
Liner shipping strategies: an overview

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Abstract: This paper offers an overview of the three main current trends in the liner shipping market during the last 15 years: horizontal integration, vertical integration and the investment in bigger vessels. It tries to explain why these strategies took place and are closely interrelated. Finally, the paper shows how the uncertainty on the potential future overcapacity and on the repeal of the exemption of shipping conferences from European competition rules could play on future strategies.

Keywords: liner shipping; container vessels; horizontal integration; vertical integration; shipping conferences.

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1 Introduction

Liner shipping markets have experienced impressive growth rates during the last 15 years. The worldwide container traffic rose for instance from approximately 30 million teus in 1990 to 100 million in 2006. Forecasts predict that the worldwide trade will reach more than 200 million teus by 2020 (ISL, 2006). These growth rates are a consequence of the expansion of containerisation but also, of course, of the globalisation of the world economy leading to the relocation of industrial production.

To answer to this impressive growth, liner shipping companies have implemented different strategies during the last 15 years. The objective of this paper is to identify these strategies. Section 1 deals with the process of horizontal integration by shipping lines and its corollary, the increase in firms' size. Section 2 discusses the issue of vertical integration that can be seen as a complementary strategy of the former. Section 3 focuses on the increasing size of containerships, which can be seen as a motive for horizontal and vertical integration. Finally, the last section investigates what the future of liner shipping

markets could be and notably sheds light on the imminent repealing of the exemption from competition rules given by the European commission to liner shipping conferences.

2 The emergence of global carriers

The first element that comes to mind when analysing the main trends in the liner shipping markets during the last 15 years is the increase in the size of firms and the emergence of global carriers. Various sources can be used to illustrate this phenomenon. For instance, the market share of the ten biggest world carriers increased from 50% of the world capacity in January 2000 to 60% in January 2007, corresponding to a growth in the cumulated capacity from 2.5 million in 2000 to 6.3 million teus in 2007 (AXS-Alphaliner, 2007). During the same period, the cumulated market share of the five biggest carriers moved from 33% to 43%.

According to the same source, Maersk Line, the market leader, experienced an increase in its market share from 12% in 2000 to 17% in 2007, or a total capacity of 1.7 million teus. MSC, the second largest carrier in 2007 with a carrying capacity of 1.03 million teus in 2007 has upgraded its capacity by 800,000 teus during the last seven years. CMA CGM, the third carrier accounted for 685,054 teus in January 2007, and has increased its capacity by 400,000 teus since 2000.

If the growth in capacity for the main carriers is general, the path chosen by shipping lines differs however (Cariou, 2000; Slack et al., 2002; Notteboom, 2004). Two main paths can be distinguished: internal (or organic) and external growth. For the former, chartering and direct investments in new vessels are the main vectors, while for the latter, Mergers and Acquisitions and strategic alliances are the preferable modes. Of course, far from being exclusive, according to each individual shipowner and to the period considered, one way over another is preferred. External factors such as market conditions and internal factors such as financial capacities or market positioning can explain it.

For instance, during the last 15 years and in parallel to direct investments, Maersk Line had been involved in a strategic alliance with SeaLand (1995–1999) before entering into a wave of Mergers and Acquisitions of Safemarine, CMB-T and SeaLand in 1999, and P&O Nedlloyd in 2005. Each strategy has of course its pros and cons.

Chartering instead of ordering new vessels (around 55% of Maersk Line, 40% for MSC and 65% for CMA CGM is charter-in in January 2007) provides for instance more flexibility, reduces the initial capital requirement¹ and the delivery time, but is more costly in the long run. Mergers and Acquisitions offer the advantage of inducing a steady increase in the carrying capacity, in the commercial and logistical network, but also carry high costs. For instance, the value of the takeover of P&O Nedlloyd by Maersk Line in 2005 was estimated around 2.5 billion USD (Anonymous, Lloyd's List, 2005, 1 August) to which, organisational costs should be added.

