

Competition effects of vertical integration in container ports: assessing the European Commission decisional practice

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Abstract

Purpose – Container liner shipping companies started expanding their business by investing in container port terminals in the late 1990s. This market entry results in an extensive presence of vertically integrated liners and terminals. This study aims to explore the competition effects of this vertical integration trend based on a regional (European) analysis. In particular, it extracts lessons from the European Commission (EC) cases on the competition effects of vertical integration. The critical analysis of the cases examined at the institutional level intends to reach conclusions on whether liner–terminal vertical integration harmed or advanced competition in the relevant markets and/or the extent that there is a need to revise the current policy practices.

Design/methodology/approach – This study critically assesses the EC's decisional practices in port container terminal vertical mergers in the last 25 years (1997–2021). Based on a literature review comparing maritime and competition economists' perspectives, it reviews the types of mergers examined, the methodology followed for relevant market definition and calculation of market shares and the estimated competition effects. The Hamburg–Le Havre area is the port range used as a case study for comparing the decisional practice with actual market developments. These container ports serve the greatest consuming market of final and intermediate goods in Europe and are gateways to Central and Eastern Europe.

Findings – The assessment identifies a need for expanding the investigation as a precondition for reaching conclusions on both the anti- and pro-competitive effects. First, only a limited number of transactions have been notified to the EC. Second, the empirical research identified a gap in this process, as there were no decisions (phase I) on vertical mergers between 2008 and 2016. Third, the ex ante assessment has not applied a phase II in-depth analysis to any case due to the absence of competition concerns. Finally, due to the absence of complaints, there is a lack of any ex post assessment of the effects of vertical integration.

Research limitations/implications – This assessment is important for understanding the current and emerging features of intra-port and inter-port competition and the potential effects that the continuation and expansion of liner companies' vertical integration strategies will have along maritime supply chains. It also contributes to the broader discussion on liner companies' strategies, such as the research and policy-making efforts around the globe to understand the impact of both vertical and horizontal integration.

Practical implications – These discussions are critical for a diversity of businesses that use liner shipping services or provide facilities and services to container shipping lines or ports. They are important for the interests of customers and consumers as they could inform any needed re-visiting of competition policy to protect from the dominance of any market developments that would lead to conditions limiting competition. Expanding analysis on the competition effects of non-notified mergers would help a better understanding of market changes.

Social implications – Enhancing competition and limiting monopolies is valuable from a consumer's perspective. This is more so in the case of maritime trade that serves the needs of societies. The study contributes by generating a better understanding of how decision-makers have worked towards that direction and what realignments are worthy.

Originality/value – There are no previous comprehensive reviews and analyses of the ways that policy-makers at the regional level have addressed the competition effects of vertical integration strategies of liner shipping companies when enhancing competition is valuable from a consumer perspective. Comparing



maritime economists and competition, the study, via its literature review, also offers a comparison of maritime and competition perspectives on these competition effects, allowing positioning of how effective decisional-making practices have been.

Keywords Liner shipping, Vertical integration, Container terminals, Competition, European Commission

Paper type Research paper

1. Introduction

The decision of liner shipping companies to invest in container terminals dates back to the 1990s. Such decisions have been part of a broader transformation of the seaport industry accelerated by the advent of transshipment and the increase in global maritime trade (cf. [Notteboom et al., 2022](#); [Kollia, 2019](#)). The entry of shipping lines altered container ports, resulting in an extensive presence of vertically integrated liners and terminals worldwide, including the European market. While the trend continues, European Union (EU) institutions monitor vertical integration in the maritime industry, as in all EU sectors, to assess the resulting competition effects.

This research attempts to extract lessons from the relevant discussions and decisions of the European Commission (EC) over the last 25 years on the competition effects of the mentioned vertical integration trend. In particular, it explores whether the decisional practices allow concluding on the pro-competitive and anti-competitive effects that liner (shipping companies) – terminal vertical integration (LTVI) might produce. By analysing the cases examined at the institutional level it reaches conclusions on whether the ongoing process allows to understand the extent that LTVI has harmed or advanced competition in the relevant markets or a revise of the current policy practice at the European level to reach such conclusions,

This study critically assesses the EC decisional practice in seaport container terminal vertical mergers from 1997 to 2021. It reviews the types of mergers examined, the methodology followed for market definition and calculation of market shares, and the estimated effects of the notified mergers. This enables us to conclude whether these decisional practices advanced the targeted accurate understating of the relevant market (as the EC advocates since late 1990s: [EC, 1997](#)) and allowed to realise the actual competition effects these transactions have on container terminal services and, ultimately, on the shippers and the consumers of the transported goods.

This assessment is important for understanding the current and emerging features of intra-port and inter-port competition and the potential effects that the continuation and expansion of liner companies' vertical integration strategies will have along maritime supply chains. It also contributes to the broader discussion on liner companies' strategies, such as the research and policy-making efforts around the globe to understand the impact of both vertical and horizontal integration. These discussions are critical for a diversity of businesses that are users of liner shipping services or provide facilities and services to container shipping lines or ports. They are important for the interests of customers and consumers as they could inform any needed re-visiting of competition policy to protect from the dominance of any market developments that would lead to conditions limiting competition.

The Hamburg–Le Havre area is the port range used as a case study for comparing the EC decisional practice with actual developments in the market. Eight major container ports, and 25 deep-sea container terminals that handle over 50 million TEUs per year ([Lloyd's List, 2022](#)), are located within a distance of about 850 kilometres, with this main port region in Europe being among the main ones in the world.

These container ports serve the greatest consuming market of Europe, where over 200 million people produce and consume final and intermediate goods, and are gateways to Central Europe and the emerging economies of Eastern Europe. These ports attract growing traffic of semi-finished products from Asian countries, mainly China, providing a

convergence of the deep-sea services linking Europe with the US and Asia, and comprising a dense network of north-south trades (cf. [Parola and Musso, 2007](#)).

Most importantly for the present study, this is also a port range with a history of vertical integration. The first LTVI took place in Bremerhaven, Germany, in 1998, when North Sea Terminal Bremerhaven (NTB) GmbH & Co was founded by three proprietary companies, Bremer Lagerhaus Gesellschaft (BLG) Container GmbH, Maersk Deutschland GmbH and Sea-Land Service Inc, with the shares held at equal parts by the joint venture of BLG and Eurokai, “Eurogate GmbH & Co. KGaA, KG”, and “A.P. Moller-Maersk (APM) Terminals Deutschland Holding GmbH”. Thus, this is a region worth examining and a case that allows meaningful comparisons between notified and non-notified mergers to the EC and an assessment of policy approaches regarding their competition effects.

