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Λιμενικός Ανταγωνισμός: Επιπτώσεις Ανταγωνισμού από την κάθετη ενοποίηση στους λιμένες εμπορευματοκιβωτίων

Port Competition: Competition Effects of Vertical Integration in container ports

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SUMMARY

The research examines the competition effects of the LTVI on shippers. Specifically, it examines effects concerning the price, thus the terminal handling charges (THCs), the choice of services, and the quality of service. Empirical research shows that any efficiencies gained from the vertical integration have not been passed on to shippers. Shippers do not benefit from the liners' entry in container terminal services in terms of THCs, even if such an entry is a profitable business. THCs continued to increase for both integrated and non-integrated liners, making apparent that vertical integration has not led to the elimination or at least the reduction of double marginalisation. Furthermore, the choice of services is limited and the quality of service is declined.

The main motivation of the present PhD thesis is to investigate the competition of container seaports in terminals level, and specifically the competition effects of liner – terminal vertical integration (LTVI). The investment of liner companies in container terminals dates back to the late 1990s, constituting the third wave of terminal operators' entry. The entry of liners in terminals' operation changed the market radically, as it created the liner-terminal vertical integrated company (LTVIC). However, the competition effects of vertical integration have not been sufficiently evaluated by researchers and institutions: although maritime economists discuss the competition effects of LTVI they have not yet proceeded to empirically research their assessment. In addition, in the developed literature on competition effects of vertical integration of the competition economists, no empirical evidence research related to LTVI can be found. A significant discrepancy between the number of vertical transactions carried out and the number of vertical mergers notified to the European Commission (EC) is also noted when studying the European market. Consequently, there is a lack of *ex ante* in-depth assessment of competition effects of the LTVIC. Moreover, there is a lack of *ex post* assessment of the competition effects of vertical integration at EC level due to the lack of relevant complaints. However, as evidenced by other EC vertical integration cases, a lack of complaints does not necessarily signify that competition actually works - which underscores the necessity and importance of further research.

The study's activities may be divided into three phases: a literature review of both maritime and competition economics; a review and a critical assessment of the European Commission's cases; and the case study of the competition effects of vertical integration in the Hamburg – Le Havre port range. The study of the mergers that have been carried out in the Hamburg - Le Havre range includes both quantitative and qualitative analysis. The combined use of the two approaches has provided findings that can be stereotyped and used with other port ranges: standardised approaches permit the study to be replicated in different areas or over time with the production of comparable findings.

The in-depth research covered by the doctoral thesis examined the competition effects of vertical integration, given the increasing market shares of the liners in the upstream market of container terminal services and based on the analysis of the market structure of the two vertical markets. The market shares of liners in the market of container terminal services are estimated at terminals' level in throughput and capacity terms, including the minority shareholdings and the intra-group (captive) transactions. It turned out that liners which call at a container terminal are rivals only in the case they engage in the same trade route under the relevant market definition, based either on the point of origin/point of destination (O&D) pair approach or the hub-and-spoke network approach.

In order to understand vertical restraints, it is necessary to understand at least two markets, i.e. the upstream market and the downstream market. Competition economists conclude that competition effects of the vertical mergers depend on the structure of the upstream and downstream markets and can be procompetitive or anticompetitive, although they recognise that most of the times both types of effects co-exist. The research shows that all conditions competition economists consider necessary for vertical integration to produce anticompetitive effects are met. First, the downstream market of container liner shipping is conducive to horizontal collusion, as shows a number of cartel EC cases over time. Second, excess capacity, as a necessary condition for coordination on prices and/or output, is met in both markets. Vertical integration enhances rather than creates problems: when coupled with horizontal power it can impair competition to a greater extent than the exercise of horizontal power alone. Both markets are characterised by concentration and an oligopoly structure. In downstream market horizontal mergers have resulted in high concentration which is enhanced by alliances and consortia.

Vertical integration is beneficial in highly competitive markets but not quite so in oligopoly or monopoly markets. As long as horizontal merger standards are met by avoiding concentration in both the upstream and downstream markets, vertical mergers are based only on efficiency motives and cannot exert any anticompetitive effects, should therefore be permitted. There is a need to concentrate on effects, even if no relevant evidence for anticompetitive practices of firms or between firms is found, like in the recent EC case of liners AT. 39850 Container Shipping (07.07.2016). *"If we are going to rely on competition to ensure that ports are efficient and that their benefits are widely-distributed then it is necessary to ensure that competition actually exists – within ports and between them"* (Goss, 1999: p. 7).

Finally, during the study new topics for further research have arisen, such as the estimation of the profitability of liners by investing in container terminals.

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AEC	Africa East Coast
ANZ	Australia/New Zealand
AO	Australasia & Oceania
APL	American President Lines
APMM	A.P. Moller - Maersk
APMT	APM Terminals
ASC	Africa South Coast
ATZ	APM Terminals Zeebrugge
AWC	Africa West Coast
BAF	Bunker Adjustment Factor
BER	Block Exception Regulation
BOT	Build-Operate-Transfer
CAC	Central America & Caribbean
CAF	Currency Adjustment Factor
Con	Conglomerate
CSAV	Compañía Sudamericana de Vapores
CSCL	China Shipping Container Lines
CTA	Container Terminal Altenwerder (HHLA)
CTB	Container Terminals Burchardkai (HHLA)
CTB	Container Terminal Bremerhaven (Eurogate)
CTH	Container Terminal Hamburg (Eurogate)
CTS	Container Trade Statistics Ltd
CTT	Container Terminal Tolleront
CTW	Container Terminal Wilhelmshaven
DG	Directorate General
DMT	Delta MSC Terminal
DPSG	Dr Pepper Snapple Group
DPWL	DP World Limited
EA	East Asia
EATA	Europe Asia Trades Agreement
EC	European Commission
ECT	Europe Combined Terminals BV
EEA	European Economic Area
EEC	European Economic Community
EJVs	Equity Joint Ventures
ELAA	European Liner Affairs Association
ESC	European Shippers Council
EU	European Union
Eur	Europe
ITF	International Transport Forum
JICT	Jakarta International Cargo Terminal
JV	Joint Venture
JWP CT	JadeWeserPort Container Terminal
LTVI	Liner – Terminal Vertical Integration
LTVIC	Liner-Terminal Vertical Integrated Company
ME	Middle East
MED	Mediterranean
MOL	Mitsui O.S.K. Line
MoU	Memorandum of Understanding
MPET	MSC PSA European Terminal
MSC	Mediterranean Shipping Company
NA	North America
NE	Northern Europe
NOL	Neptune Orient Lines
NTB	North Sea Terminal Bremerhaven GmbH & Co.
NYK	Nippon Yusen Kaisha
O&D	Point of Origin / Point of Destination
OECD	Organisation for Economic Co-operation and Development
OOCL	Orient Overseas Container Line
OOIL	Orient Overseas (International) Limited
OPDR	Oldenburg-Portugiesische Dampfschiffs-Rhederei GmbH & Co. KG
OSC	Ocean Shipping Consultants
PND	Portable Navigation Devices
PONL	P&O NEDLLOYD
PPA	Piraeus Port Authority
PTP	Port Tanjung Pelepas
QPGL	Qingdao Port Group
R&D	Research & Development
RCPM	Rotterdam Container Participatie Maatschappij BV
RRC	Raising Rivals' Cost
S. Afr	South Africa
SAEC	South America East Coast
SAWC	South America West Coast
SIPG	Shanghai International Port Group
SNCF	French incumbent rail company
SPV	Special Purpose Vehicle
TAA	Trans-Atlantic Agreement
TCCC	The Coca-Cola Company

F.E.	Far East
FAS	Russia's Federal Antimonopoly Service
FEFC	Far Eastern Freight Conference
FETTCSA	Far East Trade Tariff Charges and Surcharges Agreement
FMC	Federal Maritime Commission (US)
FTC	Federal Trade Commission
GMP	Generale de Manutention Portuaire
HHI	Herfindahl-Hirschman Index
HHLA	Hamburger Hafen- und Logistik AG
HMM	Hyundai Merchant Marine
HPH	Hutchison Port Holdings
HwV	Horizontal with Vertical Effects
ICTSI	International Container Terminal Services Inc.
INSC	Indian Sub-Continent
TCT	Taranto Container Terminal
TEUs	Twenty Equivalent Unit
TFEU	Treaty on the Functioning of the EU
THCs	Terminal Handling Charges
TIL	Terminal Investment Limited
TOs	Terminal Operators
TPO	Terminal Porte Océane
U.A.E.	United Arab Emirates
UASC	United Arab Shipping Company
UK	United Kingdom
UNCTAD	United Nations Conference on Trade and Development
US	United States
ZIP	Zeebrugge International Port

CHAPTER 1:

INTRODUCTION

1.1 INTRODUCTION

The vertical integrated company appeared in the field of containerised transport as a result of the technical innovation, in both the shipping and the port industries, as well as of various institutional changes. It is since its advent in the mid-1960s, that containerisation has brought about the integration of the transport chain and consequently the vertical integrated company in the maritime industry and generally in transport. The nature and the characteristics of the liner shipping, namely regular and scheduled cargo transport on a specific route, led to contracts between shipping lines and port authorities including the existence of dedicated terminals at container ports. Upon the deregulation on port services, Terminal Operators (TOs) emerged, as did the further involvement of shipping companies in equity terms in port operations, but also in other parts of the supply transport chain.

The vertical integrated company was created, among others, by mergers. The terms "downstream" and "upstream" describe the (potential) commercial relationship that the merging entities have to each other. In general, the commercial relationship is one where the downstream firm (in this case: the liner company) purchases the output from the upstream firm (in this case: the container terminal) and uses it as an input in its own production/service, which it then sells on to its customers.

The continuous increase of liners' equity shares in the upstream market of container terminal services, in both regional and global level, raises competition concerns. These concerns are deepened by the confidential, or even secret, nature of shareholders' agreements. Nevertheless, no pertinent empirical studies exist, therefore, validity of these concerns remains to be proved.

In addition, policy-makers have still to address such questions. At least at the European level, assessment of the competition effects of vertical mergers between container terminals and liner companies (liners) has been limited. The empirical research of the present study confirms that the total of mergers notified to the European Commission (EC) has been

remarkably limited, not least because according to the EC Merger Regulation[1] there is no obligation for non-controlling minority shareholdings to be notified at all.

The present study investigates the competition effects of the vertical integration between the upstream market of container terminal services and the downstream market of container liner shipping services.

1.2 THE STRUCTURE OF THE STUDY

The study starts with a review of the literature (**Chapter 2**), analysing the evolution of the liner-terminal vertical integrated company (LTVIC). Maritime economists discuss liners' entry in the operations container port terminals expressing the probability of some competition effects, both procompetitive and anticompetitive. In the context of this research field though the specific terms are not used. On the one hand, vertical integration in the maritime sector reaps all of the benefits of intermodal transport and increases the efficiency of cargo movement. On the other hand, vertical integration may result in less competition, which may facilitate higher prices. Given that no empirical study has been performed to assess the competition effects of the vertical integration between liners and container terminals, the concerns of maritime economists raise questions and set the frame for further research.

To better understand the framework and answer these questions, attention turns on the literature on competition theories, in particular that part that focuses on vertical integration and its competition effects. **Chapter 3** reviews the economics literature on competition effects (procompetitive and anticompetitive) of vertical integration. Vertical mergers lead to highly controversial welfare consequences in competition policy, thus have attracted an increasing attention in the last decades. A variety of procompetitive efficiency gains, such as the elimination of double marginalisation, have traditionally been juxtaposed with a major anticompetitive concern, that of foreclosure of competitors as vertically integrated firms would gain market power. Some theoretical models, as well as a limited number of empirical models, have been developed to access competition effects. Although none of

[1] Council Regulation (EC) No 139/2004 of 20 January 2004 on the control of concentrations between undertakings (the EC Merger Regulation) Official Journal L 24, 29.01.2004.

them concerns the maritime industry, some may still be adopted, as they refer to markets with similar characteristics.

Chapter 4 describes the methodology on which the research design is based. It explains the steps that were followed in the research process as well as the techniques employed throughout this process. Reference is made to the importance of the evidence gathered through the empirical case study, the Hamburg-Le Havre port range, for a more than twenty years period (1996-2018) in order to test the theories discussed in Chapter 2 and Chapter 3. The selected case study generated knowledge in one of the main port ranges in the world, widely acknowledged as a distinctive port area, and provided the basis for new theoretical developments in respect to competition effects of liner – terminal vertical integration (LTVI). The chapter also reviews how the activities followed during the research process enhance the quality of this research, making it possible and valid to draw more general conclusions in place and time.

Specifically, **Chapter 5** provides a systematic analysis and assessment of the EC approach in estimating the vertical competition concerns, aiming to extract conclusions on the advancements made within the existing regulatory framework. This approach is distinguished in *ex ante* assessment, in case of the notified vertical mergers to the EC, and in *ex post* assessment, in case of antitrust and cartel EC cases. The chapter concludes that more research is needed not only because very few mergers have been notified to the Commission, but also because any relevant in depth analysis of competition effects is missing.

The European Commission, in its *ex ante* assessment of notified vertical mergers between liners and terminals has not applied an in-depth analysis (phase II) to any case, due to the absence of competition concerns. This absence is a result of the estimated low market shares. But are the real market shares really that low? **Chapter 6** discusses the problems with the relevant market definition and therefore, the calculation of market shares of the upstream and the downstream markets. Furthermore, it describes the potential competition effects that would have been examined by the Commission in case of a phase II vertical merger assessment. It concludes that there is a need to focus more on market structure and effects.

To understand the vertical restraints of a LTVIC, it is necessary to understand at least the two relevant markets of the upstream container terminal services and of the downstream container liner shipping services, respectively. **Chapter 7** analyses the structure of both vertical markets in the Hamburg-Le Havre port range. In particular, it (a) defines the relevant markets of container terminal services and container liner shipping services, including the geographic market(s) of the selected area; (b) estimates the total market size of the container terminal services, the market shares in throughput and capacity terms, and the concentration level; (c) describes the evolution of market shares; (d) analyses the liners' entry; and (e) discusses the liners' market shares, the alliances formed and the concentration level of liners observed. The analysis of the two vertically related markets shows that they both have all factors that lead to anticompetitive effects.

Chapter 8 examines competition effects of the vertical integration in the Hamburg-Le Havre port range. Specifically, it examines the effects of the LTVI on shippers, concerning the terminal handling charges (THCs), choice of services, and quality of service. Empirical research shows that any efficiencies gained from the vertical integration have not been passed on to shippers.

The concluding **Chapter 9** discusses the theoretical and practical implications of the above research. With no access to confidential customer contracts and shareholders' agreements between liners and terminal operators, the study is mainly based on equity interests. However, it consists the first ever assessment of competition effects of the vertical integration in maritime industry by using theoretical and empirical practices. In the light of these findings the study concludes in suggesting topics for further research.

CHAPTER 2:

PORTS, VERTICAL INTEGRATION OF LINER SHIPPING AND THE POTENTIAL OF COMPETITION EFFECTS: A LITERATURE REVIEW

2.1 INTRODUCTION

The last decades the port sector has been subject to major reforms. Until the late 1970s, with few exemptions (i.e. the US and Hong Kong), ports worldwide had been heavily regulated public entities. The early 1980s marked the commencement of reforms in port government, operations and management, via the devolution of responsibilities to third parties. An example of port privatisation is the UK and the decision of the British government to sell its shares to private investors. Other countries, such as Malaysia, the Philippines, Italy, Thailand, China, New Zealand etc., followed this example and started to lease out their port assets following different patterns (Frémont, 2007; Brooks and Cullinane, 2007). Today private actors have a major role in most ports with international trade (Brooks et al, 2017).

Private entry was accompanied by the globalisation of trade but also of stevedoring business. Container terminal operators entered into the global port business for different reasons in three phases (Midoro et al., 2005). The first wave (including: HPH, P&O Ports, SSA, ICTSI, Eurokai, and others) dates back to the mid-1980s when P&O Ports decided to invest for the first time in a terminal facility in Port Klang, Malaysia. The second wave (including: PSA, CSX, BLG, HHLA, Dubai P.A., Dragados, TCB and others) dates back to 1996, when PSA acquired a share in Dalian Container Terminal, China. Liner companies (including: Maersk, Evergreen, Hanjin, K Line, NYK, MSC etc.) belong to the third wave of entrants, which dates back to the late 1990s during the early transhipment revolution (for a timescale of internationalisation: Olivier 2007).

The third wave altered the picture, as the entry of liner companies in container terminals vertically integrates liners and terminals. In addition, liners and terminal operators invested in intermodal transport (inland ports, rail, air), forwarding and logistics, expanding the vertical integration, and continue to do so. In parallel, technology and new regulations of

public authorities permitted modern forms of cooperation among liner companies, such as alliances and consortia. Along with changes in the production-distribution-consumption process, these trends implied that port competition progressively changed from competition between individual ports to competition between supply chains (Robinson, 2002).

This chapter provides a review of the literature analysing the evolution of the liner-terminal vertical integrated company (LTVIC). More specifically it defines the LTVIC and its forms, as well as the factors of its creation. Moreover, it mentions the potential competition effects of the vertical integration between liner companies and container terminals. Finally, it raises the questions for further research.

2.2 VERTICAL INTEGRATED MARITIME COMPANIES

2.2.1 STRUCTURE AND FORMS

The coordination between the upstream market, i.e. the provision of container terminal services, and the downstream market, i.e. the provision of container liner shipping services, is a most common form of the vertically integrated company in the maritime sector. This integration may be on a contract and/or ownership basis. The latter refers to ownership of the firm operating the terminal, mainly through a concession agreement[2] by creating a Special Purpose Vehicle (SPV).[3] In general, the typical institutional structure in the port sector is the landlord port model. It is estimated that 85 to 90% of global ports are landlord ports, which accounts for about 65-70% of global container port throughput.[4] In low and middle-income countries, concessions and build-operate-transfer (BOT)[5] seaport projects

[2] Although concession is a long-time contract it does not carry the meaning of one. According to the definition of the Directive 2014/23/EU (p. 3, par. 11) on the award of concession contracts: *"Concessions are contracts for pecuniary interest by means of which one or more contracting authorities or contracting entities entrusts the execution of works, or the provision and the management of services, to one or more economic operators. The object of such contracts is the procurement of works or services by means of a concession, the consideration of which consists in the right to exploit the works or services or in that right together with payment. Such contracts may, but do not necessarily, involve a transfer of ownership to contracting authorities or contracting entities, but contracting authorities or contracting entities always obtain the benefits of the works or services in question".*

[3] Special Purpose Vehicle (SPV) is an entity created by one or more companies for the specific, limited and usually temporary purpose, such as a concession.