Another path that has been taken by shipowners is strategic alliances, a multiroute version of the former consortia. Through slot exchange agreements, strategic alliances give the possibility for partners to increase their quality of services (frequency, space availability), without investments. The main drawback comes from the coordination between partners within an alliance, and from the instability in alliance memberships, notably in the case of Mergers and Acquisitions. For instance, the merge between P&O (UK) and Nedlloyd (The Netherlands) in 1996, where the former was operating within the Grand Alliance,² and the latter within the New World Alliance³ led the new group to

choose the Grand Alliance, and inevitably had a negative impact on the New World Alliance' partners.

A similar analysis applies to the recent choice by Maersk Line following its takeover of P&O Nedlloyd in 2005 to leave the Grand alliance. Strategic alliances appear then to be nowadays the preferable path for rather small companies⁴ that can not sustain the financial burden of new investments, wish to enter into new markets and/or want to increase their bargaining power vis-à-vis stevedoring companies (Section 3).

When it comes to evaluating the impact of the consolidation of shipowners on their profitability, Global Insight (2005) retaining a sample of 30 shipowners, stressed that the return on investments was around 7.5% during the 2000–2004 period, a similar return to other transportation industries. The relationship between firms' size and their individual performance is however more difficult to assess. It is not so surprising considering the vast literature from Industrial Economics stressing the absence of a direct relationship between concentration and market power (see Tirole, 1998 for instance). But another reason can be put forward and is the focus of the next section. Horizontal integration can only be a winning strategy as long as all links within the supply chain (port and inland transport) adapt.

3 The move to vertical integration

The growth in container port throughputs has also been tremendous during the last 15 years. It was even amplified by liner shipping companies' strategies that reshaped their networks. Via hubs and Spokes systems, a multiplying effect from transshipment occurs and puts even more pressure on ports. Once again, numerous statistical sources can be used to illustrate this trend. For instance, the worldwide container throughputs increased from 86 millions teus in 1990 to 309 million in 2003 (Ocean Shipping Consultants, 2004).

During that same period, the rise was from 32 million to 147 million for Asian, from 24 million to 70 million for European and from 17 million to 40 million in North American ports. When it comes to the share of transshipment, it reached 45% for Asian, 22% for Chinese, 21% for North European and 32% for Mediterranean ports in 2003.

Considering the inability for ports to adjust in the short run and their high occupancy rates, ports were also in the need for long-term investments in the beginning of the 1990s. At the same time, two elements were limiting their capacity to invest. Firstly, ports were mainly controlled by state-owned companies and margins in public finance were low. Secondly, stevedoring companies were rather small- or medium-sized companies, local or regional, with restricted financial capacities. Two main trends were then to appear.

Similarly to what happened in liner shipping markets, international stevedoring companies emerged. For instance, the cumulative market share of the six biggest stevedoring companies increased from 15% in 1991 to 36% in 2003⁵ (see for instance Brooks, 2000; Heaver et al., 2000; Notteboom, 2002; Midoro et al., 2005; Olivier, 2005; Gouvernal et al., 2005; Gouvernal, 2006). Then, some stevedoring companies, directly (as AP Moller Terminal for Maersk Line) or indirectly (as Port Synergy, a joint venture between CMA CGM and P&O Ports) controlled by shipping lines entered the business, in other words, vertical integration took place.

This strategy can be analysed as a complementary strategy to the previous horizontal integration process (Section 2), and more specifically to their decision to invest in bigger containerhips (Section 4). As stated earlier, these strategies can only be winning as long as the main links within the logistical chain adapt. A shipping line that considers that the current and future market conditions in the stevedoring or inland transportation markets are not going to give it the possibility to find a sufficient quality of services in terms of time in ports, hinterland access, etc., might then decide to enter the market. The company can then decide to finance solely or to participate through joint ventures in the financing of infrastructures and superstructures. This need in specific assets that can not be offered by the market can then call for hierarchy (full control), using Williamson's (1975) typology.

The importance of port and logistical branches within the shipping lines can be used to illustrate the degree of differentiation among shipowners (Midoro and Parola, 2006). A distinction exists then between shipping lines mainly focusing on shipping services such as MSC, Cosco and Hyundai and that use bilateral contracts with stevedoring companies, and those who try to develop their own services along the logistical chains (Maersk Line and CMA CGM for instance when it comes to port operations and/or rail and barge shuttles). Focusing on ship-to-shore interface, a distinction can also be found between shipping lines having strong control over stevedoring operations such as Maersk Line via dedicated terminals and via his own stevedoring company (APM terminal),⁶ those having limited control via dedicated terminals but joint ventures with stevedoring companies (CMA CGM, MSC); and those, relatively smaller, that are using multi-user facilities and rely on bilateral contracts with stevedoring companies with which they do not have any financial relationships.⁷ Apart from previous explanations, other reasons explain these different choices.