2. On vertical integration and competition effects

2.1 *The maritime economists*

The entry of liner shipping companies into container terminals in the late 1990s vertically integrated the port and shipping markets. Vertical integration in terminal and inland operations emerged as one of the core strategies of the maturity phase of container shipping lines to reduce costs and remain competitive, with the other ones being increasing vessel size, horizontal cooperation through shipping alliances and vessel sharing arrangements, and slow steaming (for a recap: [Wilmsmeier and Monios, 2020](#)). Recent examples of vertical integration in the European region include the expansion of the Hapag-Lloyd terminal footprint in the Northern European (Jade Weser Port) and Mediterranean (Tanger Med and Italy) markets in 2021 and 2022, respectively, and the 2019 Mediterranean Shipping Company (MSC) takeover of operations in Gioia Tauro in Italy.

Selective acquisitions are part of container lines’ strategies to strengthen their presence via investments. The factors that lead to this strategy are mainly the protection of liners’ interests, such as securing trans-shipment hubs to help consolidate trans-shipment volumes, rationalising services, and the operation of the port as a surplus generator.

Vertical integration is either full or partial. The latter is further distinguished as joint venture or minority interests and is either active or passive. Scholars studying these trends (i.e., [Parola and Musso, 2007](#); [Soppe et al., 2009](#); [Frank and van der Horst, 2010](#)) include exclusive contracts to vertical integration, as these contracts may have the same competition effects as equity integration. Given the extensive liners’ interests in intermodal transport, port competition has emerged from competition between individual ports to considerable competition between maritime supply chains.

Competition between carrier-controlled terminals is not usually direct but a result of primary shipping activities and inter- or intra-supply chain competition in which liner companies are the key-players. [Midoro et al. \(2005\)](#) mention four factors that led liners to control several terminals all over the world: (a) the growth of the ship size, (b) the increase in trans-shipment operations along east-west routes, (c) the substantial increase in stevedoring costs as mega-vessels cannot be handled at all terminals, and (d) the inadequacy of terminal capacity in some congested areas in terms of expected future demand. Vertical integration is an evolution in the strategy of some liner shipping companies that they see the stevedoring market as a potentially profitable activity with higher margins than those existing in sea transport. In this study, we question whether it is also an activity less visible to the regulators.

In that direction, the terminal involvement of liners is correlated with their ships’ size; horizontal mergers and alliances permitted the use of the larger of them ([Imai et al., 2006](#)). Facilitated by adjustments to port governance models (see: [Brooks et al., 2017](#)) and the endorsed market entry practices (see: [Pallis et al., 2008](#)), container shipping lines have become major players in the container terminal market by entering key ports, using shareholdings,

joint ventures with local or global terminal operators, sister companies or subsidiaries focused on terminal operations (Parola *et al.*, 2013; Satta and Persico, 2015).

The engagement of container liner shipping companies in alliances has also raised the discussion on the effects of Liner (shipping companies) -Terminal Vertical Integration (LVTI) on port selection. The main incentives for alliance formation relate to achieving critical mass in the scale of operation, exploring new markets, enhancing global reach, improving fleet deployment, and spreading risks associated with investments in large container vessels (cf. Slack *et al.*, 2002; Song and Panayides, 2008). Cariou (2001) has argued that a shipping line might be inclined to send more ships to dedicated terminal facilities because of considerations of optimal use. Farrell (2012) discussed examples demonstrating that the investment of a shipping line in a terminal does not necessarily mean that its traffic will stay there. Notteboom *et al.* (2017) conclude that no matter the year of observation or the alliance under consideration, terminal involvement by one or more members of shipping alliances in a port does not result in the effective inclusion of that port as a port of call in one or more liner services of that alliance. Yet, all these assessments are based on port selection – calling explicitly for studies examining the effects of LVTI on competition between terminals in a port or in a port range.

Liners adopt different strategies to obtain, *inter alia*, “dedicated handling services”. Some acquire terminal facilities and act as stevedoring companies; others invest money in terminals (minority shares, joint ventures) without being involved in the day-to-day operations and outsource the latter to local or global pure stevedores. Others enter into agreements with stevedoring companies for customised or semi-customised services. Parola and Musso (2007) divide the degree of involvement of liners in terminal handling into four categories, ranging from contractual agreements to direct investments of carriers in port facilities:

- (1) A special agreement (contract) is reached between the terminal and the liner, based on TEU throughput. The terminal operator agrees to provide priority and, in some cases, allows a throughput-based discount on port charges. Examples include the Port of Singapore Authority (PSA) facilities in Singapore (terminal agreements with different carriers) and the Europe Container Terminals (ECT) Delta terminal in Rotterdam (berthing agreements with main alliances).
- (2) The liner holds a minority share (usually less than 20%) in the terminal but has no part in the revenue created except through dividends. The carrier is involved in mid-to long-term planning but not short-term management and terminal operations. Examples include Maersk in Gioia Tauro, Italy (with Eurogate) and China Cosco Shipping (Cosco) in some Hutchison Port Holdings (HPH) terminals in China.
- (3) The liner and the terminal operator undertake a 50/50 joint venture. The terminal can be managed by the terminal operator or a third-party stevedore. Examples include the Kwai Chung port in Hong Kong (Cosco-HPH) and Bremerhaven (Eurogate-Maersk).
- (4) A dedicated terminal, owned (51% or more) and operated by the liner, which can even attempt to cater for third-party traffic. Examples include the APM terminals in Algeciras, Los Angeles (Pier 400) and Rotterdam, and the Evergreen terminals in Taranto and Coco Solo.

Two more categories should be added.

- (1) The liner holds a minority share; however, a special agreement between the parties is reached. Such an example illustrating this fifth category is the EUROGATE Container Terminal Wilhelmshaven (CTW), where Maersk holds 30%; however, a Partners’ Agreement prescribes that up to 49% of JWP CT’s total operational capacity will be dedicated to A.P. Moller - Maersk (APMM) and/or its affiliates.

- (2) The liner company has sole control (100%) of the terminal and operates it as a common user terminal. Examples illustrating this sixth category are the APM terminals Rotterdam and Maasvlakte II - Phase I Rotterdam, which are both solely controlled by Maersk, and Piraeus container terminals Pier II & Pier III, which are controlled exclusively by Cosco.

2.1.1 Pro-competitive and anti-competitive effects. Vertical integration in the maritime sector reaps all benefits of intermodal transport, allows liners to provide better service, increases the efficiency of cargo movement, minimises transaction costs, reduces the operational time for cargo handling and ensures security and service quality standards which are bound to be beneficial for shippers, enhances corporate performance and increases corporate value by reducing transaction costs (see Table 1). Nevertheless, Heaver (2015) offers examples illustrating that the design and operation of well-co-ordinated service do not require common ownership – though one might argue that common ownership would better facilitate capital expenditure and/or investment.

