

Travel, Logistics & Transport Infrastructure Practice

Data will decide success in the next normal of bulk and tanker shipping

COVID-19 and commodity-related trends are likely to depress medium-term demand, but companies that can leverage deep market insights will have the opportunity to outperform in the postcrisis economy.

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Bulk shipping has been attenuated for the past decade, despite some short-lived rebounds. In the medium term, the impact of COVID-19 and commodity trends is likely to continue to depress demand, dampen rates, and pose a number of other logistical challenges to the bulk and tanker shipping sector.

Even in this challenging environment, however, we see potential opportunities to outperform. Data is more accessible than ever, which means companies can access deep market insights around economic and commodity trends, shipping analytics, and customer information. Industry players that invest in analytics can use data-led insights to seize opportunities in four main areas: finding attractive subsectors and niches, optimizing vessel portfolios, improving commercial choices, and operating existing vehicles more effectively.

The bulk and tanker shipping industry has historically been characterized by more instinctive decision making (based on judgment and experience), so this will require a step change in analytics capability. The investment will be significant, but those companies that fully leverage the new data sources and cutting-edge analytics techniques will be well positioned and resilient in the postcrisis world.

Bulk and tanker shipping slowed due to COVID-19, a challenging economic environment likely to persist in the next normal

Declining demand has led to sluggish growth in bulk and tanker shipping during the past decade. COVID-19 has compounded many of these issues; the slowdown in global economic growth has further decelerated demand for key bulk commodities, leading to a sustained oversupply of shipping capacity. The bulk shipping market grew at a CAGR of just 1.3 percent between 2015 and 2020, for example, and growth rates are expected to hover at around 0.8 percent per annum until

2030, with the fall in growth driven largely by declining Chinese demand for coal and iron ore.¹

Despite slowing demand, the supply capacity of the dry bulk shipping market is expected to continue to increase. Shipbuilding is expected to add 3 to 4 percent to active capacity annually in the next ten years, while decommissioning will remove around 1 to 2 percent. The comparatively low rate of ship scrapping is due both to the relatively young age of the global dry bulk fleet (average ship age is 10.2 years²) and to the low price of scrap. Overall, therefore, supply will increase at a CAGR of 1 to 3 percent.

This mismatch between weak demand and growing supply could depress rates over the coming years (Exhibit 1). Rates for dry bulk shipping experienced a surge before the 2008 financial crisis because of the strong demand for many commodities (including iron ore, coal, and grains), but have remained low since, and are not expected to rebound in the coming years.

The tanker shipping sector also faces significant challenges. COVID-19 and a number of recent geopolitical challenges have had a significant impact for major commodities such as crude oil (Exhibit 2). Shipping demand has contracted sharply and—despite a slight short-term rebound—is expected to remain at a low level in the medium term, and then decline further after 2032 as a result of the energy transition. Tanker shipping capacity is likely to grow steadily, driven by a large number of outstanding orders. Again, this low demand growth and steady supply growth will likely lead to a sustained oversupply of tanker shipping capacity in the next five years.

Uncertainty around environmental regulation may negate some of the projected excess shipping capacity. There is still a lack of clarity around several environmental questions, including the level of greenhouse-gas reduction targets and the right fuel choice for the future. Ongoing uncertainty might dampen shipbuilding orders by

