3

FREIGHT RATES AND MARITIME TRANSPORT COSTS

Developing countries, especially in Africa and Oceania, pay 40 to 70 per cent more on average for the international transport of their imports than developed countries. The main reasons for this situation are to be found in these regions' trade imbalances, pending port and trade facilitation reforms, as well as lower trade volumes and shipping connectivity. There is potential for policymakers to partly remedy the situation through investments and reforms, especially in the regions' seaports, transit systems and customs administrations.

Container freight rates remained volatile throughout 2014 although with different trends on individual trade lanes. Market fundamentals have not changed significantly despite the expansion in global demand for container shipping. This was mainly due to pressure from the constant supply of vessels that the market rates continued to face, with the introduction of very large units on mainlane trades and the cascading effect on non-mainlanes trades. The tanker market, which encompasses the transportation of crude oil, refined petroleum products and chemicals, witnessed an equally volatile freight rate environment in 2014 and early 2015. The dry bulk market freight rates faced another challenging year influenced by the surplus capacity that still exists and the uncertainties in demand projections. Bulk carrier earnings fell 5 per cent from 2013 to reach an average of $9,881 per day in 2014. The low level of earnings exerted financial pressure on owners and led to several companies filing for bankruptcy.

A. DETERMINANTS OF MARITIME TRANSPORT COSTS

Policymakers and shippers have an interest in understanding the determinants of international maritime transport costs. Maritime transport handles over 80 per cent of the volume of global trade (and about 90 per cent of developing countries' volume of international trade is seaborne) and knowing the reasons for differences in what a trader pays for the international transport of merchandise goods can help identify possible areas for intervention by policymakers. Extensive recent research has helped identify the main determinants of freight costs (see Cullinane et al., 2012; ECLAC, 2002; Sourdin and Pomfret, 2012; and Wilmsmeier, 2014; and the literature reviewed therein).

Figure 3.1 summarizes seven groups of determinants. The remainder of this section will introduce each one of

these groups and discuss the options for policymakers to help reduce international maritime transport costs.

In recent years, policymakers and industry players have increasingly mainstreamed environmental sustainability criteria into their planning processes, policies and structures, not only to respond to global challenges for reducing emissions and improving the environmental footprint but also as a means to improve energy savings and to achieve a more efficient allocation of available resources. Specific actions may involve developing fuel-efficient vessels, improving energy efficiency, reshaping transport architecture and networks, adapting and developing appropriate infrastructure, rethinking and optimizing operating procedures of freight logistics, harnessing new technologies, and supporting information and communications technology and intelligent transport systems.

Figure 3.1. Determinants of maritime transport costs

Ports
- **Infra- and supertructure**
- **Port productivity**
- **Port operator model**
- **Port tariffs**

Trade flows
- **Trade imbalances**
- **Volumes of trade**
- **Complementarity of trade**

Shipped product
- **Volume of shipment**
- **Value**
- **Type of produce**

Determinants of international maritime transport costs

Structure of the maritime industry
- **Competition**
- **Liner services supply**
- **Regulation**

Facilitation
- **Trade facilitation**
- **Transport faciliation**

Ship operating costs
- **Crewing**
- **Bunker**
- **Registration**

Position within the global shipping network
- **Connectivity**
- **Centrality**
- **Distance**

Source: UNCTAD secretariat, based on Wilmsmeier, 2014.

1.　Trade and transport facilitation

Reducing waiting times in seaports for ships and their cargo has a direct bearing on trade costs. First, from the shippers' perspective, it implies lower costs associated with the holding of inventory en route to the final destination. It has been estimated that each additional day cargo spends in transit is equivalent to an ad valorem tariff of 0.6 to 2.1 per cent (Hummels and Schaur, 2013). Second, waiting times also imply costs to the carrier, which will ultimately have to be passed on to the client through higher freight charges. Wilmsmeier et al. (2006) estimated that a 10 per cent reduction of the time it takes to clear customs implies a reduction of the maritime freight of about 0.5 per cent.

Different trade facilitation measures can be implemented to reduce waiting times and improve the logistics performance of countries in other ways. It has been suggested by UNCTAD (2015) that the transparent publication of trade-related information (such as measures included in article 1 of the WTO TFA) as well as the simplification and reduction of customs formalities (such

as measures included in article 10 of the WTO TFA) have a particularly high statistical correlation with a country's ranking in international logistics benchmarks, such as the World Bank Logistics Performance Index (figure 3.2).

2.　Ship operating costs

Technological advances have led to a continuous reduction in vessel operating costs over the decades. Improved fuel efficiency, economies of scale, and automation in port operations all help to reduce environmental and financial costs (see chapter 2).

However, the drive to invest in lower operating costs may have some negative repercussion on freight rates. For example, as carriers invest in larger and more energy-efficient vessels in the current market situation – to achieve economies of scale or to improve fuel efficiency – they inadvertently also contribute to a further oversupply of capacity. While the individual carrier may benefit from cost savings from deploying bigger vessels, all carriers bear the burden of the resulting oversupply and lower freight levels – to the benefit of importers and exporters.

Figure 3.2.　Statistical correlation between articles of the WTO TFA and indicators for trade efficiency
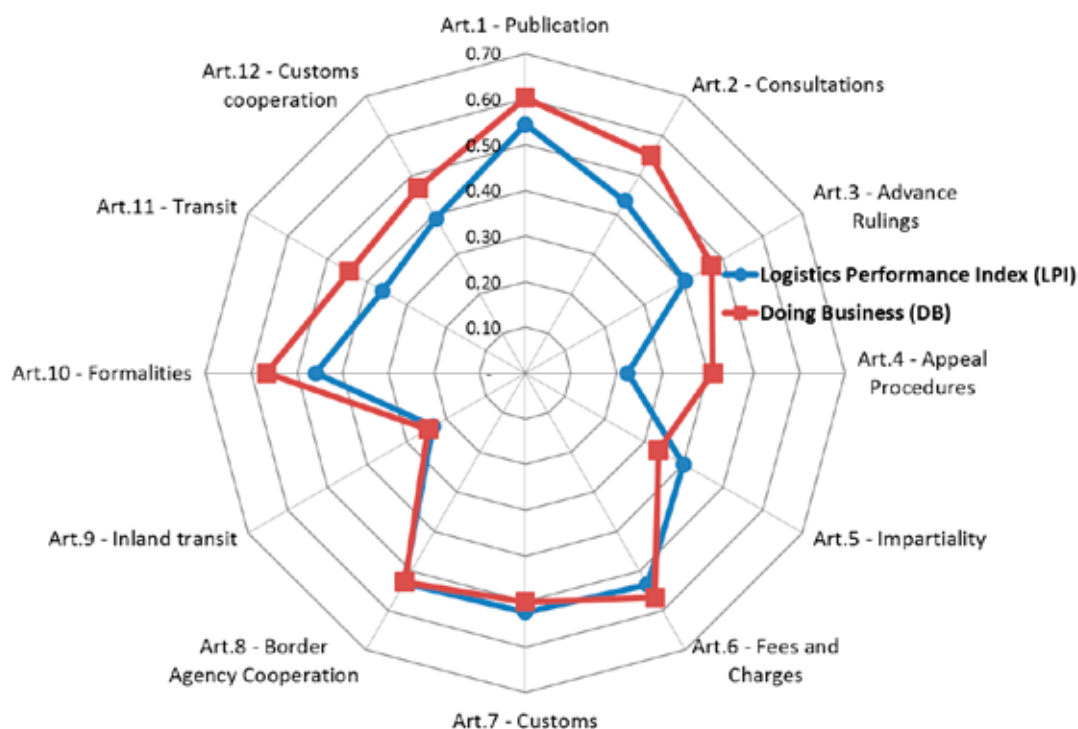
Source: UNCTAD secretariat, based on data from the World Bank (Logistics Performance Index and Doing Business Index) and WTO (number of category A notifications).
Note: The axis in the chart represents the partial correlation coefficient between the notification of trade facilitation measures under the 12 TFA articles and the value in the Logistics Performance and the Doing Business indices.