Efficiencies gained by vertical integration	Vertical integration competition concerns
Increases efficiency of cargo movement (OECD/ITF; Transport Research Centre (2008))	It may be detrimental to welfare. Agreements between different service providers (i.e., shipping lines, terminal operators and land (railway and road) transport operators may limit or hamper competition for space and traffic at ports (Álvarez-Sun Jaime <i>et al.</i> , 2015)
Reaps all of the benefits of intermodal transport (Frémont, 2010)	Increases barriers to entry for potential competitors Parola <i>et al.</i> (2015)
Minimises transactions costs, reduces operational time for cargo handling, and ensures security and service quality standards that will certainly be beneficial for shippers (OECD, 2011)	Vertical integration and the associated bundling of services might act as a barrier to entry in container handling (de Langen and Pallis, 2006; Vanelslander, 2011; Parola <i>et al.</i> , 2015)
Enhances the corporate performance and corporate value by reducing transaction costs. Improves efficiency of their supply chain operations (Parola <i>et al.</i> , 2015)	The involvement of liners in terminal operations shifts balance of power in the market, with increasingly large shipping companies exerting more control. As an example, the ECT terminal operator, although being the “de facto monopoly cargo handler” in Rotterdam, eventually had to yield to the demands of Maersk (Heaver <i>et al.</i> , 2000)
Allows liners to provide better service (Álvarez-Sanjaime <i>et al.</i> , 2011)	Substantial concentration in the stevedoring market and the emergence of dedicated facilities in northern Europe, make this co-operative-competitive paradigm stronger and stronger (Parola and Musso, 2007)
	In order competition to be protected, specifically transparent regulations may protect the access and the equal business opportunities of the non-integrated shipping companies to the essential facilities of the strategic and vital terminals (OECD, 2011)
	A horizontally and vertically integrated transport chain raises the problem of competition in a situation that could turn into a monopoly (Frémont, 2010)
	Horizontal and vertical integration result in a power concentration of port customers and an increase in their bargaining power over port managements (Cetin and Cerit, 2010)

Table 1.
Potential impact of vertical integration in the maritime world: a literature review

On the other hand, certain competition concerns have been expressed by researchers who consider that vertical integration creates a barrier to entry for potential competitors, may limit or hamper the competition for space and traffic that would otherwise arise at ports, and gives more control to large shipping companies [1]. Intra-port competition is beneficial for the competitiveness of ports, for local and national economies, and for consumers and exporting industries. Particularly, by suppressing monopolistic market power, it prevents the potential of monopolistic excess rent-seeking by port service providers who enjoy excess market power and acts as an engine of innovation and specialisation, allowing for the achievement of economies of scope and flexible multi-service organisation structures that are essential in modern seaports (Goss, 1999; Notteboom, 2002; de Langen and Pallis, 2006). These positive effects guide policy initiatives at local, national or supranational levels aiming to lower entry barriers in the market and generate conditions that enable intra-port competition in the provision of port services – though market conditions, such as the scale of operations (Defillipi, 2004; Kasselimi *et al.*, 2011) might limit the potential of such competition.

Álvarez-Sun Jaime *et al.* (2015) mention that although ports find it advantageous to engage in such an integration process, this may be detrimental to welfare. Agreements between different service providers, i.e., between shipping lines, terminal operators and land transport operators (railway and road) may limit or hamper the competition for space and traffic that would otherwise arise at ports.

Researchers recognise vertical integration and the associated bundling of services as a barriers to entry in container handling (De Langen and Pallis, 2006; Vanelander, 2011; Parola *et al.*, 2015). Vertical integration may not only lead to customer foreclosure but may also foreclose a rival from an entry in the upstream market of container terminal services: concessions have a very long duration and close the market to new investors who wish to enter. In addition, incumbents gain an advantage in the renewal of the concession contract relating to both formal (often referred to in the contract) and substantive reasons (both asymmetric information compared to other competitors as they already operate the terminal and gain experience will be evaluated on a new bidder not only in the same terminal or port but also in any other geographical area). The concession contracts include clauses that prevent competition in order to protect the interests of the contractor, i.e., the agreement between Cosco and Piraeus Port Authority (PPA) (see Psaraftis and Pallis, 2012). There are cases in which the competition authorities, namely the Indonesian Competition Commission, consider that such clauses restrict competition.

Carrier-controlled terminals, particularly dedicated terminals, could raise competition concerns. Acquiring exclusivity within a network industry facing increasing returns to scale and facing bottlenecks could be a way to deter entry (Cariou, 2008).

The notion of the liner-terminal vertical integrated company (LTVIC) becomes more significant due to the existing consortia and alliances between shipping lines. Liner companies provide their services either individually with their own vessels (owned or chartered) or through cooperation agreements with other shipping liner companies. Cooperation agreements can consist of slot charter agreements, consortia and alliances. Both consortia and alliances are vessel-sharing agreements, the main difference being that alliances cover rather multiple trades, i.e., they are a matrix of vessel-sharing agreements. Fleming and Baird (1999) recognise the power of liner companies' alliances on ports, suggesting that a shifting focus on the part of any one of the great carrier alliances or consortia could produce dramatic effects on the fortunes of major transshipment container ports (i.e., Felixstowe, Southampton or other UK container ports).

Heaver *et al.* (2000) state that a greater concentration, especially in an oligopolistic environment, results in less competition, which may be conducive to higher prices. They add that the involvement of liners in terminal operations shifts the balance of power in the market, with increasingly large shipping companies exerting more control, mentioning as an example

the ECT terminal operator, which although was the “de facto monopoly cargo handler” in Rotterdam, it eventually had to yield to the demands of Maersk. [Van de Voorde and Vaneslander \(2009\)](#) conclude that in the case where a shipping company, through vertical integration, has gained control of the container terminal where its vessels are loaded and unloaded, that company will find it relatively easy to determine in which links of the chain the greatest cost savings may be achieved by distributing resources differently so that the productivity level of the different links is modified.

The concerns mentioned make wanted empirical studies to assess the competitive effects of vertical integration between liners and container terminal(s). As expected, studies on port competition continue to focus mainly on either inter-port ([Alvarez-Sun Jaime et al., 2015](#); [Merkel, 2017](#)) or intra-port competition ([Dong et al., 2016](#)). Yet liners’ involvement in port operations has also started capturing scholarly interest, with studies analysing the way integration strategies contribute to the selection of container terminals ([Saeed and Aaby, 2013](#); [Notteboom et al., 2017](#)) and what are the impacts of this vertical integration on the stability of shipping alliances (i.e., [Crotti et al., 2020](#)). The present study expands this research agenda by focussing on the competition effects of shipping lines vertical integration.

