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UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT

# REVIEW OF MARITIME TRANSPORT 2011

*Report by the UNCTAD secretariat*

## *Chapter 1*



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# DEVELOPMENTS IN INTERNATIONAL SEABORNE TRADE

## CHAPTER 1

*The world economic situation has brightened in 2010. However, multiple risks threaten to undermine the prospects of a sustained recovery and a stable world economy – including sovereign debt problems in many developed regions, and fiscal austerity. These risks are further magnified by the extraordinary shocks that have occurred in 2011, which have included natural disasters and political unrest, as well as rising and volatile energy and commodity prices. Given that for shipping, all stands and falls with worldwide macroeconomic conditions, the developments in world seaborne trade mirrored the performance of the wider economy. After contracting in 2009, international shipping experienced an upswing in demand in 2010, and recorded a positive turnaround in seaborne trade volumes especially in the dry bulk and container trade segments. However, the outlook remains fragile, as seaborne trade is subject to the same uncertainties and shocks that face the world economy.*

*This chapter covers developments from January 2010 to June 2011. Section A reviews the overall performance of the global economy and world merchandise trade. Section B considers developments in world seaborne trade volumes and looks at trends unfolding in the economic sectors and activities that generate demand for shipping services, including oil and gas, mining, agriculture and steel production. Section C highlights some developments that are currently affecting maritime transport and have the potential to deeply reshape the landscape of international shipping and seaborne trade.*

## A. WORLD ECONOMIC SITUATION AND PROSPECTS<sup>1</sup>

### 1. World economic growth<sup>2</sup>

In 2010, the world economy embarked on a recovery path with gross domestic product (GDP) growing at 3.9 per cent over the previous year (table 1.1). The stimulus measures taken by governments at the onset of the crisis helped jump-start growth. However, the effect of these measures started to fade away as governments initiated a shift towards fiscal consolidation. The end of the inventory cycle, the downside risks in developed economies and the dampening effect on GDP growth of rising energy prices, with Brent crude oil prices averaging \$80 per barrel in 2010 against \$62 per barrel in 2009,<sup>3</sup> have combined to also slow down growth in the second half of the year.

In 2010, developed economies recorded positive growth, with their GDP expanding by 2.5 per cent. The United States and Japan performed better than the European Union, growing respectively by 2.9 per cent, 4.0 per cent and 1.8 per cent. Developing economies and economies in transition continued to drive the global recovery with the rebound being led by large emerging economies, in particular China (10.3 per cent), India (8.6 per cent) and Brazil (7.5 per cent). Almost unburdened by the financial crisis and consequent economic downturn, China, India and other developing countries resumed their expansion by generating their own growth instead of relying on exports to developed economies' markets. While the United States remains the main source of import demand for Asia, China has evolved into an independent engine of regional growth and a larger source of final demand for a number of emerging developing economies, including the Philippines, the Republic of Korea and Taiwan, Province of China.<sup>4</sup>

The lead taken by developing countries in powering global growth reflects a shake-up in the world's economic order which has taken decades to unfold. UNCTAD data show that the share of developing countries in the global economic output rose from about 17 per cent in 1980 to over 28 per cent in 2010, raising the influence of these countries in the world's economic performance. In 2010, China overtook Japan as the world's second biggest economy (in nominal terms) and is leading the transformation

together with some of the world's fastest-growing economies such as India and Indonesia. An important economic milestone in 2010 was Brazil's ranking as the world's seventh largest economy after surpassing Italy.<sup>5</sup> Goldman Sachs is now predicting that the BRIC countries (Brazil, Russian Federation, India and China) will overtake the G-7 countries in size of their economies by 2018, i.e. much sooner than its original prediction of 2040 made a decade ago.<sup>6</sup>

The overall strong performance of developing countries as a group conceals differences between countries and groupings. For example, GDP growth in South Africa (2.8 per cent) was much lower than the rates recorded by China, India and Brazil. Similarly, the recovery in many of the least developed countries (LDCs) remained below their potential with GDP growth (4.8 per cent) not returning to its pre-crisis levels.

The economic downturn and consequent increase in unemployment, together with the drop in social spending, can cause a serious setback to social equity and poverty alleviation. Although some ground has been gained, between 2007 and the end of 2009, at least 30 million jobs are estimated to have been lost worldwide as a result of the global financial crisis.<sup>7</sup> The global economy still needs to create at least another 22 million jobs to return to the pre-crisis level of global employment.<sup>8</sup> It is further estimated that 47 million to 84 million more people are falling into or staying in extreme poverty because of the global crisis.<sup>9</sup> While these considerations are not specific to the LDCs, they are nevertheless more detrimental for these countries in view of their inherent vulnerability to any erosion in economic and development gains achieved as part of efforts to attain the Millennium Development Goals (MDGs).

Trends in world industrial production – a leading indicator of demand for maritime transport services – mirrored the developments in world GDP. The industrial production index published by the Organization for Economic Cooperation and Development (OECD) shows that the index for OECD countries, with 1990 as the base year, fell in 2009, before rebounding in 2010 for both OECD and non-OECD countries. The pace-setters were the Republic of Korea and China, with their 2010 industrial production expanding by 17.2 per cent and 15.7 per cent, respectively.<sup>10</sup>

The strong correlation between industrial activity, GDP growth, merchandise and seaborne trade continues unabated, as shown in figure 1.1. The deep contraction of 2009 is followed by a V-shaped recovery

**Table 1.1. World economic growth, 2007–2011<sup>a</sup> (annual percentage change)**

Region/country	1991–2004 Average	2007	2008	2009	2010 <sup>b</sup>	2011 <sup>c</sup>
<b>WORLD</b>	2.9	4.0	1.7	-2.1	3.9	3.1
<b>Developed economies</b>	2.6	2.6	0.3	-3.6	2.5	1.8
<i>of which:</i>						
<b>United States</b>	3.4	2.1	0.4	-2.6	2.9	2.3
<b>Japan</b>	1.0	2.4	-1.2	-6.3	4.0	-0.4
<b>European Union (27)</b>	2.3	3.0	0.5	-4.2	1.8	1.9
<i>of which:</i>						
<b>Germany</b>	1.6	2.7	1.0	-4.7	3.6	3.0
<b>France</b>	2.1	2.4	0.2	-2.6	1.5	2.1
<b>Italy</b>	1.5	1.5	-1.3	-5.0	1	0.9
<b>United Kingdom</b>	2.9	2.7	-0.1	-4.9	1.3	1.3
<b>Developing economies</b>	4.7	8.0	5.4	2.5	7.4	6.3
<i>of which:</i>						
<b>China</b>	9.9	14.2	9.6	9.1	10.3	9.4
<b>India</b>	5.9	9.6	5.1	7.0	8.6	8.1
<b>Brazil</b>	2.6	6.1	5.2	-0.6	7.5	4.0
<b>South Africa</b>	2.5	5.5	3.7	-1.8	2.8	4.0
<b>Least Developed Countries (LDCs)</b>	4.6	8.5	6.7	4.5	4.8	5.2
<b>Transition economies</b>	-1.0	8.6	5.4	-6.7	4.1	4.4
<i>of which:</i>						
<b>Russian Federation</b>	-1.0	8.5	5.6	-7.9	4.0	4.4

Sources: UNCTAD secretariat calculations, based on United Nations Department of Economic and Social Affairs (UN-DESA), National Accounts Main Aggregates database, and World Economic Situation and Prospects (WESP) 2011: Mid-year Update; Economic Commission for Latin America and the Caribbean (ECLAC), 2011; OECD, Stat database; and national sources.

<sup>a</sup> Calculations for country aggregates are based on GDP at constant 2005 dollars.

<sup>b</sup> Preliminary estimates.

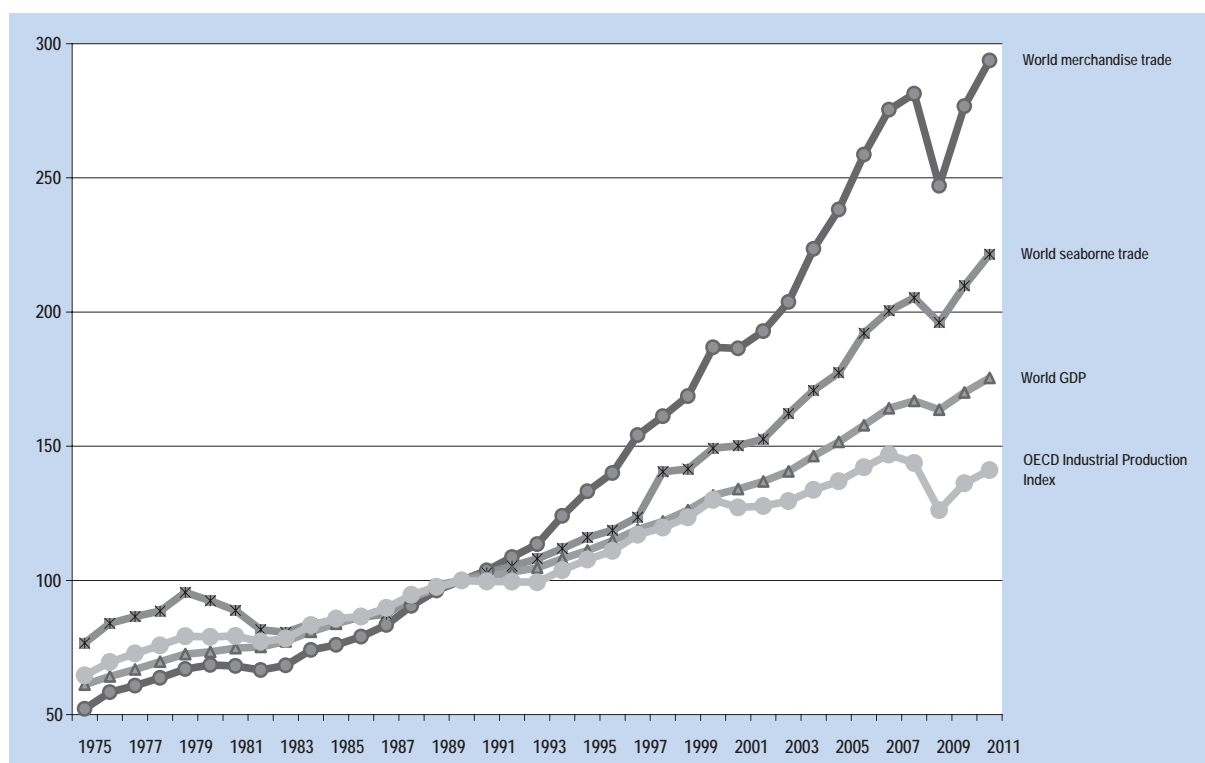
<sup>c</sup> Forecasts.

in all indicators with signs of some stabilization in 2011. Interestingly, some decoupling between GDP growth and the industrial production, reflecting partly the growing contribution of services to GDP, can be observed. Equally, seaborne trade grows faster than both the industrial production and GDP, also reflecting, in particular the rapid expansion in container trade which carries semi-finished and manufactured goods (consumer goods and durables).

The world recovery is set to continue, albeit at a slower pace, with world GDP projected to grow by 3.1 per cent in 2011. While GDP growth in all

economies is expected to decelerate, the recovery continues to be driven by emerging developing markets. However, these projections are subject to many downside risks which can derail growth. These include renewed stresses in the euro area, sovereign risks, high unemployment in advanced economies, rising food and commodity prices, the risk of a rise in trade protectionism, inflationary pressures in emerging markets, and the end of the stimulus funding impact as all countries, with the exception of the United States, proceed with fiscal consolidation. In addition, the world economy is facing new problems stemming

**Figure 1.1. Indices for world GDP, the OECD Industrial Production Index, world merchandise trade and world seaborne trade (1975–2011) (1990=100)**



Source: UNCTAD secretariat, on the basis of OECD Main Economic Indicators, May 2011; UNCTAD's *The Trade and Development Report 2011*; UNCTAD's *Review of Maritime Transport*, various issues; WTO's *International Trade Statistics 2010*, Table A1a; and the World Trade Organization (WTO) press release issued in March 2011, "World trade 2010, prospects for 2011". WTO merchandise trade data (volumes) are derived from customs values deflated by standard unit values and adjusted price index for electronic goods. The 2011 index for seaborne trade is calculated on the basis of the growth rate forecast by Clarkson Research Services.

from a number of exceptional events. These include (a) some of the worst natural disasters in history, such as the floods and cyclones hitting Australia and the triple disaster of earthquake, a tsunami and nuclear crisis in Japan; (b) political unrest in Western Asia and North Africa; and (c) a continued trend of higher oil prices and global energy insecurity. Oil prices (Brent) edging up in April to \$125 per barrel could act as a drag on economic growth. Already, in 2011, a softening in household consumption demand and rising inflation is being observed in many economies.<sup>11</sup> These factors are combining to erode the gains from the rapid yet fragile recovery of 2010 and are undermining the prospects of more sustainable future economic growth.

With Japan representing the world's third largest economy and a key player in industrial networks, the ripple effects of the disaster in Japan are being felt globally due to the disrupted production networks and reduced business confidence. Japan's retail

sales are estimated to have dropped by 8 per cent and household spending by 2 per cent.<sup>12</sup> Preliminary estimates indicate that the value of damage to building and infrastructure is nearing 25 trillion Yen or about \$300 billion.<sup>13</sup> Another estimate by the World Bank puts the cost of the damage caused by the earthquake and tsunami to Japan's economy at \$122 billion–\$235 billion.<sup>14</sup> These figures are equivalent to 2.5 per cent to 4 per cent of the country's GDP in 2010. Some data confirmed the severity of the impact of the earthquake in Japan and its economy, with industrial production falling by 15 per cent (annualized rate) in March 2011, the sharpest monthly drop on record.<sup>15</sup> UNCTAD revised downward projections for Japan's GDP growth, although reconstruction and investment activity are likely to revive the economy.

In sum, while the overall economic situation in 2010 has brightened and expectations for 2011 remain positive, multiple risks are currently clouding the prospects of a sustained recovery and a stable world



economy. These risks are magnified by extraordinary shocks and events, including natural disasters and political unrest as well as rising and volatile energy and other commodity prices.

## 2. World merchandise trade<sup>16</sup>

Overcoming the slump of 2009 (–13.6 per cent) and in tandem with the recovery in the world economy, the volume of merchandise trade (i.e. trade in real terms, adjusted for changes in prices and exchange rates), bounced back, and is estimated by UNCTAD to have grown at a robust rate of 16.2 per cent in 2010 (table 1.2). During the same year, the value of world merchandise exports increased by 22 per cent, owing in particular to the price effect of rising commodity prices.

According to WTO, the surge in the volume of world exports registered the largest annual growth recorded in a data series dating back to 1950. The recovery was robust from mid-2009 to mid-2010, when trade volumes expanded at an annualized rate of nearly 20 per cent.<sup>17</sup> The rapid rise in volumes can also be explained by the same factors that had precipitated the slump in 2009. These include the transmission channels offered by the spread of global supply chains and the product composition of trade compared to GDP. However, trade growth lost momentum during the second half of 2010 in line with the deceleration of world economic growth. Although global trade is estimated to have returned by the end of 2010 to its 2008 peak level, the recovery remains below-trend.<sup>18</sup>

An uneven economic recovery has led to an equally uneven merchandise trade performance, with the speed of the recovery varying across regions and country groupings (table 1.2). Just as the global economic recovery was anchored by developing regions, so was the rebound of world merchandise trade. Robust growth in large emerging economies such as China and India, combined with their deeper economic integration and intensified intraregional trade, have powered the expansion in world merchandise trade. The share of developing countries in global trade increased from about one third to more than 40 per cent between 2008 and 2010.<sup>19</sup>

The deepening of economic ties between developing regions is best illustrated by the fast-evolving relationship between China and large emerging economies such as Brazil. In early 2009, when China overtook the United States as Brazil's main trading

partner,<sup>20</sup> it also became the main investor in Brazil in 2010 with \$17 billion in capital being injected.<sup>21</sup> China is also involved in Africa, with 1,600 Chinese companies investing in African agriculture and mining as well as in manufacturing, infrastructure and commerce.<sup>22</sup>

Driven, in particular, by the fast growth of import demand in Eastern Asia and Latin America, export volumes of developed economies have also recovered, growing by 16.5 per cent in 2010. This growth is set against the low levels of 2009, when their export volumes contracted by 22.4 per cent. Export volumes in Africa and Latin America also recovered, although at rates slower than the world average. As shown in table 1.2, Asia recorded the largest increase in export volumes led by China (28.3 per cent) and Japan (27.9 per cent). However, growth in Japan is to be measured against the low levels of 2009 when, unlike China, Japan's export volumes contracted by 24.9 per cent. The United States and the European Union saw their export volumes grow by 15.3 per cent and 18.2 per cent, respectively. Exports of transition economies also recovered and expanded by 12 per cent.

