

Gigantism in Container Shipping, Ports and Global Logistics; a Time-lapse into the Future

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The impact of containerization

A central theme that has permeated the discussion on conferences and alliances is the development in the size of containerships over the past 30 years or so. And rightly so. The economies that have ensued from the *gigantism* in ship sizes are profound, and so is their role in promoting trade and economic development. Economies of scale in shipping, together with competition among carriers, have reduced transport costs to such an extent that *geographical distance* plays a much lesser role today, as a determinant of trade between nations, and it is being increasingly replaced in trade models by the concept of *economic distance*, as the latter is proxied by ocean freight rates (cf. transport costs). At the same time, the reliability of containerization has not only revolutionized cargo systems, but it has also been the ‘father’ of *modern day logistics and distribution*. The latter systems, in their turn, together with information and communication technologies, have transformed not just transport, but every aspect of our everyday lives.

Although *causality* in economics is often difficult to establish, I have many times tried to demonstrate that gigantism in container shipping has been facilitated by increasingly competing ports; concentration in the form of global shipping alliances; and sailing speed of ships, as a function of bunker fuel prices.

The importance of sailing speed

As regards the latter (sailing speed), it is well understood that this is a crucial parameter in determining the effective supply of tonnage in the shipping market and, together with “port-speed”, i.e. cargohandling efficiency, influence the optimum size of containerships on a certain trade route. Effective fuel management, incidentally, can save a company hundreds of millions of dollars a year. Still, however, the present day practice of slow-steaming to save on fuel doesn’t come cheap, as it increases pipeline and other inventory costs of shippers and has therefore an impact on logistics.

Diseconomies of scale in container shipping

But let us return. For more than 30 years, I have been preaching that it is *port efficiency and productivity* themselves, rather than any technological developments in ship design, construction or propulsion, that have induced the gigantism in containerships we observe today. Port efficiency and productivity all over the world have been advancing with leaps and bounds, as a result of port

competition, brought about by globalization, trade liberalization and competition among exporting nations.

However, that there are limits to the growth in ship sizes and these depend on freight demand; port capacity, facilities and technology; land infrastructure; other logistical costs; the future of global shipping alliances; and the attractiveness and future of the hub-and-spoke system in container transportation.

I have often shown earlier that -in situations where the ship has to be turned around in a port within a fixed time interval, say with 48 hours irrespective of her size- it costs more to handle a container arriving on a large ship than one arriving on a smaller one. In other words, cargo handling time per TEU is longer after a certain ship size, and this is a distinct '*port diseconomy of scale*'.

Big ships impose substantial demands on port capacity, without however paying commensurately for this demand or, indeed, bringing more traffic to the port. It can easily be established that *call size* is only moderately correlated with vessel size. In addition, one can now simultaneously accommodate only two ships of the latest generation (400 meters) in a one kilometre of quay wall, instead of three ships (300 meters) of the earlier generation. Berth utilization obviously goes down and so does the utilization of Ship-to-Shore (StS) cranes, for bigger ships mean lower call frequency.

One needs fewer bigger ships, and fewer port calls, to serve a given amount of yearly demand. Thus, *connectivity* goes down and, with it, the contribution of shipping to trade and development. In addition, a reduction in the frequency of carrier itineraries (i.e. number of services), caused also by slow-steaming, impacts the inventory costs of traders, thus defying the very principles of supply-chain optimization; and this is a clear *diseconomy* along the supply chain. Finally, filling up the bigger ship in Asia is easier said than done. To do so, the ship has to call at more Asian ports than what her size would warrant, often picking up containers at random and at short notice, without due consideration to the importance of proper *stowage planning*. As a result, ship- and terminal stowage planning at the other end (Europe / North America) often becomes a nightmare.

Review of Consortia Block Exemption and its impact on shipping and ports

Just above, I noted that the gigantism in shipping has been induced by both port competition and shipping alliances. Indeed, without the ability to use each other's ships, no carrier by himself alone would be able to achieve a *capacity utilization* high enough to justify the use of present day mega-ships, while at the same time offering the frequency that markets demand. But carriers have gone a step too far: At the time of writing, three alliances carry 80% of global trade. Such consolidation, in an industry that is already highly concentrated, is bound to take place under the increasing scrutiny of the regulator who, with the final consumer in mind, is likely to encourage more competition rather than further consolidation. If this happens, i.e., if container shipping becomes more open and competitive in the future, and alliance agreements regarding vessel sharing, investment planning, etc. are scrutinized more closely for their compatibility with competition law, as I expect, the *joint filling of the ship* will become more difficult and ship sizes shall by necessity decrease, together with an increase in the number of ports of call. Low prices would then be achieved through more competition rather than big ship sizes. This is the more so when it is

doubtful if the *economies of scale* in shipping are passed on to the final consumer, as required by the *consortia block exception* from the provisions of competition law in Europe.

