Drewry
Maritime Advisors

Two steps away from liner paradise?

SPOTLIGHT REPORT | July 2017

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Two steps away from liner paradise?

SPOTLIGHT REPORT

July 2017

Two changes to liner shipping's fundamentals means that the industry could finally be on the verge of attaining sustainable profitability.

Introduction

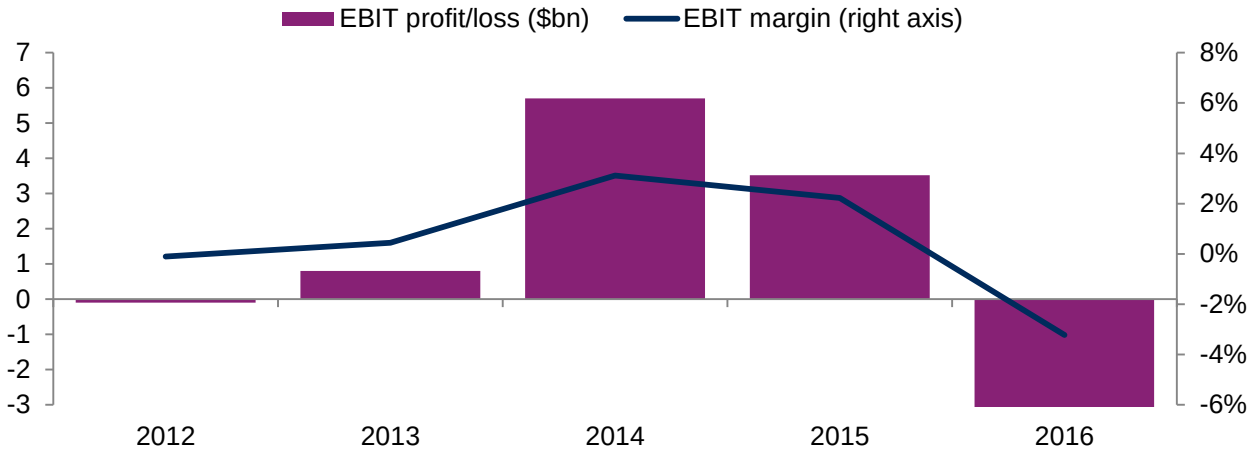
"With useless endeavour
Forever, forever,
Is Sisyphus rolling
His stone up the mountain!"

Henry Wadsworth Longfellow (1807–1882)

Liner profitability follows a familiar pattern: a short period of acceptable results followed by a return to gloom. Why should an industry that has contributed so much to the trade-driven prosperity of the modern world be consigned to the fate of Sisyphus; to roll its stone up the mountain only to stumble just before the summit and descend once more into the depths below?

An assessment of the fundamentals

Figure 1: Estimated carrier industry EBIT profit/loss and EBIT margins, 2012-16



Note: EBIT margins based on average of sample carriers after currency conversion to US dollars when necessary. Sample consists of APL - excluded post 4Q15; CMA CGM; Evergreen Marine Corp; Hanjin Shipping (container) - excluded post -2Q16; Hapag-Lloyd, HMM (container until 4Q15, all acttvities thereafter); K Line (containerships); Maersk Line; Matson (ocean transportation); MOL (containerships); NYK (liner); Regional Container Lines; Samudera Container Lines; Wan Hai; Yang Ming and Zim.

The answer lies not in the folly of individual lines, but in a series of economic factors and forces that have a profound impact on the industry. The implications of these are reviewed below.