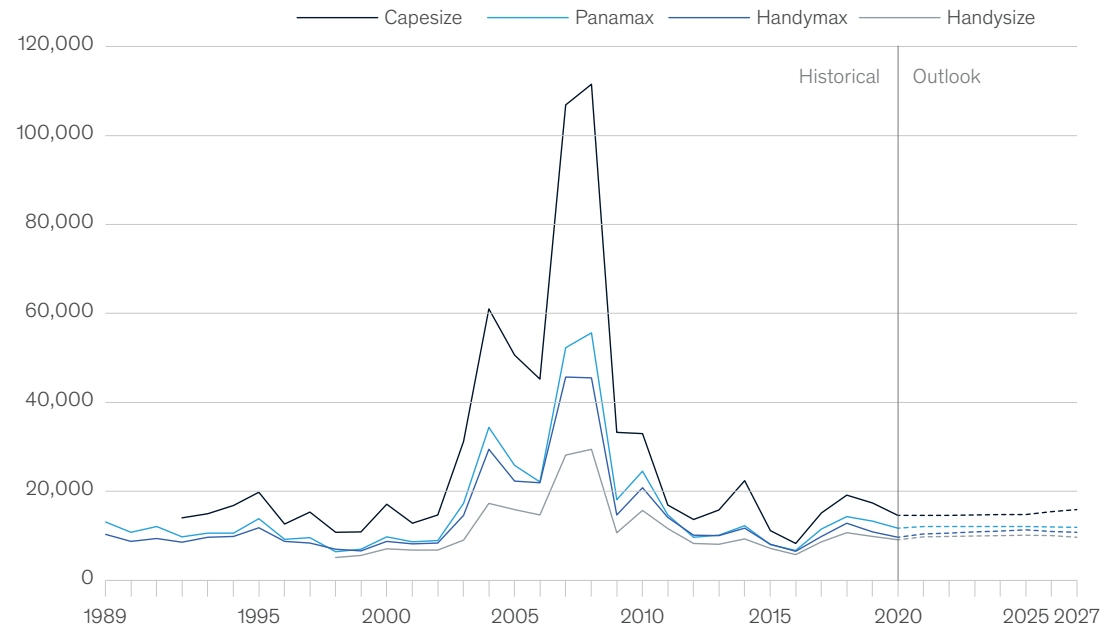
¹ Commodity model, McKinsey Basic Materials Institute.

² McKinsey analysis of Clarksons data.

Exhibit 1

Rates for dry bulk shipping have been low since the global financial crisis and are not expected to rebound in the coming years.

Projection of dry bulk rates, \$ per day



the mid-2020s. This would go some way toward matching industry supply and demand.

Companies that invest in analytics can use data-led insights to seize opportunities in four main areas

Despite the challenging economic environment, there are still opportunities to buck the overall industry trend. We see four areas of potential performance improvement, all of which require sophisticated analytical capabilities:

1. finding attractive subsectors and niches through insight into end customers
2. optimizing portfolios based on relative attractiveness and risk level of different vessel classes

3. improving commercial choices

4. operating vessels more effectively

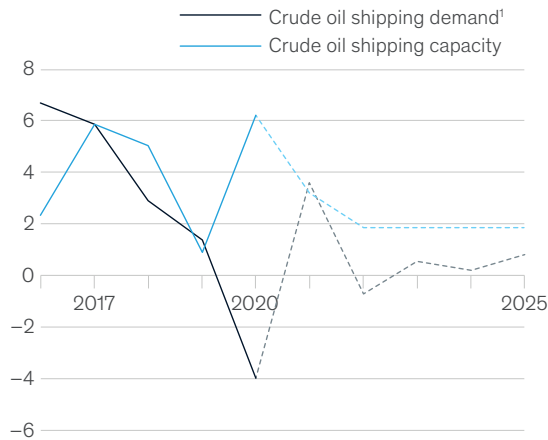
1. Finding attractive subsectors and niches through insight into end customers

Despite the global industry outlook, some submarkets remain attractive (Exhibit 3). Iron ore, for example, is a large, stable, and profitable market—though it will start to shrink during the coming years. Our modeling indicates the Chinese market drives around 70 percent of the global seaborne iron ore shipment. Chinese iron ore imports are expected to fall from 990 million tons in 2019 to 769 million tons in 2030 (a decrease of around 2.4 percent per year), however, because of China's declining demand for steel, increasing supply of scrap, and rising adoption of the electronic arc furnace.

Exhibit 2

With the growing number of outstanding shipbuilding orders, crude oil oversupply will intensify in the next few years.

Growth rate of global crude oil shipping demand and capacity, year over year, %

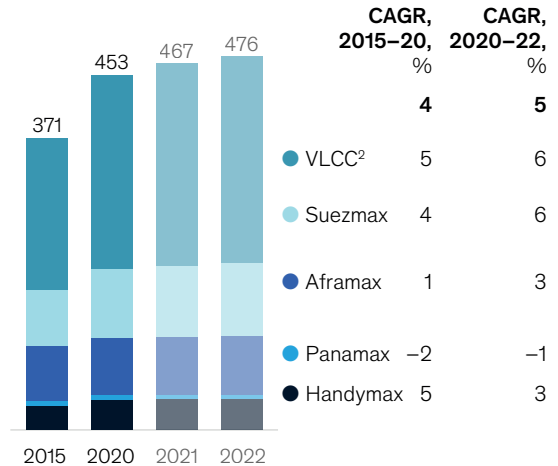


¹Calculated as ton, minus nautical miles.