2.2 The competition economists

Vertical integration occurs when a firm does something for itself that it could otherwise procure on the market, and it may happen by (a) pursuing a course of action *de novo*, (b) merger, or (c) a long-term contract between two vertically related firms that maintained legally separate ownership ([Hovenkamp, 2010](#)).

The driving factors on which the firm’s integration strategy depends can be divided into five categories:

- (1) Firms are driven to vertical integration to reduce costs: (a) by avoiding cartel or monopoly prices to suppliers who are met in highly concentrated markets ([Hovenkamp, 2010](#)); (b) by producing internally what was more expensive to procure externally ([Coase, 1937](#)); (c) by using managers rather than markets to procure inputs or distribute their products; (d) by avoiding transactional costs. Transactional considerations, rather than technological insuperabilities, determine whether a firm integrates or not ([Williamson, 1981](#)).
- (2) Firms vertically integrate to secure an input ([Kessler and Stern, 1959](#)).
- (3) Firms are vertically integrated around transactions with potentially high profits ([Balakrishnan and Wernerfelt, 1986](#)).
- (4) Firms are vertically integrated to solve the hold-up problem ([Spiegel, 2015](#)).
- (5) Some firms integrate not to do this themselves but to prevent others from doing it to them ([Balakrishnan and Wernerfelt, 1986](#)).

Most of the vertical mergers do not raise competition concerns and may achieve efficiencies through eliminating transaction costs or avoiding incomplete contracting. Anyway, firms in a vertical relationship need to cooperate to improve the production or distribution of their goods and the provided services. This cooperation may lead to cost and time reduction and risk elimination. Researchers have explored conditions under which exclusive contracts may enhance efficiency ([Segal and Whinston, 2000](#)).

Competition effects of vertical integration are primarily distinguished as procompetitive and anticompetitive, although these two categories in general co-exist. Procompetitive effects of vertical mergers include minimisation of transaction costs, economies of scale and scope, elimination of double marginalisation, higher quality products and increased investment, and

dynamic efficiencies in the form of innovation (see: [Lafontaine and Slade, 2007](#); [Reisinger and Tarantino, 2015](#)). Even vertical or horizontal foreclosure may be socially beneficial in certain circumstances, as they enhance the incentive to innovate or develop new products which require huge investments.

On the other hand, anticompetitive effects harm consumers and social welfare. Such effects of vertical integration are mainly distinguished in non-co-ordinated (foreclosure) and co-ordinated (collusion) ones, although it seems that foreclosure is encountered more often. Foreclosure may be an input or customer foreclosure and -full or partial-can be performed in various ways, such as raising rivals' costs, margin squeeze, price discrimination, exclusive dealing and information exchange. It can be substantial even if competitors remain in the market and even if they can achieve the minimum efficient scale of production. Research shows that anti-competitive foreclosure arises as an equilibrium phenomenon in a coherent model where sophisticated firms use a wide range of strategies and counterstrategies ([Hart and Tirole, 1990](#)). Exclusionary effects can harm not only downstream competitors but also their customers ([Salop and Culley, 2014](#)). Input and customer foreclosure can function independently or in combination, reinforcing one another.

Collusion, express or tacit, may be facilitated by vertical integration in the following ways: (a) by interfirm information exchanges, (b) by enhancing the transparency of pricing, (c) by eliminating the incentives of a disruptive firm, (d) by creating more symmetry in costs, or placing the merged firm in a stronger position to punish defectors, and (e) by exclusive contracts ([Salop and Culley, 2014](#)). The vertically integrated company (VIC) has the power to make the collusion agreement sustainable by reducing the incentive of upstream rivals to defect from an agreement by foreclosing part of the downstream market. In addition, a VIC is better able to punish defections and has fewer possibilities to accept punishments.

Although researchers recognise the potential efficiency benefits of partial vertical integration (joint ventures, minority shareholdings) ([Coase, 1937](#); [Williamson, 1981](#)), they state that vertical partial acquisitions can raise competitive concerns to both upstream and downstream divisions. Specifically, the concerns are related to (a) the impact of the acquisition on the incentives of both firms and (b) any exchanges of information entailed by the partial ownership interests, even if they are passive ([Salop and Culley, 2014](#)). The entailed information may give the partially integrated firms the ability to foreclose or co-ordinate. Anticompetitive effects differ between forward ([Rey and Tirole, 2007](#); [Spiegel, 2013](#)) and backward integration ([Spiegel, 2013](#); [Levy et al., 2018](#)) and controlling and non-controlling minority interests.

Research shows that several conditions are necessary for vertical integration to produce anticompetitive effects. First, at least one of the upstream and downstream markets is conducive to horizontal collusion ([Riordan and Salop, 1995](#)). Second, if firms co-ordinate on prices and/or output, the excess capacity is a necessary condition for such coordination to have taken place ([Sacher and Sandford, 2016](#)). Vertical integration enhances problems rather than creates them. Thus, vertical integration coupled with horizontal power can impair competition to a greater extent than the exercise of horizontal power would do so alone. As long as horizontal merger standards are met, vertical mergers cannot have anticompetitive effects. Economic theory shows that the following factors should be considered during the assessment of anticompetitive effects: concentrated and oligopoly structure of the upstream or/and downstream market; the existence of barriers to entry; the existence of scarce and essential input; the portion of the foreclosed market; the efficiencies gained and the status of the foreclosed rival (equal efficient rivals or not).

Based on different assumptions, using empirical evidence or not, a lot of models have been developed (See for example: [Hart and Tirole, 1990](#); [Ordovery et al., 1990](#); [Chipty, 2001](#); [Nocke and White, 2007](#); [Levy et al., 2018](#)) that lead to ambiguous results. The extent of competition effects varies and depends on the conditions in an individual market; therefore, they must be evaluated on a case-by-case basis.

3. Vertical mergers in container terminals: hamburg – le havre (1997–2021)

In vertical mergers, the liner company (downstream firm) enters a container terminal (upstream firm) that is used by the liner either as a common user terminal, which offers terminal services to the third liner companies, or as a dedicated terminal. Generally, the commercial relationship that the merging entities have with each other is one where the “downstream” firm purchases the output from the “upstream” firm and uses it as an input in its own production, which it then sells to its customers. The market where the former transactions occur is referred to as the intermediate.

As detailed in Figure 1, the total observed transactions in the port range under examination over the period 1997–2021 are 55.

