1

Shipping Markets and Their Economic Drivers

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1.1 An Introduction to Shipping

Before diving into the drivers of shipping markets and looking at their performance, a short introduction will be given into the maritime value chain, the various shipping segments and the types of shipping markets. An overview of the cost structures will also help to provide an understanding of the conduct of shipping markets.

1.1.1 The Maritime Value Chain

Numerous types of economic participants with specific functions constitute the maritime value chain. From a shipping finance perspective, the yard, the owner, the charterer and of course the capital are obviously the most important ones. A broader view of shipping markets, however, requires attention also be given to ship managers, freight forwarders, cargo owners, brokers and all types of other market participants. Depending on the shipping segment, these functions are typically combined (integrated) to a different degree. In general, everything between a single purpose company and a fully integrated shipping division or a larger corporate structure is feasible. For an overview see Fig. 1.1.

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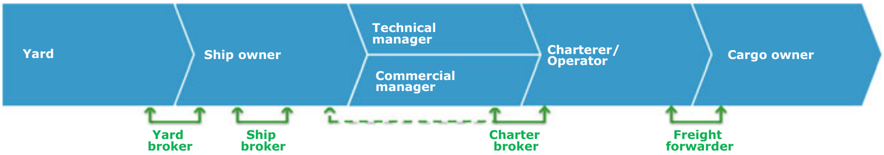

Fig. 1.1 The maritime value chain (*Source*: Own graph)

1.1.1.1 Ship Owner

The ship owner is a person, a company or an investment fund which acquires a vessel from a yard or from the second-hand market to hire it out to a charterer. The owner's earnings are the difference between the charter rate and the sum of the costs incurred by owning the vessel (interest and repayments, potentially subject to exchange rate fluctuations, are the capital expenses—CAPEX) and making it available (maintenance and repair, including docking, stores and lubricants, crewing, insurance as well as management and administration are the operating expenses—OPEX). The owner mandates a ship manager to run the vessel with crew, maintenance and so on (technical ship management) and to market the vessel to charterers (commercial ship management). The latter can be facilitated via a ship broker. On the income side, the owner's risks lie in the charter rate, employment and the lifetime of the vessel with regard to the second-hand value (for ongoing employment or scrapping). On the cost side, both OPEX and CAPEX bear risks for the earnings. The risk with regard to the earnings potential of other voyage related costs (which are primarily fuel and costs of port and passage (canal fees)) can lie with the owner or with the charterer/operator (for more details see Figs. 1.3 and 1.4).

1.1.1.2 Shipyards

Vessels are built, maintained, repaired and eventually scrapped (recycled) in shipyards. Traditionally, yards offered all three services (newbuilding, maintenance and repair) but further specialization has taken place during recent decades. Scrapping in yards, as opposed to beaching vessels (dismantling of vessels purposely run aground), develops with increasing environmental regulations. With respect to shipping finance, yards mainly interact with shipowners during the newbuilding stage, and with ship managers who take care of maintenance and repair of the vessel during docking on behalf of the owner.

1.1.1.3 Charterers

The charterer's business is to hire a vessel from the shipowner and sell transport services to a cargo owner or freight forwarder. In some segments, the charterer may also be called the operator. He or she may provide this transport service on fixed routes and schedules doing "liner" business, as is typical in container shipping, or employ the vessel based on a single (or trip-by-trip varying) cargo owner's requirements, as is typical in bulk shipping for example. The charterer's business risk lies in the spread between the existing charter contract and the freight rate development, and in his or her ability to utilize (fill) the vessel efficiently. The charterer may use brokers to charter the vessel and sell transport services.

1.1.1.4 Cargo Owners

Cargo owners want their raw materials or goods to be supplied to an intended destination. Depending on their annual transport needs and volumes, they either buy transport services directly from the owner, acting as a charterer themselves (common e.g. in the iron ore and crude oil business), from the charterer/operator (common e.g. for large consumer goods customers or in project cargo) or from a freight forwarding company (common e.g. for smaller volumes of containerized cargo). The cargo owner's commercial risk lies in the development of freight rates.

1.1.1.5 Freight Forwarders

Freight forwarders provide transport and related services to cargo owners, whose limited regular demand for transport does not justify a logistics department of their own with all the required functions and expertise. Rather, they buy transport services from the vessel's charterer/operator and sell it on to cargo owners. In container shipping, freight forwarders are among the biggest customers of container liners. As freight forwarders typically pass on the actual costs of the transport service and gain their earnings from a fairly stable markup for their services, their exposure to freight market rate volatility is rather moderate. Their risk lies rather in the variability of demand for their services.

1.1.1.6 Ship Managers

A ship manager is mandated by the shipowner to run and maintain the vessel (technical management, crewing) and market it to charterers (commercial management). All the operating expenses of the vessel are borne by the owner, based on pre-agreed crewing and the OPEX budget. The ship manager typically receives a fixed annual fee to administer the vessel. Hence, he or she is not directly exposed to charter rate volatility. Only a limited share of ship management contracts is related to the charter rate earned or to performance indicators.

1.1.1.7 Brokers

Brokers with various specializations act as intermediaries in shipping markets. Yard brokers facilitate contracts between yards and shipowners, especially in newbuilding, but also for repair and regular docking. Shipbrokers support the S&P of second-hand tonnage as well as the chartering of vessels (linked to commercial management). Freight brokers can facilitate larger freight contracts, for example in bulk and project cargo.

1.1.2 The Shipping Segments

According to Clarkson Research Services Limited (2014), the global merchant fleet comprised about 88,000 vessels above 100 GT (gross tons, a measure for a ship's volume), worth about USD900 billion in spring 2014. The main segments are bulkers (36% of GT at 10,046 vessels), crude and product tankers (23% of GT at 9,243 vessels) and container vessels (17% of GT at 5,087 vessels). Significant by number but small in terms of gross tonnage are also tugs (<1% of GT at 16,297 vessels), general cargo ("other dry", 6% of GT at 15,837 vessels), offshore vessels (4% of GT at 10,199 vessels). For more details, see Fig. 1.2. Looking at the distribution from vessel value or value of goods shipped, container vessels gain share compared with tankers and especially bulk carriers.

1.1.3 The Various Shipping Markets

A single vessel is subject to various shipping markets. The newbuilding market, the S&P market and the demolition market look at the ownership of the vessel, while the freight market (time charter and voyage charter, amongst other forms of charterparties) looks at the transport service of the vessel. Another differentiation of shipping markets has also been provided by Stopford (2009). The key markets will be introduced briefly in the following, while a more detailed explanation of the market drivers can be found in Chap. 2.

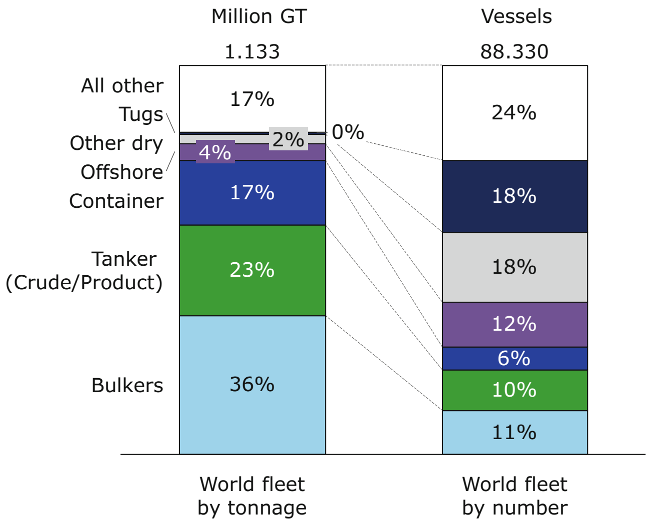

Fig. 1.2 Overview of the global merchant fleet (*Source*: Clarksons)

1.1.3.1 The Newbuilding Market

Usually buyers of vessels enter the newbuilding market as they either want to employ the vessel on their own, assuming future employment on the freight market, or plan to charter it out either based on a long term contract they have already agreed or on speculation of a good spot (voyage) market. They will accept about two years of waiting time for a newbuild, as opposed to purchasing existing tonnage, if no suitable vessels (size, efficiency, etc.) are available on the second-hand market. When shipping markets are booming and yard slots are scarce, yards show a limited willingness to change specifications relative to their standard designs. When markets are low, buyers can tender their newbuilding order amongst several qualified yards, especially if they are looking at a series of vessels. Typically, newbuilding prices of different segments of vessels develop largely in parallel (see Sects. 1.4, 1.5 and 1.6 and Figs. 1.11, 1.18 and 1.26), as many yards are flexible.

1.1.3.2 The S&P Market

The S&P market structure and conduct depend on the phase of the shipping cycle. At advanced recovery and peak times, the S&P of vessels is typically a very simple private transaction between seller and buyer, facilitated by one or two shipbrokers. The banks of the seller and buyer are involved but don't play a major role in the transaction. Second-hand prices are based on recently reported transactions of "similar" vessels and the indices built on them. During heydays, buyers are focused on the availability of vessels judged on their condition solely on the records provided by the seller, and pay hardly any attention to energy efficiency. Second-hand prices can even exceed newbuilding prices due to their immediate (or prompt) availability. Conduct changes when markets fluctuate. Banks become more active and may initiate an auction if the owner isn't able to service the loan or put the vessel up for sale on their own initiative. Vessel condition and energy efficiency are looked at more carefully, though the reported prices seem to reflect differences in efficiency to a limited degree only. Overall, about 1,000–1,200 merchant vessels are traded per year. In relative terms, bulkers and tankers are traded about twice as often (*c*.6% per year when comparing reported transactions with the existing fleet) as container vessels (*c*.3% per year).

1.1.3.3 The Demolition Market

The final stage of a vessel's economic life cycle is the demolition market. Vessels are bought based on their scrap value, which is determined by their lightweight tonnage (LWT). Buyers pay a certain price in USD per LWT. The owner either sells the vessel directly to a scrap yard or uses a cash buyer for the vessel's last journey. The price differs depending on the environmental care that will be required during scrapping. Qualified scrapyards typically pay lower prices than cash buyers who beach the vessel. With upcoming regulation at the EU and global level (the Hong Kong Convention), more environmental care will be enforced.

1.1.3.4 The Charter Market

Charter markets for ships subdivide into voyage charter (also referred to as spot charter) and time charter. Both are differentiated by the duration of the contract and some related obligations. A voyage charter contracts a vessel to transport a certain cargo between two specified ports. This is common in dry-bulk and tanker shipping. A variation is the contract of affreightment (COA), where a shipowner agrees to ship a certain amount of cargo between two specified ports in a series of shipments within a certain period of time. If time allows, he or she can perform other voyage charters in between. Pools of vessels, which could be seen as another variant of voyage charter, are groups of comparable bulkers or tankers which are marketed jointly and share income according to a specific agreement. A time charter fixes the vessels for a certain period of time (between two months and ten years). While time charter is basically the only charter contract relevant in container shipping and in all segments with vessels built to purpose (e.g. ferries, cruise, offshore), other merchant segments like dry bulk and tanker use both time and voyage charter. The charterer can dispose of the vessel during the charter period, potentially even performing voyage charter trips for other cargo owners. A bareboat charter is a variant of a time charter in which the charterer takes care of the crewing and maintenance. Bareboat charter is common if the owner is a financial investor who is not involved in shipping operations.