Oversupply of shipping capacity combined with a weak global economy has been a main factor affecting freight rates in recent years. In an effort to deal with low freight rate levels and to leverage some earnings, carriers have looked at measures to improve efficiency and optimize operations in order to reduce unit operating costs. Some of these measures involved operational consolidation, slow steaming, idling, and replacing smaller and older vessels with newer and more fuel efficient ones.

Although operating costs in shipping have been decreasing, the total costs of the transport system have declined less. First, total costs for the carrier have to take into account the costs of investing in new assets. Second, larger ships and the increasing use of hub ports also require ports and port cities to invest in additional capacities for storage, handling and intermodal connections. These additional costs – including external social and environmental costs – are not born by the carrier, but by the ports and local communities.

Lower operating costs as compared to higher fixed costs (that is, the capital costs associated with larger and more fuel-efficient ships) will likely also lead to more volatile freight rates. In the short term, the freight costs will have to cover at least the operating costs of the carrier; put differently, if the price of a transport service does not cover at least the fuel, communications and crewing costs, the carrier will anchor the ship and not offer the transport service. In the long term, however, the freight charges will have to cover the total average costs, including the fixed costs. As operating (variable) costs are lower today than in previous decades, this means that freight rates may also reach lower levels than in the past. Lower unit operating costs in bigger vessels, however, can only be reached if utilization rates are sufficient; if they are not, the carrier might be affected by diseconomies of scale. The risk of the latter also increases with ship size, particularly if demand and supply do not develop in line with each other. Effectively, freight rates appear to fluctuate more today than in earlier decades, and the changing structure of operating versus fixed costs is probably one of the reasons for this trend.

3.   Distance and a country's position within shipping networks

Shipping goods over a longer distance requires more time (capital costs) and fuel (operating costs). Thus,

Figure 3.3.   The "no-relationship" between distance and maritime transport costs

$R^2 = 0.0174$
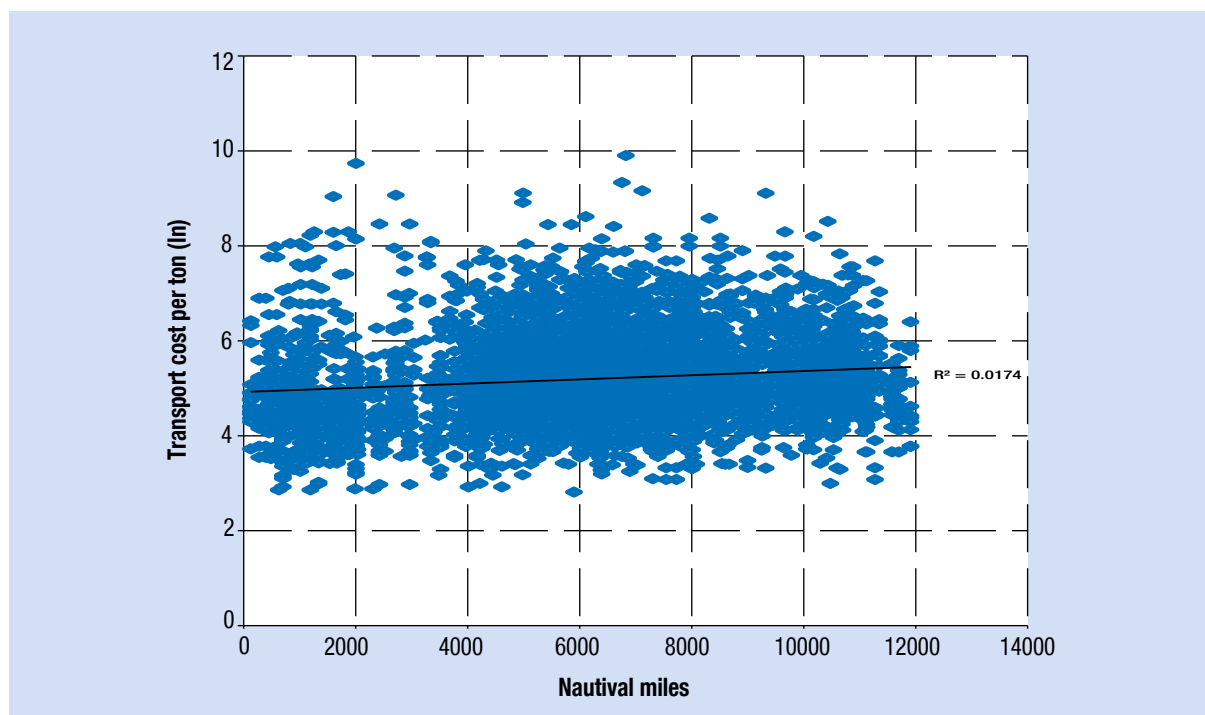
Source: ECLAC and UNCTAD secretariat, based on data from the International Transport Database – ECLAC, 2013.
Note: Based on 12,595 observations of maritime transport costs in international trade for the year 2013 at the Standard International Trade Classification two-digit level.

trading partners that are further away from main markets might expect to be also confronted with higher bilateral freight costs. As regards the impact of distance, the traditional gravity model would suggest that countries that are further away from each other will trade less (see, for example, Tinbergen, 1962; Pöyhönen, 1963; and Linnemann, 1966). However, traditional gravity models ignore effective distance and connectivity as potentially described by network structures (for example, the regular shipping liner services configuration). Limão and Venables (2001) show, using the example of shipping costs to Baltimore, that geographic distance alone cannot explain price differences in freight rates (figure 3.3).

Figure 3.3 illustrates that the geographical maritime distance only has a small statistical correlation with freight costs. More than the geographical distance, it may be rather the economical distance, as for example captured by shipping connectivity and a country's position within global shipping networks, that emerges as the relevant factor for international transport costs. Bilateral liner shipping connectivity, as captured by the UNCTAD LSBCI (see chapter 2) has a stronger bearing on freight costs than distance (figure 3.4).

Research on liner shipping connectivity frequently concludes that the position within a network has a more significant impact than the notion of geographical distance (Kumar and Hoffmann, 2002; Márquez-Ramos et al., 2005; Wilmsmeier et al., 2006; Wilmsmeier, 2014; Angeloudis et al., 2006; and McCalla et al., 2005). This important finding also needs to be seen in the context of the influencing variables of liner network connectivity such as ship size and frequency, which are determined by the overall level of trade, the geographic position and last but not least port infrastructure endowment and development options (see chapter 4).

The functioning of the network and its structure involve complex interaction between the maritime and port industry, and also the country and international organizations acting as governing and regulating bodies. Decisions made by these actors will subsequently also influence the cost of transport for a country or region in trade with its counterparts. Figure 3.4 (section C.3) exemplifies the reduction in freight rates with increasing connectivity, where connectivity is an expression of shipping possibilities, port infrastructure endowment and industry structure (for a detailed discussion, see Wilmsmeier and Hoffmann, 2008; and Wilmsmeier, 2014).

