



# Valuing ships the LTAV approach

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The purchase or sale of ships or shipping companies, raising equity or debt capital on the capital markets, collateralizing ship or company-related loans from banks, or considering impairment for external accounting. The reasons to value a ship are many and varied. The Long Term Asset Value (LTAV) – a ship valuation method based on a discounted cash flow model (DCF) – has been in place since 2009. At a time when economic pressures are encouraging shipping companies to make significant changes to their fleets, application of the LTAV is more relevant than ever.

### **Current market situation**

The bankruptcy of South Korea's Hanjin Shipping in 2016 marked the peak of the global crisis in the container shipping industry. Some news outlets compared the event to the failure of Lehman Brothers in 2008.

Huge overcapacity in the market has led to increasingly intense price competition, pushing down freight rates. As a result, profitability of many industry players has fallen significantly. This ultimately led to the bankruptcy of Hanjin Shipping, the world's seventh largest container shipping line.

The market has since consolidated. While the top five container shipping companies had a market share of 31 percent in 2000, this had risen to 65 percent by 2019. But despite consolidation helping companies to achieve higher freight rates, the outlook remains unstable.

Political uncertainties such as the trade war between China and the US, Brexit and tensions in the Middle East could adversely affect the global economy, and the shipping industry in particular.

New environmental regulations have added to pressure on the industry. A new regulation came into force this year that requires shipping companies to use more environmentally friendly fuel that is more expensive. Smaller companies in particular may not be able to pass additional costs on to customers due to their relatively low bargaining power.

Even in the face of such uncertainties, the industry is expected to grow – although slowly. To improve profitability, many companies are scrapping parts of their current fleet and ordering larger ships. This should reduce average costs per container.

Such changes to fleets is just one example of why valuation in the shipping industry is highly relevant at the moment.

### **Valuation of ships using the LTAV approach**

As with any asset, the value of a ship should be determined solely on the basis of future profitability, i.e. its capacity to generate financial surpluses. The LTAV approach is a discounted cash flow weighted average cost of capital (WACC) approach based on the future free cash flows that the valuation object can generate through use. The future free cash flows are discounted to the valuation date using a risk-equivalent discount rate.

The objective of the LTAV approach is to provide a valuation basis that is independent of price fluctuations and oriented to a ship's long-term earnings potential. This approach is widely accepted in the industry, as it is a conclusive concept that leads to resilient results even in times of crisis. Moreover, it would not be clear why different valuation principles should be applied to ships than to real estate or companies, for instance.