1.1.3.5 The Freight Spot Market

While the charter market refers to the transport capacity of the entire vessel, the freight market just looks at parcels smaller than a total vessel. Today, as tramp shipping with part-loads of mixed cargo does not play a major role anymore, freight markets with small parcel sizes are most relevant in container shipping. Besides the regular rate announcements of the leading container lines, the Shanghai Containerized Freight Index (SCFI) is the typical reference for freight rates of container shipments, for example from Shanghai to Northern Europe. Alliances, in turn, must not align freight rates, but share the cargo capacity of vessels to increase their utilization. In dry-bulk and tanker shipping, freight spot markets correspond to voyage charter fixtures, as the traded parcels typically match vessel capacities.

1.1.3.6 Forward Freight Agreements

Forward freight agreements (FFAs) are derivatives instruments used to hedge freight rates against future market developments, based on a specified single freight route, a basket of freight routes or a freight index (such as the Baltic Dry Index—BDI). FFAs are principal-to-principal contracts between actual buyers and sellers of transport services in an over-the-counter (OTC) market typically facilitated by a freight broker, or they are exchange-based on regulated derivatives exchanges. FFAs are common in the dry bulk and tanker market. More details about the freight derivatives market and their instruments can be found in Chap. 15.

1.1.4 Cost Structures in Shipping

The last aspect to be mentioned before looking into the drivers of shipping markets are the cost structures and the "Who bears what cost?" category. As the cost structures differ significantly between vessel segment, speed, bunker price and other factors, two examples will suffice at this point to illustrate what the different shipping markets cover.

Figure 1.3 shows the cost structure of a midsize container vessel at today's speed pattern and a bunker price of 600 USD/t heavy fuel oil (HFO). The owner bears the capital costs (CAPEX) as well as the fixed and some voyage related operating costs (OPEX) of the vessel, and charters it out in a time charter contract to an operator who additionally bears the bunker costs and terminal charges. From the owner's perspective, about two-thirds of his or her costs are capital costs (interest and repayment) while about one-third are operating expenses. All these operating expenses are handled typically via a ship manager who crews, runs and maintains the vessel on behalf of the owner. From the operator's perspective, charter is about one-third of total costs; bunker and terminal charges each about one-fourth; and other costs of passage and port (canal, tugs, etc.) make up the rest.

Figure 1.4 shows the cost structure of a very large crude carrier (VLCC) at today's speed pattern and a bunker price of 600 USD/t HFO. The owner charters out the vessel in a voyage charter contract to a cargo owner (e.g. an oil major). In this case, the owner bears all costs (CAPEX, OPEX as well as bunker) and receives the voyage charter rate from the cargo owner. In his or her

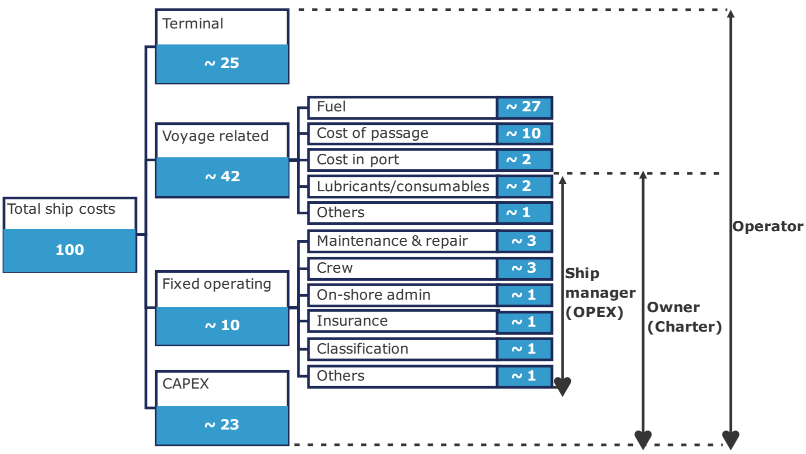

Fig. 1.3 Cost structure of a panamax container vessel (*Source*: Own model)

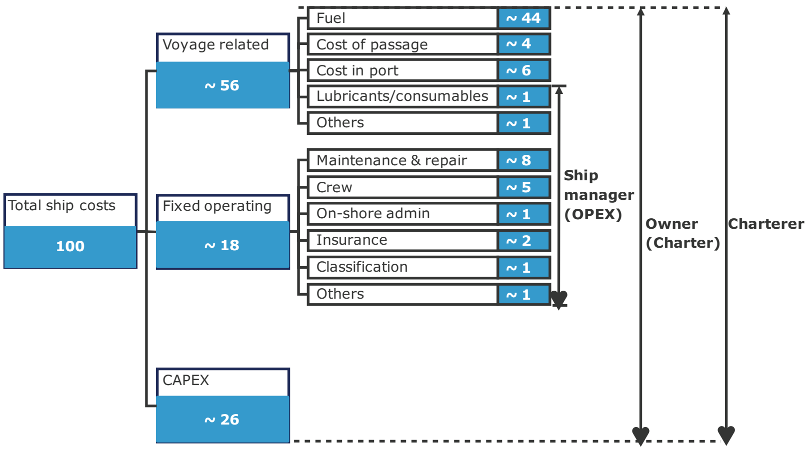

Fig. 1.4 Cost structure of a VLCC (*Source*: Own model)

cost structure, bunker accounts for 40–50% of total costs, CAPEX for about one-fourth, OPEX for about one-fifth, and the rest consists of costs of passage and port. The higher cost shares of fuel and some OPEX items for a VLCC, compared with a container ship, might be surprising at first sight. However, the cost shares in container shipping are significantly diluted by the high terminal costs, with each container move accounting for about USD250.

1.2 The Drivers of Shipping Markets

Markets are the simple mechanism that determine optimal volumes and prices, based on demand and supply. External influences and boundaries, behavior-related imponderabilities, timing effects and other "disturbances" complicate real markets, as opposed to simplified market models. This also applies to shipping markets, the newbuilding and S&P market as well as charter and freight markets. This section provides an overview of the drivers of demand and supply for tonnage and transport services and also for shipping market performance and cyclicality. The specifics for the dry-bulk, tanker and containership shipping markets will constitute subsequent sections; together these sub-segments represent 27% of all merchant vessels, but make up 76% of gross tonnage and, presumably, a similarly high share of the total fleet value. In many of the smaller segments, the vessels are designed and built for a specific charterer (e.g. ferries and cruise ships as well as offshore) rather than for a general market, which results in less liquidity and markets with many characteristics. Hence, a detailed discussion of these segments would exceed the scope of this book.

1.2.1 Demand for Transport Capacity

The development of the world economy, measured in gross domestic product (GDP), is the first and most important driver for shipping markets. Nevertheless, it is obviously less the pure number of “global GDP” which is driving the need for transport work but more the way the regions interact and generate global GDP. Some global megatrends underlie economic development. Fang et al. (2013) assume the global population will grow from 6.9 billion people in 2010 to about 8.0 billion people in 2030, with 96% of population growths coming from developing countries. The population in developed countries will decline, in turn, and increase significantly in age. Urbanization will continue, with more and more megacities being located by the sea and having direct access to international trade.

Political decisions co-determine how the global megatrends translate into trade and shipping. Are capitalism, free trade and Western lifestyle the aim of sociocultural evolution? What would these mean in terms of resource requirement and production? How will we react to climate change and global debt? Is inequality needed to fuel economies? Different answers and political pathways to these questions are conceivable and will affect shipping. Regional trade blocks in Europe (the EU), North America (NAFTA), Southeast Asia (ASEAN), among others, may continue to stimulate trade within their own areas. The World Trade Organization (WTO) may come to further global free trade agreements, reducing the relevance of regional trade blocks. A backwards trend with more economic sanctions, isolation and nationalization of economies is also possible.

Under the more likely political pathways, some economists estimate global GDP will more than double or nearly triple between 2010 and 2030, with China as one of the main drivers, potentially resulting in a 20% share of global GDP in 2030, and India and Brazil as new entrants into the global Top 5 besides the USA and Japan (Fang et al. 2013). These economists assume the purchasing power in Asia will increase by a factor of 8 by 2030, while granting a factor of 3 only to the OECD countries.

However, looking ahead, many uncertainties have the potential to affect trade flows and shipping. Geopolitical and social conflicts, such as the tense situation between Ukraine and Russia or the Arab Spring and radicalization in some Islamic countries in the Middle East, limit economic development and trade in these regions. Environmental regulation impacts upon trade flows (e.g. an accelerated nuclear phase that drives out the trade in liquefied natural gas (LNG)). Economic challenges lie in the high debts of countries and private households, and an excess of liquidity due to cheap central bank money (stimulus packages) along with a deflation risk and devaluation of certain currencies, leading to drastic effects on exchange rates (currency war). Kim (2014) argues that an "end of normal" scenario (high debt, no or negative growth) is 40% probable, that a "new normal" (high debt, slow growth) is 50% probable, while attaching just a 10% probability to the "back to normal" scenario (high debt, strong growth). The nearly "traditionally" good prospects for China also seem to have become cloudy lately. A cooling down of the real estate boom bears some risk for the hard landing of the shadow banking sector. Despite growth rates of still about 7%, China's decelerating GDP growth seems to have begun to follow the earlier trends of more mature economies such as Taiwan, South Korea and Japan (De la Rubia 2014).

The question now is how global GDP—or rather the way the regions collaborate and generate global GDP—can translate into seaborne trade. The basic economic principles of the "division of labour" (Adam Smith, 1776, in *The Welfare of Nations*), the "comparative advantages" of nations and their effects on foreign trade (David Ricardo, 1817, in *On the Principles of Political Economy and Taxation*), and globalization with continued relocation of production and processing from developed to emerging countries are well understood. According to Stopford (2009) the "west line" in the development of sea trade started in 3000 BC in Mesopotamia. While these classical theories apply evidently to trades between countries with differing factor endowments (e.g. raw materials), they seem to lack reasoning regarding intra-industry trade, which means export and import of the same type of goods by one country (e.g. cars from Germany to Korea and back). However, as the "same type of good" does not mean the "same product", intra-industry trade can be understood via economies of scale by limiting the variety of production in one country while exchanging with another (the "new trade theory" attributed to Paul Krugman).

