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DEVELOPMENTS IN INTERNATIONAL SEABORNE TRADE

The world economy embarked on a slow-moving recovery led by uneven growth in developed economies and a slowdown in developing countries and economies in transition. In 2014, the world gross domestic product (GDP) increased marginally by 2.5 per cent, up from 2.4 per cent in 2013. Meanwhile, world merchandise trade increased by 2.3 per cent; this is down from 2.6 per cent in 2013 and below the pre-crisis levels.

Accordingly, preliminary UNCTAD estimates indicate that global seaborne shipments have increased by 3.4 per cent in 2014, that is at the same rate as in 2013. Additions to volumes exceeded 300 million tons taking the total to 9.84 billion tons. This performance unfolded in the context of a number of developments, including (a) a slowdown in large emerging developing economies; (b) lower oil price levels and new refinery capacity developments; and (c) a slow-moving and uneven recovery in the advanced economies.

On balance, growth in world GDP, merchandise trade and seaborne shipments is expected to continue at a moderate pace in 2015. The outlook remains uncertain and subject to many downside risks, including continued moderate growth in global demand and merchandise trade, the fragile recovery in Europe, diverging outlooks for net oil consumers and producers, geopolitical tensions, and a potential faster slowdown in developing economies, in particular the large emerging economies, as well as uncertainty about the pace and the implications of the slowdown in China.

A. WORLD ECONOMIC SITUATION AND PROSPECTS

1. World economic growth

Global GDP increased by 2.5 per cent in 2014, up from 2.4 per cent in 2013 (see table 1.1). Although positive, this growth remains below the pre-crisis levels with almost all economies having shifted to a lower growth path. Growth in the advanced economies accelerated to 1.6 per cent, while GDP in both the developing economies and the economies in transition expanded at the slower rates of 4.5 per cent and 0.9 per cent, respectively. The emerging recovery in the advanced economies was uneven, led by accelerated growth in the United States (2.4 per cent) and the United Kingdom of Great Britain and Northern Ireland (3.0 per cent) and a fragile recovery in the European Union (1.3 per cent). Meanwhile, GDP growth in Japan came to a standstill due, among other factors, to the 2014 consumption tax increase and the fading away of the effect of the fiscal and monetary stimulus introduced in 2013.

Gross domestic product growth in the transition economies was constrained by weak exports and external financing constraints as well as the uncertainty caused by the geopolitical conflicts in the region. Although developing countries remained the engine of growth, contributing three quarters of global expansion in 2014 (International Monetary Fund, 2015), slower GDP growth reflects, in particular, weaker expansion in developing America and a slowdown in China. Elsewhere, the economies of the least developed countries (LDCs) continued to expand at a rapid rate (5.3 per cent).

China continued to grow at the relatively robust rate of 7.4 per cent. However, this rate is much below the average growth of 10.0 per cent achieved years earlier and reflects, to a large extent, the slowdown in the industrial production. Growth in industrial production averaged 8.0 per cent in 2014, down from 14.0 per cent in 2011 and 10 per cent in 2012 and 2013 (*Dry Bulk Trade Outlook*, 2015a). Meanwhile, GDP in India expanded by 7.1 per cent and is expected to grow at a faster rate in 2015. The slowdown in China entails some important implications for seaborne trade,

Table 1.1. World economic growth, 2012–2015 (annual percentage change)

Region/country	*2012*	*2013*	*2014*	*2015[a]*
WORLD	2.2	2.4	2.5	2.5
Developed economies	1.1	1.3	1.6	1.9
of which:				
European Union 28	-0.5	0.1	1.3	1.7
of which:				
France	0.2	0.7	0.2	1.2
Germany	0.4	0.1	1.6	1.5
Italy	-2.8	-1.7	-0.4	0.7
United Kingdom	0.7	1.7	3.0	2.3
Japan	1.7	1.6	-0.1	0.9
United States	2.3	2.2	2.4	2.3
Developing economies	4.7	4.8	4.5	4.1
of which:				
Africa	5.1	3.8	3.4	3.2
South Africa	2.2	2.2	1.5	1.9
Asia	5.1	5.6	5.5	5.2
China	7.7	7.7	7.4	6.9
India	4.4	6.4	7.1	7.5
Western Asia	4.0	4.1	3.3	2.5
Developing America	3.2	2.8	1.4	0.8
Brazil	1.8	2.7	0.1	-1.5
Least developed countries	4.3	5.3	5.3	3.5
Transition economies	3.3	2.0	0.9	-2.6
of which:				
Russian Federation	3.4	1.3	0.6	-3.5

Source: UNCTAD. *Trade and Development Report 2015*. Table 1.1.
[a] Forecast.
Note: Calculations for country aggregates are based on GDP at constant 2005 dollars.

shipping investors, service providers and users in view of the country's major role in supporting growth in Asia as well as in other developing regions. On the import side, dry bulk shipping and crude oil tankers have benefited the most from China's robust demand while, on the export side, container shipping, especially on the intra-Asian routes and westbound to Europe and North America, was the main beneficiary. The impact of a further slowdown in China will extend beyond the Chinese and Asian borders.

Looking forward, global economic growth is projected to moderate in 2015 supported mainly by growth in the advanced economies and relatively strong growth in Asia. Growth in developing countries as a group is expected to decelerate due to factors such as the low oil price levels and their impact on oil exporting countries, persistent political uncertainties, concerns about developments involving the European Union and Greece, and a continued rebalancing of China's economy.

The precise impact of lower oil prices will depend largely on their duration. The broad effects of a drop are generally positive as it stimulates global demand. However, this also implies an income shift from oil producers to consumers. Lower oil price levels will support the purchasing power of consumers in importing countries. For example, a sustained $30 decline in oil prices is expected to result in over $200 billion per year of savings for consumers in the United States through lower prices for gasoline, diesel, jet fuel and home heating oil (*Politico Magazine*, 2014). Conversely, demand from oil exporting countries will be constrained, including as a result of fiscal adjustments (for example, cuts of subsidies), unfavourable terms of trade and loss of revenue. It is estimated that each one-dollar fall in oil prices will result in a $2 billion loss in revenue for the Russian Federation (Johnson, 2015). Meanwhile, the oil and gas export earnings of the Gulf Cooperation Council countries are expected to decline by around $300 billion (International Monetary Fund, 2015). Other potential impacts of persistent lower oil prices relate to the delays, postponements or cancellations of oil and gas investment projects that may only have been feasible in a higher energy price-setting. Reduced energy sector investments will, in the medium or long term, likely dampen production as well as growth in oil and gas trades.

In sum, the world economy has embarked on a slow moving global recovery. On balance, GDP growth is expected to continue to moderate in 2015 with the outlook remaining subject to many downside risks, including a global demand and merchandise trade that undershoot expectations, the different economic outlooks for net oil consumers and producers, political shocks and geopolitical tensions, a potential faster slowdown in large developing economies, as well as uncertainty about the pace of the slowdown in China and related implications for the world economy, trade and seaborne shipments.

2. World merchandise trade

In 2014, the volume of global merchandise trade (that is, trade in value terms but adjusted to account for inflation and exchange rate movements) increased at the slower rate of 2.3 per cent, down from 2.6 per cent in 2013. Reflecting an uneven recovery in the advanced economies, this performance remained below the pre-crisis trends, with slower growth in developing economies and economies in transition constraining growth in overall merchandise trade volumes (see table 1.2).

Despite the deceleration recorded in 2014, developing countries continue to fuel global merchandise trade flows. UNCTAD data indicate that although developed economies continue to contribute the largest shares to world exports and imports (51.1 per cent and 54.9 per cent, respectively, in 2014), their contribution has been declining over the years. Meanwhile, the contribution of developing countries and economies in transition to world merchandise trade has been on the rise.

The share of developing countries in world exports in 2014 was estimated at 45.0 per cent (32.0 per cent in 2000), while their share of world imports amounted to 42.2 per cent (28.9 per cent in 2000). This reflects the shift in economic influence observed over recent years whereby developing countries are gaining greater market share in world merchandise trade both in terms of growth and levels.

The uneven performances among and within country groupings impacted the performance of containerized trade in 2014. Breaking away from patterns observed since 2009, volumes on the Asia–Europe and trans-Pacific container trade lanes (peak leg) reversed trends and recorded robust growth during the year.

Projected growth remains vulnerable, however, given continued uncertainties arising in connection with weaker growth in emerging economies, particularly a potential sharp slowdown in China, as well as concerns about the fragile recovery in the European Union and the situation in Greece. The slowdown

in China will impact on the global recovery in trade volumes and affect the prospects of other countries, especially developing countries that have over recent years deepened their economic and trade relations with China through greater integration into regional and global value chains and by emerging as key sources of supply in terms of raw commodities.

A rebalancing of China's economy can significantly reshape the maritime transport landscape and alter shipping and seaborne trade patterns. The super cycle experienced by shipping over the past years was driven by globalization and rapid growth in the division of international labour and fragmentation in international production processes. Within the globalized context, the resource-intensive growth phase of China and its greater integration into the global production and value chains have been a key driver. As China has generated much of the growth in world seaborne trade since 2009, the challenge for shipping is to ensure that the trade dynamism generated by China's expansion continues and is replicated elsewhere.

In addition to the performance of global GDP and trade, other factors may also be at play and currently shaping the slow global economic and trade recovery. The long-term trade to GDP ratio of two to one appears to be unwinding. Over the past few years, world GDP has been growing at about the same rate as trade. This may be the result of limited growth in the fragmentation of global production processes, a maturation of value chains (in China and the United States), a change in the composition of global demand with a slow recovery in investment goods that are more trade intensive than government and consumer spending, costlier or limited trade finance, and potentially a rise in "reshoring"/"nearshoring". In the latter case, it has been observed that trade in intermediate goods may have weakened recently and could signal reshoring activity or at least a lack of further offshoring (HSBC Bank, 2015). However, views on reshoring/nearshoring remain inconclusive. Some observed trends suggest that a number of manufacturers are offshoring certain operations while at the same time bringing other activities back home or closer to home. Therefore, while some reshoring may be taking place due to increasing labour costs in the offshore locations, factors other than labour costs are taken into account when making relevant decisions about production sites. These include the quality of labour and access to foreign markets such as the Chinese markets (Cohen and Lee, 2015).

Table 1.2. Growth in the volume of merchandise, 2012–2014 (annual percentage change)

2012	2013	2014	Countries/regions	2012	2013	2014
2.0	2.6	2.3	**WORLD**	2.0	2.3	2.3
0.6	1.4	2.0	**Developed economies**	-0.4	-0.3	3.2
			of which:			
-0.1	1.7	1.5	European Union	-2.5	-0.9	2.8
-1.0	-1.9	0.6	Japan	3.8	0.5	2.8
3.9	2.6	3.1	United States	2.8	0.8	4.7
4.0	4.2	2.9	**Developing economies**	5.1	6.1	2.0
			of which:			
5.5	-2.0	-3.6	**Africa**	13.2	5.2	3.3
3.2	2.1	2.4	**Developing America**	3.3	4.0	0.6
4.0	5.2	3.5	**Asia**	7.7	6.6	2.2
			of which:			
6.2	7.7	6.8	China	3.6	9.9	3.9
-1.8	8.5	3.2	India	5.9	-0.2	3.2
9.6	3.1	0.3	Western Asia	9.2	9.6	0.2
0.7	1.8	0.2	**Transition economies**	5.6	-0.8	-8.5

Source: UNCTAD secretariat, based on UNCTADstat.
Note: Data on trade volumes are derived from international merchandise trade values deflated by UNCTAD unit value indices.

Consequently, it may be argued that long-term trade recovery depends on trends in GDP growth as well as on how the relationship between trade and GDP unfolds and whether relevant initiatives to further stimulate demand and trade are implemented. These may include stimulating demand for investment goods (for example, capital goods, transport and equipment) that are more import intensive; reorganizing supply chains with a new scope for the division of international labour, including in South Asia, sub-Saharan Africa and South America; increasing trade finance; furthering the liberalization of trade and reducing protective measures. In this respect, the potential for greater trade liberalization is firming up with the adoption of the World Trade Organization (WTO) Trade Facilitation Agreement (TFA) and the negotiations relating to the potential expansion of the WTO Information Technology Agreement. Other initiatives including, among others, the Transatlantic Trade and Investment Partnership between the European Union and the United States, which could raise the transatlantic annual GDP by $210 billion (Francois et al., 2013) and the Trans-Pacific Partnership, which could boost world income by $295 billion, also have the potential to further stimulate global trade (Petri and Plummer, 2012).