Table 1: An assessment of the fundamentals driving the market

FACTOR	EFFECT	COMMENTS
Economies of scale	Structural overcapacity	Lines always build bigger vessels to exploit economies of scale. This leads to continual overcapacity
Perishability	Push for short-run contribution – rate erosion	Unused capacity cannot be stored. Lines cut rates in order to boost utilisation
High operational gearing	Push for short-run contribution – rate erosion	Lines' networks represent a high fixed cost burden. The logical response is to maximise utilisation
Commoditised service offering	Limited differentiation of product; price competition	Price is the principal competitive weapon
Fragmented industry	No coordination of capacity development, intense competition	Too many carriers and no dominant carriers to establish market stability
Inelastic demand curve	Falling rates have a limited effect on demand	Seafreight is a negligible element in the landed cost of manufactured goods and makes no difference to end market demand

The six problems preventing carriers from reaching liner paradise:

1. Economies of scale

The biggest problem that gets in the way of sustainable carrier profitability is the general acceptance that to survive carriers must seek economies of scale. This has a very important consequence: industries that are characterised by economies of scale tend to suffer from structural overcapacity.

The container shipping industry is no exception to the rule and until very recently has been engaged in an arms-race for ever larger ships. Orders for newbuilds have since ceased, primarily because there is such an over-supply of ships on the water that carriers are now forced to constantly juggle their biggest assets from trade-to –trade to prop up utilisation, while an increasing number of smaller vessels are either being idled or scrapped to facilitate the cascade.

2. & 3. Perishability and High operational gearing

Problem number two is perishability. In common with most service industries, liner shipping cannot store its product; when a vessel sails, unused capacity goes to waste. This would be less important without the impact of problem three: high operational gearing. By definition, liner services are scheduled and regular and an individual sailing forms part of a complex and carefully crafted network. This has two consequences: first, the vessel cannot be delayed in the hope that additional cargo will materialise to fill spare capacity; second, by establishing a liner network, the carrier commits itself to substantial fixed costs. Therefore, once the network is set up, the role of the trade lane manager is to maximise contribution to these fixed costs.

The combination of perishability and high fixed costs lead to continuous erosion of freight rates when overcapacity exists. What this means in practice can be illustrated by a short example:

A line has 500 TEU of spare capacity on a particular sailing. It is approached by a customer who offers 100 TEU of cargo for the sailing, provided that a rate reduction of US$ 50/TEU is offered. The trade lane manager calculates that, after the rate reduction is given, this parcel of cargo will generate a contribution to fixed costs of US$ 30,000. In these circumstances, the logical action is to reduce the rate to secure the shipment.

4. Commoditised service offering

Lines work very hard to differentiate themselves, but the reality is that their core product, the point-to-point move of a container, is now highly commoditised. This commoditisation has been reinforced by an overall rise in operational standards and the pervasiveness of the large vessel sharing alliances.

The scope for differentiation now lies in the rates offered and the logistics and e-business services provided by the leading lines, which are often only loosely coupled with the point-to-point move.

5. Fragmented industry

Until the recent wave of carrier M&A (mergers and acquisitions) it was a source of continued surprise that the supply side of the liner market remained so fragmented with no shortage of competition on any given trade route.

In such a perfectly competitive market, the seller is a price-taker and can have no individual influence on the market. It can sell as much as it likes (the demand curve for the individual firm is perfectly elastic) at the market price, but not above it.

Even in the era of supposedly confidential service contracts, there is a high degree of transparency in the market. Lines are familiar with each other's customer base and are often able to discover the terms of any service contracts or special rate arrangements.

6. Inelastic industry demand curve

The industry is far from perfectly elastic with respect to price; falling freight rates do not stimulate a counterbalancing rise in demand.

This should come as no surprise; the demand for shipping only arises because of demand for the goods being shipped and therefore depends primarily on the volume of trade in these goods. The availability of substitutes (air, sea-air and rail freight for example) has an effect too, but much smaller.

The degree to which the price of shipping can affect the demand for the goods depends largely on the proportion of total landed costs that it constitutes. For consumer goods on the dominant legs out of Asia, for example, this is very low.

For these commodities, changes in the freight cost will clearly have no impact on the retail price of the item in the store. In other words, freight rates can be cut to ribbons with no effect on demand at all; demand is completely inelastic and the normal price equilibrium mechanism, where demand rises as price falls, does not work.