It is difficult to forecast seaborne trade based on the development of global economic indicators. Looking at seaborne trade in total—not yet at specific segments—economists are not very successful in their attempts to correlate GDP growth with trade growth. Even the International Monetary Fund (IMF) and leading banks don't have a conclusive explanation as to why 3.4% GDP growth in 2012 resulted in just 2.8% trade growth, while 3.9% GDP growth resulted in 5–6% trade growth in 2015 (Kounis 2014). Also, the indicator "seaborne trade per capita"—with 2.5–5.5 tons in OECD countries, about 1.5 tons in China and below 1.0 tons in most of South America, India and Africa—is just an indication that the latter countries will catch up in trade volumes (Clarkson Research Services Limited 2014). Obviously, a segment specific perspective is needed to forecast shipping markets, rather than a bottom-up approach, segment by segment.

1.2.2 The Supply of Transport Capacity

The supply side of shipping markets is determined by the existing fleet, newbuildings and scrapping. The laying-up of vessels and the variation of vessel speed offer some flexibility to react to supply–demand imbalances. A high level overview of the existing fleet was given in the previous section 1.1.2. According to Clarkson Research Services Limited (2014), historical newbuilding orders had an average of about 2,200 merchant vessels and about 65 million GT per year in the time frame 2000–2013. With less than 20 million GT, average annual scrapping was by far lower, resulting in an annual fleet growth of 4.9% (in GT) during 1996–2013, with a peak of 6.5–8.0% in each year between 2005 and 2011. This compares to a growth in tonnage requirement (trade) of 3.9% in the time frame 1996–2013.

Newbuilding and scrapping activities are increasingly pushed by changes in regulatory boundaries, infrastructural limitations and factor costs. On the regulatory side especially, environmental requirements (double hulls for tankers in the 1990s, sulfur emission limitations in emission control areas in the 2000s and upcoming ballast water treatment) have put pressure on existing vessels and accelerate their economic aging. Increasing bunker prices and upcoming ECO designs with 30% better energy efficiency at today's operating profiles force less efficient vessels to leave the market. The "cascading effect" of using the largest possible design on a given route acts in the same way. Also, the extension of the Panama Canal and the Suez Canal, the newbuilding of the Nicaragua Canal and the potential opening of the Arctic route will shake up the existing fleet and open up opportunities for larger vessels with lower specific transport costs.

The slowing down of vessels during the current shipping crisis in order to benefit from lower bunker costs per 1,000 cargo miles had a positive side effect for shipowners. In the container segment about 2.0 of 17.0 million TEU (12%) are absorbed compared to pre-crisis speed patterns (Alphaliner 2015). The laying-up of vessels has a similar effect: capacity is temporarily removed from the market. Visibility is best in the container sector, as vessels are typically on time charter contracts. As late as 2014/early 2015, 110–120 vessels with a total capacity of 230,000 TEU have been laid up, equaling 1.3% of the total container fleet. During the trough of the crisis, lay-ups peaked at nearly 600 vessels, five times as many as today (Alphaliner 2015).

More specific developments on the supply side in dry-bulk, tank and container shipping will follow in the respective chapters below.

1.3 Shipping Market Performance

Although shipping enjoys a fairly stable increase in transport demand of about 4% per annum in the long run, it regularly suffers from strong cyclicality. Stopford (2009) differentiates three cycle lengths in shipping: seasonality, mid-term cycles of about seven years and long-term cycles of 30 years and more. Seasonality originates from fluctuations on the demand side. While transport capacity is largely fix within a 12-month time period, transport demand—for example, from consumer goods being shipped from China to Europe in the fall for the Christmas business, or not being shipped during the Chinese New Year in February—varies and, as such, impacts on the utilization of container vessels and the respective freight rates. This effect can be easily traced in the development of the SCFI.

The actual challenges for shipping investments are the mid-term cycles. In contrast to seasonality, they are largely supply driven, with a few exceptions from external shocks to the demand side (for example, the financial crisis that followed the collapse of Lehman Brothers Bank in 2008). Against the background of a fairly stable increase of 4% per year of the global transport demand, the regular oversupply in shipping is "home made". This originates from timing effects and mass psychology on very fragmented markets with low entry barriers for vessel ownership. Two to three years lead time from order to delivery of a vessel regularly leads to significant over-ordering when charter rates are good. A well-known actor typically starts the order rally, potentially backed with long-term charter contracts. Many others follow, trusting his or her market judgment (e.g. favorability of ECO ships, the need for LNG carriers) and hoping to find employment for their additional vessels, even if they have not backed the orders with charter contracts yet. The availability of yard capacity and financing may be limiting factors for these followers at times, but usually there are no real entry barriers (e.g. private equity firms and export credit agencies step in when regular ship financing gets scarce). As soon as the vessel is delivered, it supplies capacity for the next 25 years. With a typical split of 60% CAPEX and 40% OPEX from the owner's perspective, shipowners may accept the temporary employment of their vessels at cash costs (OPEX plus interest share of CAPEX) or marginal costs (OPEX or even just the OPEX of the vessel in operation minus the OPEX of the vessel laid up), which puts pressure on the charter rates on the market. A market collapse results in reduced orders, but, due to time lags, it may take years for the excess capacity to be absorbed by the global trade growth. Stopford (2009) analyzed that cycle lengths came to an average of seven to even ten years peak-to-peak, but discovered a quite high volatility of the cycle length.

The long-term cycles of 30 and more years are less relevant for shipping investments, as their length exceeds a vessel's economic life cycle and especially their amortization schedule. More research would be needed to bridge them to the long waves of about 50 years identified by Kondratieff and Schumpeter, who link them to major technical innovations. Yet, Kondratieff cycles and long-term shipping cycles don't seem to match fully.

Given the cyclicality of shipping markets, many shipowners do their business with the ambition of earning at least cash costs during the bad times and to survive and earn high margins during the few good years. Operators of vessels typically own a certain number of the vessels they run, while chartering the other ones. They typically keep vessels throughout their lifetimes (as their business model is the provision of a transport service rather than asset play), while riding the cycle with the chartered ones.

Looking at the earnings of merchant vessels in total, a few composite indices can be used. Best known is the ClarkSea Index, a weighted average of the charter income (before deduction of OPEX and CAPEX) from tankers, bulkers, container vessels and gas carriers (see Fig. 1.5). To determine the ability to service CAPEX and potentially get a return on investment as an owner, OPEX (the costs of maintenance and repair, including docking, stores and lubricants, crewing, insurance as well as management and administration)

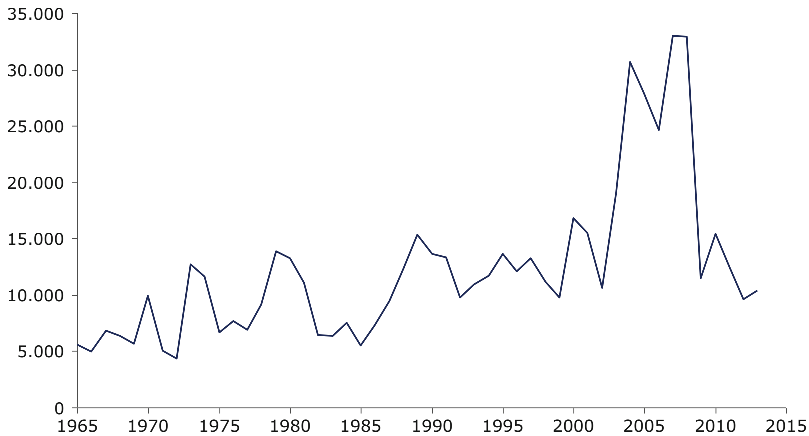

Fig. 1.5 Earnings in merchant shipping since 1965 (ClarkSea Index) (*Source*: Clarksons)

of currently about USD500 per day on average over the four vessel segments need to be deducted. It needs to be noted that the index is quoted in nominal terms. An average annual increase of the ClarkSea Index of 3.1% (the slope of the linear regression from 1965 to 2013) may be compared to an average USD inflation rate of 4.2% in the same time frame. This development has increasingly put pressure on the profitability of shipping, even if the 4.2% refers to the USA and not necessarily to global shipping factor costs.

1.4 The Bulk Shipping Market

1.4.1 The Structure of the Bulk Shipping Market

The bulk shipping market comprises about 10,000 vessels with a total tonnage of about 400 million GT (a 36% share of the total merchant fleet). The main sub-segments with their cargo capacity are listed in the table below. Size ranges per sub-segment may vary slightly depending on the source.

Very large ore/bulk carrier (VLOC/VLBC)	200,000–400,000 dwt
Capesize	100,000–200,000 dwt
Panamax	65,000–100,000 dwt
Handymax	40,000–65,000 dwt
Handysize	10,000–40,000 dwt

In addition, there are further sub-segments named according to infrastructural limitations (e.g. Kamsarmax with length up to 229 meters, Newcastlemax with beam up to 47 meters) and cargo owners (e.g. Valemax with 400,000 dwt). Further differentiation comes with the vessel's equipment (e.g. geared vs gearless). As outlined before, both voyage charters and time charters are commonly used for chartering contracts in dry-bulk shipping.

1.4.2 The Drivers of the Bulk Shipping Market

The main products in bulk shipping are coal, iron ore, grain and various minor bulks such as rice, sugar, wood chips, fertilizers and cement. According to Torp (2014), global dry-bulk shipping amounted to 4.3 billion tons in 2013 with a 29% share of coal, 27% iron ore, 14% grain/oilseeds/sugar and 30% minor bulks. Since 2004, dry-bulk shipment grew with a compounded annual growth rate (CAGR) of 5.6%, showing a good correlation of development with global GDP. In 2013, 40% of global dry-bulk shipments were imports to China, of which 67% was iron ore and 27% coal.

In 2013, 75% of global ore shipments were going to China. Since 2008, China has been importing more ore than all other countries together (De la Rubia 2014). From 2013 to 2014, its iron ore imports were projected to grow from about 800 million tons to 900 million tons. China imported about 1.3 times as much as the big four iron ore producers Vale, Rio Tinto, BHP Billiton and FMG jointly produce (Zhang 2014). The main production and shipments originate from Australia and Brazil (each with about 20% of global reserves). This strong increase of Chinese ore imports has been driven by a similar increase in the output of the country's steel mills. The domestic supply of iron ore couldn't keep up with the demand and is continuously losing its share against imports. With China's GDP growth slowing down from above 10% during recent years to the roughly 7% that economists expect, and especially with construction activity shrinking for the first time in a decade, crude steel production and ore imports are likely to slow down over the coming years, though increasing steel exports may compensate for a slowing domestic demand to some degree (Zhang 2014). At the same time the big mining companies are undergoing a heavy expansion scheme, which is expected to increase the global iron ore supply substantially for the years to come. Just Vale's plans to double iron ore exports until 2020 could potentially create demand for 230 additional Capesize bulk carriers. Other significant recent developments in the dry-bulk markets have been two agreements between Vale and two Chinese state companies to coordinate the shipment of iron ore. The cooperation between Vale and Cosco involves the newbuilding of ten VLOCs of 400,000 dwt each. In addition, Cosco will take ownership of four of Vale's existing VLOCs. In the other agreement, Vale will cooperate with China Merchants Group in a newbuilding program for ten VLOCs (DNV GL 2014).