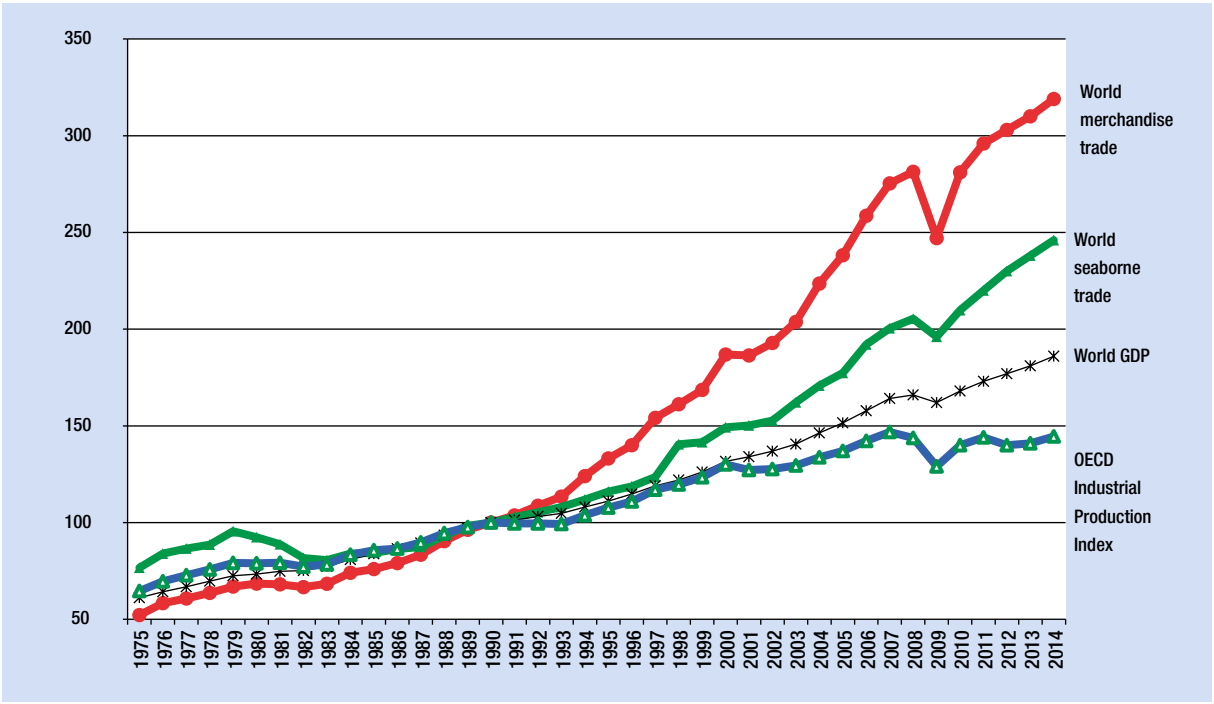
B. WORLD SEABORNE TRADE

1. General trends in seaborne trade

Although the responsiveness of trade to GDP growth may have moderated over recent years, demand for maritime transport services and seaborne trade volumes continue to be shaped by global economic growth and the need to carry merchandise trade. Figure 1.1 highlights the association between economic growth and industrial activity, as measured in this particular case by the Organization for Economic Cooperation and Development (OECD) Industrial Production Index, merchandise trade and seaborne shipments.

Preliminary estimates indicate that the volume of world seaborne shipments expanded by 3.4 per cent in 2014, that is, at the same rate as in 2013. Additions to volumes exceeded 300 million tons, taking the total to 9.84 billion, or around four fifths of total world merchandise trade. Dry cargo was estimated to have accounted for over two thirds of the total, while the share of tanker trade, including crude oil, petroleum products and gas was estimated to have slightly declined from

Figure 1.1. The OECD Industrial Production Index and indices for world GDP, merchandise trade and seaborne shipments (1975–2014) (base year 1990 = 100)



Sources: UNCTAD secretariat, based on OECD Main Economic Indicators, June 2015; United Nations Department of Economic and Social Affairs, 2015; LINK Global Economic Outlook, June 2015; UNCTAD *Review of Maritime Transport*, various issues; WTO, appendix table A1a, World merchandise exports, production and gross domestic product, 1950–2012; WTO press release 739, 14 April 2015.

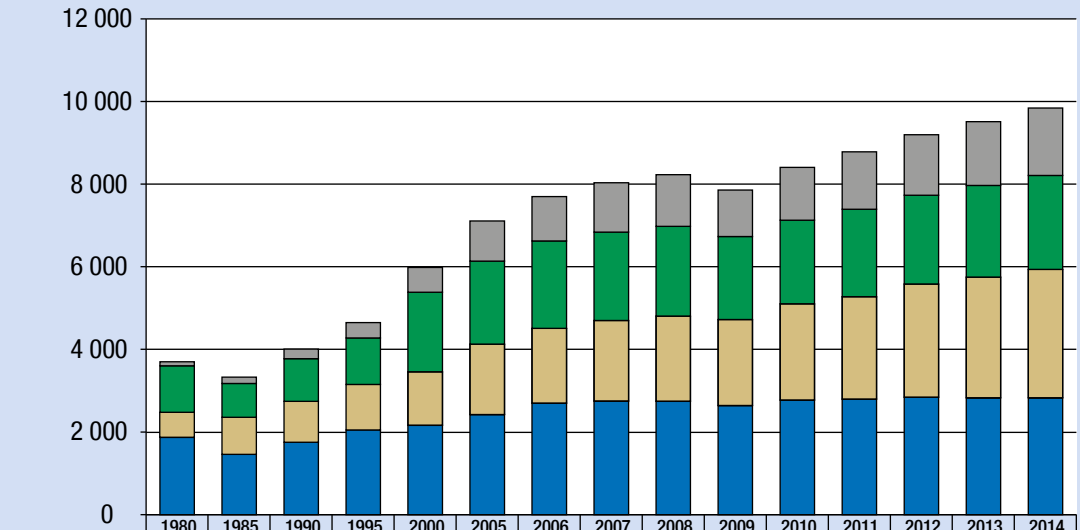
Table 1.3. Developments in international seaborne trade, selected years (millions of tons loaded)

Year	Oil and gas	Main bulks[a]	Other dry cargo	Total (all cargoes)
1970	1 440	448	717	2 605
1980	1 871	608	1 225	3 704
1990	1 755	988	1 265	4 008
2000	2 163	1 295	2 526	5 984
2005	2 422	1 709	2 978	7 109
2006	2 698	1 814	3 188	7 700
2007	2 747	1 953	3 334	8 034
2008	2 742	2 065	3 422	8 229
2009	2 642	2 085	3 131	7 858
2010	2 772	2 335	3 302	8 409
2011	2 794	2 486	3 505	8 784
2012	2 841	2 742	3 614	9 197
2013	2 829	2 923	3 762	9 514
2014	2 826	3 112	3 903	9 842

Sources: UNCTAD secretariat, based on data supplied by reporting countries and as published on the relevant government and port industry websites, and by specialist sources. Data for 2006 onwards have been revised and updated to reflect improved reporting, including more recent figures and better information regarding the breakdown by cargo type. Figures for 2014 are estimated based on preliminary data or on the last year for which data were available.

[a] Iron ore, grain, coal, bauxite/alumina and phosphate rock; the data for 2006 onwards are based on various issues of the *Dry Bulk Trade Outlook*, produced by Clarksons Research.

Figure 1.2. International seaborne trade, selected years (millions of tons loaded)



	1980	1985	1990	1995	2000	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Container	102	152	234	371	598	969	1 076	1 193	1 249	1 127	1 280	1 393	1 464	1 544	1631
Other dry cargo	1 123	819	1 031	1 125	1 928	2 009	2 112	2 141	2 173	2 004	2 022	2 112	2 150	2 218	2272
Five major bulks	608	900	988	1 105	1 295	1 709	1 814	1 953	2 065	2 085	2 335	2 486	2 742	2 923	3112
Oil and gas	1 871	1 459	1 755	2 050	2 163	2 422	2 698	2 747	2 742	2 642	2 772	2 794	2 841	2 829	2 826

Sources: UNCTAD, *Review of Maritime Transport*, various issues. For 2006–2014, the breakdown by type of cargo is based on Clarksons Research, *Shipping Review and Outlook*, various issues.

nearly 30.0 per cent in 2013 to 28.7 per cent in 2014 (see tables 1.3, 1.4 (a) , 1.4 (b) and figure 1.2).

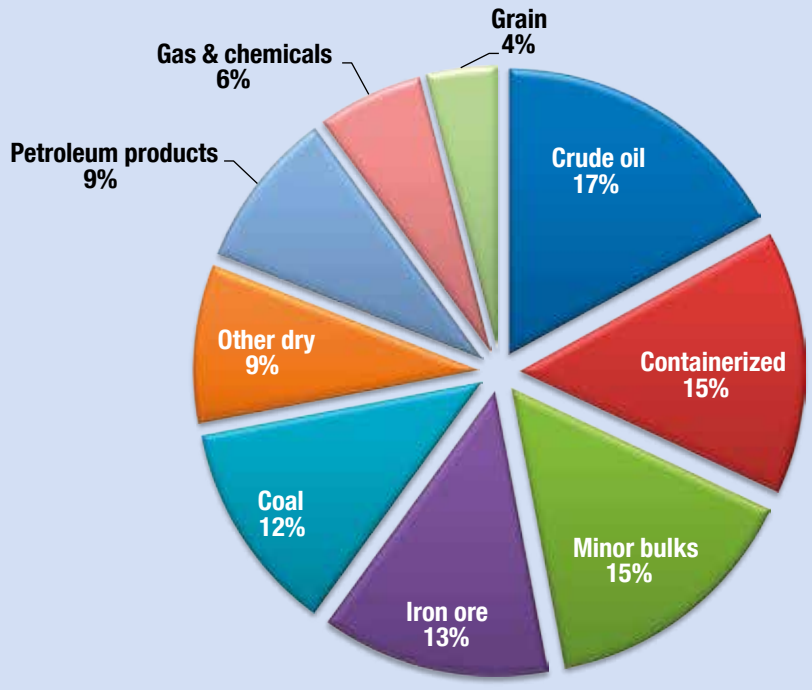
Dry cargo shipments increased by 5.0 per cent, while tanker trade contracted by 1.6 per cent. Within dry cargo, dry bulk trade, including the five major bulk commodities (iron ore, coal, grain, bauxite/alumina and phosphate rock) as well as the minor bulk commodities (agribulks, metals and minerals, and manufactures) is estimated to have increased by 5.0 per cent, taking the total to 4.55 billion tons. Although growth in coal trade is estimated to have decelerated significantly to 2.8 per cent as compared with over 12.0 per cent in 2012 and 5.0 per cent in 2013, dry bulk shipments continued to be supported by the rapid expansion of global iron ore volumes, which in turn, was driven by China's continued strong import demand.

"Other dry cargo" (general cargo, break bulk and containerized) accounted for 35.2 per cent of all dry cargo shipments and is estimated to have increased by 4.9 per cent to reach 2.47 billion tons. Containerized trade, which accounted for about two thirds of "other dry cargo", was estimated to have increased by a strong 5.6 per cent, taking the total to 1.63 billion tons. In 2014, the performance of tanker trade weakened as compared with the previous year. Crude oil shipments contracted (-1.6 per cent), while petroleum products (+1.7 per cent) and gas trades (+3.9 per cent) expanded at slower rates. The structure of world seaborne trade is presented in figure 1.3.

Developing countries continued to contribute larger shares to international seaborne trade. Their contribution in terms of global goods loaded was estimated at 60 per cent, while their import demand as measured by the volume of goods unloaded reached 61 per cent (see figure 1.4 (a)). Behind the headline figures however, the individual contributions vary by regions and type of cargo, reflecting among other factors, differences in countries' economic structures, composition of trade, urbanization and level of development, as well as levels of integration into global trading networks and supply chains.

Over the past decade, developing countries have incrementally shifted patterns of trade. Since the 1970s, the distribution between the goods loaded and unloaded has changed significantly. As shown in figure 1.4 (b), over the years developing countries have become major importers and exporters and a driving force underpinning seaborne trade flows and

Figure 1.3. Structure of international seaborne trade, 2014



Source: UNCTAD secretariat, based on Clarksons Research, *Seaborne Trade Monitor*, 2(5), May 2015.

