1 Introduction

The international shipping industry transports about 90 percent of all goods traded globally today, yet this industry remains largely under the radar of modern society, which is why this book is needed. But at the outset, let me provide two additional reasons why I had to write this book. Today's modern shipping is facing a paradigm shift, based on two unignorable factors: China's economic realities, which have fundamentally changed the industry; and the transformation that software technology is imposing on shipping markets. Let us consider the China issue first. Ten years ago, we thought that China's ultra-high growth was in a relatively early phase but that it would have significant positive impacts on ship freight rates, above all when it came to bulk imports of raw materials such as ores, coal, oil, etc. I wrote about this period in an earlier book.[1]

Now, let us look back to around five years ago. China's growth was indeed very strong by then, largely based on imports of raw materials. As a result, the effects on the ship freight markets of shipping worldwide were considerable; in fact, supply of shipping capacity was lower than demand. This was the basis of another book.[2]

Today, further significant and fundamental structural shifts are taking place, with lower growth and a focus moving away from the dominance of imports of raw materials, above all in China. This country's economy is increasingly shifting towards the manufacturing of consumer goods. China's annual growth rate is also slowing down, from 9.9 percent in 1995 to 8 percent today, with a predicted drop to 5 percent by 2025. This sort of pattern is normal for economies that are shifting structurally from raw-materials-based manufacturing to a consumer market. Figures 1.1 and 1.2 demonstrate a very similar phenomenon in Germany, Korea, India, and Japan.

[1] *Shipping Company Strategies: Global Management Under Turbulent Conditions*, Elsevier, 2005.
[2] *Shipping Strategy: Innovating for Success*, Cambridge University Press, 2009.

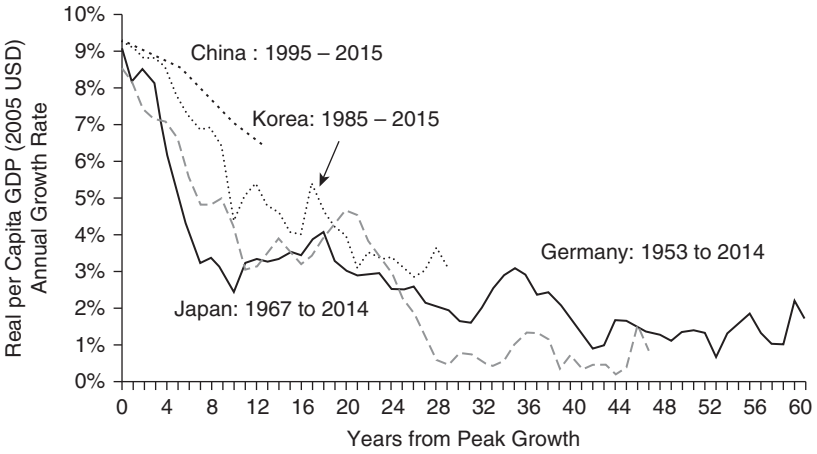

Figure 1.1 China's slowdown in context (Sources: World Bank; Marsoft, 2015)

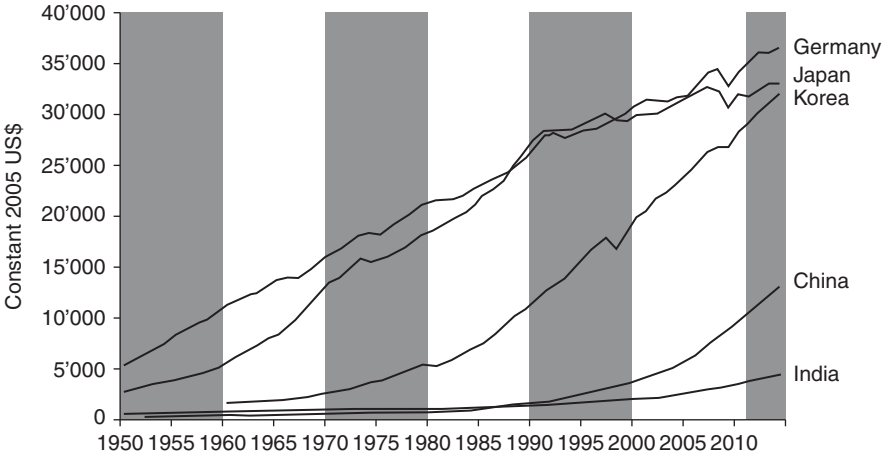

Figure 1.2 Growth in GNP per capita (China, Germany, India, Japan, Korea) (Sources: World Bank, Marsoft, 2015)

Let us consider the second factor, developments in software technology. So far, the shipping industry has been relatively untouched by developments in software technology; nevertheless, we are definitely seeing important changes, which I review in more detail in Chapter 6. It

should be remembered that the shipping industry has always been relatively conservative. Still, while it is not experiencing the same degree of transformation from software technology that many other industries have experienced, changes are emerging. Above all, several start-up companies are developing new services for the shipping industry.

There are at least six major effects on shipping freight rates as a result of this.