Even if most global coal production is used in domestic markets (e.g. inside China), coal lies ahead of iron ore with 29% of global dry-bulk shipments. India and China are the biggest importers; Australia and Indonesia the biggest exporters (Fang et al. 2013). While China's domestic coal production is flattening, imports cover the gap, resulting in fast growth in coal imports (Torp 2014). However, environmental challenges are forcing tighter regulation: China announced that it would restrict the production, consumption and import of coal with high impurity levels in a bid to fight smog, much of which is caused by using coal for heating and electricity. However, the possible effects on seaborne coal imports are difficult to predict. Firstly, it remains to be seen to whom the restrictions will apply, since there is some confusion as to which industries will be affected. Secondly, if domestic coal production cost starts to rise, the cleaner coal from sources far away from China could be more cost competitive, potentially increasing long-distance tonne-miles (DNV GL 2014).

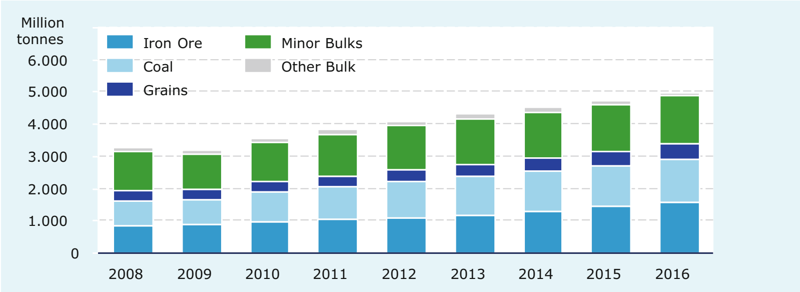

Fig. 1.6 Dry bulk demand development (seaborne trade) (*Source*: Clarksons (2008–14, actuals), DNV GL (2015/16 projections))

The markets for grain, oil seed and sugar are also assumed to grow. Some forecasts have a 50% growth from 2010 to 2030 with the USA and Russia remaining as the main exporters, and Africa, Latin America, the Middle East and Southeast Asia being the main importers (Fang et al. 2013).

1.4.3 Bulk Shipping Market Development

1.4.3.1 The Demand Side

As indicated above, the dry-bulk seaborne trade grew steadily over the past ten years with an exception in 2009 only. From 2008 to 2013, the CAGR amounted to 5.6% (Clarkson Research Services Limited 2015b) and the journey is expected to continue for the next couple of years with a CAGR of 4.7% for 2013 to 2016 (DNV GL 2015). Figure 1.6 shows the development by type of cargo since 2008.

1.4.3.2 The Supply Side

During recent years, the fleet has grown above transport demand. The CAGR from 2008 to 2013 was 11.2% and is expected to be 4.0% from 2013 to 2016 (IHS Maritime & Trade 2015). Figure 1.7 shows the development by sub-segment since 2008.

This fleet growth originated from a contracting boom in 2010, which resulted in strong deliveries in 2011 and 2012, when even high scrapping activity could not balance supply with demand (IHS Maritime & Trade 2015). Strong contracting in 2013 and 2014 will result in a further imbalance shortly. Figure 1.8 shows contracting by sub-segment since 2008, and Fig. 1.9 shows deliveries and removals.

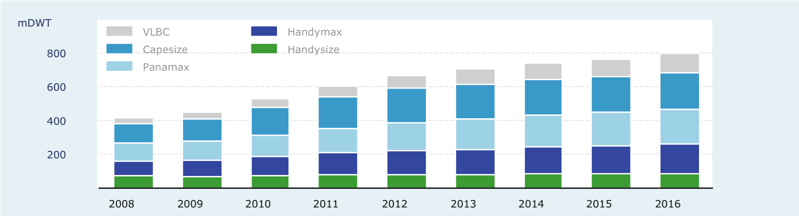

Fig. 1.7 Dry bulk fleet development (*Source*: IHS Maritime & Trade)

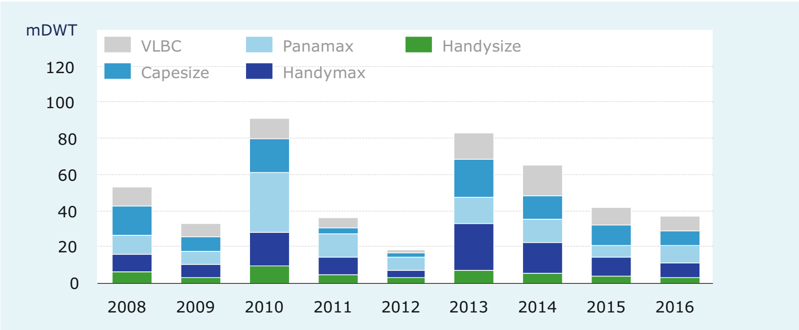

Fig. 1.8 Dry bulk (expected) contracting (*Source*: IHS Maritime & Trade)

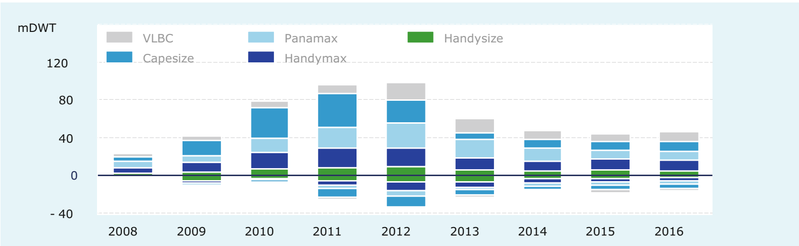

Fig. 1.9 Dry bulk (expected) deliveries and removals (*Source*: IHS Maritime & Trade)

1.4.3.3 Earnings

The earnings of bulkers can be expressed in one-year time charter rates (see Fig. 1.10 and Clarkson Research Services Limited 2015b) or on an aggregated level in the BDI. With the financial crisis of 2008 and its impact on the world economy, charter rates of Capesize bulk carriers dropped from about USD130,000 per day in 2008 to just slightly above USD20,000 per day

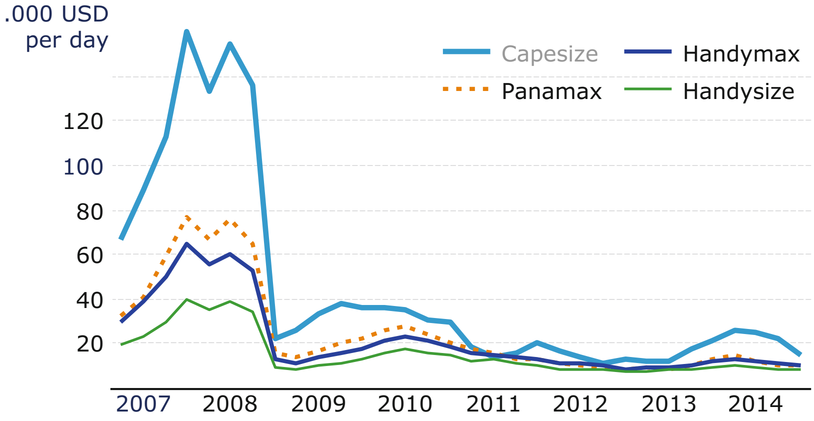

Fig. 1.10 Dry bulk, one-year, time charter rates (*Source*: Clarksons)

(a decrease of 85%). An increase to nearly USD40,000 per day in 2009 resulted in the order boom of 2010, which again put pressure on rates. In the smaller bulker segments the drop in 2008 was slightly lower. Since 2011, interestingly, the charter rates of Handysize, Handymax and Panamax bulk carriers hardly differ from each other. Looking ahead, the expected increase in transport demand for dry bulk should help earnings, but the strong contracting in 2013 and 2014 is likely to put continuous pressure on the rates.

1.4.3.4 Prices

Newbuilding and second-hand prices follow earnings. While the correlation between earnings and second-hand prices seems very high (they have dropped by about 60–70% since 2008), newbuilding prices follow earnings more moderately (they dropped by about 50% compared with 2008). The explanation lies in the shorter remaining lifetime (and thus investment horizon) of second-hand vessels compared with newbuildings. Figure 1.11 (Clarkson Research Services Limited 2015b) also shows that in the boom times the prices of second-hand vessels exceed those of newbuildings due to their immediate availability. The net present value of the second-hand vessels is mainly driven by the immediate high earnings during the current boom and only to a smaller degree by the cash flows of the mid and longer-term future. Due to the time lag between order and delivery, newbuildings may not benefit anymore from the current boom. Their net present value is rather driven by the mid and longer-term earning potential.

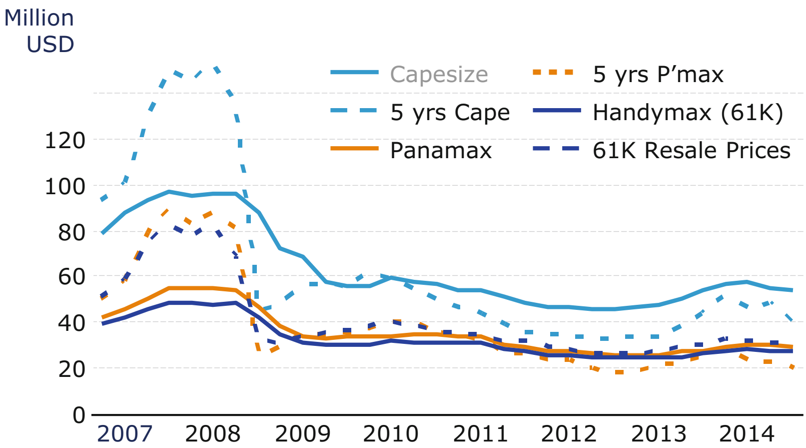

Fig. 1.11 Dry bulk newbuilding and secondhand prices (*Source*: Clarksons)

1.5 The Tanker Shipping Market

1.5.1 Structure of the Tanker Shipping Market

The tanker market comprises about 9,200 crude and product tankers with a total tonnage of about 265 million GT (a 23% share of the total merchant fleet) and about 1,600 liquefied petroleum gas (LPG) and LNG tankers of about 50 million GT (a 4% share of the total merchant fleet). The main sub-segments with their cargo capacity are listed in the table below. Size ranges per sub-segment may vary slightly depending on the source.

From a loading capacity (deadweight) perspective, the sub-segments appear to be overlapping. The difference, however, lies in the type of cargo; for example, that between crude oil (dirty tank cargo) and products and chemicals (clean tank cargo). As outlined earlier, both voyage charters and time charters are commonly used charter contracts in tanker shipping.

Crude	Ultra large crude carrier (ULCC)	>320,000 dwt
	VLCC	200,000–300,000 dwt
	Suezmax	115,000–200,000 dwt
	Aframax	70,000–115,000 dwt
	Panamax	50,000–70,000 dwt
	Handysize	10,000–50,000 dwt
Product	Long range 2 (LR2)	80,000–160,000 dwt
	Long range 1 (LR1)	55,000–80,000 dwt
	Medium range (MR)	25,000–55,000 dwt
Gas	LNG	Differentiated by volume and tank type
	LPG	Differentiated by volume and tank type
	Ethylene and other gas carriers	Differentiated by boiling point of the gas

1.5.2 Drivers of the Tanker Shipping Market

The main products in wet tanker shipping are crude oil and chemical products. "Dirty tankers" typically carry crude and heavy oil, while "clean tankers" carry refined petroleum products and chemicals. Seaborne crude trade is estimated at 37 mbpd (million barrels per day), while product trade is at about 22 mbpd (Clarkson Research Services Limited 2014).