[4] UNCTAD (2017) based on Drewry Maritime Research (2016). In a typical landlord port, the port authority enters into concession agreements or public-private partnership schemes - or a combination thereof - for a series of individual terminals. The majority of port projects are based on build- operate-transfer concession agreements; The term derives from the typology included in World Bank's Port Reform Toolkit (2001).

[5] In built-operate-transfer agreement (BOT), the concession holder invests in infrastructure and superstructure and operates the terminal for several years before returning the entire asset to the port authority.

account for 89% with the rest being management contracts/leases (6%) and divestitures (5%) (Farrell and Vanelslander, 2015).[6] Ownership integration may be full or partial, controlled (sole or joint) or non-controlled (passive minority shareholdings).

Ownership vertical integration in container terminals is a relatively new strategy, which follows ports' deregulation and privatisation. Nevertheless, vertical integration between shipping companies and ports is not a new phenomenon. Shipping companies such as P&O and Hapag Lloyd had invested in ports decades before the adventure of container box. Specifically, Hapag Lloyd invested in the port of Hamburg in 1903.[7]

Andreou et al. (2012) define vertical transportation mergers as mergers between companies operating in different modes of transport but vertically related in the supply chain. Frémont (2010) notes that although transport chain integration by shipping lines is not a new concept, the vertical integration processes began to establish themselves in the 1980s, aided by the high number of mergers carried out at different levels of the transport chain in that decade and the shipping line being the key player of the integration process. Vertical co-operation agreements that do not involve shipping companies are much rarer (Férmont, 2010; Notteboom and Rodrigue, 2010; Van de Voorde and Vanelslander, 2009). Shipping lines accounted for 21% of investors in container terminals in 2012, when the four large ITOs, Hutchison, DP World, PSA and ICTSI accounted for 33%. At the same time, airlines only made up 6% of airport investors (Farrell and Vanelslander, 2015).

Integration is more than ownership. Thompson (2009) notes that common ownership does not necessarily guarantee integration: in many cases, conglomerates have poorly-coordinated or even competing subsidiaries. Integration is a spectrum of possible relationships that distinguish it from true independence, which might be defined as separate activities or entities that interact only at arms' length basis (ibid). Degrees of integration can begin with information sharing, various kinds of cooperation, joint ventures to own

[6] These estimations are based on World Bank Public Private Advisory Facility (PPIAF), Annual Report 2012.

[7] See https://www.hapag-lloyd.com/content/dam/website/downloads/press_and_media/publications/Shipping_made_in_Hamburg_engl_05_2019.pdf. The Hapag port facilities at Kaiser-Wilhelm-Hafen and Ellerholzhafen, were each with ten metres water depth at high tide. Three kilometres of quays were equipped with 140 mobile cranes and three heavy goods cranes, seven warehouses and 22 kilometres of railway tracks.

facilities used in common, and extending to common ownership either in a single company or within a broader conglomerate or holding company.

Participation of shipping lines in terminals is dominated by Maersk, MSC and CMA CGM, all of which have associated terminal operating companies providing a mixture of dedicated and third-party services. Several of the Asian container lines are also involved in terminal public-private partnerships (PPPs), but tend to be more focused on handling their own cargo (Farrell and Vanelslander, 2015). In 2017 CMA Terminals and Cosco Shipping Ports, subsidiaries of CMA CGM and Cosco, respectively, signed a MoU to reinforce their strategic cooperation on port operations and investments.[8]

Although the vertical relation between liner companies and terminals is determined by contracts, joint ventures, partially owned subsidiaries (minority investments) and wholly-owned subsidiaries (Heaver et al., 2000; Soppé et al., 2009; Franc and Van der Horst, 2010), the ownership vertical integration is mainly partial integration. Notteboom and Rodrigue (2010) state that a substantial number of container terminals around the world include a shipping line among their shareholders, in most cases as a minority shareholder. Having examined 525 concessions of container terminals, Farrell (2012) concludes that fewer than half of SPVs are managed by a single company. Most concessions are held by consortia of between two and six strategic investors.[9]

In addition, Farrell examines the changes in the ownership structure of the SPVs since their concessions were originally awarded. Out of the 423 operated terminals in 2009 whose concession ownership could be tracked, at least 185 (44%) were reported as entering into transactions which involved more than 5% of shares changing hands.[10] Parola et al. (2012)

[8] See https://www.cmacgm-group.com/en/news-medias/signing-of-mou-between-cosco-shipping-ports-and-cma-terminals-holding-the-cma-cgm-port-subsidiary-to-reinforce-their-strategic-cooperation-on-port-operations-and-investments, dated 26 January 2017.

[9] Farrell's compiled data shows that 258 SPVs are owned by a single company, 135 SPVs are owned by two companies, 59 SPVs are owned by three companies, 29 SPVs are owned by four, 14 SPVs are owned by five and 40 SPVs are owned by six or more companies, without any distinction between vertical and horizontal JVs.

[10] Also, 10% of the tracked SPVs had recorded more than one significant change in ownership. This is in addition to terminals, which were reassigned to new operators because their concessions came to an end or were terminated. The scale of the change in ownership is attributed by the researcher to three main processes: (a) around 15% of transactions concern buy-in to terminal operating consortia by shipping lines, (b) 40-45% of transactions concern buy-out of shares from the original participants either by other members of the same consortium or by an outside party other than a shipping line, and (c) around 35% of transactions concern takeovers of companies owning shares in concessions. Farrell (2012) adds that in around two-thirds of the

show that there are four analytical angles applicable to the study of equity joint ventures (EJVs): the holding company (firm) constitutes the level I and it has joint venture(s) in container terminal(s) (level II), but also strategic partnership(s) with other holding companies (level III) which have joint venture(s) too, and all the above levels constitute a shadow family or a hidden cluster (level IV).

Liners adopt different strategies in order to obtain "dedicated handling services". Some acquire terminal facilities and act as stevedoring companies; others invest money in terminals (minority shares, joint-ventures, majority shares) without being involved in the day-to-day operations and outsource the latter to local or global pure stevedores; and others just 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:

a) A special agreement (contract) is reached between the terminal and the liner, based on TEUs throughput. The terminal operator agrees to provide priority - and in some cases allows a throughput-based discount on port charges. Such examples include PSA facilities in Singapore (terminal agreements with different carriers) and ECT Delta terminal in Rotterdam (berthing agreements with main alliances).
b) The liner holds a minority share (usually less than 20%) in the terminal, but has not part in the revenue created, except through dividends. The carrier is involved in mid- to long-term planning, but not in the short-term management and terminal operations. Examples include Maersk in Gioia Tauro (with Eurogate) and in Tanjung Pelepas, and Cosco in some HPH terminals in China.
c) A 50/50 joint venture is undertaken by the liner and the terminal operator. The terminal can be managed either by the terminal operator or by a third-party stevedore. Examples include the Kwai Chung port in Hong Kong (Cosco-HPH), Bremerhaven (Eurogate-Maersk) and Euromax terminal in Rotterdam (P&O Nedlloyd-HPH).

cases, the acquirer has been another terminal operator, mainly but not always a global terminal operator. In one fifth of the cases, the buyer has been a financial institution. Takeovers by financial institutions have so far concentrated on European and North American ports.

d) 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.

A fifth category should perhaps be added, in which 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 APMM and/or its affiliates.

Finally, it is suggested a sixth category, according to which the liner has sole control (100%) of the terminal and uses it as a dedicated or a common user terminal. Examples illustrating this sixth category are the APM Terminals Rotterdam and Maasvlakte II - Phase I Rotterdam, which both are solely controlled by Maersk, as well as Piraeus Container Terminal (Pier II & Pier III) which is solely controlled by Cosco.

Transhipment and alliances concentrate traffic volumes on a few liners and justify the investments in container terminals. According to Midoro et al. (2005), with regard to carrier involvement in terminals, the role of global alliances in port handling is of particular importance. In some cases, there is a shared transhipment terminal among liners. The Gamma Container terminal located in Pusan, operated by the major Korean ship carriers, Global Enterprises, Hanjin Shipping, Korea Express and, a foreign company, Hutchison Korea Terminal (HPH Group), is such an example. In most cases global liners run their own terminal with a captive market generated by their own vessels and with a residual capacity supplied to the other partners of their alliance. These partners are typically customers of the terminal (ibid). Joint ventures of liners on container terminals are also found in Northern Europe with Euromax Terminal Rotterdam Maasvlakte II Phase II and Antwerp Gateway being such examples (Notteboom and Rodrigue, 2010). Nevertheless, Notteboom et al. (2017) suggest that there is no linkage between alliance formation, stakes at terminals and port selection; meaning that the issue is worth to be further explored.

Table 2.1 shows the categories of liners' involvement in terminals handling.

Table 2.1 Categories of liners' involvement in terminals handling

Categories	Examples
Contract	a) PSA facilities in Singapore (terminal agreements with different carriers), b) ECT Delta terminal in Rotterdam (berthing agreements with main alliances).
Minority shareholdings	a) Maersk in Gioia Tauro (with Eurogate) and in Tanjung Pelepas, b) Cosco in some HPH terminals in China.
Joint control (50/50 shares)	a) Kwai Chung port in Hong Kong (Cosco-HPH), b) Bremerhaven (Eurogate-Maersk).
Dedicated terminal (usually accompanied by shares)	a) APM Terminals in Algeciras, Los Angeles (Pier 400) and Rotterdam, b) Evergreen terminals in Taranto and Coco Solo.
Minority shareholdings accompanied by a special agreement (e.g. joint control)	Eurogate Container Terminal Wilhelmshaven (CTW), where although Maersk holds 30%, a Partners' Agreement prescribes that up to 49% of total operational capacity will be dedicated to APMM and/or its affiliates.
Sole control (dedicated or common user terminal).	a) APM Terminals Rotterdam and Maasvlakte II - Phase I Rotterdam (Cosco), b) Piraeus Container Terminal, Pier II & Pier III (Cosco).
A shared transhipment terminal among liners (alliance).	Gamma Container terminal located in Pusan, operated by the major Korean ship carriers.

Source: Parola and Musso (2007) and author

2.2.2 DRIVING FACTORS

Vertical integration serves interests of both liner companies and terminals, for different reasons. The fact that in many cases concessions are the only way to enter into the terminal industry, the unavailability of land for entrants, as well as the enormous financial resources and the variety of skills required for realising modern terminal facilities, have led terminal operators to experiment with various forms of co-operation, which include contractual and equity co-operative agreements, equity consortia, alliances and mergers, horizontal and vertical partnerships, and other inter-firm co-operative ventures (Pallis et al., 2008; Parola et al., 2012). In addition, the characteristics of supply chain management encourage vertical integration (Heaver et al., 2001).

Shipping companies invest in ports to protect their interests in liner shipping, but they might also aim at the recovery of a surplus generated by the port operation. Specifically, shipping companies may be led to vertical integration by the need to be protected by the abuse of market power of port service providers (Langen and Pallis, 2006) and also by the

strategy to gain greater control for the service and cost levels associated with terminals over the total door-to-door transport service (Midoro et al., 2005; Langen and Pallis, 2006; Van de Voorde and Vanelslander, 2009; Notteboom and Rodrigue, 2010). In a strong competition environment, product differentiation through a wider range of offered services has a strong influence on performance (Panayides, 2003). By investing in a container terminal, the liner company can secure its port operations, save on costs and better schedule its ships (Cantos-Sanchez et al., 2011). According to Midoro et al. (2005), vertical integration is an evolution in the strategic behaviour of some liners which probably means that they see the stevedoring market as a potentially profitable sector in which higher margins than those existing in sea transport can be found. It is a common practice in various industries, large companies to invest in downstream or upstream markets as they have secured customers or suppliers for their own company. In shipping, Cosco not only operates Piraeus Container Terminals (Pier II and Pier III) for a 35+5-year period, following the international tender of 2008 (for details of the privatisation of Port of Piraeus: Psaraftis and Pallis, 2012), but it has also obtained the majority stake in Piraeus Port Authority (PPA) since 2016. In 2017 Cosco also obtained 51% stake in Noatum's Valencia and Bilbao container terminals and through Cosco Shipping Ports, it became the sole shareholder of the APM Terminals Zeebrugge, too.

On the other hand, top global stevedores such as Dubai Ports World, PSA and HPH, have signed agreements and invest in joint venture terminals with liners, as a strategy of reaction to the threat of their power. The phenomenon has applied to an extend that led scholars (Parola et al., 2013) to explore the presence of co-operative networks and "hidden families" in the container port industry. Parola and Musso (2007) mention the example of PSA in Singapore, which took a strong stand to maintain its position as a multi-user terminal. Their study details that its refusal to provide even just a contractual dedicated service to Maersk and Evergreen, caused Singapore to lose more than three million TEUs, which moved its neighbour Tanjung Pelapas in Malaysia. For the pure stevedores, dedicated terminals represent an opportunity to secure a cargo, while in the hands of the liners they enable cost stability and the possibility to put pressure on pure terminal operators. Dedicated terminals are a strategy for cutting costs and controlling integrated transport chains. Farrell (2012) argues that when container terminal concessions first began to be competitively awarded,

it was quite common for shipping lines to be excluded from the tendering process in order to avoid competition effects, such as foreclosure of third shipping lines or abuse their access to confidential information. However, later shipping lines were much sought after as terminal operators or consortium partners because of the large volumes of traffic they control, and their ability to switch some of this particularly transhipment traffic to terminals in which they have a financial interest. An explanation for this partly lies in the strategic importance ports carry for states, and the need of the latter to secure reliable supply chains. Chile and Turkey are such examples, both having altered their concessions policy. Specifically, regarding the privatisation of TCDD Samsun, Izmir and Mersin ports, although the Turkish Competition Board prevented a vertical integration that could potentially harm competition[11], a few years later, in 2015, the subsidiary of Maersk (APMM) APM Terminals (APMT), constructed a new container terminal at Aliağa, Izmir.

Although contractual agreements between liners and terminals are still the most common option, equity ventures already represent an attractive solution for sharing investment risk, and aggressive takeovers are the quickest way to penetrate a profitable market but one with high barriers to entry. Big corporations such as APMM, APL, and NYK, have resorted to diversification for balancing their portfolio and reducing their risk exposure (Soppé et al., 2009; Cariou, 2008; Rodrigue et al., 2011; Parola et al., 2015). In that direction, Midoro et al. (2005) correlate the terminal involvement of liners with their ships' size.

The involvement of liner companies in the upstream container services market is profitable, even in times of economic crisis, when liner companies suffer because of weak demand and excess supply. The profit of the terminal stations operation (APMT) in 2012 was 649 million dollars while the loss of the shipping line company (Maersk Line) was 602 million dollars.[12] In addition, APM Terminals' five US terminals accounted for only 4% of the company's invested capital but delivered 10% of the economic profit[13]. Other VICs operating in ports such as Cosco also announced corresponding results.

[11] For more details about ports in Chile and Turkey see OECD Report (2011), "Policy Roundtable, Competition in Ports and Port Services" pp. 111; 205; 206.
[12] Barnard, B., Joc, https://www.joc.com/ap-moller-maersk-group. Assessed: July 2019.
[13] Navigating Volatility, Group Annual Magazine, Maersk, p. 34, https://investor.maersk.com/static-files/ab05c370-8899-4a86-a139-15716fe878bb. Assessed: July 2019.

Moreover, the profitability of ports, not necessarily in terms of rate of return but mostly in the volume of this return as well as its underlying assets, attracted also financial firms, such as banks, insurance companies and even pension funds (Rodrigue et al., 2011). Their involvement may be direct as partners or indirect on a stock exchange basis.

According to Frémont (2007), although independence is the best strategy to draw the maximum benefit from port control, it is much easier to be found or acquired in relatively "minor" ports than it is in global ports where there may be a strong port authority or where the largest international cargo handlers are present. Midoro et al. (2005) had mentioned four factors which led liners to control a number of terminals all over the world: (a) the growth of the ship size which implies an increase in 'call size' (number of handled containers during the loading/unloading operations), (b) the increase in transhipment operations along east-west routes, (c) the dramatic 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. Thus, the need for schedule reliability and competitiveness induced liners, such as Cosco, Yang Ming, China Shipping, CMA CGM and MSC to follow the example of predecessors.

The reasons for vertical integration between liners and terminals as synopsised by Parola and Musso (2007) are: financial (cost stabilisation), economic (economies of scope), strategic (new barriers to entry, lower co-ordination cost in the transport chain, terminals as profit centres), and operational (better productivity and schedule reliability). Even in partial integration, some major ocean carriers manage to improve their schedule reliability, reduce turnaround times and stevedoring costs, and thus become more competitive by acquiring shares in terminals' facilities. The required huge deep-cost investments offer an explanation for the partial integration.

Nevertheless, Haralambidis (2017) mentions that although carriers started to invest in container terminals in the 1990s, in an effort to differentiate their service and to control better the supply chain, the situation has started to change as they appear to be returning back to core business, shedding the idea of vertical integration in favour of better horizontal integration (alliances) and dominance in shipping where they have the comparative advantage.

2.3 POTENTIAL IMPLICATIONS: COMPETITION EFFECTS

World Bank defines three types of port competition (World Bank, 2007): Inter-port competition, as that between different ports; and intra-port, as competition between different enterprises within one port complex. Intra-port competition refers to a situation where two or more different terminal operators within the same port are vying for the same market. In this case, the terminal operator has jurisdiction over an entirely terminal area, for berth to gate and competes with other terminal operators. In addition, intra-terminal competition refers to companies competing to provide the same services within the same terminal.

Due to supply chain development, port competition has changed from competition between individual ports or terminals to competition between alternate intermodal systems in which ports form an important component (Wan et al., 2013). Ports are elements in value-driven chain systems or in value chain constellations (Robinson, 2002). Competition between carrier-controlled terminals is not usually direct but a result of primary shipping activities (Midoro et al., 2005), an inter- or intra-chain competition in which liner companies is the key-player. For example, the APMM group not only attains a key and dominant position in the port it has selected as a hub, but also develops its port network according to its shipping services. These services have a certain geographical flexibility, which means that Maersk can modify its network according to the opportunities that arise and its financial capacities.

The launch of a new service may immediately produce high traffic volumes that justify the investments made in the terminal. Such examples are the port Salalah in Oman (Frémont, 2007) and the port of Tanjung Pelepas (PTP) in Malaysia.[14] Therefore, a new entry of a liner company in a port affects its throughput.