Table 1.4 (a). World seaborne trade 2006–2014, by type of cargo, country group and region (millions of tons)

Country group	Year	Goods loaded				Goods unloaded			
		Total	Crude	Petroleum products and gas	Dry cargo	Total	Crude	Petroleum products and gas	Dry cargo
		Millions of tons							
World	2006	7 700.3	1 783.4	914.8	5 002.1	7 878.3	1 931.2	893.7	5 053.4
	2007	8 034.1	1 813.4	933.5	5 287.1	8 140.2	1 995.7	903.8	5 240.8
	2008	8 229.5	1 785.2	957.0	5 487.2	8 286.3	1 942.3	934.9	5 409.2
	2009	7 858.0	1 710.5	931.1	5 216.4	7 832.0	1 874.1	921.3	5 036.6
	2010	8 408.9	1 787.7	983.8	5 637.5	8 443.8	1 933.2	979.2	5 531.4
	2011	8 784.3	1 759.5	1 034.2	5 990.5	8 797.7	1 896.5	1 037.7	5 863.5
	2012	9 196.7	1 785.7	1 055.0	6 356.0	9 188.5	1 929.5	1 055.1	6 203.8
	2013	9 513.6	1 737.9	1 090.8	6 684.8	9 500.1	1 882.0	1 095.2	6 523.0
	2014	9 841.7	1 710.3	1 116.1	7 015.3	9 808.4	1 861.5	1 122.6	6 824.2
Developed economies	2006	2 460.5	132.9	336.4	1 991.3	4 164.7	1 282.0	535.5	2 347.2
	2007	2 608.9	135.1	363.0	2 110.8	3 990.5	1 246.0	524.0	2 220.5
	2008	2 715.4	129.0	405.3	2 181.1	4 007.9	1 251.1	523.8	2 233.0
	2009	2 554.3	115.0	383.8	2 055.5	3 374.4	1 125.3	529.9	1 719.2
	2010	2 865.4	135.9	422.3	2 307.3	3 604.5	1 165.4	522.6	1 916.5
	2011	2 982.5	117.5	451.9	2 413.1	3 632.3	1 085.6	581.3	1 965.4
	2012	3 122.9	125.2	459.7	2 538.0	3 700.2	1 092.6	556.5	2 051.1
	2013	3 188.3	114.4	470.5	2 603.4	3 679.4	1 006.7	556.6	2 116.0
	2014	3 370.8	111.8	486.7	2 772.3	3 744.1	985.4	552.4	2 206.3
Transition economies	2006	410.3	123.1	41.3	245.9	70.6	5.6	3.1	61.9
	2007	407.9	124.4	39.9	243.7	76.8	7.3	3.5	66.0
	2008	431.5	138.2	36.7	256.6	89.3	6.3	3.8	79.2
	2009	505.3	142.1	44.4	318.8	93.3	3.5	4.6	85.3
	2010	515.7	150.2	45.9	319.7	122.1	3.5	4.6	114.0
	2011	505.0	132.6	42.0	330.5	156.7	4.2	4.4	148.1
	2012	544.2	135.6	40.3	368.3	148.1	3.8	4.0	140.3
	2013	551.9	145.1	32.1	374.8	77.4	1.1	10.6	65.7
	2014	591.2	136.1	43.4	411.8	80.1	0.9	11.2	67.9
Developing economies	2006	4 829.5	1 527.5	537.1	2 765.0	3 642.9	643.6	355.1	2 644.3
	2007	5 017.2	1 553.9	530.7	2 932.6	4 073.0	742.4	376.3	2 954.3
	2008	5 082.6	1 518.0	515.1	3 049.6	4 189.1	684.9	407.2	3 097.0
	2009	4 798.4	1 453.5	502.9	2 842.0	4 364.2	745.3	386.9	3 232.1
	2010	5 027.8	1 501.6	515.6	3 010.5	4 717.3	764.4	452.0	3 500.9
	2011	5 296.8	1 509.4	540.4	3 247.0	5 008.8	806.7	452.1	3 750.0
	2012	5 529.6	1 524.9	555.0	3 449.7	5 340.1	833.1	494.7	4 012.4
	2013	5 773.4	1 478.5	588.2	3 706.7	5 743.4	874.2	527.9	4 341.3
	2014	5 879.7	1 462.4	586.0	3 831.3	5 984.3	875.3	559.0	4 550.0

Table 1.4 (a). World seaborne trade 2006–2014, by type of cargo, country group and region (millions of tons) *(continued)*

Country group	Year	Goods loaded				Goods unloaded			
		Total	Crude	Petroleum products and gas	Dry cargo	Total	Crude	Petroleum products and gas	Dry cargo
		Millions of tons							
Africa	2006	721.9	353.8	86.0	282.2	349.8	41.3	39.4	269.1
	2007	732.0	362.5	81.8	287.6	380.0	45.7	44.5	289.8
	2008	766.7	379.2	83.3	304.2	376.6	45.0	43.5	288.1
	2009	708.0	354.0	83.0	271.0	386.8	44.6	39.7	302.5
	2010	754.0	351.1	92.0	310.9	416.9	42.7	40.5	333.7
	2011	723.7	338.0	68.5	317.2	378.2	37.8	46.3	294.1
	2012	757.8	364.2	70.2	323.4	393.6	32.8	51.0	309.8
	2013	815.3	327.5	82.4	405.3	432.2	36.6	65.3	330.3
	2014	761.3	301.4	78.3	381.6	466.0	36.4	69.3	360.3
America	2006	1 030.7	251.3	93.9	685.5	373.4	49.6	60.1	263.7
	2007	1 067.1	252.3	90.7	724.2	415.9	76.0	64.0	275.9
	2008	1 108.2	234.6	93.0	780.6	436.8	74.2	69.9	292.7
	2009	1 029.8	225.7	74.0	730.1	371.9	64.4	73.6	234.0
	2010	1 172.6	241.6	85.1	846.0	448.7	69.9	74.7	304.2
	2011	1 239.2	253.8	83.5	901.9	508.3	71.1	73.9	363.4
	2012	1 282.6	253.3	85.9	943.4	546.7	74.6	83.6	388.5
	2013	1 263.7	240.0	69.8	953.9	569.4	69.4	89.4	410.7
	2014	1 283.6	232.0	72.6	979.0	606.9	70.0	92.7	444.3
Asia	2006	3 073.1	921.2	357.0	1 794.8	2 906.8	552.7	248.8	2 105.3
	2007	3 214.6	938.2	358.1	1 918.3	3 263.6	620.7	260.8	2 382.1
	2008	3 203.6	902.7	338.6	1 962.2	3 361.9	565.6	286.8	2 509.5
	2009	3 054.3	872.3	345.8	1 836.3	3 592.4	636.3	269.9	2 686.2
	2010	3 094.6	907.5	338.3	1 848.8	3 838.2	651.8	333.1	2 853.4
	2011	3 326.7	916.0	388.2	2 022.6	4 108.8	697.8	328.0	3 082.9
	2012	3 480.9	905.8	398.1	2 177.0	4 386.9	725.7	355.5	3 305.7
	2013	3 686.9	909.4	435.2	2 342.4	4 728.7	767.4	369.2	3 592.1
	2014	3 826.8	927.3	434.3	2 465.2	4 897.2	768.0	392.6	3 736.5
Oceania	2006	3.8	1.2	0.1	2.5	12.9	0.0	6.7	6.2
	2007	3.5	0.9	0.1	2.5	13.5	0.0	7.0	6.5
	2008	4.2	1.5	0.1	2.6	13.8	0.0	7.1	6.7
	2009	6.3	1.5	0.2	4.6	13.1	0.0	3.6	9.5
	2010	6.5	1.5	0.2	4.8	13.4	0.0	3.7	9.7
	2011	7.1	1.6	0.2	5.3	13.5	0.0	3.9	9.6
	2012	8.3	1.6	0.8	5.9	13.0	0.0	4.6	8.4
	2013	7.5	1.6	0.8	5.1	13.1	0.8	4.1	8.2
	2014	8.1	1.6	0.9	5.5	14.2	0.9	4.4	8.9

Table 1.4 (b). World seaborne trade 2006–2014, by type of cargo, country group and region (percentage share)

Country group	Year	Goods loaded				Goods unloaded			
		Total	Crude	Petroleum products and gas	Dry cargo	Total	Crude	Petroleum products and gas	Dry cargo
		Percentage share							
World	2006	100.0	23.2	11.9	65.0	100.0	24.5	11.3	64.1
	2007	100.0	22.6	11.6	65.8	100.0	24.5	11.1	64.4
	2008	100.0	21.7	11.6	66.7	100.0	23.4	11.3	65.3
	2009	100.0	21.8	11.8	66.4	100.0	23.9	11.8	64.3
	2010	100.0	21.3	11.7	67.0	100.0	22.9	11.6	65.5
	2011	100.0	20.0	11.8	68.2	100.0	21.6	11.8	66.6
	2012	100.0	19.4	11.5	69.1	100.0	21.0	11.5	67.5
	2013	100.0	18.3	11.5	70.3	100.0	19.8	11.5	68.7
	2014	100.0	17.4	11.3	71.3	100.0	19.0	11.4	69.6
Developed economies	2006	32.0	7.4	36.8	39.8	52.9	66.4	59.9	46.4
	2007	32.5	7.5	38.9	39.9	49.0	62.4	58.0	42.4
	2008	33.0	7.2	42.3	39.7	48.4	64.4	56.0	41.3
	2009	32.5	6.7	41.2	39.4	43.1	60.0	57.5	34.1
	2010	34.1	7.6	42.9	40.9	42.7	60.3	53.4	34.6
	2011	34.0	6.7	43.7	40.3	41.3	57.2	56.0	33.5
	2012	34.0	7.0	43.6	39.9	40.3	56.6	52.7	33.1
	2013	33.5	6.6	43.1	38.9	38.7	53.5	50.8	32.4
	2014	34.3	6.5	43.6	39.5	38.2	52.9	49.2	32.3
Transition economies	2006	5.3	6.9	4.5	4.9	0.9	0.3	0.3	1.2
	2007	5.1	6.9	4.3	4.6	0.9	0.4	0.4	1.3
	2008	5.2	7.7	3.8	4.7	1.1	0.3	0.4	1.5
	2009	6.4	8.3	4.8	6.1	1.2	0.2	0.5	1.7
	2010	6.1	8.4	4.7	5.7	1.4	0.2	0.5	2.1
	2011	5.7	7.5	4.1	5.5	1.8	0.2	0.4	2.5
	2012	5.9	7.6	3.8	5.8	1.6	0.2	0.4	2.3
	2013	5.8	8.3	2.9	5.6	0.8	0.1	1.0	1.0
	2014	6.0	8.0	3.9	5.9	0.8	0.0	1.0	1.0
Developing economies	2006	62.7	85.6	58.7	55.3	46.2	33.3	39.7	52.3
	2007	62.4	85.7	56.9	55.5	50.0	37.2	41.6	56.4
	2008	61.8	85.0	53.8	55.6	50.6	35.3	43.6	57.3
	2009	61.1	85.0	54.0	54.5	55.7	39.8	42.0	64.2
	2010	59.8	84.0	52.4	53.4	55.9	39.5	46.2	63.3
	2011	60.3	85.8	52.2	54.2	56.9	42.5	43.6	64.0
	2012	60.1	85.4	52.6	54.3	58.1	43.2	46.9	64.7
	2013	60.7	85.1	53.9	55.4	60.5	46.4	48.2	66.6
	2014	59.7	85.5	52.5	54.6	61.0	47.0	49.8	66.7
Africa	2006	9.4	19.8	9.4	5.6	4.4	2.1	4.4	5.3
	2007	9.1	20.0	8.8	5.4	4.7	2.3	4.9	5.5
	2008	9.3	21.2	8.7	5.5	4.5	2.3	4.7	5.3
	2009	9.0	20.7	8.9	5.2	4.9	2.4	4.3	6.0
	2010	9.0	19.6	9.4	5.5	4.9	2.2	4.1	6.0
	2011	8.2	19.2	6.6	5.3	4.3	2.0	4.5	5.0
	2012	8.2	20.4	6.6	5.1	4.3	1.7	4.8	5.0
	2013	8.6	18.8	7.6	6.1	4.5	1.9	6.0	5.1
	2014	7.7	17.6	7.0	5.4	4.8	2.0	6.2	5.3

Table 1.4 (b). World seaborne trade 2006–2014, by type of cargo, country group and region (percentage share) *(continued)*