- Global freight rates are likely to be weakened, largely as a result of the drop in China's imports of raw materials. Bulk carrier freight rates are expected to be hit hardest. Tanker rates are still relatively strong but this may largely be due to the effect that shale oil production in the USA has had on oil prices, leading to longer transport routes for oil.
- Regional shipping trade is likely to grow, with increased exports of finished products from China to other countries in Southeast Asia, and imports from these countries in return, resulting in stronger freight rates for Southeast Asian regional shipping. This might hold for other regional shipping markets, too, such as the Caribbean and the Baltic states. While this is likely to have a positive effect on smaller dead-weight tonnage, the growth in primary transcontinental trade looks set to continue to slow.
- The export of finished products from China to Europe and the USA – electronics, TV sets, clothing, etc. – is likely to strengthen freight rates of container lines on east-west/west-east trade to Europe and the USA. However, this is unlikely to impact basic bull-carrier and tanker ship activities.
- Transportation and communications costs are falling dramatically, largely due to technological developments, but also to competition (see Figure 1.3).
- Shipping markets are being served in new ways. We see radically different alliances, such as the one between Alibaba and Maersk Line, where the former sells space in the latter's container capacity. This entails new, more convenient and on-time booking suggestions, trading in forward freight agreements (FFAs) rather than in physical ship capacity.
- New challenges are becoming a major concern. These partly relate to regulatory issues, such as emissions, and partly to safety issues, such as cyber security. Software is continually being developed to tackle these and other issues.

In parallel with these and other shifts on the demand side, we also see important changes in the supply of ship capacity. Shipbuilding has gone

through a revolution, with the major shipyards – mostly now in Japan, Korea, or China – able to deliver new tonnage at a faster rate than ever. The financing of these newbuilding activities is being increasingly taken over by national authorities, like the Chinese government, and emerging types of private investors, especially private equity funds such as Oaktree or Carlyle. I have written this book as a response to these structural shifts.

But back to China. Are we putting too much emphasis on China? Is China really this important? Are freight rates really determined by China to this extent? The answer to all these questions seems to be "Yes."

China, one of the largest countries in the world, is home to almost a quarter of the world's population. The effect on ocean freight rates from its imports of raw materials has been formidable. However, the relatively strong economic growth of China, in contrast to what we find in most of the rest of the world, has also had a positive impact on shipping freight rates. So, when China's growth begins to slow, ocean freight rates tend to collapse, as we have seen recently. In fact, most segments of world shipping are currently faced with excessively low freight rates and have been for some time. We can indeed talk about a crisis in shipping.

So, I somewhat tentatively conclude that we seem to be in the middle of a structural change in China and elsewhere that represents a paradigm shift. In this book, I discuss how innovative shipping strategies might be delineated today, in light of this paradigm shift, and in contrast to the realities the shipping industry has faced until very recently. I examine how the basics of successful shipping and efficient innovation processes in the shipping industry may also have changed.

The challenge of developing an "asset-light" strategy has also changed, and now there is a definite shift toward focusing on entire and not just partial value chains. So the organizational focus of shipping companies is on effective networking. Decision-making now focuses on fleets rather than on individual ships. The evolution of computer-based technology, above all software and cloud computing, has been a major contributing factor here. I discuss this in more detail in Chapter 6.

But before going any further, I will end this introductory chapter by summarizing the types of ships, and the changes and innovations in shipping I examine in this book.

Types of Ships

Bulk carriers transport mainly raw materials, such as coal, ore, grain, timber, pulp/paper, or cement. Most of the ships in this category are so-called *dry*, that is, they freight goods in cargo loads. There are also *wet*

bulk carriers that freight cargo (cement, for example) in tanks. The various bulk cargos are typically freighted in full shiploads.

Tankers are specifically designed to transport oil (crude or refined products), typically in full shiploads.

Container ships transport cargoes in usually twenty-foot but sometimes forty-foot containers. The capacity of container ships is expressed in terms of twenty-foot equivalent units (TEU), based on the maximum number of twenty-foot containers that a container ship can carry.

Special purpose ships, such as roll-on roll-off (Ro-Ro) car carriers, liquid natural gas (LNG) carriers, ferries, etc.

Key Changes in the Shipping Industry

Commodity Strategies: Basic Approach. The starting point for a successful commodity strategy is to try to understand the turning points in shipping freight markets, to be better able to implement meaningful *in*/*out* and/or *long*/*short* strategic decisions. A key question, therefore, is how realistically to determine such freight rate cycles, particularly now that the fundamentals are changing, with relatively less raw materials freight globally, and with more shipping capacity. Today, the issue is more to understand the effect on freight rate of the shift to finished goods and services, such as exports of food, clothing, electronics, etc., from China, regional trade, and so on. It is also more important to analyze newbuilding capacity and major trends in shipping innovations. This implies a shift in forecasting how more specialized, often relatively smaller, ships might be employed rather than the freight rates for ultra-large ships typically used for importing raw materials. It goes without saying that realistic forecasting can be difficult. This is the main reason why people turn to specialist forecasting firms such as Marsoft. However, it seems that focusing on a relatively small number of shipping markets may make more realistic forecasting easier, for example, with the benefit of concentrated efforts.