A first reason is of course coming from the financial capacity of individual shipping lines. The direct investment in port superstructures represents a substantial cost. For instance, the private contribution to the Port2000 project in Le Havre represents 279 million euros, around 26% of the total cost (Levieux, 2007).

A second reason is related to the internal policy of port authorities regarding shipping lines' involvement in the stevedoring business. Port authorities might have an interest in shipping lines sharing the investment as it might suggest that the investment is grounded. It can also be a way to be sure that they commit themselves for the future, perhaps until the end of the concession or leasing agreement even though, as any private contractual agreement, it can be terminated anytime. On that issue, the bargaining power of each partner becomes crucial.

But other operational factors could also come into play. The use of dedicated terminals can be seen as a way for shipping lines to secure access and therefore to reduce uncertainty during the time in port. Dedicated terminals can generate a tailor-made service that might not be offered with multi-user ones, and can enhance the productivity of stevedoring operations. A similar analysis can be made, although the extent of vertical integration has not been as massive yet, for the participation of shipping lines in rail or barge shuttles from maritime terminals to the hinterland.

Finally, a last explanation that could be considered as a drawback for vertical integration could be the implementation by shipping lines of strategic barriers (Brooks, 2000; Haralambides et al., 2002). Acquiring exclusivity within a network industry facing increasing returns to scale and facing bottlenecks can be a way to deter entry (foreclosure).

To conclude, it appears that in parallel to horizontal integration, vertical integration has been a salient feature of liner shipping strategies. Not only have shipping lines increased their size, but their operational scope has enlarged to new areas. When it comes to investigate the main trends in the liner shipping markets, another element deserves to have light shed on it: the investments in mega container vessels. Although already touched upon when presenting the reasons for horizontal and vertical integration by shipping lines, the next section focuses on that issue.

4 The increase in vessel size

The growth in the average size of containerships is a well documented trend in liner shipping markets. For instance, the average size has moved from 2000 teus in 1995 to 3000 teus in 2005. The evolution in the world order book from January 2000 to August 2006 also illustrates this trend (Figure 1) as well as the increase in the size of the biggest vessel in operation. Her size was around 4400 teus in 1990 and is peaking today between 12,000 and 14,300 teus according to various statistical sources (Lacoste, 2007; AXS-Alphaliner, 2007).

The capital requirement for such vessels inevitably calls for big companies able to invest (see Section 2). The need is even higher considering the obligation to invest in several vessels in order to provide homogeneity in services, and even sometimes in ports (see Section 3).