World imports grew at a slightly slower pace than exports (15.2 per cent). Imports into developing countries expanded at a faster rate (18.7 per cent) than exports (16.6 per cent) driven in particular by growth in import volumes of developing Asia. Transition economies have also recorded growth in import volumes (17.8 per cent), a rate faster than the rate of exports. Positive growth was recorded in imports volumes of developed countries (16.5 per cent), led by the positive performances of the United States, the European Union and Japan. Considering the disaster in Japan, WTO expects Japan's export volumes to drop by 0.5–0.6 per cent and its imports to increase by 0.4–1.3 per cent. Beyond the direct impact on ports and related services resulting in their inability to berth ships and to handle trade (e.g. ships unable to load perishable goods in Japan due to lack of refrigeration), the disaster in Japan has implications for global supply chains and manufacturing. For example, there have been reports about a shortage in the supply of parts needed in the production of computers, automobiles and mobile phones, including in Germany and the United States.<sup>23</sup> The disruption to business revealed that certain industries tend to rely heavily on few suppliers. That being said, the impact on the global manufacturing industry – and therefore trade – is expected to be limited by the fact that many industries have sufficient supplies for production purposes despite the “just-in-time” inventory management.

**Table 1.2. Growth in the volume<sup>a</sup> of merchandise trade, by geographical region, 2008–2010  
(annual percentage change)**

Exports			Countries/regions	Imports		
2008	2009	2010		2008	2009	2010
2.6	-13.6	16.2	<b>WORLD</b>	2.9	-13.6	15.2
11.3	-22.4	16.5	<b>Developed countries</b>	11.6	-24.9	16.5
<i>of which:</i>						
2.3	-24.9	27.9	Japan	-0.6	-12.4	10.3
5.5	-14.9	15.3	United States	-3.7	-16.4	14.7
2.9	-14.7	18.2	European Union	1.4	-14.8	14.1
0.4	-13.8	12.0	<b>Transition economies</b>	18.2	-28.8	17.8
3.2	-10.6	16.6	<b>Developing countries</b>	6.7	-10.0	18.7
<i>of which:</i>						
-2.0	-11.2	8.6	Africa	10.3	-2.7	1.4
3.0	-15.7	13.7	Latin America and the Caribbean	-2.8	-16.2	13.8
7.2	-10.5	23.5	<b>East Asia</b>	0.4	-5.3	23.1
10.5	-13.6	28.3	<i>of which:</i> China	2.3	-1.7	27.1
7.7	-6.2	15.3	South Asia	20.5	-3.0	12.0
16.8	-6.6	22.4	<i>of which:</i> India	29.7	-0.8	11.5
1.5	-10.7	18.3	<b>South-East Asia</b>	8.2	-16.6	22.0
4.0	-6.0	6.5	<b>West Asia</b>	13.4	-14.2	10.1

Source: UNCTAD (2011). Table 1.2. *The Trade and Development Report 2011*.

<sup>a</sup> Data on trade volumes are derived from international merchandise trade values deflated by UNCTAD unit value indices.

Also, alternative sources of supply chains are likely to emerge as substitutes are obtained from other locations. It is anticipated that structural changes such as relocating production sites and redesigning supply networks are likely to be marginal, as such decisions have to weigh the costs and benefits that may arise.

According to WTO, including the potential impact of Japan's earthquake, world trade is expected to grow at a slower rate of 6.5 per cent in 2011 with growth in developing economies' trade (9.5 per cent) outstripping that of advanced economies (4.5 per cent). Growth in world merchandise trade will continue, but is anticipated to moderate in 2011. A global survey by HSBC across 21 countries and involving 6,390 small and medium-sized shippers reveals that traders globally remain positive, with 9 out of 10 expecting trade volumes to increase or hold at current levels in the next six months.<sup>24</sup> Strengthened intraregional trade and greater connectivity with and within emerging markets constitute the main factor behind the positive sentiment.<sup>25</sup> However, the rebalancing toward domestic consumption and imports in large emerging economies such as China is expected to impact on

global trade in the future. Signs are already apparent with China's net merchandise exports reported to have fallen from \$40 billion in November 2008 to \$17 billion in September 2010.<sup>26</sup> This will have a bearing on trade flows and volume balance.

This positive outlook notwithstanding, there remains the question of whether developing countries can retain their position as the engine behind the growth in GDP and trade. An added concern relates to the risk of a surge in protectionist measures. Despite the 2010 renewed pledges by the G-20 to refrain at least until the end of 2013 from increasing or imposing new barriers to investment or trade, the risk of greater protectionism is resurfacing due to the fragile and uneven economic and trade recovery.<sup>27</sup> While it is estimated that new import restrictions introduced between May and October 2010 applied to 0.2 per cent of total world imports against 0.8 per cent at the height of the crisis, non-tariff measures are being introduced under various headings, including protection of health and environment.<sup>28</sup> Despite the recovery, countries are continuing to introduce measures that have the potential to restrict trade.<sup>29</sup>

According to WTO, between November 2009 and May 2010, potentially restrictive measures surpassed those facilitating trade by a factor of 3:2. It is further estimated that the G-20 protectionist measures increased by 31 per cent over the same period and about 27 per cent are further expected.<sup>30</sup>

Counterbalancing to some extent the various downside risks, the proliferation of trade agreements is likely to boost trade and promote deeper economic integration. For example, Japan and India agreed on a free trade agreement that will eliminate import tariffs on over 90 per cent of bilateral trade by value within 10 years.<sup>31</sup> Also, a number of agreements came into force in 2010 and early 2011, including the regional trade agreement between China and the Association of Southeast Asian Nations (ASEAN), as well as ASEAN–Australia and New Zealand, Turkey–Chile, Turkey–Jordan, European Free Trade Association (EFTA)–Serbia, EFTA–Albania, and Hong Kong (China)–New Zealand. The United States is expected to speed up the implementation of its trade agreements with the Republic of Korea, Colombia and Panama before the 2012 election. The United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) estimated that by the end of 2010, there were 170 preferential agreements involving at least one ESCAP member State. Of these 170 agreements, 125 are bilateral regional trade agreements.<sup>32</sup> Interestingly, these agreements are increasingly including provisions on trade facilitation (see chapter 5).

Thus, 2010 saw a swift but moderate recovery in the world economic activity and trade. While robust and sharp early on during the year, the recovery lost momentum in the second part of 2010 and into 2011. A number of uncertainties remain in view of the multiple downside risks and increase the likelihood of a much weaker than expected recovery.

## B. WORLD SEABORNE TRADE<sup>33</sup>

### 1. General trends in seaborne trade

For shipping, all stands and falls with worldwide macroeconomic conditions. Developments in the world economy and merchandise trade are also driving developments in seaborne trade. Therefore, in line with the macroeconomic framework described in the previous section, world seaborne trade experienced similar evolution with an upswing in demand in 2010, and a positive turnaround in volumes, especially for dry bulk and container trade segments.

Preliminary data indicate that world seaborne trade in 2010 bounced back from the contraction of the previous year and grew by an estimated 7 per cent, taking the total of goods loaded to 8.4 billion tons, a level surpassing the pre-crisis level reached in 2008 (tables 1.3 and 1.4, and fig. 1.2). While the surge in seaborne trade volumes helped recover the lost

**Table 1.3. Development of international seaborne trade, selected years (millions of tons loaded)**

Year	Oil	Main bulks <sup>a</sup>	Other dry cargo	Total (all cargoes)
1970	1 442	448	676	2 566
1980	1 871	796	1 037	3 704
1990	1 755	968	1 285	4 008
2000	2 163	1 288	2 533	5 984
2006	2 698	1 836	3 166	7 700
2007	2 747	1 957	3 330	8 034
2008	2 742	2 059	3 428	8 229
2009	2 642	2 094	3 122	7 858
2010 <sup>b</sup>	2 752	2 333	3 323	8 408

Source: Compiled by the UNCTAD secretariat on the basis of data supplied by reporting countries and as published on the relevant government and port industry websites, and by specialist sources. The 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 2010 are estimated based on preliminary data or on the last year for which data were available.

<sup>a</sup> Iron ore, grain, coal, bauxite/alumina and phosphate. The data for 2006 onwards are based on various issues of the *Dry Bulk Trade Outlook* produced by Clarkson Research Services Limited.

<sup>b</sup> Preliminary estimates.



Table 1.4. World seaborne trade in 2006–2010, by type of cargo and country group

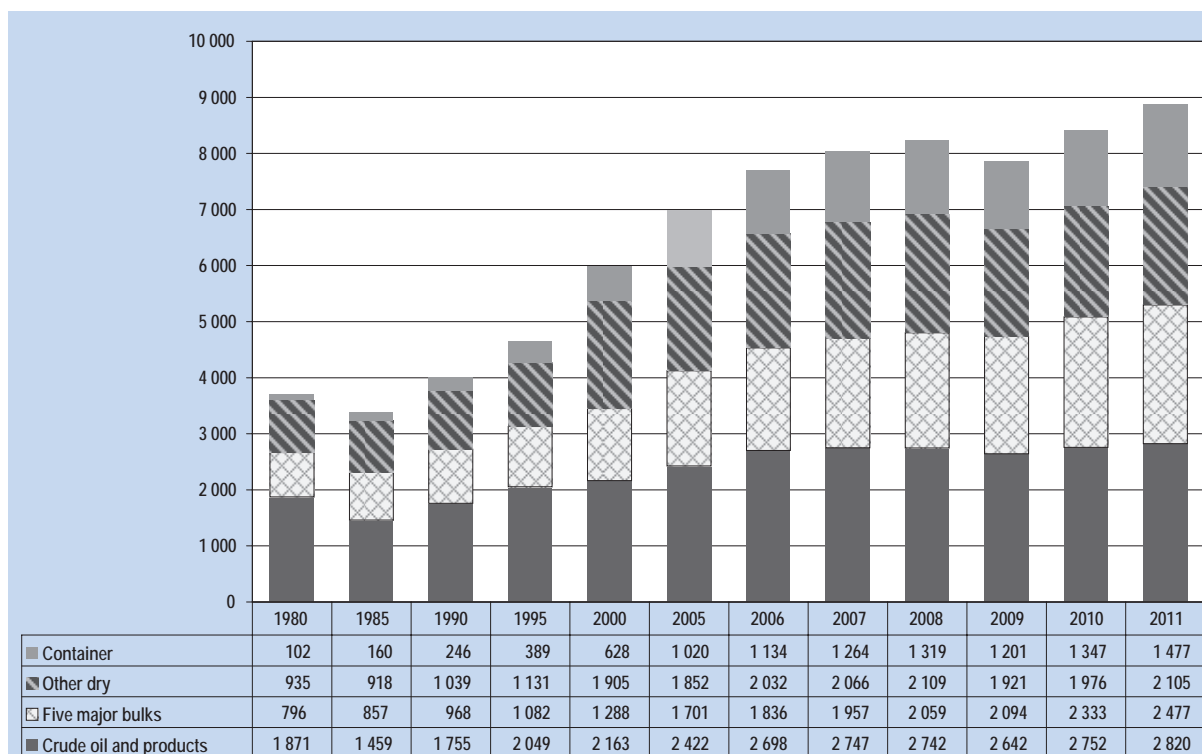
Country group	Year	Goods loaded				Goods unloaded			
		Total	Crude	Products	Dry cargo	Total	Crude	Products	Dry cargo
Millions of tons									
<b>World</b>	2006	7 700.3	1 783.4	914.8	5 002.1	7 878.3	1 931.2	893.7	5 053.4
	2007	8 034.1	1 813.4	933.5	5 287.1	8 140.2	1 995.7	903.8	5 240.8
	2008	8 229.5	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	8 408.3	1 784.9	967.5	5 655.8	8 377.8	1 938.9	969.3	5 469.7
<b>Developed economies</b>	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	2 832.5	125.7	418.5	2 288.2	3 592.1	1 158.5	545.1	1 888.5
<b>Transition economies</b>	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
<b>Developing economies</b>	2006	4 829.5	1 527.5	537.1	2 765.0	3 642.9	643.6	355.1	2 644.3
	2007	5 020.8	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	5 060.1	1 509.0	503.1	3 047.9	4 663.7	776.9	419.6	3 467.1
<b>Africa</b>	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	733.3	343.6	81.5	308.2	399.3	42.0	39.3	318.0
<b>America</b>	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	1 129.6	231.0	73.2	825.4	407.5	69.3	76.6	261.6
<b>Asia</b>	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	3 190.7	932.9	348.2	1 909.5	3 843.5	665.6	300.0	2 877.9
<b>Oceania</b>	2006	3.8	1.2	0.1	2.5	12.9	0.0	6.7	6.2
	2007	7.1	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

**Table 1.4. World seaborne trade in 2006–2010, by type of cargo and country group (concluded)**

Country group	Year	Goods loaded				Goods unloaded			
		Total	Crude	Products	Dry cargo	Total	Crude	Products	Dry cargo
<b>Percentage share</b>									
<b>World</b>	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	21.2	11.5	67.3	100.0	23.1	11.6	65.3
<b>Developed economies</b>	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	33.7	7.0	43.3	40.5	42.9	59.7	56.2	34.5
<b>Transition economies</b>	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	1.5	0.2	0.5	2.1
<b>Developing economies</b>	2006	62.7	85.6	58.7	55.3	46.2	33.3	39.7	52.3
	2007	62.5	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	60.2	84.5	52.0	53.9	55.7	40.1	43.3	63.4
<b>Africa</b>	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	8.7	19.2	8.4	5.4	4.8	2.2	4.1	5.8
<b>America</b>	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	13.4	12.9	7.6	14.6	4.9	3.6	7.9	4.8
<b>Asia</b>	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	37.9	52.3	36.0	33.8	45.9	34.3	31.0	52.6
<b>Oceania</b>	2006	0.0	0.1	0.0	0.0	0.2	0.0	0.7	0.1
	2007	0.1	0.1	0.0	0.0	0.2	0.0	0.8	0.1
	2008	0.1	0.1	0.0	0.0	0.2	0.0	0.8	0.1
	2009	0.1	0.1	0.0	0.1	0.2	0.0	0.4	0.2
	2010	0.1	0.1	0.0	0.1	0.2	0.0	0.4	0.2

Source: Compiled by the UNCTAD secretariat on the basis of data supplied by reporting countries and as published on the relevant government and port industry websites, and by specialist sources. The 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 2010 are estimated based on preliminary data or on the last year for which data were available.

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



Source: *Review of Maritime Transport*, various issues. For 2006–2010, the breakdown by dry cargo type is based on Clarkson Research Services, *Shipping Review and Outlook*, various issues. Data for 2011 are based on a forecast by Clarkson Research in *Shipping Review and Outlook*, Spring 2011.

ground of 2009, growth in 2010 is to be measured, however, against a deep contraction of the previous year and set against a growing world fleet capacity.