The path to liner paradise

In the environment outlined above, lines will only ever make money when trade volumes grow to such an extent that total capacity is filled – at least on the dominant legs of trade routes; it is only under these circumstances that the downward pressure on rates is released. Crucially, in the current market structure, these circumstances will only ever arise by chance.

However, recent changes to these previously entrenched liner fundamentals are changing the rules of the game. In Drewry's opinion, by fixing just two of the six problems - economies of scale and fragmented industry - carriers can reach the liner paradise of sustainable profitability. There is evidence that the repair work is being carried out.

Are economies of scale running out?

Last year, Drewry carried out a simulation study of the operational and financial impacts on lines, terminal operators, ports and other supply chain stakeholders as vessel size increases up to and beyond 18,000 teu. The study results suggest that the economies of scale in vessel size, that have been a key feature of the liner industry, may be running out.

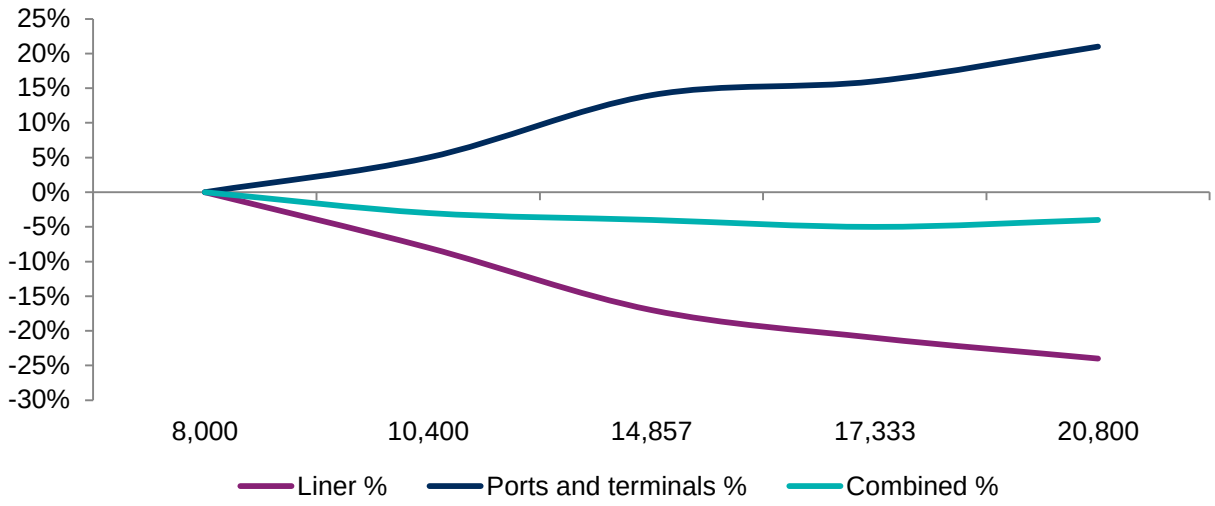
Crucially, this would mean that future vessel ordering will no longer be driven by the need to secure economies of scale but will instead be based on lines' assessment of future demand growth, leading eventually to closer harmonisation of supply and demand.

The Drewry study found that scale economies from megaships only work for the total supply chain if terminals can increase productivity in line with increases in vessel size. Larger vessels place greater demands on ports, where channels have to cater for deeper draughts and on terminals, which need to upgrade equipment, yard facilities and manning levels to effectively handle increased peak cargo volumes.

Figure 2 shows the combined shipping line and port 'total system' cost savings peak at only 5% of total network costs and economies of scale diminish as vessel sizes rise beyond 18,000 teu.

The consequence of such a reduction in the scope for further economies of scale will be to reduce the industry's propensity for ordering ever larger ships to reduce unit costs (irrespective of demand requirements), and generating structural overcapacity, the prime cause of poor and uncertain profitability.

Figure 2: Are economies of scale running out?



