types involved in the carry of different cargo types on various routes.

- ²⁶ Capesize vessels are the largest dry bulk carriers and so named because they had to sail pass the Cape of Good Hope because they were too large to transit the Suez or Panama Canals.
- ²⁷ Bloomberg (2011). Freight rates poised to tumble as 35-mile line of ships passes coal demand, 10 January.
- ²⁸ The world's biggest container ship, the *Emma Maersk* (2006), and her seven sister-ships, were constructed here.
- ²⁹ Business Monitor Online (2010). Mitsubishi yard closure reflects long-term shipbuilding decline, 26 July.
- ³⁰ See <http://www.reclaiming-spaces.org/transformation/archives/302>.
- ³¹ TR Defence (2011). Turkish shipyards struggle due to financial crisis. 6 February. See <http://www.trdefence.com/2011/02/06/turkish-shipyards-struggle-due-to-financial-crisis/>.
- ³² Clarkson (2011). *Shipping Review and Outlook*. Spring, p59.
- ³³ *Ibid.*, p66.
- ³⁴ The Shippers' Voice (2011). Container freight derivatives, April.
- ³⁵ Lloyd's List (2010). Container lines on track for \$17bn profits in 2010, 14 December.
- ³⁶ CIMB (2010). Container shipping. 7 June. Available from http://www.remisiers.org/cms_images/research/Jun06-Jun10/REG-CS-070611CIMBOW.pdf.
- ³⁷ Since 1998, the Hamburg Shipbrokers' Association has published the Hamburg Index, which provides a market analysis of container ship time charter rates of a minimum duration of three months.
- ³⁸ The New ConTex is a daily index that appears every Tuesday and Thursday and is compiled by a panel of international brokers on charter rate fixtures for six container vessel sizes.
- ³⁹ Some of the largest German shipowners who charter their tonnage are C-P Offen, Peter Dohle, NSB N'Elbe, Norddeutsche, Rickmers and E.R.Schiff. Between them they represent more than 2 million dwt. (Source: *Clarkson's Container Intelligence Monthly*, May 2011).
- ⁴⁰ (2011) Asia-Europe rates shock. *Containerisation International*, 3 June.
- ⁴¹ IFW (2011). Asia to Europe rates still on the slide. 13 April. Available from <http://www.ifw-net.com/freightpubs/ifw/article.htm?artid=20017864731&src=rss>.
- ⁴² JCTrans. (2011). Shanghai container index up on all routes. 16 May. Available from <http://info.jctrans.com/jcnet/news/osn/20115161004026.shtml>.
- ⁴³ The data shown are the average for the decade, indicating only the relative price of freight as a percentage to imports, not the actual transport costs per se. Variations by country and over time will undoubtedly exist. The data must be read along with trade volume data to see how they have changed over time.
- ⁴⁴ World Bank (2007). Port and maritime transport challenges in West and Central Africa. Sub-Saharan Africa Transport Policy Program (SSATP). Working Paper No. 84, May.
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