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Current and future scenario for shipping companies

maritime economy

2019

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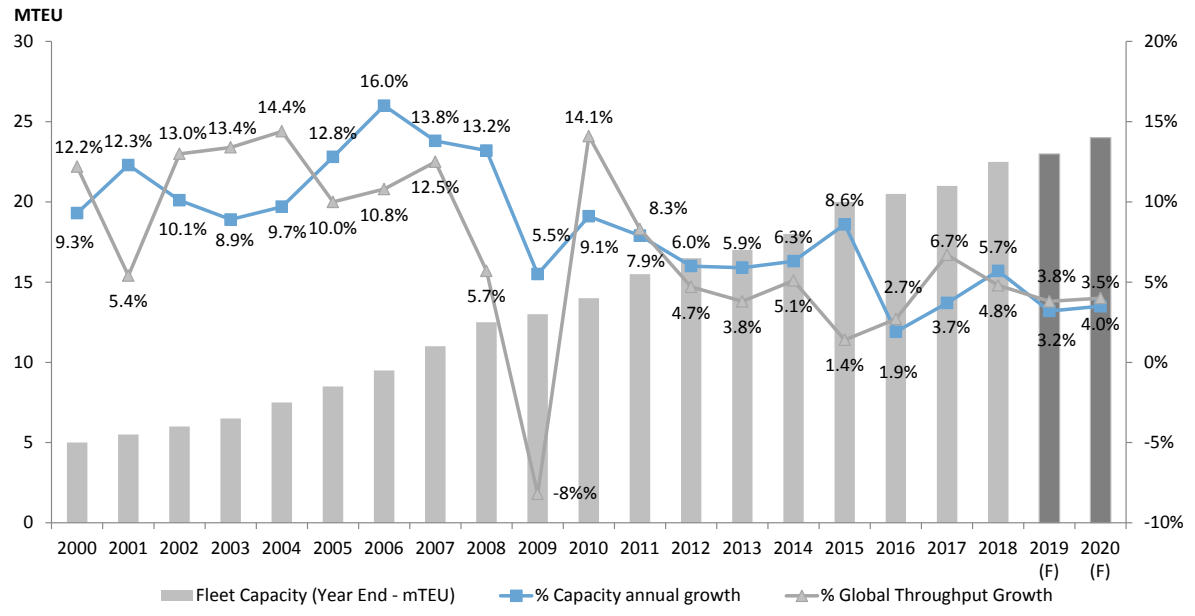
Global active and idle fleet

The global containership fleet grew by 5.7% to reach 22 million TEU at the end of 2018, according to Alphaliner figures. Forecasts see a further increase in Cellular Fleet capacity to reach almost 24 million TEU in 2020.

The global fleet included 5,285 ships with a capacity of 22.4 million TEU as at 1 Feb 2019. The orderbook reached 2,655 TEU, 11.8% of current fleet. Of the 22.4 million TEU of capacity, almost 50% are concentrated on ships with size ranging between 4,000 and 10,000 TEU and almost 15% on the 12,500-15,200 size range. Orderbook capacity breakdown confirms the rising importance of mega-ships: 36% of Orderbook capacity is relative to ships with a 18,000-21,000 TEU size. No orderbook for ships with a size between 4,000 and 10,000 TEU. So the role of megaship in the global fleet capacity is to grow even more. In 2000 cellular ships had an average size of 2,600 TEU; ten years later in 2010 average ship size was 4,700 TEU (2,100 TEU more). In 2018 it exceeded 5,100 TEU and due to an orderbook much more oriented towards megaships, the average size is expected to grow even more in 2018 and 2019, exceeding 5,300 TEU.

A glance at historical data on orderbook gives us some ideas about the trend in 1) global activity (or throughput) in the container transport sector; 2) carriers' mood about the present time and their expectation on future activities.

Cellular Fleet Growth vs Global Throughput



Graph 1 - Source: SRM elaboration on Alphaliner

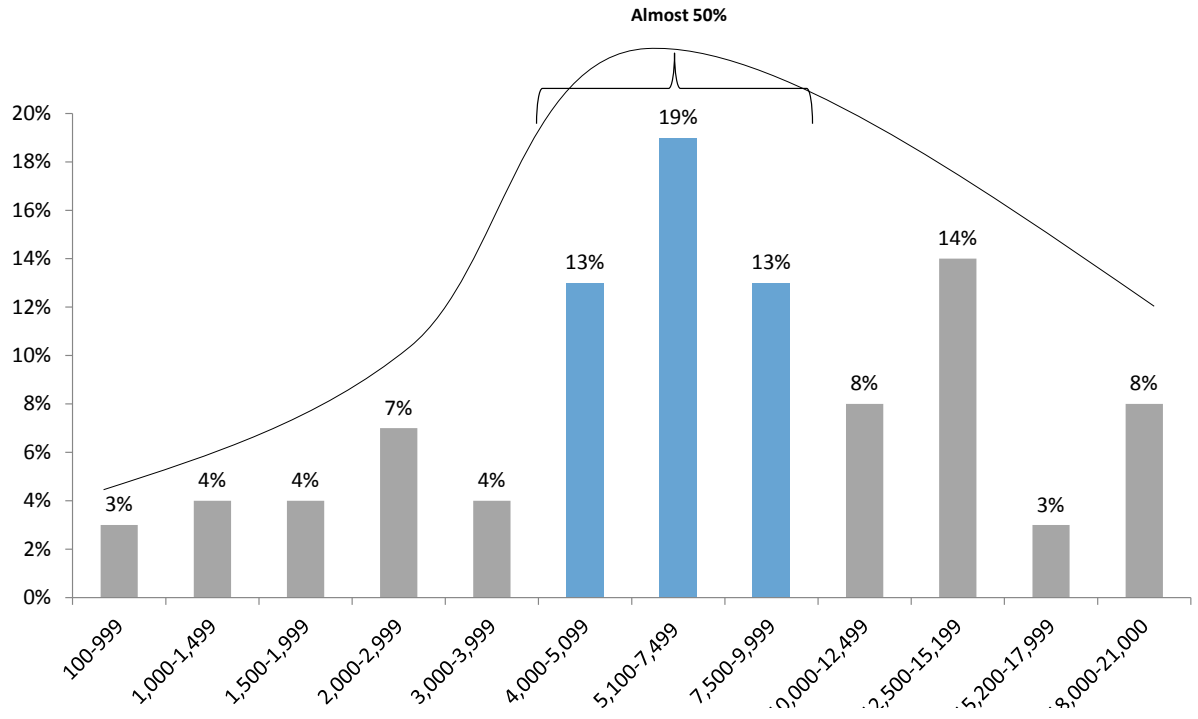
The *orderbook-to-fleet ratio* reached its peak in 2008 at 22% just before the economic crisis occurred. Then the ratio fell down to set at around 10% in 2018. Before the 2009 economic crisis global throughput grew at a rate above 10% in many years; after 2009 it was around or below 5% in many years and is going to set at around 4% in 2019 and 2020.

Liner Fleet as at 1 February 2019

	01-Feb-19
No. of cellular ships (units)	5,285
Total cellular capacity (kTEU)	22,437
Year-on-year increase (%)	5.1%
Chartered fleet (%)	53.9%
Cellular fleet as % of liner total	98.2%
Cellular fleet idle (%)	2.8%
Orderbook (mTEU)	2,655
Orderbook as % of current fleet	11.8%

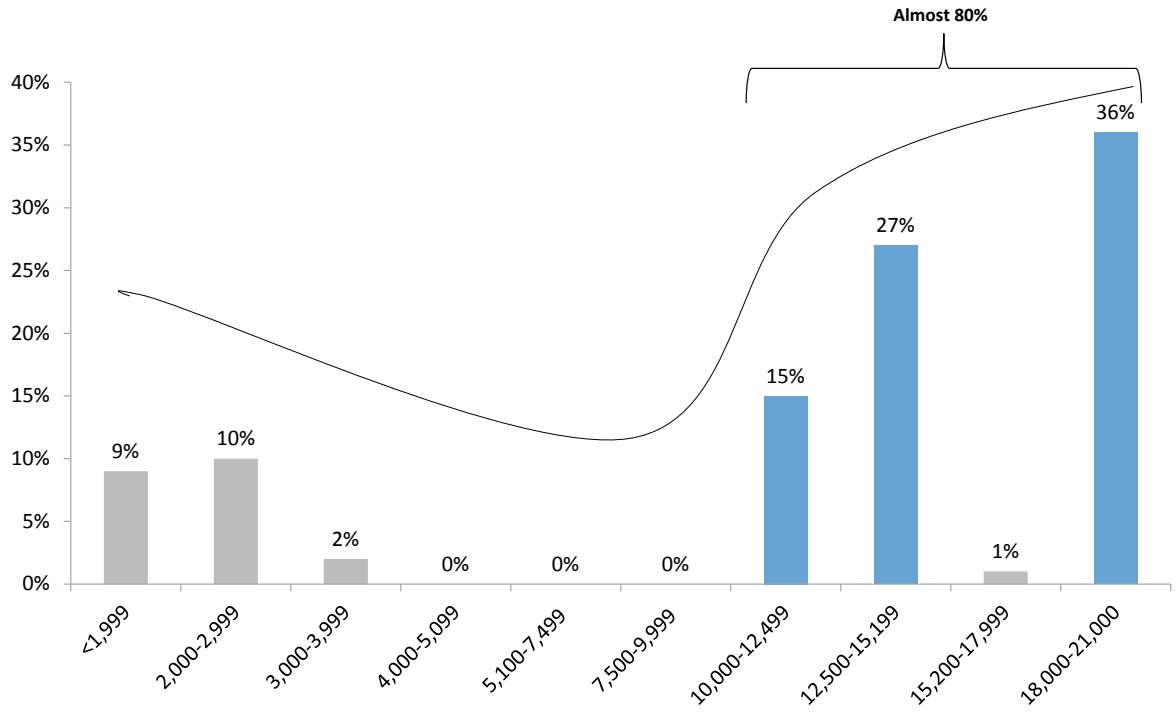
Table 1 - Source: SRM elaboration on Alphaliner

Fleet Capacity Breakdown by TEU size range (% of TEU)