Consolidation creates a stable concentrated market

A second escape route is available through a change in market structure, from perfect competition, towards oligopoly. In oligopoly there are few sellers and each is of such size that a change in price or output will have an immediate and appreciable effect on other firms.

Collusive oligopoly gives rise to cartels and would therefore be resisted by regulators, but there is another form of oligopoly, with different mechanisms. In a non-collusive oligopoly, firms take decisions independently, based on particular assumptions about the anticipated behaviour of their rivals.

The Kinked Demand model assumes that each oligopolist will expect the worst possible reaction from competitors. Thus, if the oligopolist wishes to increase price, he must assume that competitors will not follow and that his sales and market share will fall. If, on the other hand, he decides to reduce price, his competitors will match his action and revenue will fall. Similar constraints will equally apply to the introduction of new production capacity. In these circumstances, it is easy to see how non-collusive oligopoly would promote both price stability and capacity control.

The conference system at its zenith was a successful attempt by lines to create the conditions of collusive oligopoly. It collapsed with the arrival of new and aggressive carriers, which ushered in many of the characteristics of perfect competition. If there were now to be a phase of extensive industry consolidation, a position of non-collusive oligopoly would be the natural outcome. The result would be price stability and much closer matching of capacity to demand.

This throws a different light on the rationale for consolidation. To date it has been represented as the development of scale economies through acquisition; actually, it is a route to a new market structure.

To assess the evolving state of market concentration in liner shipping Drewry has used the widely-respected Herfindahl–Hirschman Index (HHI).

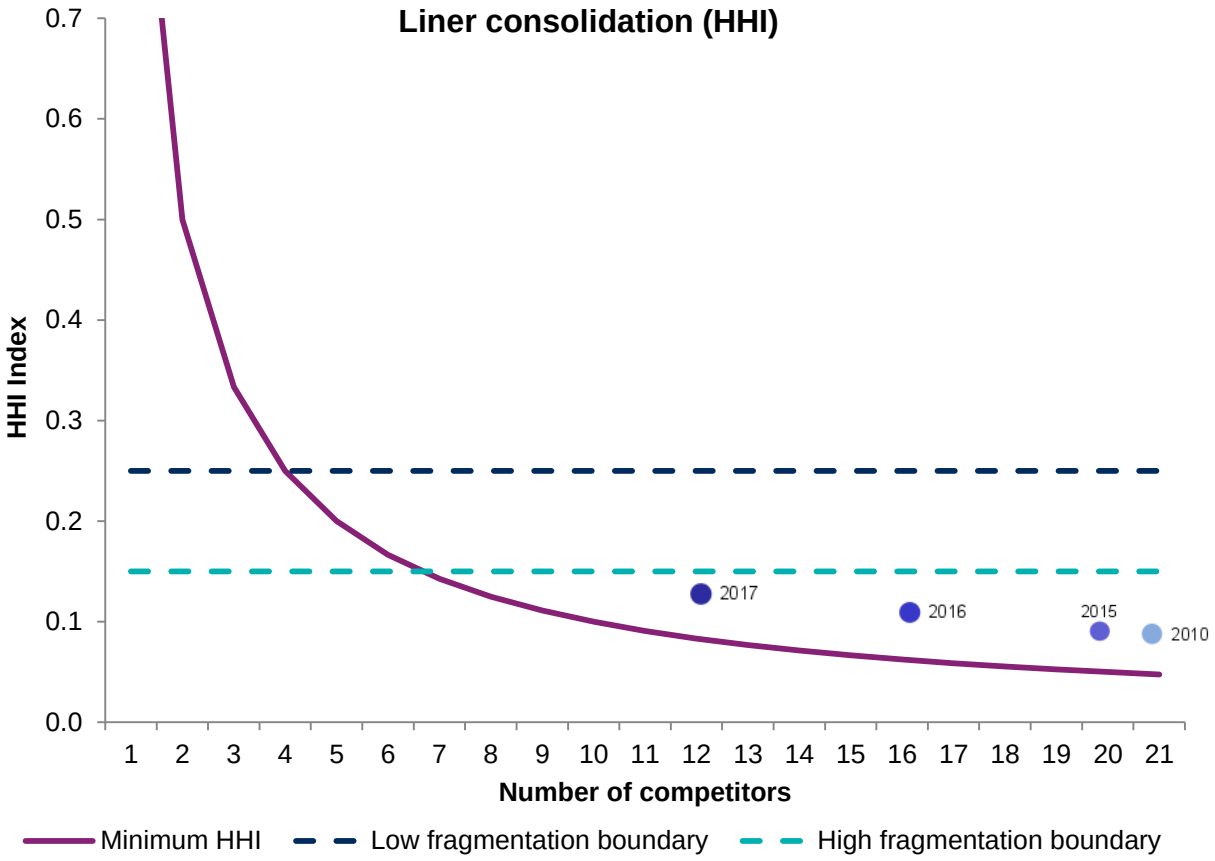
The HHI index is an approach used to measure the size of a company (in this case, of liner operators) in relation to the industry they are in, and can indicate the amount of competition between them.