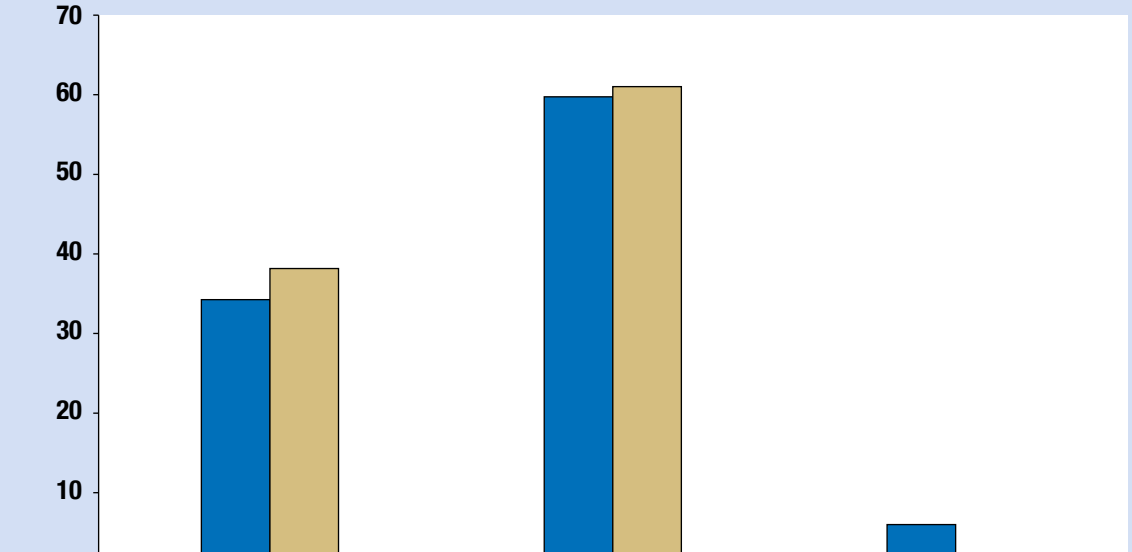
Country group	Year	Goods loaded				Goods unloaded			
		Total	Crude	Petroleum products and gas	Dry cargo	Total	Crude	Petroleum products and gas	Dry cargo
		Percentage share							
America	2006	13.4	14.1	10.3	13.7	4.7	2.6	6.7	5.2
	2007	13.3	13.9	9.7	13.7	5.1	3.8	7.1	5.3
	2008	13.5	13.1	9.7	14.2	5.3	3.8	7.5	5.4
	2009	13.1	13.2	7.9	14.0	4.7	3.4	8.0	4.6
	2010	13.9	13.5	8.7	15.0	5.3	3.6	7.6	5.5
	2011	14.1	14.4	8.1	15.1	5.8	3.7	7.1	6.2
	2012	13.9	14.2	8.1	14.8	5.9	3.9	7.9	6.3
	2013	13.3	13.8	6.4	14.3	6.0	3.7	8.2	6.3
	2014	13.0	13.6	6.5	14.0	6.2	3.8	8.3	6.5
Asia	2006	39.9	51.7	39.0	35.9	36.9	28.6	27.8	41.7
	2007	40.0	51.7	38.4	36.3	40.1	31.1	28.9	45.5
	2008	38.9	50.6	35.4	35.8	40.6	29.1	30.7	46.4
	2009	38.9	51.0	37.1	35.2	45.9	34.0	29.3	53.3
	2010	36.8	50.8	34.4	32.8	45.5	33.7	34.0	51.6
	2011	37.9	52.1	37.5	33.8	46.7	36.8	31.6	52.6
	2012	37.8	50.7	37.7	34.3	47.7	37.6	33.7	53.3
	2013	38.8	52.3	39.9	35.0	49.8	40.8	33.7	55.1
	2014	38.9	54.2	38.9	35.1	49.9	41.3	35.0	54.8
Oceania	2006	0.0	0.1	0.01	0.0	0.2	-	0.7	0.1
	2007	0.0	0.1	0.01	0.0	0.2	-	0.8	0.1
	2008	0.1	0.1	0.01	0.0	0.2	-	0.8	0.1
	2009	0.1	0.1	0.02	0.1	0.2	-	0.4	0.2
	2010	0.1	0.1	0.0	0.1	0.2	-	0.4	0.2
	2011	0.1	0.1	0.0	0.1	0.2	-	0.4	0.2
	2012	0.1	0.1	0.1	0.1	0.1	-	0.4	0.1
	2013	0.1	0.1	0.1	0.1	0.1	-	0.4	0.1
	2014	0.1	0.1	0.1	0.1	0.1	-	0.4	0.1

Sources: UNCTAD secretariat, based on data supplied by reporting countries and as published on the relevant government and port industry websites, and by specialist sources. Data from 2006 onwards have been revised and updated to reflect improved reporting, including more recent figures and better information regarding the breakdown by cargo type. Figures for 2014 are estimated based on preliminary data or on the last year for which data were available.

demand for maritime transport services. They are no longer only sources of supply of raw materials, but also key players in globalized manufacturing processes and a growing source of demand. In terms of regional influence, Asia continued to dominate as the main loading and unloading area in 2014, followed by the Americas, Europe, Oceania and Africa (figure 1.4 (c)).

The impact of the drop in oil price levels since June 2014 extends beyond the energy markets and the world economy to also affect shipping and seaborne trade, in particular tanker trade. Indirect impacts are felt through changes in the areas of activity and sectors that generate the demand for maritime transport services. These include changes in production costs, economic growth, income and purchasing power of oil producers/exporters and consumers/importers, terms of trade, and investments in oil and gas, as well as investments in alternative fuels and fuel efficient technologies. Meanwhile, direct impacts on shipping and seaborne trade are reflected in lower fuel and transport costs. Ship bunker fuel costs have fallen significantly over the past few months. For example, the 380 centistoke bunker prices in Rotterdam dropped from $590 per ton in June 2014 to $318 per ton in December 2014, a drop of 46 per cent (Clarksons Research, 2015a). Lower fuel costs reduce ship operators' expenditure and rates paid by shippers. This, in turn, can stimulate the demand for maritime transport services and increase seaborne cargo flows.

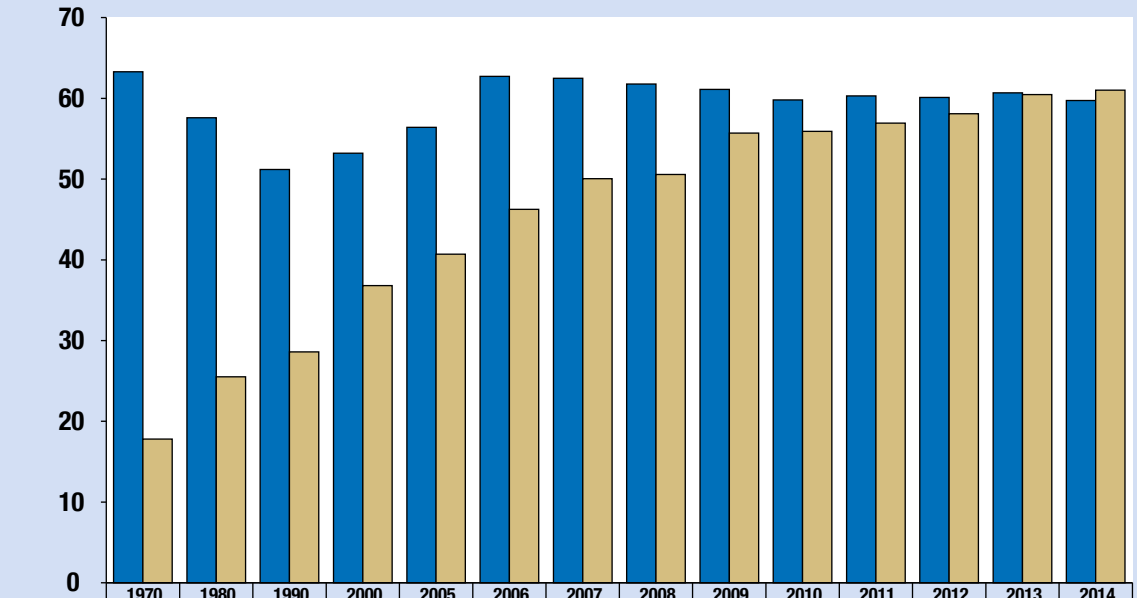
Figure 1.4 (a). World seaborne trade, by country group, 2014 (percentage share in world tonnage)



	Developed economies	Developing economies	Transition economies
Loaded	34	60	6
Unloaded	38	61	1

Sources: UNCTAD secretariat, based on data supplied by reporting countries and as published on the relevant government and port industry websites, and by specialist sources. Estimated figures are based on preliminary data or on the last year for which data were available.

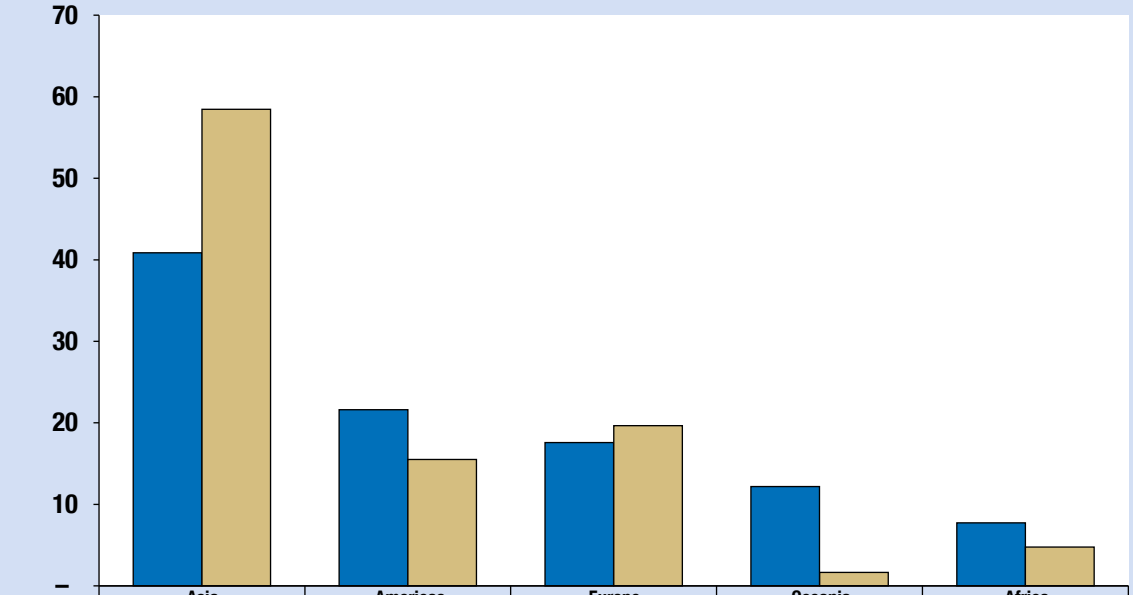
Figure 1.4 (b). Participation of developing countries in world seaborne trade, selected years (percentage share in world tonnage)



	1970	1980	1990	2000	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Loaded	63	58	51	53	56	63	62	62	61	60	60	60	61	60
Unloaded	18	26	29	37	41	46	50	51	56	56	57	58	60	61

Source: UNCTAD *Review of Maritime Transport*, various issues.

Figure 1.4 (c). World seaborne trade, by region, 2014 (percentage share in world tonnage)



	Asia	Americas	Europe	Oceania	Africa
Loaded	41	22	18	12	8
Unloaded	58	16	20	2	5

Sources: UNCTAD secretariat, based on data supplied by reporting countries and as published on the relevant government and port industry websites, and by specialist sources. Estimated figures are based on preliminary data or on the last year for which data were available.

In addition to being potentially beneficial to shippers and trade generally, it may be argued that lower bunker fuel costs can further shape the global shipping networks and enhance market access and connectivity by making, for example, additional port calls on existing services more cost-effective. Furthermore, in addition to supporting demand and therefore larger crude trade volumes, lower oil prices and the related "contango" can lead to the use of tankers as storage units to store oil. Although a number of fixtures were reported in 2014 and early 2015, oil storage did not become as widespread as initially expected given the less promising trends in oil futures and the rise in charter rates (Clarksons Research, 2015a).

Some observers have commented that a lower price and cost environment could potentially undermine the competitiveness of energy-efficient ships and "eco-ship" designs and equipment (*Ship & Bunker*, 2014a). Others have argued that the benefits generated from slow steaming, a major cost-cutting measure implemented since 2008/2009, could be eroded as ships resume sailing at faster speeds (*Journal of Commerce* (*JOC*), 2014). While uncertainty about the future of slow steaming remains, so far it would appear that average operating speeds have not increased, owing probably to the slower design speed of eco-ships and the risk for profitability. Faster speeds are likely to liberate excess capacity back into some shipping markets and therefore undermine the fundamentals of the market and the profitability (*Lloyd's List*, 2015a). It was noted that if carriers were, for example, to speed up their services to remove one week from transit times on the Asia–Europe container route, they would be adding 2.5 per cent to the existing capacity on the route (*Lloyd's List*, 2015b). To put this in perspective and based on information obtained from Clarksons Research, it should be noted that prior to implementing slow steaming, a typical structure for a journey from the Far East to Europe, for example, included eight ship services to maintain weekly calls over a period of 56 days for full rotation (28 days for one leg). With the implementation of slow steaming, the number of ship services increased to ten to maintain weekly calls, while transit times increased to 70 days for a full rotation (35 days for one leg).

A related development that affects the shipping industry is the coming into force on 1 January 2015 of the requirement under the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 (MARPOL) annex

VI (Regulations for the Prevention of Air Pollution from Ships), specifically under regulation 14, which covers emissions of sulphur oxides (SO_X) and particulate matter from ships. The ECAs were established under MARPOL annex VI for SO_X and include the Baltic Sea area, the North Sea area, the North American Atlantic area, and the United States Caribbean Sea area. Ships trading in ECAs are required to use fuel oil with a sulphur content of no more than 0.10 per cent from 1 January 2015. The previous limit was 1.00 per cent (IMO, 2015). The current limit applied in waters other than ECAs is 3.50 per cent and is set to drop to 0.50 per cent on and after 1 January 2020; however, the coming into force of this latter limit is subject to a review to be completed by 2018 regarding the availability of the required fuel oil (IMO, 2015). Although ship operators were concerned about the cost of using more expensive lower sulphur fuels, the lower oil price environment has helped offset the price premium, with the cost of cleaner fuel remaining reasonable given the general lower oil prices and bunker fuel costs (Barnard, 2015). However, in anticipation of the potential increase in bunker fuel costs, some carriers have announced some surcharges that will be applied if necessary.