Figure 3.4.   The relationship between transport costs and LSBCI, 2012 and 2013
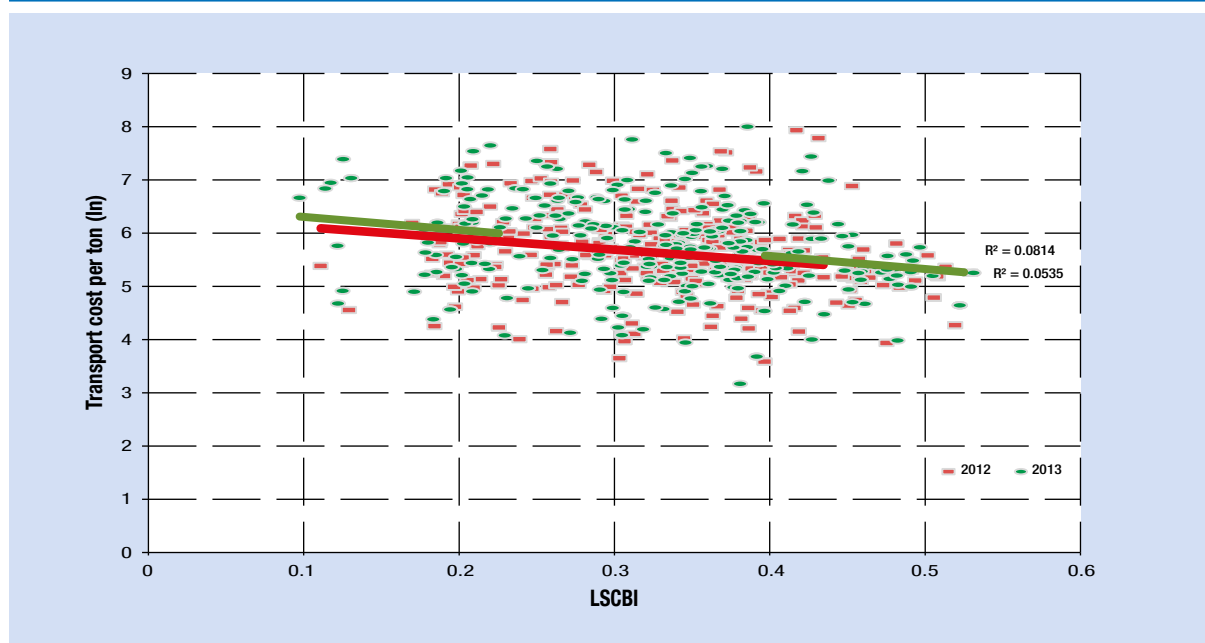
$R^2 = 0.0814$
$R^2 = 0.0535$

Source: UNCTAD secretariat, based on data from the International Transport Database – ECLAC, 2012 and 2013.
Note: Based on 7,868 observations of maritime transport costs in international trade for the years 2012 and 2013 at the Standard International Trade Classification one-digit level.

4.   Competition and market regulation

Price-setting in transport and logistics markets significantly depends on the level of effective competition. Competition in the transport markets depends on the size of the market and effective market regulation. Any impediment to free competition and the potential existence of collusive behaviour, atomization and monopolies will have impacts on price structures, and these factors are discussed in the following paragraphs.

Historically, shipping lines have tried to concentrate activities in accordance with other market players at certain points, as they are aware of the benefits of economies of agglomeration and scope. This has given room for the development of hub-and-spoke strategies and share capacity, in which the hubs are nodes for high-volume services to interchange cargoes and to transfer cargo to secondary routes.

The different strategies of shipping lines, the balance of power between shipping lines, shippers and ports, and constraints related to inland transportation can impact on the evolution and characteristics of and competition in maritime shipping networks. Moreover, strategic alliances between the port

and the shipping industry, which have both been driven by strong concentration processes and vertical integration at global level, have a profound influence on maritime network structure and also on the degree of integration of a region in the global maritime transport network.

Policymakers need to carefully observe concentration processes in the maritime industry and be aware of possible negative effects on the trade and competitiveness of a country's exports, predominantly in network peripheral countries and regions. See figure 2.6 (chapter 2), which illustrates the decreasing number of shipping companies providing services in individual markets.

5.   Value, volume and type of shipped product

The influence of the unitary value of the product on ocean freight rates has to be interpreted in the context of the history and structure of shipping markets. The value of the product also determines the elasticity of demand, that is, the willingness of the shipper to pay higher or even premium rates. Earlier works (Wilmsmeier, 2003; Wilmsmeier et

Figure 3.5.   Transport costs and economies of scale
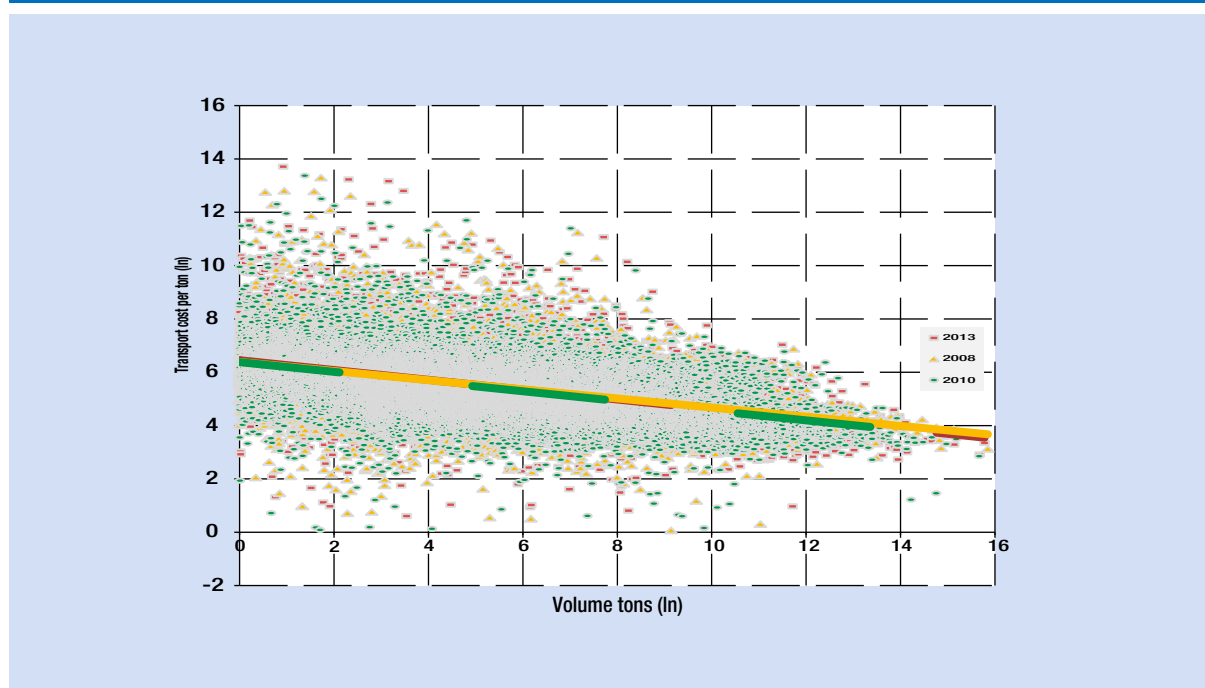
Source: UNCTAD secretariat, based on data from the International Transport Database – ECLAC, 2008–2013.
Note: All data are at the Standard International Trade Classification two-digit level, excluding products in Standard International
            Trade Classification commodity groups three and nine.

al., 2006; Martínez-Zarzoso and Suárez Burguet, 2005; and Wilmsmeier and Martínez-Zarzoso, 2010) all identify a relevance of the product unit value on transport costs. Palander (1935) had already proposed that transport costs were not regular but varied according to the weight, bulk, value and perishability of the product, and mode of transport and distance. Radelet and Sachs (1998) found that countries differed in their average "cost, insurance, freight"/"free on board" ratios not only due to differences in shipping costs but also due to differences in composition of commodity mix in external trade.

Despite the fact that there is no obvious reason for the connection between the freight rate and value of a product, a wide range of works describe the relationship between a product's unit value and the freight charged. The reason is that operators assume that unit value is inversely related to the elasticity of demand for transport. Besides insurance costs, feedering in hub-and-spoke networks, modal switching and the like, can also have an influence. Each product has a certain risk sensibility during transport. Risk in this context can refer to timely delivery, the probability of theft and/or high sensitivity to changes in the environment (temperature and the like).

Wilmsmeier and Sánchez (2009) analysed transport cost determinants for containerized food imports to South America and showed that a 10 per cent rise in the value of the commodity increased transport costs by around 7.6 percent. Special transport conditions and needs for certain types of cargo are also reflected in the structure of international maritime transport costs. Containerization has produced standard units in terms of size; nevertheless the requirements for transporting goods vary and thus different types of containers exist to satisfy these demands. The transport of refrigerated cargo has certain implications.

Economies of scale occur at two different levels. First, system internal economies of scale, which reflect the decrease in transport costs per ton, as the size of the individual shipment increases. Second, system external economies of scale, which reflect the decrease in transport costs as the volume of trade between two countries increases. The latter is also linked to other determinants of transport costs, such as levels of competition, vessel operation costs and port infrastructure.