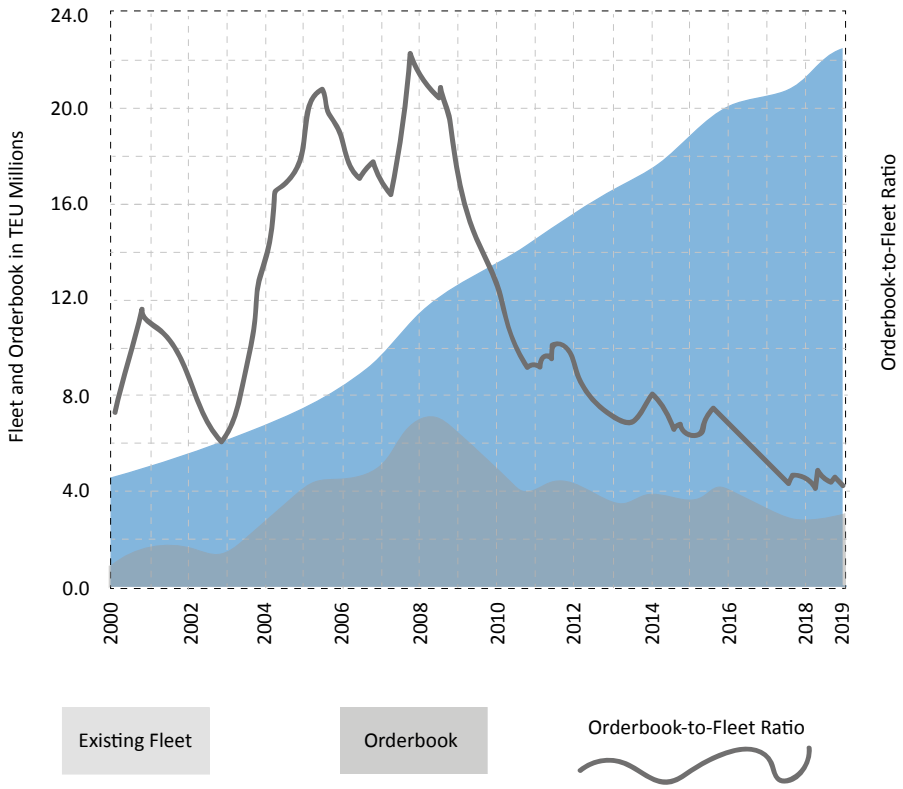
Graph 2 – Source: SRM elaboration on Alphaliner (February 2019)

Orderbook Fleet Capacity Breakdown by TEU size range (% of TEU)



Graph 3 - Source: SRM elaboration on Alphaliner (February 2019)

Orderbook-to-Fleet Development 2000-2019 (Cellular ships only)



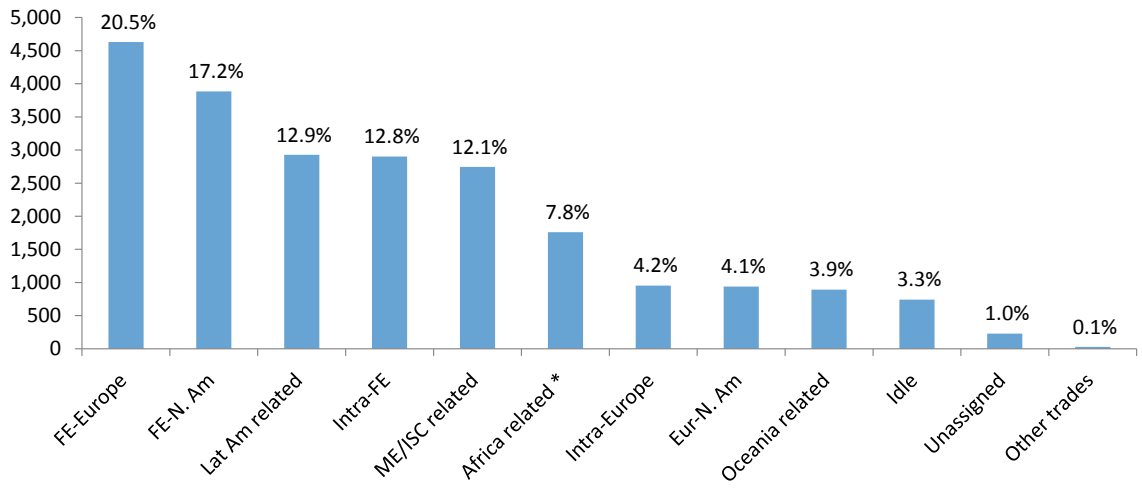
Graph 4 - Source: SRM on Alphaliner (February 2019)

As at February 2019 of the over 22 million TEU of capacity deployed, 20.5% (4.6m) are in the Far East–Europe trade, 17.2% (3.9m) in the Far East-North America, 12.9% in Latin American and related trade, 12.8% (2.9m) in the intra Far East trade, 12.1% (2.7m) in the Middle East related trade and 7.8% (1.7m) in the Africa related trade.

The Far East–North America tradelane with 467 thousand TEU is the one with the highest weekly capacity deployed, followed by Far East–Europe with 426 thousand TEU. While the Far East–North America and the Far East–Europe tradelanes weekly capacity deployed have followed an almost stable upward trend over the last year (2018) with a year-on-year change of 4.7% and 4.5% respectively as at February 2019. The Europe–North America tradelane has recorded a more unstable pattern, although the year on year percentage change was 2.9% as at February. The idle containership capacity edged up to 207 units for 654,000 TEU as at 4 February 2019, or 2.9% of the total cellular fleet. Such a percentage reached its lowest level in February 2018 at 0.9%, then it has recorded a steady increase up to 2.9% in February 2019 (2% more year on year). The weak demand for ships has permeated across all fleets segments, including the larger sizes, with 12 units of more-than-7,500 TEU currently (February 2019) unemployed. However, the highest increases of idle ships have been recorded in the 1,000-1,999 TEU size but increases have been recorded also in the other size ranges.

To complete the general scenario on the shipping sector, let's have a look on the regional trend for global throughput. While North Europe and North America lost percentage share between 2000 and 2018, China and Hong Kong gained market from 16.9% to 33.2% at the expense of all the other regions except for Africa.

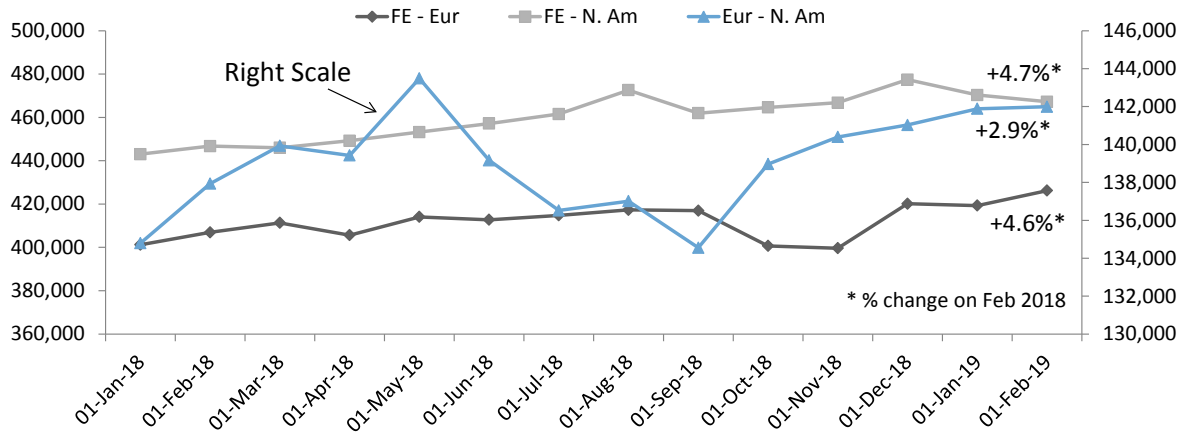
Global Capacity Deployment Breakdown by Trade (% of TEU)



*Africa related refers to Sub-Saharan Africa.

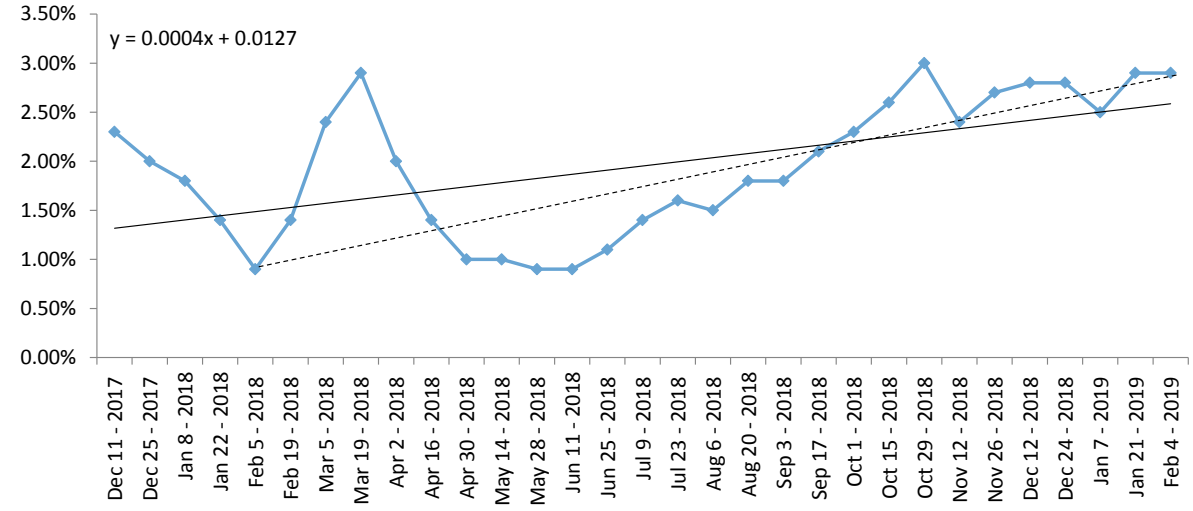
Graph 5 - Source: SRM elaboration on Alphaliner (February 2019)

Weekly Capacity Deployed on Main East-West Tradelanes (TEU)



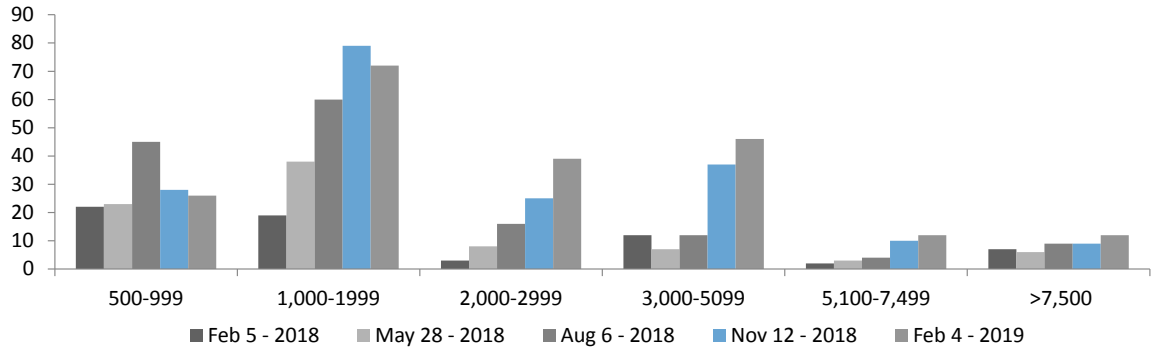
Graph 6 – Source: SRM elaboration on Alphaliner