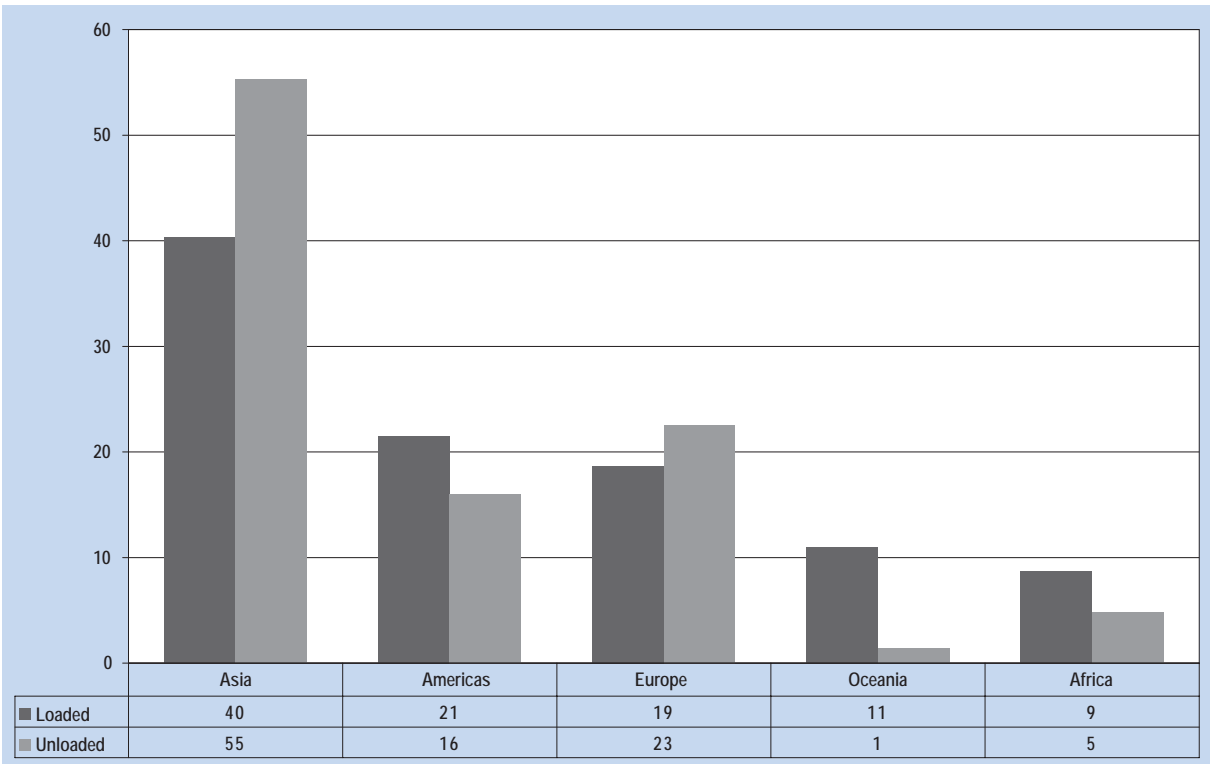
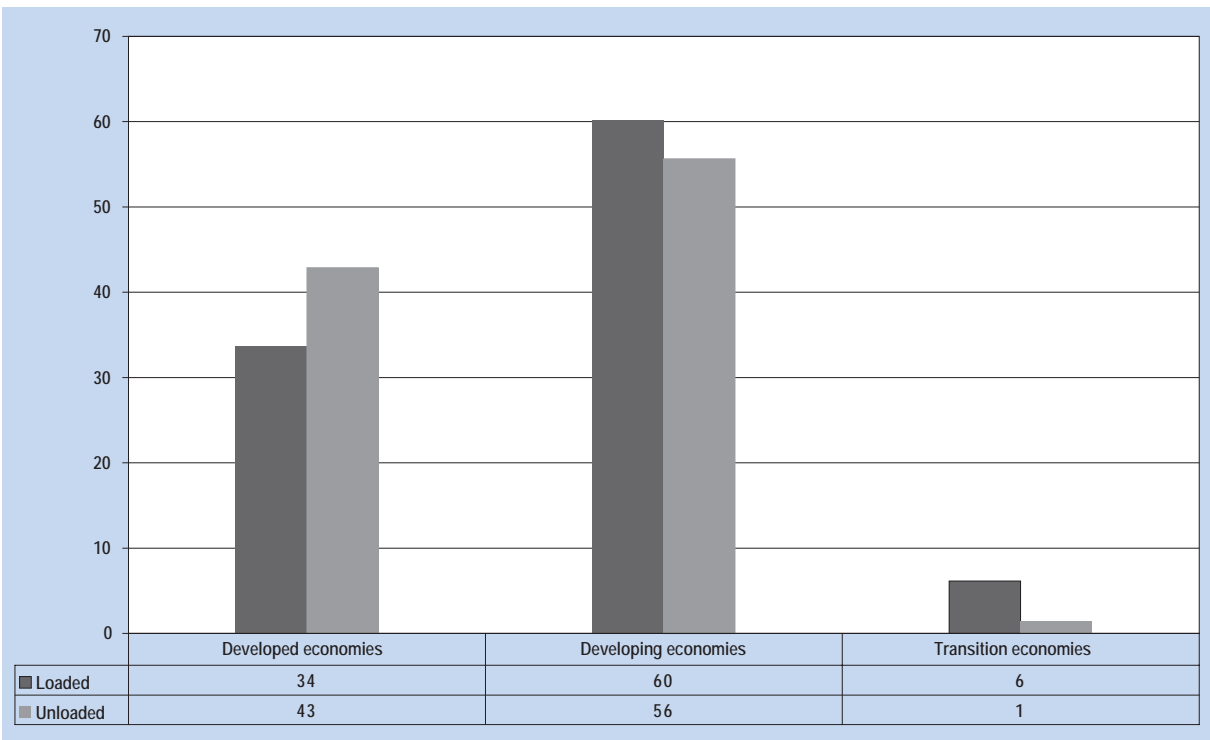
As shown in table 1.4 and figure 1.2 container trade and major dry bulks are driving this expansion. In 2010, world seaborne trade continued to be dominated by raw materials, with tanker trade accounting for about one third of the total tonnage and other dry cargo including containerized accounting for about 40 per cent. The remainder (about 28 per cent) is made of the five major dry bulks, namely iron ore, coal, grain, bauxite and alumina and phosphate.

In 2010, dry cargo, including major dry bulks, minor dry bulks, general cargo and containerized trade bounced back and expanded by a firm 8.4 per cent over 2009. Growth reflected the continued effect of the stimulus spending which boosted investment and demand for raw materials. It was fuelled in particular by both industrial activity in emerging regions and inventory restocking. Oil trade volumes also recovered and grew by 4.2 per cent over 2009, driven in particular by growing energy demand in emerging regions of Asia.

Reflecting their rising position as the engine of growth, developing countries continued to account for the main loading and unloading areas, with their shares of total goods loaded and unloaded in 2010 amounting to 60 per cent and 56 per cent, respectively. Developed economies' shares of global goods loaded and unloaded were 34 per cent and 43 per cent, respectively. Transition economies accounted for 6 per cent of goods loaded, and 1 per cent of goods unloaded (fig. 1.3 (a)).

The contribution of various regions to world seaborne trade volumes underscores the dominance of large emerging developing economies and reflects the concentration of resources and raw materials, which make up the bulk of seaborne trade. Asia is by far the most important loading and unloading area, with a share of 40 per cent of total goods loaded and 55 per cent of goods unloaded. As shown in figure 1.3 (a), other loading areas ranked in descending order are the Americas (21 per cent), Europe (19 per cent), Oceania (11 per cent) and Africa (9 per cent). Europe unloaded more cargo tonnage (23 per cent) than the Americas (16 per cent), followed by Africa (5 per cent) and Oceania (1 per cent).

Figure 1.3. (a) World seaborne trade, by country group and region, 2010 (percentage share in tonnage)



Source: Compiled by the UNCTAD secretariat on the basis of data supplied by reporting countries and as published on the relevant government and port industry websites, and by specialist sources. Figures are estimated based on preliminary data or on the last year for which data were available.

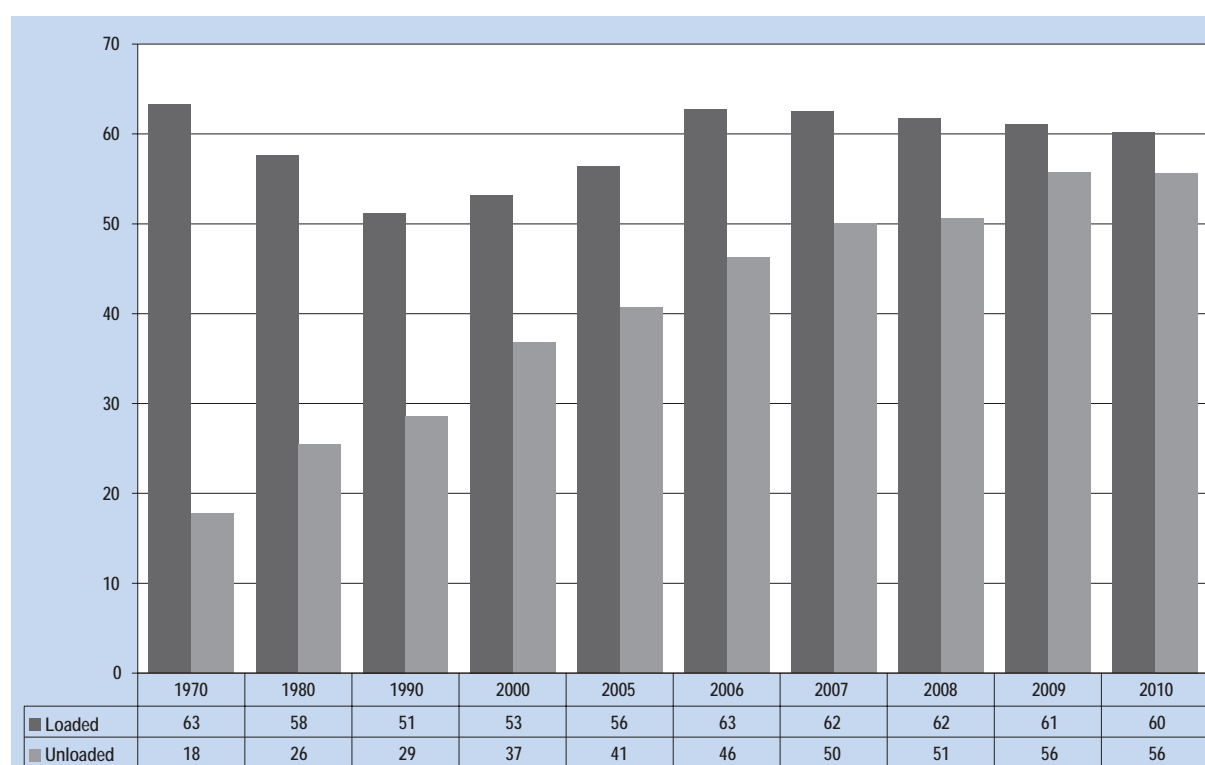
Figure 1.3 (b) highlights the evolution of seaborne trade patterns of developing regions. Since 1970, and reflecting the structure of their trade and the predominance of high volume and low value bulk cargoes such as raw materials and natural resources, developing economies had a surplus in terms of cargo tonnage, since they have consistently loaded (exports) more than unloaded (imports) cargoes. Another distinct trend observed in figure 1.3 (b) is that the volume of cargo unloaded (imports) in developing regions has grown steadily over the same period and has reached near parity with the percentage volume of goods loaded (exports) in 2010.

Growing import and export volumes of developing regions reflect their greater participation in world trade and globalized production. As argued in sections A and B above, the relative weight of developing economies has been increasing due in particular to their role as a catalyst of growth, which helped weather the 2009 downturn and propel the economic recovery in 2010. The rising prices of energy and raw materials, and new resource discoveries have helped

promote increases in exports of mineral fuels and chemicals from resource-rich countries in Asia, Latin America and Africa. Additionally, many developing countries followed export-led economic growth policies, effectively increasing their relative share of manufactured goods exports over the years.

The growth in the proportion of goods unloaded also reflects the emergence of developing countries as a major source of import demand, largely attributable to a fast-growing middle class and increased requirements for more sophisticated consumption goods and diversified imports. The expansion of South-South trade, enabled by more South-South investments, has also helped boost the import demand of developing countries as new markets that offer goods at more competitive prices become accessible (e.g. growth in container trade from China to West Africa to the detriment of Europe). This trend is likely to continue and vary with shifting patterns of comparative advantages (e.g. higher labour costs in China as compared with other emerging economies in Asia and Africa).

**Figure 1.3. (b) Participation of developing countries in world seaborne trade, selected years**  
(percentage share in world tonnage)



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



## 2. Seaborne trade by cargo type

### *Tanker trade*

#### **Crude oil production and consumption**

Oil is a commodity of key strategic importance, accounting for over 34 per cent of the world's primary energy consumption in 2010. Crude oil production and reserves are heavily concentrated among a handful of major producers and regions, in particular in Western Asia. Major players in the oil business – including producers, consumers, importers and exporters – are featured in table 1.5. In 2010, about 1.8 billion tons of crude, equivalent to 45 per cent of world crude oil production, were loaded on tankers and carried through fixed maritime routes.

The pace of world oil trade and the dependence on longer haul supply have increased over the last several years, with China and India emerging as major importers, and West Africa and more recently Brazil with its latest offshore oil finds, as growing major exporters. With more recent oil discoveries and the depletion of some oil fields in Europe and Western Asia, some shifts in global oil supply and demand networks are likely to emerge (e.g. exports from Brazil to Asia). Reflecting its ever-growing energy demand and increasing dependence on imports for meeting this demand, China's oil companies have, over recent years, boosted their investments in overseas oil-related extraction and production activities through strategic partnerships and acquisition deals. Pursuing its diversified geographical approach to securing its supply, China has developed an impressive global network with investments in neighboring Kazakhstan and the Russian Federation, and has stretched this network to Australia, West Africa, Sudan and the Americas. These developments are already altering the patterns of shipping globally, and trends in oil trade are shifting, as illustrated by growth in tanker ton-mile demand. They are anticipated to intensify as China looks at both existing and new regions from which to secure its supply. In 2010, tanker demand measured in ton-miles was estimated to have grown by 2.2 per cent after declining by 1.9 per cent in 2009.<sup>34</sup>

In 2010, oil demand followed trends in the global economic growth, namely growing along two tracks and at uneven pace. After a decline in 2009, oil demand is estimated to have grown by 3.1 per cent to reach 87.4 million barrels per day (mbpd) in 2010. Demand from the OECD countries, which make up 52.5 per cent of the world total, increased by 0.9

per cent. Oil consumption in advanced economies is expected to remain flat in the coming years due to policies that encourage, among others, fuel efficiency, increased use of ethanol and biofuels, as well as measures taken to reduce dependency on fossil fuels and cut carbon emissions.

In contrast, non-OECD countries saw their oil demand jump by a strong 5.6 per cent in 2010. China recorded world's fastest growth with its oil demand expanding by an impressive 10.4 per cent in 2010. It imported 54 per cent of crude requirements in 2010, exceeding its initial target of not importing more than 50 per cent of its crude requirements. China's reliance on imports is projected to intensify further, reaching 66 per cent in 2015 and 70 per cent in 2020.<sup>35</sup>

For 2011, world consumption growth is expected to remain relatively robust, but moderate due partly to the fact that the 2010 levels were relatively high and to the dampening effect of higher oil prices and tighter monetary policies in many developing countries.

Global crude oil production is estimated to have risen by 2.2 per cent in 2010 to reach 82.1 mbpd. Production in countries of the Organization of the Petroleum Exporting Countries (OPEC) increased by 2.5 per cent, given the slippage in compliance with the production ceiling. Non-OPEC production grew by 1.9 per cent, driven by growth in Brazil, China and transition economies of Asia. The importance of OPEC producers is expected to grow with their share of global production, projected to rise from 40 per cent in 2010 to 46 per cent in 2030, a level not reached since 1977.<sup>36</sup>

Globally, a number of geopolitical risks are also weighing on the supply forecast. These include the spread of the political unrest to other countries of North Africa and Western Asia and the possible disruption in crude oil supply. Other concerns are equally ever-present and include the risk of lower production in the Niger Delta region, tensions relating to the Islamic Republic of Iran's nuclear programme and resumed security problems in Iraq. These uncertainties – together with other concerns over the state of the world economy, fiscal sustainability and China's efforts to slow the rapid growth of its economy – are exerting further pressure on oil prices.

In 2010, oil prices rebounded from their 2009 levels, which had fallen off drastically from the surge in 2008. With growing positive sentiment about the prospects of the world economy and the events in North Africa and Western Asia, oil prices (Bent) soared to well over \$120 per barrel in April 2011.<sup>37</sup> The projected

**Table 1.5. Oil and natural gas: major producers and consumers, 2010 (world market share in percentage)**

World oil production		World oil consumption	
Western Asia	31	Asia Pacific	31
Transition Economies	17	North America	25
North America	13	Europe	17
Africa	12	Latin America	9
Latin America	12	Western Asia	9
Asia Pacific	10	Transition Economies	5
Europe	5	Africa	4

World natural gas production		World natural gas consumption	
North America	24	North America	25
Transition Economies	24	Europe	19
Western Asia	14	Asia	17
Asia	14	Transition Economies	15
Europe	9	Western Asia	13
Latin America	7	Latin America	7
Africa	7	Africa	3
Other	2	Other	1

Source: UNCTAD secretariat on the basis of data published in British Petroleum (BP) *Statistical Review of World Energy 2011* (June 2011).