To produce the HHI score, a value for market share is needed. Drewry has used liner capacity as a proxy for market share. A higher HHI score indicates lower levels of competition with an increased

market power; a low HHI score indicates high levels of competition, high levels of fragmentation and less market power.

Consolidation is creating a more concentrated and stable market

Figure 3: HHI Index Assessment: Liner consolidation progress



The good news for carriers is that the industry has embarked on another round on major M&A (mergers and acquisitions) in the past year or so, following a 10-year hiatus. This has pushed market concentration up to the high fragmentation boundary. Further concentration beyond present levels will increase carriers' ability to manage capacity effectively.

Table 3 presents all of the deals and bankruptcies since 2010. As can be seen the focus of late has been at the upper end of the carrier rankings, which has far greater impact on industry consolidation.

Table 3: Carrier M&A, bankruptcies since 2010 (deals involving Top 20 carriers highlighted)

Year	Company	Comment
2017-18	**NYK, MOL, K Line**	**Merger of container units into ONE**
	OOCL	**to be acquired by Cosco**
	Hamburg Süd	**to be acquired by Maersk**
	UASC	**Merger into Hapag-Lloyd**
2016	**CSCL**	**Merger into Cosco**
	Euro Container Line	acquired by Samskip
	Great Southern Shipping	placed into liquidation
	Hanjin Shipping	**filed for bankruptcy**
	Interocean Lines	ceased liner operations
	NOL/APL	**acquired by CMA CGM**
	SM Line	acquired Hanjin's Transpacific assets
	Trinity Shipping Line	ceased liner operations
2015	Nan Tsing Container Lines	Domestic Chinese operator ceased operations
	SeaFreight	acquired by Crowley
2014	**CCNI's container business**	**acquired by Hamburg-Sud**
	CSAV's container business	**merged with Hapag-Lloyd**
	Delta Shipping Line	ceased liner operations
	Horizon-Alaska operations	acquired by Matson
	Hubline	withdrew from container shipping
	OPDR	**acquired by CMA CGM**
	Tropical Shipping	acquired by Saltchuk (parent of Sea Star Line)
2013	Grand China Shipping	ceased liner operations
	Hainan PO Shipping	ceased liner operations
	STX Pan Ocean	filed for bankruptcy
2012	Bernuth Lines	acquired by King Ocean
	Feederlink	acquired by Unifeeder
	Reef Shipping	acquired by Matson
2011	MISC	withdrew from container shipping
	Swee Joo	filed for bankruptcy
	The Containership Company	ceased liner operations
	Trailer Bridge	filed for bankruptcy
	Yanghai Shipping Co	ceased liner operations
2010	Go Angola Line	ceased liner operations
	Maruba	ceased liner operations

Source: Drewry Maritime Research

As things stand, upon completion of the latest M&A (the Ocean Network Express, or ONE, merging of the Japanese companies' container units is expected to become operational in April 2018) and taking into account future newbuild deliveries, there will only be 10 carriers with a minimum 2% share of global capacity by start of 2021 (see Table 4), which between them will control approximately 82% of the world fleet.