2. Seaborne trade in ton–miles

The ton–mile unit offers a more accurate measure of demand for shipping services and tonnage as it takes into account distance, which determines ships' transportation capacity over time. In 2014, growth in ton–miles performed by maritime transportation was estimated to have increased by 4.4 per cent, up from 3.1 per cent in 2013 (see figure 1.5) (Clarksons Research, 2015b). Dry bulk commodities, namely iron ore, coal, grain, bauxite and alumina, phosphate rock and minor bulks accounted for nearly half of the total 52,572 estimated billion ton—miles performed in 2014. The ton—miles of the dry bulks expanded at a firm rate (6.4 per cent for major dry bulk commodities and 5.2 per cent for minor bulks). Ton-miles generated by containerized trade were estimated to have increased by 5.4 per cent (Clarksons Research, 2015b), driven by the recovery on the peak legs of the Asia–Europe and trans-Pacific trade routes as well as the continued rise in the longer haul North–South trade volumes. Coal and iron ore import demand from Asia has contributed significantly to the growth in dry bulk trade volumes over recent years. Apart from China, iron ore and coal demand from other fast growing economies such as India and the Republic of Korea has also been on the rise.

With crude oil volumes estimated to have contracted in 2014, the associated ton–miles remained flat, indicating growth in distances travelled. The average haul of crude oil trade to Asia was estimated at over 5,000 miles in 2014, or 9 per cent greater than 2005 levels (Elliott-Green, 2015). China has been driving growth given its increasing sourcing of crude oil imports from various locations, including both long and shorter haul routes (for example, the Caribbean, West Africa, Western Asia and the Russian Federation). India is also increasingly sourcing crude oil imports from Western Asia, Western Africa and the Caribbean, resulting in growing long-haul imports. The average haul of Indian crude oil imports was estimated at over 4,000 miles in 2014, up from 1,900 miles in 2005 (Elliott-Green, 2015). The United States has also contributed to the ton–mile trends observed over recent years. While its crude oil imports have fallen by nearly half since 2005, its crude oil ton–miles have declined less rapidly. This reflects the United States' oil trade patterns as larger import declines were recorded on the short-haul trades (for example, West Africa) as opposed to the longer haul Western Asian route. In 2014, the average haul of crude oil imports into the United States increased to 7,000 miles, representing an 18 per cent increase over 2005 (Elliott-Green, 2015). Ton–miles generated by the trade of petroleum products increased by 3.8 per cent, while gas trade ton–miles expanded by 2.6 per cent, driven mainly by growth in the liquefied petroleum gas (LPG) flows (Clarksons Research, 2015b).

3. Seaborne trade by cargo type

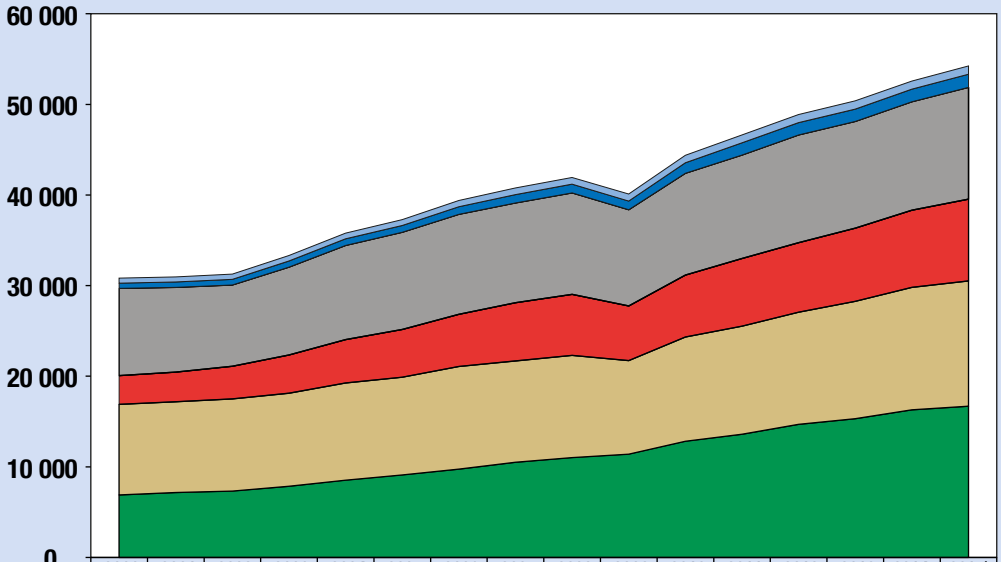
(a) Tanker trade

Crude oil

While oil prices are an important market signal, other factors are also increasingly shaping the tanker trade landscape. These include the response of shale oil producers to the lower oil price levels, policy decisions by members of the Organization of the Petroleum Exporting Countries, geopolitical developments, and political tensions.

Reflecting subdued growth in global oil consumption in 2014 (+0.8 per cent) (International Energy Agency, 2015), crude oil shipments were estimated at 1.7 billion tons in 2014, a drop of 1.7 per cent over the previous year. The firm import demand of Asian countries, in particular China and India, the effect of lower oil prices on stock building, and increased oil

Figure 1.5. World seaborne trade in cargo ton–miles by cargo type, 2000–2015 (billions of ton–miles)



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014[a]	2015[b]
Chemicals	552	562	593	606	625	651	689	724	736	765	824	864	889	908	899	912
Gas	576	591	611	662	719	736	833	913	956	958	1 147	1 344	1 346	1 347	1 382	1 444
Oil	9 631	9 352	8 971	9 698	10 393	10 729	11 036	11 011	11 200	10 621	11 237	11 417	11 890	11 779	11 969	12 339
Container	3 170	3 271	3 601	4 216	4 785	5 269	5 757	6 422	6 734	6 030	6 833	7 469	7 673	8 076	8 514	9 024
Other (minor bulks & other)	9 998	10 023	10 167	10 275	10 729	10 782	11 330	11 186	11 272	10 325	11 504	11 927	12 375	12 952	13 514	13 833
Five main dry bulks	6 896	7 158	7 331	7 852	8 527	9 107	9 745	10 503	11 028	11 400	12 824	13 596	14 691	15 312	16 294	16 685

Source: UNCTAD secretariat, based on data from Clarksons Research (2015b).
[a] Estimated
[b] Forecast

supply (+2.5 per cent) have combined to offset the limited growth elsewhere and the decline in import volumes of the United States and Europe.

In 2014, crude oil imports into the United States declined by nearly 12 per cent to reach 4.5 million barrels per day, while imports into China increased by 9.8 per cent (5.6 million barrels per day) (Clarksons Research, 2015c) in tandem with its growing refinery capacity, strategic petroleum reserves requirements as well as the supporting effect of lower oil prices. This trend is likely to continue given the expected further growth in China's refinery capacity and petroleum reserve requirements. Underpinned by a rising national refinery capacity, India has over recent years emerged as an important crude oil importer (Clarksons Research, 2015d). On the export side, members of the Organization of the Petroleum Exporting Countries maintained the production levels to retain market share. African crude exports contracted by 4.6 per cent due to technical problems in Angola, infrastructure-related disruptions in Nigeria as well as conflicts in Libya. An overview of global consumers and producers of oil and gas is presented in table 1.5.

Table 1.5. Major producers and consumers of oil and natural gas, 2014 (world market share in percentage)

World oil production		*World oil consumption*	
Western Asia	32	Asia Pacific	34
North America	18	North America	22
Transition economies	16	Europe	15
Developing America	12	Developing America	10
Africa	9	Western Asia	9
Asia Pacific	9	Transition economies	5
Europe	3	Africa	4
World natural gas production		***World natural gas consumption***	
North America	26	North America	26
Transition economies	22	Asia Pacific	20
Western Asia	17	Transition economies	17
Asia Pacific	15	Western Asia	14
Europe	7	Europe	13
Developing America	7	Developing America	8
Africa	6	Africa	4

Source: UNCTAD secretariat on the basis of data published in the British Petroleum (BP) *Statistical Review of World Energy 2015* (June 2015).

Note: Oil includes crude oil, shale oil, oil sands and natural gas liquids NGLs – the liquid content of natural gas where this is recovered separately). The term excludes liquid fuels from other sources as biomass and coal derivatives.

Refined petroleum products

Developments in refinery capacities can significantly shape crude and product trade patterns. In 2014, the global refinery capacity increased by 1.4 per cent (British Petroleum, 2015), driven mainly by growth in Brazil, China, Singapore and Western Asia. According to UNCTAD's estimates, which include gas trade, the volume of petroleum products and gas loaded in 2014 increased by 2.3 per cent and reached 1.11 billion tons. Meanwhile, data from Clarksons Research indicate that petroleum products are estimated to have increased by 1.7 per cent in 2014 and reached 977 million tons, while gas trade increased by 3.9 per cent and totalled 319 million tons (Clarksons Research, 2015b).

On the supply side, increasing exports from Western Asia (+6.3 per cent), the United States (+4.0 per cent) and the economies in transition (+3.6 per cent) helped support growth (Clarksons Research, 2015b). Imports into Latin America (+11.8 per cent) and developing Asia (other than China) (+6.3 per cent) have been the main driver of growth. Meanwhile, imports into Africa, Australia, India, Japan and the Republic of Korea are estimated to have remained steady, while imports into China, the United States and Europe declined by 25 per cent, 12.5 per cent and 1.5 per cent, respectively (Clarksons Research, 2015b).

During recent years, China has moved away from being a net importer of oil products. Together, China's domestic oversupply of petroleum products, growing refinery capacity and reduced national demand have contributed to reducing import needs and increasing exports. Refinery capacity in Western Asia has also been on the rise, reflecting growing domestic requirements as well as export needs. Although the capacity growth was limited in the United States, throughput increased by 3.5 per cent, taking the country's global share to over 20 per cent in 2014 (British Petroleum, 2015).

Natural gas and liquefied gases

Liquefied natural gas (LNG) increased its share of global gas trade carried by sea in 2014. Volumes increased by 2.5 per cent, taking the total to 333.3 billion cubic metres. Growth was driven by higher import demand in China, India, the United Kingdom, Brazil and Mexico. Japan, the largest world importer, increased imports by 1.4 per cent, while the Republic of Korea, the second largest importer, recorded a decline of 5.7 per cent as inventory restocking was completed (British Petroleum, 2015). Rising import demand in developing Asia and America was supported by growing power generation, petrochemical and heating demand, as well as expanded regasification capacity in China and India.

Major exporters, including Qatar, reduced exports, while others such as Algeria, Australia, Malaysia and Papua New Guinea recorded increases in export volumes. Meanwhile, LNG imports into the United States have been curtailed by the shale revolution. However, the country has the potential to eventually emerge as an important gas exporter (British Petroleum, 2015).

Overall, firm global demand for LNG, led by the Asian economies, is expected to support growth in LNG carrier demand, while environmental regulations and air emission controls may lead to a growing role for gas. Some observers predict that LNG volumes will double by 2020, with Australia emerging as a world leading exporter together with other producers such as the Russian Federation, the United States, Canada and East Africa (*Lloyd's List*, 2015c). These developments will affect demand for gas carriers and further shape LNG trade flows and patterns.

Global LPG trade is estimated to have increased by 12.7 per cent in 2014 to reach 71 million tons. Growth was largely supported by the expansion of shale production in the United States and LPG exports (Clarksons Research, 2015a). Imports of LPG into China and India remained firm and contributed to raising long-haul trades and helping absorb more gas carrier capacity (Clarksons Research, 2015a).

(b) Dry cargo trade: Major and minor dry bulks and other dry cargo

The import demand of emerging developing economies, in particular China and India, remained the main driver of growth in dry bulk cargo shipments in 2014. During the year, the increase in world seaborne dry bulk shipments was estimated at 5.0 per cent, a slower rate than the previous four years (*Dry Bulk Trade Outlook*, 2015a). Growth was underpinned by the strong expansion in iron ore trade (+12.4 per cent) which accounted for about 30.0 per cent of all dry bulk cargo and reached 1.34 billion tons. In contrast, coal trade shipments were estimated to have increased by a modest 2.8 per cent, a much slower rate than the double-digit growth recorded in 2012

(+12.3 per cent). Shipments of the five major bulk commodities increased by 6.5 per cent, while the volume of minor bulk commodities is estimated to have increased by 2.0 per cent, reaching 3.1 billion tons and 1.43 billion tons, respectively. Exports of dry bulk commodities such as bauxite, nickel ore, iron ore and coal were constrained by, among other factors, bans on mining activities, restrictions on exports, weather patterns, regulatory measures and policies seeking to promote national producers and industries. An overview of global producers and users of steel as well as importers of select major dry bulk commodities is presented in table 1.6.