Idle TEU As % of cellular fleet



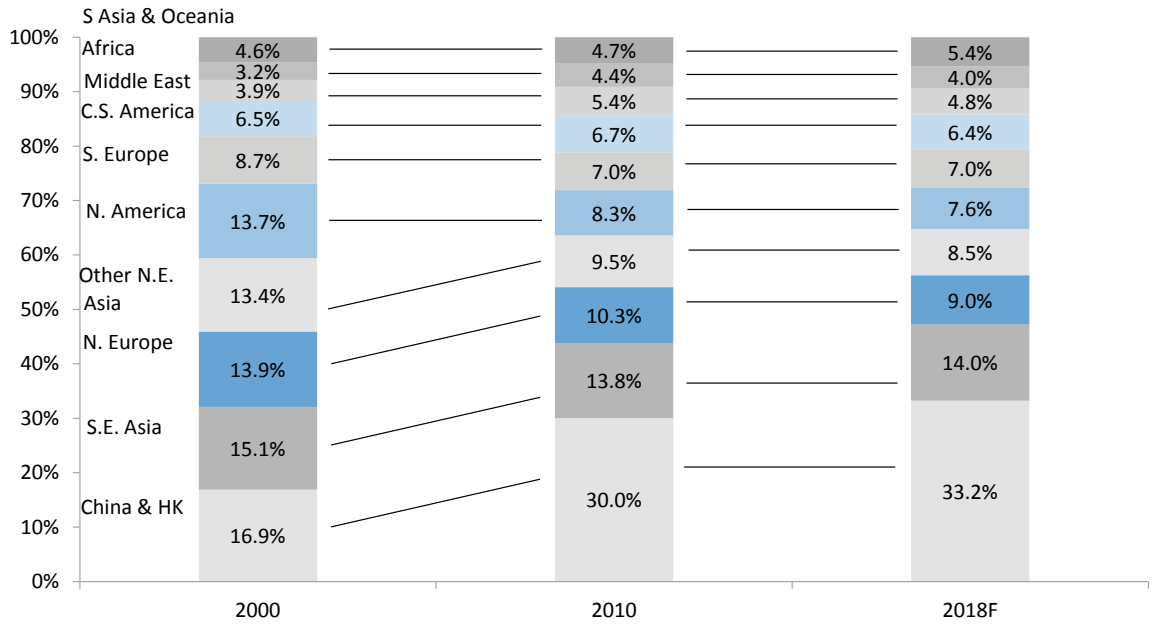
Graph 7 – Source: SRM elaboration on Alphaliner

Units of Idle ships for vessel size (TEU)



Graph 8 – Source: SRM elaboration on Alphaliner

Regional Share of Global Container Activity - Global Port Throughput breakdown



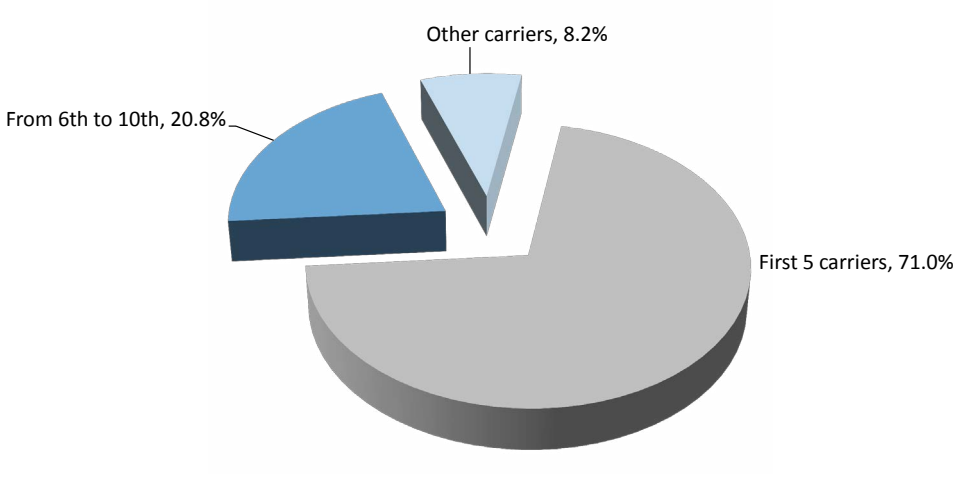
Graph 9 – Source: SRM elaboration on Alphaliner

Top 10 Carriers: fleets and financials

Top 10 Carriers: fleets

The shipping market is concentrated in the hands of a few carriers. More specifically the top 5 carriers hold 71% of global current fleet in terms of TEU. If we add 5 carriers more, the top 10 carriers hold more than 90% of the current fleet.

Top 10 Carriers: share of global current fleet in terms of TEU (February 2019)



GRAPH 10 – SOURCE: SRM elaboration on Alphaliner

APM-Maersk leads the table with more than 4m TEU of capacity, followed by MSC (3.3m TEU), COSCO group (2.8m TEU), CMA CGM group (2.6m TEU) and Hapag-Lloyd (1.6m TEU). COSCO group, Evergreen and HMM are the carriers with the highest percentage growth in the last year (respectively +50.6%, +13.6% and +22.6%).

If we take a decade as a period of analysis, COSCO group (+460%, more than 5 times bigger than 2009) and Hapag–Lloyd (+220%) are the carriers with the highest growth in their fleet capacity. CMA CGM Group follows with a +160% increase between 2009 and 2019.

Top 10 Carriers: current TEU and percentage change

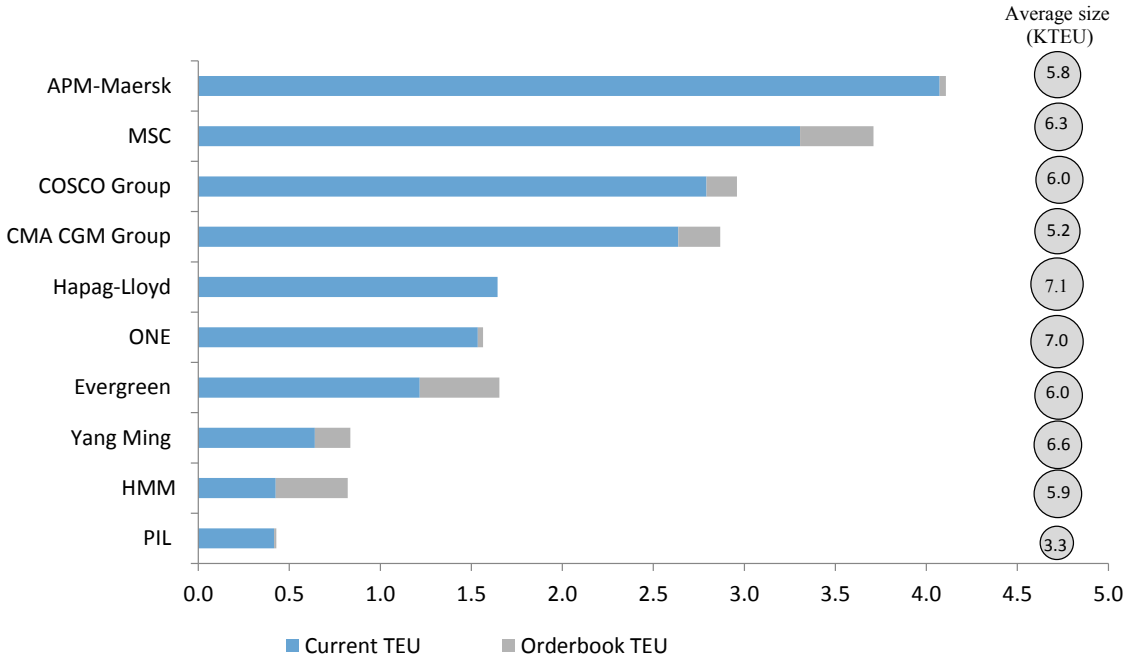
	Operated Fleet (mTEU) as at February 2019	Change Feb 2019 vs Feb 2018 (%)	Change 2019 vs 2009 (%)
APM-Maersk	4.07	-3.3	100
MSC	3.30	3.8	120
COSCO Group	2.79	50.6	460
CMA CGM Group	2.64	3.6	160
Hapag-Lloyd	1.64	6.1	220
ONE	1.53	2.4	33
Evergreen	1.22	13.6	100
Yang Ming	0.64	7.2	113
HMM	0.42	22.6	68
PIL	0.42	5.1	121

Table 2 - Source: SRM elaboration on Alphaliner

The analysis of the orderbook in terms of TEU is interesting. We can see that while orderbook for APM-Maersk is not very big as at February 2019 (just 3 ships accounting for 34,160 TEU), it is bigger for MSC (23 big ships with a 430,552 TEU additional capacity, about 17,000 TEU for ship on average). COSCO Group and CMA CGM Group are also investing, respectively with 14 ships more (equivalent to 166,951 TEU more) and 19 ships more (229,752 TEU more). Big orders also for Evergreen, Yang Ming and HMM. In particular, while Evergreen is investing in smaller ships (its orderbook includes 71 ships with an additional capacity of 437,580, about 6,000 TEU for ships on average), Yang Ming is investing in medium-size ships (23 ships with an additional capacity of 194,110 TEU, about 8,000 TEU on average) and HMM in very large ships (20 ships more with an additional capacity of 396,000 TEU, 19,800 TEU for ship on average). Anyway, at the moment APM-Maersk is the carrier with the highest percentage of ultra-large vessels (more than 18,000 TEU) (15% of its Fleet capacity), while CMA CGM Group is the one with the highest percentage of very-very large vessels (between 15,000 and 18,000 TEU) (8%). Yang Ming is the carrier with the highest percentage of very

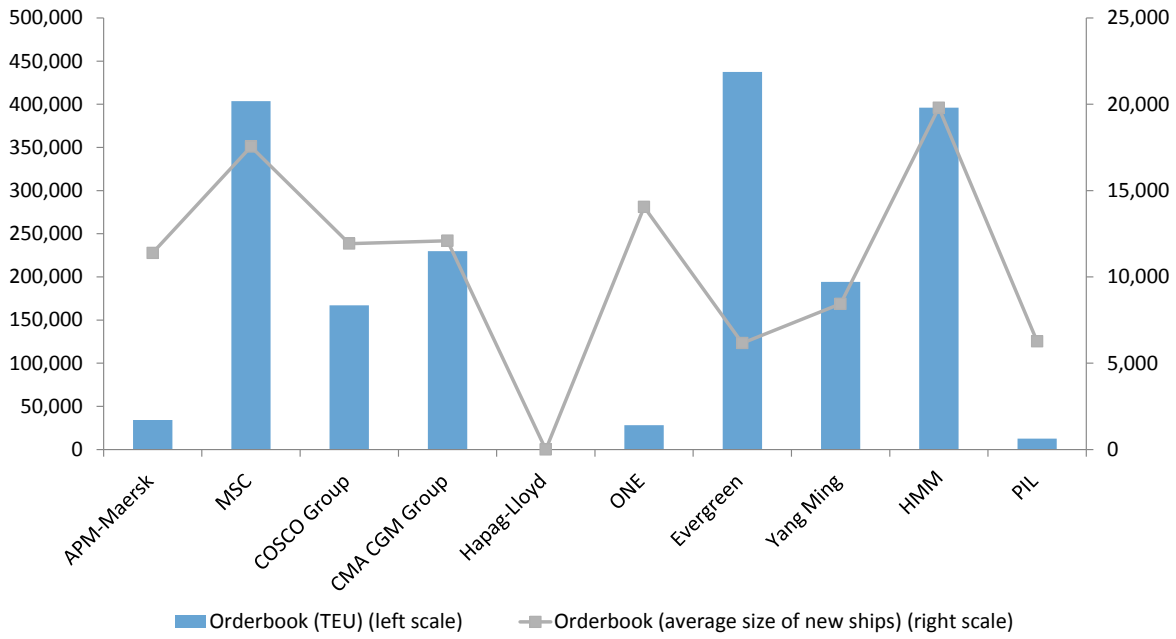
large vessels (10,000-15,000 TEU) (41% of its fleet) and Evergreen shows the biggest percentage as for the 7,500-10,000 category (28%). HMM has the biggest percentage of 5,100-7,500 TEU ships (24%) and 3,000-5,100 TEU ships (29%).