[14] In 1998, Maersk vacated Jebel Ali, United Arab Emirates, for Salalah in Oman with a 16 metres draft for vessels. From 1998 to 1999, the traffic passing through Salalah increased from 17,493 to 648,613 TEUs, as it has a good location on the Europe-Eastern Asia route, which means that mother vessels do not have to be diverted from their ocean route and makes it possible to serve the Middle East, Eastern Africa and the islands in the Indian Ocean by a network of North-South lines. A second example is the increase of the traffic at the port of Tanjung Pelepas (PTP) in Malaysia, from 418,000 in 2000 to 2 million TEUs in 2001, when Maersk switched to the new port from Singapore, which had a monopoly position as a transhipment hub in South-Eastern Asia (Asgari et al., 2013; Frémont, 2007). Moreover, the change of Maersk's transhipment base from Singapore to PTP may have influenced the ensuing movement by (the independent) Evergreen to PTP (Chang

2.3.1 PROCOMPETITIVE AND ANTICOMPETITIVE EFFECTS

In general, researchers recognise efficiencies gained from vertical integration. Vertical integration in the maritime sector reaps all benefits of intermodal transport, allows liners to provide better service, increases efficiency of cargo movement, minimises transactions costs, reduces operational time for cargo handling, 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 2.2**).

Table 2.2 Efficiencies gained by vertical integration

Efficiency	Source	Year
Increases efficiency of cargo movement.	OECD/ITF	2008
Reaps all of the benefits of intermodal transport.	Frémont (OECD)	2010
Allows liners to provide better service.	Álvarez-San Jaime et al.	2011
Minimises transactions costs, reduces operational time for cargo handling, ensures security and service quality standards which will certainly be beneficial for shippers.	OECD	2011
Enhances the corporate performance and corporate value by reducing transaction costs. Improves efficiency of their supply chain operations.	Parola et al.	2015

Álvarez-Sun Jaime et al. (2015) demonstrate that integrated ports have two more pricing tools for maximising profit, which gives them a competitive advantage against non-integrated ports: they are able to offer two different services, one previously provided only by including port services, and a bundle including both the port services and the inland transport services. Nevertheless, Heaver (2015) offers examples illustrating that the design and operation of a well-coordinated service does not require common ownership[15].

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

et al., 2008). It is noted that APMM holds a minority share in Port of Tanjung Pelepas (see the official site of the port, www.ptp.com.my, and Parola and Musso, 2007).

[15] Specifically, APL Logistics was the first line to offer a port-to-door, time-guaranteed, less-than-container (LCL) service in 2006. This was from China into the US, with APL being the ocean carrier and Con-Way Freight performing the inland carriage. Japan, South Korea, Singapore and Taiwan were added as origins in 2007 and Mexico was added as a destination in 2009. In 2008, a full-container guaranteed service was introduced from China to the US. In 2009 Hanjin and MOL introduced time-guaranteed services on routes from Asia to the US West Coast with distribution in the US being handled by Old Dominion Freight Line and the railway operator BNSF.

limit or hamper the competition for space and traffic that would otherwise arise at ports, and gives more control to large shipping companies (see **Table 2.3**).

Table 2.3 Competition concerns arise from vertical integration

Competition Concern	Source	Year
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 et al.	2000
Vertical integration and the associated bundling of services might act as a barrier to entry in container handling.	De Langen and Pallis Vanelslander Parola et al.	2007 2011 2015
Carrier-controlled terminals, in particular 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
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
It 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.	Álvarez-Sun Jaime et al.	2015
Increases barriers to entry for potential competitors.	Parola et al.	2015

The competition concerns mainly spring from the horizontal integration of liner companies (mergers, acquisitions and alliances). Heaver et al. (2000) state that greater concentration, especially in an oligopolistic environment, results in less competition, which may be conducive to higher prices. They add that involvement of liners in terminal operations shifts 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.

In addition, researchers express competition concerns related to horizontal or horizontal and vertical integration, as shown in **Table 2.4**.

Table 2.4 Competition concerns arise from horizontal or horizontal and vertical integration

Competition Concern	Source	Year
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
Integration has reduced the number of players, with an attendant risk of abuse of market power. The market power of the ports *vis-à-vis* shippers and shipping companies has become correspondingly weaker.	OECD/ITF	2008
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
A horizontally and vertically integrated transport chain raises the problem of competition in a situation that could turn into a monopoly.	Frémont (OECD)	2010
The growing concentration of the market has increased the risk that fair competition may become distorted and results in an oligopolistic market structure with potential impacts on the market, freight rates and shippers.	UNCTAD	2017

Notteboom and Rodrigue (2010) state that traditional stevedoring companies opted for horizontal integration to partly counterbalance the consolidation trend in liner shipping. The scholars add that as horizontal integration in liner shipping through strategic alliances and mergers and acquisitions has enhanced consolidation at the demand side, the top 20 carriers controlled 26% of the world slot capacity in 1980, 42% in 1992 and more than 60% in 2008. In 2019 the top 10 carriers control the 83% of the total capacity (Alphaliner, 2019). Substantial concentration in the stevedoring market and the emergence of dedicated facilities in Northern Europe make this arm-wrestling stronger and stronger (Parola and Musso, 2007).

The OECD (2011) conducted a survey that included reports of certain countries on competition of ports. Indonesia's report mentioned that in order to protect competition, specific transparent regulations may defend access and equal business opportunities of non-integrated shipping companies to the essential facilities of the strategic and vital terminals.

Researchers recognise vertical integration and the associated bundling of services as a barrier to entry in container handling (De Langen and Pallis, 2007; Vanelslander, 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.[16] 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 gained 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, which prevent competition in order to protect the interests of the contractor, i.e. the agreement between Cosco and PPA.[17] There are cases in which the competition authorities, namely the Indonesian Competition Commission, consider that such clauses restrict competition.[18]

2.3.2 IMPLICATIONS OF ALLIANCES

The notion of the LTVIC becomes more significant due to the existed consortia and alliances between shipping lines. Liner companies provide their services either individually with their own operated vessels (owned or chartered) or through co-operation 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

[16] Flemming Dalgaard, the Senior Vice President and Managing Director for Europe and Russia of DP World in his presentation during the Nonura Transport Conference on 21.03.2012 argued that the average life of concessions is 43 years and that in reality they are perpetual as historically concessions have always been renewed.

[17] See Law 3755/2009 (Governmental Gazette A52) article 9.2 “Ratification of the Convention for the concession of the port facilities of Piers II and III of "Piraeus Port Authority SA" (PPA) container terminal and setting related issues”. It is noted that according to the Commission although non-competition clauses are justified for periods of up to three years, there are exceptional cases in which longer periods may be justified (for more details, see the “Commission Notice on restrictions directly related and necessary to concentrations”, 05.03.2005).

[18] For more details see the decision of Case No. 04/KPPU-I/2003 JAKARTA INTERNATIONAL CARGO TERMINAL (JICT), which was confirmed by the Supreme Court of the country in 2004 (OECD (2011), p. 252 and www.jftc.go.jp/eacpf/cases/terminal.pdf).

are a matrix of vessel sharing agreements.[19,20] So each company participates in one alliance and in more consortia.

For example, in 2015, the CMA CGM Group signed a strategic partnership agreement with United Arab Shipping Co and CSCL, called Ocean Three (O3) alliance. At the same time, as shows **Annex Table 2.5**, CMA CGM participates in 26 consortia in trades from/to Europe with other liner companies, which participate in other alliances.[21] The consortia partners of CMA CGM, include (a) Maersk, which belongs to the 2M alliance with MSC, (b) Hanjin which - until its bankruptcy in 2016 - belonged to the CKYHE alliance with Cosco, K Line and Yang Ming, and (c) Hapag Lloyd which belongs to the G6 alliance with APL, HMM, MOL, NYK and OOCL.

In 2014, the 16 carriers in the four large alliances (CKYHE, 2M, Ocean3, G6) controlled 95% of the cargo volumes moving in the major East West trades (Leach, 2015). In April 2017, three main alliances, The Alliance, Ocean Alliance and H2M, with a total fleet of 15.862.743 TEUs were operating, representing at least 76.6% of the operational market (Sanchez and Mouftier, 2017). In 2018 although the number of alliances remains the same, the members of alliances are fewer due to the recent mergers. It is estimated that in 2019 three alliances carry 80% of the world container throughput (Haralambides, 2019).

In maritime transport, horizontal mergers and alliances permit the use of large ships and increase the profits of the liner companies by gaining economies of scale.[22] On the other hand, alliances of liner companies and larger ships negatively result on stowage planning,

[19] A "trade" is defined by the range of ports which are served at both ends of the service (e.g. Northern Europe - North America and back). A "leg of trade" is defined as one of the two directions of a trade (e.g. Northern Europe -North America is the first leg; North America – Northern Europe is the second leg).

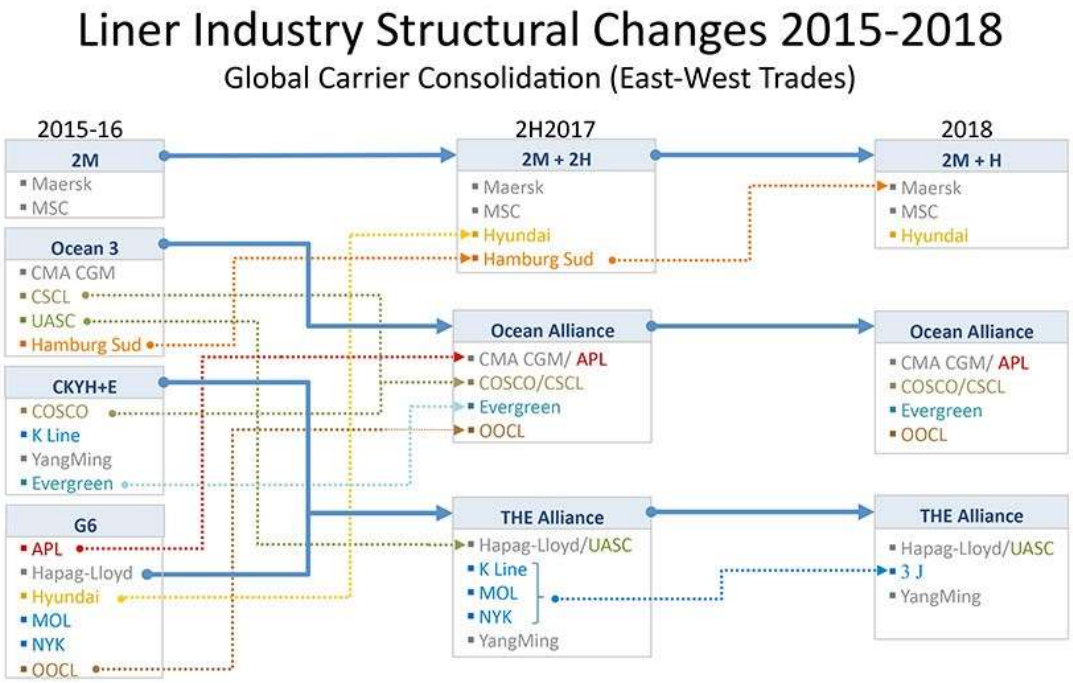
[20] Article 101(1) of the Treaty on the Functioning of the European Union (TFEU) prohibits agreements between undertakings that restrict competition, but Article 101(3) of the TFEU allows declaring such agreements compatible with the internal market provided that they contribute to improving the production or distribution of goods or to promoting technical or economic progress, while allowing consumers a fair share of the resulting benefits. Such declarations are made by the Commission through measures known as Block Exemption Regulations (BERs). The Commission Regulation 870/95 was the first Consortia BER regulation which was adopted in 1995 and since then it has been prolonged and amended 4 times. The current Consortia BER Commission Regulation 906/2009 sets the specific conditions for the Article 101(3) exemption of consortia agreements. These conditions aim at ensuring that consumers (users) enjoy a fair share of the resulting benefits resulting from the efficiencies. The Consortia BER which is the only remaining maritime specific competition measure, will expire on 25 April 2020.

[21] Data assessing from EC Case M.7908 - CMA CGM/NOL (29.04.2016).

[22] For example, Triple-E 18,000 TEUs container ships of Maersk that was expected to save the company around £750,000 per typical voyage from Shanghai to Rotterdam (Alexandrou et al., 2013).

meaning that in order to fill a larger ship, a carrier calls at more loading ports than would be warranted by the economics of a hub-and-spoke system, picking up containers even at the last minute before departure[23] (Haralambidis, 2017). According to Guan et al. (2017), a 1% growth in ship size and its auxiliary industry operations increases time in port by nearly 2.9% and creates diseconomies of scale at ports, indicating that economies of scale that are gained at sea are lost at ports (UNCTAD, 2017).

Figure 2.1 Liner industry alliances



Source: http://pacificatrucks.com/z-Ocean-Carrier-Alliances, dated 20.09.2018

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 fortune of major transhipment container ports (i.e. Felixstowe, Southampton or other UK container ports).

Alliances have the power to change the industry landscape and port operators face much risk as they invest in the necessary equipment to handle ultra-large vessels. In 2013, three

[23] The author adds the argument of a terminal operator that the terminal does 150 moves per hour for a major independent carrier but only 100 for an alliance ship. Moreover, slot swaps among alliance members do not make things easier as the shippers book containers with one company and they find out that they landed at the other end on the ships of another carrier.

of the world's largest shipping companies, namely Maersk, MSC and CMA CGM, announced their plans to cooperate on three major trade routes: Europe-Asia, trans-Pacific, and trans-Atlantic. In theory, the proposed P3 alliance would have employed larger ships and combat a capacity glut in the business. The alliance would have had more than 40% of Asia-Europe and trans-Atlantic trade and 24% of the trans-Pacific market, according to industry estimates.[24] Regulators in Europe, China and the US examined whether the benefits of the alliance outweigh possible negative impacts on customers, other providers of vessel services and ports. Concerns involved the foreclosure of competitors and an increased bargaining power towards service provided by ports. Cargo owners and shippers' groups had questioned the P3 alliance, because it could potentially dominate key trade routes, pushing out smaller carriers and potentially driving up prices. Especially for ports the agreement stated: *"(a) The Parties are authorized to discuss and agree upon the terminals to be called by the vessels operated hereunder. Terminals shall be selected on the basis of such objective operational criteria as the Parties may agree from time to time, and such selection will also take into account any financial interest of a Party in a terminal".*[25]

The issue of whether buyer power exists in practice was addressed in the EU's submission in OECD meeting Competition in Ports and Port Services in 2011. It is believed that shipping companies are often organised into conferences and consortia, increasing their scale and potentially giving them considerable buyer power. Nevertheless, the above document states that: *"However, the European Commission has not found this to be a convincing argument because conferences regulate only the prices charged for shipping services; they do not interfere with shipping operators' decisions about routes and ports of call. The Commission was also doubtful that consortia facilitated substantial buyer power because consortia members actually compete with each other on both price and end-to-end service. Thus, the Commission was of the view that, although shipping companies can be large and conferences and consortia can increase concentration, buyer power may still be limited in the maritime sector"* (OECD, 2011: p. 11).

[24] Reuters 17.06.2014.
[25] See P3 Network Vessel Sharing Agreement, FMC Agreement No 012230, paragraph 5.4 "Terminals, Stevedores and Other Services".

In September 2018, the Commission launched a public consultation on the evaluation of the Consortia BER, as a part of the evaluation of the Consortia Regulation, which had started in May 2018. According to the Commission, the objective of the consultation was the collection of evidence and views from stakeholders in order to assess the impact and relevance of the Consortia Regulation and provide an evidence base for determining whether it should be left to expire or prolonged (and if so, under which conditions). In November 2018, and during the above mentioned public consultation on the evaluation of the Consortia BER[26], ITF (2018) published a report on the impact of alliances in container shipping, advocating that liner shipping does not have unique characteristics that justify exemptions from competition law, either for conferences or for alliances.

In the OECD's report (2011) it is also noted that as integration is likely to be more flexible than it has been in the past, horizontal integration will be achieved through alliances rather than through mergers. Nevertheless, in the years that followed many and important mergers took place in liner shipping.[27] In parallel, the alliances, as mentioned earlier, become fewer and bigger.

Munari (2012: p. 5) stating the peculiarities of liner shipping[28] concludes that if liner carriers were to compete among themselves for pricing, this would produce "rate wars" and a "destructive competition" whose consequences would undermine the stability of trade". He adds that: *"Given the importance of having reliable and constant shipping services carrying goods traded in world markets, not only was cartelization accepted, but it was even welcomed in many instances as the most effective organizational model for our sector. In this regard, also the stability of tariffs deriving from this model was acknowledged as being of value, since this would reduce fluctuations of prices in the goods*

[26] The deadline of this public consultation was 20.12.2018.
[27] Such as CMA CGM acquired NOL, Hapag Lloyd acquired United Arab Shipping Company, Maersk acquired Hamburg Südamerikanische Dampfschifffahrts-Gesellschaft KG (HSDG) and Cosco acquired OOIL (see the EC cases: M.7908 - CMA CGM/NOL (29.04.2016), M.8120 - Hapag Lloyd/UASC (23.11.2016), M.8330 - Maersk/HSDG (10.04.2017) and M.8594 - COSCO SHIPPING/OOIL (05.12.2017)).
[28] Specifically he states that the perfect competition model cannot apply to the liner shipping sector for the following reasons: (a) fixed costs are proportionately much higher than variable costs, (b) entering and exiting a given market is not so easy and entails substantial shifting costs, (c) the unit of supply in the liner shipping market (i.e. the vessel) does not correspond to, and is much bigger than, the unit of demand (i.e. the parcel or cargo unit), thus making it quite awkward for the carrier to constantly adapt its offer in order to match the fluctuations of demand.

traded worldwide, this being depicted again as an overall advantage for the economic system".

Global alliances can be considered as a breakthrough in comparison to previous forms of agreements as they are not limited to a single trade but they aim at covering all major routes, as well as a number of significant north-south trades and regional feeder links. These alliances have also extended their area of influence beyond vessel operations towards the shared use of container terminals, joint equipment management, intermodal transport, logistics and so on.

Due to the limited number of terminals able to operate mega-vessels and to the operational difficulties these vessels generate in multi-user terminals, the contractual strength of third-party stevedores has increased over time (Midoro et al., 2005). In order to evaluate the bargaining power of liners versus container terminal operators, it is useful to analyse the concentration ratio of the slot capacity supplied. Since carriers co-operate by setting up vessel sharing agreements and global alliances, the ratio should somehow also take into account alliance membership (Parola and Musso, 2007).

The new mergers, acquisitions and mega alliances that took place in 2016 and 2017 would lead to better handling of supply and better utilisation of fleet, and in turn to better market conditions, improved earnings for the container shipping sector and better services for shippers. However, regulators need to keep a close watch on anticompetitive behaviour in the liner markets, as growing concentration may lead to market abuse, supply constraints and higher prices. For example, shipping lines may exert market power, limit supply and raise prices in the long run and once the industry reaches stability. Ports, including transhipment ports where competition is high and market shares are volatile, may be negatively affected in cases where deployment strategies by the alliances and the stringent requirements of ultra large container ships result in increased preference for more direct connections. Some ports could be left out, while others may lose their market share (UNCTAD, 2017). In contrast, there is the opposing point of view that higher level of concentration does not necessarily lead to reduced competition (Fusillo, 2012; Hirata, 2017).