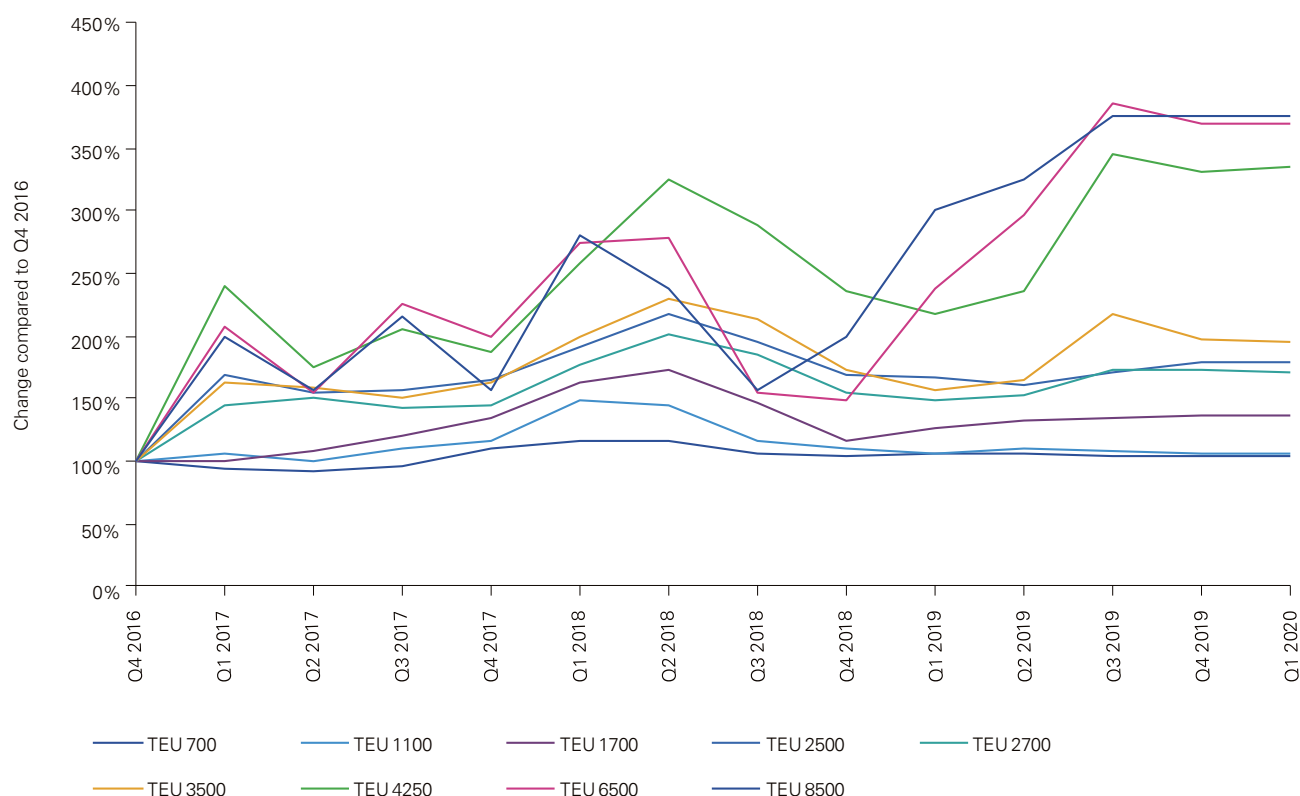
### **Determining cash flows**

To determine the cash flows relevant to a valuation, all income and expenses relating to the ship's operation are to be estimated as realistically as possible using operating value drivers. The charter rates achievable in the market wield a particular influence over a ship's value. The market is still recovering from the crisis that peaked in 2016 with the bankruptcy of Hanjin Shipping that year. The following chart illustrates the volatility of prices over recent years.

For the duration of an existing charter contract, the charter rates are to be applied in accordance with the provisions in the contract. For the time following expiry of the charter contract, the follow-up charter rates expected at expiration should be applied. By contrast, a simplified reference to an average of recent (e.g. ten) years is not appropriate for future expectations. This is because a valuation requires relevant data that is future-oriented. Volatility over recent years has made historical data even less meaningful for this purpose.

Charter rates should rather be forecast on the basis of current charter rates in the market for the respective ship type. It is important to note that it can often be several years before existing charter contracts expire. In this case, currently achievable rates must be projected into the future. Any forecast should take account of the respective market situation.

## Container Freight Rates over time



Source: Harper Petersen, KPMG analysis

For instance, possible rate increases should be considered with caution due to existing overcapacity at present.

As charter rates are usually paid on a daily basis, the corresponding operating days should be specified. The maximum possible anniversaries should not be used, but always take into account a laytime due to technical reasons or overhauls or repairs.

Operating costs (e.g. crewing expenses) for the ongoing operation of the ship are to be considered as major expenses. Operating costs can be easily derived regularly from the ship's past operations, taking inflation into account if necessary. Cost reduction measures should only be reflected if they have been planned sufficiently concretely and the effects are realistic. If such measures involve (advance) payments, for example for conversions to the ship,

these should also be recorded. Moreover, management costs must be incorporated. These are to be calculated depending on the contract structure as a function of charter revenues or – as has increasingly been the case in recent years – as a fixed fee per year. The class costs for the ship, i.e. the costs of the recurrent assessment of its structural condition, are to be recorded in full in the period in which they are incurred – with reduced operating days in years in which the class is due.

### Estimating the residual value and other valuation parameters

Finally, the ship's residual value at the end of its economic life must be estimated. This is determined based on the weight of the ship and the expected price of steel. In practice, the current price of steel is often used for simplification purposes due to a lack of

information on steel price trends. Travel costs for scrapping should also be taken into account where appropriate. In a ship valuation, the relevant periods are defined by the ship's remaining useful life. Due to the oversupply of ships, it is currently recommended that the remaining useful life should be total useful life, which is less than the technical useful life.

The WACC is to be used for discounting. In accordance with the Capital Asset Pricing Model, it includes

- Cost of equity – consisting of a risk-free basic interest rate and a risk premium that comprises the general market risk premium and the (asset-) specific beta factor, and
- The cost of debt – consisting of a risk-free basic interest rate plus a risk premium (spread).

### Limitations of single-value models

The above-mentioned value drivers are to be predicted over a comparatively long period of use of up to 25 years in the context of a ship valuation. In addition, some of these value drivers have been subject to significant fluctuations in the past. The current market situation means that considerable planning uncertainty can be expected going forward. These single-value planning models frequently used in practice merely add up the income and expenses once they have been determined. Even though the single-value planning model is suitable for standard valuations, it reaches its limitations in more complex valuations. The reasons for this include single-value planning models not taking into account the fluctuation margins of the value drivers and distribution curves within these fluctuation margins.

### The advantages of multi-value models

Instead of single-value models, multi-value planning models should be used when valuing ships. Monte Carlo simulations are especially suitable for mathematically mapping value drivers' fluctuation margins. For this purpose, the bandwidths of the main value drivers, such as transport volumes, charter rates, bunker prices and exchange rates, are to be estimated after a detailed analysis of internal and external information. Based on the analysis of the value drivers, a distribution curve can also be determined for the respective value driver within its value range.

By using a multi-value planning model, planning uncertainty can be comprehensively taken into account in the valuation and a resilient value range for the ship determined based on this. Furthermore, Monte Carlo simulations allow the (maximum) influence of individual value drivers to be separated in the valuation.

In such times of uncertainty, confidence in valuations is critical. Due to their neutrality and expertise, an

external expert can make a valuable contribution to the acceptance of the valuation results by all parties involved, both in the analysis and sensitization of the planning as well as in the valuation itself.

A ship assessment carried out and documented in accordance with the principles set out in this article may

further increase stakeholders' acceptance of the LTAV approach. Potential sellers and purchasers of ships receive a comprehensible basis for negotiations to determine the purchase price; lenders have a reliable basis for collateralizing loans; and accountants have comfort over the values stated in the balance sheets.



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