Iron ore shipments

Supported by increased production and exports from Australia, seaborne iron ore trade is estimated to have grown by 12.4 per cent, taking the total to 1.34 billion tons in 2014 (*Dry Bulk Trade Outlook*, 2015a). While growth in China's steel production decelerated in 2014 (World Steel Association, 2015), its iron ore imports remained robust due to lower international iron ore prices and the ample supply from Australia. The cheaper and higher quality imported iron ore displaced domestic supply. There are significant concerns, however, about the long-term developments in China's steel industry and related implications for dry bulk shipping. On the positive side for shipping, the increased Indian import demand may indicate the potential of India to further rely on iron ore imports to support its growing steel production sector. India's iron ore imports are currently expected to grow by 23 per cent in 2015.

Shipments from Australia are estimated to have increased by 24.2 per cent and accounted for over half of global iron ore exports in 2014. Exports from Brazil, which accounted for 25.3 per cent of world iron ore shipments, increased by 5.4 per cent. Exports from Sierra Leone grew by approximately 51.0 per cent to reach 18.1 million tons despite the negative impact of the Ebola outbreak on mining activities (*Dry Bulk Trade Outlook*, 2015b).

Looking forward, while, in the short term, iron ore shipments are expected to continue to grow, concerns relating to a slowdown of China's steel industry and import demand are causing uncertainty in the outlook for bulk carrier demand. Additionally, while lower iron ore prices stimulated iron ore trade in 2014, the sharp fall in prices raises concerns about the ability of some miners to continue production at a loss (Trimmel, 2015).

Table 1.6. Some major dry bulks and steel: Main producers, users, exporters and importers, 2014 (world market shares in percentages)

Steel producers		*Steel users*	
China	50	China	46
Japan	7	United States	7
United States	7	India	5
India	5	Japan	4
Republic of Korea	4	Republic of Korea	4
Russian Federation	4	Russian Federation	3
Germany	3	Transition economies	3
Turkey	2	Germany	3
Brazil	2	Turkey	2
Ukraine	2	Mexico	1
Other	15	Other	22
Iron ore exporters		***Iron ore importers***	
Australia	54	China	68
Brazil	25	Japan	10
South Africa	5	Europe	9
Canada	3	Republic of Korea	6
Sweden	2	Other	7
Other	12		
Coal exporters		***Coal importers***	
Indonesia	34	China	20
Australia	31	Europe	19
Russian Federation	9	India	18
Colombia	6	Japan	15
South Africa	6	Republic of Korea	11
Canada	3	Taiwan Province of China	5
Other	12	Malaysia	2
		Thailand	2
		Other	9
Grain exporters		***Grain importers***	
United States	26	Asia	33
European Union	14	Africa	21
Ukraine	10	Developing America	20
Canada	9	Western Asia	19
Argentina	8	Europe	5
Russian Federation	8	Transition economies	2
Others	25		

Sources: UNCTAD secretariat, based on data from World Steel Association, 2015; *Dry Bulk Trade Outlook* (May 2015a); Clarksons Research (2015b); and International Grains Council, Grains Market Report, June 2015.

Coal shipments

Growth in world coal shipments (thermal and coking) decelerated to 2.8 per cent with total volumes estimated at 1.2 billion tons. Thermal coal exports, which accounted for over two thirds of coal trade in 2014, are estimated to have increased by 3.8 per cent and reached 950 million tons. Coking coal shipments fell marginally (—0.8 per cent) to 262 million tons, owing mainly to reduced import demand from China (*Dry Bulk Trade Outlook*, 2015a).

China was the main engine fuelling the rapid expansion of world seaborne coal trade over the past decade, with its share of global coal shipments reaching 20.0 per cent in 2014, up from 2.0 per cent in 2005. An estimated 10.0 per cent drop in China's coal imports in 2014 may have a significant impact on dry bulk shipping demand. Factors contributing to the drop in China's imports include, among others, the falling import demand, which reflects China's regulations on saleable coal use, a slowdown in steel production, coal import taxes and quality limits, efforts to protect the domestic coal mining industry, hydroelectric power production and government initiatives to reduce air pollution.

Elsewhere, imports into the European Union have also dropped and are expected to further depress as member States comply with the Large Combustion Plant Directive (European Commission, 2001). The Directive contributed to reducing coal emissions by 5.0 per cent between 2008 and 2013, as some stations have already been closed (Jones and Worthington, 2014). Reflecting its growing steel production, India's coking coal imports are estimated to have grown by 24.3 per cent, while thermal coal imports grew by 7.1 per cent. On the export side, total thermal coal exports from Indonesia dropped by 1.7 per cent, while exports from the United States fell by 33.7 per cent, owing in particular to rising mining production costs, lower international coal prices and, generally, weaker global demand. Coking coals exports from the main exporters, including Canada, the Russian Federation and the United States, also declined in 2014, with the exception of exports from Australia (+3.6 per cent) (*Dry Bulk Trade Outlook*, 2015a).

Grain shipments

Reflecting improved weather conditions and harvest recovery in key exporters including Canada, the European Union, Ukraine and the United States, and, in the case of the Russian Federation, a favourable exchange rate, global grain shipments (including wheat, coarse grain and soybean) are estimated to have increased by 11.1 per cent in 2014 and totalled 430 million tons (*Dry Bulk Trade Outlook*, 2015a). Other exporters including Australia and Argentina recorded flat growth rates or contractions in export volumes during the crop year 2013/2014.

Japan, the top world importer, imported less grain (-1.3 per cent), while China, the second world importer, increased its imports, in particular of soybeans (+16.4 per cent). The strong demand from China will continue to support soybean export shipments from developing America. Other grain importers such as Algeria, Indonesia, the Islamic Republic of Iran, Mexico and Saudi Arabia increased their imports, while the economies in transition Brazil, Colombia, Morocco and Tunisia reduced their imports, given ample domestic supply.

Bauxite, alumina and phosphate rock

Bauxite trade continues to face uncertainty due to Indonesia's export restrictions, introduced in January 2014. Global bauxite and alumina trade volumes are estimated to have contracted by 24.5 per cent in 2014 to reach 105 million tons. China's import volumes of bauxite contracted by over half in 2014, a stark contrast with the 79.0 per cent increase of 2013, when refiners stockpiled the mineral in anticipation of the export ban (*Dry Bulk Trade Outlook*, 2015a). Indonesia used to be the largest exporter of bauxite to China. However, with the application of the export restrictions, China is increasingly sourcing its imports from Malaysia. In the meantime, Australia has the potential to emerge as an important supplier.

In 2014, global shipments of phosphate rock are estimated to have increased by 7.2 per cent, taking the total volume to 30 million tons. World phosphate rock production declined by 2.2 per cent, with contractions in output in China and the United States being to some extent offset by increased production in Morocco. Global production capacity is projected to grow owing to expansions in existing mines in Jordan, Kazakhstan, Morocco, Peru, the Russian Federation and Tunisia. World consumption of phosphorus pentoxide (P_2O_5) from phosphate rock is also projected to increase, with the largest growth occurring in Asia and developing America. These trends are likely to drive up shipments of phosphate rock and shape the associated flows and trade patterns.

Dry cargo: Minor bulks

Growth in global shipments of minor bulk commodities are estimated to have decelerated to 1.8 per cent in

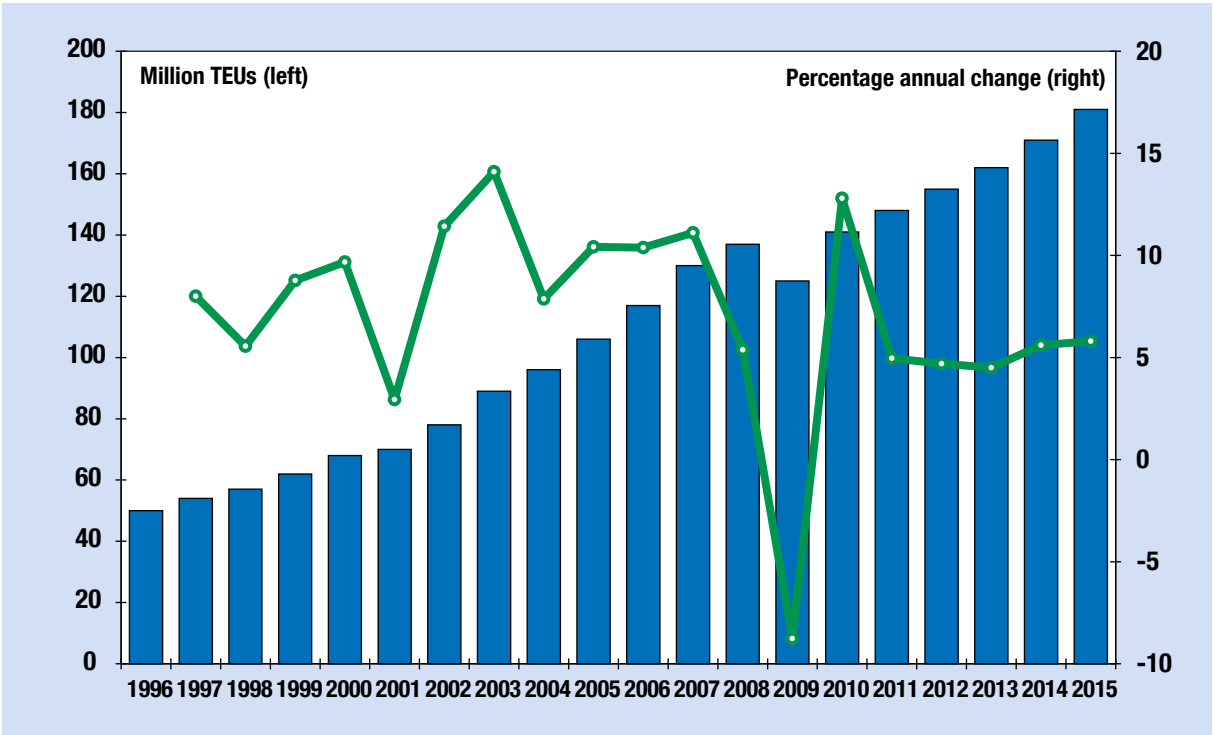
2014, with total volumes reaching 1.43 billion tons. Manufactures (steel and forest products) accounted for 41.9 per cent of the total followed by metals and minerals (35.4 per cent) and agribulks (22.8 per cent). While manufactures and agribulks each increased by 6.0 per cent in 2014, metals and minerals declined by 3.0 per cent (*Dry Bulk Trade Outlook*, 2015a). Growth in manufactures reflected the firm increase in Chinese steel production and export growth supported by a tax rebate on some products as well as weaker domestic steel demand. Exports of metals and minerals were constrained by reduced Indonesian exports of nickel ore following the implementation of the export ban in January 2014. China's nickel ore imports are increasingly sourced from the Philippines, which have come to dominate the international nickel ore market in the past year. The drop in metals and minerals is also reflective of the fall in anthracite shipments resulting from a drop in Viet Nam's exports (Clarksons Research, 2015a).

Other dry cargo: Containerized trade

In 2014, global containerized trade was estimated to have increased by 5.3 per cent and reached 171 million TEUs (see figure 1.6 (a)). Global growth was boosted by the recovery on the headhaul journeys (peak legs) of the major East–West trans-Pacific and Asia–Europe trade lanes. Partly reflecting the recovery in the United States and the improved prospects for Europe, containerized trade volumes carried on the Asia–Europe and trans-Pacific peak legs are estimated to have increased by 7.5 per cent and 6.3 per cent respectively (Clarksons Research, 2015e). In comparison, and reflecting a weaker import demand in Asia, trade volumes on backhaul journeys remained weak. Weaker demand for imports from Europe and North America does not necessarily reflect a drop in the overall import demand, as imports into Asia often include waste and other residual products. Volumes on the westbound leg of the trans-Pacific route contracted while shipments on the eastbound leg of the Asia–Europe trade route increased only marginally (see table 1.7 and figure 1.6 (b)).