Despite the above-mentioned concerns, no empirical study has been performed to assess the competition effects of the vertical integration between liners and container terminals. The limited studies on port competition have focused on either inter-port (De Borger and Van Dender, 2006; Álvarez-Sun Jaime et al., 2015; Merkel, 2017) or intra-port competition (Saeed and Larsen, 2010; Dong et al., 2016) without considering liners' involvement.

In his analysis related to the economic rent in seaports and particularly to how this rent arises, who should receive it and the appropriate policies of the governments in retrospect, Goss (1999: p. 3) uses the expression *"in seaports, as elsewhere",* meaning that common characteristics between seaports and other sectors can be met. He concludes that (ibid: p. 7): *"If we are going to rely on competition to ensure that ports are efficient and that their benefits are widely-distributed then it is necessary to ensure that competition actually exists – within ports and between them".* Goss claims, *inter alia*, that a necessary condition is that there is competition in the chains of transport providers, brokers and others lying beyond the port, thus at vertical and horizontal level.

2.4 SOME LESSONS FROM OTHER MODES

During recent years, although studies have taken into account factors such as hinterland access and road congestion in order to observe their impact on ports and port competition (Zhang, 2008; Yuen et al., 2008; Wan et al., 2013), none of them has taken into account the liner companies' interests on container terminals. Moreover, researchers examine the factors of port choice without including interests of liner companies as a factor of port choice in their study.

On the other hand, there are studies that have examined the potential implications of vertical integration in other modes of transport, such as air (Xiao et al., 2016) or rail transport (Levin and Weinberg, 1979; Harris and Winston, 1983; Chapin and Schmidt, 1999).

Harris and Winston (1983) estimate the potential consequences of vertical and horizontal rail mergers respectively by measuring separately two classes of potential effects: (a) the cost savings which might be realised by rail carriers through increased operating efficiencies and improved capacity utilisation; and (b) the improvements in service quality which would potentially accrue to the users of the rail system. Their analysis concludes

that vertical mergers appear more beneficial than horizontal ones, with their main benefit being improved service rather than reduced costs for shippers. This does not mean that rail operators could not benefit from these service quality effects: improved service enables them to increase market share at existing rates, or maintain market share with higher rates. The scholars underline that with improvements in service, shippers would be willing and able to pay higher rates. The point is that there are significant benefits to be realised, whether by railroads or shippers. Their study recognises that rail costs and service quality are significantly affected by market competition and/or coordination among rail carriers and conclude that only if vertical mergers reduce the number of carriers substantially-and with minimal anti-competitive effects-the cost savings will be significant.

Levin and Weinberg (1979) used post-merger changes in market shares to measure the effect of rail mergers. In their analysis, increases in market share are assumed to reflect social benefits (increase of social welfare from the part of the producer). Chapin and Schmidt (1999) measured the efficiency of US rail firms after deregulation and found that mergers increase technical efficiency but reduce scale efficiency. They conclude that firms may merge to acquire market power from ownership of track and that increases in efficiency after deregulation were not attributable to mergers per se (also: Andreou et al., 2012).

2.5 CONCLUDING REMARKS AND RESEARCH QUESTIONS

The emerging market conditions and the conducted literature review revealed that the entry of liner companies in container terminals since the late 1990s vertically integrated two markets. The characteristics of supply chain management encourage vertical integration, which is desirable of both liner companies and terminals, for different reasons. The factors that lead to liners' integration strategy are mainly the protection of their interests and the recovery of a surplus generated by the operation of the port. On the other hand, ports need capital and securing customers.

Vertical integration is full or partial; the latter being further distinguished to joint venture or minority interests, with minority interests being either active or passive. Moreover, researchers include exclusive contracts to vertical integration, as they may have the same competition effects with equity integration. Considering liners' interests in intermodal

transport, the port competition changed from competition between individual ports to competition between supply chains.

On the one hand, researchers recognise the efficiencies gained by vertical integration: in the maritime sector vertical integration reaps all of the benefits of intermodal transport, allows liners to provide a better service, increases the efficiency of cargo movement, minimises transactions costs, reduces operational time for cargo handling, and ensures security and service quality standards which will certainly be beneficial for shippers.

On the other hand, studies mention that the power concentration of the liner companies, through horizontal (mergers, consortia, alliances) and vertical integration, may lead to abuse of their market position. Specifically, they 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.

Therefore, vertical integration may result in less competition, which may be conducive to higher prices. In order to avoid competition effects, such as foreclosure of third shipping lines or abuse their access to confidential information, it was quite common for shipping lines to be excluded from the tendering process, when container terminal concessions first began to be competitively awarded. However, later shipping lines were much sought after as terminal operators or consortium partners because of the large volumes of traffic they control, and their ability to switch some of this particularly transhipment traffic to terminals in which they have a financial interest.

As port competition is competition between alternate intermodal systems; and competition between carrier-controlled terminals arises as a result of primary shipping activities, it is important to examine not only if non-integrated shipping companies have access on an equal basis to the terminal facilities, but also if they operate in the same trade routes as integrated ones. In other words, to examine whether third liners using an integrated terminal constitute real competitors to the liner(s) with interests on the terminal. Capacity constraints, as well as excess of capacity must also be taken into account.

It is worth pointed out though that the limited studies on port competition have focused on either inter-port or intra-port competition without considering liners' involvement. No

empirical study has been performed to assess competition effects of the vertical integration between liners and container terminals, although there are some limited studies for other modes of transport, namely rail, concentrated mainly on the effects on the part of the supplier.

2.5.1 RESEARCH QUESTIONS

In the light of the detailed market conditions and the conducted literature review, the present study researches empirically the competition effects of the vertical integration between liners and container terminals, that is, whether liners' involvement results in procompetitive or anticompetitive results. It does so (a) grounding on theories regarding competition (Chapter 3), (b) taking into account lessons learnt from other transport modes (Section 2.4), and proceeding to (c) an empirical analysis evaluating the EC assessment of competition effects of vertical integration and (d) studying empirically a particular port range (Hamburg-Le Havre – on the methodology: Chapter 4).

In order to reach conclusions, and assess the core research question:

R.1. *Which are the potential competition effects of vertical integration between liner companies and container terminals?*

The empirical part of this research considers two groups of research questions. The first one relates to existing assessments by decision makers at European level:

R.2. *What is the methodology already used to assess competition effects of vertical integration?*

R.3. *What is the European Commission's assessment procedure on the notified vertical mergers between liners and container terminals? and*

R.4. *What are the conclusions that might be reached by the notified merger cases to institutions such as the European Commission?*

The second group relates to the analysis of empirical data in a major container port region such as the Hamburg – Le Havre port range:

R.5. *Which are the competition effects of LTVI in a major container port region such as the port range under examination?*

In particular, based on empirical data of the Hamburg – Le Havre port range, what is the degree of liners' entry in container terminal services? Have all vertical mergers been notified to the Commission? Have liners obtained dominant or even collective dominant position in any relevant market of the above-mentioned port range? If yes, are there any elements/is there any evidence for non-coordinated (abuse of their dominant position, i.e. input or customer foreclosure) or coordinated effects (collusion) that lead to a price increase?

To better comprehend the framework and provide answers to the aforementioned questions, Chapter 3 discusses the related literature on competition theories focusing on vertical integration and its potential (procompetitive and anticompetitive) competition effects.

Annex: Table 2.5 CMA CGM's memberships in consortia on overlapping trades from/to Europe

No	Traded	Consortium partner 1	Consortium partner 2	Consortium partner 3	Name of service
1.	Mediterranean - East Asia (MED-EA)	CSCL (O3)	UASC (O3)		BEX2, BEX
2.	Northern Europe - North America (NE-NA)	UASC (O3)	Hamburg Süd		Vespucci
3.	Northern Europe - North America (NE-NA)	Maesrk (2M)			St Laurent 1
4.	Northern Europe - North America (NE-NA)	Marfret			Panama Direct Line
5.	Mediterranean - North America (MED-NA)	UASC (O3)	Hanjin (CKYHE)	CSG (CSCL) (O3)	Amerigo Express
6.	Northern Europe - Middle East (NE-ME)	UASC (O3)			EPIC
7.	Mediterranean - Middle East (MED-ME)	UASC (O3)	Hanjin (CKYHE)	CSG (CSCL) (O3)	Amerigo Express
8.	Mediterranean - Middle East (MED-ME)	UASC (O3)			EPIC
9.	Northern Europe - Indian Sub-Continent (NE-INSC)	UASC (O3)			EPIC
10.	Northern Europe - Indian Sub-Continent (NE-INSC) (westbound only)	Hapag Lloyd (G6)			NEMO (EAX)
11.	Mediterranean - Indian Sub-Continent (MED-INSC)	UASC (O3)	Hanjin (CKYHE)	CSG (CSCL) (O3)	Amerigo Express
12.	Mediterranean - Indian Sub-Continent (MED-INSC)	UASC (O3)			EPIC
13.	Mediterranean - Indian Sub-Continent (MED-INSC) (westbound only)	Hapag Lloyd (G6)			NEMO (EAX)
14.	Northern Europe - Central America & Caribbean (NE-CAC)	Marfret			Panama Direct Line
15.	Northern Europe - Central America & Caribbean (NE-CAC)	Hapag Lloyd (G6)			Europe Carribbean
16.	Northern Europe - Central America & Caribbean (NE-CAC)	Marfret			Northern Europe French
17.	Northern Europe - Central America & Caribbean (NE-CAC)	Hapag Lloyd (G6)	Hamburg Süd		West Coast Chile Eurosal
18.	Mediterranean - Central America & Caribbean (MED-CAC)	Marfret			Guiana
19.	Mediterranean - Central America & Caribbean (MED-CAC)	Marfret			Mediterranean Caribbean
20.	Northern Europe-South America West Coast (NE-SAWC)	Hapag Lloyd (G6)	Hamburg Süd		Sling 1
21.	Northern Europe-Australasia& Oceania (NE-AO)	Marfret			Panama Direct Line
22.	Northern Europe-Australasia& Oceania (NE-AO)	Hapag Lloyd (G6)			NEMO (EAX)
23.	Mediterranean-Australasia& Oceania (MED-AO)	Hapag Lloyd (G6)			NEMO (EAX)
24.	Northern Europe - Africa East Coast (NE-AEC)	UASC (O3)			EPIC
25.	Mediterranean - Africa East Coast (MED-AEC)	UASC (O3)			EPIC
26.	NE-EASC	Marfret			Guiana

Source: Data accessing from case M.7908 - CMA CGM/NOL (29.04.2016)

CHAPTER 3:

POTENTIAL COMPETITION EFFECTS OF VERTICAL INTEGRATION

3.1 INTRODUCTION

This chapter reviews the literature on competition theories focusing on vertical integration of firms, as an essential theoretical background in order to address the key research question related with the potential competition effects of vertical integration between liner companies and container terminals, and understand, the probable competition effects.

Integrated in the analysis are references to the methodologies used to understand competition effects, in order to conclude which methods are to be applied for the assessment of competition effects of the market under examination. The methodology applied in this thesis is presented in detail in Chapter 4.

The occupation of researchers with the vertical integrated company (VIC) concerns its definition and categories, the driving factors of integration and its competition effects (procompetitive and anticompetitive). Researchers commonly estimate competition effects of vertical integration by developing theoretical, and occasionally empirical, models. Empirical evidence though is rare and is mainly based on decisions taken by the competition authorities.

3.2 THE VERTICAL INTEGRATED COMPANY

3.2.1 DEFINITIONS

The VIC has interested researchers since the 1920s. Vertical integration is the functional co-ordination of one or more units in each of the several successive stages of production or distribution, so that they are all operated as a single, unified industrial process (Frank, 1925; Kessler and Stern, 1959). Cole (1952) defines vertical integrated company as that type of organisation that comes into existence when two or more successive stages of production and/or distribution are combined under the same control. In the same line, Hovenkamp (2010) identifies that vertical integration may occur by: (a) pursuing a course

of action de novo, (b) merger, (c) a long-term contract between two vertically related firms that maintained legally separate ownership. He states that vertical integration occurs when a firm does something for itself that it could otherwise procure on the market. Grossman and Hart (1986) define a firm to consist of those assets that it owns or over which it has control and emphasise the benefits of having control in response to situations in which there are difficulties in writing or enforcing complete contracts. According to Riordan (1990), vertical integration, occurring by internal growth or by a merger, is the organisation of successive production processes within a single firm, a firm being an entity that produces goods and services. The owners of a firm directly or indirectly control the use of assets, and keep the profits from production after compensating other claimants. Thus, vertical integration brings upstream and downstream[29] assets and production under unified ownership and control (Riordan, 2005).

3.2.2 FORMS OF VERTICAL INTEGRATION

Kessler and Stern (1959) mention that vertical integration may be ownership integration (integration by stock or asset) or contract integration (vertical contractual arrangements such as requirement, output, exclusive dealing, franchise, consignment, and agency agreements); although they recognise the differences between these two forms. They consider vertical joint venture as a hybrid integration device which combines ownership and contract, as typically a supplier and his customer set up a jointly-owned subsidiary in order to transact their business. Joint venture combines ownership and contract as it is always accompanied by a "Shareholders' Agreement".

Furthermore, ownership vertical integration is distinguished in forward and backward (Davis et al., 1938; Kessler and Stern, 1959; Riordan, 2005). Forward vertical integration occurs when a firm expands the scope of its activities to both production and distribution of the final product by creating its own distribution facilities. On the other hand, a firm

[29] The terms "downstream" and "upstream" are used to describe the (potential) commercial relationship that the merging entities have with each other. Generally, the commercial relationship 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 on to its customers. The market where the former transactions take place is referred to as the intermediate market (upstream market). The latter market is referred to as the downstream market (see footnote 4 of "Guidelines on the assessment of non-horizontal mergers under the Council Regulation on the control of concentrations between undertakings", 2008/C 265/07).

integrates backward when it produces an intermediate good that is a component in the assembly (input) of a final product by building its own manufacturing facilities. Riordan adds that vertical integration in either or both directions can be partial or full, depending on whether the firm produces all its requirements for an input, or distributes its final product exclusively through its own distribution channels. O'Brien and Salop (2000) add that vertical integration can be partial if a firm acquires an ownership share of an upstream supplier or downstream customer, possibly with limited control rights.

Lastly, Kessler and Stern (1959) distinguish vertical integration in tapered integration and mixed integration. They argue that tapered integration differs from a mixed integration in that the latter involves the use of contract for some factors of production or distribution and ownership for others while the former involves the use of contract for securing part of the firm's needs for some factor and ownership for the rest of that same factor.

3.2.3 DRIVING FACTORS

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

a) Firms are driven to vertical integration in order to reduce costs:
   1. by avoiding cartel or monopoly prices to suppliers which are met in highly concentrated markets (Marshall, 1919; Bain, 1959);
   2. by producing internally what was more expensive to procure externally (Coase, 1937);
   3. by using managers rather than markets in order to procure inputs or distribute their products (Chandler, 1977);
   4. by avoiding transactional costs. Transactional considerations, rather than technological inseparabilities, determine whether a firm integrates or not (Williamson, 1975; 1979).

b) Firms are vertically integrated to secure an input (Kessler and Stern, 1959[30]).

[30] To illustrate this, they describe how backward vertical integration by ownership increased greatly in the period immediately following World War II, since many producers were never sure when and whether they would get another shipment of raw materials as a result of widespread material shortages and consequent private rationing.

c) Firms are vertically integrated around transactions with potentially high profits (Balakrishnan and Wernerfelt, 1986).
d) Firms are vertically integrated in order to solve the hold-up problem (Spiegel, 2015).
e) Some firms integrate not to do this themselves, but to prevent others from doing it to them (Balakrishnan and Wernerfelt, 1986).

A first vertical merger may induce mergers of the remaining independent firms as well, which in turn may affect the profitability of the first merger (Allain et al., 2014).

3.3 COMPETITION EFFECTS

Economic analysis demonstrates that competition effects of vertical integration depend on the structure of the markets in which a VIC operates. The market power of firms in the relevant market(s) is among the most important elements of market structure. Market power is the profitable ability to raise price above cost or to exclude competitors, and is usually traced back to conditions of industry concentration, and homogenised product offer. Durable market power that yields supra-competitive profits is protected by barriers to entry which can be financial, institutional, technical etc. (Riordan, 2005). Vertical mergers give cause for competition concerns as they may lead to the achievement, enhancement, or maintenance of market power. They can also facilitate the harmful exercise of market power that already existed. This fact can lead to higher prices, lower product quality, limited variety, reduced investment and less innovation. Vertical merger law and policies aim to block or remedy mergers that are likely to lead to such harmful effects. These competitive benefits and harms can similarly occur from mergers of firms producing complementary products (Salop and Culley, 2014).

Bork (1978) argues that as long as horizontal merger standards are met by avoiding concentration in both the upstream and downstream markets, vertical mergers are based only on efficiency motives and should be permitted, as they cannot exert any anticompetitive effects. Bain (1959) expressed a heightened fear of foreclosure and a belief that the procompetitive rationales for vertical integration tended to diminish as markets became more concentrated. Vertical integration is beneficial in highly competitive markets but not quite so in oligopoly or monopoly markets. Even uneconomical vertical integration might be profitable for a firm if it produced offsetting benefits in the form of increased

barriers to entry by new firms. Therefore, vertical integration appeared to be motivated by market advantage rather than cost savings (Bain, 1956; 1959; Balakrishnan and Wernerfelt, 1986). Riordan (1998) demonstrates that the net effect on economic efficiency is negative when an integrated dominant firm's output market share is high compared to its input market share.[31] Therefore, vertical integration does not always lead to increased efficiency. The efficient scale of the company is an important factor.

Riordan (2005) states that vertical integration by investment in new productive assets usually expands markets, and therefore presumably does not raise competitive concerns. Fotis (2013) notes that the vertical integration motive may result, *inter alia*, in (a) a reduction of the suppliers' bargaining power, (b) an increase of the vertical integrated company's bargaining power, (c) continuous access to input, (d) possible cost advantage against the competitors, and (e) confronting the uncertainties of the economic environment.

According to OECD (2007b), vertical mergers can result in an anticompetitive effect (foreclosure or coordination) and to distinguish between anticompetitive and pro-competitive transactions is a tough challenge for an effective enforcement policy. As anti- and procompetitive effects co-exist, it is necessary to identify that a vertical merger might result in foreclosure though it is not sufficient for the enforcement.