²Very large crude carrier.

Source: Clarksons; Energy Insights by McKinsey

Global crude oil tanker capacity, by ship type, million tons



The global markets for grain and bauxite are also stable and potentially profitable, though they are smaller. Both markets will also grow over the coming years. Soybeans are expected to have a high growth rate, rising from 130 million tons in 2020 to 163 million tons in 2030. Bauxite shipping will grow rapidly in the next five years, and then stabilize. The shape of bauxite supply and demand will also change. Guinea will contribute more than 70 percent of global bauxite exports. China will drive demand, and bauxite is expected to make up 80 percent of Chinese imports from Guinea by 2023.

Data-driven insights such as these on which cargoes are growing and where should be used to inform all commercial decisions (see sidebar “About McKinsey’s trade model methodology”). Shipping companies should fully leverage as many data sources as possible to triangulate and improve accuracy, and should be guided by the following principles.

Collect data that is as granular as possible. Most currently available forecasts aggregate at the level of major commodities, but this is not sufficient; companies will need to have a thorough, in-depth understanding of which categories of cargo are likely to grow, and which routes are likely to be most promising. Forecasts should drill down to the level of “iron ore from Australia’s Dampier port to the United Kingdom’s Port Talbot,” for example.

Be open to new cargo categories and new routes. The shape of global supply and demand is shifting, and shipping companies will need to be ready to adapt. Companies should make sure all routes and types of cargo are in the scope of research, including those with which they are not yet familiar. Companies that can get ahead of developing route or commodity trends may be able to pick up a considerable amount of new business. For example, China accounts for a large proportion of soybean imports, which it currently sources mostly from the

Exhibit 3

Globally, iron ore will remain as a critical category, and grain and bauxite are expected to become increasingly important.

Key commodities

Key commodities		Market size		Stability		Profitability	
		Shipping market size, million tons, 2025	CAGR, %, 2019–25	Industry concentration	Share of LTC ¹ volume	Entry barrier	Demand for differentiated service
				Attractiveness ● High ● Medium ● Low			
Ore	Iron ore	1382	−0.8	●	●	●	●
Coal	Coking coal	920	0.8	●	●	●	●
	Thermal coal	316	1.3	●	●	●	●
Grain	Soybean	145	2.2	●	●	●	●
	Corn, wheat, rice	296	1.8	●	●	●	●
Bauxite		174	4.7	●	●	●	●
Domestic coastal market	Coal	~700	~1.5	●	●	●	●

¹Long-term contract.

United States and Brazil. In the future, however, the evolving global trading environment and domestic policy changes mean that emerging regions are likely to account for an increased portion of China's soybean imports.

Get closer to customers. Customers are important sources of data and insight. Shipping companies that can cultivate strong customer relationships will have a better chance of understanding their future plans, and therefore of finding ways to

About McKinsey's trade model methodology

The insights from this paper come from McKinsey's trade model. The database covers the global trade flow of major commodities across various industries. Outputs can be broken down by transport mode (air, ocean container, or ocean bulk), commodity (such as agricultural products, metals, or machinery), and specific trade lanes. Inputs can also be customized to use client-specific data.

The model uses historical trade flow as the baseline, and then applies selected macroeconomic scenarios and commodity behaviors (relating to supply and demand) to create the preliminary commodity trade flows. These commodity outlooks are then discussed and fine-tuned with internal and external industrial experts. The overall output is a package of granular demand forecasts for

a variety of recovery scenarios. Insights from these models can be used to inform strategy (such as by looking at portfolio risk exposure), commercial decisions (such as sales team focus and positioning in key verticals and trade lanes), and operational decisions (such as asset and workforce deployment, and capacity management).

serve them—both through core shipping and through value-added services (such as blending and transshipment).

2. Optimizing portfolios based on relative attractiveness and risk level of different vessel classes

Shipping investments are by nature risky. Shipping companies often make long-term commitments to vessels without securing similar long-term commitments from customers. Demand patterns, geopolitics, and regulation can all shift significantly over the approximately 25-year life span of any individual vessel.