Figure 1 Order book in 6000+ teu containerships – January 2000–August 2006

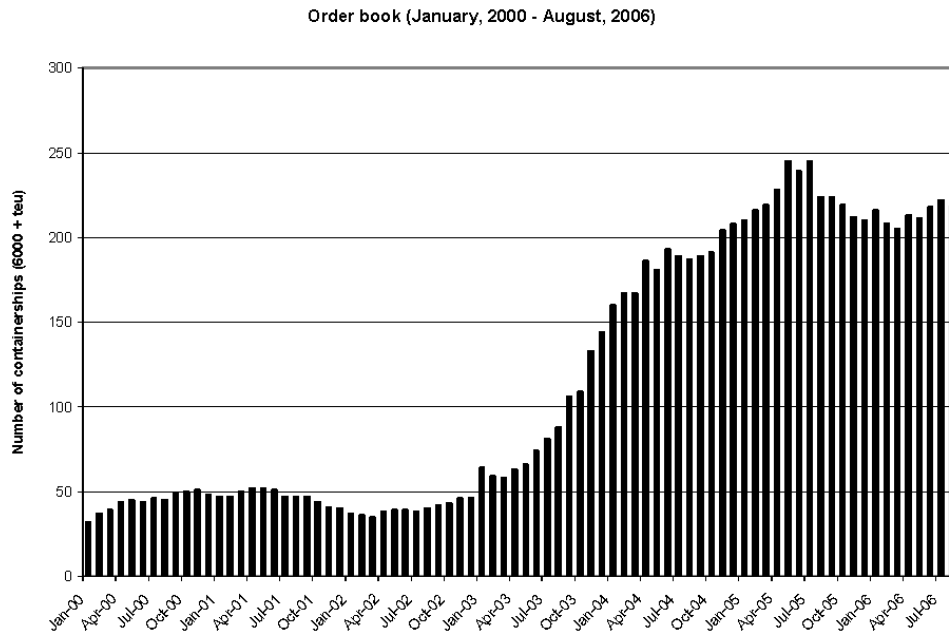


Figure 1 Order book in 6000+ teu containerships – January 2000–August 2006 (continued)

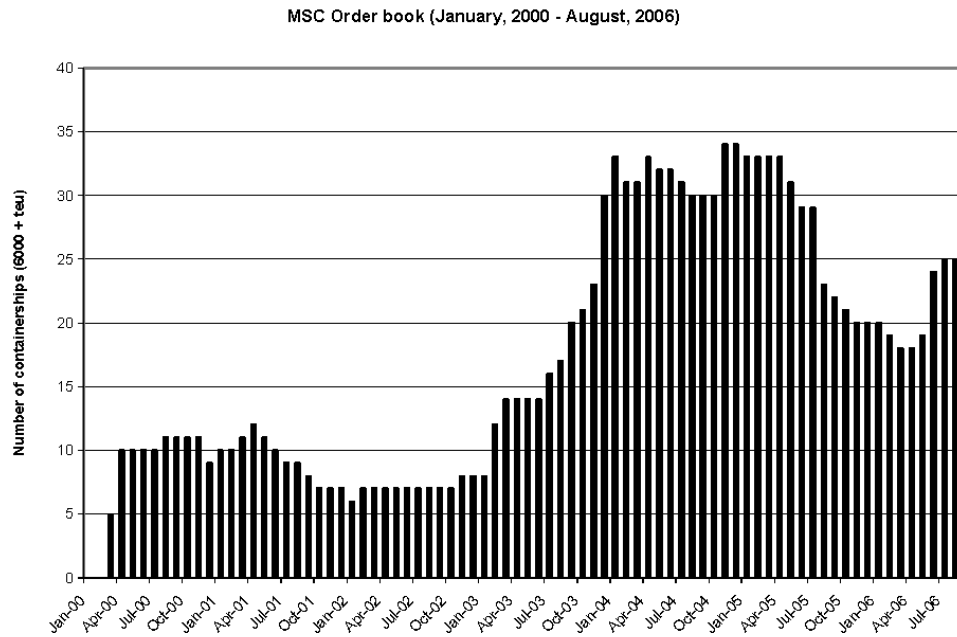
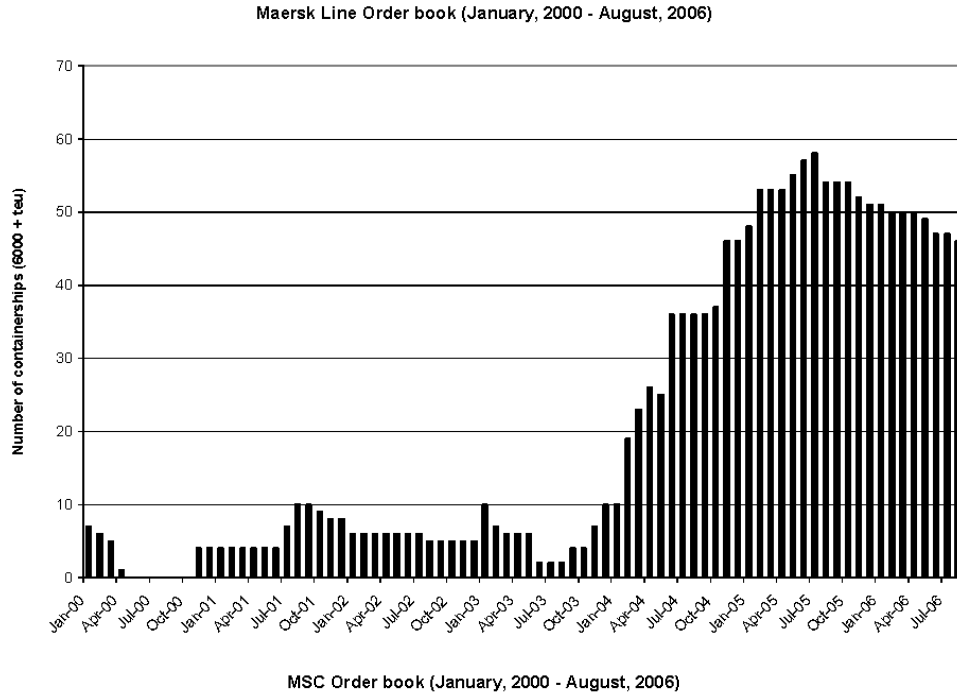
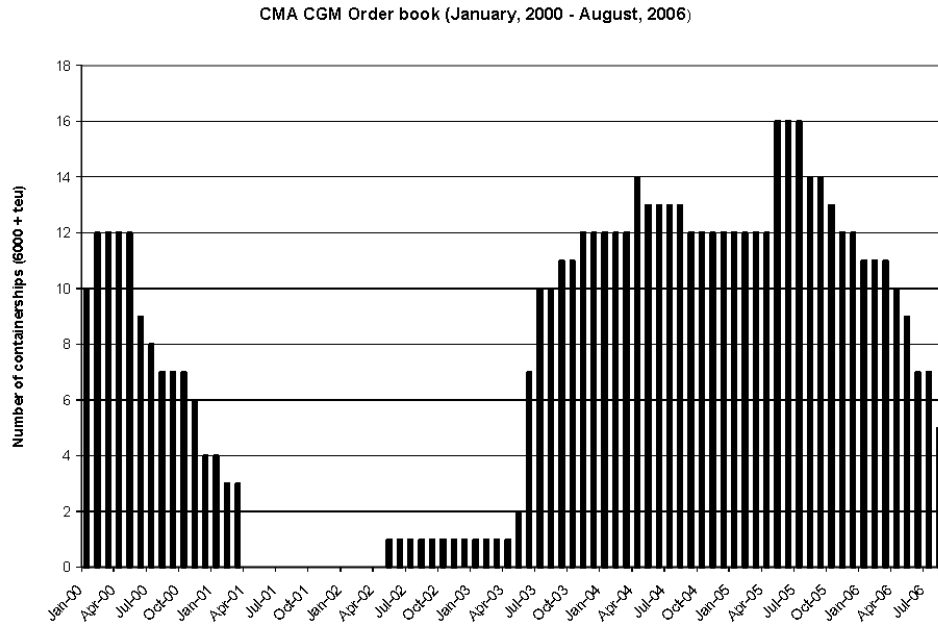