A voice from the past: the 'second scenario'

There are a number of macro-trends that, in addition to the above might advocate for smaller ships and more port calls; particularly the latter. In a nutshell: Transshipment costs and if they can help it shippers prefer to have their goods as close to them as possible; Consolidation and distribution use land infrastructure without paying full costs for the private use of a public good; The external costs of hub-and-spoking (congestion; pollution; accidents) may at times be as high as 2% of European GDP. I have thus argued that transshipment, warehousing and distribution don't come cheap, as our enthusiasm with logistics often assumes. It is good to know this and thus make sure that the costs (internal and external) of logistics operations are paid in full, including the costs of using *public* infrastructure. The latter because (to a large extent) *infrastructure* is no longer a *public good* and thus the *user-pays* principle should in principle apply.

Liner shipping conferences

But industry concentration is not something new in liner shipping, and before alliances were invented we had, and still do, *liner conferences* for more than 100 years. Without going too much in length in this preliminary note to the European Commission, one could say that the difference between the two forms of carrier 'cooperation' is that, in conferences, profit maximisation is pursued through price-setting while, under alliances, the same objective is pursued through better cost control. From the viewpoints of market efficiency, consumer welfare and shipper interests, the latter pursuit (cost control) is a much better alternative.

Conferences are perhaps the only international price-fixing cartels that have stayed outside the ambit of antitrust regulations for a long time. There are good reasons for this and I would be amiss not to repeat them here.

All *national* declining cost industries, i.e. "high fixed - low variable" cost industries, from agriculture and pharmaceuticals to steel, aviation, railroads and shipbuilding, have historically enjoyed some degree of protection from price competition. But shipping is a predominantly *international* industry and, thus, no national laws could possibly apply to regulate competition. It has thus been considered that price competition should be limited through a *self-regulating mechanism*, allowing carriers to charge on the basis of *long-run average costs*, to the benefit of a sustainable, regular, frequent and reliable service, according to the requirements of demand (i.e. the shippers themselves). This rate-stabilizing mechanism was found in the face of *conferences*.

In 2008, the European Commission, under strong lobbying from the European Shippers' Council (ESC), banned conferences to and from its territory. In the "Erasmus Report", prepared for the European Commission, I have shown this to be a very wrong decision: the removal of *some* self-regulatory power from an industry as international as liner shipping, I had argued, where no national competition law could apparently apply, would lead –with mathematical certainty– to higher *rate instability* and transport system unreliability, seriously jeopardizing global *Just-in-Time* systems of production and distribution. In addition, such a step was bound to invoke further consolidation in shipping. At the end of the day, the European citizen would again have to foot the

bill of ill-conceived and introvert policies that ran against global European competitiveness. At the time of writing (2019 – i.e. 18 years later), these findings have been fully confirmed.

Concentration in container shipping

There is little doubt that *cooperative schemes* among carriers, such as those of conferences and alliances constitute forms of industrial concentration which, in principle, should be abhorred. In spite of its alleged and incessantly proclaimed efficiency gains, consolidation is bad news for both employment and price levels. Also, in imperfectly structured markets, such as container shipping, it is doubtful if efficiency gains are passed on to the consumer through lower prices, or are appropriated by the producer through higher profits. In this regard, two things need to be discussed: a) whether concentration is necessarily a bad thing; b) in order to say something meaningful about concentration one first needs to define the *relevant market* to which concentration measures should apply.

Is container shipping a contestable market?

My answer to (a) is not very convincing. Using Baumol's theory of *contestable markets*, I argue that concentration might not matter after all, i.e. concentration should not necessarily lead to monopoly power (and its abuse), as long as markets are contestable; in other words, they are markets where *entry* and *exit* are easy and exit is relatively costless. Easiness of entry, however, means *threat* of entry and this is enough to 'discipline' incumbent carriers from abusing any monopoly power, and charge prices equal (if not below) to the average long-run cost incurred in producing the desired output, yielding them thereby only normal profit. In addition, in *multi-product network industries* such as liner shipping, *cherry-picking* (or cream-skimming or market-niching, as the terms go) by aspiring new entrants could eventually cost incumbents not just a share of their market but, indeed, their entire market. This, because the *cherry* (dense service) was cross-subsidizing the *cherry tree* (network). As most industrial economists these days, however, I conclude with a well-known Greek adage: "*he who has honey at his fingertips is bound to lick it in the end*"; in our case, sooner or later concentration is bound to lead to monopoly power and *rent-seeking* by carriers.