The medium term is especially uncertain in today's shipping industry. The timing and shape of the post-COVID demand recovery is difficult to predict, and strengthening environmental regulations—including

IMO 2050 requirements on decarbonization—will not likely result in appreciable industry changes until after 2030.

Scenario planning can be used to capture the range of possible outcomes, and this should include an in-depth analysis of the relative attractiveness of asset classes across different scenarios. The risk and return of different vessel portfolios are determined by four factors: macrodrivers, demand outlook, supply outlook, and profitability (Exhibit 4). For each scenario, a plot of the risk and return of different asset portfolios can be helpful in identifying the optimum portfolio for any given level of risk.

Many companies are currently holding suboptimal portfolios. The high rates of economic growth before 2008 meant that many bulk shipping

Exhibit 4

Risk and return of a portfolio action are driven by four factors.

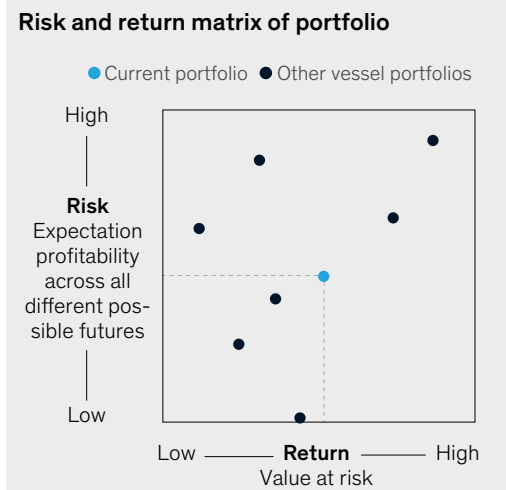
Risk and return drivers

	Portfolio composition dimensions		
	Asset class mix (eg, Capesize vs Panamax)	Asset control (owned vs charter-in)	Commercial choice (eg, TC ¹ out vs contracts of affreightment)
Macrodrivers (incl recovery from COVID-19)	Relative exposure of macro drivers to each dimension		
Demand outlook (commodity flows)	Asset class exposure to commodities	—	Customer commercial preference by commodity flow
Supply outlook (incl future technologies)	Supply concentration by asset class	Relative cost of NB ² price vs charter rates	—
Profitability and cost structure	Relative cost differential across asset classes	LIBOR ³ rate company rating	Fuel price utilization

¹Time chartered.

²New build.

³London InterBank Offered Rate.



companies had a large self-owned fleet, which generally included a number of large capesize vessels. These assets are riskier and less profitable during an economic downturn, and companies should therefore consider shifting their portfolio to rent these assets (rather than owning them) or signing long-term contracts of affreightment to minimize risk exposure.

3. Improving commercial choices

In the aftermath of the 2008 global financial crisis, most larger shipping companies (and ship owners) have demonstrated increased risk aversion and are no longer prepared to gamble on economic growth. Companies now typically choose one of two models—stable or cyclical—to manage risk. Both models can be effective, but the choice of model has substantial implications for commercial decisions (see sidebar “Stable or flexible—two possible risk management approaches”).

Regardless of the model they choose, all bulk companies will need to decide how to price. Commercial decisions in bulk and tanker shipping are often based on judgment and experience, though some industry leaders are now starting to supplement this with data-driven insights.

Data should be vital input to all commercial decisions, but the precise data needs are different for long- and short-term contracts. For long-term contracts, time charter rate forecasts for the next one to three years have direct implication for the target duration and price of each contract. To forecast future rates, companies should use models of both industry demand (using granular demand-side data) and industry supply. For short-term contracts, the highly dynamic market is less affected by the long-term supply-demand landscape, but more dependent on immediate capacity needs (which flow from short-term local supply and demand imbalances).

Digital and advanced analytics can help shipping companies develop insights that may give them an edge over competitors. Data can be gathered and

used to sharpen commercial decision making in many innovative ways.

Analyzing competitor ship positioning. Due to the automatic identification system (AIS), all vessel movements are now transparent, and shipping companies have access to the real-time and historical position of their competitors' vessels. Algorithms also allow shipping companies to understand competitor loads and customers, and even to forecast their deployments, which can lead to quicker, better commercial decisions. Competitor vessel information can be used, for example, to develop hypotheses on vessel utilization and therefore cost position, which could in turn be used to inform commercial negotiations.