In 2011, the main crude oil importers were Europe, North America, China and South Asia. Exports mainly came from the Middle East, Africa and the Commonwealth of Independent States (CIS), the regional organization whose participating countries are the former Soviet republics. Until 2030, economists are assuming strong import growth in China (even a tripling by 2030), South Asia and Southeast Asia, while exports are expected to grow from the Middle East and Africa. It is assumed that these trends will result in a massive increase in crude oil trade from the Middle East eastwards to China and other Asian countries (Fang et al. 2013). Russia and the USA are likely still to be the main producers in 2030, but uncoupling to some degree from seaborne crude trade. The USA is expected to develop from a crude importer to an increasing exporter of oil products and, potentially, even crude, due to the tight and shale oil "revolution" initiated by the wide use of hydraulic fracking in domestic oil and gas exploration. The new production technology has added 3 mbpd of production over the past two years and is now the highest since 1986. The drop in US crude imports, however, is likely to be (over-) compensated by the increase of Chinese crude imports (Sand 2014). Looking at the impact on crude oil tanker demand, the trend may even be positive, as relatively short voyages from West Africa to the USA are replaced by longer voyages to China/Asia. The longer hauls are said to lead to a 2.1% increase in tonnage demand (DNV GL 2014). Mid and longer-term development depends on the success of Saudi Arabia's attempt to force US tight and shale oil and gas producers out of business, with extremely low oil prices based on high production volumes. The continued low price environment obviously creates financial problems for costly US tight/shale oil producers but also for many other members of the Organization of Petroleum Exporting Countries (OPEC), who might try to influence Saudi Arabia to reduce production to sustainable price levels again. The use of VLCCs as floating storage is a temporary effect of a low oil price.

Trade with petroleum products and chemicals is less straightforward than crude oil trade. There are trends towards more local value add, with investments into refinery capacity in China, in the Middle East and in the USA, though build up in Latin America and Africa is limited; Europe is by comparison losing refining capacity. This indicates a need for more long-haul product trade through the Atlantic towards Europe which seems to have stimulated the heavy contracting of LR2 product tankers in 2013 (Hartland Shipping Services Ltd 2014). The demand increase for MR product tankers appears to be fueled by intra-Asia trades but may cool down again as soon as Chinese refinery capacity is up and running.

Looking at gas tankers, LNG needs to be differentiated from LPG and other gaseous products such as ethylene. LNG faces a boom as an energy source, especially since the Fukushima Daiichi accident in Japan in March 2011, with the increasing political intention to phase out nuclear power in many developed countries. Major investments into production and liquefaction capacity are currently being made in the Middle East, the USA, Australia, West Africa and Malaysia. Also, for the Arctic region there are plans for LNG floating production storage and offloading (FPSO) and floating storage and regasification units (FSRUs) (Roger et al. 2014). If these plans materialize, they will have a very significant impact on the need for VLGCs. For US exports alone, 80–130 LNG carriers could be needed by 2020. The pace and extent of this development, however, also depend on the development of the price of crude oil.

1.5.3 Tanker Shipping Market Development

1.5.3.1 The Demand Side

Overall, seaborne crude trade was steady in 2014 with about 37 mbpd. Due to longer hauls from West Africa to Asia, instead of shorter transatlantic routes to the USA, the deadweight demand increased by about 2.1%, which was mainly covered by the larger sub-segments (VLCC demand grew by about 4.2%). Also, floating storage has started to absorb capacity. Mid-sized crude tankers, as Aframaxes, suffered from lower European imports. Looking ahead, there is significant uncertainty, driven by the development of the oil price. Demand for product tanker capacity is increasing above 4%, mainly driven by MRs used in intra-Asian trades and by LR2s for the longer hauls (Fig. 1.12).

1.5.3.2 The Supply Side

The capacity of crude and product tankers has grown steadily over the past decade. The CAGR from 2008 to 2013 was 4.5% and is expected to be 2.7%

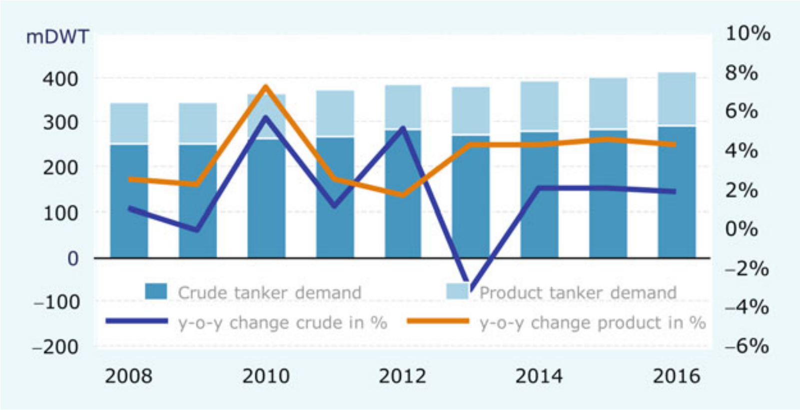

Fig. 1.12 Tanker demand development (*Source*: Clarksons (2008–14, actuals), DNV GL (2015/16 projections))

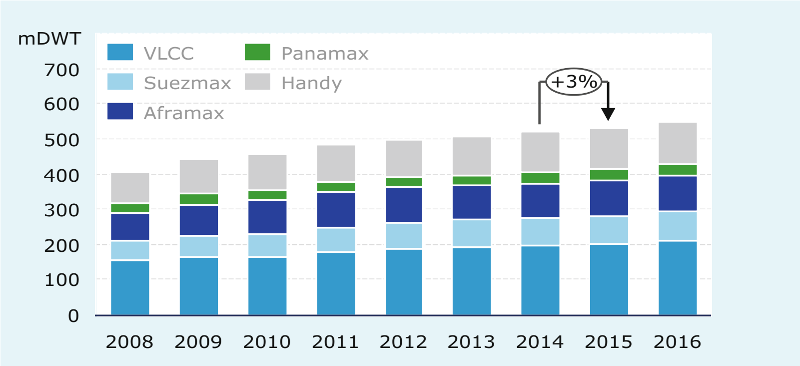

Fig. 1.13 Tanker fleet development (*Source*: IHS Maritime & Trade)

from 2013 to 2016 (IHS Maritime & Trade 2015). Figure 1.13 shows the development by sub-segment since 2008.

Contracting was low in 2011 and 2012 but strong in 2013 and 2014 (IHS Maritime & Trade 2015). Overall 12%, depending on the sub-segment between 7 and 18%, of the current tonnage is still in the order books (especially MR/Handysize and VLCCs). Figures 1.14 and 1.15 display recent and forecasted contracting and order books.

Scrapping activity was above average in 2010, 2012 and 2013, taking highest relative effect among Aframax vessels and VLCCs (see Fig. 1.16;

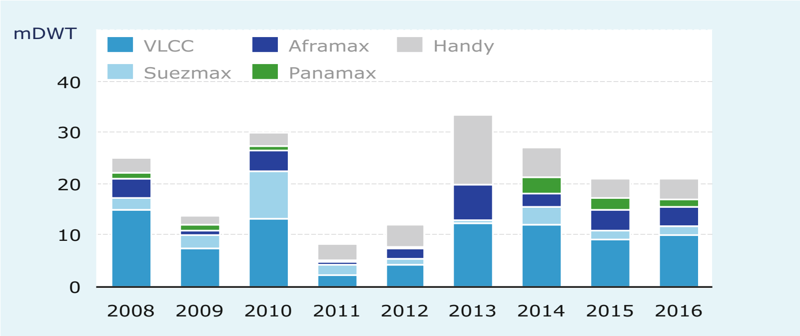

Fig. 1.14 Tanker (expected) contracting (*Source*: IHS Maritime & Trade)

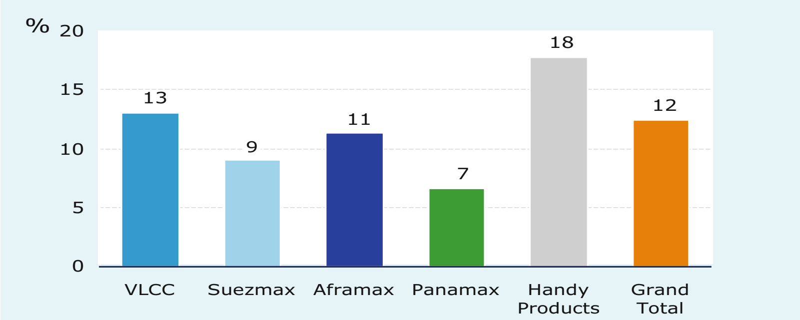

Fig. 1.15 Tanker order book vs existing fleet (*Source*: IHS Maritime & Trade)

IHS Maritime & Trade 2015). With currently high scrap values of about USD525 per ldt, this may remain an attractive option for semi-elderly vessels.

1.5.3.3 Earnings

Tanker earnings show a similar picture as displayed for bulk carriers. A sharp drop from 2008 to 2009 of about 80%, some recovery in 2010 and a largely horizontal development since then with some seasonality; that is, spikes towards the winter season in the crude segments. Interestingly, VLCCs, Suezmaxes and Aframaxes don't differ much in their freight rates, as seen in Fig. 1.17 (Clarkson Research Services Limited 2015b).