Top 10 Carriers: current TEU, Orderbook TEU (in millions) and average size of vessels (in thousands)(February 2019)



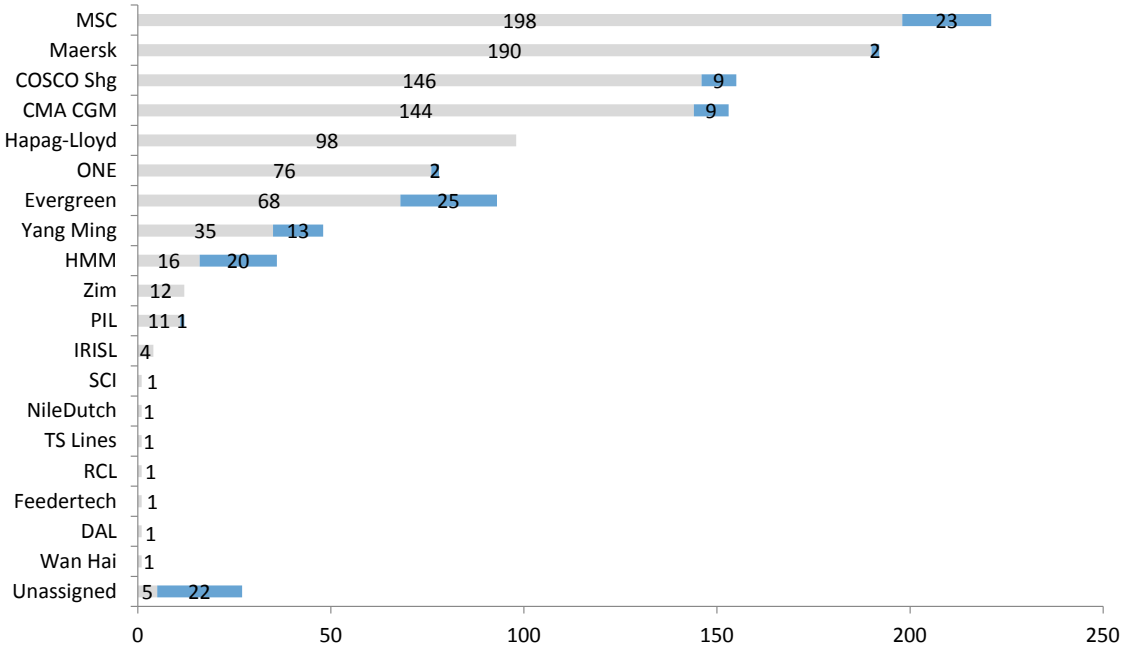
Graph 11 – Source: SRM elaboration on Alphaliner

Top 10 Carriers: Orderbook TEU and average size of new vessels (February 2019)



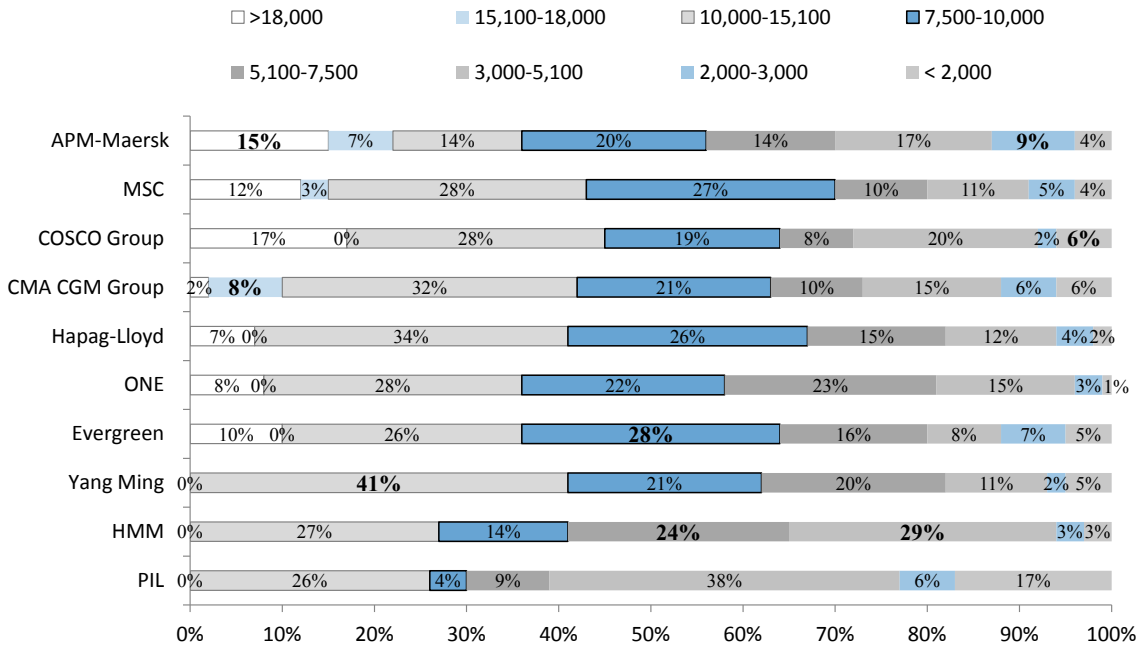
Graph 12 – Source: SRM elaboration on Alphaliner

VLCS Deployment by Carrier Vessels above 7,500 TEU only (No. of units) (February 2019)



Graph 13 – Source: SRM elaboration on Alphaliner

Main Carriers breakdown of operated capacity by TEU size range (February 2019)



In bold type the highest percentage for the size class.

Graph 14 – Source: SRM elaboration on Alphaliner

Financial results

This paragraph analysis top 10 carriers economic performances as for 2017 and 2018 as a whole and then clusters each carrier based on their revenue share and their growth in 2018. As data were not available for some companies, the total value of revenues of top 10 carriers is an estimate both for 2017 and 2018 based on available data. In 2018 it has been estimated a total revenue of about $145bn, a 25.3% increase compared with $115bn in 2017. As a result also revenue per TEU has increased.

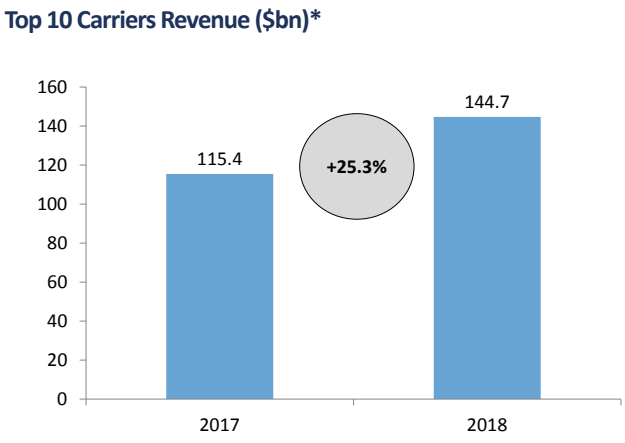
In 2018 carriers recorded on average a revenue of about $7,700 per TEU, $1,600 more than in 2017.

While top 10 carriers are on the growth in terms of revenue, they are on the downturn in terms of economic margin. In fact total Earning Before Interests, Taxes, Depreciation and Amortization (EBITDA) is estimated to be $6bn, a 41% decrease compared to $10.1bn in 2017.

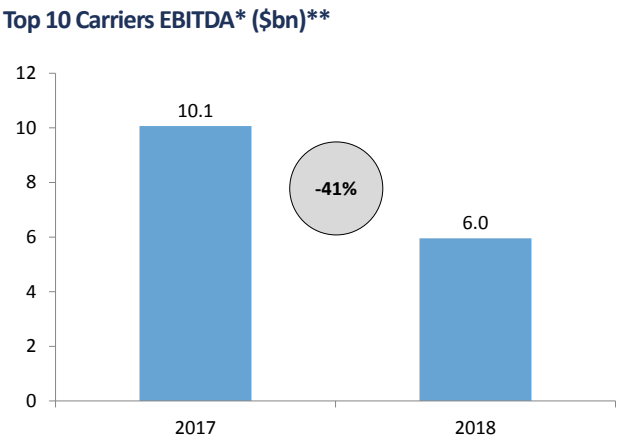
As a consequence EBITDA, as percentage of Revenue moved to 4.1% in 2018, down from 8.7% in 2017, while Net Profit moved to -0.1% in 2018, down from 1.8% in 2017.

The economic pattern described above is better clear if we analysis quarterly data of top 10 carriers as a whole.

Revenues graph is on the rise: it was about $15bn in the 1st quarter of 2017 and more than $20bn in the latest quarters. On the other hand EBITDA quarterly data reached a peak of about $2.2bn in the 3rd quarter of 2017, falling down at around $1bn in the quarters of 2018. It is clear that the drop in operating margins is mainly the result of the increase in bunker price that has caused an increase in shipping expenses.