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). Excludes liquid fuels from other sources as biomass and coal derivatives.

growth in oil demand, coupled with uncertainties over supply, will continue to support oil prices at current or increased levels in 2011. Most forecasters have settled in the \$100–\$125 per barrel range with differences in projections showing that it is difficult to predict oil prices when an element of speculation is also at play.

### Crude oil shipments

Demand for crude oil tankers is closely correlated with the global oil demand. In 2010, seaborne shipments of crude oil recovered and returned to pre-crisis levels. Crude oil loaded in 2010 amounted to about 1.8 billion tons, a 4.3 per cent increase over 2009. Western Asia remained the largest loading area, followed by the economies in transition, Africa and developing America (see tables 1.4 and 1.5). The major unloading areas were North America, developing Asia, Europe and Japan. Growing energy demand of Asian developing economies, specifically China and India, as well as stronger demand in Western Asia are positioning these regions as importing players. This is reflected, as previously noted, in China's increased involvement in the energy and mining sectors of resource-rich

countries through growing partnerships. Companies based in China or Hong Kong, China, participated in a total of \$13 billion of outbound mining acquisitions and investments in 2009.<sup>38</sup> Major oil importers in advanced economies are losing their relative importance as a source of import demand, given the relatively high stocks of crude oil in developed economies and their subdued demand for oil, with the exception of the United States.

Looking ahead, growth in crude oil trade is expected to slow down in 2011. Uncertainties such as the political turmoil in oil-exporting regions or natural disasters such as the earthquake and tsunami in Japan could have unforeseen consequences for crude tanker trade.<sup>39</sup> The disruption in oil supply in the Libyan Arab Jamahiriya could lead to increased demand for tanker ton-miles as importing countries look for alternative sources of crude to compensate the reduced output. For example, ton-mile demand for Suezmax could increase due to the European refineries buying more West African crude since West Africa's crude oil is of similar grade to crude oil from the Libyan Arab Jamahiriya.

### **Refinery developments and shipments of petroleum products**

Global refinery throughputs averaged 74.8 mbpd, an increase of 2.4 per cent over 2009. A cold winter in the United States and Europe and the economic recovery boosted oil demand and caused a rebound in OECD output. Refineries in non-OECD countries, namely China and India, as well as the Russian Federation, also recorded high outputs. Normal temperatures in the United States and Europe and a slowdown in global economic growth are expected to moderate oil demand growth, and consequently throughput growth, compared with recent high levels. Also, the earthquake in Japan could lead to reduced crude oil demand as refineries damaged by the earthquake continue to be out of operation.

The refining sector has moved from an era of booming demand between 2004 and mid-2008 to difficult times, when demand is constrained and capacity is in surplus, especially in OECD regions. Capacity continues to grow with the largest capacity growth expected to take place in Asia-Pacific followed by Western Asia. During 2009, five new refineries were brought on line in Western Asia and the Far East.

In this context, while 2010 may have been a positive year, some uncertainty remains as regards the prospects of petroleum products shipments. Reflecting developments in the world economy and the influence of weather patterns of 2010, world shipments of petroleum products increased by 3.7 per cent in 2010, taking the total to 967.5 million tons (see table 1.4). The outlook for 2011 remains overall positive but subject to the same downside risks facing the global economy and oil demand: considerations such as an expansion in product tanker fleet capacity, a surplus in the global refining capacity, and a geographical shift of global refining centres to the East in tandem with the shift of the main source of consumption demand. These factors are likely to alter the structure, patterns, ton-mile demand and the overall geography of petroleum product trade.

In a separate development and with its position as the third-largest oil importer, an important issue emerging in 2011 is the impact of the disaster in Japan on tanker shipping. The shortfall in refinery output in Japan could raise the demand for petroleum product to make up for the reduced gasoline and fuel oil. However, lower refinery throughput is likely to diminish crude oil tanker demand as crude oil for feedstock declines. As refineries return to full operation, crude oil tanker

demand would then benefit from a surge in demand. That being said, it should be noted that Japan held 590 mbpd of crude and products in December 2010, an amount equivalent to 169 days of net import. This means that any potential effect on tanker trade will not be felt in the short term.

### **Natural gas supply and demand**

Natural gas makes up about 24 per cent of the world energy consumption, after oil and coal. Considered to be a much cleaner fossil fuel source in view of its lower carbon content, natural gas is increasingly emerging as an attractive fuel source. Liquefied natural gas (LNG) has more recently emerged as a viable alternative to nuclear energy.

In 2010, world production of natural gas rebounded by 7.3 per cent to reach 3,193.3 billion cubic metres (bcm). Together, Europe and the transition economies combined accounted for 32.6 per cent of the global production, followed by North America. Other producers included the Asia-Pacific region, with a share of 15.4 per cent (table 1.5). The production is boosted by a strong recovery in the output of the Russian Federation, rising United States production and a surge of output from Qatar. Global LNG production also expanded in 2010 with the largest LNG producer, Qatar, being responsible for the bulk of the additional supply. With rising production in Qatar, Western Asia is expected to overtake the Asia-Pacific region as the world's third largest producing region in 2012. Train 7 of the Qatar Gas 4 project initially contracted to supply the United States, China and Dubai, has been recently completed. However, some of the cargo is likely to be diverted away from the United States market towards Asia, particularly Japan. Expected growth in Japan's LNG demand, the world's largest LNG consumer, and higher Asian LNG prices are contributing to shifting LNG exports towards Asia.

While growing from a low base, world consumption of natural gas rebounded by 7.4 per cent to reach 3,169 bcm in 2010, owing to lower prices and stronger industrial production in both the OECD countries and emerging economies. Demand increased in all regions, with the fastest regional growth being recorded in Europe, Asia and the Pacific region. Demand for natural gas is projected to grow at a stronger rate after 2011, driven mainly by higher oil prices, efforts to reduce carbon emissions and the surge in Asia's demand for LNG. Again, growth in demand is expected to be propelled by non-OECD

countries, particularly China and India, as well as the Islamic Republic of Iran and Saudi Arabia. Demand in advanced economies is also expected to rise, driven by policies aimed at reducing dependency on higher carbon content energy sources such as oil. Japan is expected to increase its consumption of LNG as a result of the damage sustained by its nuclear power facilities.

### **Liquefied natural gas shipments**

In 2010, world LNG shipments increased by over 22 per cent to reach 297.6 bcm, driven by over 50 per cent growth in Qatar's output. In October 2010, there were 56 export terminal projects in operation in 18 countries, with a number of projects under construction or planned, including in Australia, the Islamic Republic of Iran and Papua New Guinea.<sup>40</sup> Canada and Brazil might also emerge as potential LNG exporters as plans for developing liquefaction facilities are being drawn. Qatar remains the main LNG exporter, followed by Malaysia, Indonesia, Algeria and Nigeria. Several new exporters are emerging and include Angola, Australia, Peru, Saudi Arabia and Yemen.

As of October 2010, there were 90 import terminals in 20 countries with several others reported to be under construction or envisaged (e.g. in Germany, Croatia, Romania and Singapore).<sup>41</sup> China has six import terminal projects set for completion in 2013 while the Netherlands, Thailand and Sweden expect their import terminals currently under construction to start operations in 2011. Overall, the number and the size of storage tanks are increasing together with growing average size of gas carriers.<sup>42</sup>

Reflecting a stronger industrial demand, the largest Asian LNG markets – Japan, the Republic of Korea and Taiwan, Province of China – experienced a rapid growth in imports in 2010. Also, with the advent of the United States gas boom, large volumes of LNG are being diverted and shipped to areas of stronger demand, mainly in Asia. Capitalizing on the strong demand, the Russian Federation and China are expected to sign an export agreement for gas delivery by mid-2011, while an agreement between China and Turkmenistan is expected to be signed later in 2011. South America is also growing into an important LNG importer, with the start-up of import terminals in Chile, Brazil and Argentina in recent years. As regards Japan, the reconstruction-related demand is likely to benefit LNG trade through the potential transition away from coal and nuclear during

the rebuild of powering plants. The diversification of sources of supply and the geographical shift in LNG trade brought about new discoveries and the emergence of new import players could lead to increased ton miles.

### ***Dry cargo shipments: major and minor dry bulks and other dry cargo***

The year 2010 was positive for dry cargo as total volumes bounced back and grew by 8.4 per cent to nearly 5.7 billion tons. Dry bulk cargo (major and minor bulks) amounted to about 3.3 billion tons of this total, up by a firm 11 per cent over 2009. The strong comeback is due in particular to the recovery in world steel production and the associated growth in import demand for iron ore and coking coal. Growing demand for steam coal fuelled by, among other things, growing urbanization in large emerging developing countries such as China and India, also had a role to play. Income growth in emerging economies has also supported growth in grain shipments used as feedstock, with the evolving consumption needs of these economies and their shifting towards the consumption of more diversified foods, including meat and related products. While these developments are encouraging, the low base effect should also be taken into account given the sharp drop in dry cargo volumes recorded in 2009.

### **Major dry bulks: iron ore, coal, grain, bauxite/alumina and phosphate rock**

The share of major dry bulks has been expanding over the past four decades, while that of oil trade has been losing its relative weight over the same period. Major dry bulks accounted for 17.4 per cent of total goods loaded in 1970, 24.4 per cent in 1990 and 21.5 per cent in 2000, and ranged between 25 per cent and 28 per cent between 2008 and 2010. Within the major dry bulk commodities, coal accounted for 28 per cent of the total loaded in 1984, 33.3 per cent in 1990, 31.8 per cent in 2000 and 38.6 per cent in 2010. The share of iron ore stood at 36.3 per cent of total major dry bulks loaded in 1984, and fluctuated between 35.8 per cent in 1990, 34.7 per cent in 2000, and 42.3 per cent in 2010. Over the 1984–2010 period, coal and iron ore volumes moved in tandem, both growing at an average annual rate of over 5 per cent (figure 1.4). The share of bauxite and alumina has been decreasing, from 5.5 per cent in 1984 to 3.4 per cent in 2010, owing partly to producers preferring to refine bauxite on site which results in less shipments of bauxite.

This growing share of dry bulk cargo reflects in particular the fast-growing demand for raw materials such as coal and iron ore used as inputs in steel-making and industrial activity, especially in large developing regions such as China, India, and increasingly in oil-rich Western Asian countries, where important investments are poured into their infrastructure development.

### Coal production, consumption and shipments

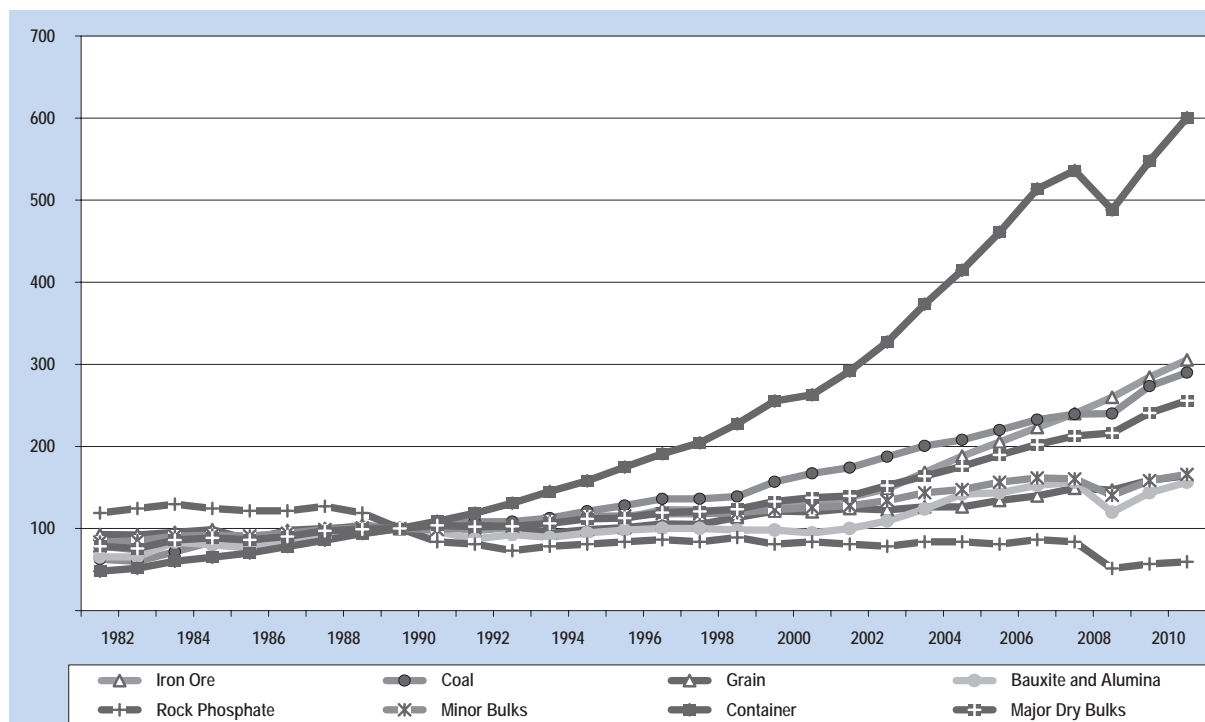
Growth in global coal demand outpaces overall energy demand growth, largely because of coal's increasing share in the energy mix of emerging countries. World coal consumption grew by 7.6 per cent in 2010, reflecting the requirements of the economic recovery and a higher demand from the steel industry. Growth in China's consumption remained robust, as did India's. However, consumption in China is expected to grow at a slower rate over 2011–2012 in tandem with developments in the wider economy,<sup>43</sup> lower demand from the steel industry, and heightened efforts to curb carbon emissions (table 1.6).

Global coal production rebounded strongly in 2010, growing by 6.3 per cent, owing to the recovery in demand and the favourable prices, and led by Indonesia (19.4 per cent), New Zealand (16.8 per cent)

and China (9 per cent). The outlook for 2011 remains positive, with the global coal production expected to grow, albeit at a more moderate rate than in 2010, reflecting in particular the expected weaker demand in China and the relatively high production levels recorded in 2010.

In 2010, the volume of coal shipments (thermal and coking) totalled 904 million tons, up by 14.4 per cent year on year. Thermal coal exports, where Indonesia holds a present market share of 43.9 per cent, increased by 12.4 per cent in 2010 to reach 663 million tons. In 2010, Australia and Indonesia together accounted for 65.2 per cent of the world's total thermal coal shipments. Other major thermal coal exporters included Columbia, the Russian Federation, South Africa China and the Bolivarian Republic of Venezuela. A strong demand in China and India has boosted import levels of thermal coal while the return to strong economic growth in Japan and the Republic of Korea offered further support. Thermal coal exports to the Pacific have more than outweighed the downturn in import demand in Europe and the United States, which dropped in 2010 due to a combination of stringent environmental measures and comparatively low gas prices.

Figure 1.4. Growth in five major dry bulks, 1982–2010 (indices, 1990 = 100)



Source: UNCTAD secretariat based on *Review of Maritime Transport*, various issues; and on Clarkson Research Services; *Shipping Review and Outlook*, Spring 2011.



As coking coal is used in steelmaking, its trade patterns follow closely developments in the world economy as well as those in steel demand and production and the associated iron ore trade. Dominated by Australia, with a market share of 66 per cent, shipments of coking coal also increased even at a much faster rate (20 per cent) than thermal coal taking the total to 241 million tons in 2010.

Over recent years, coal exporters such as Colombia, South Africa, the United States and Canada are increasingly directing their exports towards Asia. In 2010, Colombia shipped cargo to India, a change reported to have been encouraged by weaker demand in Europe and the United States, relatively better prices in Asia and lower shipping costs. South Africa is also eyeing the Asian market with India becoming its largest single market in Asia, a diversion from its traditional European and United States markets. The problems facing Australia may have contributed to this trend as Australia's exports have been affected by heavy rains in 2010 and a cyclone in early 2011, as well as persistent infrastructure bottlenecks. Australia estimated the lost coal and agricultural exports at \$2.97 billion<sup>44</sup> while the Queensland Resources Council notes that coking coal output will be 10–20 per cent lower year on year in the second quarter of 2011.<sup>45</sup>

The main destinations of both thermal and coking coal exports are Japan and Europe, which together account for 38.4 per cent of global imports in 2010 (table 1.6). In 2009, China became a net importer of coal for the first time and an increasing proportion of China's demand will be met by imports. Its demand, however, may fluctuate depending on the level of its domestic stocks and international prices. However, India was the foremost driver of growth in seaborne coking coal trade in 2010. It overtook China as the second largest importer due to the emergence of Mongolia as a major supplier (some 30 per cent in 2010). India is expected to overtake China as a major driver of growth in steam coal trade. China's concerns about its economy overheating, large coal reserves, uncompetitive prices and India's greater dependence on imports explain the shift in China's import demand and the emergence of India as an increasingly large importer.

