Container shipping: Change of course towards sustainability

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After several decades of dynamic growth rates, the overall conditions for the container shipping business have fundamentally changed since 2008. The industry suffers on the one hand from substantial excess capacities and on the other hand from persistently fragile demand, resulting in low freight rates. Despite the challenging market environment, there are still some attractive opportunities, however. The market winners will be those companies able to gain cost advantages through global alliances and to achieve efficiency improvements, for example through lower energy consumption. For investors, this means identifying those marine oriented transport service companies which have been adept at identifying the opportunities arising from such challenges and which have an integrated business model geared towards sustainability.

Modern container shipping has its origins in the 1950s. From around the middle of the 1960s the industry experienced an unbroken run of dynamic growth lasting several decades. Up to 2008, the annual growth rate was around 9% on average in the long-term. The main reason for this sustained pace of expansion was the broader regional distribution of labour and the internationalisation of the value chain. This widening regional separation between production and consumption, symptomatic of globalisation, caused world trade to expand at a much faster pace than global GDP up to 2008.

Figure 1: Growth in trade volumes compared with global GDP growth

In 2009, in the wake of the global financial crisis, the container shipping business saw its volumes slump by around 10% for the first time in its history. Although container volumes have bounced back since then, the annual growth rates are much lower on average, as can be seen in Figure 1. They are likely to be around 5% at the most over the next few years.

Encouraged by the dynamic growth rates achieved in the past, shipping companies placed orders for the construction of new and substantially bigger ships. Given the fact that there is an interval of around three years between an order for a new vessel being placed and its actual completion, there is still a considerable number of new ships due to enter service in the near future. Since, on top of that, shipping companies are reluctant – despite lagging demand – to scrap their old ships that have already been written off in the books, excess capacities are likely to persist up to early 2016, as illustrated in Figure 2.

Figure 2: Supply and demand trends in the container shipping market

The imbalance between supply and demand since the start of 2015 has pushed down freight rates even further (see also Figure 3), after they had held up particularly...
well in trade with the USA, while shipping volumes between Europe and Asia and also within Asia itself at least remained relatively stable on the whole. One of the main reasons for this trend is a significant drop in Chinese exports to Europe on the one hand, and the slowdown of China’s economy on the other hand, which triggered a corresponding decline in import volumes.

Given the fact that growth rates on the supply side are not expected to ease off until 2016, freight rates will probably not improve before that point either – and even then, are only likely to do so if there is a sustained stabilisation of the Chinese economy.

Expanding regional production slows the rapid pace of globalisation

While the development of available container capacities can be predicted relatively accurately based on shipbuilders’ existing order books, forecasting trends on the demand side is much more difficult. Demand for container transport facilities will mainly depend on the performance of the global economy. Here the economic development of Asia (especially China), the USA and Europe will play a crucial role. This is clearly shown in Figure 4, which illustrates global container trade flows. The exceptionally high container volumes on the trading routes between Asia and Europe and Asia and North America contrast with the much lower volumes on the Europe-North America, North America-Latin America, and Latin America-Europe routes.

In addition to the cyclical effect, a structural factor has recently also been exerting a growing influence on global container volumes. While the cyclical factor affects volumes in both directions, the structural factor must be interpreted as clearly negative for future container volumes. This can best be described as a growing trend towards “near-sourcing” of semi-finished products and components for production and assembly on the one hand, and finished products for direct consumption on the other hand. The economic backdrop to this is to be found in the disproportionate rise in China’s wage costs in recent years, which has made the Middle Kingdom less attractive internationally than many other emerging markets located much closer to the USA (e.g. Mexico) or Western Europe (e.g. Romania). Figure 5 clearly highlights the outlined scenario of China’s deteriorating relative competitiveness compared with Mexico, based on the development of hourly wages paid over the past 10 years.

Due to the sharp rise in labour costs since the year 2000 and the high transport costs associated with the huge...
distances involved, the former star exporter China is not only increasingly lagging behind Mexico, but behind other countries as well. Even the gap between low-wage states within the USA is gradually closing, not least thanks to the much lower energy costs America now enjoys. As Figure 6 shows, China’s advantage in production costs compared to the US states with the most attractive overheads is now less than 10%.

As China continues its transformation from a low-cost emerging economy to a highly developed industrial and service-based nation, the trend described will become even more pronounced in future.

**High fixed costs encourage more firms to form alliances**

The container shipping industry is currently suffering not only from the major cyclical market uncertainties and structural challenges already described, but also the overall trend towards standardisation of the container transport services offering. On the client side, this is putting more emphasis on the price argument rather than focusing on the service. In terms of the services offered across the entire value chain, container shipping companies therefore have much less opportunity to differentiate themselves from the competition through their service offering. This is in stark contrast to the freight and logistics companies with a global footprint, such as Kühne + Nagel or Deutsche Post DHL.