Table 4: Carriers with >2% share of containership capacity (active & on order), 000 teu, July 2017

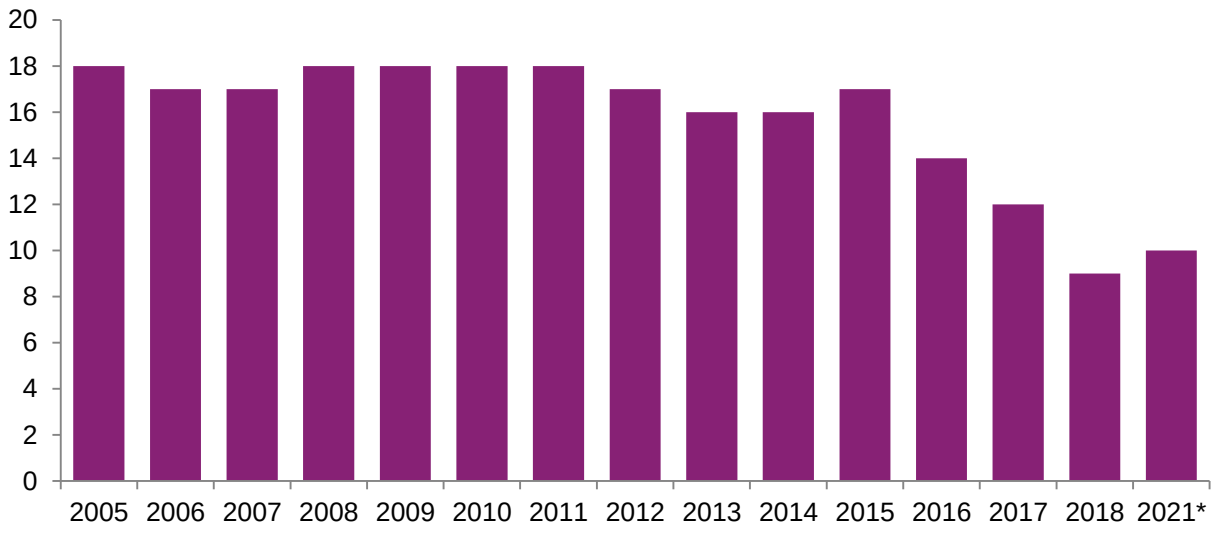
Carrier group	Active ships	Orderbook	Total	Share (%)
Maersk Line	3,828	410	4,238	18.4%
MSC	2,916	187	3,104	13.5%
Cosco-OOCL	2,185	698	2,883	12.5%
CMA CGM	2,168	225	2,393	10.4%
Ocean Network Express (ONE)	1,378	340	1,719	7.5%
Hapag-Lloyd	1,533	40	1,573	6.8%
Evergreen	984	324	1,308	5.7%
Yang Ming	596	112	708	3.1%
PIL	358	144	502	2.2%
HMM	458	0	458	2.0%
Zim	308	11	319	1.4%
Wan Hai	235	15	250	1.1%

Notes: Includes all recent M&A deals, including CMA CGM's impending 4Q17 purchase of Mercosul Line from Maersk Line; Data is subject to change. Source: Drewry Maritime Research

This scenario does not account for any future M&A, but the accelerating trend towards oligopolisation in container shipping is clear. As Figure 4 highlights, as recently as 2015 there were 17 carriers with at least a 2% share.

Even within the future Top 10 there is a wide gap between the top 4 carriers (sharing 55% of the world fleet), the three lines ranked five to seven (20%) and the last three lines (7%). Inevitably, as the gap between the leading four carriers and everyone else beneath gets wider speculation will mount about whether the smaller players can keep up and remain cost-competitive, opening up further potential M&A opportunities to get the industry closer to the magic HHI low-fragmented line.