### **Iron ore and steel production and consumption**

Iron ore trade is correlated with growth in world steel production. In 2010, global steel production increased by 15 per cent, taking the total output to 1.4 billion tons. Crude steel production in China totalled 626.7

million tons, accounting for 44.3 per cent of the world total. In 2010, the world's apparent steel consumption grew by 13.2 per cent in 2010 and is projected to further increase by 5.9 per cent in 2011 to reach 1,339 million tons. While steel consumption is projected to expand in all regions in both 2011 and 2012, world steel demand is nevertheless expected to be affected by the introduction of tighter monetary policy aimed to slow down the Chinese economy and its steel-intensive construction sector. Preliminary estimates for Japan point to a 15 per cent disruption to supply of the steelmaking industry. In the short term, Japanese demand is forecast to fall by 10 per cent in 2011. However, given the reconstruction requirements, a complete recovery is likely by 2012.

A recovery in global crude steel production supported growth in global iron ore shipments which expanded by 9.0 per cent in 2010, taking the total to 982 million tons. Major iron ore exporters included Australia, Brazil, Canada, India, and South Africa (table 1.6). Key iron ore mining companies remain Vale (Brazil), BHP Billiton (Australia) and Rio Tinto (Australia/United Kingdom). In 2010, Australia and Brazil, which together control nearly three quarters of the market, saw their export volume rise by 10.9 per cent and 17.0 per cent respectively. With the exception of India and Mauritania, growth in volumes of other exporters such as Canada, Sweden, South Africa and Peru have also picked up speed.

Strong imports into Japan, the Republic of Korea and the European Union more than offset the decline in China's imports (–2 per cent). China's iron ore imports totalled 602.6 million tons, or around 61.4 per cent of the world total. China's consumption patterns may be currently changing in line with changes in its economy, growth model and steelmaking sector. Iron ore imports by China, which saw an unparalleled growth over the past few years, are likely to change by efforts of its Government to slow down rapid economic expansion. China's dominant role as a key player cannot be overemphasized, as illustrated by actions taken by iron ore mining companies and exporting countries to ensure that they are able to meet the strong iron ore demand from China. In February 2011, Brazil released a national mining plan which aims to double output of key mineral groups including iron ore, gold and copper between 2010 and 2030. With a \$270 billion investment in mining research and processing, Brazil's iron ore output is set to increase by 58 per cent between 2010 and 2015.<sup>46</sup>

**Table 1.6. Major dry bulks and steel: major producers, users, exporters and importers, 2010  
(market shares in percentages)**

Major steel producers		Major steel users	
China	44	China	45
Japan	8	EU 27	11
United States	6	North America	9
Russian Federation	5	CIS	4
India	5	Middle East	4
Republic of Korea	4	South America	4
Germany	3	Africa	2
Ukraine	2	Other	22
Brazil	2		
Turkey	2		
Others	19		
Major iron ore exporters		Iron ore importers	
Australia	40	China	61
Brazil	31	Japan	14
India	10	EU 15	11
South Africa	5	Republic of Korea	6
Canada	3	Middle East	2
Sweden	2	Other	6
Other	9		
Major coal exporters		Major coal importers	
Australia	33	Japan	22
Indonesia	32	Europe	17
Colombia	8	China	14
South Africa	7	India	13
Russian Federation	7	Republic of Korea	13
United States	5	Taiwan, Province of China	7
Canada	3	United States	2
China	2	Thailand	2
Others	3	Malaysia	2
		Brazil	1
		Other	10
Major grain exporters		Major grain importers	
United States	33	Asia	31
EU	10	Latin America	22
Canada	9	Africa	22
Argentina	8	Middle East	18
Australia	8	Europe	5
Others	33	CIS	2

Source: UNCTAD secretariat on the basis of data from the World Steel Association (2011); Clarkson Research Services, published in the May 2011 issue of *Dry bulk Trade Outlook*; and World Grain Council (WGC), 2011.

A new trend to observe with respect to iron ore trade is the evolution of purpose-built very large ore carriers (VLOCs). To capitalize on the important iron ore demand from China and to ensure high market share on this trade, Vale, the Brazilian mining giant ordered a giant fleet of 80 VLOCs by 2015.<sup>47</sup> Of these, 36 ships will be of 400,000 deadweight tons (DWT), which is roughly twice as large as existing Capesize ships. Business with China alone is contributing one third of Vale's operating revenue.<sup>48</sup>

Looking ahead, the outlook for iron trade is positive, with iron ore shipments expected to grow by a firm 6 per cent to hit the 1 billion mark for the first time in 2011. Nevertheless, it remains subject to developments in the wider economy and the steelmaking sector, and more importantly, to the exact effect of China's policies aimed at moderating its economic expansion including its steel making sector.

### Grain shipments

Grain shipments are to a large extent determined by weather conditions in producing and exporting countries. However, other factors are increasingly influencing the volume, structure and patterns of grain shipments and include (a) the shift in demand and usage (e.g. industrial purposes vs. feed); (b) environmental and energy policies that promote the use of alternative energy sources such as biofuels; (c) the evolution in consumption and demand patterns (e.g. higher meat consumption in emerging developing countries lead to more grain shipments for feedstock); and (d) trade measures aimed at promoting or restricting trade flows.

Total grain production in 2009/2010 fell by 4.4 per cent to 1,794 million tons while consumption increased by 2 per cent to reach 1,761 million tons. As in recent years, growth remains strongest in feed and industrial sectors with direct human food consumption rising at a comparatively slower pace. In mid-2010, drought and fires in the Russian Federation, Ukraine and, to a lesser extent, North America affected the harvests and led to an increase in grain import volumes of many regions. The increased demand was met largely by the United States and Argentina, and entails positive implications for grain trade ton-mile, especially the supramaxes engaged on long-haul transatlantic routes. For 2010/2011 global grain production is expected to decline by 3.6 per cent while consumption is set to grow (1.7 per cent).

World grain shipments totalled 343 million tons in the calendar year 2010, up by 8.2 per cent over 2009. Wheat and coarse grain accounted for 72.6 per cent of the total grain shipments. For the crop year 2010/11, volumes of wheat exports are expected to fall by 4 per cent due to a 49 per cent drop in exports from countries other than the five largest exporters (Argentina, Australia, Canada, the European Union and the United States) whose exports, as a group, are expected to grow by a solid 19 per cent (see table 1.6 for major grain exporters and importers). Wheat exports from Argentina and the United States, in particular, are expected to rise by a robust 47 per cent and 45 per cent respectively, reflecting improved harvests and demand in areas which recorded less positive crop years or are experiencing strong growth in demand.

For the crop year 2010/11, grain imports (table 1.6) are expected to expand at a strong rate in the European Union (68 per cent), the Russian Federation (500 per cent), China (41 per cent), Ecuador (20 per cent), and Morocco (43 per cent). The additional import requirements of these countries are offset by reduced demand in Japan (-5 per cent), Bangladesh (-13 per cent) and the Islamic Republic of Iran (-49 per cent). It is estimated that if demand were to remain constant at the 2010 level, global wheat consumption could increase by 40 per cent by 2050, a growth rate that would mirror expansion in the world population by that time.<sup>49</sup> Based on projections by the United States Wheat Associates, domestic production of North Africa, Western Asia, Sub-Saharan Africa, Indonesia, the Philippines, Brazil, Mexico, India and China will increase by 23 per cent while their consumption is expected to grow by 49 per cent between 2010 and 2050.<sup>50</sup> It is likely that with changes in political regimes in North African and Western Asian countries there would see changes in policies affecting grain shipments. New leaders of these countries may be pursuing food policies along different path which will impact on the global grain business. For example, they could follow the Saudi Arabia's approach to enhancing its food security by adding sufficient storage space to boost stocks and acquiring cropland in other countries.<sup>51</sup>

An important development with a bearing on grain markets and trade is the rise in food prices recorded in 2010 and early 2011. In February 2011, food prices have increased by more than 30 per cent year-on-year, owing in particular to production shortfalls resulting from adverse weather, falling stocks and the strong demand supported by a recovery of many emerging

economies. It has been estimated that if a 30 per cent increase in global food prices persists throughout 2011, GDP growth for some food-importing countries in Asia, for example, could decline by 0.6 percentage points.<sup>52</sup> Combined with a 30 per cent increase in world oil prices, the reduction in GDP growth could reach 1.5 percentage points compared with a situation with no hikes in food and oil prices.<sup>53</sup> Clearly, there is a need to improve productivity, increase agricultural investment, and adopt all measures necessary to enhance food security especially for the more vulnerable populations.

### **Bauxite/alumina and phosphate rock**

In 2010, world trade in bauxite and alumina rebounded by a strong 22.7 per cent, and totalled 81 million tons. With Europe, North America and Japan being the main importers, the strong recovery reflects the improved situation in industrial activity in these economies and the continued investment expenditure in emerging developing economies supported by the stimulus funding and the rapid pace of industrialization. The major loading areas for bauxite included Africa, the Americas, Asia and Australia. Australia was also a major exporter of alumina, accounting for about half of world exports, while Jamaica contributed a growing share.

Rock phosphate volumes bounced back at a firm rate of 21 per cent, to 23 million tons, reflecting the improved economic situation in main importing countries such as the United States. Increased grain production encouraged by higher prices and growing demand, especially from Asia, helped boost demand for fertilizers. Some easing of the credit conditions may have also helped in relation to the sale of farm inputs such as fertilizers. Phosphate rock volumes are expected to remain steady in 2011, partly reflecting further consolidation in the economic recovery and demand for grains. Plans are still under way for the expansion of existing operations, for example in Brazil, China, Egypt, Finland, Morocco, the Russian Federation and Tunisia. Once operational, supply and demand and the underlying shipping patterns will likely be affected, especially as regards demand for handysize capacity and deployment.

### **Dry cargo: minor bulks**

In 2010, minor bulks trade also recovered from the 2009 dip and expanded by 11 per cent, taking the total volume of minor bulk shipments to 954 million tons. Overall, trade in minor bulks fared well, although imports remained around 3 per cent below the pre-

downturn levels. Steel and forest product trades account for the largest growth in terms of volumes while in terms of growth rate, coke (78.7 per cent) and potash (59.7 per cent) trades recorded the most significant year-on-year expansion. With the bouncing back of the world steel production, scrap volumes increased by 10 per cent to reach 98.8 million in 2010, a level almost equivalent to the 2008 level and above the 2007 level. Strong demand and favourable weather conditions supported growth in sugar and rice shipments, which increased respectively by 10.4 per cent and 7.8 per cent in 2010. Trade in the majority of fertilizers rebounded strongly (16.9 per cent), whilst imports of metals and minerals such as manganese ore and cement all increased in tandem with the resurgence of the global steel production and construction industries. Minor dry bulk trades are projected to grow by 5 per cent in 2011, driven in particular by strong growth in agribulks, metals and minerals and manufactures.

### **Other dry cargo: containerized cargo**

The balance of 2.4 billion tons of dry cargoes is made up of containerized (56 per cent) and general cargoes. Driven largely by the increasing international division of labour and productivity gains within the sector, container trade, the fastest-growing cargo segment expanded at an average rate of 8.2 per cent between 1990 and 2010 (tables 1.7 and 1.8 and figures 1.5 and 1.6).

Container trade volumes experienced an unexpected robust recovery fuelled by a surge in demand across nearly all trade lanes. In 2010, global container trade volumes bounced back at 12.9 per cent over 2009, among the strongest growth rates in the history of containerization (figure 1.5). Table 1.7 features container trade volumes on the three major East–West container routes from 1995 to 2009. Over this period, the continuing expansion in container trade volume is compelling, as is the drastic drop in volumes recorded in 2009. According to Clarkson Research Services data, container trade volumes reached 140 million 20-foot equivalent unit (TEUs) in 2010, or over 1.3 billion tons.

Growth in container trade volumes was propelled by the double-digit rates involving Asia, namely Far East–North America and Asia–Europe (table 1.8). Volumes on these two largest East–West trade lanes are expected to exceed 2008 levels. However, volumes on the transatlantic lane, which experienced a drop of 19 per cent in 2009, are expected to remain below

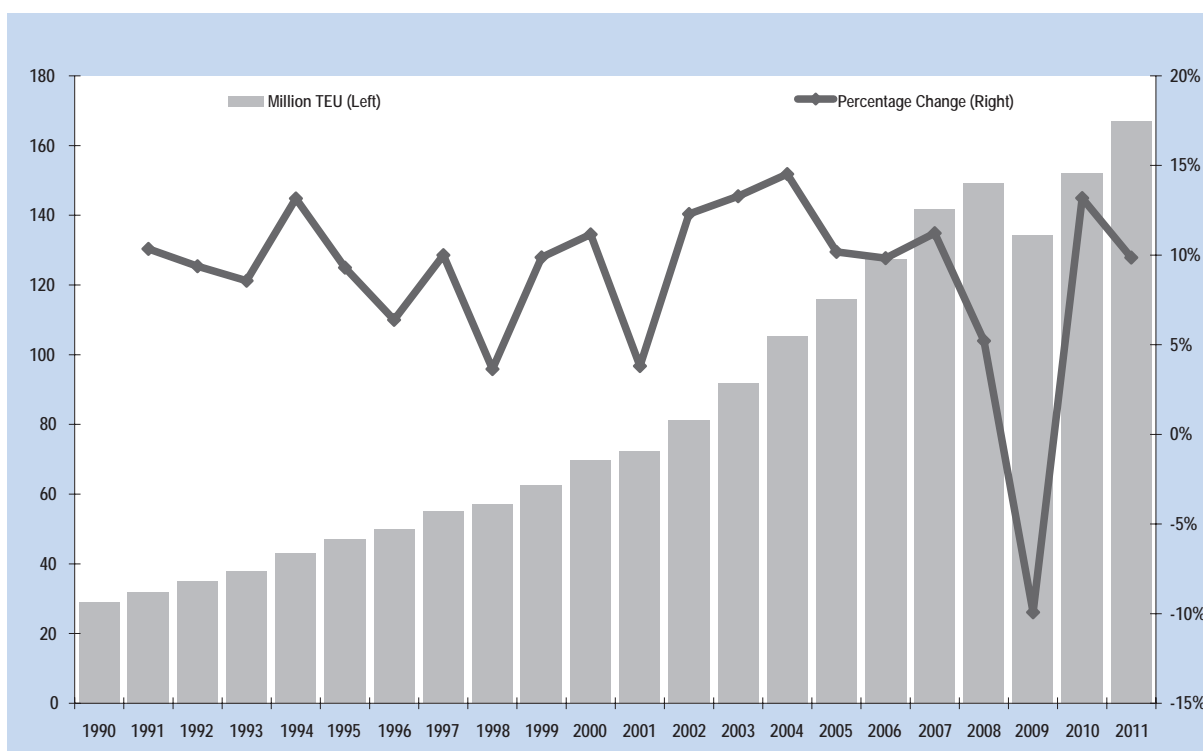
the pre-downturn levels. While the transatlantic lane is gradually diminishing in global importance, Western Asia's trade with developing economies in the Indian Subcontinent and southern hemisphere is expanding rapidly. It should be noted that, although conditions have improved, slow steaming continues to be implemented by container operators as a way of cutting costs of fuel and absorbing capacity as well as a move to fulfill other strategic objectives such as energy efficiency and environmental sustainability, including cutting carbon emissions (see section C and chapter 2).

Growth in 2010 is estimated to have been more robust on North–South (14.1 per cent) and non-main lane East–West trades (18.7 per cent). This has been illustrated by the Europe to South/Central America trade, which grew by 20.1 per cent in the first quarter of 2011 and Europe to sub-Saharan Africa trade, which grew by 27.5 per cent year-on-year over the same period. Meanwhile, intraregional trade grew by an estimated 11.6 per cent in 2010, propelled by intra-Asian trade, which continues to be fuelled by growth in developing economies such as China.

Along with fast-growing intraregional trade, these emerging lanes provided a market for the deployment of cascaded ships.