Price agreements among the shipping companies are hardly possible given the existing strict anti-trust regulation. Alliances through mergers and acquisitions are also proving to be difficult due to the resulting negative synergy effects on revenue, and the inflexibility of the owners. Since at the same time operating on a global scale is absolutely essential, the only option left to shipping companies is to invest in bigger ships and at the same time form selective alliances with rival firms.

Shipping companies are now trying to slash their costs through economies of scale, by commissioning ultra-large container ships with a capacity of more than 12,000 standard containers. With this in mind, shipping companies have ordered more large ships – despite existing overcapacities – as illustrated in Figure 7. In the race for cost leadership, sheer size plays a key role, as shown by the significantly leaner cost structure of the global market leader Maersk compared with its peer group. The company has a cost advantage of around 10% compared with the sector as a whole. As a result, this Danish shipping giant remains profitable even as other container shipping companies are posting losses in the meantime.

As well as absolute cost pressure, cost flexibility is becoming increasingly important. For this reason, even the biggest shipping firms are forming alliances. Such alliances allow firms to collectively increase the loads of even the biggest ships, while at the same time reducing the total number of journeys made. However, the positive effect only acquires its full potential if at the same time the shipping company engages in active fleet management in a commercial sense. On the one hand, this includes getting the fleet structure right (range of vessel sizes and split between leased and owned ships), and on the other hand the careful monitoring of the overall fleet size, which includes scrapping outdated vessels actively.
Strict environmental standards put extra pressure on container shipping

Around 90% of total transportation in world trade is by sea. At the same time, the international shipping industry only accounts for around 10% of the energy consumed globally by the transport sector. The carbon intensity of the shipping industry is therefore essentially very favourable when compared directly with other modes of goods transport.

Nevertheless, the International Maritime Organisation (IMO) predicts that by 2050 CO₂ emissions could increase by a factor of 2.5 compared with 2007 levels – despite the assumption of much more moderate growth in international freight volumes compared with previous years. This is down to the cruise industry, which continues to enjoy high rates of growth in response to the backdrop of rising disposable incomes, demographic trends and the ongoing popularity of cruise holidays. According to the Cruise Lines International Association (CLIA), no less than 55 new ultra-large cruise ships are due to come into service worldwide by 2020, with a total investment volume of more than USD 25 billion.

The regulatory framework was first defined by the IMO in 1997, with specific standards on permitted CO₂ emissions only being passed in 2011. The two most important regulations finally came into force in 2013. They are based on the one hand on the Energy Efficiency Design Index (EEDI) and on the other hand on the Ship Energy Efficiency Management Plan (SEEMP). The EEDI sets minimal energy efficiency criteria for ships being commissioned for the first time. The SEEMP formulates a mechanism for improving the energy efficiency of older ships already in service. The implementation of the limits imposed by the provisions of the EEDI and SEEMP will lead to substantial improvements in carbon efficiency by 2030, as clearly shown in Figure 10.
existing value of 1.0%. Fuel with such a low sulphur content is likely to be around 50% more expensive than the typical bunker oil used to date. Total transport costs for transatlantic container traffic in particular will rise by about 20% as a result.

**Substantial potential for improving energy efficiency**

Apart from using modern diesel-powered ship engines, as developed by companies such as Wärtsilä (Finland), MAN (Germany) and Caterpillar (USA), energy efficiency can also be improved by a number of other nautical, physical and mechanical optimisations. As Figure 11 shows, speed optimisation is becoming exceptionally important when it comes to possible ways of improving efficiency. The savings potential is between 10% and 30%, while the second most effective measure – air lubrication of the ship’s hull – can increase efficiency by between 5% and 15%. Air lubrication involves blowing small air bubbles under the bottom of the ship. This lessens the direct contact between the hull’s outer shell and the water, thereby reducing the friction as the ship moves through the water.

**Figure 11: Measures to improve energy efficiency and their efficacy in %**

Another technology already in use is the “towing kite” system. This system is based on sails shaped like parachutes that hover around 150-200m above the freighter and propel the ship forward with the help of high-altitude winds. These systems provide savings of up to 10% in fuel consumption and CO₂ emissions. Fuel consumption essentially depends on the size of the ship and the speed it is travelling. There is an exponential rise in fuel consumption at speeds above 14 knots. For example, a container ship with a total capacity of 8,000 standard containers and travelling at 24 knots consumes around 225 tonnes of fuel per day. If the ship’s speed is reduced to just 21 knots, fuel consumption drops by as much as 33%, to 150 tonnes.