Figure 1 Order book in 6000+ teu containerships – January 2000–August 2006 (continued)

Source: Adapted from Fairplay Newbuilding Statistics

The main argument in favour of such mega vessels or Ultra Large Container Ships (ULCS) is related to economies of scale at sea (Gilman, 1999; Stopford, 1999; Cullinane and Khanna, 1999a, 1999b; Cariou, 2000). In particular, two elements are generating some savings: capital and fuel costs (around 50/60% of operative costs) that grow less proportionally than the carrying capacity of a vessel. For instance, the representative new building price of a 6500-teu containership in 2001 was estimated around 70 million USD compare to 29.4 million USD for a 2000 teus one (Drewry Shipping Monthly, 2007), corresponding to a capital cost per teu of 10,770 USD for the former and 14,700 for the latter. In the last quarter of 2006 and as a consequence of shipyards' capacity constraints, the price for a 6500-teu vessel was 100 million USD (15,380 USD per teu) and 41 million USD for a 2000-teu vessel (20,500 USD per teu). Furthermore, a study by Drewry Shipping consultants (2001), assuming a bunker cost of 110 USD per ton,⁸ estimates the fuel cost around 0.60 USD per teu per annum for a 10000-teu vessel, against 0.87 USD for a 4000-teu vessel.

At the same time, numerous elements limit the use of bigger vessels. The first one is due to technical factors, notably related to naval architecture. For instance, containerships more than 10,000 teus represent a technological gap in terms of propulsion if the standard commercial speed of 25 or more nautical miles per hour is to be kept. The size of the engine and the length of the shaft might also limit the carrying capacity of the vessel. Furthermore, the growth in the number of containers above deck (Odense Shipyard, 2007)⁹ and the swinging effect generated lead to structural pressure on the hull and also, to potential damages for goods stuffed into containers located on upper levels.

Considerations for the environmental impact of such mega vessels could also represent a limit. For instance, a study by Stapersma and Grimmeliu (2003) on the volume of sulphate, nitrate and carbon air emissions generated by containerships stresses

that 8000-teu vessels might enjoy a clear advantage compared to 12000 or 16000 teu ones. At the same time, improvements in the design of the hull for 12000-teu containerships could easily be achieved according to authors.

The second limit regarding the optimal size of containerships is related to the capacity of ports to accommodate such vessels. For instance, Emma Maersk which is the biggest vessel in operation in 2007 is 397-m long, 56-m wide, and has a draft of around 16 m. Few ports in the world are able to offer the nautical conditions, infrastructure, superstructures, and the inland connections that such a vessel needs. Few ports are also able to offer a quality of service maximising the utilisation rate and minimising the time in port where diseconomies of scale are taking place.¹⁰ Furthermore, the extensive use of hubs and spokes systems for such vessels inevitably increases the feeder and transshipment costs for shipowners (Imai et al., 2006).

The time in port and the port productivity appear then to be crucial elements for the future commercial success of such vessels (projects for 18000-teu vessels are under consideration), and can explain the move of shipowners into vertical integration (Section 3). These needs for high-density trade lanes and highly efficient port facilities also explain why most of bigger vessels are found in East/West trades. For instance, Anonymous, Lloyd's Shipping Economist (Mars 2006) shows that amongst the $82 \times 7300 +$ teu containerships deployed in the beginning of 2006, 11 were used in service between Mediterranean/Far East/WC North America, 21 between Far East/WC of North America and 50 in North Europe/Far East trade.

Nevertheless, if the investment in large containership vessels faces some limits, shipowners are investing. Figure 1 presents the monthly total order book in 6000 + containerships from Fairplay Newbuildings statistics¹¹ in the 2000–2006 period (27 largest shipowners). New orders were particularly strong from the beginning of 2003 until the beginning of 2005.

Since then, a general stabilisation has taken place due to similar rates for new orders and deliveries, and can be detected for the three most active shipping lines (Maersk Line, MSC and CMA CGM). The last section discusses the reasons for this relative slow down in the global volume of the order book and more specifically, the effects from the future potential overcapacity and from the repeal of the exemption to European competition rules for shipping conferences.

5 A few open questions for the future

Former sections aimed at reviewing the main trends in liner shipping markets, the strategies implemented by shipping lines and the reasons for such strategies. Several elements are still to be considered when it comes to investigating if these evolutions will continue.

A first element is of course related to future demand. On that issue, most analysts (Drewry Shipping Consultant, Clarkson, Mercer, and Global Insight for instance) predict a worldwide growth rate in container trade for the next 15 years between 6 and 8% per year. Uncertainty however still exists in the future growth rate of industrial production in China, in the possibility to extend the array of commodities carried by container, and in the imbalance of trade. For the latter, almost 50% of containers leaving North America and 20% in Europe are nowadays empty (ISL, 2007).

The second element is evolution in supply. Even assuming a steady increase in demand, the huge investments by shipping lines during the last years will probably lead to overcapacity. The Supply/Demand ratio in 2001 was about 94 and reached 104.5 in 2004 (Global Insight, 2005). These issues shed light on the impact of liner shipping strategies on future tariffs and therefore on their profitability, knowing that at the same time pressures on fuel and container repositioning costs exist.