Figure 3.5 illustrates the effect of economies of scale as volume per shipment. These are economies of scale realized outside a company as a result of its location and occur when trade between two countries has low tariffs and customs restrictions, or a region has an efficient and effective transport infrastructure.

6. Port characteristics and infrastructure

Port performance is essential for the efficiency and effectiveness of the maritime network. Port infrastructure endowment can be described by variables such as number of cranes, maximum draught and storage area at origin and destination ports. The interaction of these variables is decisive. Installing ship-to-shore gantries, for example, may well lead to higher port charges for the shipping line. The line may still achieve an overall saving, because its ships spend less time in the port, or because it can change from geared to gearless vessels. This, in turn, will also lead to lower freight rates.

However, development of port infrastructure is only worthwhile if the entire transport system benefits and not if bottlenecks are only shifted to another element within the system. Factors influencing productivity are physical, institutional and organizational. Physical limiting factors include the area, shape and layout of the terminal, the amount and type of equipment available, and the type and characteristics of the vessels using the terminal. Lack of cranes, insufficient land, oddly shaped container yards, inadequate berthage, inadequate gate facilities, and difficult road access are all physical limiting factors. Productivity must be considered in a system perspective for it to be of maximum value to industry. This is important from a policy perspective, thus emphasizing the need for co-modality and multimodal visions in policy recommendations and guidance. All players should have an awareness of the entire system and be wary of becoming its weak link.

Empirical results presented by Wilmsmeier et al. (2006) are quite clear and straightforward: increases in port efficiency, port infrastructure, private sector participation and inter-port connectivity all help to reduce the overall international maritime transport costs. If the two countries in their sample with the lowest port efficiency improved their efficiency to the level of the two countries with the highest indexes, the freight on the route between them would be expected

to decrease by around 25 per cent. Improvements in port infrastructure and private sector participation, too, lead to reduced maritime transport costs. Unlike distance, port efficiency can be influenced by policymakers. Doubling port efficiency at both ends has the same effect on international maritime transport costs as would a "move" of the two ports 50 per cent closer to each other.

Hence, improving port efficiency and productivity and introducing technical advances as well as port design and planning measures to improve efficiencies and reduce time can reveal important insights to policymakers.

7.　Trade flows and imbalances

The volume and type of cargo has a direct bearing on the carrier's costs. The volume of cargo is important as it allows for economies of scale, both on the sea leg as well as in port, although at times the economies of scale achieved on the shipping side may lead to congestion and diseconomies of scale in the port.

The extent to which the costs incurred by the carrier are passed on to the client depend on the market structure and also on the trade balance. On many shipping routes, especially for most bulk cargoes, ships sail full in one direction and return almost empty in the other. Having spare capacity, carriers are willing to transport cargo at a much lower freight rate than when the ships are already full. Freight rates are thus far higher from China to North America than for North American exports to China. By the same token, freight rates for containerized imports into Africa are higher than for exports. To some extent the differences in freight rates that depend on the direction of trade may be considered, in order that a market mechanism may help reduce imbalances. Those that have a trade deficit pay less for the transport of their exports.

In containerized trade, balance of trade flows is key in price-setting for shipping lines. Shipping lines calculate the costs to move a container on a return-trip basis, taking probability for empty positioning into account. When trade balance is negative, a country's imports exceed its exports and the greater the imbalance, the lower the freight rates will be for the country's exports; but if exports exceed imports, then the larger the imbalance, the higher the expected freight rates for exports will be. This divergence, associated with the sign of trade imbalance, occurs as a result of the freight rate price-fixing mechanisms applying in the liner market. Liner companies know that recurrently on

one of the legs of the turnaround trip, the percentage of vessel capacity utilization will be lower, and therefore adapt the pricing scheme to the direction of the trip and to its corresponding expected cargo. Freight rates will be higher for the shipments transported on the leg of the trip with more traffic, as the total amount charged for this leg must compensate the relatively reduced income from the return trip, when part of the vessel's capacity will inevitably be taken up with repositioned empty containers. Excess capacity on the return trip will increase the competition between the various liner services, and as a result freight rates will tend to be lower. Organization of the transport service market can reduce empty movements through information and equipment sharing, freight-pooling, and transnational cooperation of transport service providers.

B.　INTERNATIONAL TRANSPORT COSTS

International transport costs are a key component of trade costs and economic development. Recent research in Asia and the Pacific suggests that tariffs account for only 0–10 per cent of bilateral comprehensive trade costs, while other policy-related trade costs (that is, of a non-tariff nature) account for 60–90 per cent of bilateral trade costs. Put differently, issues such as transport costs, maritime connectivity, and procedures have a stronger bearing on trade costs than customs duties (Economic and Social Commission for Asia and the Pacific, 2015).

Based on data from merchandise imports, UNCTAD has estimated the expenditures on international transport (all modes of transport) for country groups (figure 3.6). For the average country, international transport costs amounted to approximately 9 per cent of the value of imports during the decade 2005–2014. Among the main regional groupings, African countries paid the most (average of 11.4 per cent) against an average of only 6.8 per cent for the developed countries.

Having considered the seven main determinants of maritime transport costs, it is now possible to discuss possible reasons for the overall freight costs estimated for different country groups, and in particular why Africa and Oceania pay more for the transport of their imports than other regions. These points are highlighted in the following paragraphs:

(a) *Trade and transport facilitation*: Many countries in Africa are landlocked, depending not only
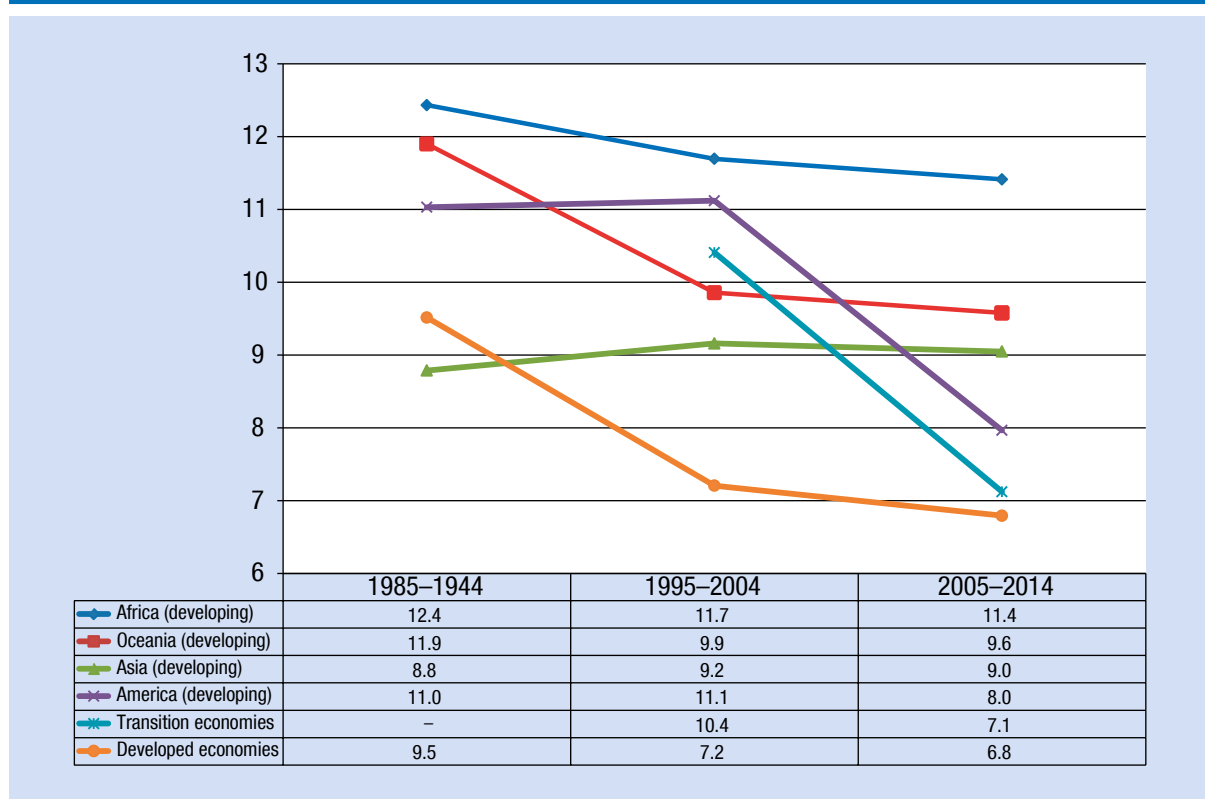
on the procedures of their own customs and other border agencies, but also on those of the neighbouring transit countries. This situation had been termed the "landlocked with bad neighbours trap" by Collier (2008). Many countries in Africa and Oceania also report low scores in indicators such as the Doing Business Index or the Logistics Performance Index (see chapter 5 on the linkages between trade facilitation and sustainable development).