**Minor modifications to the hull construction have a major impact – example of the bulbous bow**

Ship building has seen the development of different hull shapes over the course of time. Attention has been focused on the structure of the bow, with the “bulbous bow” becoming particularly common for many large ships of modern construction. The distinctive bulb projecting under the surface of the water modifies the way the water flows around the hull, thereby significantly reducing drag. For the bulbous bow to have the desired effect, however, the ship must travel within a speed range which suits that particular vessel. Following the sharp drop in demand for container transport volumes in 2009, the shipping companies decided to reduce the speed of many ships (slow steaming), in order to save fuel. Since the contours of their ships’ bows were designed for a higher average speed (over 20 knots), many shipping companies decided to retrofit the bulbous bow to ships already in service so as to achieve optimum fuel consumption at lower speeds.

**Successful companies rely on sustainability, cost leadership and cost flexibility**

Given the challenging market situation of overcapacities on the supply side, low and very volatile demand, and depressed freight volumes, efficiency optimisation is becoming increasingly important. When weighing up capital commitment, delivery schedules and energy costs, it is the latter that are playing a more prominent role in con-
tainer traffic. Aside from the stricter international standards on emissions, the industry will therefore be steered towards a greater level of sustainability purely due to commercial considerations.

Cost reduction through economies of scale: To cut their costs, the world’s biggest shipping companies such as Maersk are relying on increasingly large ships. Combined with a reduced travelling speed that is ideally matched to the ship’s construction, fuel costs can be cut by up to 50%. Smaller shipping companies whose vessels are not so big will either be squeezed into niche markets or forced to fold completely.

Cost flexibility: Ideally cost leadership should go hand in hand with cost flexibility. By forming selective alliances, average load quotas can be optimised on even the biggest ships. One prime example is the G6 Alliance, which brings together five Asian shipping companies and the German shipping group Hapag-Lloyd. Japan’s Mitsui OSK Lines is also a member of the G6 Alliance. The company not only operates container and bulk ships, but also the world’s biggest tanker fleet. The operation of special spherical tankers for transporting LNG is in particular a very profitable business.

Companies linked to the freight shipping industry also offer attractive investment opportunities

While shipping companies are engaged in a capital-intensive business with corresponding financial risks, a number of associated companies have a business model that is far less reliant on investment.

Integrated logistics services companies: The two globally leading freight forwarding service groups, Kühne + Nagel and Deutsche Post DHL, run a business model which is closely linked with marine transport, but is, however, typically asset light. The central elements of their logistics services provide end-to-end integrated management of goods along their entire transportation route, which can include disposition, monitoring, insurance, warehousing, customs clearance, quality controls, scheduling and time-critical fine distribution, as well as other services. These companies also tend to offer dedicated solutions for customer who need to transport particularly tricky goods such as perishable, dangerous or very valuable items. From the freight forwarders’ point of view, shipping companies are merely an outsourced transportation service that the logistics com-

Alternative forms of propulsion for freight vessels: Developing sustainable solutions is gaining traction

There are already many technical measures available for reducing the CO₂ emissions of conventional ship engines. Although there is still no sign of an immediate switch to alternative propulsion systems that only emit a fraction of current carbon dioxide levels, concrete solutions are already starting to emerge. The first step is for the industry to switch from heavy fuel oil to liquefied natural gas (LNG). This would reduce carbon emissions by around 20%. At the moment, however, there are still a number of logistical and financial hurdles preventing the switch to LNG. Building ships powered by LNG costs roughly 30% more than conventional ships. On top of that, most dockyards do not have adequate LNG refuelling and storage facilities. Even so, LNG may still offer an interesting interim solution in the short to medium term. But in the long run, LNG itself is unable to offer a big enough reduction in CO₂ emissions. Research is therefore under way into concepts other than those based on conventional fossil fuels. Here the focus is moving back to an ancient form of propulsion completely forgotten by the modern shipping industry: wind power. For example, a European network of companies and universities is pushing ahead with a design concept for an Ecoliner. An Ecoliner is a freight ship with a capacity of more than 8,000 tonnes and a total length of 138 metres. The ship is powered by a hybrid system comprising four large, fully automatic sails and a diesel generator. At least 50% of the energy is generated by wind. The rest comes from an electric motor that draws its power from a diesel generator. Using biofuels would make the vessel almost completely carbon neutral. But it will take several years before such ships become widely available.

Picture 2: Ecoliner: concept study

Source: www.fairtransport.eu, 2015
Companies deliberately avoid providing themselves, thereby tying up less capital and ensuring a lower fixed cost structure.