These transactions concern (a) the first entry of liners in container terminal operations, mainly by the purchase of shares of an incumbent terminal operator and more rarely by share swap and lease contract: the entry is accompanied by non-controlling minority interests, joint or sole control, (b) increase or decrease in share-holdings by purchasing or selling shares respectively, which may lead to a change of control and/or exit of liners, (c) closure of the terminal (only in two cases). The analysis shows that further empirical study in the container terminal services market is needed to extract reliable conclusions. The reference here is on the definition of the relevant market and the measurement of market shares in a world of alliances and complex cooperative liner shipping networks, and ‘hidden families’ in the container port industry (as unveiled in: Parola *et al.*, 2014).

4. The European Commission method of assessing vertical integration

4.1 Competition and European policies for ports

The involvement of the EC in assessing competition in maritime shipping and ports is not surprising. Europe’s ports are vital gateways, linking the single European market and its transport corridors to the rest of the world, with 74% of goods entering or leaving Europe by sea. Ports are equally important for intra-European trade: 37% of the intra-EU freight traffic passes by EU ports. These are also employment generators, with 1.5 million workers employed in European ports and the same amount again employed indirectly across the 22 EU maritime member states (EC-DG Move, 2022). From an economic and public policy perspective, ports are economic catalysts for the regions they serve, the core value being the support they offer to trade flows and an ecosystem of related activities (Notteboom *et al.*, 2021).

Therefore, issues related to competition and market entry have been among the foundations of the EC efforts since 1997, when the EU embarked on a search for a long-term

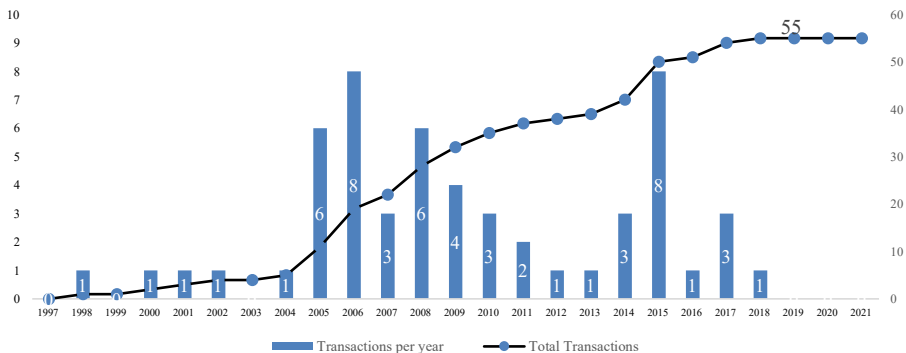


Figure 1.
Vertical liner-terminal transactions (Hamburg–Le Havre; 1997–2021)

Source(s): Authors’ calculations

European Port Policy (Pallis, 1997; Chlomoudis and Pallis, 2002). The positive effects of intra-port competition guided the EU initiative to enhance the contestability of the market when it was challenged by existing market entry mechanisms favouring global players (Pallis *et al.*, 2008) and a remarkably high and rising market concentration. Conditions of entry in the port market formed two successive EC proposals that the European Parliament rejected in 2004 and 2006 (Pallis, 2006). The opening of the market and contestability remain core parts of the EU strategy, along with other measures boosting growth and competitiveness in Europe's Single Market (for details: EC, 2013). Finally, in 2017, the EU endorsed a regulation on market access to port services and the financial transparency of ports (Regulation, 2017/352 – EC, 2017a) that lowers legislative entry barriers and establishes entry rules for various port services in 319 EU ports. The outcome of a discussion that lasted 16 years, it highlights both the international dimension of port competition and the difficulties in advancing (de) regulatory measures applying to ports in multiple countries as ports vying for traffic shares differ in many ways (markets, governance, geography, rules of entry for third parties).

Beyond these, as in any sector of the economy, the efforts to improve its competitiveness have to be aligned with the competition principles and related policies of the single European market. Thus, the competition effects of mergers and state aid rules in ports have been examined in the context of the EC competition policy, leading to a number of relevant decisions and forming the decision case practice. Similarly, the EC has also examined the competition effects of the formation of alliances in container shipping. This examination led to the endorsement of a General Block Exemption Regulation (EC, 2009), which in 2020 was prolonged until 2024), that set out an automatic exemption for certain agreements between liner shipping companies, allowing them to cooperate and provide joint services. On the contrary, the discussion on vertical (or horizontal) integration in ports remains inconclusive, and this has motivated this study: The foundations of the EC policies on ports are based on the principle that establishing open and fair competition and a level playing field between service providers is essential for enhancing the competitiveness of the European port system.

4.2 Examination subject to notification

In assessing the likelihood of an anticompetitive input or customer foreclosure scenario, the EC examines *ex ante* whether the merged entity would have, post-merger, the ability and the incentive to foreclose its rivals, as well as whether a foreclosure strategy would have a significant detrimental competition effect.

This examination is subject to certain conditions only, i.e., when involved parties are obliged to a relevant merger notification. In line with the EU regulatory framework, the EC must be notified of any merger with an EU dimension before its implementation. The EU dimension means that the merging firms reach one of the following turnover thresholds:

- (1) a combined worldwide turnover of all the merging firms over €5000 m, and (ii) an EU-wide turnover for each of at least two of the firms over €250 m, or
- (2) a worldwide turnover of all the merging firms over €2500 m, and (ii) a combined turnover of all the merging firms over €100 m. In each of at least three-member states, (iii) a turnover of €25 m. For each of at least two of the firms in each of the three-member states included under (ii), and (iv) EU-wide turnover of each of at least two firms of more than €100 m.

In both alternatives, an EU dimension is not met if each of the firms achieves more than two-thirds of its EU-wide turnover within the same member state. In such a case, mergers have to be notified to that member state. Smaller mergers not having an EU dimension may also fall under the remit of national competition authorities too.

Notably, some of the mergers may have the EU dimension to be notified to the EC, but they have not been notified. Some other transactions, such as minority interests not accompanied by joint control, are not considered mergers and therefore are not obliged to a notification. In addition, some vertical mergers may have been notified to the concerned member state authorities.

4.3 Notified LTVI mergers

During the examined period, five (5) vertical mergers between terminal operators and container liner companies have been notified to the EC (Table 2). This is only a small fraction of the actual number of cases, which is 55.

In Case M.9789 – Compagnie Maritime d’Affrètement - Compagnie Générale Maritime (CMA CGM)/CMP/TERMINAL LINK (EC, 2020), there is a horizontal merger between container terminals which would be considered as vertical too, as the one container terminal was jointly controlled by TIL, which is a company indirectly controlled by MSC (see Case M.8459 – EC, 2017b) and after the merger both terminals are jointly controlled by TIL.