(b) *Operating costs*: Operating costs (including costs of repairs and maintenance, hull and machinery and protection and indemnity insurance premiums, crewing, provisions, stores, water and lubricating oil) for vessel operators are overall the same, largely independent of routes or locations. However, these vary depending on ship type and age. Routes with bigger and/or newer vessels will have lower operating costs. Further operating costs may vary over time and depend on fuel prices, but they cannot systematically explain why freight rates would be higher on one route compared to another.

(c) *Position within shipping networks*: In particular, SIDS in Oceania are negatively affected by their geographical position, far from most major shipping routes. Promoting inter-island connectivity and developing regional/subregional hub ports, as well as upgrading or redeveloping port infrastructure and improving cargo handling with a potential to reduce freight costs, could be considered. In Africa, some countries have been able to benefit from their geographical position and offer trans-shipment services. Egypt, for example, benefits from the traffic passing through the Suez Canal, and Mauritius and Morocco both have established important hub ports. Most other African countries, however, are relatively far from the major East–West shipping routes.

Figure 3.6. International transport costs: Freight costs as a percentage of value of imports, ten-year averages within country groups, 1985–2014

	1985–1944	1995–2004	2005–2014
Africa (developing)	12.4	11.7	11.4
Oceania (developing)	11.9	9.9	9.6
Asia (developing)	8.8	9.2	9.0
America (developing)	11.0	11.1	8.0
Transition economies	–	10.4	7.1
Developed economies	9.5	7.2	6.8

Source: UNCTAD secretariat estimates. Data represent the cost of international transport, excluding insurance costs, as a percentage of the "cost, insurance, freight" value of the imported goods.

Notes: Averages within the country groups are unweighted, that is, each country's freight ratio is assigned the same weight when calculating the average. Data are for all modes of transport.

(d) *Regulation and industry structure*: SIDS in Oceania, as well as several smaller African economies, only provide relatively small markets. As a result, shippers may be confronted with oligopolistic markets, where low levels of competition may lead to higher prices. In this context it would be a mistake to restrict competition by, for example, introducing any national or international cargo reservation regime.

(e) *Shipped product*: For manufactured goods, ad valorem transport costs tend to be lower than for raw materials, given the lower value per ton of raw materials compared to manufactured goods. As many developing countries from Africa and Oceania mostly import manufactured goods, the freight costs could actually be expected to be lower than in other regions. On the other hand, the types of manufactured goods imported into African and Oceanian developing countries tend to be of relatively lower value – that is, on average the cars, clothes or tools imported into Africa are of lower per unit value than those imported into Europe or North America. Hence, the cost of transport increases as a percentage share.

(f) *Port characteristics and infrastructure*: Many African and Oceanian developing countries, as well as those in Latin America and the Caribbean, are confronted with transport infrastructure bottlenecks. The largest ships that can be accommodated in most of these two regions' ports are far smaller than those that call at ports in other regions. Also, private sector participation through concessions is less frequent in developing countries such as those in Africa and Oceania. Both aspects contribute to higher transport costs. In this context, promoting regional/subregional hub ports that could handle larger vessels should be considered, including hub-and-spoke feedering, and interlining and relay services, as well as promoting private–public partnerships to upgrade and develop port infrastructure and cargo handling and operations.

(g) *Trade flows*: Most countries in Africa and Oceania have a merchandise trade deficit. As a consequence, ships are more likely to arrive fully loaded and have spare capacity when returning to China, Japan or Europe. Freight rates for imports should thus be higher than freight rates for exports. Given that figure 3.6 reflects data on imports, Africa and Oceania appear to have higher freight costs than the other regions. Although comprehensive data is not available, anecdotal evidence suggests that, effectively, freight rates for exports are lower than those for imports in most countries in these two regions.

In conclusion, the analysis of UNCTAD data on transport costs suggests that developing countries, especially in Africa and Oceania, pay more for the international transport of their imports than developed countries. The main reasons for this situation are to be found in these regions' trade imbalances, pending port and trade facilitation reforms, as well as lower trade volumes and shipping connectivity. There is potential for policymakers to partly remedy the situation through investments and reforms, especially in the regions' seaports, transit systems and customs administrations.

There is also a clear call for policymakers and port authorities to strengthen transnational cooperation to improve the development of the whole system, focusing on the causes that put a region or country at risk of becoming peripheral and uncompetitive. While there is not much that policymakers can do about their country's geographical position, some policy options exist to reduce costs by improving port infrastructure and increasing efficiency in the logistics chain, including through trade and transport facilitation, and more efficient port operations, or to become more attractive as a port of call, which would entail more port investments, and maritime transport service liberalization, as well as economic reforms to strengthen industry and trade relations.

C. RECENT DEVELOPMENTS IN FREIGHT RATES

In 2014, the freight rates market remained very volatile in its various segments. The continuous delivery of newly built large vessels and hesitant demand in the global shipping market put pressure on rates, as described below.

1. Container freight rates

Container freight rates remained volatile throughout 2014 although with different trends in individual trade lanes. Market fundamentals did not change significantly despite the expansion in global demand

for container shipping (see chapter 1). This was mainly due to the constant supply pressures that the market rates continued to face with the introduction of very large units in mainlane trades and the cascading effect on non-mainlane trades (see chapter 2).

As shown in figure 3.7, the growth in global demand for container shipping reached 6 per cent in 2014 (compared to 5 per cent in 2013), outpacing that of supply, which remained at 5 per cent. Global container demand was boosted mainly by strong trade growth on the peak leg mainlanes of the Far East–Europe and the trans-Pacific, where North Europe imports and United States imports from Asia performed particularly well in 2014.
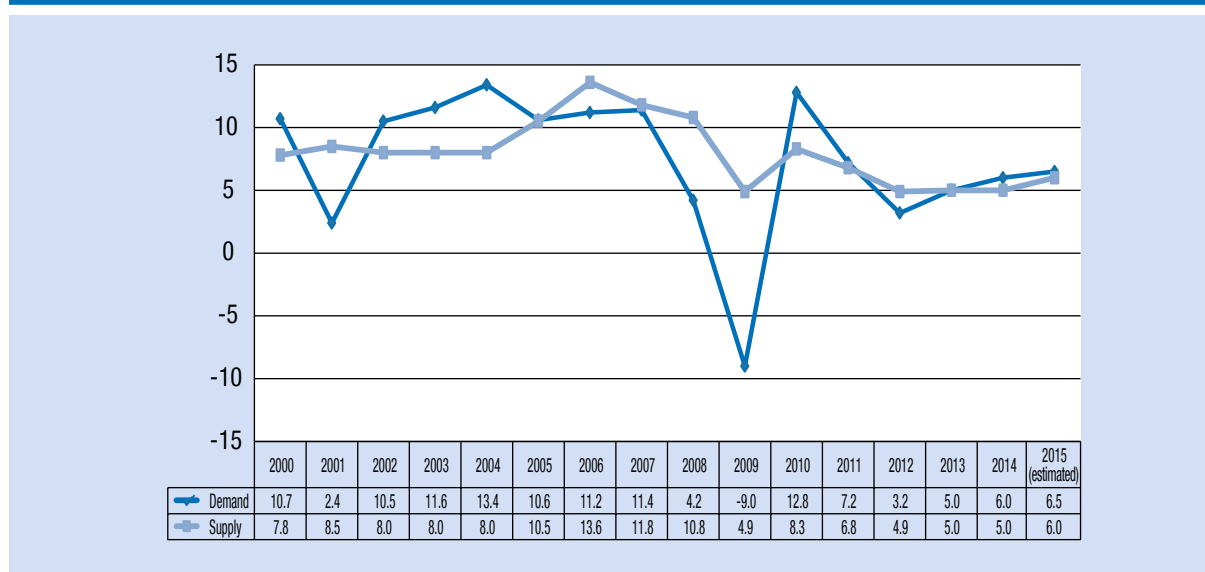
Mainlane freight rates recorded a general improvement in 2014 compared to 2013 levels. The Far East–Northern Europe rates averaged $1,161/TEU in 2014, up by 7 per cent from the 2013 average. In the trans-Pacific freight market, robust trade volumes as well as cargo diversions due to congestion problems at United States West Coast ports towards the end of 2014 improved freight rates on the Asia–United States East Coast lane. The Shanghai–United States East Coast freight rate averaged $3,720/40-foot equivalent unit (FEU) in 2014, 13 per cent higher than in 2013, compared to the Shanghai–West Coast route, which averaged $1,983/FEU, 3 per cent less than in 2013 (table 3.1).