Industrial/Specialized Strategies: Basic Approach. As noted, an emerging paradigm shift is that shipping strategy might become part of a broader logistics pattern, for example, in huge industrial firms. Specialized shipping can allow industrial firms to integrate the shipping dimension in their value chain, allowing for relatively less own-manufacturing at home (Lorange, 2009) and much smaller inventories due to transshipment. An industrial firm would still be able to make full use of a given ship as part of its operations on a sale/leaseback basis. The funds freed up by doing so could be used for other purposes, for example, the firm's downstream investments.

Innovation. Innovations are changing all size classes of ships, including smaller ships. Examples include the 14,00 TEU SAVER class of large container vessels developed by Seaspan and the so-called 12,500 dwt MPP/HL vessels that have recently been developed by several shipping companies (BBC Chartering, Briese, Krey, Auerbach) located in the small German city of Leer. Such ships could become particularly competitive in emerging regional trades. Innovations in infrastructure are also being called for, as are process innovations in sales/buy-back and hub/spoke route arrangements. I examine this issue in detail in the case studies of Seaspan, A.P. Möeller-Maersk and Briese/BBC Chartering later in this book.

Innovations in Shipping

Four Key Issues

- The emergence of so-called paper trading (FFS), which allows a shipper to charter fewer units than an entire ship, and also opens up forward trading of part-units of ships, based on expectations of ship market rate developments.
- The emphasis on a review of the organizational culture of shipping companies to enhance their ability to conceive and implement innovations (Jenssen, 2003).
- Marketing: partly marketing good innovations effectively, through social media and the Internet (Lorange and Rembiszewski, 2014); partly marketing systems to the shipping industry, with a performance guarantee. I examine this in more detail in the case study of the Norwegian company Jotun later in this book.
- Innovations in shipping financing are also developing rapidly. Innovative project financing, such as Denstad's approach (described in Chapter 5) is an example. Other examples are related to the involvement of private equity in ship fleets, such as Carlyle's association with Seaspan's China expansion, or Oaktree's with the restructuring of TORM, cases that appear later in this book.
  - *Asset-light*. With the increased pressure on shipping companies to maintain a satisfactory level of profitability, there seems to be a strong drive toward operating ships without actually owning them – see the Western Bulk cases later in this book. Shipping-related firms that actually control cargo are especially well suited to take advantage of this. A good example is specialty chemical logistics companies, such

as Odfjell or Stolt-Nielsen, which not only own large fleets of specialty chemical tankers but also own/operate a number of tanker terminals, and run a service between these terminals as well, which in many ways is comparable to line operations. Here, Odfjell or Stolt-Nielsen "control" the cargo. This has opened up "sale/leaseback" for several of their ships. Container lines provide further examples. These focus on marketing approaches to attract cargo from shippers that will be transported through their network of liner services. These companies do not necessarily need to own their ships – they are marketers, not shipowners. Container ships are increasingly chartered in, as shown in the Seaspan, Danaos, or Costamare cases in this book (Jephson and Morgen, 2014).

– *Network organizations.* It is particularly important for shipping companies today to be as close as possible to the customer, that is, to have organizational activities in which the customers are also involved. This applies, for instance, to container lines that have an organizational presence in places like Singapore, Hong Kong, and Shanghai. It is essential for these companies to maintain nimbleness and focus on cost-containment, which involves a lot of outsourcing. Key specialists can be brought into the network on a contract basis. By pursuing nimbleness, the potential for speedy adaptation could be increased (Jenssen, 2003). The restructuring of A.P. Möller-Maersk, the world's largest shipping organization, into several independent entities was driven by the need for rapid adaptability – high growth and profitability were achieved through more streamlined organizational entities.
– *A new business model for shipowning firms?* The return on invested capital for many shipowning companies is clearly below standard today, given an extensive period of relatively low freight rates. A revised business model might be in order for shipowning firms. As well as striving to become less asset-heavy, focusing on innovations, and revising organizational forms, stronger links to customers' entire value chains might be needed. The use of cloud computing may be one answer to this. However, creating new business models is not so simple. Stopford (2015) has suggested that a key strategic focus should shift from decisions around individual ships to a fleet-wide perspective. The success of asset-light, IT-based platform owners, such as Uber or Amazon, is undisputed. Could an analogous approach be created in the shipping industry? Examples are emerging, as demonstrated in the DNV conference on this in 2015 (Klaveness, 2015), and I discuss this further in Chapter 6.

In this book, I consider these and other emerging factors. However, it is important to emphasize at the outset that an organization needs

to be able to position itself meaningfully to create value when it comes to paradigm shifts. This requires better implementation of basic strategy and business models for modern commodity, industrial, and specialized shipping. Changes like innovating to become more asset-light, creating organizational networks, shifting to a total fleet focus, and more effective adaptation of cloud computing are still in their infancy. So, let us now look at each of these issues in more detail.