Using algorithmic prediction to find cargo in spot markets. Shipping companies can now track a series of indicators (including key economic, trade-related, industrial, and retail metrics) to model which commodities show predictable freight volume and rate increases, and therefore to find promising short-term cargo. Advanced models can even use historical data to identify the best routes and regions, allowing ships to choose locations that are likely to offer appropriately timed opportunities with maximum returns.

Using satellite or drone pictures to monitor moves along the value chain. Satellites and image analysis software can be used to track the progress of maintenance in oil fields or refineries. One way they might do this would be by counting the number of maintenance machines that enter or operate within a site. Information such as this can help companies monitor their upstream markets, and therefore make early tactical decisions about likely shipping capacity needs, for instance.

4. Operating vessels more effectively

Improving asset efficiency and cost competitiveness is key to success, especially during the current market downturn. Shipping lags behind most other industries in its use of data to inform operational decisions. Data and analytics should be

Stable or flexible—two possible risk management approaches

Companies adopting the so-called stable model are matching terms of vessel ownership with long-term volume contracts, which are usually locked in before vessel commitments are made. In the past five years, Japan's Mitsui O.S.K Lines (MOL) restructured its fleet to reduce market exposure.¹ Before the restructuring, MOL had significant unmatched long-term capacity. It leveraged its group to secure new orders and, where long-term customer

commitments could not be found, reduced fleet size. This restructuring has allowed MOL to maintain a stable level of profitability through the recent period of volatility.

Companies adopting the so-called flexible model are willing to manage market risk. These companies tend to have a more flexible business model, and will use the charter market to buy and sell additional capacity as required. Some, such as Oldendorff, even

buy their vessels countercyclically; they expand their fleet when demand is low and then trade actively in the short-term market.² Oldendorff currently only owns around 25 percent of its fleet (exhibit). This strategy generally requires a strong global sales network and relationships with agents and the brokerage community. Private ownership, with its associated capital structure and returns expectations, may also be additionally beneficial.

¹ Navigating the future: MOL report 2019, Mitsui O.S.K. Lines, September 17, 2019, mol.co.jp.

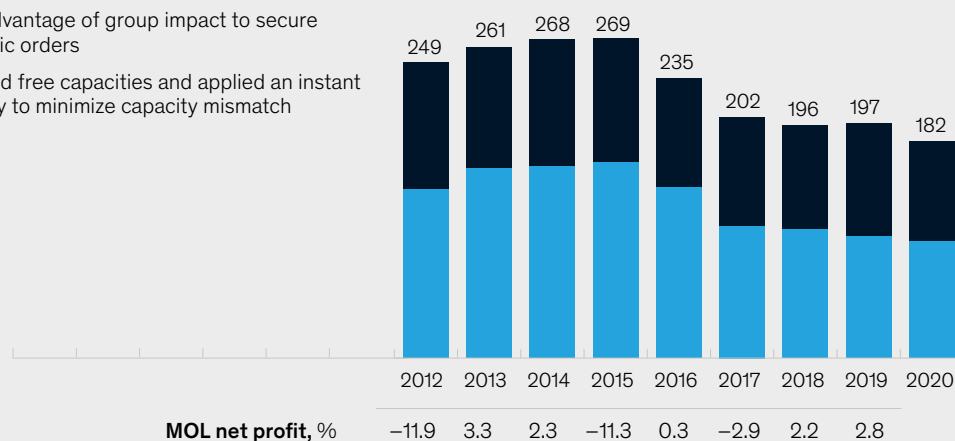
² "Our eco fleet," Oldendorff, oldendorff.com/pages/fleet.

Exhibit

Mitsui O.S.K Lines (MOL) is taking a 'stable' approach, while Oldendorff is taking a 'flexible' approach.