With trade growing at a faster-than-expected rate, the container sector was caught by surprise and created a shortage of container equipment in particular empty boxes. The shortage of containers observed in 2009 resulted from the large-scale scrapping of old boxes during the downturn, low production levels and financially strapped carriers, and their attempts to cut costs, including that of repositioning empty boxes. Equipment and ship capacity shortages that were experienced following a rebound in demand in the fourth quarter of 2009 and early 2010 have led to a fact-finding investigation by the Federal Maritime Commission into the availability or non-availability of supply capacity on the transpacific trade during that same period.<sup>54</sup> While it was concluded that no clear evidence was found as regards unlawful practices by carriers, ocean liners were nevertheless urged to ensure that capacity shortages are prevented in the future. Also, Global Alliances (Grand, Green and New

**Figure 1.5. Global container trade, 1990–2011 (TEUs and annual percentage change)**



Source: Drewry Shipping Consultants, *Container Market Review and Forecast 2008/09*; and Clarkson Research Services, *Container Intelligence Monthly*, May 2011.

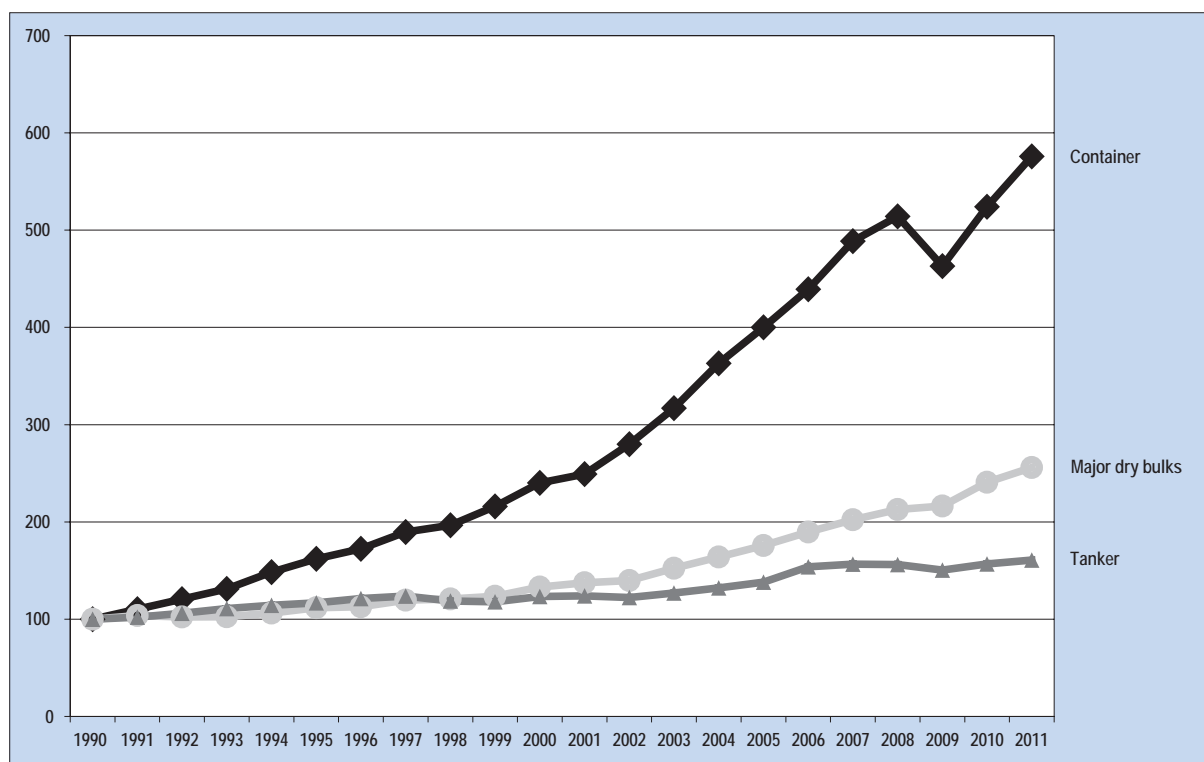
Note: The data for 2011 were obtained by applying growth rates forecasted by Clarkson Research Services in *Container Intelligence Monthly*, May 2011.



**Table 1.7. Estimated cargo flows on major East–West container trade routes, 1995–2009 (TEUs)**

	Transpacific		Europe Asia		Transatlantic	
	Far East – North America	Far East – North America	Far East – Europe	Europe – Far East	Europe – North America	North America – Europe
1995	3 974 425	3 535 987	2 400 969	2 021 712	1 678 568	1 691 510
1996	3 989 883	3 649 871	2 607 106	2 206 730	1 705 173	1 603 221
1997	4 564 690	3 454 598	2 959 388	2 323 256	2 055 017	1 719 398
1998	5 386 786	2 857 440	3 577 468	2 097 209	2 348 393	1 662 908
1999	6 108 613	2 922 739	3 898 005	2 341 763	2 423 198	1 502 996
2000	7 308 906	3 525 749	4 650 835	2 461 840	2 694 908	1 707 050
2001	7 428 887	3 396 470	4 707 700	2 465 431	2 577 412	1 553 558
2002	8 353 789	3 369 647	5 104 887	2 638 843	2 633 842	1 431 648
2003	8 997 873	3 607 982	6 869 337	3 763 237	3 028 691	1 635 703
2004	10 579 566	4 086 148	8 166 652	4 301 884	3 525 417	1 883 402
2005	11 893 872	4 479 117	9 326 103	4 417 349	3 719 518	1 986 296
2006	13 164 051	4 708 322	11 214 582	4 457 183	3 735 139	2 053 710
2007	13 540 168	5 300 220	12 982 677	4 969 433	3 510 123	2 414 288
2008	12 896 623	6 375 417	13 311 677	5 234 850	3 393 751	2 618 246
2009	10 621 000	6 116 697	11 361 971	5 458 530	2 738 054	2 046 653

Source: Based on Global Insight Database as published in the “International Maritime transport in Latin America and the Caribbean in 2009 and projections for 2010”. *Bulletin FAL*, Issue No. 288 – Number 8/2010, ECLAC.

**Figure 1.6. Indices for global container, tanker, and major dry bulk volumes, 1990–2011 (1990 = 100)**

Source: UNCTAD secretariat, based on *Review of Maritime Transport*, various issues; and on Clarkson Research Services, *Shipping Review and Outlook*, Spring 2011.

**Table 1.8. Estimated cargo flows on major East–West container trade routes, 2008–2010**  
(millions of TEUs and percentage change)

	Transpacific		Europe Asia		Transatlantic	
	Far East – North America	North America – Far East	Asia – Europe	Europe – Asia	Europe – North America	North America–Europe
2008	13.4	6.9	13.5	5.2	3.3	3.3
2009	12.0	7.0	11.5	5.5	2.8	2.5
2010	14.3	8.6	13.5	5.6	3.2	2.8
<b>% change 2009–2010</b>	<b>19%</b>	<b>23%</b>	<b>18%</b>	<b>2%</b>	<b>13%</b>	<b>10%</b>

Source: Container Trade Statistics (CTS), May 2011, and *Containerisation International*, May 2011.

World), the Transpacific Stabilization Agreement and the Westbound Transpacific Stabilization Agreement are now subject to special monitoring requirements and greater oversight. According to the new rules, the groupings have to report changes in overall capacity at a monthly instead of at a quarterly basis, as well as disclose copies of minutes of meetings held by the member lines.

A related development on the regulatory front was the growing pressure to reform the anti-trust legislation governing liner shipping in the United States.<sup>55</sup> Capacity constraints noted above, and their impact on rates, have led shippers to seek the abolition of the antitrust immunity of ocean carriers. Motivated by concerns over some container carrier practices, including abrupt enactment of surcharges, rolling scheduled cargo from ships, and refusing to carry containers on ships from other carriers, a bill was introduced in the United States Congress in 2010 proposing the removal of the antitrust immunity given to the liner shipping industry engaged in United States trade. While the bill died on the order, pressure, including from shippers to amend the existing legislation, is expected to continue. Elsewhere and in a separate and yet related development, Singapore decided to extend by five years until 31 December 2015 its block exemption for liner shipping antitrust immunity.<sup>56</sup>

Empty boxes and their repositioning result from the notorious trade flow imbalances inherent to container shipping. Empty container repositioning is a challenge for the industry since it raises costs and complicates the operational environment. Drewry estimates that there were 50 million TEUs of empty container movement in 2009. Assuming a nominal cost of \$400 per TEU for each empty movement (covering terminals, box hire, damage, storage, etc.) carriers imbalance costs are

estimated at \$20 billion in 2009. If the cost of land-side repositioning of empty containers is added, the total cost in 2009 would reach \$30.1 billion or 19 per cent of global industry income in 2009.

According to Clarkson Research Services, global container trade is projected to grow by 9.7 per cent in 2011 to reach 154 million TEUs, outpacing supply growth by 1.7 percentage points. The realization of the outlook, however, depends on continued and sustained growth in demand as well as a good management of growth in ship supply capacity. Aside from the downside risks associated with a potential overcapacity, other uncertainties include the strength of the recovery in Europe and the United States, the evolution in the financial situation in Europe, and the unemployment rate. In addition, container shipping is increasingly facing new challenges that entail potentially some cost implications as well as changes to the structure and operations of the industry.

Relevant emerging challenges include the rise of environmental awareness resulting in more stringent environmental regulation, capacity bottlenecks at ports and hinterland connections, rising fuel prices and rising protectionist bias. The triple disaster, including the nuclear crisis, affecting Japan since March 2011, had direct (e.g. infrastructural damage) and indirect impacts (e.g. broader implications for container trade) on some container ports. For example, concerns over radiation have the potential to affect the level of service and capacity deployment. It has been reported that, after the unfolding of the nuclear crisis, many ships did not call at Japan's ports over concerns of contamination. Container shipping could also be impacted by lack of exports from Japanese factories, causing liner companies to skip Japan's ports on their transpacific trading lanes. More importantly, disruption to the supply chains and the manufacturing business and the potential

related consequences, including a structural shift in the global manufacturing industry, are likely to affect container trade.

While the challenges facing the container industry may be significant, a number of opportunities are also emerging and could pave the way for further growth and open new markets. As argued throughout this chapter, the global economy is increasingly being driven by emerging economies, not just BRICs (Brazil, Russian Federation, India and China) but also other emerging economies such as Argentina, Chile, Indonesia, Nigeria, Oman, Qatar, Saudi Arabia, South Africa, Thailand and Viet Nam. New arteries of growth are opening up and more value added services are being packed into containers. The potential is important and many industry players are aware of it as well as the need to be prepared to capitalize on related commercial opportunities. This seems to be already the case, as evidenced by the evolving strategies of some ocean carriers and logistics services such as Maersk Line, CMA CGM, Hamburg Sud, Damco, and Kuehne and Nagel. Over recent years, these companies appear to be preparing to take full advantage of the rising opportunities in emerging markets and sectors including through equipment procurement, personnel designation and changes to organizational structures.

## **C. SELECTED EMERGING TRENDS AFFECTING INTERNATIONAL SHIPPING**

The latest economic downturn and the subsequent recovery have highlighted new trends that are reshaping the landscape of international maritime transport and trade. While not an exhaustive list, the key issues set out below are emerging as very important. These include, in particular, (a) a global new design; (b) energy security, oil prices and transport costs; (c) cutting carbon emissions from international shipping and adapting to climate change impacts; (d) environmental sustainability and Corporate Social Responsibility; and (e) maritime piracy and related costs.

### **1. A Global new design**

With large emerging economies such as the BRICs being the main engine of growth and trade expansion, the relative weight of advanced economies such as the European Union and the United States appears

to be diminishing. The downturn has reinforced a shift of the economic influence from the North and the West to the South and East. This, clearly, is altering the shipping industry's operating context and can be expected to evolve further as cargoes, markets and trade patterns also change in response to the new global design. One recent study finds that China will overtake the United States and dominate global trade in 2030; China will feature in 17 of the top 25 bilateral sea and air freight trade routes.<sup>57</sup> The study also concludes that four key areas could potentially present significant opportunities for transport and logistics firms, including (a) increased intra-Asia-Pacific trade, developed-developing region trade (e.g. China and Germany); (b) intra-emerging economies trade (e.g. China-Latin America); and (c) China-Africa trade. Together, these developments are expected to cause a shift in global trade away from advanced economies toward emerging developing countries as these continue on their urbanization path, growing consumer demand, and a relocation of lower value manufacturing toward new locations (e.g. from China to Indonesia). These developments are likely to affect market segments differently and result in shifts in international transport patterns, with transport growing faster on some routes than others. This also raises the opportunity of opening new markets. In this respect, one study assessing the routing flexibility of container shipping finds that the Cape of Good Hope route has the potential to emerge as a viable alternative to the Suez Canal route for 11 South-South trade lanes, including West Africa-Oceania, West Africa-East Africa, East Coast South America-Oceania and East Coast South America-East Africa.<sup>58</sup> From the perspective of shipping, however, these trends raise crucial questions and uncertainties. For example, there remain questions with respect to the future and the shape of globalization in view of (a) a potential growth in regionalization;<sup>59</sup> (b) the Doha Round of multilateral trade negotiations; (c) the proliferating trade agreements; (d) the possible growth of trade protectionism; (e) efforts of balancing global economic growth and trade flows; and (f) the complex nexus between energy security, oil prices, transport costs, climate change and generally environmental sustainability. These issues need to be better understood and their implications duly considered and assessed, and to the extent possible, incorporated into the decision-making process involving shipping (e.g. planning, investment, ship design, expansion, market locations, etc.).<sup>60</sup>

## 2. Energy security, oil prices and transport costs

The rapid growth in global trade recorded over the past few decades was powered by easily available and affordable oil. Shipping, which handles over 80 per cent of the volume of world trade, is heavily reliant on oil for propulsion and is not yet in a position to adopt alternative energy sources.<sup>61</sup> However, as evidenced by the recent surges in oil prices and as highlighted by many observers, the era of easy and cheap oil is drawing to an end with the prospect of a looming peak in global oil production. It should be noted, however, that there could be some mitigating facts such as high oil prices and carbon emissions concerns that push the industry to consider alternatives such as natural gas and renewable energy sources.

Supply and demand fundamentals are the major driver of oil price hikes. According to the International Energy Agency (IEA), worldwide oil demand is outstripping growth in new supplies by 1 million barrels per year. China is leading the growth in demand and nearly 20 million vehicles will be added to roads in 2011. The IEA estimates that some \$60 billion must be invested in global oil production capacity every year in order to meet global demand.<sup>62</sup> Higher oil prices can impact on shipping and trade through both their dampening effect on growth – as it is estimated that \$10 per barrel rise in the price of oil, if sustained for a year, can cut about 0.2 percentage points from GDP growth<sup>63</sup> – and the upward pressure on the cost of fuel used to propel ships – as higher oil prices drive up ship bunker fuel prices. As fuel costs can account for as much as 60 per cent of a ship's operating costs, a rise in oil prices will undoubtedly increase the transport cost bill for the shippers and therefore potentially undermine trade.<sup>64</sup> A recent study by UNCTAD has shown that a 10 per cent increase in oil prices would raise the cost of shipping a container by around 1.9 per cent to 3.6 per cent, while a similar increase in oil prices would raise the cost of shipping one ton of iron ore and one ton of crude oil would increase by up to 10.5 per cent and 2.8 per cent, respectively.<sup>65</sup> The study concludes that “the results of the investigation confirm that oil prices do have an effect on maritime freight rates in the container trade as well as in the bulk trade with estimated elasticities varying, depending on the market segment and the specification. Moreover, the results for container trade suggest the presence of a structural break, whereby the effect of oil prices on container freight rates is larger in periods of sharply rising and more volatile oil prices, compared to

periods of low and stable oil prices”.<sup>66</sup> Bearing in mind the perspective of developing countries, another recent study estimated the impact of higher bunker prices on freight rates, as well as the impact of higher freight rates on consumers and producers.<sup>67</sup> The analysis, which was conducted for several markets – including grain, iron ore, and the container and tanker trades – finds that in the longer term, a change in fuel costs may alter patterns of trade, as the competitiveness of producers in different locations changes as a result of increased transport costs. In line with results of UNCTAD's own investigation, the elasticity of freight rates to bunker prices was found to differ across shipping routes and trades. “The costs pass-through of increased freight rates into product prices also varied across product and market from nearly zero to over 100 per cent: this meant that in some cases the increased costs were effectively paid for by the consumer, and in other cases by the producer.” In this context, a good understanding of the interplay between transport costs, energy security and oil price levels is fundamental, especially for the trade of developing countries.