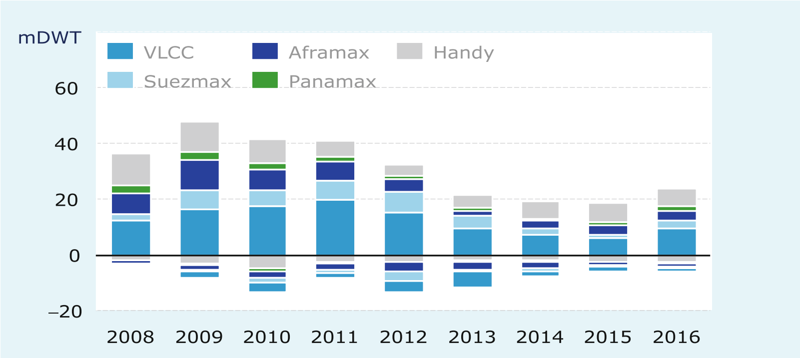

Fig. 1.16 Tanker (expected) deliveries and removals (*Source*: IHS Maritime & Trade)

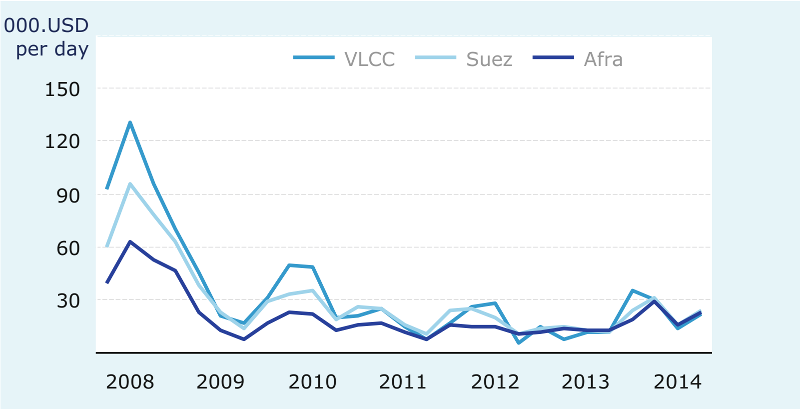

Fig. 1.17 Crude oil tanker earnings (*Source*: Clarksons)

1.5.3.4 Prices

Again second-hand prices largely follow current earnings, whereas five-year-old VLCCs can achieve prices about twice as high as those of Aframaxes and MR/Handysize, which were converging from 2008 to early 2014. As expected, newbuilding prices are more stable and showed largely horizontal development since 2009 (Clarkson Research Services Limited 2015b) (see Fig. 1.18).

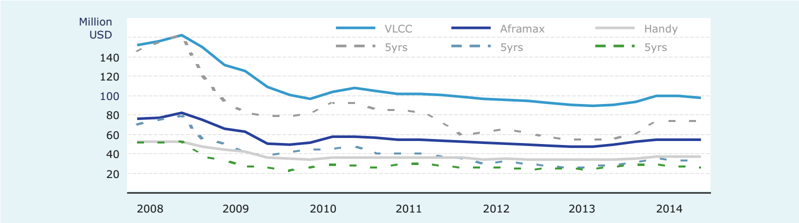

Fig. 1.18 Tanker newbuilding and secondhand prices (*Source*: Clarksons)

1.6 The Container Shipping Market

1.6.1 Structure of the Container Shipping Market

With about 5,100 vessels and 188 million GT (17% of world tonnage) the container segment is the third largest in merchant shipping. The main sub-segments with their cargo capacity are listed in the table below. Size ranges per sub-segment may vary slightly depending on the source.

Ultra large container vessels (ULCV)	>14,000 TEU
New Panamax	8,000–14,000 TEU
Post Panamax	5,000–8,000 TEU
Panamax	3,000–5,000 TEU
Sub Panamax	2,000–3,000 TEU
Handy	1,000–2,000 TEU
Feeder	<1,000 TEU

Further sub-segments are named according to infrastructural limitations (e.g. Bangkokmax with a draft of 27 feet), and differentiation is made based on the vessel's equipment, especially in the smaller segments (e.g. geared vs gearless). As outlined earlier, container vessels are typically chartered out in time charter contracts initially up to ten years, with subsequent short-term contracts down to two months.

1.6.2 The Drivers of the Container Shipping Market

Containerships transport all types of cargo in small parcel sizes; at first these were in 20 foot containers, but today 40 or even 45 feet are the norm. As containerized transport costs are higher compared to bulk shipment, goods in small parcel sizes or with a high specific value are shipped in containers. These are typically consumer goods. In 2005, the OECD published statistics with specific freight values ranging from USD20,000 per 40-foott container (retail prices) for assembled furniture to USD3.6 million for mid-range clothing. Consumer electronics ranged from USD70,000 to 430,000 (retail value). Even assuming a 100% trade margin and 20% VAT, this amounts to a cargo value from USD4,200 per TEU up to USD750,000 per TEU. At the upper end of cargo value, container shipping competes with air freight based on voyage duration and the resulting capital employment for the cargo.

Looking at trade routes in 2013, Asia to Europe (head haul westbound) made up 35% of global TEU miles, transpacific (head haul eastbound) 29%, intra-Asia 12%, intra-Europe 3%, transatlantic (head haul westbound) 3%, and 18% for other trades (Lunde 2014). Analysts anticipate container trade growth, especially intra-Asia, the Far East to the Middle East (head haul westbound), the Far East to Europe (head haul westbound), the Far East to Latin America east coast (head haul eastbound through the Panama Canal) and North America to Latin America (Fang et al. 2013). A major trend in recent years has been the increase in trans-shipments: 10% in the 1980s to about 30% today. More than 50% of these trans-shipments happen in China, Southeast Asia and other Asian countries (Frew 2014). Neglecting the current shipping crisis with overcapacity in container lines, this trend towards trans-shipments does not seem to have ended, especially with more ULCVs being delivered, which cannot access many ports. Another trend, accelerated by the shipping crisis, is the cascading effect. With overcapacity and high bunker prices (at least until mid-2014), economies of scale have gained more importance. Hence, the liners employ the largest possible vessels in their services to minimize slot costs. This cascading effect puts severe pressure on mid-sized and smaller container vessels (Frew 2014).

The growth in global GDP is typically used as an approximation for container trade development. Prior to 2003, there was a long term multiple of 3, between 3% GDP growth and 9% growth in containerized freight; 3% of the 9% originated from GDP, 3% from increasing globalization and 3% from the increasing containerization of cargo from bulker or reefer vessels to container vessels. Since 2003, this multiple of 3 does not hold true anymore. For 2014–2016, Howe Robinson expects a ratio of about 1.2 for global trade growth vs global GDP growth, and of 1.6 for containerized trade growth vs global GDP growth. In 2012 and 2013, both ratios have been about 1.0, and each of the figures grew by a good 3%. Hoehlinger (2012) evaluates further macro-variables to predict container ship trade, but not all of the correlations shown seem to be plausible explanations.

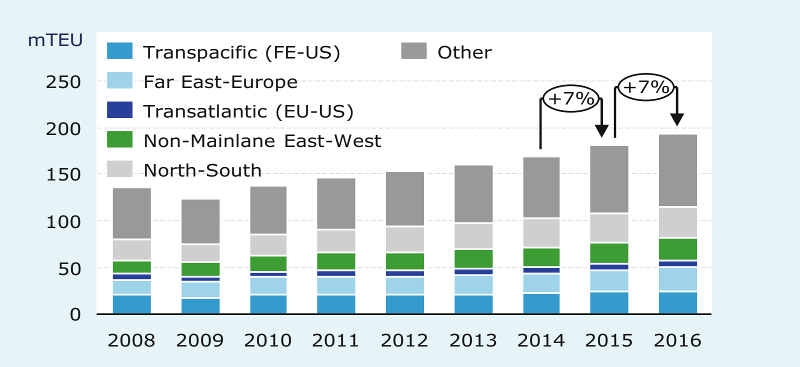

Fig. 1.19 Container vessel demand development (containerized trade) (*Source*: Clarksons (2008–14, actuals), DNV GL (2015/16 projections))

1.6.3 Container Shipping Market Development

1.6.3.1 The Demand Side

Between 2008 and 2013, the demand for containerized trade grew with a CAGR of 3.4%. Considering the drop in 2009 the CAGR was as high as 6.6% up until 2013 (Clarkson Research Services Limited 2015b). Analysts predict a CAGR of 6.3% for 2013–2016 (Hartland Shipping Services Ltd 2014), as also seen in Fig. 1.19.

1.6.3.2 The Supply Side

The supply of container tonnage grew even above demand with a CAGR of 7.3% from 2008 to 2013, and is predicted to increase further with a CAGR of 5.3% from 2013 to 2016, based on today's order book (IHS Maritime & Trade 2015). This growth will mainly come from new Panamax and ULCVs, as seen in Fig. 1.20.

After a limited market recovery in 2010, massive contracting was seen in 2011 and again in 2013 and 2014, based on the race between lines for bigger and more energy efficient capacity (IHS Maritime & Trade 2015). Of the new orders, 80–90% relate to vessels above 8,000 TEU, as seen in Fig. 1.21.

Based on 2013 and 2014 contracting, massive deliveries arrived on the market in 2014 and will continue to arrive in 2015 and 2016 (IHS Maritime & Trade 2015). Even if scrapping activities, especially in the Panamax segment, took some capacity out of the market, capacity growth above demand

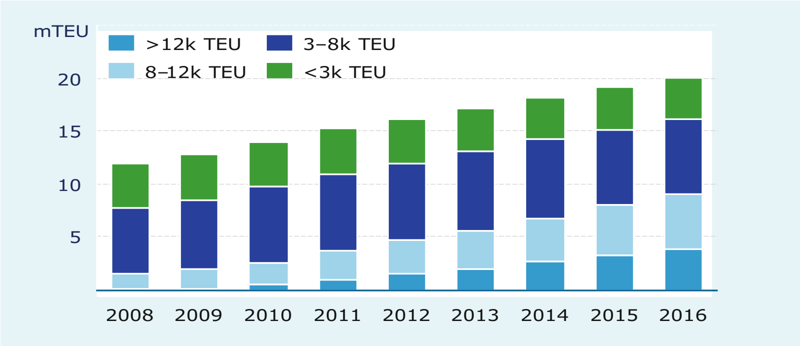

Fig. 1.20 Container vessel fleet development (*Source*: IHS Maritime & Trade)

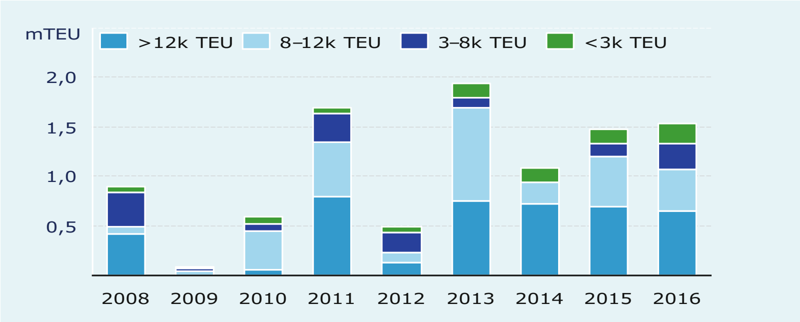

Fig. 1.21 Container vessel (expected) contracting (*Source*: IHS Maritime & Trade)

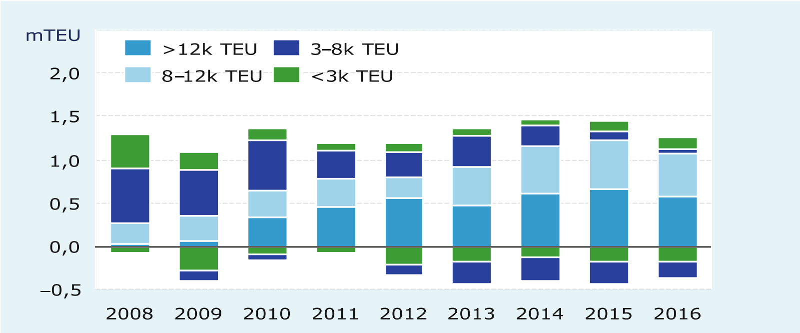

Fig. 1.22 Container vessel (expected) deliveries and removals (*Source*: IHS Maritime & Trade)

growth cannot be hindered, as seen in Fig. 1.22. The average scrapping age has decreased from 30 years in 2007 to 21 years in 2014 (Hartland 2014).