*Data for MSC and ONE are estimated. 2018 is estimated based on first 3 quarters data.
Graph 15 – Source: SRM elaboration on Alphaliner



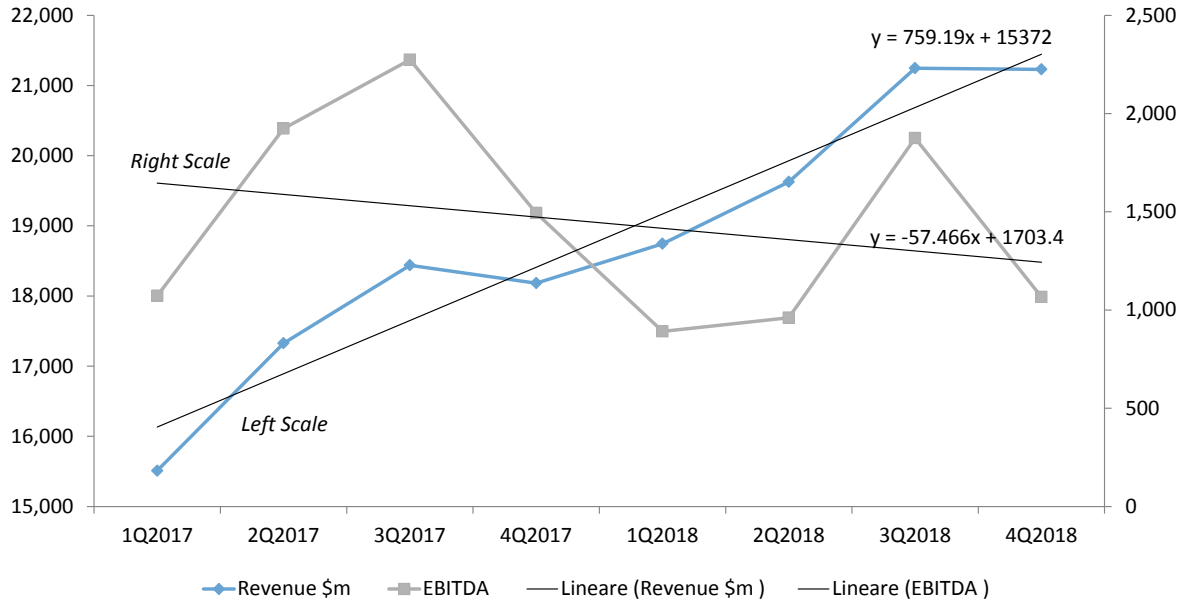
* Earning Before Interests, Taxes, Depreciation and Amortization.
**Data for MSC and ONE are estimated. 2018 is estimated based on first 3 quarters data.
Graph 16 – Source: SRM elaboration on Alphaliner

Top 10 Carriers Economics*

	2017	2018	change
Revenues ($bn)	115.4	144.7	25.4%
Revenues/TEU ($)	6,182.9	7,750.9	$1,568
EBITDA ($bn)	10.1	6.0	-40.8%
EBITDA Margin %	8.7%	4.1%	-4.6%
Net Profit Margin %**	1.8%	-0.1%	-1.9%

* Data for MSC and ONE are estimated. 2018 is estimated based on first 3 quarters data.
** Excluded HMM (for its too big losses), MSC and ONE (as data were not available).
Table 3 – Source: SRM elaboration on Alphaliner

Top 10 Carriers Revenue and EBITDA by quarter ($m)*

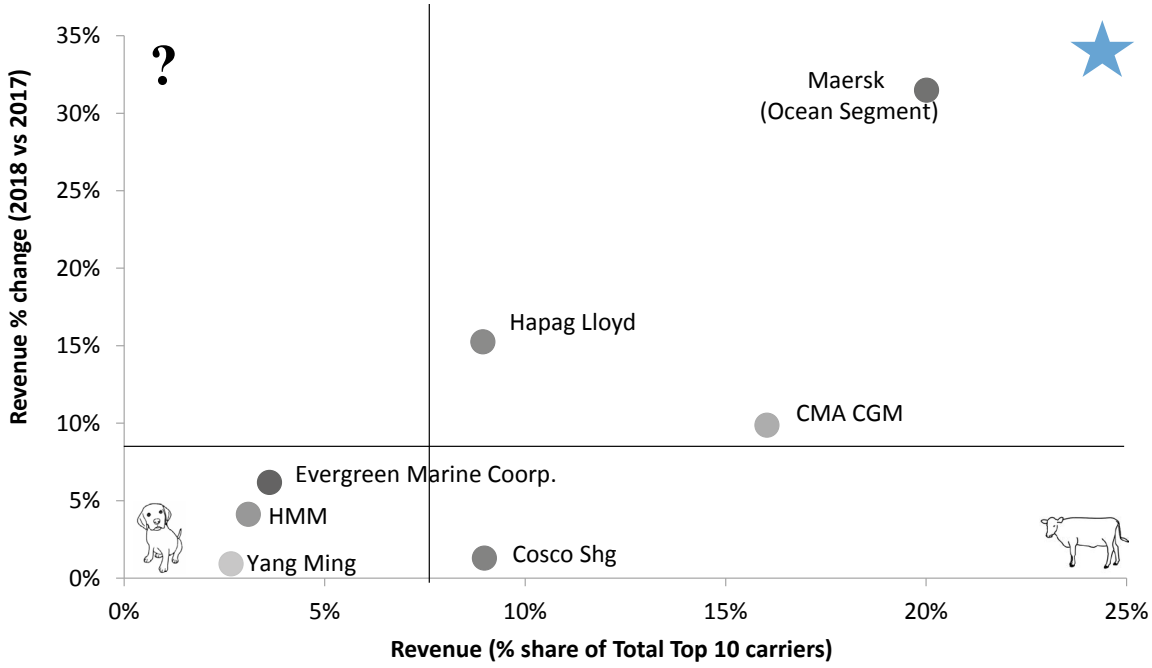


*Data for 4th quarter are estimated.
Graph 17 – Source: SRM elaboration on Alphaliner

This paragraph is going to close by comparing top 10 carriers on the Boston Consulting Group Matrix. This model was original thought for products, by clustering them based on their market share and their percentage growth. But the same logic can be easily extended to companies. So when a company shows better than average share of market and growth, it falls in the top-right corner (or "star" corner). Such a company is like a star, it has a good share of the market and is still on the growth. Maersk, Hapag Loyd and CMA CGM are in this corner. On the upper-left corner, we find "Question-mark" companies, which are on the growth, but with a little market share. A lot of companies are on the bottom left part of the matrix (dog), with low growth and market share. On the bottom right, there are companies with a low percentage growth and a big market share.

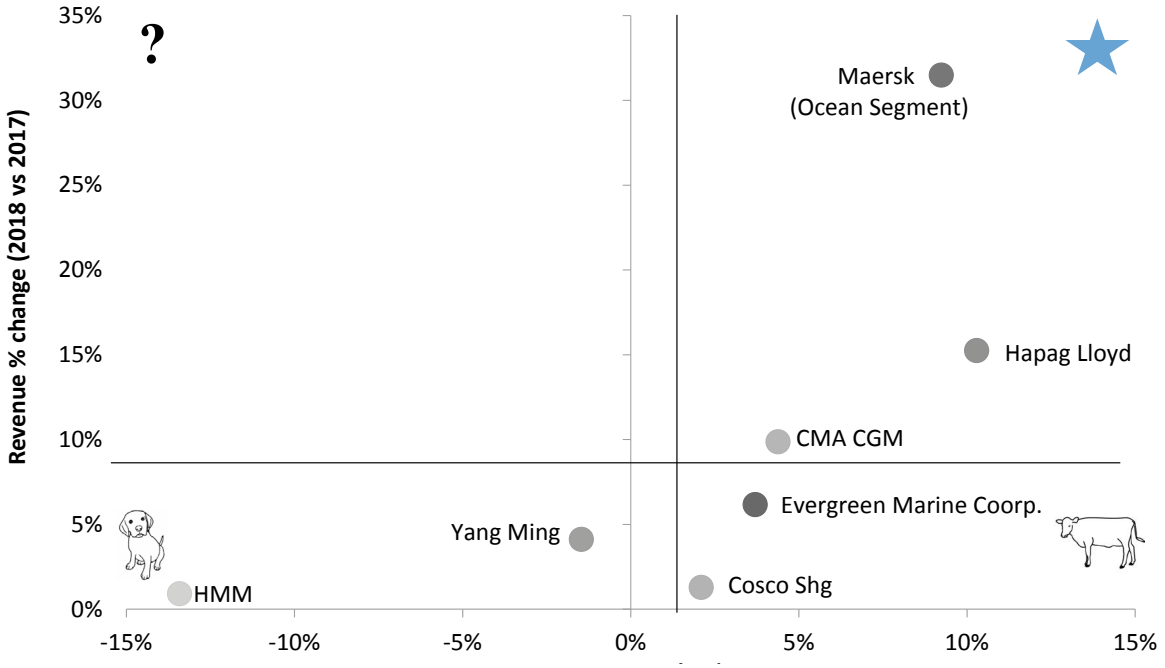
A similar analysis has been carried out as for Revenue growth and EBITDA. So instead of market share we assess the company based on their economic soundness.

Top 10 Carriers Revenue share and growth as at 2018*



*Data are not available for MSC and ONE.
Graph 18 – Source: SRM elaboration on Alphaliner

Top 10 Carriers EBITDA* and Revenue growth as at 2018**



* EBITDA Margin as % of Revenue.
** Data are not available for MSC and ONE.
Graph 19 – Source: SRM elaboration on Alphaliner

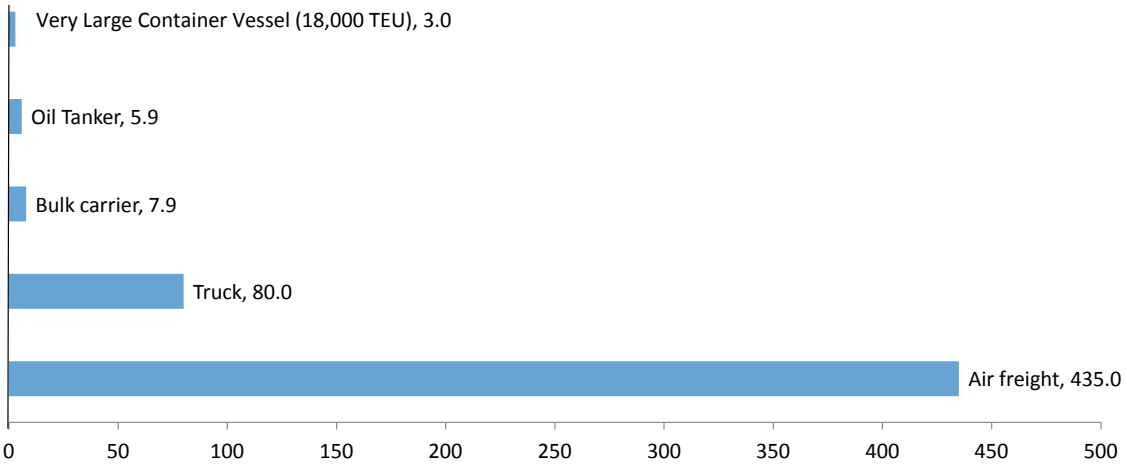
IMO 2020: effects on shipping strategies

The main type of "bunker" oil for ships is heavy fuel oil, derived as a residue from crude oil distillation. It contains *sulphur* which, following combustion in the engine, ends up in ship emissions. Sulphur oxides (SOx) are harmful to human health, and in the atmosphere, SOx can lead to acid rain, which can harm crops, forests and aquatic species, and contributes to the acidification of the oceans.