Researchers often include contracts in vertical integration. All companies carry out transactions by using contracts and as such they would be considered as vertically integrated companies. On the other hand, there are contracts that have the same competition effects (procompetitive or anticompetitive) with the ownership vertical integration (full or partial). Therefore, vertical contracts may increase efficiency by reducing cost, time and risks and/or may restrict competition such as exclusive dealing or vertical restraints' contracts. In the industrial organisation literature one can find authors such as Bork (1978) who argue that contracts increase both the efficiency and social welfare but also authors such as Kessler and Stern (1959) who state that vertical integration, whether by contract or

[31] This conclusion depends on the specifics of the dominant firm model: (a) large dominant firm competing downstream against a competitive fringe; (b) perfectly competitive upstream market; (c) no price discrimination in upstream or downstream markets (Riordan, 1998).

ownership, necessarily forecloses access to a segment of the market, since competitors of the integrating firm can often no longer deal with the integrated enterprise.

It follows the analysis of the effects of a vertical integration in categories, including exclusive dealing and discrimination contracts. The effects may be overlapping and mutually reinforcing; and as such some of the specific effects classified under a particular category could have been classified under another category instead. For example, information exchange may facilitate both foreclosure (intra-firm information exchange between different levels of the VIC) and coordination (intra- and inter-firm information exchange between firms of the same level of production) **(Table 3.1)**.

Table 3.1 Competition effects of vertical integration

Non-coordinated effects	Coordinated effects
Foreclosure (Input or customer, full or partial) performed in various ways:	**Collusion (express or tacit) facilitated by:**
• raising rivals' cost	• inter-firm information exchange
• margin squeeze	• enhancing transparency of pricing
• price discrimination	• eliminating the incentives of a disruptive firm
• exclusive dealing	• creating more symmetry in costs, or placing the merged firm in a stronger position to punish defectors
• information exchange	• exclusive contracts

3.3.1 NON-COORDINATED EFFECTS: FORECLOSURE

Potential exclusionary effects on either upstream or downstream rivals have been a primary concern arising in vertical mergers. Not only economists but also competition authorities have shown that under certain circumstances vertical mergers may result in foreclosure and anti-competitive outcomes. By examining forty-six (46) mergers challenged in the period 1994–2013, Salop et al. (2014) concluded that foreclosure was alleged in thirty-five (35) of them.[32] Research shows that anticompetitive foreclosure arises as an equilibrium phenomenon in a coherent model where sophisticated firms use a wide range of strategies

[32] Elimination of potential competition was alleged in nine matters, misuse of competitors' sensitive information to exclude in 22 matters, collusive information exchange in 11 matters, elimination of a disruptive buyer or other facilitating effects in three matters, and evasion of regulation in two matters. Unilateral effects and price discrimination were discussed but not specifically alleged as harms in any of the cases.

and counterstrategies (Ordover et al., 1990; Hart and Tirole, 1990; Bolton and Whinston, 1991).

By developing a theoretical model Hart and Tirole (1990) show how vertical integration changes the nature of competition in upstream and downstream markets and identify conditions under which market foreclosure will be a consequence or a purpose, or both, of such an integration.[33] Rey and Tirole (2007) define market foreclosure as a firm's restriction of output in one market through the use of market power in another market. Specifically, foreclosure refers to a dominant firm denying proper access to an essential good it produces, with the intent of extending monopoly power from that segment of the market (the bottleneck segment) to an adjacent segment (the potentially competitive segment). An input produced by a dominant firm is essential if users who are denied access to it cannot cheaply duplicate it.[34] Foreclosure can be input or customer, full or partial. Input foreclosure may be applied to the downstream rivals, although customer foreclosure may be applied to both upstream and downstream rivals.

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.

[33] Specifically, they develop three variants of the basic model, each of which illustrates a different motive for integration: (a) Variant 1, called ex post monopolisation, focuses on the incentive for a relatively efficient upstream firm to merge with a downstream firm to restrict output in the downstream market; (b) Variant 2, called scarce needs (scarce needs refers to the fact that downstream firms have limited input requirements), describes an upstream firm merging with a downstream firm to ensure that the latter purchases its supplies from the former rather than from others; (c) Variant 3, scarce supplies, reverses the role of upstream and downstream firms. A third incentive to integrate may arise when upstream firms are capacity-constrained regarding needs of downstream firms, with upstream and downstream firms again bargaining over the terms of trade: a downstream and an upstream firm may then merge to ensure that the upstream firm channels its scarce supplies to its downstream partner rather than to other downstream firms. The model shows three sources of social loss from mergers and two sources of social gain (for social gain see the section "Procompetitive effects"). First, in variant 1 the merger raises consumer prices to the extent that it allows the merged firms to monopolise the market ex post. This reduces the sum of consumer and producer surplus for the usual reasons. Second, in all three variants of the model, a merger of U1 and DI may cause exit by U2 or D2 or both. This ex ante monopolisation effect again gives U1-D1 greater market power ex post, causing consumer prices to rise and consumer plus producer surplus to fall. Third, mergers involve incentive and legal costs, which we have represented by a fixed amount E.

[34] The authors mention that a stadium, a railroad bridge or station, a harbour, a power transmission or a local telecommunications network, an operating system software and a computer reservation system have all been deemed as essential inputs by antitrust authorities.

Foreclosure can be substantial even if rivals remain into the market or can achieve a minimum efficient scale of production. Even if the simple foreclosure rate is low, the targeted firm may significantly lose competitiveness, for example, if the unrestrained substitutes are less efficient or their producers lack sufficient capacity or have an incentive and ability to coordinate. Vertical integration that fails to increase market power by eliminating competitors or raising entry barriers is unlikely to have adverse consequences for consumers (Riordan, 2005).

When the bottleneck owner favours some firms or products in the adjacent market to the detriment of other competitors, the foreclosure is partial (Rey and Tirole, 2007). Kessler and Stern (1959) state that vertical integration, whether by contract or ownership, necessarily forecloses access to a segment of the market, since competitors of the integrating firm often can no longer deal with the integrated enterprise. They add that studies have demonstrated that competition can be impaired when vertical integration is utilised in conjunction with existing market imperfections to make a new entry into the industry unprofitable and thus strengthen horizontal power. In particular, such barriers to competition can be raised by vertical integration when horizontal power in one market or stage of production creates leverage for the extension of the power to bar entry at another level. Thus, vertical integration coupled with horizontal power can impair competition to a greater extent than the exercise of horizontal power would do so alone.

Hombert et al. (2009) show that, under linear tariff competition, the key determinants leading to equilibrium partial foreclosure are the downstream products' substitutability and the entrant's cost (dis-)advantage. The impact of market structure, on the other hand, is usually ambiguous. For instance, while conventional wisdom suggests that the entry of integrated firms should increase the competitive pressure on the upstream market, they have provided an example, in which an increase in the number of integrated firms usually makes partial foreclosure easier to sustain.

Foreclosure -full or partial- can be performed in various ways, such us raising rivals' cost, margin squeeze, price discrimination, exclusive dealing, information exchange.

a) Raising Rivals' Cost (RRC)

Coate and Kleit (1990) mention that the basic Raising Rivals' Costs idea can be traced back to Director and Levi (1956: p. 290) who refer to a "special case" condition where a firm with monopoly power can decide to impose additional costs upon itself for the sake of restriction. Such a restriction can prove valuable if its effect would be to impose greater costs on possible competitors. Anticompetitive activities for raising rivals' cost will be targeted at selected industry competitors rather than applied uniformly to all (Mandy et al., 2016).[35]

A vertically integrated firm might engineer an increase in rivals' costs by driving up the price of a scarce input[36] (Salop and Scheffman, 1983; Riordan, 1998, 2005) or reduce the costs of incumbent firms and thus putting entrants at a disadvantage (Balakrishnan and Wernerfelt, 1986; Salop and Culley, 2014). By artificially increasing its own demand for the scarce input, the vertically integrated firm elevates the market price of the input, thus raising the costs of its unintegrated rivals. Vertical integration matters for this incentive, because self-supplied input requirements are insulated from the price increase.[37] Consequently, the higher input price impacts the costs of the integrated firm and its downstream competitors asymmetrically. This cost raising strategy benefits the downstream operation of the integrated firm by causing rivals to exit the market or otherwise reduce their supply of the final good. While final consumers are harmed by higher downstream prices, the exclusion of less efficient rivals contributes to an overall economic efficiency, to the extent that market share shifts toward the more efficient vertically integrated firm.

Ordover et al. (1990) showed that an integrated firm might stop supplying downstream rivals, in order to confer market power upon other suppliers and in this way raise

[35] Their analysis suggests the importance of being able to determine not only whether anticompetitive conduct is likely to occur, but also where it is likely to be directed. Such a determination can help policymakers both to discern anticompetitive conduct ex post and to determine ex ante the industry participants that are most likely to be targeted for anticompetitive behaviour. This information, in turn, can facilitate the design of policies to limit anticompetitive behaviour and help make sense of the clamour of claims and counter-claims that regulatory and antitrust enforcement typically entail.

[36] Scarcity is indicated by an upward slopping curve for a competitively supplied input, meaning that a positive shift in demand for the input elicits an expansion of supply only at a higher price (Riordan, 2005).

[37] Put another way, by driving up the market price of input, the vertically integrated firm increases the value of its own upstream assets. The greater returns of downstream foreclosure outweigh the higher opportunity cost of these assets.

downstream rivals' costs. They assert that if the rivals' costs of inputs are increased, they will be forced to reduce their production and raise the prices they charge in the downstream market. Less competition allows the downstream division of the integrated firm to increase its market share and prices, which may lead to profits of the vertically integrated firm rising, even if there are no production efficiency benefits deriving from the vertical integration. The end result is the prices of final goods and total producer's surplus going up and consumers being worse off.

If the vertically integrated firm refuses to deal with independent downstream firms, the resulting increased market power of its upstream rivals may lead to higher fixed fees charged to downstream customers, with the resulting higher fixed costs of market participation causing some downstream firms to exit the industry. According to Riordan (2005) a vertically integrated firm might commit to refuse to deal with downstream competitors in various ways: First, by establishing a reputation for exclusive self-supply; Second, the upstream division of the vertically integrated firm might design its product to be incompatible with products or manufacturing processes of downstream competitors; Third, downstream competitors might be concerned that a vertically integrated supplier would have an incentive to reduce the quality of the input, or of complementary services, thus automatically disadvantaging its upstream division and increasing the market power of upstream rivals.

According to Salop and Scheffman (1983), as it is better to compete against high-cost firms than low-cost ones, raising rivals' costs has obvious advantages over predatory pricing. Thus, raising rivals' costs can be profitable even if the rival does not exit from the market. A higher-cost rival quickly reduces output, allowing the predator to immediately raise price or market share without expensive sacrifices which require a deep pocket. In addition, product standards and other government regulations, as well as advertising expenditures and R&D races, can raise rivals' relative compliance costs.

Allain et al. (2014) highlight that while vertical integration is traditionally seen as a solution to the hold-up problem, it can generate hold-up problems for rivals. They state that an integrated supplier benefits from degrading the support offered to independent rivals, so as to limit their effective capacity in the downstream market. As an example, the authors

mention the French incumbent rail company SNCF, which in 2012 was fined by the national competition authority for having prevented, through various means, rival freight operators from accessing facilities that were essential to their business. For instance, SNCF strategically overbooked train paths, and did not release (or did so very late) those that were not used.[38] Focusing on vertical foreclosure effects that arise in competition for inputs, Bolton and Whinston (1991) consider a setting in which downstream firms are concerned about supply assurance and demonstrate that vertical mergers may exacerbate the supply assurance problem faced by non-integrated firms.

A more concentrated downstream market profits the integrated firm, while presenting consumers with less choice and higher prices. Similarly, a strategy for raising rivals' costs can preserve the market power of a vertically integrated firm by deterring entry into upstream and downstream markets. In some cases, the threat of defensive backward integration by rivals limits the raising rivals cost effect of vertical integration (Ordover et al., 1990).

b) Margin squeeze

One of the means that the VIC uses in order to exclude competitors is the margin squeeze practice. A margin squeeze is said to arise when the margin between the price at which the integrated firm sells the downstream product and the price at which it sells the essential input to rivals is too small to allow downstream rivals to survive or effectively compete, to the detriment of downstream consumers. A margin squeeze can arise only when (a) an upstream firm produces an input for which there are no good economic substitutes; (b) the upstream firm sells that input to one or more downstream firms; and (c) the upstream firm also directly competes in that downstream market against those firms. The primary antitrust concern is that a firm engaging in a margin squeeze may limit, restrict or prevent the development of competition in the downstream market. Depending on the circumstances, this may raise the price or reduce the quality or variety of products available to downstream customers. It may also undermine the success of reforms aimed at promoting competition in the downstream market **(**OECD, 2009b: p. 7).

[38] For more details the authors point to the Decision of the French Competition Authority No. 12-D-25, available at http://www.autoritedelaconcurrence.fr/pdf/avis/12d25.pdf.

Jullien et al. (2014) identify two different rationales that may result into a margin squeeze: (a) they review theories that explain the behaviour of the vertical integrated company as a result of the willingness to exclude competitors from the market which, as they argue, may be grounded in foreclosure theory, and (b) they explore an alternative approach that explains the behaviour as a result of the exercise of upstream market power and the attempt by the owner of an upstream bottleneck to maximise its monopoly rent. They add that the notion of margin squeeze refers to the possibility that the combination of retail and wholesale prices adopted by the vertically integrated firm may make downstream competitors unprofitable, even though their services are socially valuable. Margin squeeze may be viewed as a particular form of predation or of vertical foreclosure, or as an abuse of different nature. Whether or not a margin squeeze is treated as a separate abuse should ultimately depend on whether there is a specific theory of harm, distinct from existing theories. In the first approach, the behaviour of margin squeeze treatment is the result of the willingness to exclude competitors from the market.

According to Salop and Scheffman (1983) vertical price squeezes can be viewed as a conduct to raise rivals' costs. Under appropriate conditions, a dominant firm finds backward integration to be a cost-effective way to raise downstream prices. If the upstream merger partner has some market power, input price increases so that downstream rivals will raise their costs, allowing the dominant firm to increase price or output. Upstream profits are sacrificed but downstream profits rise disproportionately. Three conditions are discussed: profitability to the dominant firm; injury to rivals; and consumer welfare losses. These conditions are then related to analogous concepts in the antitrust law of exclusionary practices.

c) Price discrimination

According to Riordan (2005), important issues encompassing the power of contracts concern the ability and incentive of upstream firms for price discrimination. Price discrimination is traditionally categorised into three types: First-degree price discrimination refers to bargaining over terms on a customer-by-customer basis. Second-degree price discrimination involves different customers paying different prices because they make different choices from the same menu of possibilities. Quantity discounts are an important example of second-degree price discrimination, as customers electing different

quantities end up paying different average prices. Finally, third-degree price discrimination means setting prices for different groups of customers, for example, setting different prices in geographically distinct markets. Rey and Tirole (2007) argue that second-and third-degree price discrimination is an instrument in the forecloser's toolbox as it generalises exclusivity or tying arrangements by favouring some customers over the others, but gives the bottleneck owner some flexibility in serving discriminated-against customers. Even if outright third-degree price discrimination is prohibited, the bottleneck owner may be able to duplicate it in an apparently anonymous way, that is through second-degree price discrimination. For example, a loyalty program offered to all or rebates based on the rate of growth of purchases may target specific customers even though they formally are available to all customers. Similarly, substantial price discounts may allow the survival of only a few customers; for instance, a large enough fixed (that is, consumption independent) fee transforms a potentially competitive downstream industry into a natural monopoly industry. For example, the favoured specific customer may be a subsidiary or an alliance partner of the maritime VIC which uses the vast majority of terminal services.

At the same line, Salop and Culley (2014) argue that a vertical merger might permit a firm with pre-existing market power to price-discriminate more effectively in the downstream market and harm targeted groups of consumers.[39] Therefore, price discrimination would be used as a means of foreclosure.

High-unified prices may also be used as a means of foreclosure, as the VIC takes advantage of them due to internal transactions. In addition, virtual internal transactions may be used to eliminate profits not only for tax avoidance purposes but also to eliminate concerns for abuse of dominance position by showing limited profits. The advantageous position of the vertical integrated company in relation to independent companies concerning tax and other factors can also be added.[40]

[39] Price discrimination does not always harm consumers. For example, Dertwinkel-Kalt et al. (2014) argue that price discrimination of a monopoly supplier may benefit consumers in the presence of downstream buyer power. A relatively efficient downstream firm may benefit from a higher uniform input price because of a raising rivals costs effect where rival firms are harmed proportionally from an input price increase. This, however, can only happen if firms are sufficiently asymmetric with regard to their input efficiencies.

[40] See the Kessler and Stern (1959) analysis for the gains of firms during the transaction and after the transaction of merger.

d) Exclusive dealing

Under certain circumstances exclusive contracts may enhance efficiency.[41] On the other hand, contracts may have anticompetitive effects. Bain (1959) is more suspicious of vertical integration by contract, particularly if the contract involves the exclusion of rivals, as in the case of tying and exclusive dealing. Researchers have identified conditions under which exclusive dealing may serve anticompetitive purposes by deterring an efficient entry (Williamson, 1979; Blair and Kaserman, 1983; Aghion and Bolton, 1987; Rasmusen et al., 1991; Bernheim and Whinston, 1998; Segal and Whinston, 2000a; Fumagalli and Motta, 2006; Simpson and Wickelgren, 2007).

In addition, Hart and Tirole (1990), O'Brien and Shaffer (1992), McAfee and Schwartz (1994) emphasise that, under secret contracting, exclusive dealing or vertical integration can help a dominant supplier exert its market power.

According to Riordan (2005) an equally important element of market structure for analysing vertical integration is the power of contracts to align incentives and control the conduct of firms. Generally, contract power refers to the ability of firms to commit credibly not to behave opportunistically (Williamson, 1975; 1985; 1989), either *via* explicit legally enforceable contracts, or *via* implicit contracts supported by self-enforcing behavioural norms (Baker et al., 2002).

Salop and Culley (2014) state that as exclusionary harms and certain efficiency benefits might be also achieved with vertical contracts and agreements, without the need for a vertical merger, it might be argued that certain efficiency claims are not merger-specific, too.

Fumagalli et al. (2012) study a model whereby exclusive dealing can both promote investment and foreclose a more efficient supplier. Since exclusive dealing promotes the seller's investment, the seller and the buyer realise a greater surplus from bilateral trade if exclusivity is in place. Hence, there exist conditions under which the incumbent is able to compensate the buyer for the rents that are lost from not trading with the more efficient

[41] For more details see the section below "3.4 Procompetitive effects".

entrant, in which case the buyer and the incumbent enter into a welfare-detrimental exclusive dealing.