Between 2012 and 2014, we saw an idle (laid-up) container fleet of up to 300 vessels or 0.8 million TEU or 5% of the total. At the end of 2014, the idle

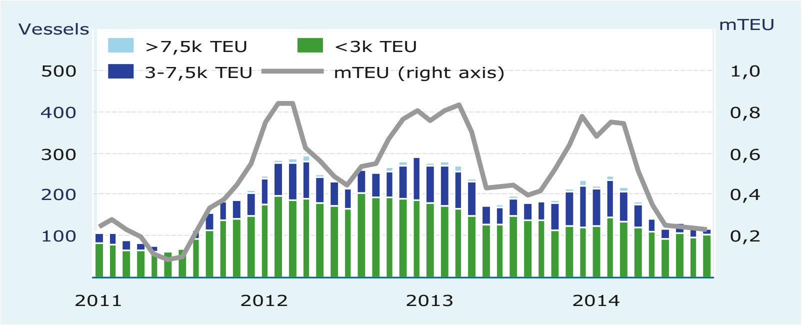

Fig. 1.23 Container vessel idle fleet (*Source*: Alphaliner)

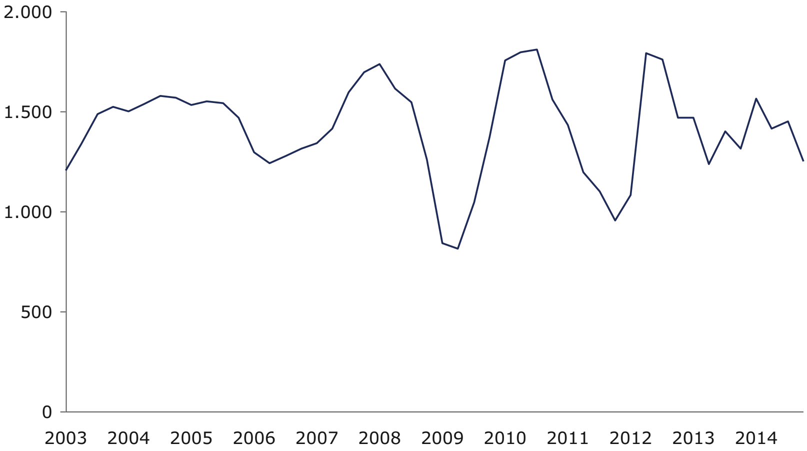

Fig. 1.24 Container freight rate development (CCFI China—Europe) (*Source*: Clarksons)

fleet had reduced to 1.3%, as seen in Fig. 1.23 (Alphaliner 2015). In addition, about 2.0 million TEU are currently absorbed by slow steaming, compared to pre-crisis speed patterns.

1.6.3.3 Earnings

As container shipping is determined by container lines, a first look at earnings needs to form a view on the development of freight rates. The SCFI and the China Containerized Freight Index (CCFI) are the most commonly used indicators of freight rate development, as seen in Fig. 1.24 (Clarkson Research Services Limited 2015b).

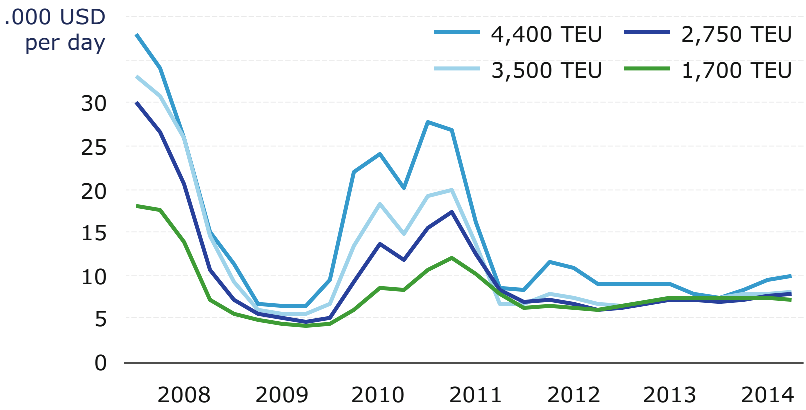

Fig. 1.25 Container vessel, one-year, time charter rates (*Source*: Clarksons)

Looking at the charter rates, various indices can be used: the Howe Robinson Container Index (see Howe Robinson 2014), Harper Petersen's HARPEX, the Container Ship Time Charter Assessment Index (ConTex) and others of lower importance; see Fig. 1.25 (Clarkson Research Services Limited 2015b). Comparing freight and charter rate development, charter rates are much more stable, as they look at longer time horizons and neglect seasonal effects.

1.6.3.4 Prices

As we have seen when looking at dry-bulk and tanker shipping, second-hand as well as newbuilding prices follow charter rates to some degree, with newbuilding prices obviously more stable than the second-hand prices. The price differences between the sub-segments remain fairly stable. Overall, newbuilding prices are about 40% below the 2008 level, a difference significantly smaller than in the other vessel segments. Also, the drop in second-hand prices was a bit more moderate, whereas the number of deals is very limited (76 in the first half year 2014). Many owners (or their banks) didn't seem to be willing to sell at low market prices, as seen in Fig. 1.26 (Clarkson Research Services Limited 2015b).

1.7 The Offshore Market

1.7.1 Structure of the Offshore Market

The offshore market comprises about 10,200 vessels (a 12% share of the total merchant fleet) with a total tonnage of just 50 million GT (a 4% share of the

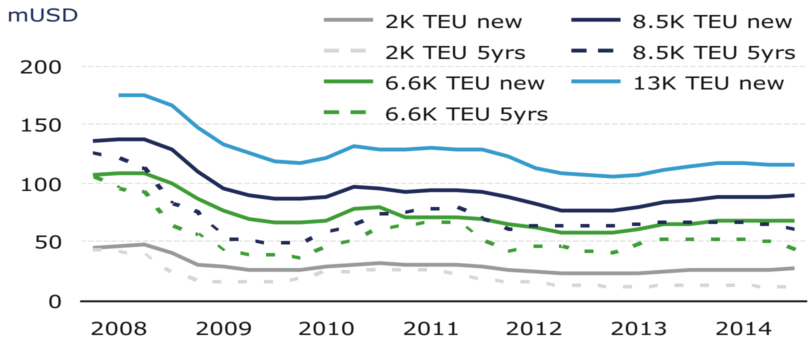

Fig. 1.26 Container vessel newbuilding and secondhand prices (*Source*: Clarksons)

total merchant fleet; Clarkson Research Services Limited 2014). The segment comprises numerous groups of offshore support vessels (OSV) as platform supply vessels (PSV), anchor handling, salvage and transportation tugs, cranes and erection vessels (including semi-submersibles), cable and pipe laying vessels, and all kinds of rigs and other mobile offshore units (MOUs). Overall, the sector is dominated by vessels serving the oil and gas industry. Compared to merchant ships, these vessels are largely fit for their specific purpose, and the liquidity on their markets is usually limited. A very detailed overview on the market is provided, for example, by the *Offshore Intelligence Monthly* report of Clarkson Research Services (Clarkson Research Services Limited 2015a).

1.7.2 Drivers of the Offshore Market

As the segment is dominated by vessels serving the oil and gas industry, the oil price is the single key driver for market development. While in the long run the oil price equals the marginal costs of exploration and production (E&P), it, in turn, determines which oil and gas fields can be explored and brought into production. In times of high oil prices, activities in challenging regions (deep sea, arctic) increase. In times of low oil prices, investments into these projects are reduced or stopped. This is what we currently observe.

The offshore market has been under pressure and is expected to remain oversupplied for at least the next two years. The current overproduction of oil (around 2 mbpd) has its impact on the oil price and hence the whole offshore industry. In addition more drilling vessels will enter this falling market in 2015 and 2016. The drilling contractors have taken the worst hit. Three of the five worst performers in the Standard and Poor's 500 index in 2014 were in fact drilling contractors (DNV GL 2015). As oil companies keep reducing their spending, more field developments are being postponed or cancelled. Due to the current situation, the ordering volumes for offshore units were reduced substantially in 2014; 2015 and 2016 are expected to be even worse. In the light of diminishing profits, rig owners are trying to cut their costs, and scrapping activity has started to increase. As many as 20 units have already been announced to be removed from the market, and we can expect this number to continue to grow (DNV GL 2015). In addition, the cold-stacking of old units has increased in order to remove the excess capacity. The rig utilization rate continues to go down as the gap between supply and demand widens. Many units compete for the same projects, which lead to falling day rates. As the day rates are moving towards break-even levels, fixing activity is also low.

1.7.3 Offshore Market Development

1.7.3.1 The Demand Side

As outlined above, the demand for the majority of offshore vessels is driven by oil and gas exploration and production. Sharp oil price increases from 2006 to 2008, and again from 2010 to 2013, have led to increased offshore activities reflected in E&P CAPEX, as seen in Fig. 1.27. According to Rystad Energy (2015), offshore CAPEX for 2014 have grown by only 4.9%. This year's forecast shows a negative development of 3.5%. Several oil companies have announced significant cuts in their E&P spending in the region of 20–30%. Nevertheless, Rystad expects that the prolonged level of low upstream spending will eventually lead to a lower oil supply and hence higher prices and also increased investments from 2017 to 2018.

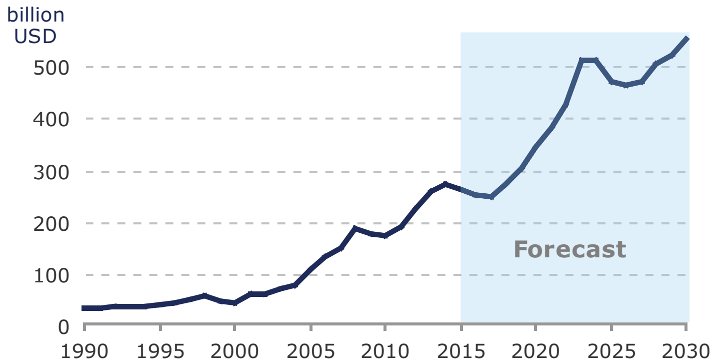

Fig. 1.27 Offshore exploration and production CAPEX (*Source*: Rystad Energy)

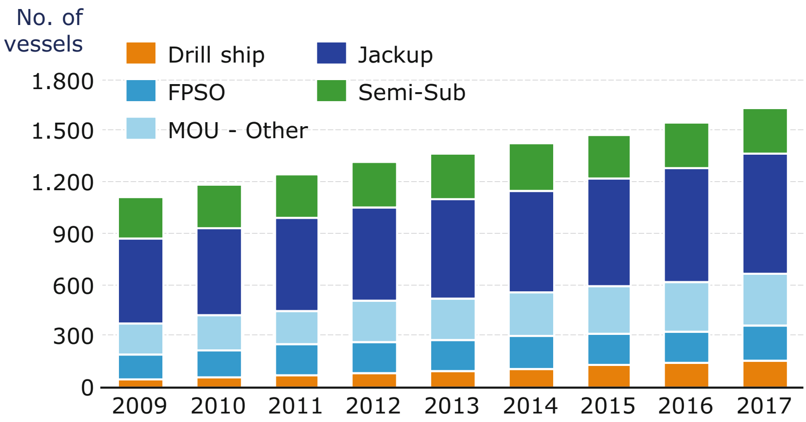

Fig. 1.28 Offshore vessel fleet development (MOU) (*Source*: Clarksons (2008–14, actuals), DNV GL (2015/16 projections))

Utilization rates have been steadily falling for the past year, with jack-up units being less affected compared to the floaters. The current utilization rate hovers around 90%, which is regarded as low.