All the notified vertical container terminal mergers bar one (Case M.9789 - EC, 2020) have the same direction concerning investments from container liner companies to container terminals. Therefore, they reflect backward vertical integration, as firms providing intermediate service (in this case: seagoing transportation services) that is a component in the supply chain aim to develop their own input facilities (in this case: container terminal services), so as to offer the entire of the final product.

Concerning the method of transaction, the most popular way is the purchase of shares (PoS). All these transactions were notified to the EC, as the control of the target company was joint control, even in the cases with minority shareholders. For example, in Case M.2422 - Hapag-Lloyd/Hamburger Hafen-Und Lagerhaus/HHLA-CTA (EC, 2001), Hapag Lloyd acquired joint control of the Altenwerder container terminal by obtaining just 25.1% of shares, while in Case M.5066 -Eurogate/APMM (EC, 2008a), Maersk acquired joint control of JWP CT container terminal by obtaining 30% of the shares.

4.4 EC methods for assessing competition effects

The EC carries out two types of assessments of vertical integration effects: *ex-ante* and *ex-post* assessments respectively. The *ex-ante* assessment is carried out after a vertical merger notification, while the *ex-post* assessment is carried out after a complaint or *ex-officio*.

No	Case	Decision name	Decision date	Port	Country	Terminal	Way
1	M.2422	Hapag-Lloyd/ Hamburger Hafen- Und Lagerhaus/ HHLA-CTA	22/08/ 2001	Hamburg	Germany	Altenwerder	PoS
2	M.3576	ECT/PONL/ EUROMAX	22/12/ 2004	Rotterdam	The Netherlands	Euromax	CJV
3	M.5066	Eurogate/APMM	05/06/ 2008	Wilhelmshaven	Germany	Jwp Ct	PoS
4	M.8459	TIL/PSA/PSA DGD	31/07/ 2017	Antwerp	Belgium	Deurganckdok West	PoS
5	M.9789	CMA CGM/CMP/ TERMINAL LINK	18/03/ 2020	Rotterdam	Netherlands	Rotterdam World Gateway Terminal	PoS

Table 2.
Seaport container terminal vertical mergers notified to the EC concerning the port range Hamburg–Le Havre (1997–2021)

Note(s): * PoS = Purchase of shares; CJV= Creation of JV for construction and operation; ** The control is always joint control

Source(s): Authors’ estimations

The first stage of the evaluation methodology is common for both types of assessment and concerns the relevant market definition and the calculation of the market shares. In both cases, the precondition for the further evaluation of the competition effects is the high market shares in the defined relevant market(s).

During the *ex-ante* estimation, the Commission examines (a) the possible non-co-ordinated effects (the ability, the incentive and the potential effect of the VIC to foreclose its competitors), as well as (b) the possible co-ordinated effects. Co-ordinated effects arise when the merger changes the nature of competition so that firms that previously did not co-ordinate their behaviour are significantly more likely to co-ordinate to raise prices or otherwise harm effective competition. During an *ex-post* estimation, the Commission examines the real effects according to Articles 101 or/and 102 of the EU Treaty. Specifically, it examines all the possible and direct evidence of anticompetitive behaviour due to the abuse of dominant position or co-ordinated behaviour.

5. An assessment of the EC decisional practice

5.1 Limited extent of vertical mergers analysis

Concerning the assessment of competition effects, in general, the above-mentioned notified vertical mergers have been assessed as ones that do not raise any competition concerns due to the estimated limited market shares.

Markets of container terminal services are considered vertically affected if (i) one or both parties hold a 30% market share in the container terminal service market or the containerised liner shipping services market, and (ii) one or both parties are active on the respective upstream market, i.e. container terminal services market that serves one of the trades on which one or both parties are active, or downstream market, i.e. container liner shipping on trade including the concerned terminal (see case M.7908 CMA CGM/NOL - EC, 2016).

For three of the above-mentioned vertical cases, in particular those concerning the mergers of EUROMAX (Case M.3576 - EC, 2004a), JWP CT (Case M.5066 - EC, 2008a) and MPET (Case M.8459 - EC, 2017a) terminals, respectively, a phase I procedure has been applied and limited information is given.

A phase II procedure has not been applied to any case examined. Therefore, the related decisions do not provide comprehensive information about the competition effects of the LTVI. No competition concerns were raised even in a case with high market shares (Case M.8459 – EC, 2017a).

Although both upstream and downstream markets are characterised by oligopoly structure, concentration, alliances and barriers to entry, vertical mergers did not raise competition concerns, allowing a critical assessment of each stage of the Commission's evaluation procedure.

Concerning the *ex-post* assessment of competition effects of LTVI, there is no EC case due to the absence of relevant complaints. As a result, and in the absence of any provision for any other indirect means making such evaluation, there is no assessment of the competition effects of LTVI at the EC level.

Therefore, for this study, EC merger decisions in both markets of liners and container terminals are examined for conclusions to be drawn on the EC definition of the relevant markets and market share calculations.

5.2 The EC definition of the relevant market

When defining the relevant market, the EC endorses the traditional consideration that, in the light of the technology evolution and not least, the new practices of both container liner shipping and container terminals, it is worth revisiting.

For instance, neither all container terminals in the same geographic market are substitutes nor all liners that call at the same terminal are rivals. Firstly, only terminals with adequate infrastructure (quay length, draft) and cargo-handling capacity (whether this refers to cranes, straddle carriers or machineries, terminal space or operational procedures) are able to serve mega-ships. The limited capacity terminals are not substitutes for this category of vessels, although the reverse is true.

Secondly, the definition of the geographic market of containerised transport services should differ from that of tramp shipping. A good example is the air transport sector, where the Commission has found that the relevant product market for passenger air transport services should be defined based on the point of origin/point of destination (O&D) pair approach or the basis of the hub-and-spoke network approach (see Cases M.3280 – Air France/KLM (11.02.2004) (EC, 2004b), M.4439 – Ryanair/Aer Lingus (27.06.2007) (EC, 2007), where during the EC's market research, competitors submit that competition occurs on a network basis as carriers operate a hub-and-spoke system and because of the increasing size and scope of airline alliances. In their view, the O&D approach fails to capture the nature and the extent of such competition). One might consider rival liners, not all liners calling at the same terminal, but those that engaged in the same routes. Yet, even this approach needs further qualification, given the implications of alliance formation when serving. The other liner companies may be *potential rivals* and approached as such when evaluating developments in competition. Such a distinction would affect the calculation of market shares of liners, which would then be estimated more accurately.