Chen (2014), by implementing counter-factual experiments to study the effect of banning exclusive dealing of beer producers in Northern California, shows that the welfare improvement associated with banning exclusive contracts is very small. Asker (2016), by evaluating the effect of exclusive distribution in the Chicago beer market in 1994, shows that foreclosure effects are not present in this market.

Chen (2014) argues that economic theories vary in their explanations of exclusive contracts. Traditionally, the Chicago school has claimed that exclusive dealing cannot be used as a device for monopolisation (Posner, 1976; Bork, 1978): if the sole purpose of exclusive contacts were to restrict competition, downstream buyers would never sign them in the first place because doing so would only lower the potential total surplus. Bernheim and Whinston (1998) support this claim by showing that common agency and exclusive dealing are both efficient when there is no contracting externality. Moreover, incentive theories show that exclusive dealing enhances incentives for investment once contracting externality is allowed (Marvel, 1982; Besanko and Perry, 1993; Martimort, 1996; Bernheim and Whinston, 1998; Segal and Whinston, 2000b). In addition, there have been a number of antitrust cases involving exclusive dealing contracts and the court ruling has often led to considerable controversy (Aghion and Bolton, 1987).

Table 3.2 Categorisation of exclusive contracts

Paper	Contracts	Buyers	Exclusive contracts
Rasmussen-Rasmeyer-Wiley (1991) Segal-Whinston (2000)	Not breachable	Final	Anticompetitive
Fumagalli-Motta (2006)	Not breachable	Perfect Bertrand competitors	Neutral
Simpson-Wickelgren (2007)	Breachable w/ expectation damages	Final (Almost) perfect Bertrand competitors	Neutral Anticompetitive
Gratz-Reisinger (2014)	Breachable w/ expectation damages	Downstream w/ varying degrees of competition	Neutral, anticompetitive, or procompetitive, depending on degree of downstream competition

Source: Gratz and Reisinger (2014)

Looking into the relevant debate, Gratz and Reisinger (2014) argue that exclusive contracts may be neutral, anticompetitive, or procompetitive depending on the degree of the downstream competition **(Table 3.2)**.

Rey and Tirole (2007) consider exclusive dealing as a substitute to vertical integration. In particular, a policy that would prevent vertical mergers would have no effect if exclusive dealing were allowed.

e) Information exchange

Blignaut et al. (2010) state that vertical integration can lead to the extension of market power from one stage of production to another through foreclosure, by pre-empting competition through discriminatory, limited (or the total refusal of) access to an essential input and by access to commercially sensitive information on its downstream rivals. Allain et al. (2014) mention that such concerns were at the heart of the discussions pertaining to the 2008 merger between TomTom, the leading manufacturer of portable navigation devices (PNDs), and Tele Atlas, one of the two main providers of digital map databases for navigation in Europe and North America. The Commission stressed the importance of information exchange[42] as Tele Atlas' customers had to share information on their future competitive actions with their map supplier.[43] The answer to the above concerns is the ring-fencing commitment (Chinese walls) which is imposed by the competition authorities after the clearance of a merger notification. However, this practice has been criticised by the researchers for its ineffectiveness.

In **Table 3.3**, are listed articles that test for foreclosure effects by Lafontaine and Slade (2007). They include studies that consider imperfectly competitive industries, in which some firms are vertically integrated and some are not and state that some authors have

[42] Case M.4854 - TOMTOM/TELE ATLAS (14.05.2008).

[43] In addition, the authors mention the Federal Trade Commission (FTC) cases "In the Matter of PepsiCo Inc.", FTC-file 091-0133 of 26/02/2010, and "In the Matter of The Coca-Cola Company", FTC-file 101-0107 of 27.09.2010. The FTC put conditions on a vertical merger between PepsiCo and its two largest bottlers and distributors, who were also servicing its rival Dr Pepper Snapple (DPSG). The FTC expressed the concern that "*PepsiCo will have access to DPSG's commercially sensitive confidential marketing and brand plans. Without adequate safeguards, PepsiCo could misuse that information, leading to anti-competitive conduct that would make DPSG a less effective competitor* [...]". Likewise, in a case involving the acquisition by The Coca-Cola Company (TCCC) of its main US bottler, the FTC was concerned that "*TCCC's access to this information could enable it to use the information in ways that could impair DPSG's ability to compete and ultimately injure competition by weakening a competitor*". The FTC eventually ordered PepsiCo and TCCC to set-up a firewall in order to regulate the use of this commercially sensitive information.

uncovered evidence of foreclosure. In addition, foreclosure should be examined in relation to potential procompetitive effects of vertical integration as illustrated by two of the papers in the table (i.e. Mullin and Mullin, 1997; Chipty, 2001), which assess that trade-off and conclude that efficiency gains outweigh foreclosure costs. Finally, the evidence in favour of anticompetitive foreclosure is therefore, at best weak, particularly when one considers that the industries studied were chosen because their vertical practices have been the subject of antitrust investigations.

Table 3.3 Assessments of foreclosure and Raising Rivals Costs

Author(s)	Year	Industry	Data/ Technique	Variable Examined	Finding
Allen	1971	Cement and concrete	Descriptive	Acquisitions	Foreclosure
Reiffen and Kleit	1990	Railroads and terminals	Descriptive	Access to railroad terminals	No foreclosure
Rosengren and Meehan	1994	Challenged mergers	Event study	Returns, unintegrated downstream rivals	No foreclosure
Waterman and Weiss	1996	Cable TV programming and distribution	Cross sectional regressions	Program offerings	Fewer rival programs carried Foreclosure
Snyder	1996	Crude oil and refining	Event study	Returns, integrated rivals	Foreclosure
Mullin and Mullin	1997	Iron ore and steel	Event study	Returns, downstream consumers	No foreclosure Efficiency gains
Ford and Jackson	1997	Cable TV programming and distribution	Cross sectional TV regressions	Subscription price Program cost	Foreclosure Lower program cost No welfare change
Chipty	2001	Cable TV programming and distribution	Cross sectional TV regressions	Program offerings, price, & subscriptions	Fewer rival programs carried Foreclosure Efficiency gains outweigh losses
Hastings and Gilbert	2005	Gasoline refining and sales	Difference in difference	Wholesale price to unintegrated rivals	Foreclosure
Hortacsu and Syverson	2007a	Cement and concrete	Panel Difference in difference Probit	Concrete price Concrete production Plant survival	No foreclosure Efficiency gains

Source: Lafontaine and Slade (2007)

3.3.2 COORDINATED EFFECTS

The collective exercise of market power occurs when a group of firms coordinate their price increases to reduce the extent of substitution by their customers for one another. A coordinated effect arises from a vertical merger if post-merger firms, whether upstream or downstream, are effectively aligned, either because reaching a tacit agreement on the coordinated outcome is rendered easier or enforcement is made more effective (OECD, 2007b). The OECD report pinpoints the common assumption of all theories, i.e., that depending on the case theory, at least one of the upstream and downstream markets are conducive to coordination, otherwise, the coordinated effects of a vertical merger are not likely to be significant.

Sacher and Sandford (2016) mention that although the theoretical relation between excess capacity and coordinated interaction is ambiguous, with empirical literature reflecting this ambiguity, if firms coordinate on prices and/or output, excess capacity is a necessary condition for such coordination to have taken place.

Vertical integration might facilitate collusion by aiding the required activities for a successful express or tacit collusion: reaching an agreement, monitoring compliance, and punishing defections, at both upstream and downstream levels (Riordan, 2005; Salop and Culley, 2014). Matsushima (2009) argues that vertical integration may cause a welfare loss in terms of anti-competitive market segmentation. Vertical integration may be facilitative of coordinated effects by simply reducing the number of firms among which to coordinate, by removing or weakening competitive constraints or by altering certain market conditions that make coordination more likely (Blignaut et al., 2010). Specifically, vertical integration may facilitate collusion in the following ways: (a) by interfirm information exchanges, (b) by enhancing transparency of pricing, (c) by acquiring a disruptive firm or 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, (e) by exclusive contracts (Salop and Culley, 2014; OECD, 2007b, Bon et al., 2013; Chen and Riordan, 2004).[44]

[44]Even the US Non-Horizontal Merger Guidelines refer to two circumstances in which vertical integration could facilitate collusion: (a) by making it easier to monitor price changes, (b) elimination of a particularly disruptive buyer in a downstream market and may thus facilitate collusion upstream (Bon et al., 2013).

a) Information exchange and transparency of pricing

Coordination effects may be a result of information exchange between firms at the same level of production. The downstream division of the merged firm might share commercial information (sales, throughput, prices etc.) of the upstream firms with the upstream division of the merged firm, and vice versa. In this way, consensus can be reached or detection lags can be reduced, both of which can facilitate coordinated effects or parallel accommodating conduct (Salop and Culley, 2014). Riordan (2005) states that vertical integration might increase the ability and the incentive for tacit or express collusion by changing the information structure of markets.[45]

Blignaut et al. (2010) state that vertical integration can also lead to the facilitation of coordinated effects, when it assists firms in the market in implicitly or explicitly coordinating their pricing, output or related commercial decisions. For example, the integrated firm may either obtain access or utilise its previous access to confidential or commercially sensitive information about the activities of its competitors, for its own gain. The exchange of this information may result in the tacit coordination of prices and other trading conditions.

Riordan and Salop (1995) produce an informal theory of how information exchange through a vertically integrated firm facilitates upstream collusion. Suppose that the vertically integrated firm does not satisfy all of its input requirements internally, and solicits bids from rival upstream firms to supply its remaining requirements. The vertically integrated firm can potentially use this information to monitor compliance of its upstream rivals with a collusive agreement. Moreover, the downstream division, in the course of its ongoing communications with upstream rivals, might be able to engineer an agreement to keep input prices high. For example, upstream firms might be able to signal a proposed agreement to the downstream division via their bids. In this way, the downstream division acts as a conduit for communication for the upstream industry. For such an exchange to

[45] Specifically, Riordan (2005) states that: *«If a vertically integrated firm contracts out for some of its input requirements, then the downstream division may obtain price quotes and possibly other competitively sensitive information from upstream competitors. The downstream division can transmit this information to the upstream division, and similarly can transmit information in the opposite direction in the course of commercial communications with outside suppliers. Thus, the downstream division of a vertically integrated firm potentially is a conduit for information exchange that potentially increases the likelihood of coordinated conduct».*

have an anticompetitive effect several conditions must apply. First, the upstream industry must be otherwise conducive to horizontal collusion. Second, the bid information received by the downstream division must be "projectable", meaning that this division has to be informed on prices upstream rivals charge to other downstream firms. This is most likely if price discrimination is infeasible. Third, the information must be unique, i.e. must not be available through any alternative source. These requirements greatly narrow the circumstances in which a facilitating-collusion theory based on information exchange is potentially applicable (Riordan 2005).

By using a model, Nocke and White (2007) show that clearly vertical integration cannot improve the observability of prices per se since all contract offers are completely public and incentives to deviate would be the same even if upstream offers are private information, so that observability per se does not matter. But in the light of their model's results with sequential timing, they note that observability of defections from the collusive agreement is very relevant if firms can react to them; and that vertical integration does enhance the integrated firm's ability to react against observed defections, therefore facilitating collusion. To put it another way, they show that when upstream prices are sluggish compared to downstream prices, vertical integration is particularly effective in sustaining collusion.

b) Eliminating the incentives of a disruptive firm or acquiring a disruptive firm

According to Salop and Culley (2014) a vertical merger can facilitate coordination in the upstream market by eliminating the incentives a downstream division of the merged firm may have to act as a disruptive buyer[46] that deters coordination by upstream firms. The VIC might gain more net profits from that upstream coordination than it loses downstream by possibly having higher input costs. Where the downstream firm is a critical disruptive buyer in the pre-merger market and the upstream market is vulnerable to coordination, this concern could lead to higher input prices that would harm non-merging downstream firms and would be passed on to consumers as higher downstream prices. In addition, the authors argue that a vertical merger may facilitate coordination in the downstream market by

[46] The US Non-Horizontal Merger Guidelines define a disruptive buyer as one which is substantially different from the others, in the sense that price-cutting is so particularly attractive to this buyer, that removing him from the downstream market may significantly reduce incentives to cheat on a collusive agreement.

weakening the disruptive behaviour of a non-merging downstream firm. This weakening of the maverick or disruptive firm can be implemented with targeted input foreclosure or threats of foreclosure. A vertical merger can facilitate coordination in the downstream market by weakening maverick or other disruptive competitive behaviour of a non-merging downstream firm.[47] If a non-merging firm is a maverick or otherwise disruptive competitive influence in the premerger market, the upstream division of the merged firm might weaken the incentives for that behaviour by raising the price it charges to the disruptive firm or reducing its access to inputs. Alternatively, the downstream division might use customer foreclosure threats to induce upstream firms to raise their input prices charged to that disruptive firm.

Nocke and White (2007) argue that it is not obvious that the acquisition of a disruptive buyer whose business is particularly attractive will especially facilitate upstream collusion. Such an acquisition is a double-edged sword since one upstream firm now owns an attractive outlet for cheating, so its own incentive to cheat increases (in their model this shows up as the punishment effect). They argue that indeed integration with a low-cost or large downstream firm mostly facilitates collusion, but a general analysis identifying disruptive buyers awaits further research. They conclude that the dynamic effects of vertical restraints remain largely unexplored.[48] Riordan (2005) states that legal theories about vertical integration facilitating collusion by aiding the monitoring of downstream prices, as well as the disruptive buyer theory, still have a long way to go before finding a solid foundation in modern economic analysis.

c) Symmetry in costs and punishment effect

Salop and Culley (2014) argue that vertical integration may facilitate collusion by creating more symmetry in costs or placing the merged firm in a stronger position to punish

[47] No such concern exists about eliminating the downstream division of the merged firm acting as a maverick. If the downstream division of the merged firm were a maverick, there would be no incentive to use the merger to eliminate its maverick behaviour, since the downstream division would be made worse off and the upstream division of the merging firm would not gain from downstream coordination.

[48] Nocke and White (2007) show that other vertical restraints (exclusive dealing or retail price maintenance) are only very imperfect substitutes for vertical merger in facilitating collusion. Jullien and Rey (2000) analyse the idea (related to the notion that vertical restraints may facilitate the monitoring of prices) that resale price maintenance may facilitate collusion. In an agency model where retailers face demand shocks which are not observed by wholesalers, resale price maintenance acts to smooth downstream prices, making cheating easier to detect.

defectors. A vertical merger might facilitate coordination by reducing costs of the merged firm. Those lower costs could create more symmetry in costs and structure which in turn may lead to similar desired prices among firms. In addition, lower costs may aid the merged firm to punish defectors, which may consequently deter defection.

Nocke and White (2007) show that the net effect of vertical mergers is to facilitate collusion through the following means:

a) An outlets effect: by foreclosing part of the downstream market, a vertically integrated firm reduces the incentive of upstream rivals to defect from an agreement.
b) A reaction effect: a vertically integrated firm is better able to punish defections of upstream competitors by quickly increasing competition in the downstream market. In contrast, a non-integrated market structure must wait to renegotiate supply contracts before punishing a defection effectively. In addition, it is typically more difficult to punish an integrated structure, so that integrated firms are able to make more profits in the punishment phase than not integrated upstream firms.
c) A lack of commitment effect: a vertically integrated firm finds a departure from upstream collusion less profitable because of rivalry in the downstream market. Independent downstream firms are less willing to deal with a vertically integrated firm because of a rational expectation that the vertically integrated firm will expand in the downstream market if the collusion breaks down.

Nocke and White mention cases of collusion which involve industries where one or more firms were vertically integrated. Such cases are German Steel cartels (Tosdal, 1917); bromine cartel (Levenstein, 1997); railways (Porter, 1983); timber-cutting (Baldwin, Marshall and Richard, 1997); joint bidding for oil and gas tracts (Hendricks, Porter and Tan, 2000). Upstream collusion does seem to be a particular problem in intermediate goods industries, many of which exhibit substantial vertical integration. The authors help in understanding why this may be the case, and also why one might see asymmetry in the degree of vertical integration in such industries. They identify two potential motives for vertical merger. Since the first vertical merger reduces the critical discount factor above which collusion is sustainable, vertical mergers could be driven by the desire to make collusion sustainable when it otherwise would not be ("the collusive motive"). Collusion

becomes easier even though a merger will typically make deviation from a collusive agreement more tempting for the integrated firm itself. Indeed, this observation highlights a further motive for vertical merger even in cases where collusion is in any case feasible, the "market share motive". An integrated firm will typically need to be granted a larger market share to be convinced not to undercut the collusive price.[49] Further, they show that while the first vertical merger always facilitates collusion, successive mergers after this may not; therefore, intermediate levels of integration may be optimal. They find this interesting since many industries seem to have the feature that vertically integrated firms compete with separated ones, and it is not always clear why such differing arrangements should arise.[50]

Biancini and Ettinger (2017) study the effects of a vertical merger on the ability of downstream firms to collude in a repeated game framework. They show that vertical integration increases the total collusive profits by increasing the stakes of collusion, but it creates an asymmetry between the integrated firm and its unintegrated competitors. An optimal collusive profit-sharing agreement takes care of the increased incentive to deviate from the integrated firm, while an optimal punishment abolishes the challenge related to the asymmetries in the non-cooperative state. As a result, vertical integration generally favours collusion. They show that in a simple double oligopoly context, vertical integration generally increases the feasibility of downstream collusion. The authors mention that a vertical merger could help firms facilitate collusion in contexts in which previous attempts proved ineffective.[51]

d) Exclusive contracts

Chen and Riordan (2004) argue that vertical integration might facilitate an effective cartelisation of a downstream industry via exclusive contracts. Generally, an upstream

[49] The authors mention Levenstein (1997) as an example that seems to fit this case (Levenstein, M. C. (1997): "Price Wars and the Stability of Collusion: A Study of the PreWorld War I Bromine Industry", Journal of Industrial Economics, 45(2), 117-137).

[50] Nocke and White (2007) offer as examples Bindemann (1999) on the oil industry, Woodruff (2002) on the Mexican footwear industry, Slade (1998a, b) on the UK beer industry and the gasoline retail market in Vancouver (respectively), and Chipty (2001) and Waterman and Weiss (1996) on the US cable television industry. For an alternative theoretical rationale for asymmetric outcomes, Ordover et al. (1990).

[51] Their examples include the European Merger Guidelines which recognise that evidence of past coordination is an important element when evaluating the coordinated effect of merger; and the US Guidelines which indicate past price wars as a possible indicator of failed attempts to collude.

supplier might organise a cartel by contracting with a downstream industry to restrict output and prices to final consumers. Exclusive contracts could prevent downstream participants from defecting by contracting with alternative upstream suppliers.