Concerning non-mainlanes, freight rates performed less well as they also continued to face supply pressures from the cascade of large tonnage capacity coming from the mainlanes. On the North–South trades, where high levels of capacity redeployment have taken place, freight rates for Shanghai–South America averaged as low as $1,103/TEU in 2014, 20 per cent lower than in 2013. On the Shanghai–Singapore intra-Asian route, freight rates remained relatively flat, averaging around 1 per cent higher in 2014. The overcapacity also continued to influence the charter market and rates have remained more or less unchanged at low levels over the year.

In addition to cascading as a means of managing oversupply, carriers have continued to adopt idling and slow steaming (notwithstanding the decrease in fuel prices during the final months of 2014), which is estimated to have absorbed around 2.5 million TEUs of global nominal capacity. The idling of container ships fell to 0.2 million TEUs at the end of 2014, equivalent to 1.3 per cent of fleet capacity (Clarksons Research, 2015a).

At the same time, asset sales, consolidation and the cooperation efforts of several shipping lines to save on costs while improving efficiency and offering a worldwide network of routes have helped to improve operating margins in 2014. For instance,

Figure 3.7. Growth of demand and supply in container shipping, 2000–2015 (annual growth rates)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015 (estimated)
Demand	10.7	2.4	10.5	11.6	13.4	10.6	11.2	11.4	4.2	-9.0	12.8	7.2	3.2	5.0	6.0	6.5
Supply	7.8	8.5	8.0	8.0	8.0	10.5	13.6	11.8	10.8	4.9	8.3	6.8	4.9	5.0	5.0	6.0

Source: UNCTAD secretariat, based on data from Clarksons Research Container Intelligence Monthly, various issues.

Notes: Supply data refer to total capacity of the container-carrying fleet, including multipurpose and other vessels with some container-carrying capacity. Demand growth is based on million TEU lifts. The data for 2015 are projected figures.

Maersk Group, having launched a new sustainability strategy[1] in 2014 (which will run from 2014 to 2018), has seen its biggest contributor of overall emissions, Maersk Line, improve its efficiency by approximately 8 per cent in 2014 and save $98 million worth of fuel (Maersk Sustainability Report, 2014). Combined with reductions in unit costs (due to better vessel utilization and network efficiencies) and increases in volumes (while rates decreased by 1.6 per cent), Maersk Line reported a very satisfactory result of $2.3 billion profit in 2014 ($831 million higher than 2013).[2]

In addition, the plunge in fuel prices during the second half of 2014, including a steep fall in bunker fuel prices, with rates falling from $600 per ton in July 2014 to $250 in January 2015 (Barry Rogliano Salles, 2015) has also helped carriers boost their margins. In a survey covering 15 publicly traded carriers, it was noted that revenue decreased by 3 per cent compared with 2013, following a 5 per cent decline from 2012 (AlixPartners, 2015). In 2014, industry revenue remained more than 16 per cent below its 2008 peak of more than $200 billion.

Table 3.1.	Container freight markets and rates					
Freight markets	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
Trans-Pacific			($ per FEU)*			
Shanghai–United States West Coast	1 372	2 308	1 667	2 287	2033	1970
Percentage change		68.21	-27.77	37.19	-11.11	-3.10
Shanghai– United States East Coast	2 367	3 499	3 008	3 416	3290	3720
Percentage change		47.84	-14.03	13.56	-3.7	13.07
Far East–Europe			($ per TEU)			
Shanghai–Northern Europe	1 395	1 789	881	1 353	1084	1161
Percentage change		28.24	-50.75	53.58	-19.88	7.10
Shanghai–Mediterranean	1 397	1 739	973	1 336	1151	1253
Percentage change		24.49	-44.05	37.31	-13.85	8.86
North–South			($ per TEU)			
Shanghai–South America (Santos)	2 429	2 236	1 483	1 771	1380	1103
Percentage change		-7.95	-33.68	19.42	-22.08	-20.07
Shanghai–Australia/New Zealand (Melbourne)	1 500	1 189	772	925	818	678
Percentage change		-20.73	-35.07	19.82	-11.57	-17.11
Shanghai–West Africa (Lagos)	2 247	2 305	1 908	2 092	1927	1838
Percentage change		2.56	-17.22	9.64	-7.89	-4.62
Shanghai–South Africa (Durban)	1 495	1 481	991	1 047	805	760
Percentage change		-0.96	-33.09	5.65	-23.11	-5.59
Intra-Asian			($ per TEU)			
Shanghai–South-East Asia (Singapore)		318	210	256	231	233
Percentage change			-33.96	21.84	-9.72	0.87
Shanghai–East Japan		316	337	345	346	273
Percentage change			6.65	2.37	0.29	-21.10
Shanghai–Republic of Korea		193	198	183	197	187
Percentage change			2.59	-7.58	7.65	-5.08
Shanghai–Hong Kong (China)		116	155	131	85	65
Percentage change			33.62	-15.48	-35.11	-23.53
Shanghai–Persian Gulf (Dubai)	639	922	838	981	771	820
Percentage change		44.33	-9.11	17.06	-21.41	6.36

Source: Clarksons Research *Container Intelligence Monthly*, various issues.
Note: Data based on yearly averages.

The year 2014 also witnessed a reshaping of alliances. The failure of the P3 network between the three largest shipping companies, Maersk Line, Mediterranean Shipping Company and CMA CGM led to the creation of two important alliances: the 2M network, a 10-year vessel-sharing agreement between Maersk and the Mediterranean Shipping Company on the Asia–Europe and transatlantic routes; and the Three Ocean Alliance sharing agreement between CMA CGM, China Shipping Container Lines and United Arab Shipping Company, in a bid to save costs on key container routes between Asia and Europe, as well as Asia and North America. These alliances are expected to shift the industry towards the use of larger, more eco-efficient ships, particularly on Asia–Europe routes, and to yield cost savings by deploying larger and more efficient vessels and better utilization, coupled with lower CO_2 emissions.

Another important alliance is the global cooperation agreement between United Arab Shipping Company and Hamburg Süd that will give the Dubai-headquartered carrier access to South American trades, namely the Europe–South America east coast and Asia–South America east coast trades, and the German shipping line access to Asia–Europe and trans-Pacific trade, namely the Asia–North Europe and Asia–United States trades (*Lloyd's List Containerisation International*, 2014). Moreover, the German Hapag-Lloyd and the Chilean CSAV completed their merger, becoming the fourth-largest liner shipping company in the world.

For 2015, the container market can expect another challenging year. The order book schedule indicates that further ultra-large container ships will be delivered to the mainlanes in 2015–2016, and the extent to which cascading continues will largely determine freight rates on both the mainlane and non-mainlane trades. Moreover, some new challenges could emerge in the future, as global trade is expected to be increasingly concentrated around regional manufacturing hubs,

thereby potentially decreasing future travel distances (Danish Ship Finance, 2015). The charter market environment may improve with significant scrapping levels of small and medium-sized vessels and the relatively small order book of container ship capacity in the smaller size ranges.