Figure 4: No. carriers with min 2% share of world containership fleet capacity



Note: *Post M&A and currently scheduled newbuild deliveries. Source: Drewry Maritime Research

If these two developments (falling scale economies returns and industry consolidation) were to coincide, the pressures arising from structural overcapacity and market structure would greatly reduce. Sustained liner profitability would no longer be an unattainable dream but a solid reality.

Table 5: Conditions for sustainable profitability are in sight

FACTOR	EFFECT	CHANGE..?	COMMENTS
Economies of scale	Structural overcapacity	Economies of scale run out	Lines will build to match demand not to chase economies of scale. Pursuit of share is less important
Perishability	Push for short-run contribution – rate erosion	No	Unchanged
High operational gearing	Push for short-run contribution – rate erosion	No	Unchanged
Commoditised service offering	Limited differentiation of product; price competition	Unlikely	Unchanged
Fragmented industry	No coordination of capacity development, intense competition	Industry consolidation	A small number of large carriers is able to match capacity to demand and promote increased rates
Inelastic demand curve	Falling rates have a limited effect on demand	No	Rising rates have a limited effect on demand, supporting profitability

Risks to spoil the party

There are numerous risks on this path to nirvana.

Development	Outcome	Consequence
Container handling revolution	Berth productivity rises and port time falls	Vessel economies of scale become viable
Consolidation stops	Industry remains highly fragmented	Lines strive for share, no price discipline
Vessel technology breakthroughs	New vessels deliver lower unit costs, tempting lines to order	Overcapacity remains
Excess shipbuilding capacity persists	Newbuild prices remain low, tempting lines to order	Overcapacity remains

Container handling revolution

It is possible that new technology will emerge that will herald a container handling revolution, whereby the scale economies are achieved on the land-side too. Were this to occur (something Drewry believes is unlikely in the short-to-medium term due to the resistance to invest by both ports/terminals and carriers) it would re-kindle the incentive to buy even more, larger, mega-ships.

Consolidation grinds to a halt

Shippers are getting used to consolidation in the container industry. That doesn't mean they have to like it. As their pool of carriers shrinks they are more likely to lobby competition regulators to step in. Recent container M&A such as Maersk Line's takeover of Hamburg Süd and the proposed ONE merger of Japanese carriers have encountered minor regulatory issues so any future deals may have to contend with conditions being applied that make them less attractive to conclude. The onus will be on carriers to disprove any form of collusive oligopoly is occurring.

The $6.3 billion sale of OOIL/OOCL to Cosco means there aren't many other really attractive takeover candidates left on the shelf. OOIL and its container unit OOCL have a good track record for above-average profits in a challenging market and a reputation for being a very well-run company, earning the moniker "The Perfect Bride" by Drewry Maritime Financial Research. The same cannot be said for any other target line. This was reflected in the substantial price-to-book premium of 1.4x, which is a fair bit above OOIL's historical average P/B of 0.8x. Takeover-hungry carriers might find more resistance as the pressure to sell will be lower now that the industry is expected to return to profit from 2Q17 onwards, which could force any purchaser to pay above market value.

Additionally, while the number of global carriers with scale is contracting and those that remain have locked-down big trades such as Asia-Europe, there still remain a lot of smaller operators in other routes. With cheap steel, low charter rates and rising freight rates the barriers to entry for new players are low. For example, new entrant SM Line emerged out of the ashes of Hanjin in the Transpacific trade so as one carrier went another stepped in, at least in one corridor. This means the level of fragmentation will always vary from trade to trade.

Another potential barrier is the high-degree of state involvement in liner shipping that can see decisions made for other reasons than purely commercial. Governments often see shipping lines as strategic assets and have in the past been less inclined to sell or wind down failing companies.