3.3.3 EFFECTS OF PARTIAL VERTICAL INTEGRATION

Partial acquisitions among horizontally and vertically related firms are very common.[52] While most of the literature on vertical foreclosure has focused on full vertical mergers, in reality, many such mergers involve partial acquisitions of less than 100% of the shares of a supplier creating partial backward or forward integration (Spiegel, 2013). Authors emphasise the benefits of a firm responding to situations in which there are difficulties in writing or by enforcing complete contracts (Coase, 1937; Klein et al., 1978; Williamson, 1979), and active minority shareholdings or joint control -accompanied by shareholders agreement- is an achievable solution to that direction.

Literature indicates that the anticompetitive effects of a partial vertical integration are mainly foreclosure ones (input and customer foreclosure) and examines the effects on prices. The effects differ between forward and backward integration, controlling, non-controlling minority interests and full integration. O' Brian and Salop (2000) argue that in a vertically integrated joint venture, the analysis of competitive incentives is more complicated because of the combination of the horizontal and vertical elements. In that case the existence of spillover effects should also be examined in case the parent companies use the joint venture as a means to coordinate their behaviour in the relevant market that the latter operates or in other relevant markets, including the geographic ones.

Although researchers recognise the potential efficiency benefits, they estimate that vertical partial acquisitions can raise competition concerns to both upstream and downstream divisions. Those concerns relate to: (a) the impact of the acquisition on the incentives of both firms, and (b) any exchange of information entailed by the partial ownership interests,

[52] Hunold and Stahl (2016) mention that Allen and Phillips (2000) show that in the United States, 53% of corporate block ownership involves firms in related industries. In the 2014 wave of the Mannheim Enterprise Panel, Hunold and Stahl found that of all German firms with more than 20 employees reported in that database, all with financial interests in one or more firms in the same NACE two- and three-digit industry, 32% and 33% respectively, held minority stakes. As only "substantive ownership" shares are recorded in that survey, these percentages are a lower bound.

even if it is passive (O' Brian and Salop, 2000; Salop and Culley, 2014). The entailed information may offer the partially integrated firms the ability to foreclose or to coordinate.

Moreover, researchers argue that the effects between forward and backward shareholdings differ as follows:

a) Forward partial integration

Allain et al. (2014) argue that in case of forward partial integration in equilibrium, an independent supplier has no incentive to degrade the quality of its support; likewise, a partially integrated firm provides good support to its downstream subsidiary. Whether the upstream company obtains or not the control of the downstream company is of no consequence as tariffs are decided by the upstream firms. They conclude that partial forward integration leads to more hold-up concerns than full integration, whereas partial backward integration at most replicates the same concerns in case that the downstream firm has control over upstream decisions.

Gilo and Spiegel (2011) note that controlling partial forward shareholdings may lead to more customer foreclosure than a full merger: a supplier with a controlling partial forward shareholding fully benefits from increased upstream sales when inducing its downstream target not to buy inputs from competing customers, but only bears a share of the foregone profits of the downstream firm. Furthermore, Spiegel (2013) shows that when the partial forward integration gives the upstream supplier control over the integrated downstream firm, the upstream supplier will use its control to curb the investment of the integrated downstream firm to limit the negative horizontal externality that it imposes on the non-integrated downstream firm and hence on its willingness to pay for the input. From an antitrust perspective, the analysis shows that partial backward integration leads to more foreclosure of non-integrated rivals than full vertical integration, while partial forward integration leads to less foreclosure.

Rey and Tirole (2007) point out that an upstream firm may be unable to sell its products at a profit maximising price if contracts between upstream and downstream firms are secret.[53]

[53] Having concluded a high-price contract with a downstream firm, the upstream firm would be tempted to offer another downstream firm a cheaper price since the upstream firm normally does not fully bear the negative externalities thereby inflicted on the first downstream firm. Since each firm anticipates the upstream firm's temptation to offer cheaper contracts to competitors, the upstream firm is essentially forced to sell its

By acquiring a passive structural link in a downstream firm, the upstream firm participates in the target's downstream losses when also selling its inputs at more favourable terms to a downstream competitor. This structural link thus allows the upstream firm to alleviate the commitment problem discussed by Rey and Tirole (2007), albeit to a lesser extent than a vertical merger. As a structural link partially restores the upstream firm's power to sell at high prices and may thus lead to higher prices, it reduces the need of the upstream firm to foreclose downstream firms (e.g. by means of exclusive dealing arrangements) in order to circumvent the commitment problem.[54]

Spiegel (2013) as well as Gilo et al. (2012) show that incentives to foreclose are typically weaker compared to fully integrated firms because only a small proportion of the downstream profits accrue to the upstream firm through its minority share. Hence the upstream loss of foregone sales is traded off with only a fraction of the downstream gain of a weaker competitor. They also note that input foreclosure is unlikely to be further aggravated if the upstream minority shareholder obtains control rights in the downstream firm through the minority stake. Passive structural links in a downstream firm may also allow an upstream firm to protect its market power when contracts are not publicly observable.

Specifically, for passive minorities, Spiegel (2013) shows that passive vertical integration always leads to less foreclosure than controlling vertical integration, though it is not necessarily better for consumers compared to controlling vertical integration. The effects of an upstream firm acquiring a passive structural link in a downstream firm, thereby participating in the profits of the latter, depend on whether upstream price discrimination is possible or not. In a setting where price discrimination is not possible and in which the upstream firm sets linear tariffs, the upstream firm typically expands the sold quantity and the resulting lower wholesale prices are passed through to consumers (Flath, 1989). Once an upstream firm internalises part of the downstream margin, it is intuitively willing to increase quantity at the expense of its upstream margin. This reduces double

goods for a price that is below the price it would charge in case of observable contracts. See also European Commission (2008), paragraph 44 footnote 5.

[54] Note that financial interest in the downstream firm is sufficient for this theory of harm – control rights are not necessary.

marginalisation and is thus procompetitive. The effect intensifies in the ownership share with a full merger as the limit case.

Under the (presumably more relevant) alternative scenario whereby upstream firms may discriminate between buyers, an upstream minority shareholder may have incentives to (partially) foreclose its inputs to other downstream.

b) Backward partial integration

Hunold and Stahl (2016) show that downstream prices increase with the acquisition of the typical downstream firm's passive interests in the efficient supplier and they decrease with the acquisition of controlling interests. Furthermore, passive partial backward integration is profitable when controlling full backward integration is not. It follows that unlike fully controlling vertical integration, passive partial backward integration gives rise to competition policy concerns.

Allain et al. (2014) argue that hold-up concerns do not arise if the downstream firm does not control the upstream firm, as the latter behaves as an independent supplier. The authors add that this corresponds to the "legal unbundling" scenario considered by Höffler and Kranz (2011), where a downstream firm owns an upstream monopolist, but the upstream firm is legally independent and maximises its own profits. They find that such legal unbundling does not give the supplier any incentive to engage in sabotage, and yet may encourage the downstream firm to expand output.

Spiegel (2013) shows that when the partial backward integration gives the integrated downstream firm control over the upstream supplier, the price at which the input is sold to the non-integrated downstream firm increases. This is because the integrated downstream firm's share in the upstream supplier's profit must compensate it in full for the negative horizontal externality that the rival imposes on it (otherwise it will use its control over the upstream supplier to refuse to sell to the rival).

Levy et al. (2018) study the incentive of companies to acquire a partial stake in a vertically related firm and then foreclose rivals. By considering a model in which two downstream firms buy inputs from several upstream suppliers, they show that whether such partial acquisitions are profitable depends crucially on the initial ownership structure of the target

firm and on the corporate governance.[55] More specifically, they show that partial backward integration, which leads to input foreclosure, is particularly profitable when the target upstream supplier is initially held by dispersed shareholders. In that case, the downstream company can acquire the minimal stake that ensures control and hence minimise its share in the upstream loss from foreclosure. The rest of the loss is incurred by the remaining shareholders of the target upstream company, who effectively subsidise the input foreclosure.[56] The authors note that a key driving force in their analysis is that the passive shareholders of the foreclosing firm (upstream firm under backward integration and input foreclosure and downstream firm under forward integration and costumer foreclosure) subsidise the foreclosure of rivals and hence foreclosure arises for a larger set of parameters when there are more passive shareholders.

The immediate effect of holding passive structural links in an upstream supplier is that the downstream firm partly internalises the upstream margin of its product and thus has an incentive to sell more quantity at the expense of its downstream margin. As a consequence, the supplier faces an increased demand and thus has an incentive to increase its upstream price. Under the assumption that the upstream firm may not discriminate between buyers, Flath (1989) as well as Greenlee and Raskovich (2006) show that the different effects of partial vertical integration tend to be neutralised. In Greenlee and Raskovich (2006), the sold quantities of the non-owning firms are reduced since these firms end up paying effectively higher input prices, a reduction, however, which tends to be offset by additional sales of the downstream firms with minority shareholdings. Passive backward structural links may yet have anti-competitive effects if there is some competition in the upstream

[55] Levy et al argue that this model can be modified to consider customer foreclosure, under which the integrated downstream firm stops buying from non-integrated rival suppliers after integration.

[56] The authors also use the model to study additional ownership structures. In particular, they consider: (a) the incentive to partially integrate and then foreclose rivals when the target firm has initially two controlling shareholders, (b) the incentive to backward integrate when the downstream firm initially holds a non-controlling stake in upstream firm (i.e. a toehold), and (c) the incentive of a controlling a shareholder of a downstream firm to acquire a stake in an upstream firm either directly or through some other firm that it controls rather through the downstream firm itself. Toehold stake is a stake of less than 5% of a target company's outstanding stock made by a shareholder. A toehold purchase of just under 5%, while not a significant stake in a firm, allows the shareholders a "toe-holds" grip on the company and its decision making. Toehold shareholders hold a significant place: (a) in the instance of a shareholder vote, and (b) in the instance of two main shareholders without a shareholders' agreement, trying to obtain the shares majority in order to acquire control of the company. See for example the case of the Greek coastal shipping company Hellenic Seaways, when the two main shareholders (Piraeus Bank and Grimaldi), were trying to obtain control of the company before its merger with Attica in 2008.

market and if upstream price discrimination is feasible. In this scenario, passive shareholdings of a downstream firm in a supplier that also serves downstream competitors may soften downstream competition according to Hunold et al. (2012). As the downstream shareholder participates in the upstream firm's profits, it benefits from input sales to its downstream competitors. Hence, a downstream minority shareholder has incentives to increase its sales price.[57] Hunold et al. point out that this effect is achieved only if the minority shares do not confer significant control. In markets where a full merger would decrease downstream prices due to reduced double marginalisation, passive backward shareholding increases downstream prices.

A backward structural link of a downstream firm to its supplier may facilitate input foreclosure if the supplier can discriminate among buyers and if significant influence is conferred. As shown by Spiegel (2013) as well as Gilo et al. (2012), the downstream minority shareholder may cause the target upstream firm to foreclose downstream rivals, even though this typically reduces the upstream profits.[58] The controlling downstream firm internalises the full benefit of a weaker downstream competitor, but only bears its minority share of the upstream losses due to foregone sales. Hence, the specific case where a downstream firm acquires a minority stake in an input provider that confers material influence may promote input foreclosure to a greater degree than a full merger. However, it is important to note that the model relies on the assumption that the controlling (downstream) firm is not residual claimant of the partially owned firm's profits.[59] Gilo and Spiegel (2011) also note that by the same logic passive partial backward integration is less conducive to customer foreclosure than a full merger as the downstream losses are fully internalised, but the upstream gains only partly accrue to the downstream firm with the structural links. **Table 3.4** summarises the effect of vertical structural links with material influence on the incentive to foreclose competing firms:

[57] This mechanism is similar to that of passive horizontal structural links, but the magnitude of the anti-competitive effect depends inter alia on the upstream margin rather than on the downstream margin.
[58] See also Baumol and Ordover (1994).
[59] Sometimes, controlling firms conclude profit transfer agreements with the partially owned firm that guarantees the remaining owners a fixed profit.

Table 3.4 The influence of partial vertical integration on the incentive to foreclose competing firms

	Partial forward integration	Partial backward integration
Input foreclosure	-	+
Customer foreclosure	+	-

Source: Gilo and Spiegel (2011)

"+" signifies that the effect may be more pronounced than in a full merger; "-" indicates that the effect is typically less pronounced than in a full merger.

If the interaction between two vertically related markets takes the form of tenders, passive minority ownerships of a downstream firm in an upstream firm may lead to another subtler competitive distortion. According to Bulow et al. (1999), there is both empirical and theoretical evidence that bidders with some toehold in the auctioned object are typically bidding more aggressively than other bidders do. Moreover, when bidders are uncertain about the true value of the auctioned good and when the private information is relevant for all other participants, then bidders without a toehold may bid even less aggressively in order to avoid overpaying for the sold item.

The bidding behaviour increases the likelihood that a partially vertically integrated bidder wins the auction. Moreover, bidders with a minority stake win while paying a relatively low mean price. These distortions are unrelated to the intrinsic merits of the integrated firm and possibly give rise to inefficiencies.[60] Summing up, if upstream firms can discriminate among buyers, especially partial backward integration that confers material influence in upstream firms may lead to input foreclosure. Furthermore, vertical minority shares in a downstream firm that confer far-reaching control rights may be conducive to customer foreclosure. In addition, when upstream firms differ in their costs to produce input goods, passive vertical minority shares may be used as a commitment device to soften downstream competition. This is in line with several recent cases of the Commission where a vertical theory of harm was pursued. Taken together, forward passive shareholdings tend to reduce

[60] According to Harbord and Binmore (2000), these effects could have materialised if the acquisition of the Manchester United football club by the TV channel BSkyB were cleared. Manchester United received roughly 7% of the proceeds from the sales of the Premier League's broadcasting rights. According to Bulow, Huang and Klemperer (1999), the acquisition was blocked in large part because of concerns that by acquiring Manchester United and therefore participating in the proceeds of the tenders for the broadcasting rights, BSkyB as a bidder in these tenders would be able to shut out other television companies.

double marginalisation but may to some extent also facilitate (partial) foreclosure and may help upstream firms to commit to higher prices if contracts with downstream firms are not observable to all downstream customers. Backward minority shareholdings that confer control to the downstream firm tend to significantly facilitate input foreclosure, whereas passive backward shareholdings may dampen downstream competition and thereby lead to increased consumer prices. Moreover, passive backward shareholding can distort competition in tender markets. Although the literature has focused on input foreclosure so far, it is conceivable that similar considerations hold for customer foreclosure.

Structural links may in certain circumstances deter future entry. In its contribution to the OECD (2008), the Commission has pointed out that competition concerns could arise when a structural link either significantly impedes third party access to the equity of the target via acquisition, or makes it less likely that the acquirer enters itself in the market where the target is active. A formal economic model on these concerns has not been developed yet. In addition, the prospect of foreclosure as a consequence of partial backward or forward integration along may deter entry. In the absence of entry-barriers, potential anti-competitive effects of structural links may thus be attenuated by subsequent entry.

In addition to the direction of a partial integration (forward or backward) as well as to controlling or non-controlling minority shares, the type of the other (minority or majority) partners of the joint venture is also an important factor of competition effects.

3.4 PROCOMPETITIVE EFFECTS

Most vertical mergers do not raise competition concerns and may achieve efficiencies through eliminating transaction costs or avoiding incomplete contracting. Anyway, firms being in a vertical relation need to cooperate in order to improve the production or distribution of their goods and provided services. This cooperation may lead to cost and time reduction and to risk elimination.

Researchers have explored conditions under which exclusive contracts may enhance efficiency (Besanko and Perry, 1993; Segal and Whinston, 2000b; De Meza and Selvaggi, 2007; Groh and Spagnolo, 2004; Vasconcelos, 2010).

The Chicago School, based on a model where an upstream monopoly firm sells to perfectly competitive firms, argued that vertical mergers are efficient. According to the single monopoly profit theory, if the upstream monopolist integrates forward by acquiring a downstream firm, then the integrated firm would continue to earn exactly the same level of economic profits, assuming that the remaining firms in the downstream industry continue to behave competitively. Essentially, the same argument applies to backward integration if the downstream industry is a monopoly (monopsonist on the input market) and the upstream industry is perfectly competitive. According to Riordan (2005) a second theory of the Chicago School concerning procompetitive effects of vertical integration is the eliminating markups theory.[61]

Moreover, according to Salop and Culley (2014) the cognisable efficiency benefits can lead to increased competition and, as a result, reverse potential anticompetitive impacts or deter the conduct that raises those concerns. Benefits may include cost reductions and improved product design that can lead to lower prices or elimination of double marginalisation, higher quality products, and increased investment. The merger can also spur investment by reducing the risk of hold-up. This risk can occur when one firm has to sink costs in anticipation of a long-term relationship with the other and there is fear of hold-up problems that cannot be resolved with a long-term contract. In addition, in markets vulnerable to coordination, a vertical merger might reduce the likelihood of coordinated effects by the creation or enhancement of a maverick, or it might disrupt oligopoly coordination by decreasing the incentives to coordinate. While a vertical merger can increase the likelihood of coordination, it may also have the opposite effect under certain circumstances and reduce the likelihood of coordination.

By developing a model, Reisinger and Tarantino (2015) show that when a monopoly producer who deals with asymmetric retailers via secret two-part tariffs is integrated with the inefficient retailer, he keeps the rival retailer active on the product market due to an output-shifting effect. This effect can induce the integrated firm to engage in below-cost pricing at the wholesale level, thereby rendering an integration procompetitive.

[61] Therefore, empirical evidence on eliminating markups with vertical integration is mixed. For more details see Riordan (2005) and Salop et al. (2014).

Loertscher and Reisinger (2014) analyse a model in which the effects of vertical integration on consumer and overall welfare depend on the underlying market structure. By analysing the competitive effects of backward vertical integration when firms exert market power upstream and compete a la Cournot downstream, they argue that vertical integration is more likely to be procompetitive if the industry is otherwise more concentrated (small number of non-integrated rivals). More generally, in their model vertical integration is procompetitive under fairly wide circumstances because efficiency effects tend to dominate foreclosure effects. Because of this, even vertical integration that leads to full foreclosure of the rivals can be procompetitive. However, vertical integration can also increase consumer surplus and decrease total welfare because final output may be produced at higher costs after integration. The study of Hortaçsu and Syverson (2007) is mentioned as example of evidence, which finds that vertical integration in the cement and ready-mixed concrete industries has led to output increases and price decreases and shows that these effects can be attributed to productivity increases that arise from firm size. The study of Lafontaine and Slade (2007) is also mentioned, which finds that the efficiency effect dominates the foreclosure one in almost all studies, therefore, vertical integration has led to a fall in the final good price in almost all cases.