Concentration and 'relevant market'

My reply to (b) is very clear: the wider (geographically) the *potential* outreach of a seller, the less concentrated his market would be. For instance, the market of the city where the port is located is fairly *captive*. But as the port tries to extend its hinterland towards the region, the country or the continent, the market becomes just a *potentially targetable* market, with more players and thus more competition. Simply put, to say that the (global) market share of Maersk Line is 19% means very little as, from a competition point of view, what Maersk does in Latin America has very little relevance in northern Europe. To talk therefore about *concentration* we first need to define a "marketplace", i.e., the *relevant market*, in which carriers "actually" compete. But, with global logistics and distribution, this is easier said than done. For instance, The Shanghai-Rotterdam *port-to-port* market may be highly concentrated, with just a handful of carriers offering services, but if one were to consider that, actually, the market is the *door-to-door* importation of bicycles made in Wuhan, China to Paris, France, then the market is highly competitive with many players offering services, using not only those two ports but many others, at both ends of the trade. Simply put, if the market is *port-to-port*, it could indeed be concentrated; if however the market is *door-to-door*,

including a miscellany of *add-on* logistics services, it could well be considered as not concentrated at all.

Carrier strategies and a novel pricing concept

Containerization has gradually led to the *commoditization* of the ocean (port-to-port) liner service. This situation has led to excruciating competition among carriers who -in the 1990s- realized that survival meant differentiation. Investment in logistics services and related infrastructure, rather than in ships, allowed carriers to become more *asset light*, thus more agile in coping with the vagaries of the business cycle. The example of global forwarders and 3PLs was very convincing: They suffered the least from the 2009 economic meltdown just because they didn't own any ships but were able to 'buy' capacity as and when required. They could thus "ride the business cycle", chartering in and out at will, while carriers were stuck and burdened with shipping tonnage, 'sinking' with it in every market downturn.

All the above would be fine, were it not for carriers who, in their anxiety to fill their ever bigger ships, have been found quite willing to sell capacity to NVOCCs, thus making them both their customers *and* their competitors. Recent estimates raise the percentage of NVOCC-managed capacity to 40% of total liner shipping slot capacity. I have always maintained that this carrier strategy is a folly: Building larger and larger ships, while knowing that you will be unable to fill them, and then selling the extra capacity to your competitor corresponds to nothing less than offering him the knife to stab you in the back. One could in this sense also argue that the industry has fallen into some sort of vicious circle where the need to cut costs leads to the construction of larger ships, creating overcapacity that depresses rates thus leading to a stronger need to cut costs and so on and so forth.

A novel idea I have recently proposed to carriers, in an effort to create 'leverage' for them against 3PLs is pricing of all-in, door-to-door, services that is leveraged around the component carriers maintain a comparative advantage; i.e. the ocean transportation leg of the supply chain. In economics, this pricing strategy is known as *raising rival's costs*; i.e., the rival is forced to buy an essential input (shipping) at a higher price. Simply put, this means that the carrier charges a higher price for the ocean transportation leg, where he maintains a comparative advantage (i.e. also the component with the lowest price elasticity of demand), and lower prices for the other components of the supply chain (e.g. road transport) where he competes. From a competitiveness perspective, the door-to-door transport price should remain the same as before, but the NVOCC would now have to pay much more for his ocean freight requirements and this would put him at a comparative disadvantage.

By mid 2000s, the situation I have described above had started to change. Carriers appeared to be returning back to core business, shedding the idea of vertical integration in favor of greater market share (and thus long-term profit) in core business (transportation), through mergers and the strengthening of shipping alliances. Better horizontal integration (alliances), therefore, and dominance in the sector (shipping) where they had the comparative advantage was the predominant strategy of carriers. This *return to the roots* was been the result of the weakening or banning of conferences, and the low freight rates and service unreliability that have ensued as a result.

At the time of writing, the situation may again be changing soon, in view of the impending review of the consortia block exemption regulation. Carriers have started preparing for an attack on alliances by investing again along the supply chain.

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