Furthermore, hinterland and trans-shipment services are generally not so distinct, as ships call at a terminal to unload both hinterland and trans-shipment traffic containers, and terminals can also serve both hinterland and trans-shipment traffic. In 2001, the Commission mentioned in Case JV.55 that container liner companies choose as a trans-shipment hub a port with sufficient hinterland volumes to justify a direct call by container liner shipping service. In our days, mega-ships used and operated by modern alliances, carry large volumes of containers that intend to both hinterland destinations and trans-shipment. Therefore, the distinction between hinterland and trans-shipment container terminal service is essential in geographic areas where the hinterland is objectively limited, e.g., when island terminals are included without any significant hinterland, such as the container terminal Marsaxlokk in Malta, or when there are not any efficient inland connections. In some port ranges, such as Rotterdam-Le Havre, the distinction between hinterland and trans-shipment traffic is hardly applicable.

In addition, the geographic dimension of the container terminal services market is questionable. The improved inland networks have functionally and spatially expanded the port and hinterland (Notteboom and Rodrigue, 2005). The generated dynamics are complex: on the one hand, port regionalisation and integration to supply chains may have reduced the needs for trans-shipment (see, for example, the multi-modal development of CMA CGM Group in France); on the other hand, the restricted calls of mega-ships have made the trans-shipment as even more necessary. The redefinition of upstream and downstream product and geographic markets is further demanded due to the above structural changes taking place in the market and under the concept that the terminalisation of container activities leads to inter-terminal competition, whether these are within a port (intra-port), or located in different ports (inter-port).

5.3 Calculation of market shares of container terminal services

The calculation of market shares is based on the relevant market, meaning that the correct estimations presuppose a precise market definition. Nonetheless, the present calculation of market shares faces additional questions:

First, container terminal market shares are based on each terminal operator's throughput calculations, which may include feeder services.

Second, the fact that in market share estimations, the EC does not include the shares of minority shareholdings in case they are not accompanied by joint control should be questioned, as these minority shareholdings might result in significant competition effects. For example, the effective PSA share of 20% of Hutchison should not be underestimated due to both the size of these two terminal operators and the geographic market that they are operated in Northern Europe (Rotterdam-Antwerp).

The third one is related to the changes in the capacity of each terminal and the total relevant market. The Commission mentions that only capacity figures were used for calculations, both for 2006 and 2014, to have a common base for comparison and to eliminate the unpredictable element of throughput for 2014, the year that the examining terminal would become fully operational (Case M. 5066 - EUROGATE/APMM (05.06.2008)-EC, 2008a). Nevertheless, the data show that even the terminal capacity is unpredictable, not only the throughput. Not only new developments took place during the examined period but also projects were changed or abandoned, as well as terminals closed.

The EC excludes the captive capacity and throughput when assessing both terminals' market share and total market size. This practice gives an advantage to the vertically integrated companies between shipping lines and container terminals, as their throughput and capacity are considered captive and therefore excluded from the calculation. On the other hand, the market shares of pure terminal operators are overestimated, as the remaining total throughput is limited. See, for example, the analysis for Algeciras and Maersk in case JV. 55 - HUTCHISON/RCPM/ECT (03.07.2001), where the Commission considers that as the throughput of the main Algeciras container terminal, which the A.P. Møller group controls, represents a captive production as is generated by its subsidiary Maersk Sealand, and therefore is not included in the market by the Commission when determining market shares. In addition, it is noted that the Maersk Sealand terminal had an estimated capacity in 1999 of 2.1 m. TEUs when the other Algeciras terminal, Isla Verde, had an estimated total of just 200.000 TEUs (for capacity estimations as mentioned: Drewry, 2020).

Finally, differences between the hinterland and trans-shipment shares lead to wrong calculations, e.g., based only on trans-shipment throughput shares. However, the hinterland throughput and capacity shares of the notifying parties are much lower. JV.55 - HUTCHISON/RCPM/ECT (03.07.2001) is one such case.

5.4 Calculation of market shares of containerised transport services

Concerning the downstream market of containerised transport services, the difficulties would remain even if the market were defined accurately in a simplified form, e.g., a pair of ports such as Shanghai-Rotterdam. Before detailing them, it is noteworthy that there are routes for which liners argue that they are unique operators; to give an example, the schedule of Maersk AE20 EASTBOUND, where the company claims that it is the 'Unique coverage from Italy, Spain and France to North Asia' (Maersk, 2022); www.maersk.com, assessed on 27 January 2017:

- (1) Although the Commission can estimate the market size of a specific relevant market and consequently the market shares of liners, it usually adopts market shares based on traffic volumes given by each liner to the consultant offices (e.g., Drewry, Alphaliner, etc.). Firms may provide more accurate information to the Commission than consultants in volume terms (e.g., with the distinction between deep sea and feeder services). In addition, firms are obliged, if they are questioned, to provide information to the Commission in value terms.
- (2) Sharing agreements such as consortia and alliances enhances the difficulties of market shares' calculations as a ship's call concerns cargo of different liners; for example, the relevant data of the CMA CGM/NOL merger case (29.04.2016 – EC, 2016).

The most accurate market share calculation would be based on firms' turnover concerning the relevant market. Certainly, such a calculation pre-supposes a precise market definition. However, the EC retains the authority to ask for the specific turnovers of the relevant markets, thus implementing the desirable approach.

The Commission mentions that consortia and alliances restrict competition between their members. However, in line with the Consortia BER Regulation 906/2009 (EC, 2009), which has been prolonged until April 2024 after the Commission's re-evaluation of its impact, consortia and alliances may continue to benefit from a block exemption if their market shares are below 30%. Cooperation of shipping liners planning to strategically take advantage of this, has taken place in the past and is evident in the evolution of alliances with considerable shares that emerged in the recent past (for details on the evolution of container shipping alliances in the 2010s: [Notteboom et al., 2022](#)). While arguments for different motives have been reported (i.e., Maersk and MSC intentions to pursue diverge individual strategies), it is worth noting that the early-2023 announcement of the decision to end the 2 M in January 2025 means the conclusion of a vessel sharing alliance in which market share exceeds the market share threshold of 30%.

Although liners are obliged to self-assess compliance to the Consortia BER Regulation, there are cases in which they are above the market threshold, even though the relevant market is defined in the way described above. For example, during the assessment of notified ECT/PONL/EUROMAX merger (EC, 2004a), the Commission found that on six out of the eight trades, the market share of the respective consortium, or the Grand Alliance that PONL had participated, was apparently above the market share threshold of 30%. Hence, these co-operations were not exempted under the consortia block exemption (see Case M.3576). Even in such cases, however, no competition concerns have been raised.