IMO regulations to reduce sulphur oxides (SOx) emissions from ships first came into force in 2005, under Annex VI of the *International Convention for the Prevention of Pollution from Ships* (known as the MARPOL Convention). Since then, the limits on sulphur oxides have been progressively tightened. From 1 January 2020, the limit for sulphur in fuel oil used on board ships operating outside designated emission control areas will be reduced to 0.50% m/m (mass by mass).

Maritime transport emits around 1,000 million tonnes of CO_2 annually and is responsible for about 2.5% of global greenhouse gas emissions (3rd IMO GHG study). Shipping emissions are predicted to increase between 50% and 250% by 2050 – depending on future economic and energy developments. In terms of CO_2 emissions per tonne of cargo transported in one mile, shipping is recognised as the most efficient form of commercial transport. IMO regulations on energy efficiency support the demand for ever greener and cleaner shipping. A ship which is more energy efficient burns less fuel so emits less air pollution.

Comparison of Typical CO_2 emissions between modes of transports (grams per tonne-km)



Graph 20 – Source: SRM elaboration on IMO GHG study (2009)

The new limits in Sulphur emissions: tools and sanctions

For ships operating outside designated emission control areas the current limit for sulphur content of ships' fuel oil is 3.50% m/m (mass by mass). The new limit will be 0.50% m/m which will apply on and after 1 January 2020.

There is an even stricter limit of 0.10% m/m already in effect in *Emission Control Areas* (ECAs) which have been established by IMO. This 0.10% m/m limit applies in the four established ECAS: the Baltic Sea area; the North Sea area; the North American area (covering designated coastal areas off the United States and Canada); and the United States Caribbean Sea area (around Puerto Rico and the United States Virgin Islands).

Fuel oil providers already supply fuel oil which meets the 0.10% m/m limit (such as marine distillate and ultra-low sulphur fuel oil blends) to ships which require this fuel to trade in the ECAs.

In order to meet IMO requirements, there are essentially three alternatives for ships:

1. *Use fuel oil with enough low levels of Sulphur*. Refineries may blend fuel oil with a high (non-compliant) sulphur content with fuel oil with a sulphur content lower than the required sulphur content to achieve a compliant fuel oil.
2. *Use scrubbers*. Some ships may limit the air pollutants by installing exhaust gas cleaning systems, also known as "scrubbers". This is accepted by flag States as an alternative means to meet the sulphur limit requirement. These scrubbers are designed to remove sulphur oxides from the ship's engine and boiler exhaust gases. So a ship fitted with a scrubber can use heavy fuel oil, since the sulphur oxides emissions will be reduced to a level equivalent to the required fuel oil sulphur limit.
3. *Use different fuels*. Ships can have engines which can use different fuels, which may contain low or zero sulphur, for example, liquefied natural gas, or biofuels. However, it's estimated there will only be enough LNG to cover 10% of the required shipping fuel by 2040.

To assist ship operators and owners to plan ahead for the 0.50% sulphur 2020 limit, the MEPC has approved guidance on ship implementation planning. The guidance is part of a set of guidelines being developed by IMO for consistent implementation of the MARPOL regulation coming into effect from 1 January 2020.

All sizes of ships will need to use fuel oil that meets the 0.50% limit from 1 January 2020. And there are no possibilities of delay for the deadline.

Ships taking on fuel oil for use on board must obtain a bunker delivery note, which states the sulphur content of the fuel oil supplied. Samples may be taken for

verification. Ships must be issued with an *International Air Pollution Prevention* (IAPP) Certificate by their Flag State. This certificate includes a section stating that the ship uses fuel oil with a Sulphur content that does not exceed the applicable limit value as documented by bunker delivery notes or uses an approved equivalent arrangement. Port and coastal States can use port State control to verify that the ship is compliant. They could also use surveillance, for example air surveillance to assess smoke plumes, and other techniques to identify potential violations.

Sanctions are established by individual Parties to MARPOL, as flag and port States. IMO does not set fines of sanctions - it is down to the individual State Party.

Implementation is the remit and responsibility of the Administrations (flag States and port/coastal States). Ensuring the consistent and effective implementation of the 2020 0.50% m/m sulphur limit is a high priority.

IMO'S Sub-Committee on *Pollution Prevention and Response* (PPR) has been developing guidance to ensure consistent implementation of the 0.50% m/m sulphur limit. The ship implementation planning guidance includes sections on:

- risk assessment and mitigation plan (impact of new fuels);
- fuel oil system modifications and tank cleaning (if needed);
- fuel oil capacity and segregation capability;
- procurement of compliant fuel;
- fuel oil changeover plan (conventional residual fuel oils to 0.50% sulphur compliant fuel oil);
- documentation and reporting.

The latest figures showed that the yearly average sulphur content of the residual fuel oils tested in 2017 was 2.54%. The worldwide average sulphur content for distillate fuel in 2017 was 0.08%.

The new limits in sulphur emissions: the effects on bunker costs

The new standards for Sulphur emissions is going to have different effects on various sectors, in particular on *refiners*, *shipping companies* and *scrubber producers*.

Refiners

Even though most industry players can expect to increase their costs, refiners who are already capable of processing low-sulfur oil will benefits from IMO 2020. In particular, refineries in China and the U.S. can take advantage of their advanced systems to

generate environmentally-friendly and low-sulfur distillates. Big oil refineries in the U.S. Gulf Coast see the opportunity to make more profits from the expected high demand for low sulfur fuels.

Shipping companies

The overall shipping capacity will likely remain the same when the IMO deadline arrives. With the looming shortage of low-sulfur fuel and the high cost of converting to a liquefied natural gas (LNG) system, more carriers will install scrubbers to remain compliant with the IMO 2020 rules. In some cases, the IMO 2020 regulation may actually increase capacity as ship line producers aim to create new eco-friendly vessels to enter the market.

According to industry estimates, more than 90% of the global vessel fleet will be relying on compliant fuels when the sulphur rules step into force on 1 January 2020.

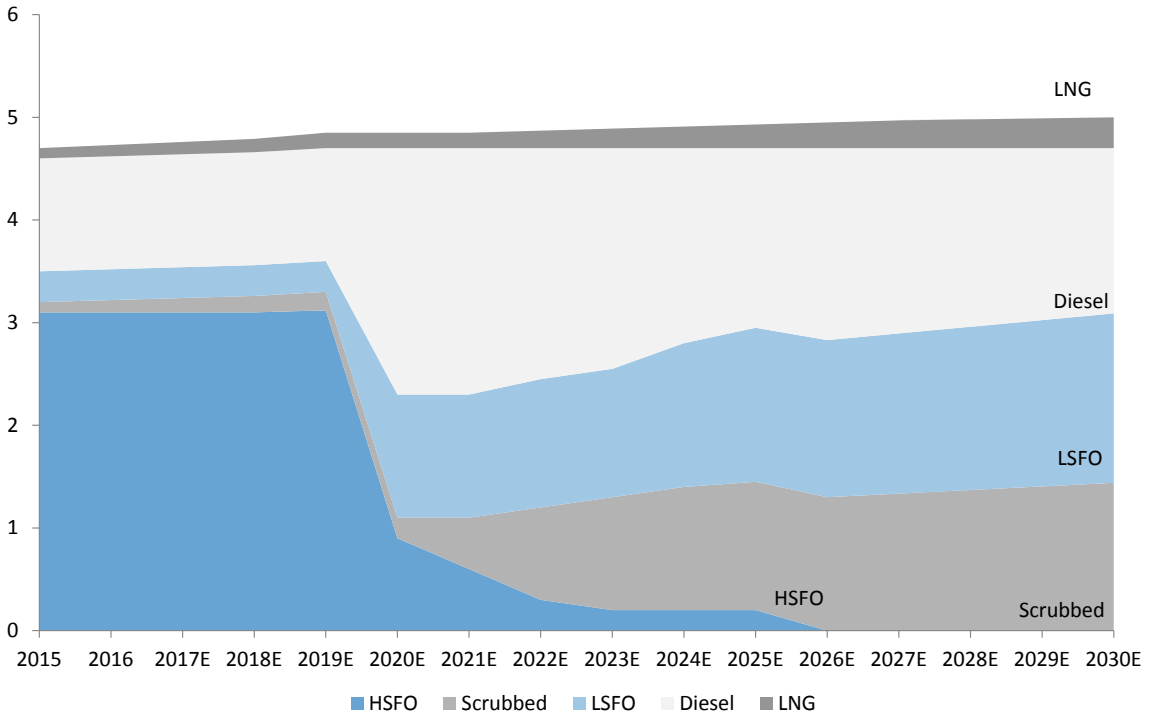
According to a study released by Goldman Sachs (*The IMO 2020: Global Shipping's Blue Sky Moment; May 2018*), In a full compliance scenario, the total impact to consumer wallets in 2020 could be around $240 bn, which may largely transfer to the pockets of refiners: $200 bn will come from higher fuel retail price and $40 bn from the higher Marine freight due to the higher cost ships are going to face and pass on the customers. $80bn revenue will be under threat for heavy sour crude oil producers, so that 70% of the benefits will occure to complex refiners, able to shift from High Sulphur Fuel Oil (HSFO) to Low Sulphur Fuel Oil (LSFO).

In order to cover these additional costs, many carriers such as Maersk, CMA, CGM, and MSC announced bunker surcharges and so costs for compliance will have to be passed on to customers/trade. This will result in freight rate increases of between 5 to 10%, depending on the tradelane.

Scrubbers

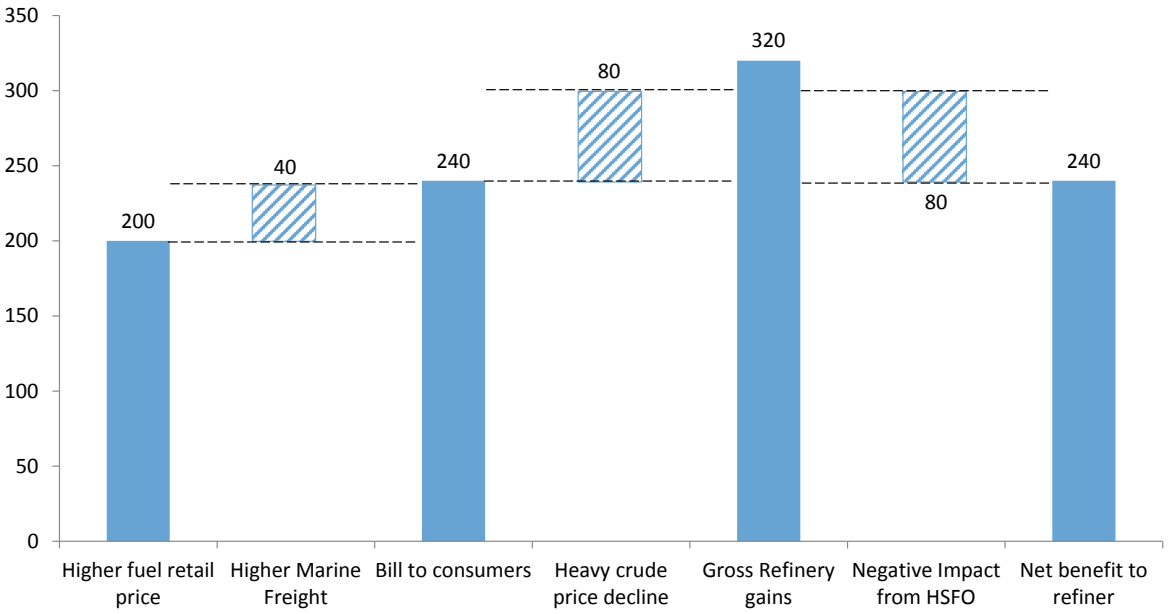
According to the Goldman Sachs study (May 2018) mentioned above, 5,000 ships could install scrubbers by 2025 which represents a revenue pool of $15 bn. A current payback period of scrubber installation of 4 years (relative to using compliant fuel in 2020) has been estimated. It is expected scrubber installation to pick up from 2020 as payback period may fall to 2 years based on the current forward diesel-HSFO spread, and expect scrubber penetration in ships to be 4%/18% by 2020/25.