1.7.3.2 The Supply Side

During recent years, the offshore fleet has grown steadily in number. For MOUs, the CAGR from 2009 to 2014 was 5.2%, with more than 20% annual growth in drill ships (Clarkson Research Services Limited 2015a, b). Assuming that contracted vessels will actually be delivered, this trend is going to continue until 2016/17 (DNV GL 2015); see Fig. 1.28.

Offshore support vessels have shown a similar development recently, with an overall CAGR of 6.2% from 2009 to 2013, with construction vessels growing at 12% per annum (Clarkson Research Services Limited 2015a, b). Figure 1.29 shows the development by vessel type. Known orders have already slowed down, so that a CAGR of about 2% is expected for fleet growth from 2014 to 2017 (DNV GL 2015).

Figure 1.30 shows the (expected) contracting for MOUs and OSVs (Clarkson Research Services Limited 2015a). In 2014, there were only 370 vessels contracted, which is far behind the number registered in recent years, representing only 40% of the volume contracted in 2007, which was a record year in terms of ordering. MOU contracting will probably also be lower in the next year (especially for drilling units). The uncertainty in the market has held back OSV owners from contracting new vessels. They seem to have taken

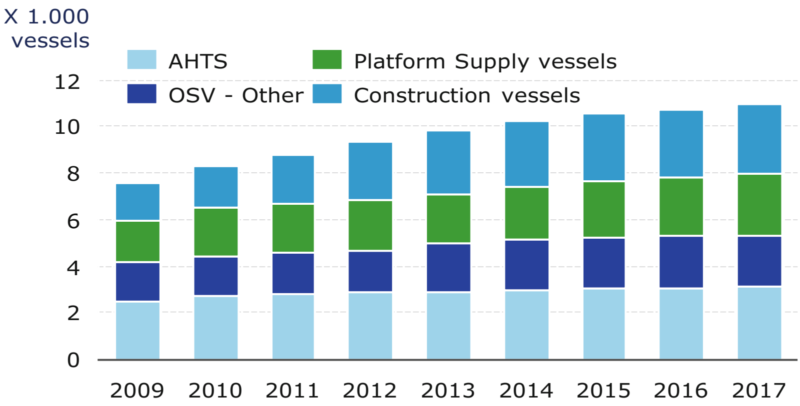

Fig. 1.29 Offshore vessel fleet development (offshore support vessels) (*Source*: Clarksons (2008–14, actuals), DNV GL (2015/16 projections))

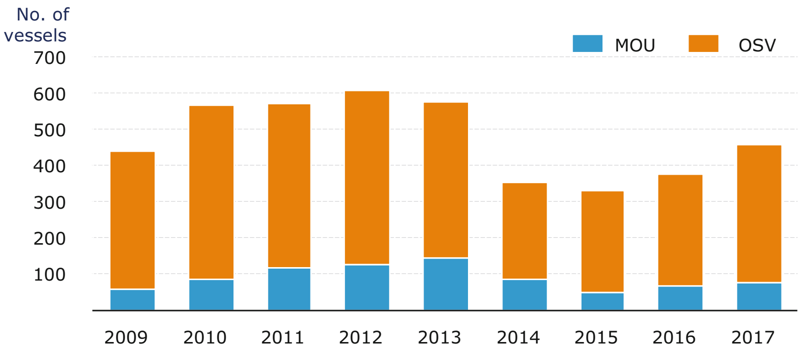

Fig. 1.30 Offshore vessel (expected) contracting (*Source*: Clarksons (2008–14, actuals), DNV GL (2015/16 projections))

a "wait and see" approach. DNV GL expects limited ordering, particularly in the PSV sector as the oversupply increases (DNV GL 2015).

Figure 1.31 displays expected deliveries and removals of OSVs and MOUs. With 550 vessels entering the market in 2014, newbuilding deliveries have been high (Clarkson Research Services Limited 2015a). Another 480 vessels are expected to be delivered in 2015. There will be fewer OSVs, but still a considerable amount of MOUs. As many as 200 drilling units are scheduled for delivery in the coming years, though several are being built on speculation and are likely not to be delivered on time, or even cancelled. Stacking and scrapping continues, as owners have to reduce their cost base.

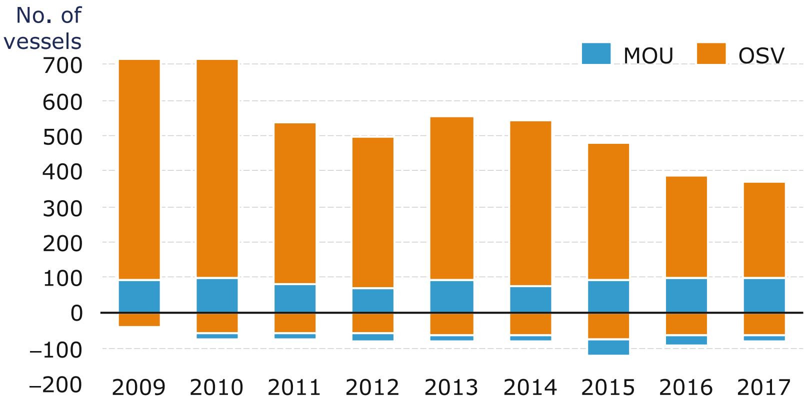

Fig. 1.31 Offshore vessel (expected) deliveries and removals (*Source*: Clarksons (2008–14, actuals), DNV GL (2015/16 projections))

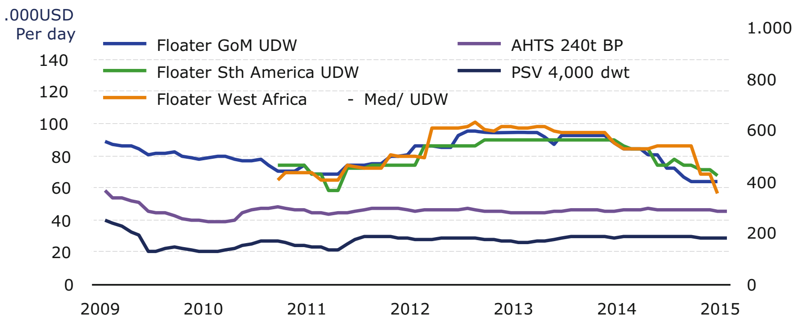

Fig. 1.32 Offshore vessel, one-year, time charter rates (*Source*: Clarksons)

A total of 33 old, uncompetitive and capital intensive floaters have been announced to be scrapped since January 2015. Most of them were semi-sub-drilling units, built in the 1970s. More removals are expected to be announced (DNV GL 2015).

1.7.3.3 Earnings

The earnings in the offshore segment can be expressed in one-year time charter rates (see Fig. 1.32). While OSV (for example anchor handling tugs (AHTs) and PSVs) earnings have been fairly flat since 2011/12, MOUs entirely lost in 2015 the 35% earnings increase they made between 2011 and 2013 (Clarkson Research Services Limited 2015a). Despite high rig availability, fixing activity has remained low, and oil companies have started to renegotiate existing contracts.

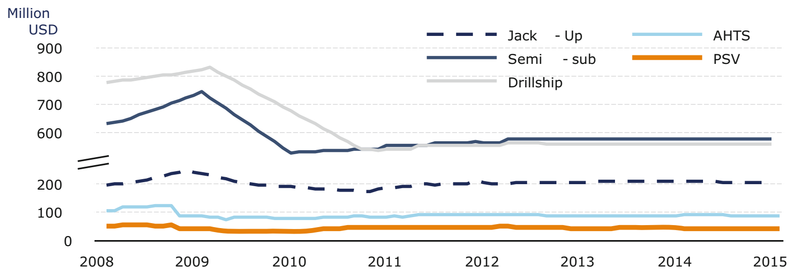

Fig. 1.33 Offshore vessel newbuilding prices (*Source*: Clarksons)

1.7.3.4 Prices

Newbuilding prices of MOUs, especially of drill ships, fell sharply after the financial crisis of 2008 and towards 2010, but have moderately recovered in 2012 and remain fairly stable. Prices of OSVs have been less affected and have remained fairly constant since 2011; see Fig. 1.33 (Clarkson Research Services Limited 2015a, b).

1.8 Summary

In the maritime value chain, shipowners, yards, charterers, cargo owners, freight forwarders, ship managers and brokers constitute various "shipping markets" regarding the vessel itself (newbuilding market, S&P market and demolition market) and the transport service which comes with it. Whereas the development of the world economy is the first driver of demand for shipping, the development of "global GDP" does not provide a valuable approximation for the demand side of shipping markets. Rather the ways regions interact and generate global GDP need to be looked at, resulting in shipping sector specific perspectives. The supply of transport capacity is determined by the existing fleet, newbuildings and scrapping. The laying-up of vessels and the variation of vessel speed offer some flexibility for reacting to supply–demand imbalances. Although shipping enjoys a fairly stable increase of transport demand of about 4% per annum, it regularly suffers from strong cyclicality. The actual challenge lies in the mid-term cycles of about seven years. Low entry barriers (sufficient yard capacity and availability of capital), fragmented markets with well-known leaders and many followers, timing effects (two to three years lead time until delivery, 25 years vessel lifetime) and a cost structure which allows temporary pricing at cash or marginal costs regularly result in shipping crises. The dry-bulk market is driven by coal

(29%, dominated by imports to China and India), iron ore (27%, of which 75% of imports go to China), grain and other agricultural goods (14%) and other minor bulks (30%). The wet-tanker market constitutes crude oil shipments (62%) and chemical product shipments (38%). Gas tankers primarily transport natural gas in the form of LNG and LPG but also numerous specialty gases. The third biggest segment is container shipping which covers all types of goods in small parcel sizes or with high specific value. The majority of them are consumer goods. The Asia to Europe trade route made up 35% of global container miles in 2013, followed by transpacific (29%) and intra-Asia (12%). The offshore segment is driven by oil and gas exploration and production. Ordering, delivery and scrapping follow the crude oil price. Rates are fairly stable for OSVs but have dropped for MOUs since the oil price decline in the first half of 2014.

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