5.5 Reflections on the assessment of competition effects

The EC, considering that the market shares need to be higher to create competition concerns, does not proceed to an in-depth analysis of effects by opening a phase II procedure. An in-depth analysis, however, would allow for examining the non-co-ordinated and co-ordinated effects of an LTVIC, i.e., by applying the Commission's guidelines on assessing non-horizontal mergers (EC, 2008b), and relevant initiatives (i.e., EC, 2004c, 2008c).

In particular, the Commission does not examine the non-co-ordinated effects, such as foreclosure. Two forms of foreclosure can be distinguished in the case of LTVIC. The first is the case of input foreclosure, where an LTVIC is likely to restrict access of container liner companies to terminal services. The second one is customer foreclosure, where a LTVIC is expected to foreclose container terminals by limiting their access to a sufficient liner company base or foreclose liners by restricting their access to shippers or forwarders, i.e., the direct or indirect customers of liner companies, respectively. Therefore, input foreclosure may be applied to the liner rivals, while customer foreclosure may be applied to terminal and liner rivals. These two types of foreclosure can function independently or reinforce one another in combination. Foreclosure may be partial when the LTVIC favours some liners or terminals in the adjacent market to the detriment of other competitors.

In assessing the likelihood of an anticompetitive input or customer foreclosure scenario, the Commission would have to examine: (a) whether the LTVIC would have, post-merger, the ability to substantially foreclose access to container terminal services (input foreclosure) or foreclose access of container terminals to liners (customer foreclosure), (b) whether it would have the incentive to do so and (c) whether a foreclosure strategy would have a significant detrimental effect on competition downstream or on consumers in the downstream market. In practice, these factors are often examined together since they are closely intertwined.

The second group of potential effects that should be examined are the co-ordinated ones, more specifically, the potential of collusion. Vertical integration may facilitate collusion in the following ways: (a) by interfirm information exchanges, (b) by enhancing the transparency of pricing, (c) by eliminating the incentives of a disruptive firm, (d) by creating more symmetry in costs, or placing the merged firm in a stronger position to punish defectors, and (e) by exclusive contracts.

Given the characteristics of upstream and downstream market structures and due to the difficulties in both markets' definition and calculation of market shares, the Commission should concentrate more on the potential of these effects being present in the case that liner companies proceed to vertical integration and their involvement in the operation of container terminals.

6. Conclusions

This study examined the EC's decisional practice in assessing the competition effects of LTVI in the container market by examining the relevant merger cases over the last 25 years (1997–2021).

First, this examination revealed that only a limited number of transactions has been notified to the Commission. Non-notified mergers are never assessed, while during the assessment of a notified merger, every previous integration is considered as not 'merger specific' (see: Case M.8459). Second, the empirical research identified a gap in this process, as there were no decisions on vertical mergers (Phase I) between 2008 and 2016. However, many vertical mergers took place during this period, and the whole market changed dramatically.

Third, the review of the decisional practice highlighted that the EC, in its *ex-ante* assessment of notified vertical mergers between liners and terminals, has yet to apply a *phase II* in-depth analysis to any case due to the absence of competition concerns. Therefore, the related decisions do not provide extended information about the actual competition effects (whether anti-competitive or pro-competitive) of the LTVIC. Fourth, the research shows that both the market definition and the calculation of market shares have been subject to specific difficulties that are worth to be addressed.

Finally, due to the absence of complaints, there is a lack of any *ex post* assessment of the effects of vertical integration. Nevertheless, the absence of complaints in the upstream market does not mean that competition works (see: EC Case Antitrust (AT). 39748 Automotive Wire Harnesses (10.07.2013)). According to economic theory, vertical integration produces anticompetitive effects when at least one of the upstream and downstream markets is conducive to horizontal collusion. The discussed relevant cases of liners that have taken place over the same period (e.g., AT. 39850, AT. 40009) show that the downstream market might be conducive to horizontal collusion.

Given the difficulties related to the market definition and calculation of market shares, it is essential to concentrate more on the structure of the relevant markets and the potential competitive effects of horizontal and vertical integration. The current characteristics of both upstream and downstream markets i.e., oligopoly market structures, substantial levels of concentration in service provision, widespread endorsement of alliance formation, high barriers to entry, etc. create the need to reverse the procedure of EC *ex-ante* assessment of merger effects, i.e., the ability, incentive and non-co-ordinated and/or co-ordinated effects. Not only do the large vertically integrated companies have the ability and the incentive to foreclose on their rivals but they might also increase their shares in the global market. Even an increased market share may be an effect of anti-competitive practices. Additionally, the high market shares, in reality, are higher due to alliances and consortia.

There is also a need for further research concerning the competition effects of vertical mergers in the upstream market of container terminal services, including all the transactions

between liners and container terminals, by applying economic theory. “*In ports like elsewhere*”, as would be advocated by Goss (1999), there are two main ways in which LTVICs may significantly impede effective competition: non-co-ordinated effects and co-ordinated effects.

Such research needs to take into account the dynamics of both markets. On the one hand, alliance membership comes with challenges and impediments for the carriers involved. With the recent decision of the 2 M alliance partners MSC and Maersk not to extend their vessel-sharing agreement further than 2025, the picture might shift considerably. Future research on the implications of structural changes in alliances, but also the ways that the design of joint liner services and the selection of ports of call between alliance members, particularly when one or more alliance members operate their own carrier-owned global container terminal networks, will help evaluate the far-reaching vertical integration strategies of carriers and their competition effects – especially as in recent years the regulatory scrutiny of the practices of container shipping lines has intensified. An indirect effect of other regulatory developments is worth considering in light of future compliance requirements with carbon footprint requirements in the maritime sector, vertical integration might be necessary to establish the required supply chains for alternative green fuels.

Most of all, it is worth examining the effect of LTVI on consumers and thus the shippers. What matters most is that the EC protects an effective competitive process and not simply protects competitors. This may well mean that competitors who deliver less to consumers in terms of price, choice, quality and innovation will leave the market (see relevant tests applied during the examination of cases, e.g., less efficient competitor test). The matter is whether any of the efficiencies gained have passed to the consumers.

Note

1. Although the analysis of market concertation is beyond the scope of this paper, it is worth noting that concerns about horizontal integration have been also present, i.e. as early as 1996 when the top ten companies had a global market share of container capacity of 33 per cent of a global capacity of 5.4 million Twenty Equivalent Unit (TEU) the concentration in the market was considered to be “worrying”, where today this share more than doubled, and reached over 69 per cent of a global capacity of 25 million TEU since 2018 (Wilmsmeier and Monios, 2020).

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