IMO 2020 sulphur cap: from high sulphur towards clean fuels in marine industry (mn bpd)



Graph 21 – Source: SRM elaboration on Goldman Sachs (May 2018)

Net transfer of $240bn from consumers to refiners in 2020 due to IMO sulphur cap in a 100% compliance scenario, (data on $bn)



Graph 22 – Source: SRM elaboration on Goldman Sachs (May 2018)

Shipping sector future scenario

In liner shipping market, there are four very distinctive trends in the past decade: (1) Increasing number of larger ships in the main trade routes; (2) more capacity in the hands of fewer shipping companies; (3) alliances dominating major routes; (4) and low industry profit margins over a long time.

As of the start of 2019, 90 out of 92 containerships larger than 18000 TEUs are used in FE-Europe route; between 15,200 and 17,999, only 1 used in FE-N. America route, and 31 on the FE-Europe. These large ships can enjoy scale economies, which gives the owner cost advantage in the competitive market. When the demand is high, having large ships can translate to high earnings. However, when the demand is low, to fill up the large ships is difficult. This created a huge downward force on the market freight rate and made the smaller shipping companies difficult to survive. As a result, many merge and acquisitions happened in the market, which made the large shipping companies larger. In addition, to make better use of the large ships, most of the operators on the major routes formed alliances. Now, only 3% of the capacity in the FE-Europe route is not controlled by three alliances. For FE-N. Am route, the non-allianced capacity is 18%, as HMM just exited from the 2M Alliance. These alliances made the level of competition in these routes unprecedentedly high for two reasons. First, they all use large mega containerships and can offer lower freight rate due to their low average cost. Second, the alliance is formed using Vessel Sharing Agreement (VSA). In VSA, the members are still responsible to negotiate with their own customers on pricing. As the service quality of different members using the same ship are essentially the same, price cutting become the only way to compete with each other.

The high competition in the major trade routes amid the sluggish world economy has created big problem for the companies in these routes. The following graph summarizes the average quarterly operating margins of the main carriers from 2008 to the first half of 2018. Among the total 42 quarters, only 17 of them are positive. In other word, about 60% of the time the industry is having negative operating margin! According to an estimate by McKinsey & Co, the overcapacity in liner shipping has destroyed USD 110 billion of shareholder value[1] in the past 21 years! Nevertheless shipping cycle is unavoidable in the industry, and shipping companies are prepared to suffer temporally losses. However, if the industry has more negative periods than the positive ones, it has to change. Otherwise, investors will lose their interest, more public/government support is required, merge and acquisition will happen. Some may leave the market, actively or involuntarily. Those who stay may have to stick together to avoid the chill in the long winter nights of shipping market!

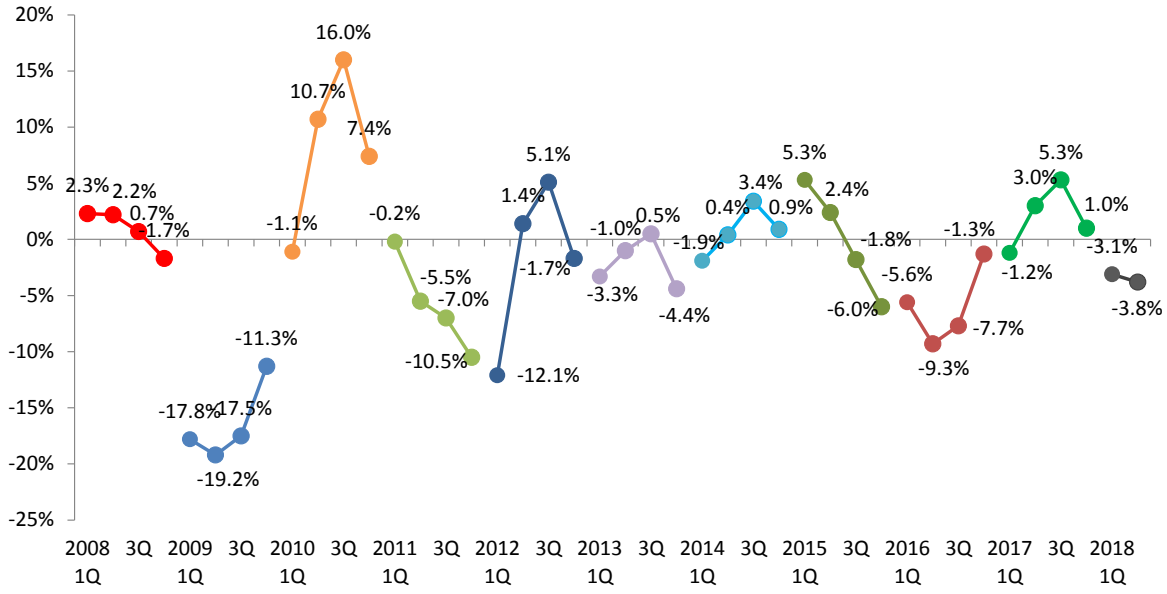
[1] https://seanews.co.uk/shipping/container/liner-shipping-ma-destroyed-usd-110bn-of-shareholder-value-in-21-years-report/

Number of ships by size on different routes (as of 01-01-2019)

	100-999	1,000-1,999	2,000-2,999	3,000-3,999	4,000-5,099	5,100-7,499	7,500-9,999	10,000-12,499	12,500-15,199	15,200-17,999	>18,000
Eur-N. Am	0	5	15	18	80	28	32	0	0	0	0
FE-N. Am	0	1	8	0	40	120	160	51	67	1	0
FE-Europe	0	0	0	0	15	17	28	20	115	31	90
ME/ISC related	32	116	59	16	57	108	87	27	29	0	0
Africa related	40	71	110	70	119	17	41	4	4	0	0
Lat Am related	50	106	120	57	41	61	113	55	10	0	0
Oceania related	19	31	15	21	65	56	9	0	0	0	0
Intra-FE	577	640	237	35	164	15	0	0	0	0	0
Intra-Europe	194	234	55	11	23	20	5	0	0	0	0
Other trades	3	4	5	1	0	0	0	0	0	0	0
Unassigned	10	8	5	5	2	9	5	3	3	0	2
Idle	48	86	35	11	35	5	0	0	9	2	0
Total	973	1302	664	245	641	456	480	160	237	34	92

Table 2 - Source: Alphaliner monthly monitor (January 2019)

Average carrier quarterly operating margins from 2008



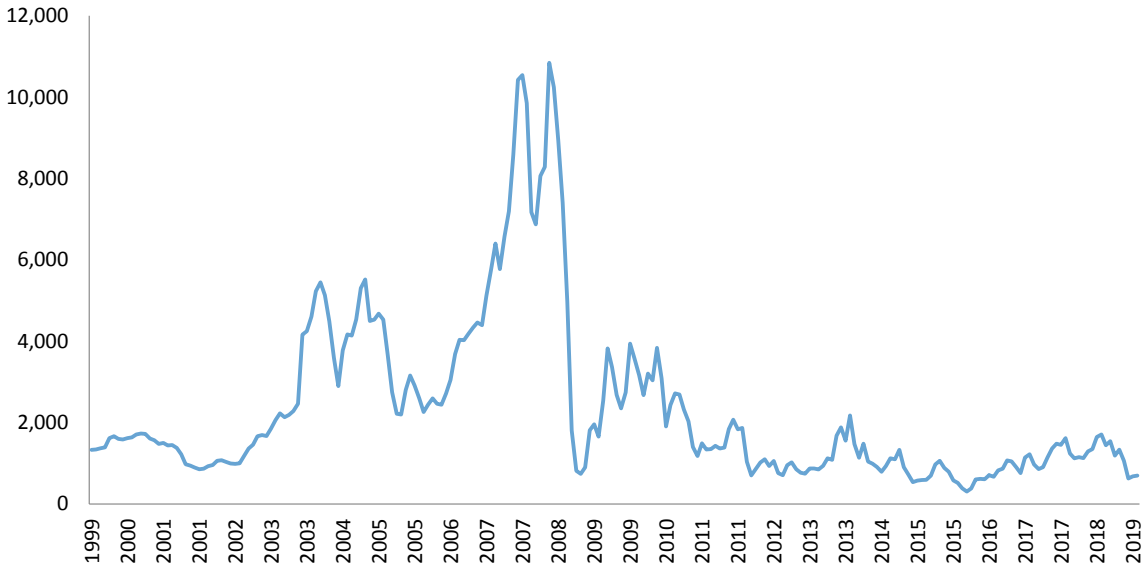
Average of CMA CGM (incl APL to 2Q 2016), CSCL (to 1Q2016), EMC, Hanjin (to 3Q 2016), Hapag-Lloyd (incl CSAV to 2014), HMM, Maersk, ONE (from 2Q 2018, formerly KL, MOL, NYK), WHL, YML, Zim

Graph 23 - Source: Alphaliner monthly monitor (January 2019)

Looking back, the situations after 2008 is not much worse than that before 2003. Examining the Baltic Dry Index (BDI), the barometer of the shipping industry, the low market index after 2012 is like that before 2003. As the following graph shows, there is no much difference between the shipping market after 2012 and those before 2003, except that the current index is obviously lower. This general decreasing in the shipping freight rates is attributable to the technology improvement in shipping. With larger ships, better management, better information, the cost of maritime transportation decreases over time. Therefore, even the demand increases from to (Graph 25) the long-term equilibrium prices will decrease.