Apart from the impact on transport costs, sustained high oil prices raise a number of questions for international shipping. These include, for example, how to deal with related implications for capital-intensive newly built ships of any changes in fuel type and fuel technology requirements; and the potential for a modal shift when feasible from other modes of transport in favour of shipping, given the relative energy efficiency of ships as compared with other modes of transport. Another issue arising as important for shipping is regulatory-driven and relates to the transition to low sulphur fuel.<sup>68</sup> Tighter sulphur limits for marine fuels were introduced through amendments to the International Convention on the Prevention of Pollution from Ships, known as MARPOL 73/78. The MARPOL Convention includes Annex VI titled “Regulations for the Prevention of Air Pollution from Ships” and which sets limits on NOx and SOx emissions from ship exhausts, and prohibits deliberate emissions of ozone depleting substances.<sup>69</sup> The limits set out in Annex VI can have far-reaching implications for the shipping and oil industry as they affect bunker fuel costs and quality,<sup>70</sup> the future of residual fuel, oil refineries, as well as technologies such as exhaust cleaning systems and alternative fuels. Sulphur limits under MARPOL Annex VI will become effective for emission control areas (ECAs) such as the Baltic Sea, the North Sea, the United States and Canada in 2015. The limits will apply globally from 2020 or 2025.<sup>71</sup>

### 3. Cutting carbon emissions from international shipping and adapting to climate change impacts

The discussion on energy security and sustainability is closely tied to the current debate on addressing the climate change challenge, since energy can be viewed as both the root cause of the problem and the potential solution. Carbon emissions from international shipping result from the burning of heavy oil in ships' bunkers. Consequently, addressing the issue of bunker fuel through, for example, technology or operational solutions and economic instruments or other measures that provide incentives and/or deterrents can help cut emissions and therefore solve the carbon emissions problem. However, recent estimates by the IEA indicate that greenhouse gas (GHG) emissions increased by a record amount in 2009, to the highest carbon output in history, jeopardising the likelihood of reaching manageable carbon concentration levels.<sup>72</sup> The IEA estimates that if the world is to mitigate the worst impacts of climate change, annual energy-related emissions should not exceed 32Gt by 2020. If the 2010 emissions level is sustained, the 32Gt limit will be exceeded a full nine years ahead of schedule.<sup>73</sup>

Like other economic sectors, international shipping is facing a dual challenge in relation to climate change. International shipping relies heavily on oil for propulsion and generates at least 3 per cent of global carbon emissions and these emissions are projected by the International Maritime Organization (IMO) to treble by 2050. International shipping is now the subject of negotiations under the auspices of the IMO and the United Nations Framework Convention on Climate Change (UNFCCC). Current discussions are guided by a number of proposals that aim to introduce a variety of measures that could help curb carbon emissions from international shipping. Relevant measures being considered include operational and technological as well as market-based instruments, such as emissions trading scheme and a levy on ships' bunker fuel (see chapter 5 for detail on the IMO/UNFCCC negotiations). However, international shipping and more broadly maritime transport is also facing the challenge of adapting to the current and potential impacts of climate change.

Little attention has been paid so far to the impact of climate change factors such as sea-level rise and extreme weather events on maritime transport, especially ports – the crucial nodes of the global

chains linking together buyers and sellers, importers and exporters, and producers and consumers.<sup>74</sup> While mitigation action in international shipping is crucial to curb carbon emissions, building the resilience of the maritime transport systems and strengthening their ability to cope with climatic factors are equally important. Adaptation in transport involves enhancing the resilience of infrastructure and operations through, inter alia, changes in operations, management practices, planning activities and design specifications and standards. The extended timescale of climate change impacts and the long service life of maritime infrastructure, together with sustainable development objectives, imply that effective adaptation is likely to require rethinking freight transport networks and facilities. This may involve integrating climate change considerations into investment and planning decisions, as well as into broader transport design and development plans.<sup>75</sup>

One recent study has estimated that, assuming a sea level rise of 0.5 m by 2050, the value of exposed assets in 136 port mega-cities will be as high as \$28 trillion.<sup>76</sup> The challenge is thus significant, and raising awareness and improving understanding of the impacts of climate change on maritime transport and the associated adaptation requirements, including funding needs, are fundamental. Accurate information on the likely vulnerabilities and a good understanding of relevant climatic impacts – including their type, range and distribution across different regions and industries – are required for the design of an effective strategy for adequate adaptation measures in transport. Mobilizing requisite resources to finance adaptation action in maritime transport is important, particularly for developing regions. Yet, so far, resources generally allocated to adaptation remain inadequate, especially when compared with the significant adaptation costs estimated in various reports and studies.<sup>77</sup> It is against this background that the High-level Advisory Group on Climate Change Financing (AGF) – established by the Secretary-General of the United Nations in February 2010 to consider, among other things, the potential sources of revenue that will enable achievement of the level of climate change financing that was promised during the UNFCCC in Copenhagen in December 2009 – recommended imposing a price on carbon emissions from international transport as a potential source for important funding for climate action.<sup>78</sup>

To help fill the prevalent information gap, raise awareness and contribute to shaping effective adaptation action in transport, UNCTAD is increasingly devoting attention to dealing with “the climate change challenge on maritime



transport". Earlier related work by the UNCTAD secretariat includes the Multi-year Expert Meeting on Transport and Trade Facilitation, held 16–18 February 2009, whose theme was "Maritime Transport and the Climate Change Challenge". The meeting, held in Geneva, brought together around 180 delegates from 60 countries, including representatives from 20 international organizations, as well as the international shipping and port industries. The three-day meeting was the first of its kind to deal with the multiple challenges of climate change for the maritime transport sector in an integrated manner, focusing both on mitigation and adaptation, as well as on related issues, such as energy, technology and finance.<sup>79</sup> Experts at the meeting highlighted the urgent need to reach agreement in the ongoing negotiations on a regulatory regime for GHG emissions from international shipping.<sup>80</sup> They noted then with great concern that so far, insufficient attention had been paid to the potential impacts and implications of climate change for transportation systems, and in particular for ports, which are key nodes in the supply chain and vital for global trade. The central role of technology and finance was highlighted, as was the need for international cooperation among scientists and engineers, industry, international organizations and policymakers in relation to the preparation and design of adequate adaptation measures.<sup>81</sup>

More recently, and drawing on its mandate and this work, UNCTAD and the United Nations Economic Commission for Europe (ECE) jointly convened a one day workshop on 8 September 2010 with a focus on "Climate Change Impacts on International Transport Networks".<sup>82</sup> The workshop aimed in particular to help raise awareness of the various issues at stake, with a view to assisting policymakers and industry stakeholders, including transport planners, operators, managers and investors, in making informed adaptation decisions. The workshop provided a useful platform for considered discussions and set the pace for future work on how best to bridge the knowledge gap relating to climate change impacts on transport networks and effective adaptation responses for both developed and developing countries. Work on these important considerations continues with the establishment in March 2011 of an international group of experts under the auspices of the ECE to help advance understanding of climate change impacts on international transport networks and related adaptation requirements.<sup>83</sup> The first meeting of the international Expert Group was held on 5 September 2011. It approved the work plan of the Expert Group and its key deliverables, which will include

a substantive report on relevant issues as well as an international conference to disseminate the results of its findings.

Following up on the abovementioned work, UNCTAD organized on 29-30 September 2011 an Ad Hoc Expert Meeting on "Climate Change Impacts and Adaptation: A Challenge for Global Ports". The meeting aimed to provide policymakers, key public and private sector stakeholders, international organizations as well as scientists and engineers with a platform for discussion and an opportunity to share best practices relating to climate change impacts on ports and associated adaptation requirements.<sup>84</sup>

#### **4. Environmental sustainability and corporate social responsibility**

Greater public awareness is driving demand for industries to adopt the principles of corporate social responsibility (CSR) including environmental sustainability.<sup>85</sup> This pressure about the socio-economic as well as environmental sustainability is being felt among the shipping community from both individuals and corporate customers, and there is an increasing call for the shipping industry to adopt as part of its strategic planning, business and operations increased levels of CSR, especially as it applies to environmental sustainability.<sup>86</sup> In adhering to these principles, the shipping community is expected to achieve efficiency, effectiveness and quality of service, while at the same time taking into account the cost generated by any potential negative externalities generated by their activities, including environmental and social. This is particularly illustrated by the growing demand for greater transparency which means that customers and business throughout the supply chains, whether internal or external to the shipping industry, are demanding that social and environmental targets be set and fulfilled to ensure better performances. New technology enables real-time monitoring and assessment of the degree to which shipping is demonstrating leadership in terms of complying with environmental and social targets. The shipping industry can be expected to demonstrate the quality of its performance by allowing customers, regulators and other potentially interested parties to review their performance records. The shipping industry – through the Case for Action paper, which looks ahead to 2040 – recognizes this emerging trend and is considering ways in which it can best respond to these shifting

demands.<sup>87</sup> The Case for Action Paper was released under the Sustainable Shipping Initiative (SSI) which brings together leading companies from across the industry and around the world. The goal of the SSI is to transform the global shipping industry and the wider maritime sector by establishing a new, sustainable approach as the norm.

This is illustrated by the liner operators who are increasingly adapting their market strategies to emphasize the ecological and social dimensions as factors of competitiveness business. An example is the ordering by Maersk Line of the triple E-class 18,000 TEUs ships. The design of the 18,000 TEU ships is named triple E-class, reflecting three principles: economy of scale, energy efficiency and environmental improvement.<sup>88</sup> The ships are expected to be deployed on the Asia–Europe route. This trend is likely to step up competition as few other carriers could potentially be in a position to also order larger ships with a view to enhancing economic and resource-use efficiency, environmental sustainability as well as safeguarding market shares. For instance, CMA CGM announced in May 2011 that three of its 13,830 TEU ships on order are to be increased in size to a super-post-Panamax 16,000 TEU class, i.e. potentially the largest ships afloat if received before Maersk's 18,000 TEU ships.<sup>89</sup> Germanischer Lloyd, a leading classification society for large vessels, maintains that the technology is available for the building of 18,000 TEU ships, although the port infrastructure required for the handling of such ships may be lacking. As these ships are expected to be delivered in 2014, it can be expected that ports will be modified to adapt to the new ship sizes. However, ports that rely on tides may be facing more challenges in handling these super-post-Panamax ships.<sup>90</sup>

## 5. Maritime piracy and related costs<sup>91</sup>

Despite international efforts to address the problem of maritime piracy, IMO reports that a total of 489 actual or attempted acts of piracy and armed robbery against ships occurred in 2010. This represents an increase of 20.4 per cent over the 2009. Consequently, 2010 is marked by the IMO as the fourth successive year that the number of reported incidents increased. The scale of the attacks and the size of the vessels targeted are raising further concerns in the international community. This threatens to undermine one of the world's busiest shipping routes (Asia–Europe) and chokepoint (the Suez Canal).<sup>92</sup>

While shipping has in many cases avoided the piracy affected area in the Gulf of Aden and off the coast of Somalia by rerouting via the Cape of Good Hope, this alternative is not without costs. These costs are likely to be passed on to shippers in the form of higher freight rates and surcharges. Piracy activities raise insurance fees and ship operating costs, and generate additional costs through rerouting of ships. It is argued that if piracy attacks increased 10 times, it would lead to a reduction of 30 per cent in total traffic along the Far East–Europe trade lane, and that only 18 per cent of the total traffic would sail through the Cape of Good Hope. Existing studies provide a wide range of cost estimates depending on the methodology and the cost items considered. One recent study has estimated the total cost of maritime piracy in 2010 at \$7 billion–\$12 billion per year, including the ransoms, insurance premiums, rerouting ships, security equipment, naval forces, prosecutions, piracy deterrent organizations and the cost to regional economies.<sup>93</sup> Re-routing ships, insurance premiums, naval forces and security equipment account for the bulk of the costs.

It is estimated that a rerouting through the Cape of Good Hope results in a diversion which lengthens the voyages, and generates costs in addition to the opportunity cost of being unable to make more voyages in a given time period. Additionally, in view of the geographical concentration of recent piracy activity, Africa is likely to be directly affected. In 2010, the macroeconomic costs for four selected African countries and Yemen amounted to \$1.25 billion, with Egypt incurring largest loss per year (\$642 million) followed by Kenya (\$414 million), Yemen (\$150 million), Nigeria (\$42 million) and Seychelles (\$6 million).<sup>94</sup> In Kenya, for example, the costs of imports are estimated to increase by \$23.9 million per month and the costs of its exports by \$9.8 million per month due to the impact of piracy on the supply chains.<sup>95</sup> However, another report shows that – based on a case study of a 10,000 TEU ship sailing from Rotterdam to Singapore – insurance risk premiums and the Suez Canal transit fees offset to a great extent the additional fuel and opportunity costs of going through the Cape of Good Hope.<sup>96</sup> Thus, in addition to the security risk involved in sailing through piracy ridden areas and related direct costs (e.g. loss of life, injury, loss of ship or cargo, etc.), transiting through the Suez Canal or rerouting via the Cape of Good Hope both entail other significant costs (e.g. delays, higher insurance premiums, opportunity costs, fuel costs, revenue loss for the Suez Canal Authority/Egypt, etc.) which pose a burden to the shipping industry and will ultimately be borne by global trade.<sup>97</sup>

## ENDNOTES

- <sup>1</sup> Data and information used in Section A are based on various sources including in particular: United Nations Department of Economic and Social Affairs. (2011). *World Economic Situation and Prospects 2011*. United Nations publication. New York; United Nations Department of Economic and Social Affairs. *The World Economic and Social Survey*. (2010): Retooling Global Development. New York; International Monetary Fund (2011). *World Economic Outlook: Tensions from the Two-Speed Recovery: Unemployment, Commodities, and Capital Flows*. April; Podan P.C, Organization for Economic Cooperation and Development (OECD). (2011). *What is the Economic Outlook for OECD Countries? An Interim Assessment*. April. Paris; Economic Commission for Africa. and African Union. (2011). *Economic Report on Africa: Governing Development in Africa- The Role of the State in Economic Transformation*; World Trade Organization (WTO). (2011). *World Trade 2010, Prospects for 2011*. Press Release. 7 April; and Economist Intelligence Unit (EIU). (2011). *Country Forecast. Global Outlook*. May.
- <sup>2</sup> For a more comprehensive overview of world economic developments, see UNCTAD's Trade and Development Report, 2011, available at [www.unctad.org](http://www.unctad.org).
- <sup>3</sup> United States Energy Information Administration data available at [www.eia.gov](http://www.eia.gov) (data accessed on 25 May 2011).
- <sup>4</sup> Economist Intelligence Unit (EIU). (2011). *Country Forecast. Global Outlook*. May.
- <sup>5</sup> Based on data by the UNCTAD secretariat.
- <sup>6</sup> Foroohar, R. (2011). Rise of the Rest – Developing Economies See Rising Wealth. *Time*. Economy Briefing. 4 April.
- <sup>7</sup> United Nations Department of Economic and Social Affairs. (2011). *World Economic Situation and Prospects 2011*. United Nations publication. New York.
- <sup>8</sup> Ibid.
- <sup>9</sup> Ibid.
- <sup>10</sup> Clarkson Research Services. (2011). Dry Bulk Trade Outlook. May.
- <sup>11</sup> Ibid.
- <sup>12</sup> United Nations Department of Economic and Social Affairs. (2011). *World Economic Situation and Prospects*. Monthly Briefing No 31. May.
- <sup>13</sup> Shipping and Finance. (2011). 23 May. p. 24.
- <sup>14</sup> Mathews S (2011). Disaster Could Cost Japan \$235 Billion. *Lloyd's List*. 23 March.
- <sup>15</sup> United Nations Department of Economic and Social Affairs (2011). *World Economic Situation and Prospects*. Monthly Briefing No 31. May.
- <sup>16</sup> Based, in particular, on the *UNCTAD Handbook of Statistics* and on information published by the World Trade Organization (2011) in "World trade 2010, prospects for 2011". Press release. April. Available at [www.wto.org](http://www.wto.org).
- <sup>17</sup> United Nations Department of Economic and Social Affairs (2011). *World Economic Situation and Prospects 2011*. United Nations publication. New York.
- <sup>18</sup> Ibid.
- <sup>19</sup> Ibid.
- <sup>20</sup> *Containerisation International*. (2011). Building BRICs. 1 March. (<http://www.ci-online.co.uk/>).
- <sup>21</sup> Ibid.
- <sup>22</sup> Economist Intelligence Unit (EIU). (2011). *Country Forecast. Global Outlook*. May.
- <sup>23</sup> United Nations Department of Economic and Social Affairs. (2011). *World Economic Situation and Prospects 2011*. New York. United Nations. Also reported in various press clippings from *Containerisation International* and *IHS Fairplay*.
- <sup>24</sup> Shipping and Finance. (2011). *Bright Prospects of World Trade*. p.26.
- <sup>25</sup> Ibid.
- <sup>26</sup> Price Waterhouse Coopers (PWHC). (2011). *Economic Views: Future of World Trade: Top 25 Sea and Air Freight Routes in 2030*. 2011.
- <sup>27</sup> United Nations Department of Economic and Social Affairs. (2011). *World Economic Situation and Prospects 2011*. United Nations publication. New York.
- <sup>28</sup> OECD-WTO-UNCTAD. (2010). *Report on G20 Trade and Investment Measures (September 2009 to February 2010)*. 8 March.
- <sup>29</sup> Economist Intelligence Unit (EIU). (2011). *Country Forecast. Global Outlook*. May.
- <sup>30</sup> Ibid.
- <sup>31</sup> Masaki H (2011). "Japan, India to Sign Free Trade Agreement". *The Journal of Commerce Online*. 15 February.
- <sup>32</sup> United Nations Economic and Social Commission for Asia and the Pacific (ESCAP). (2011), *Economic and Social Survey of Asia and the Pacific- Regional Connectivity and Economic Integration*. Bangkok: United Nations.