In that regard, the debates that took place during the reexamination by the European commission of the exemption given to shipping conferences to competition rules deserve to be scrutinised. Briefly, the exemption has actually existed since 1875, and was given considering the stabilising effect of shipping conferences on tariffs. It was considered to be both at shippers and at shipping lines' advantage (see for instance Davies, 1983). The ground for this exemption is that a pure and perfect competition would lead to fluctuations in prices and in quality of services (like it occurs in the tramping markets) that would not offer shipowners the possibility to pay back their investments. It was then decided that one should leave the possibility for shipping lines to offer joint liner services and to collectively set tariffs, hereafter referred to as shipping conferences.

Although numerous debates occurred during the last century, several reasons explain why the exemption that was formally given by the European commission in 1986 (RCEE 4056/86) is about to end in fall 2007.¹² The first grievance is that official tariffs are not used anymore. For instance, 90% of transatlantic contracts would be nowadays confidential service contracts, and are not using the official tariffs provided by shipping conferences. Furthermore, shipping conference tariffs that are more or less stable and are used more as a guideline only represent 30% of the final costs to be paid. Surcharges such as Bunker Adjustment Factors, Currency Adjustment Factors, war risk, and winter surcharges, etc., have to be added and vary every month (Cariou and Wolff, 2006).

However, if the faculty for shipping lines to stabilise prices through shipping conferences is questionable, their faculty to coordinate and streamline services, thanks to cooperation should not be underestimated. As a matter of fact, the 15 shipowners cooperating within the Far Eastern Freight Conference are still controlling around 60% of the total capacity in Europe/Far East trade, a similar share prevailing for Trans-Atlantic trades. The focus and debates have then been shifted to another issue: the need for shipping lines, expressed by the European Liner Affairs association (EELA), to replace previous shipping conferences by an information exchange system.

Several reasons could justify it. Firstly, if the end of shipping conferences might not have much of an impact on the larger shippers, what about the smallest ones that are still using official tariffs? Secondly, the current situation where overcapacity might take place could become a regular feature in the market. It will then lead to more bankruptcies, Mergers and Acquisitions that might not be, in the near future, beneficial to shippers.

6 Conclusions and remarks

The objective of this paper was to present an overview of the main trends in the liner shipping markets. As stated, the enlargement in firms' size, in vessels' capacity and in services' coverage have been the most salient features. At the same time, many questions still remain. Firstly, how will the new European regulations regarding shipping conferences that will probably spread to other parts of the world affect these strategies?

In that regard, the limits imposed by regulators represent an additional constraint other than already pre-existing technical and commercial ones.

Secondly, if pure and perfect competition conditions are implemented, how will shipowners behave? Will they enter into a famous Prisoner Dilemma where, the inability to exchange information might lead them to a suboptimal equilibrium? Which strategic behaviours might then take place?

Whatever the answers are, the future evolutions in liner shipping markets are definitively going to be interesting to follow. After more than a century of economic studies investigating the need or not to implement pure and perfect competition conditions in the market, shipowners might now be forced to face them.

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Notes

- ¹A new 6500 teu containership is estimated around USD 100 million in 2006, Drewry Shipping Monthly.
- ²In partnership with Hapag-Lloyd, NYK and NOL.
- ³In partnership with OOCL, MOL and APL.
- ⁴Hapag-Lloyd, the largest shipowner belonging to a strategic alliance in 2007 is ranked number five.
- ⁵Hutchison Port holding, PSA Corporation, AP Moller Terminals, P&O Ports, SSA, Eurogate.
- ⁶APM Terminal presents himself as an independent profit centre that is not working exclusively for Maersk Line.
- ⁷This typology is actually reductive as according to different markets, a shipping line may adopt different strategies.
- ⁸The actual cost of bunker is more than 200 USD per ton for IFO.

⁹On the Emma Maersk, the biggest containership in operation, the length of the shaft is 125 m and the height on deck is nine containers (Odense Shipyard, 2007).

¹⁰The time charter rate for a 3500-teu vessel was around USD 24 682 per day in January 2007 (Drewry Shipping Monthly).

¹¹Using statistics from Fairplay Newbuilding, we compute a monthly stock variable (order book) such as the order book (in t) = order book (in $t - 1$) + New orders (in t) – deliveries (in t).

¹²For more information, the reader can refer to <http://europa.eu.int/comm/competition/antitrust/legislation/maritime/> that provides full access to the main studies and debates that led to this decision.