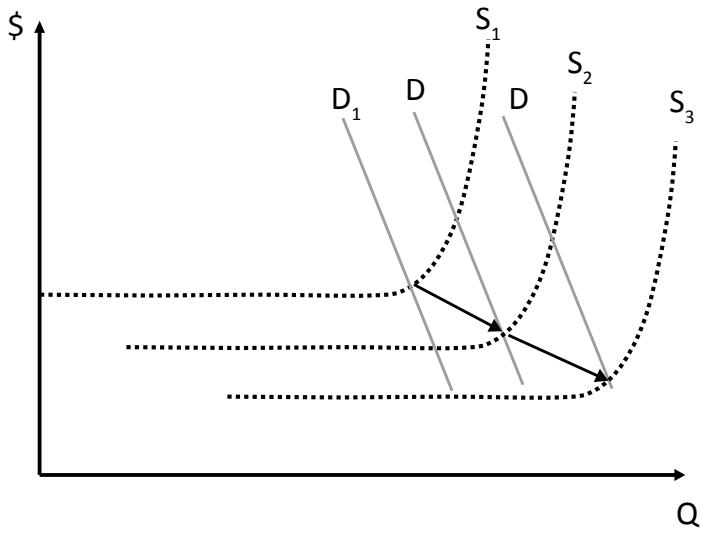
In the past two decades, the most obvious technology progress in shipping is the increase in shipsize. The container ships have experienced the fastest increase in size, followed by Bulkers and Tankers. This continuous growth in ship size is the result of the ship-owners' continuous pursue of Economies of Scale, and the increase demand in international trade. Bigger ships enable the owner to enjoy lower average cost, to offer a lower freight rate, and to be more competitive in the market.

The BDI from 1985 to 2018



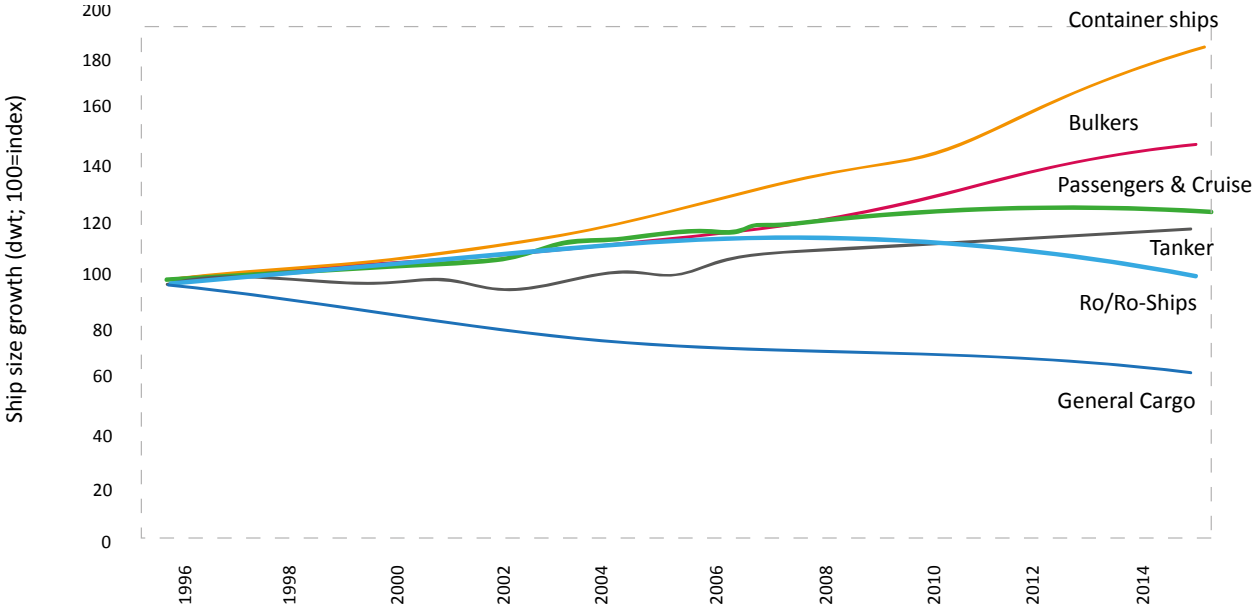
Graph 24 - Source: BDI index

Illustration on the impacts of technology progress on shipping freight rates



Graph 25 - Source: Meifeng Luo elaboration

Evolution of ship sizes from 1996 to 2015



Graph 26 - Source: The impact of Mega-ships, ITF, OECD

The benefits of large ships can only be realized when the demand is high. However, the uncertainty in the world economy and the conflicts between US and China foretells a gloomy future for world economy. Every shipping company that has owned large mega ships is facing a common difficulty: most of them can only be deployed in the major east-west route, and they all have difficulty to fill these ships. This easy way to use larger ships to increase market competitiveness, which has been used effectively in the shipping industry for many years, cannot continue. Currently, most of the major

liner shipping operators have formed alliances, to make better use of the large ships. However, they are also actively seeking new ways to reduce cost.

Looking into the future, the shipping industry may transform in following directions:

(1) *Digitization*: further efficiency increases and cost reduction

Shipping industry is very traditional. Most of the new development in IT technologies have not applied in shipping. Now, many have realized the huge inefficiencies in the current practice. Below are two examples provided by the industry leaders in the 1st International Shipping Technology and Internet Conference held in Shenzhen at February 28, 2018:

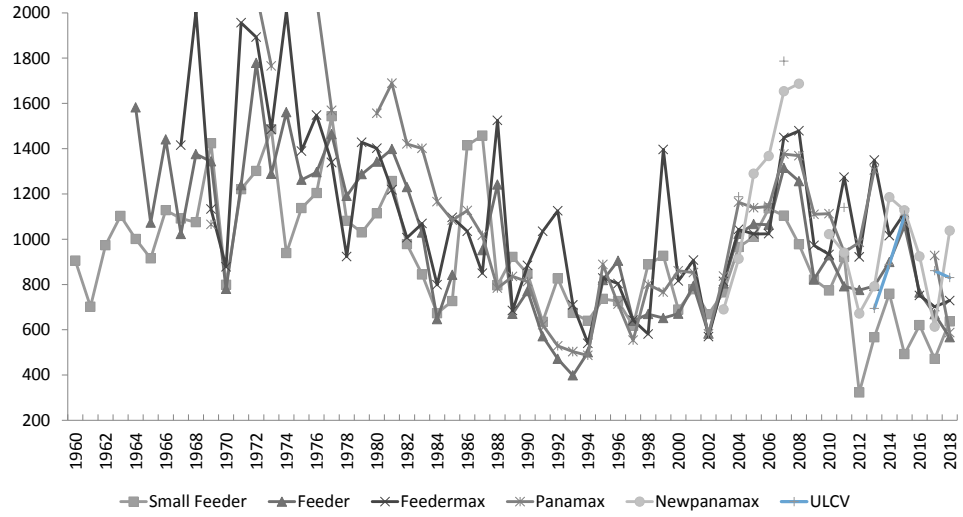
- The founder and CEO of Buyco, Mr. Carl Lauron pointed out the huge inefficiency in the current container freight contracting process. To fill in a large containership with 7000 contracts (Bill of Lading), the total admin time can amount to about four centuries, because 50% of the Bill of Ladings are paper based, and it could involve 10-20 different companies and 200 emails per shipment.
- The CEO of NYSHEX also pointed out that the current practice in container freight forwarding has resulted in a total of US$23 billion losses, due to the cancel booking/no show, blank sailing and unreliable supply chain.
- This huge inefficiency provides a huge incentive for shipping companies to use advanced technology in further cost reduction in shipping. Many freight forwarding companies has already started the transformation process. In addition to the freight forwarders, there are also many other shipping companies started to work with the IT companies, to explore the possibility for further cost reduction. Maersk, OOCL, MOL all have partnered with IT companies to develop the application of AI in shipping process. OOCL, for example, has partnered with Microsoft Research Asia (MSRA) to apply AI solution in liner network optimization, which could lead to $10 million annual savings in operation cost, according to James Henderson (Apr 27, 2018).

(2) *Shorter shipbuilding lag*: less volatility in freight rates

Shipbuilding lag, the time from ordering to delivery, are affected by both technology progress and shipping market condition. Generally, the shipbuilding lags are getting shorter in the past (Figure 5), except for the period of 2003-2008, when the demand for shipping is unexpectedly high. The shorter shipbuilding lag can shorten the shipping cycle. When ships need less time to build, the freight rate will take less time to adjust

when demand changes. This can reduce the volatility of the freight rates. Similar situation also exists in bulker sector. For example, according the IHS ship register database, an ore carrier of 325,963 DWT ordered on January 12, 2018 by Vale SA, is due to deliver at June 1, 2019. It only take 505 days to build such a large double haul ship. Ships of such size usually needs more than three years to construct.

Change of average shipbuilding lag (days) for containerships



Graph 27 – Source: IHS PC

(3) *Government subsidy*: increase the level of competition

Shipping subsidies have a long history (1933). It was popular because ships in commerce is a very important supplement to the navy or government service vessels. Now, such function gradually fade away in the world merchant fleet, but government subsidies still exist.

Today, such subsidies can have many forms, as income, tax breaks, and regulatory policies. The subsidies can directed to build new ships in a particular country, owned and crewed by a specific nationals, or to help their shipping companies when they suffer from operation losses.

The impact of such subsidies varies. As pointed out by Red Arrow Logistics[2], it can undermine the shipping industry, as it can "encourage companies to build ships which are - not needed, for companies who were not profitable and who do not have a profitable business model.- ".

[2] https://www.redarrowlogistics.com/industry-news/government-subsidies-undermine-shipping/

Thus, subsidies can increase the chance for the industry to be overcapacity, encourage inefficiency in shipping process, and nullify the function of the invisible hand.

(4) *Uncertain world economy*: **Having large containerships may not be a plus.**

The BDI index is not only the thermometer for dry bulk shipping industry, but also treated as an indicator for future global economy. When people have confidence that the market will expand, they will purchase more raw materials to prepare for the production infrastructure and facility. Thus, the demand for raw material import will increase. The current low BDI index is at historical low level. Also, according to the news from CNBC, Union Bank of Switzerland (UBS) predicated that the global growth will be lower in 2019[3]. The main factors are tighter monetary policy, the gloomy global equity markets, and the trade wars. In the long run, when China diverts away from manufacture oriented economy, and the world put more emphasize on the service economy, the demand for shipping may stay at low level.

When trade growth stands still, the increase in containership size will also halt. Furthermore, the companies that have already owned Ultra Large Container Vessels (ULCV) will feel increasingly difficult to make full use of them. The possibility to form bigger alliance is a no-pass, as regulatory bodies already concerned about its impact on market efficiency. With the uncertain global economy, it will be very challenge for those companies operating on the major trade routes.

In summary, the future shipping market will back to the normal period before 2003, with lower freight rate, shorter shipping cycle, and mediocre return. Development and application of new technology in shipping will become the main stream for shipping companies to enhance its market competitiveness. The most fitted will survive. The remaining will be those who can use the most updated technology to provide the most efficient and needed support to the global logistics services.

[3] https://www.cnbc.com/2019/01/02/ubs-2019-outlook-global-growth-to-slow-in-2019.html

maritime