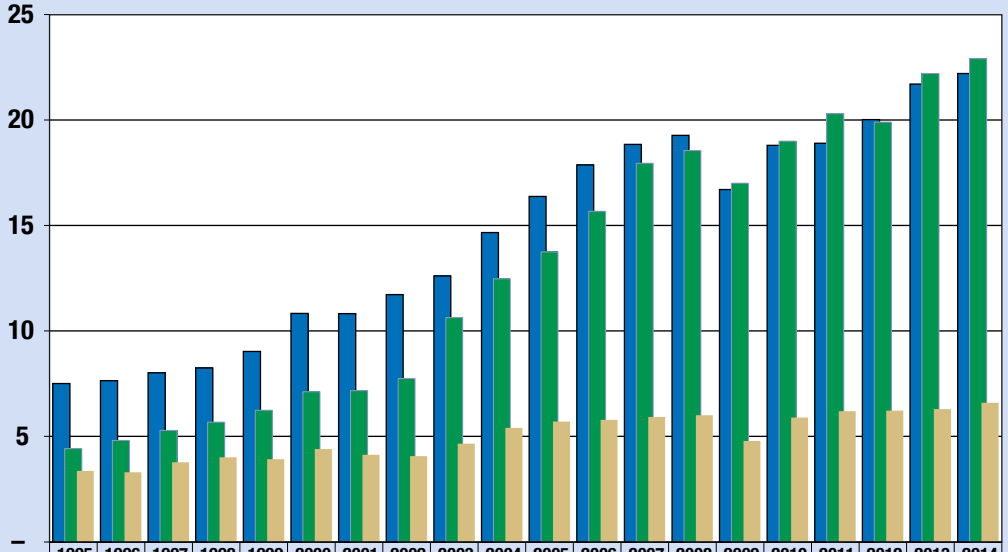
The recovery on the mainlane East–West routes does not, however, reveal the changing patterns of global demand. The total mainlane container trade is estimated to have grown by 9.0 per cent between 2007 and 2014 while trade volumes on the non-mainlane trades are said to have expanded by 45 per cent during the same period. Consequently, the share of world trade held by the mainlane trades fell from

Figure 1.6 (a). Global containerized trade, 1996–2015 (million TEUs and percentage annual change)



Source: UNCTAD secretariat, based on Drewry Shipping Consultants, Container Market Review and Forecast 2008/2009; and Clarksons Research, *Container Intelligence Monthly*, various issues.

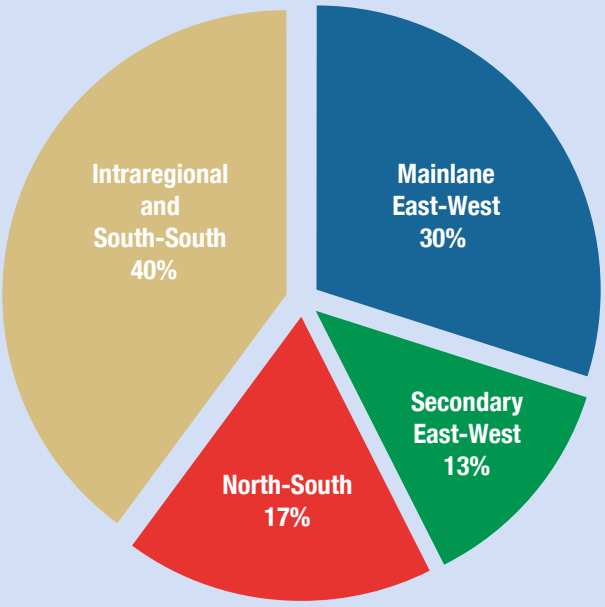
Figure 1.6 (b). Estimated containerized cargo flows on major East–West container trade routes (million TEUs), 1995–2014



	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Trans-Pacific	8	8	8	8	9	11	11	12	13	15	16	18	19	19	17	19	19	20	22	22
Europe–Asia–Europe	4	5	5	6	6	7	7	8	11	12	14	16	18	19	17	19	20	20	22	23
Transatlantic	3	3	4	4	4	4	4	4	5	5	6	6	6	6	5	6	6	6	6	7

Source: UNCTAD secretariat, based on the Global Insight Database as published in *Bulletin Fal*, 288(8/2010) (International maritime transport in Latin America and the Caribbean in 2009 and projections for 2010), United Nations Economic Commission for Latin America and the Caribbean (ECLAC). Data for 2009, 2010, 2011, 2012, 2013 and 2014 are based on table 1.7.

Figure 1.6 (c). Distribution of global containerized trade by route, 2014 (percentage share of global trade in TEUs)



Source: UNCTAD secretariat, based on Clarksons Research (2015e); and *Lloyd's List Data Hub Statistics*, various issues.

Table 1.7. Estimated containerized cargo flows on major East–West container trade routes, 2009–2014 (million TEUs and percentage annual change)

	Transpacific		*Europe Asia*		*Transatlantic*	
	Asia–North America	North America–Asia	Asia–Europe	Europe–Asia	Europe–North America	North America–Europe
2009	10.6	6.1	11.5	5.5	2.8	2.5
2010	12.3	6.5	13.3	5.7	3.2	2.7
2011	12.4	6.6	14.1	6.2	3.4	2.8
2012	13.1	6.9	13.7	6.3	3.6	2.7
2013	13.8	7.9	14.3	6.9	3.6	2.7
2014	14.7	7.5	15.4	7.0	3.9	2.7
Percentage change 2013–2014	**6.3**	**-4.5**	**7.5**	**1.3**	**8.3**	**0.0**

Source: UNCTAD secretariat, based on data from MDS Transmodal as published in *Lloyd's List Data Hub Trade Statistics*; and Containerisation International, various issues. Data for 2013 and 2014 are sourced from Clarksons Research, *Container Intelligence Monthly*, 17(4), May 2015.

36.0 per cent in 2007 to 30.0 per cent in 2014. At the same time, intraregional (led by intra-Asian trade) and South–South trade accounted for 40 per cent of global containerized volumes in 2014, followed by flows on the mainlane East–West (30 per cent), North–South (17 per cent) and secondary East–West trade routes (13 per cent) (Clarksons Research, 2015f) (figure 1.6 (c)).

Other relevant developments affecting containerized trade in 2014 included continued overcapacity, the cascading effect (ship capacity moved from main/artery lanes to secondary routes), the uncertainty about the future of slow steaming (see also section B.1) and the alignment of major container ship operators in four mega-alliances.

The oversupply of container ship capacity remained a challenge given, in particular, the current cascading effect and related implications for port infrastructure requirements, the configuration of shipping services (direct versus trans-shipments), and earnings and profitability on the routes where ships were redeployed. There were also concerns about the continued dominance of very large vessels in the container ship order book and the mismatch between the delivery of high-capacity vessels and the pattern of global demand growth.

Initially implemented in response to higher oil and bunker fuel prices, slow steaming helped manage oversupply in container shipping. Slow steaming is estimated to have resulted in the employment of 1.3 million TEUs, the equivalent of 7.0 per cent of the global container fleet capacity (*Ship & Bunker*, 2014b). Despite the recovery on the main East–West trade lanes and the lower oil prices and bunker fuel costs, the practice of slow steaming in container shipping continued and appears to be the norm as there is no outright increase in vessel speeds (*ShippingWatch*, 2014). In the meantime, shipowners continue to order very large container ships, as illustrated by the very recent ordering of 11 second-generation Triple-E container vessels with a capacity of 19,630 TEUs each (*Lloyd's List*, 2015d).

Operators on the Far East to Europe trade route continued to pursue lower costs through vessel sharing arrangements and by deploying very large container ships. Four key alliances are now in operation and include 2M, the Ocean Three, the G6 and the CKYHE. The exact impact of this new alignment of the major container ship operators has yet to be fully assessed. Meanwhile, shippers are advocating greater scrutiny and the need to conduct reviews to determine how the alliances are impacting on the industry. In this respect, European shippers have launched an initiative to carry out a wide industry survey and a review of the implications of the mega-vessel sharing agreement (*JOC* staff, 2015).

C. SUSTAINABLE AND RESILIENT MARITIME TRANSPORT SYSTEMS

The year 2015 is a milestone for sustainable development. With the international community currently elaborating a post-2015 development agenda, there is a renewed opportunity to strengthen the international commitment to sustainable development and consider how best to mainstream sustainability principles across all economic sectors, including maritime transport.

With over 80 per cent of world merchandise trade being carried by sea, maritime transport remains the backbone of international trade and globalization. Equally, the sector is a key enabling factor for other sectors and economic activities such as marine equipment manufacturing, maritime auxiliary services (for example, insurance, banking, brokering, classification and consultancy), fisheries, tourism and the offshore energy sector, as well as other marine-based industries such as shipbuilding and ship demolition. In this context, sustainable maritime transport systems entail, among other factors, transport infrastructure and services that are safe, socially acceptable, universally accessible, reliable, affordable, fuel-efficient, environmentally friendly, low carbon and climate-resilient.

Achieving greater sustainability in transport, including maritime transport, has long been recognized as a key development objective, including in the context of the 1992 Earth Summit, the United Nations Conference on Sustainable Development, UNCTAD XIII, the third International Conference on Small Island Developing States (SIDS), the second United Nations Conference on Landlocked Developing Countries, and, more recently, the United Nations General Assembly resolution on the "Role of transport and transit corridors in ensuring international cooperation, stability and sustainable development" (A/RES/69/213). Additional momentum is also generated by the work carried out by the United Nations Secretary-General High-Level Advisory Group on Sustainable Transport. Established with a view to providing recommendations on sustainable transport that are actionable at global, national and local as well as sectoral levels, the High-Level Advisory Group is expected to publish a report on the global transport outlook and convene the first international conference on sustainable development in 2016.

Against this background the following sections highlight selected relevant issues that lie at the interface of maritime transport and sustainable development.

1. Factors driving sustainability in maritime transport

Efforts to improve the energy-related, environmental and social performance of the maritime transport sector are largely driven by regulation, including in particular rules adopted under the auspices of IMO. Sustainability and resilience-motivated regulations span a broad range of issues and include safety (accidents), security (regulatory measures and piracy), marine pollution (for example, oil spills, ballast water, garbage and ship paint), labour conditions (seafarers' rights and working conditions), air pollution (SOx) and nitrogen oxides (NOx)), as well as GHG emissions.

Market requirements and growing customer demands for greater corporate social responsibility in global supply chains, transparency, agility, reliability and lighter environmental footprints are also increasingly driving significant changes in the maritime transport industry. Customers across supply chains are

Box 1.1. Examples of voluntary self-regulation in shipping

- The Clean Cargo Working Group has developed tools and methodologies to help understand and manage sustainability impacts. Relevant measures include average trade lane emissions data that can be used for a benchmarking of carriers' performances based on their carbon emissions, as well as for more informed decisions by both carriers and shippers (Business for Social Responsibility, 2014).
- The World Ports Climate Initiative, under the International Association of Ports and Harbors (IAPH): The 50 participating ports in the Initiative are engaged in reducing GHG emissions from their activities, including by influencing the sustainability of supply chains. For example, the Environmental Ship Index aims to identify seagoing ships that have better performance in terms of reducing air emissions, and includes a reporting scheme on GHG emissions from ships. The Environmental Ship Index can be used to promote clean ships (IAPH, 2015a).
- IAPH Air Quality and Greenhouse Gas Tool Box, and work relating to climate adaptation in ports such as the Climate Protection Plan Development (IAPH, 2015b).
- The Sustainable Shipping Initiative brings together leading companies from across the industry and around the world with a view to a sustainable future. Relevant activities include the launch of the Case for Action report in 2011, and efforts to promote greater uptake of sustainable shipping rating schemes to provide transparency and comparability and to enable cargo owners, charters and shipowners to integrate sustainability into commercial decisions (Sustainable Shipping Initiative, 2015).
- Charterers representing 20 per cent of global shipped tonnage are adopting policies to avoid using inefficient ships based on their GHG emissions performance (*International Transport Journal*, 2015).

increasingly expecting transportation service providers, including maritime transport service providers, to act as strategic partners that can help them achieve economic benefits as well as value for the environment and society (Business for Social Responsibility, 2010).

In response to the growing demands both at the regulatory and the market levels the maritime transport industry is increasingly, in addition to regulation and mandated measures, taking voluntary measures and adopting private self-regulation to integrate sustainability and resilience principles into activities, policies and decisions. Box 1.1 illustrates some examples of actions taken at the industry level both in response to as well as in anticipation of greater demands for improved performances in terms of sustainability and resilience.

2. Access, connectivity and infrastructure

The strategic importance of maritime transport infrastructure and services for market access, globalized production, trade competitiveness, employment, income generation, poverty reduction and social progress cannot be overemphasized. Consequently, for many developing countries, addressing the physical and non-physical barriers such as infrastructure issues (for example, insufficiency, inadequacy, congestion and maintenance requirements), missing links and interoperability of, for example equipment, vehicles, technologies and standards, is key.

However, the transport infrastructure gap remains a significant challenge in many developing regions. Global transport infrastructure needs have been estimated at $11 trillion over the period 2009–2030 (OECD, 2011). Meanwhile, the infrastructure gap in developing countries, including transport infrastructure, is significant. In the Latin America and the Caribbean region for example, investment needs required annually to meet infrastructure demand for the period 2012–2020 are estimated at 6.2 per cent of GDP, or some $320 billion (ECLAC, 2014).