2. Tanker freight rates

The tanker market, which encompasses the transportation of crude oil, refined petroleum products and chemicals, witnessed an equally volatile freight rate environment in 2014. As a whole, the Baltic index for crude oil (Baltic Dirty Tanker Index) progressed by 21 per cent in 2014, reaching 777 points, whereas the Baltic Clean Tanker Index remained almost at the same level as in 2013, with 607 points, compared to 605 in 2013. In 2014, freight rates for both crude and product carriers increased in general for all vessel segments. Demand outperformed supply for the first time since 2010, leading to higher freight rates.

The crude tanker market turned out to be better than expected in 2014, particularly towards the second half of the year, when a drop in crude oil prices increased demand for such tankers. In addition, the slow expansion in oil fleet supply (which only increased by 4.5 per cent), slow steaming and the change in trading pattern (fewer imports to the United Sates and increasing demand from the Far East economies), which resulted in longer distances (Barry Rogliano Salles, 2015), triggered a surge in 2014 spot rates in most segments (tables 3.2 and 3.3).

The collapse in oil prices by almost 60 per cent over the second half of 2014 resulted in positive impacts on the tanker market. Demand for crude oil tankers was also boosted as a consequence of the increase in oil stockpiling, especially by Asian countries (namely China), increases in refinery runs and increases in floating storage as the contango situation developed.

Table 3.2.	Baltic Exchange tanker indices								
		2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**percentage change (2014/2013)**	**2015 (first half)**
Dirty Tanker Index		1 510	581	896	782	719	642	777	*21*	853
Clean Tanker Index		1 155	485	732	720	641	605	607	*0.33*	678

Source: Clarksons Research, Shipping Intelligence Network – Timeseries, 2015.

Notes: The Baltic Dirty Tanker Index is an index of charter rates for crude oil tankers on selected routes published by the Baltic Exchange in London. The Baltic Clean Tanker Index is an index of charter rates for product tankers on selected routes published by the Baltic Exchange in London. Dirty tankers typically carry heavier oils, such as heavy fuel oils or crude oil. Clean tankers typically carry refined petroleum products such as gasoline, kerosene or jet fuels, or chemicals.

Table 3.3.   Tanker market summary – clean and dirty spot rates, 2010–2014 (Worldscale)

Vessel type	Routes	2010 Dec.	2011 Dec.	2012 Dec.	2013	2014 Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	Percentage change Dec. 2014/Dec. 2013
VLCC/ULCC (200 000 dwt+)	Persian Gulf–Japan	61	59	48	64	63	49	40	41	34	41	50	52	40	45	57	77	20.3%
	Persian Gulf–Republic of Korea	56	56	46	61	46	48	40	38	34	40	45	44	36	46	53	62	1.6%
	Persian Gulf–Caribbean/East Coast of North America	36	37	28	37	31	33	29	26	25	26	27	25	20	24	30	34	-8.1%
	Persian Gulf–Europe	57	59	26	..	n.a.	30	30	30	27	41	28	29	26	25	32	32	n.a.
	West Africa–China	..	58	47	61	57	54	45	42	39	40	48	51	45	49	59	63	3.3%
Suezmax (100 000–160 000 dwt)	West Africa–North-West Europe	118	86	70	102	109	59	62	60	58	70	85	69	59	76	102	91	-10.8%
	West Africa–Caribbean/East Coast of North America	103	83	65	97	102	57	60	60	52	64	81	63	56	79	91	79	-18.6%
	Mediterranean–Mediterranean	113	86	67	99	157	67	67	65	67	73	98	77	65	84	106	95	-4.0%
Aframax (70 000–100 000 dwt)	North-West Europe–North-West Europe	162	122	93	135	165	118	92	93	96	102	122	115	93	100	113	113	-16.3%
	North-West Europe–Caribbean/East Coast of North America	120	..	80	..	121	87	85	n.a.	70	80	90	n.a.	90	89	104	110	n.a.
	Caribbean–Caribbean/East Coast of North America	146	112	91	155	243	113	101	98	113	104	157	104	84	123	151	108	-30.3%
	Mediterranean–Mediterranean	138	130	85	100	167	87	94	92	81	81	98	100	85	92	166	106	6.0%
	Mediterranean–North-West Europe	133	118	80	107	204	83	89	87	65	74	98	104	79	92	185	108	0.9%
	Indonesia–Far East	111	104	90	99	109	97	86	86	87	96	101	110	93	90	105	116	17.2%
Panamax (40 000 - 70 000 dwt)	Mediterranean–Mediterranean	168	153	168	113	213	189	n.a.	118	n.a	n.a.	n.a.	128	120	100	n.a.	n.a.	n.a.
	Mediterranean–Caribbean/East Coast of North America	146	121	160	105	150	115	114	115	n.a.	n.a.	100	113	118	110	123	130	23.8%
	Caribbean–East Coast of North America/Gulf of Mexico	200	133	156	141	229	162	n.a.	109	121	114	162	147	118	113	148	150	6.4%
All clean tankers	Persian Gulf–Japan 70 000–80 000 dwt	125	105	116	81	73	78	88	90	91	82	87	116	108	114	115	102	25.9%
	Persian Gulf–Japan 50 000–60 000 dwt	128	119	144	93	88	98	110	93	111	110	105	120	125	132	127	110	18.3%
	Caribbean–East Coast of North America/Gulf of Mexico 35 000–50 000 dwt	158	155	162	..	103	105	101	100	96	91	142	100	95	100	131	175	n.a.
	Singapore–East Asia 25 000–35 000 dwt	193	..	220	167	158	n.a.	168	180	n.a.	n.a.	n.a.	176	130	180	158	180	7.8%

Source: UNCTAD secretariat, based on Drewry Shipping Insight, various issues.
Notes: The figures are indexed per ton voyage charter rates for a 75,000 dwt tanker. The basis is the Worldscale 100.
*   LCC: very large crude carrier; ULCC: ultralarge crude carrier.

As such, the tight availability of tonnage and increase in activity pushed up very large crude carrier spot freight rates on key freight routes, namely Asian routes, towards the end of 2014. The spike in very large crude carrier earnings which began at the end of 2013 continued into 2014, hitting the highest levels since 2010. Very large crude carrier average spot earnings stood at $43,948/day for the last quarter of 2014 and $27,315/day for the entire year in 2014, an increase of 68 per cent from 2013. The Suezmax segment showed some significant movement, particularly in the last quarter of 2014, with growing West Africa–Europe trading being substituted for its primary West Africa–United States trade route – which was virtually eliminated. Supported by low oil prices, average yearly earnings rose by 79 per cent, reaching $27,791/day in 2014 (Clarksons Research, 2015b). Aframaxes benefited from tight tonnage and active trading in the Mediterranean–Caribbean/East Coast of North America and the Caribbean/East Coast of North America/Gulf of Mexico region (Drewry, 2015). Spot earnings averaged $24,705/day in 2014, a 75 per cent increase from the previous year.

For product tankers, while market rates improved towards the end of 2014 (mainly due to low crude oil prices that prompted demand for refinery runs, particularly in the United States and Asia–Pacific), they remained generally low during 2014. This was a result of imbalance between supply and demand that persisted in 2014, where supply growth (3.9 per cent) outpaced that of demand (2 per cent) in 2014. Nevertheless, clean spot yearly earnings declined by 2 per cent, reaching $12,361/day in 2014 (Clarksons Research, 2015b).

The tanker market is likely to remain positive in 2015, with low crude oil prices and increased storage trades. Nonetheless, the market is still suffering from overcapacity and freight rates will remain under pressure. Moreover, a change in the pattern of trade and demand, namely involving the decline in refining capacity in Europe and an increase in Asia and the Middle East, may result in increasing freight rate volatility. The Middle East has begun shifting its focus from crude oil exports to downstream developments such as refineries, making Atlantic basin crude oil (namely, South American suppliers) more attractive to Asia (Danish Ship Finance, 2015).