**Operation of container terminals:** Like shipping companies, the operators of container terminals in the world's major ports can also be seen as partners of logistics groups and take on clearly defined functions on their behalf. Despite the infrastructure required (cranes, conveyor systems, extensive IT systems), the operation of container terminals is much less capital intensive than operating container ships, as the ports themselves still tend to be owned by public authorities. Hamburger Hafen + Logistik (HHLA), for example, not only operates container terminals in the port of Hamburg and Odessa, but loads the containers straight onto the rail network and transports them, using its own subsidiaries, to the major rail container hubs in Prague and Warsaw. The integrated logistics model is not only attractive in terms of transport and logistics, such as cost efficiency, high reliability of delivery and punctuality, but also due to its strong sustainability credentials.

**Conclusion:** Sustainable investment process and proprietary ESG analysis improve stock picking

The findings of this report clearly show that container shipping is an extremely challenging industry. The trends described will have a significant influence on the competitiveness of individual market players. Despite the challenging market environment, this industry still offers very attractive investment opportunities. However, comprehensive in-depth research is essential in order to identify those marine oriented transport service companies likely to be successful over the long run. From the viewpoint of a sustainable portfolio manager, this involves a detailed assessment of the environmental, social and governance (ESG) factors and the analysis of overarching industry trends, among other things. Bank J. Safra Sarasin’s proprietary sustainability analysis, combined with clearly structured investment processes, ensures that only the best companies in the sector are included in the sustainable investment funds or in our clients’ mandates (“best-in-class” approach). The analysis of individual companies and sectors by Bank J. Safra Sarasin in this report shows that potential investors should clearly favour those companies that follow a proactive strategy to optimise their energy efficiency and which also benefit from positive economies of scale and flexible cost management.

**Sustainability rating of freight shipping companies:** Strong focus on environmental criteria

Bank J. Safra Sarasin’s sustainability analysis plots two dimensions with the help of the Sarasin Sustainability-Matrix®: the ratings of the various sectors are plotted on the X axis according to their sustainability risks. The further to the left a sector lies, the greater the associated risks. The Y-axis shows how effectively the company in question manages to take into consideration the sustainability opportunities and risks in its sector, according to the “best-in-class” approach. Due to its significant environmental impacts, the marine shipping sector is rated as “below average”. This means that the securities of marine shipping companies are only eligible for Bank J. Safra Sarasin’s sustainable investment products if their sustainability score is significantly better than their peers (shaded area of the matrix).

The sustainability rating is based on three criteria: environmental, social and corporate governance (ESG). Between five and ten specific key issues are defined for each criterion, and these are used to assess the individual companies. The key themes are then given a different weighting in the final sustainability rating, depending on the industry in question. In the marine industry, the following key issues are analysed:

- CO₂ emissions (E)
- Toxic emissions and waste (E)
- Health and safety of the workforce (S)
- Ownership structure (G)
- Board of Directors (G)
- Management remuneration (G)

The environmental criteria are given the highest weighting, at 50%. The social dimension has a weighting of 30%, and corporate governance 20%.

![Positioning of selected companies in the Marine sector on the Sarasin Sustainability Matrix.](image)
If, over the course of the coming year, the available container capacities do actually decline as expected and demand starts to pick up in response to a recovering Chinese economy and robust economic performance in Europe, this could well present interesting investment opportunities for risk-aware investors. These could be in connection with one of the commercial shipping companies described in this report, or with one of the named companies that has well positioned itself in the market through a less capital-intensive business model.
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Sustainability Rating Methodology
The environmental, social and governance (ESG) analysis of companies is based on a proprietary assessment methodology developed by the Sustainable Investment Research Department of BISS. All ratings are conducted by in-house sustainability analysts. The sustainability rating incorporates two dimensions which are combined in the Sarasin Sustainability-Matrix®:
- Sector Rating: Comparative assessment of industries based upon their impacts on environment and society.
- Company Rating: Comparative assessment of companies within their industry based upon their performance to manage their environmental, social and governance risks and opportunities.

Investment Universe: Only companies with a sufficiently high Company Rating (shaded area) qualify for Bank J. Safra Sarasin sustainability funds.

Key issues
When doing a sustainability rating, the analysts in the Sustainable Investment Research Department assess how well companies manage their main stakeholders’ expectations (e.g. employees, suppliers, customers) and how well they manage related general and industry-specific environmental, social and governance risks and opportunities. The company’s management quality with respect to ESG risks and opportunities is compared with its industry peers.

Controversial activities (exclusions)
Certain business activities which are not deemed to be compatible with sustainable development (e.g. armaments, nuclear power, tobacco, pornography) can lead to the exclusion of companies from the Bank J. Safra Sarasin sustainable investment universe.

Data sources
The Sustainable Investment Research Department uses a variety of data sources which are publicly available (e.g. company reports, press, internet search) and data/information provided by service providers which are collecting financial, environmental, social, governance and reputational risk data on behalf of the Sustainable Investment Research Department.
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