Excess shipbuilding capacity

At present nobody is ordering vessels, of any type, and pretty soon yards across the world will find themselves with little to keep them occupied. The vulnerable position of shipyards has given containership operator-owners a window of opportunity to smooth out the delivery of the newbuilds to which they are committed and to massage the supply/demand balance more in their favour. Maersk Line and CMA CGM are two carriers that have pushed back deliveries from this year into 2018.

However, with governments (particularly South Korea) taking measures to save the shipbuilding industry there is a risk that shipowners will be tempted by heavy discounts to make orders the industry doesn't need. That could be what two state-backed carriers with publically announced expansion plans, IRISL and HMM, are waiting for.

The path to liner paradise is clearly laid out for carriers but for it to happen they must ensure that they continue to consolidate and avoid the temptation to add to the over-capacity burden.

What happens next…

How will we know whether or not our hypothesis is right? Here are a few leading indicators:

- The LOA of the largest newbuild vessels does not exceed 400 metres;
- Berth productivity in leading terminals stays at around 150 moves per hour;
- There is further consolidation among global container shipping lines.

If we see these indicators, we will know that liner paradise is in sight. When it is reached, there will be important implications for many stakeholders.

Shippers

The first impact will be on shippers who will have to pay freight rates that generate a reasonable return on equity to the lines; we can easily imagine rates being 50% more than they are now. For most shippers this will be irritating rather than damaging; seafreight constitutes a small proportion of total delivered costs for most headhaul cargo. Shippers will also (they are experiencing this already) have a smaller pool of carriers to choose from.

While these two outcomes will doubtless cause anxiety, there may be a silver lining in the form of reduced rate volatility.

Lessors

The container and vessel leasing industries have been, on the whole, beneficiaries of lines' erratic profitability, allowing lines to grow and to achieve economies of scale by leasing both vessels and containers. If lines' balance sheets become stronger, they may decide to finance growth from their own resources and reduce scope for leasing companies.

Terminals

Terminals are already grappling with the new concentrated alliance structure and consolidation among lines and with the operational difficulties of handling ultra-large containerships. While further concentration of carrier buying power is a challenge that needs to be addressed (consolidation and alliances among terminals is a possible response) the end of vessel upsizing would be a considerable relief.

Investors

As we head towards sustainable profitability, market caps will rise and debt yields will drop. Equity price volatility will be driven more by the macro economy and less by the historical vagaries of the liner industry.

Regulators

In a fragmented market of poor profitability, the regulator's job is relatively easy: looking out for blatant collusion on price. In the more concentrated market that is emerging where a non-collusive oligopoly could arise, regulators will be under pressure from shipper bodies to increase scrutiny to ensure that increased market power is not abused.

The truth is that, if all this happens, liner shipping will become more like a normal industry and one that can earn a fair return for providing the infrastructure that enables so much of world trade. That seems fair to us.

About the authors

Tim Power

Managing Director, Head of Drewry Maritime Advisors

E power@drewry.co.uk

Tim is Managing Director of Drewry, responsible for the implementation of company strategy and the operational Head of Maritime Advisors. He has more than 33 years' strategic and operational experience in shipping, ports and supply chain management.

Simon Heaney

Senior Manager, Drewry Supply Chains Research

E heaney@drewry.co.uk

A principal author of Drewry's popular weekly update on the container shipping sector, Container Insight Weekly. Simon has nearly two decades experience covering the container shipping market and works within Drewry's Container Research division.

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UK

15-17 Christopher Street
London
EC2A 2BS
United Kingdom

T +44 20 7538 0191

India

4th Floor, Tower C
Pioneer Urban Square
Sector 62, Gurugram
Haryana122002
India

T +91 124 497 4979

Singapore

#13-02 Tower Fifteen
15 Hoe Chiang Road
Singapore 089316

T +65 6220 9890

China

Unit D01 Level 10
Shinmay Union Square
Tower 2
506 Shangcheng Road
Pudong, Shanghai
China, 200120

T +86 (0) 21 5081 0508

drewry.co.uk