3. Dry bulk freight rates

Despite a strong start and high expectations for a positive impetus carried over from 2013, the dry bulk market freight rates faced another challenging year influenced by the surplus capacity that still exists and the uncertainties in demand projections in 2014. Bulk carrier earnings fell 5 per cent from 2013 to reach

Figure 3.8.   Baltic Exchange Dry Index, 2012–2015 (index base year 1985 = 1,000 points)
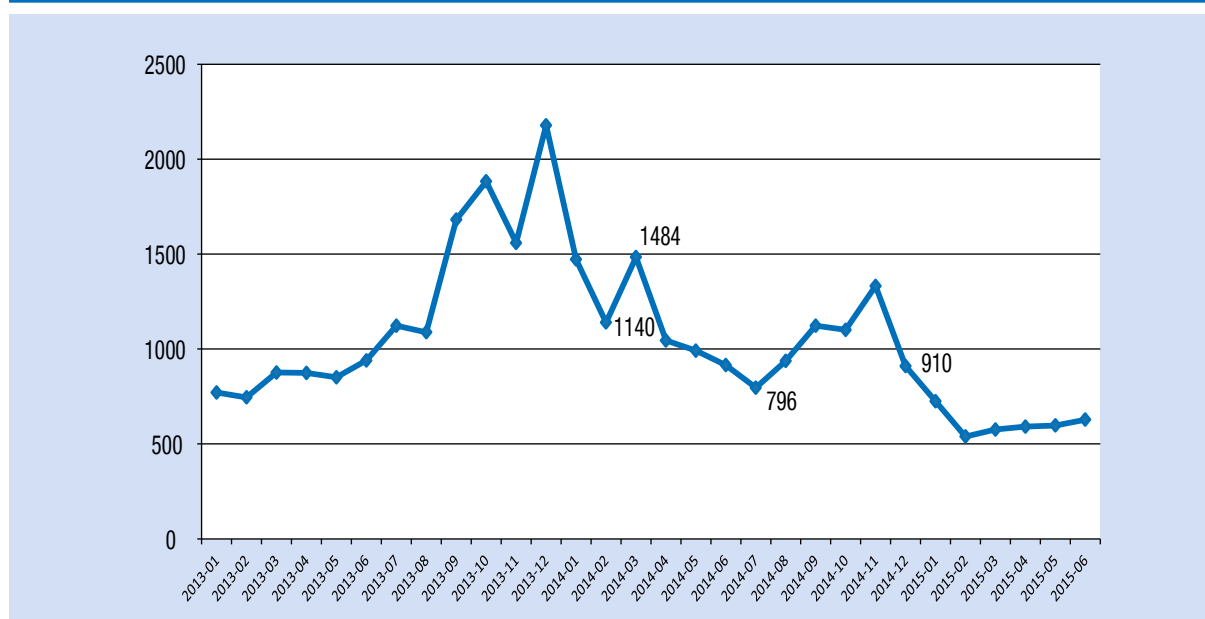
Source: UNCTAD secretariat, based on Baltic Exchange data.
Note: The index is made up of 20 key dry bulk routes measured on a time charter basis, and covers Handysize, Supramax, Panamax and Capesize dry bulk carriers, carrying commodities such as coal, iron ore and grain.

an average of $9,881/day. The low level of earnings exerted financial pressure on owners and led to several companies filing for bankruptcy (Clarksons Research, 2015b). As an overall indicator of the continued depression in dry bulk earnings, the Baltic Exchange Dry Index slid to a low level of 796 points in July 2014, to end at 910 points in December 2014 (figure 3.8).

Average earnings in the bulk carrier sector remained low and highly volatile in 2014 (figure 3.9). Capesize earnings during 2014 averaged $13,309/day, down 15 per cent from 2013. This was despite much faster growth in iron ore trade (driven by an increase in Chinese imports) than in the Capesize fleet (which grew by 4 per cent in 2014). The Panamax market continued to be negatively affected by oversupply of tonnage (driven by strong deliveries of Kamsarmaxes) and slower growth in coal trade (due to declining coal imports into China), with average earnings dropping

down 5 per cent to $6,260/day and reaching as low as $2,137/day in June 2014. Supramax average earnings fell by 12 per cent to reach $10,819/day in 2014, dropping as low as $5,905/day in August before recovering for the remaining months and ending at $8,769/day (Clarksons Research, 2015c). The Indonesian ban on exports of unprocessed bauxite and nickel ore resulted in a weak Supramax market in the Far East.

The dry bulk market rates for 2015 and beyond will continue to be dominated by growing supply and uncertainties concerning the demand for dry bulk commodities from China. Factors that could influence demand in the future include innovation in technologies that seek to improve fuel efficiency and substitute for coal, and the increased number of countries that are setting policies and regulations aimed at reducing carbon emissions.

Figure 3.9.   Daily earnings of bulk carrier vessels, 2008–2015 ($ per day)
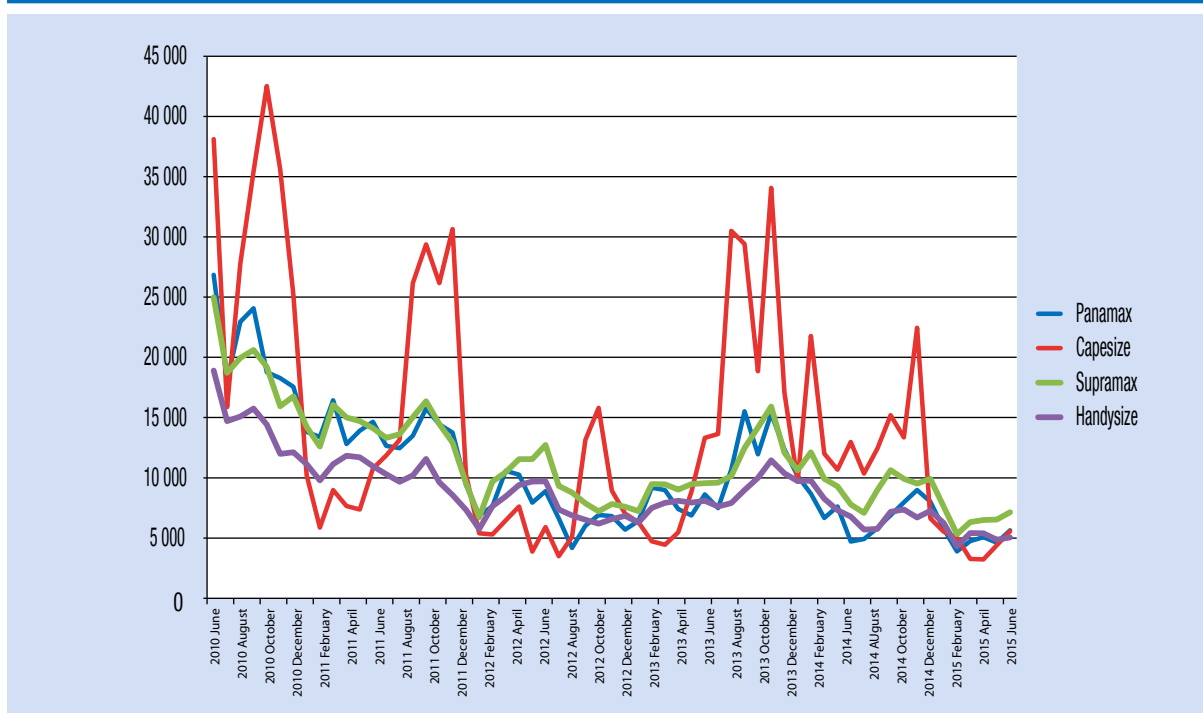
Source: UNCTAD secretariat, based on data from Clarksons Research *Shipping Intelligence Network* and figures published by the London Baltic Exchange.

Note: Handysize – average of the six time charter routes; Supramax – average of the six time charter routes; Panamax – average of the four time charter routes; Capesize – average of the four time charter routes.

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ENDNOTES

[1]   The Maersk sustainability strategy has three focus areas: enabling trade, energy efficiency and investing in education. See http://www.maersk.com/en/the-maersk-group/sustainability (accessed 9 September 2015).

[2]   See Maersk line website news articles, available at http://www.maerskline.com/ur-pk/countries/int/news/news-articles/2015/02/maerskline-report-2014 (accessed 9 September 2015).