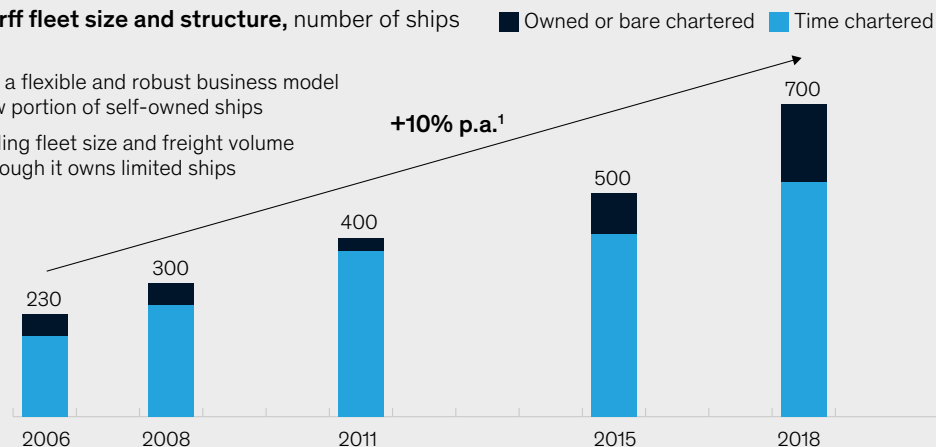
MOL, number of ships

- Take advantage of group impact to secure domestic orders
- Reduced free capacities and applied an instant strategy to minimize capacity mismatch



Oldendorff fleet size and structure, number of ships

- Applied a flexible and robust business model with low portion of self-owned ships
- Controlling fleet size and freight volume even though it owns limited ships



Superior performance comes from a deep understanding of submarkets, end customers, competitors, and ship performance.

used to inform decisions about vessel operations in a number of ways:

Improving vessel utilization through competitive analysis. AIS can provide real-time information about location, speed, draught and route, as well as about overall asset utilization, time before loading, loading, laden sailing, waiting time before discharge, discharge, ballast sailing, and dry-docking time. Companies should use this data to understand the factors that drive low utilization and to benchmark against competitors at the vessel level. This data can also be used to identify top performers, and therefore to inform key performance indicators and other performance measures.

Improving bunker fuel consumption efficiency. Shipping companies could conduct a linear analysis of speed-fuel consumption (historical data can be used to back out speed from arrival time, where necessary) and to identify saving potential by adjusting future cruising speed.

Optimizing demurrage cost. Shipping companies can use satellite-monitored vessel data and port operation information to ensure they arrive at a time that minimizes the likelihood of demurrage cost. This port operation data could also be used during negotiation with shipping companies on demurrage clauses.

Collecting onboard data using sensors. It is no longer the case that the only information a company can expect to receive about its ship is a daily 'noon report.' Data uplinks from vessels are pervasive and increasingly cost-effective. Sensors can be installed throughout the ship—including on hulls, in the engine, and in the cargo—and the resulting data can be uploaded regularly, analyzed remotely, and used to make changes to operating decisions in almost real time.

Many shipping companies have set up on-shore marine operations centers (MOCs) to analyze all the new layers of data coming from—and relating to—their vessels. An MOC is a comprehensive shipping management system that requires a technical architecture driven by big data. These systems are common in container shipping, where companies have large fleets of vessels. The MOC monitors the performance of all vessels 24 hours a day, provides early warnings of any issues, and can advise vessels on potential improvements. The MOC also enhances data circulation by connecting different data sources with midoffice to ensure data sources have been standardized before outputs are sent to different application layers.

The path forward for bulk and tanker companies

The four opportunities outlined above all have data and analytics at their heart. Superior performance comes from a deep understanding of submarkets,

end customers, competitors, and ship performance. Getting these right will require new skills and a much more advanced IT and analytics capability than many bulk companies have today.

Realizing the potential of data will require investment and reorganization across a number of fronts:

An investment in hardware and software to make the most of the new types of data will require onboard sensors and data links, as well as the capability to transform data into insights. Analytics capabilities should include the ability to use artificial intelligence techniques and machine learning on some of the larger, more complex data sets.

An expanded commercial team can build closer relationships with customers and provide insights into likely future demand, developing opportunities to work closer with the customers on logistics solutions, including value-added solutions.

A dedicated team of supply and demand analysts, based centrally, will monitor demand signals, competitor ship movements, and the progress of new shipyard orders.

A 24-hour MOC is where all insights from live operations are monitored and evaluated.

The initial investment will be significant. Larger players that can spread investment across multiple ships are likely to be at an advantage, and this—as well as the continuing oversupply of shipping capacity—may encourage further concentration within the industry and improve the overall industry structure.

There are challenging times ahead for the bulk and tanker shipping industry. Increased and more strategic use of data can be an important differentiating factor.

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