To close the gap on the large infrastructure deficit in developing countries, including in transportation, existing estimates indicate that spending must reach $1.8 trillion–$2.3 trillion per year by 2020 compared with the current levels of $0.8 trillion–$0.9 trillion per year (United Nations Development Programme (UNDP), 2013). Currently 60 per cent of estimated total annual transport infrastructure investments are allocated to OECD countries (Partnership on Sustainable Low Carbon Transport, 2015).

A well-articulated transport infrastructure vision and a long-term plan that also seeks to close the infrastructure gap in maritime transport should be pursued as matters of priority. Such efforts should be based on a careful coordination of the social, economic and physical development of maritime transport systems. Maritime transport infrastructure developers, investors and managers should mainstream sustainability and resilience criteria into their broader transport development plans at the early stages of the relevant decision-making and investment processes. As maritime transport infrastructure such as ports have long life cycles, not accounting for the long-term sustainability and resilience including climate resilience requirements, may involve costly retrofitting of equipment and infrastructure and adjustment of operations and services.

3. Energy and transport costs

As discussed in section B.1, the heavy reliance of maritime transport on fossil fuels for propulsion enhances the exposure of freight rates and transport costs to high oil price volatility. Although the mid-2014 drop in oil and bunker fuel prices may be a welcome development, the effect is likely to be short-lived, given the projected growth in the global energy demand and the risk of rapid cuts in oil production due to reduced investment in the oil extractive and refining industries.

An assessment of the effect of oil prices on maritime freight rates, including for containerized goods, iron ore and crude oil, reveals that rates and therefore transport costs in all three market segments were sensitive to a rise in oil prices, albeit at different degrees (UNCTAD, 2010). For containerized trade, the estimated elasticity ranges between 0.19 and 0.36; a similar elasticity is estimated for crude oil cargo – 0.28. For iron ore, on the other hand, the elasticity is estimated to be much larger, approximately equal to unity. Developing countries are already facing disproportionately higher transport costs, with UNCTAD estimating the 2013 average freight costs as a share of imports value at close to 7.0 per cent for developed economies, 10.0 per cent for developing economies and 8.0 per cent for the world average. The negative implications of volatile oil and fuel costs for economies' sustainable development can be significant given the potential impact on transport costs, affordability of services

and trade competitiveness. Greater sustainability in maritime transport requires as a matter of priority that the overdependence on oil-based propulsion systems be effectively addressed (UNCTAD, 2010). Reducing exposure to volatility in oil prices and fuel costs though investment in energy efficiency measures, alternative energy sources and more sustainable operational and management practices can help control fuel and transport costs, derive efficiency gains and therefore enable more effective access to markets and promote trade competiveness.

4. Energy, environment and carbon emissions

In addition to raising transport costs and acting as a barrier to trade, heavy reliance on oil for propulsion undermines resource conservation objectives and leads to environmental deterioration through air and marine pollution and carbon emissions. In 2012, carbon dioxide (CO_2) emissions from international shipping were estimated at 2.2 per cent of global CO_2 emissions (IMO, 2014a). While the contribution of international shipping to global carbon emissions may be relatively low when assessed per unit of cargo and distance travelled, these emissions are, however, likely to grow if left unchecked. Forecast scenarios for the medium term suggest that international shipping carbon emissions could increase 50–250 per cent by 2050, depending on economic growth and global energy demand. Equally, international freight, including maritime transport, is projected to more than quadruple by 2050, with associated CO_2 emissions generated by all modes engaged in the international trade between 2010 and 2050 growing by a factor of 3.9 (International Transport Forum/OECD, 2015). In this context, locking in fossil fuels and related technologies in freight transport, including maritime transport, will perpetuate unsustainable transport patterns.

Breaking away from fossil fuel-intensive maritime transport systems and shifting towards greater sustainability and resilience, including through tailored and targeted policies, regulations, incentives and programmes, is an imperative for freight transport, including maritime. Relevant strategies for the freight transport sector include, for example: promoting, when feasible and as applicable, a modal shift towards more environmentally and less energy-intensive modes (maritime, short-sea shipping, waterways and rail); shifting to lower-carbon fuels; promoting infrastructure maintenance and management; rethinking supply-chain designs, including the location of production sites; reshaping transport architecture and networks and rerouting trade to ensure the most energy-efficient and less carbon-emitting trajectories; improving cooperation and stakeholder networking; promoting trade facilitation measures that reduce border delays and inefficiencies; making greater use of information and communications technologies as well as intelligent transport systems; and promoting energy-efficient transport technologies.

The potential benefits of energy efficiency measures can be significant. The International Energy Agency considers energy efficiency as the world's "first fuel" and estimates the 2012 global investment markets in energy efficiency at between $310 billion and $360 billion (Kojima and Ryan, 2010). A significant potential for energy efficiency exists in emerging economies outside the OECD, with efficiency able to slash up to $90 billion in global transport-related fuel costs by 2020 while reducing local air pollution. In maritime transport, key regulatory instruments addressing the nexus between energy, air pollution and carbon emissions from shipping are the technical and operational measures mandated by IMO in 2011 (IMO, 2015). The relevant requirements include the Energy Efficiency Design Index (EEDI) and the Ship Energy Efficiency Management Plan (SEEMP). In considering 22 potential ship efficiency measures and calculating their aggregated cost effectiveness and reduction potential, one study finds that, by 2020, the industry's growing fleet could reduce annual CO_2 emissions by 33 per cent of the projected annual total (International Council for Clean Transportation, 2011). Another study investigated 28 energy-saving options and estimated a reduction of CO_2 emissions in shipping by 2030 of more than 50 per cent (Alvik et al., 2010). Other relevant measures include those relating to the IMO sulphur limits imposed on fuels used by ships, globally as well as in designated ECAs (see section B).

5. Climate change impacts, adaptation and resilience-building

Maritime transport is facing the dual challenge of climate mitigation and adaptation.[1] While future trends in emissions from international shipping remain uncertain (subject to international efforts/commitments to cut GHG emissions and the efforts of IMO and the twenty-first session of the Conference of the Parties

to the United Nations Framework Convention on Climate Change (COP21) and curbing GHG emissions remains an urgent imperative to ensure manageable global warming levels, the effects of climate variability and change – irrespective of the causes – are already being felt in different parts of the world, often in the poorest countries with low adaptive capacity.

Transport networks and seaports in particular are likely to be highly affected by climate change factors given port location and vulnerability. Climatic factors such as rising water levels, floods, storms, precipitation, extreme weather events and associated risks such as coastal erosion, inundation and deterioration of hinterland connections have implications for shipping volumes and costs, cargo loading and capacity, sailing and/or loading schedules, storage and warehousing. With international trade being increasingly multimodal and requiring the use of rail, road and waterway transport, these impacts will also affect the transport corridors above and beyond the ports acting as gateways.

Climate change impacts on maritime transport can be direct and indirect, that is, by causing changes in demand for maritime transport services (Gledhill et al., 2013). In this respect, one study estimated that in 2005, the exposure of 136 port megacities to coastal flooding (population and assets) was $3 trillion (Nicholls et al., 2008). When assuming a sea level rise of half a metre by 2050 (the tipping scenario), the asset exposure (that is, economic assets in the form of buildings, transport infrastructure, utility infrastructure, physical assets within built infrastructure, vehicles and other assets) of the same 136 port megacities was projected to be $28 trillion (Lenton et al., 2009). A climate-induced port closure or disruption to operations can be costly, although, to put things in perspective, a comparison with, for example, the impact of a labour dispute-related port closure can be made.

Building the climate resilience of maritime transport systems is therefore a precondition for sustainability. Enhancing understanding and technical knowledge among policymakers, transport planners and transport infrastructure managers of climate change impacts on coastal transport infrastructure, services and operations is of the essence. It is equally important to strengthen their capacity to take informed decisions and respond with effective, appropriate and well-designed climate policy and adaptation measures. Conducting risk assessments for critical transport infrastructure and facilities, especially in ports, will be crucial to ensure that any adaptation measures adopted are tailored to reflect the local conditions, especially in developing regions. However, to be more effective, enhancing adaptive capacity requires that actions are also integrated with other policies such as disaster preparedness, land-use planning, environmental conservation, coastal planning, and national plans for sustainable development.

6. Financing sustainable and resilient maritime transport

Enhancing the sustainability and resilience of maritime transport entails some cost implications and calls for additional resources. However, in an era of increasingly constrained national budgets, finding innovative ways to mobilize the requisite sources is critical. New sources and mechanisms and greater private sector involvement such as through public–private partnerships is important. In terms of innovative financing mechanisms, climate finance could emerge as an important channel for mobilizing additional resources, including for maritime transport. In this respect, at their June 2015 summit, the Group of Seven leaders reiterated their commitment to the Copenhagen Accord to jointly mobilize $100 billion per year by 2020, and to make the green climate fund operational in 2015 (Group of Seven Summit, 2015). Some analysts argue that, in connection with climate action, redirecting existing resources towards low-carbon and sustainable uses would be sufficient (Vivid Economics, 2014). The argument is as follows: the best estimate of additional investments required to mitigate and adapt to climate change in developing regions amounts to $400 billion–$500 billion per year by 2030. At the same time, overall investment in the same countries increased by more than $3.25 trillion during the period 2002–2012. Therefore, redirecting just a fraction of the expected continued growth in investment towards mitigation and adaptation action would support the realization of climate and sustainable development objectives (Vivid Economics, 2014).

In addition to increasing the levels and diversifying the sources of finance, financing energy-efficient maritime transport systems requires that the key barriers to investments such as the split incentives involving shipowners and charterers (charters do not share or give back savings to shipowners) be addressed. With investment in ship energy efficiency being generally carried out by shipowners/operators, the costs

associated with leveraging innovative ship energy-efficient technologies and alternative fuels (for example, equipment, hull design, engines, propulsion systems and operational measures) are part of the overall capital costs involved in ordering a ship. Decisions to invest, for example, in eco-ships that save on fuel use and reduce air emissions but that are more expensive, are made by shipowners/operators who depend largely on the banking sector to meet their financing requirements. On the positive side, banks are said to be increasingly taking into account sustainability criteria and ship energy-efficiency performances, in particular when making financing decisions. With energy-efficient ships being more likely to have a higher asset value and a longer lifespan, banks are reported to be increasingly favouring investments in sustainable ships such as eco-ships that entail reduced financing risks (including better chartering potential and lower fuel costs) (*The Marine Professional*, 2015).

Shipping-related market-based instruments could also be used to help finance investments in energy efficiency. At present and in addition to technical design standards, the international community, under the auspices of IMO/United Nations Framework Convention on Climate Change (UNFCCC), is considering several instruments to regulate GHG emissions from international shipping, including market-based measures such as levies/taxes and emission-trading mechanisms. Revenues generated by these instruments could be reinvested in the shipping sector, including with a view to energy efficiency measures. However, so far agreement on any international market-based instrument to regulate carbon emissions from international shipping has yet to be achieved.

Governments have a role to play in supporting private sector investment in energy-efficient technologies and alternative fuels by creating a favourable climate, including through fiscal and monetary incentives (for example, tax breaks and subsidies in support of energy-efficient technologies, grants or subsidies for research and development) and enabling regulatory and policy frameworks that support innovation and facilitate processes and procedures. Governments can also, in cooperation, for example, with the shipping and port industry, partner to leverage carbon markets to promote energy-efficient technologies. As has been argued in the case of air transport, development banks also have a role to play (World Bank/International Bank for Reconstruction and Development, 2012). For example, they could support energy efficiency measures that apply to maritime transport infrastructure (for example, technologies that support cold ironing in ports) to complement ship energy-efficiency measures.

To sum up, the year 2015 is a milestone for sustainable development, in which a path for a new international sustainable development agenda will be set, and a global climate policy framework adopted. Maritime transport has an important role to play in addressing the global sustainability and resilience agenda. The sector is thus at a critical juncture as it has an opportunity to assert its strategic importance as an economic activity that generates employment and revenue, enables trade, supports supply chains and links communities; and underscore its potential to generate value in terms of economic viability as well as social equity, resource conservation and environmental protection. However, for this role to effectively materialize, relevant sustainability and resilience criteria need to be integrated and mainstreamed into maritime transport planning, policies and investment decisions. Adopting a multi-stakeholder approach involving Governments, the maritime transport industry, financial institutions and other relevant partners is an overriding imperative for these efforts to be successful. Equally, collecting, sharing and disseminating relevant data, including relevant sustainability and performance indicators, is necessary, as is the need to scale up financing, enhance capacity-building, share best practices and enable greater use of relevant technologies.

Chapter 2 addresses trends in the world merchant fleet, chapter 4 deals with port-related developments and chapter 5 considers legal issues and regulatory developments, each highlighting ways in which the maritime transport industry can contribute to achieving greater sustainability in the maritime transport sector.

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ENDNOTES

[1] For additional information about the science of climate change and its impacts on transport, including coastal transport infrastructure, see relevant documentation on UNCTAD work in the field available at http://unctad.org/en/Pages/DTL/TTL/Legal/Climate-Change-and-Maritime-Transport.aspx.