- 33 Data and information in Section B are based on UNCTAD's statistics and reports as well as on various specialized sources, including: (a) British Petroleum (BP) (2011). *Statistical Review of World Energy 2011*. June; (b) International Energy Agency (IEA) (2010). *World Energy Outlook 2010*; (c) British Petroleum (BP) (2011). *Energy Outlook 2030*. January. London. (d) International Energy Agency (IEA). *Oil Market Report*. Various issues; (e) International Energy Agency (IEA) (2010). *Medium-Term Oil Market Report*. June; (f) United States Energy Information Administration (EIA) (2011). *Short-Term Energy Outlook*. June; (g) Organization of the Petroleum Exporting Countries (OPEC) (2011). *Monthly Oil Market Report*. June; (h) Organization of the Petroleum Exporting Countries (OPEC) (2010). *World Oil Outlook*; (i) Economist Intelligence Unit (EIU) (2011). *World Commodity Forecasts: Industrial Raw Materials*. May; (j) Economist Intelligence Unit (EIU) (2011). *World Commodity Forecasts: Food, Feedstuffs and Beverages*. May; (k) World Steel Association (2011). *World Steel Short Range Outlook*. April; (l) International Grains Council (IGC) (2011). *Grain Market Report*. April; (m) Clarkson Research Services Limited (2011). *Shipping Review and Outlook*. Spring issue; (n) Clarkson Research Services Limited (2011). *Container Intelligence Monthly*. Various issues; (o) Clarkson Research Services Limited. (2011). *Dry Bulk Trade Outlook*. Various issues; (p) *Lloyd's Shipping Economist* (LSE). Various issues; (q) *Drewry Shipping Consultants* (2010). *Container Forecasters – Quarterly Forecast of the Container Market*. September; (r) *Drewry Shipping Consultants*. *Drewry Shipping Insight*. Monthly Analysis of the Shipping Markets. Various issues; (s) Institute of Shipping Economics and Logistics (ISL). *Shipping Statistics and Market Review*. Various issues; (t) *Dynamar*. *DynaLiners*. Various issues; (u) *IHS Fairplay*. Various press articles; (v) *BIMCO Bulletins*, various issues; (w) *ICS/ISF Annual Review 2011*; (x) United States Geological Survey. (2011). *Mineral Commodity Summaries*; and (y) International Transport Forum (ITF) (2011). *Transport Outlook: Meeting the Needs of 9 Billion People*.
- 34 Schmidt JM (2010). "Ton-mile Demand for VLCCs to Rise by 2.4% Reversing Last Year's -2.95". *Shipping and Finance*. September. p.4.
- 35 Baird Maritime (2011). "Focus on China: Thirst for Oil". 18 May.
- 36 British Petroleum (2011). *Energy Outlook 2030*. January. London.
- 37 United States Energy Information Administration (EIA). Accessed on 25 May 2011.
- 38 Deloitte Global Service Ltd. (2011). *Energy Predictions 2011*. The "China Effect" No Signs of Slowing Down.
- 39 See for example, Sand P (2011). "Tsunami and Earthquake in Japan also Affects Shipping". BIMCO. 3 March; "Shipping Prepares to Meet Japan's Post-quake Demand", 24 March 2011. *IHS Fairplay*.
- 40 Wang S and Notteboom T (2011). "World LNG Shipping: Dynamics in Markets, Ships and Terminal Projects" in *Current Issues in Shipping, Ports and Logistics*. PortEconomics. Uitgeverij UPA University Press Antwerp, Brussels.
- 41 Ibid.
- 42 Ibid.
- 43 Economist Intelligence Unit (EIU). (2011). *World Commodity Forecasts: Industrial Raw Materials*. May.
- 44 *IHS Fairplay*. (2011). "Australia Reveals Cost of Flood Damage to Exports". 27 January.
- 45 See also Leander, T. (2011). Floods Expose Hazards in Global Coal Supply. *Lloyd's List*. 11 January.
- 46 *Shipping and Finance*. (2011). "Brazil to Double Output of Key Minerals". May. p.12.
- 47 See Vale Looms Over China. (2011). *Seatrade*. Issue 1. February.
- 48 Clarkson Research Services. (2011). *Dry Bulk Market Outlook*. March.
- 49 Donley A (2011). Wheat Trade to Double by 2050. *World Grain*. April.
- 50 Ibid.
- 51 See for example Sosland M (2011). "Arab Revolution of Great Importance for Wheat". World-Grain.com. 10 March.
- 52 Asian Development Bank (ADB). (2011). *Global Food Price Inflation and Developing Asia*. March. Philippines.
- 53 Ibid.
- 54 *Dynamar B.V.* (2011). *Dynaliners 05/2011, 04 February*; *Dynamar B.V.* (2011). *Dynaliners 02/2011, 14 January*; and *Dynamar B.V.* (2010). *Dynaliners 50/2010, 17 December*.
- 55 See for example, *IHS Fairplay* (2010). *Anti-competitive Laws Close in on US Carriers*. 14 October (www.fairplay.co.uk); *Lloyd's Shipping Economist* (2010). "Liner Conferences Battle Goes on". November.
- 56 *IHS Fairplay* (2010). *Shippers in Singapore Denounce Liner Protection*. 14 October.
- 57 Price Waterhouse Coopers (PWHC). (2011). *Economic Views: Future of World Trade: Top 25 Sea and Air Freight Routes in 2030*.
- 58 Notteboom T (2011). "In search of Routing Flexibility in Container Shipping: the Cape Route as an Alternative to the Suez Canal" in *Current Issues in Shipping, Ports and Logistics*. PortEconomics. Uitgeverij UPA University Press Antwerp, Brussels.
- 59 Forum for the Future – Action for a Sustainable World. (2011). Sustainable Shipping Initiative. The Case of Action.
- 60 ESKEA (2011). *Deliverable D2.1.1.1.: Maritime Transport Market*. 15 May.



- 61 See for example, Chapter 1 of UNCTAD *Review of Maritime Transport 2009 and 2010*. See in particular, UNCTAD (2010). *Oil Prices and Maritime Freight Rates: An Empirical Investigation Technical report by the UNCTAD secretariat*. UNCTAD/DTL/TLB/2009/2. 1 April.
- 62 Blair D (2011). "Price Rises Wipe Out Bids to Cut Fuel Subsidies". *Financial Times*. 12 May and Hargreaves H (2011). "Oil Price Spike: Speculators Aren't to Blame". *CNN Money*. 29 April.
- 63 Economist Intelligence Unit (EIU). (2011). *Country Forecast. Global Outlook*, May; International Monetary Fund (2011). *World Economic Outlook: Tensions from the Two-Speed Recovery: Unemployment, Commodities, and Capital Flows*. April and Te Velde, D.W. (2011). *Oil Prices, Poor Countries and Policy Responses*. Overseas Development Institute (ODI). 16 March.
- 64 See for example, Chapter 1 of UNCTAD *Review of Maritime Transport 2009 and 2010*. See in particular, UNCTAD (2010). *Oil Prices and Maritime Freight Rates: An Empirical Investigation Technical report by the UNCTAD secretariat*. UNCTAD/DTL/TLB/2009/2. 1 April.
- 65 UNCTAD (2010). *Oil Prices and Maritime Freight Rates: An Empirical Investigation Technical report by the UNCTAD secretariat*. UNCTAD/DTL/TLB/2009/2. 1 April.
- 66 Ibid.: 32.
- 67 Videoeconomics (2010.) *Assessment of the Economic Impact of Market-based Measures*. Prepared for the Expert Group on Market-based Measures, International Maritime Organization. Final Report. August.
- 68 See for example, Einemo, U. (2011). "Fuelling Up". *IHS Fairplay*. 6 January.
- 69 For additional information see [www.imo.org](http://www.imo.org).
- 70 Annex VI (Regulations for the Prevention of Air Pollution from Ships) was added to the International Convention for the Prevention of Pollution from Ships (MARPOL) in 1997, with a view to minimizing airborne emissions from ships (SOx, NOx, ODS, VOC) and their contribution to global air pollution and environmental problems. The Annex VI entered into force on 19 May 2005 and was amended in October 2008. Two sets of emission and fuel quality requirements are defined by Annex VI: (a) global requirements, and (b) more stringent requirements applicable to ships in Emission Control Areas (ECA). An Emission Control Area (ECA) can be designated for SOx and PM, or NOx, or all three types of emissions from ships, subject to a proposal from a Party to Annex VI. Existing Emission Control Areas include: the Baltic Sea; the North Sea; the North American ECA, including most of United States and Canadian coast (NOx & SOx, 2010/2012).
- 71 See [www.imo.org](http://www.imo.org). See also, ICS/ISF Annual Review 2011; Shipping and the Environment: an insightful look at the environmental issues that are affecting the shipping industry (2011). Issue 02/ Spring. *Lloyd's Register*. London.
- 72 Harvery F (2011). "Worst Ever Carbon Emissions Leave Climate on the Brink". *The Guardian*. 29 May. [www.guardian.co.uk](http://www.guardian.co.uk).
- 73 Blair D (2011). "Price Rises Wipe Out Bids to Cut Fuel Subsidies". *Financial Times*. 12 May and Hargreaves H (2011). "Oil Price Spike: Speculators Aren't to Blame". *CNN Money*. 29 April.
- 74 See for example International Finance Corporation (IFC). (2011). "Climate Risk and Business Ports: Terminal Marítimo Muelles el Bosque, Cartagena, Colombia".
- 75 See for example UNCTAD (2009). *Report of the Multi-year Expert Meeting on Transport and Trade Facilitation on its first session*. TD/B/C.I/MEM.1/3. 23 March. See also ECE and UNCTAD (2010). *Climate Change Impacts on International Transport Networks: Note by the United Nations Economic Commission for Europe and United Nations Conference on Trade and Development secretariats* (ECE/TRANS/WP.5/2010/3). 29 June. Additional information about UNCTAD's work on maritime transport and the climate change challenge, including Joint UNECE-UNCTAD Workshop "Climate Change Impacts on International Transport Networks" available at [www.unctad.org/ttl/legal](http://www.unctad.org/ttl/legal).
- 76 Lenton T, Footitt A, Dlugolecki A (2009). *Major Tipping Points in the Earth's Climate System and Consequences for the Insurance Sector*. World Wide Fund For Nature(WWF) and Allianz. Germany.
- 77 See for example UNCTAD (2008). *Maritime Transport and the Climate Change Challenge. Note by the UNCTAD secretariat*. TD/B/C.I/MEM.1/2. 9 December. See also, UNCTAD (2009). *Multi-Year Expert Meeting on Transport and Trade Facilitation: Maritime Transport and the Climate Change Challenge. Summary of Proceedings*. UNCTAD/DTL/TLB/2009/1. 1 December.
- 78 United Nations (2010). *Report of the Secretary-General's High-Level Advisory Group on Climate Change Financing*. 5 November. United Nations. New York: United Nations. [www.un.org/climatechange/agf](http://www.un.org/climatechange/agf).
- 79 UNCTAD (2009). *Report of the Multi-year Expert Meeting on Transport and Trade Facilitation on its first session*. TD/B/C.I/MEM.1/3. 23 March.
- 80 Ibid.
- 81 A summary of the proceedings of the meeting was published in December 2009 (publication No. UNCTAD/DTL/TLB/2009/1) and submitted to the United Nations Framework Convention on Climate Change (UNFCCC) secretariat ahead of the Copenhagen Conference to provide reference material, including a substantive background note prepared by the UNCTAD secretariat.

- <sup>82</sup> Additional information about the workshop including a joint UNECE-UNCTAD background note and other relevant meeting documentation are available at <http://www.unctad.org/Templates/meeting.asp?intlItemID=2068&lang=1&m=20101>.
- <sup>83</sup> For additional information visit [www.unctad.org/ttl/legal](http://www.unctad.org/ttl/legal) or [http://live.unece.org/trans/main/wp5/wp5\\_workshop4.html](http://live.unece.org/trans/main/wp5/wp5_workshop4.html). The Terms of Reference of the expert group are available at <http://live.unece.org/fileadmin/DAM/trans/doc/2010/wp5/ECE-TRANS-WP5-48e.pdf>.
- <sup>84</sup> Additional information about the Ad Hoc Expert Meeting, including related documentation, presentations and the report of the meeting are available at [www.unctad.org/ttl/legal](http://www.unctad.org/ttl/legal) under "Meetings and Events".
- <sup>85</sup> See, for example, "Global Shipping Leaders Call for Sustainable Industry". (2011). Press Release. 17 May; Meade R (2011). "Sustainable Shipping Gets More Industry Clout". *Lloyd's List*. 23 May.
- <sup>86</sup> See, for example. *Lloyds Register*. Shipping and the Environment. Issue 02. Spring 2011. See also Matthews M (2011). "Stopford Calls for Rethink on Economics and Environment". *Lloyd's List*. 30 March.
- <sup>87</sup> The Case for Action paper can be downloaded from <http://www.forumforthefuture.org/project/sustainable-shipping-initiative/more/ssi-case-action>.
- <sup>88</sup> *IHS Fairplay* (2011). "Maersk's Big Ship Order Leaves Competition Training". 10 March.
- <sup>89</sup> Wackett M (2011). CMA CGM's leviathans to pip Maersk to the post? *Containerisation International*. 26 May.
- <sup>90</sup> Beddow M (2010). Maersk examining super-super post Panamax vessels. *Containerisation International*. 26 November.
- <sup>91</sup> De Coster P, Notteboom T (2011). "Piracy off the Horn of Africa: Impact on Regional Container Services on the Middle East-Africa Trade" in *Current Issues in Shipping, Ports and Logistics*. See also Bowden, A, Hurlburt K, Aloyo, E, Marts, C and Lee, A. (2010). *The Economic Cost of Maritime Piracy*. One Earth Future Working Paper.
- <sup>92</sup> See, for example, Sand P (2011). *Need for Rethinking When to Sail Around the Cape of Good Hope to Avoid Piracy?* – Update 3. BIMCO. 3 March and Roussanoglou, N. (2011). *Hellenic Shipping News Worldwide*. 11 March.
- <sup>93</sup> Bowden A, Hurlburt K, Aloyo E, Marts C and Lee A (2010). *The Economic Cost of Maritime Piracy*. One Earth Future Working Paper.
- <sup>94</sup> *Ibid*.
- <sup>95</sup> Tsolakis K (2011). "African Trade Pays the Price for Piracy". *IHS Fairplay*. 27 January.
- <sup>96</sup> Bendall HB (2009). *Cost of Piracy: a Comparative Voyage Approach*. IAME. Copenhagen.
- <sup>97</sup> On the issue of maritime commerce and security in the Indian Ocean see for example Pandya AA, Herbert-Burns H and Kobayashi J (2011). *Maritime Commerce and Security: the Indian Ocean*. The Henry L. Stimson Center. February.
-