According to Blignaut et al. (2010) much of the controversy associated with vertical integration enforcement arises from the widely held view that anticompetitive harm from such integration is unlikely and that motivation behind vertical integration is not the enhancement or preservation of market power, but the achievement of efficiencies. The authors add that competition authorities worldwide have recognised that vertical integration can lead to the following efficiencies:[62] (a) avoiding the need for negotiation and execution of contracts and minimising risk and uncertainty (according to the transaction cost theory); (b) enabling internalisation of externalities, particularly the elimination of double marginalisation leading to a higher amount of delivered goods due to lower prices and / or innovation; (c) ensuring economies of scale and scope; (d) building up savings that would increase production and / or distribution and increased output; (e) achieving technical improvements in the quality of goods; (f) streamlining co-ordination

[62] To be considered as such, an efficiency must (i) be a direct result of the vertical integration; (ii) be demonstrable; and (iii) be likely that the benefit will be passed on to consumers.

of design and distribution of goods; and (g) promoting dynamic efficiencies in the form of innovation. Economides (1999) shows that vertical integration can improve overall product quality in a successive monopoly model with endogenous (upstream and downstream) quality choices.

Even vertical or horizontal foreclosure may be socially beneficial in certain circumstances. First, it may enhance innovators' benefit from R&D efforts and thus further motivate them to innovate or develop new products. Second, in situations where unrestrained competition in downstream or adjacent markets leads to excessive entry and duplication of fixed costs, foreclosure may help reducing excessive entry. Finally, integration may improve coordination between firms, for example by providing better incentives to monitor their efforts (Rey and Tirole, 2007).

Hart and Tirole (1990) find two potential gains from mergers in their theoretical model. First, a merger of U1 and D1 that causes exit by U2 or D2 or both leads to a saving in investment costs. To the extent that these costs were incurred by U2 and D2 to increase their aggregate profit at the expense of U1-D1, with no price effects, this exit represents a social gain. In other words, a merger-induced exit can be beneficial to the extent that it leads to a reduction in rent-seeking behaviour. Second, pure efficiency gains may result from mergers. In all three variants of their model, upstream and downstream firms make *ex ante* investments. Although these investments are taken to be industry specific, given that the industry is imperfectly competitive, they have many of the characteristics of the relationship-specific investments. In particular, an upstream firm, might be unwilling to invest, given that the absence of a perfectly competitive market for its product can cause it to be held up. Thus, a motive for a merger between an upstream and downstream firm may be to encourage investments by reducing hold-up problems. A merger carried out for these reasons will increase competition and reduce consumer prices. For simplicity reasons, the formal model supposes that firms are prepared to invest under no integration and so hold-up problems do not constitute a motive for a merger; it would be easy to challenge this assumption, however.

A vertical merger does not, therefore, necessarily result in market foreclosure of unintegrated producers. When no foreclosure occurs, a vertical merger unambiguously causes the price of the final good to decrease (Salinger, 1988).

3.5 CONCLUDING REMARKS

Competition effects of vertical integration are primarily distinguished in 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.[63]

On the other hand, anticompetitive effects harm consumers and social welfare. Such effects of vertical integration are mainly distinguished in non-coordinated (foreclosure) and coordinated (collusion) ones, although it seems that foreclosure is encountered more often. Foreclosure may be input or customer foreclosure and -full or partial- can be performed in various ways, such us raising rivals' cost, margin squeeze, price discrimination, exclusive dealing, and information exchange. It can be substantial even if rivals remain into the market and even if they can achieve minimum efficient scale of production.

Collusion, express or tacit, may be facilitated by vertical integration in the following ways: (a) by interfirm information exchanges, (b) by enhancing 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. The VIC has the power to make the collusion agreement sustainable, 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.

Concerning partial vertical integration (joint ventures, minority shareholdings), although researchers recognise the potential efficiency benefits, 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

[63] 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.

of both firms, and (b) any exchanges of information entailed by the partial ownership interests, even if they are passive. The entailed information may give the partially integrated firms the ability to foreclose or coordinate. Anticompetitive effects differ between forward and backward integration, 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. Second, if firms coordinate on prices and/or output, excess capacity is a necessary condition for such a coordination to have taken place. Vertical integration enhances problems rather than creates them. So long as horizontal merger standards are met, vertical mergers cannot have any 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; existence of barriers to entry; existence of scarce and essential input; the portion of the foreclosed market; the efficiencies gained; the status of the foreclosed rival (equal efficient rivals or not).

As competition effects such as foreclosure or collusion are not static, the first vertical merger always facilitates collusion, but successive mergers after this may not do so, so that intermediate levels of integration may be optimal.

Based on different assumptions, the models that have been developed lead to ambiguous results. The number of competition effects varies and depends on the conditions in an individual market, therefore must be evaluated on a case-by-case basis.

This research, in the selected container port range Hamburg – Le Havre: firstly explores the actual capacity of policy makers of the assessment of competition effects, and secondly proceeds to an empirical analysis of competition effects.

CHAPTER 4:

RESEARCH METHODOLOGY

4.1 INTRODUCTION

This chapter describes the activities of the study and the steps followed in selecting the research approach and ensuring the validity and reliability of the data collected and analysed. The case study research method, including both qualitative and quantitative analysis, was selected as most appropriate for applying the research methodology, influenced by the literature and the Commission's decisional practice. The chapter concludes by reviewing how the steps that have been followed during the research process, enhance the quality of this research, making it possible and valid to draw more general conclusions.

4.2 BACKGROUND TO RESEARCH DESIGN

4.2.1 CASE STUDY

Evidence gathered through experiments or empirical studies is today considered to be the most powerful support possible for a given hypothesis. The case study method is a method of study in depth rather than breadth, as it places more emphasis on the full analysis of a limited number of events or conditions and their interrelations (Kothari, 2010). Yin (1989) points out that a case study can be used to generate knowledge and provides the basis for theoretical developments, especially when knowledge in respect of the questions posed is in 'a near zero basis'. If the case under investigation is strategically selected, its evidence may contribute to the development of a candidate theory. The results have, then, the potential to become a full theory through confirmation of additional cases, assuming that the same exact path of analysis will be followed (also: Yin, 1981). Case study enables the generalised knowledge to get richer and richer as it helps in formulating relevant hypotheses along with the data which may be helpful in testing them (Kothari, 2010). Following Eisenhardt (1989), theoretical proposals developed by case studies have important strengths such as novelty, testability, and empirical validity, which arise from

the intimate linkage with empirical evidence. Given these strengths as well as the independence from prior literature or past empirical observation, case study research is particularly well suited to new research areas, or research areas for which existing literature seems inadequate.

Glasser and Strauss (1967) remark that a case study analysis can be used to establish the structural boundaries of a fact. It has the potential to generate 'middle-range' theories, falling between the 'minor working hypotheses' of everyday life and the 'all inclusive' grand theories. In generating that type of theory researchers do not seek to prove their theories but merely to demonstrate support for them. In this vein, Yin (1989) suggests that each selected study should have the potential to be a 'whole' study which could produce coherent, but limited to certain external conditions, answers to the research questions. Through carefully selected cases and the theoretical framework the researcher attempts to understand, to the fullest extent, whether different conditions will produce different case results and to articulate these conditions more explicitly (also: Yin, 1993). Finally, Frey (1970) suggests that the criteria for selecting case studies should not ignore the critical advantages resulting from practical issues like 'administrative convenience', that is, issues of proximity and data accessibility. The structure of a case study should be the problem, the context, the issues, and the lessons learned (Creswell, 2014).

4.2.2 DATA ANALYSIS

Scholars emphasise that data analysis largely depends upon the researcher's personal style (Taylor and Bogdan, 1984; Marshall and Rossman, 1989). Yin (1989), for instance, remarks that the ultimate goal of data analysis is the fair treatment of evidence, the production of compelling analytic conclusions, and the ruling out of alternative interpretations. There are few 'fixed formulas' on how to carry out data analysis and much depends on the investigator's style of thinking together with presentation of adequate evidence and due consideration to alternative interpretations. However, Yin identifies two main general analytic strategies, i.e. relying on theoretical propositions and developing a case description, and states that the former is preferable. According to him, the dominant modes of analysis contain three important techniques: (a) pattern-matching, (b) explanation building, and (c) time-series. All these steps constitute a continuous process that increases

the reliability and validity of case study. Respectively, Taylor and Bogdan (1984) describe three steps of qualitative data analysis: (a) discovering of data, (b) coding of data, and (c) discounting of data. Miles and Huberman (1994) adopt an analogous categorisation describing these steps as: (a) data reduction - i.e. through the reading of interview transcripts to identify the main phrases and statements within the concepts and the cross comparison of the collected data; (b) data display - either descriptive display, which may include a single statement or multiple statements on a particular issue, or tabular display, which may contain matrix, graph, charts, and networks; and (c) articulation drawing/verification - whereby articulation is an initial conclusion that is finalised through the verification of the data. According to Kothari (2010) processing of collected data implies editing, coding, classification and tabulation, so that they are amenable to analysis.

Notably, in qualitative research some form of conclusion may be drawn in the beginning of the fieldwork but cannot be finalised without verifying the data. It may well be that data analysis is an ongoing process and, thus, data collection, recording, and analysis in qualitative research go hand-in hand (Glasser and Strauss, 1967; Kirk and Miller, 1986). Still, it is not before the end of the data collection that research concentrates most on data analysis and interpretation. It is the cross checking of the collected data that increases the validity of the research conclusions. Marshall and Rossman (1989: p. 113) mention that, following data collection, analysis procedures contain five modes: organising the data; generating categories themes and patterns; testing the emergent hypothesis against the data; searching for alternative explanations of the data; and writing the report. To the scholars, "*each phase of data analysis entails data reduction as the reams of collected data are brought into the manageable chunks*". Furthermore, Eisenhardt (1989) suggests that case studies should be guided by a within-case analysis. The latter, she observes, involves detailed write-ups for each case as simple pure 'descriptions'. This allows the emergence of unique pattern in each case before generalisations.

4.3 THE ACTIVITIES IN THE RESEARCH PROCESS: AN OVERVIEW

4.3.1 REFLECTIONS ON RESEARCH METHODOLOGY

Davis and Garcés (2010) argue that the empirical assessment of vertical restraints is generally considerably more difficult than analysis of at least a straight forward single

horizontal merger and therefore there is less empirical research on these topics, for at least three reasons: (a) in order to understand vertical restraints it is usually necessary to understand at least two markets, the market upstream and the market downstream, (b) the economic theoretical framework is less fully developed than models, such as Bertrand pricing, and (c) the empirical analysis of such markets is not very accessible to researchers since they are often seeking to understand the contractual relationships between firms which, while often observed by competition authorities, are unobserved by the academic community. According to Davis and Garcés, a formal quantitative analysis of the effect(s) of vertical restraints or integration is not only a complex task, but also is a task where the set of tools available for empirical analysis is modest. For that reason, vertical restraints are often tackled using qualitative arguments about the likelihood of foreclosure and consumer harm rather than detailed quantitative analysis.

There have, however, been some studies at empirical estimation of the effects of vertical integration; in markets such as cable TV (Chipty, 2001, who estimates the effects of vertical integration on product offerings, prices, and number of subscriptions), retail gasoline market (Hastings and Gilbert, 2005); beer retail market (Chen, 2014); rail market (Levin and Weinberd, 1979; Harris and Winston 1983). The empirical strategies that have been used to determine the effects of vertical integration include: (a) regression analysis, (b) particularly fixed effects regressions, (c) natural experiments, and (d) event studies.

In general, the conclusions of the literature review (Chapter 3) and the Commission's decisional practice (Chapter 5) represent methods that have been extensively and effectively (in terms of advancing theoretical developments) applied in the assessment of competition effects. Hence, the logic of data collection, data analysis, and the drawn of conclusions as regards the competition effects of the LTVI has been based upon them. In turn, the implementation of a qualitative case study research strategy has implied specific steps and demanded critical choices regarding the techniques to be employed. Therefore, it is necessary to detail the stages of the research process, and explain the logic behind the choices that were made throughout this process.

As concluded in Chapter 3, there is not a unique developed model in order to assess the competition effects of vertical integration. Essentially, various models have been

developed to assess the competition effects of vertical integration. Some of them might be applied to the liner – terminal vertical integration, as they refer to the markets with similar characteristics, e.g. oligopolistic structures, homogenous products. Such models are for example the models of Salinger (1988), Nocke and White (2005), Biancini and Ettinger (2007). Nevertheless, the approach on competition effects should be done case by case. As mentioned by Davis and Garcés (2010), empirical analysis is a way to try to determine the effects of vertical restraints on consumer welfare in a particular case; as the theoretical work on vertical integration fails to generate administrable tests for real-world cases (Wong-Ervin, 2018).

4.3.2 STAGES OF THE RESEARCH PROJECT

To begin with, a summary of the activities that were carried out in the research process is provided. It must be stressed that each of these activities informed and was informed by other activities. Anyway, as mentioned by Wellington (2010), the research process is not linear but cyclical or iterative; it is a constant process of thinking, refining, going back, checking and sometimes guessing.

The study's activities may be divided in three phases. The experience gained at earlier stages of the activities helped to shape some aspects of subsequent activities.

Phase I – Literature Review

- Perusal of the literature on vertical integration of liner shipping and ports, as well as the potential competition effects;
- Synthesis of the literature and development of research questions;
- Perusal of the literature on research methodology;
- Perusal of the literature on the vertical integration economics theory and competition effects' assessment;
- Synthesis of the literature and categorisation of competition effects' assessment models/methods.

Phase II – Review and critical assessment of the European Commission's cases

- Collection of the European Commission's merger, antitrust and cartel decisions in both upstream market of container terminal services and downstream market of container liner shipping services from 1996 to 2018;

- Categorisation and analysis of the EC decisions.

Phase III – Case study

- Data collection of real liners' entries in the Hamburg – Le Havre port range for the years 1998 - 2017;
- Comparison between the real and the notified to the European Commission mergers;
- Critical assessment of the European Commission's decisional practices;
- Definition of relevant markets;
- Calculation of market shares;
- Data collection of Terminal Handling Charges (THCs) for the years 1992 – 2018;
- Data analysis;
- Assessment of competition effects on prices, choices and quality of services.

The above show very briefly how the empirical work was conducted. The processes that were followed are described in depth in the sections below.

4.3.3 THE CASE STUDY: LTVI IN THE HAMBURG–LE HAVRE PORT RANGE

Given that all the vertical mergers have not been notified to the Commission, the study assess the competition effects of liner – terminal vertical integration, by applying the economic theory (Chapter 3) and the Commission's decisional practice (Chapter 5) in the analysis of both notified and non-notified mergers, including the minority shares, in the Hamburg – Le Havre port range. The study then reaches its conclusions based on both the critical assessment of the Commission's assessment of the notified mergers and the assessment of non-notified mergers.

The study of the mergers that have taken place in the Hamburg - Le Havre range includes both quantitative and qualitative analysis. The combined use of the two approaches benefits the researcher with significant strengths:

Quantitative analysis

- Market structure description of the upstream market of container terminal services: market size, number of terminals and terminal operators, concentration level;
- Equity market shares of the upstream market in capacity and throughput terms (time-series);

- The evolution of liners' shares in the upstream market;
- Time-series of Terminal Handling Charges (THCs).

Qualitative analysis

- Liner's entry behaviour. The examination of the forms of the expanding entry of liner companies and emerging partnerships in the upstream market of container handling, is theoretically grounded in a "5-Ws" conceptual framework covering five strategic dimensions concerning their entry, i.e. "who", "why", "when", "where" and "which way".

This dual research strategy has allowed reaching findings that can be generalised to other port ranges: standardised approaches permit the study to be replicated in different areas or over time with the production of comparable findings.

As in the case of each methodology, even the applied combined approach is not without any weaknesses. In this study, the used data are limited to equity shares. Information such as contracts or shareholders agreements, although they may have the same effects to equity integration, is impossible to be collected due to its confidential nature. Additionally, the accuracy of the market shares of liners might be questioned; data for each trade, or route, or port pairs of liner companies would be useful for an undisputable precise assessment of market shares. Finally, the historic data on terminal fees – even if they are complicated - would be useful for an identical assessment of effects, as their tendency would be compared with the tendency of THCs.

4.3.4 DATA COLLECTION

The data set has been collected primarily from EC DG Competition concerning legislation and cases. Special attention has been paid to container terminal and liner companies' cases. Additional information sources include industry reports such as Drewry Shipping Consultants, Dynamar B.V., Alphaliner, the independent media organisation Mlex, as well as specialised maritime press, i.e. JOC, Containerization International, Lloyds and Port Technology. Additional information has been collected by corporate websites of ports, container terminals, liner companies, liner agents and shippers.

Equity market shares of the upstream market in capacity and throughput: Estimations of market shares are mainly based on Drewry Reports' data. In addition, relevant data have

been collected from EC merger cases and port / terminals websites and specialised maritime press. The available data on capacity concern the period 2007 – 2016 and throughput data concern the period 2003 – 2016.

Terminal Handling Charges (THCs): For the period 1992 – 2009 the data are derived from the European Commission's research (European Commission, 2009). For the years from 2010 – 2018 the THCs have been collected through the websites of liners (primary source), agents and shippers. These contain either a web page dedicated to the charges or alternatively announcements via the press releases or notices to shippers. For the missing data between known prices, a forecasting procedure of average prices has been applied, which does not affect the trend.

Liners' market shares: Liners' market shares are approximately estimated by the notified EC relevant merger cases.

4.3.5 ADEQUACY OF THE PORT RANGE UNDER EXAMINATION

Why was the Hamburg – Le Havre port range selected to be examined? Does the estimation of the competition effects of LTVI provide an accurate picture of the competition effects of LTVI in general?

The Hamburg – Le Havre port range is one of the main port ranges in the world (Thorez and Joly, 2006), widely acknowledged as a distinctive port area. Within a distance of about 850 kms, eight (8) ports - most of them major European ports - are located including 26 deep sea container terminals with more than 40 million TEUs deep sea throughput in 2016. The Hamburg–Le Havre port range is a European Union area, with history in vertical integration, as the first liner – terminal vertical integration in this area, took place in the port of Bremerhaven in 1998, and specifically in North Sea Terminal Bremerhaven GmbH & Co. (NTB).[64] Such an area allows comparisons between notified and non-notified mergers to the European Commission. In addition, the range is located in an ideal position to serve the greatest consuming market of Europe, where over 200 million people live. The Ruhr and Bavaria area in Germany, the surrounding areas of Paris in France, represent a

[64] NTB was founded by the three proprietary companies, BLG Container GmbH, Maersk Deutschland GmbH and Sea-Land Service Inc. Meanwhile the shares are held at equal parts by the joint venture of BLG and Eurokai, "Eurogate GmbH & Co. KGaA, KG", and by the "APM Terminals Deutschland Holding GmbH", the German subsidiary of the global terminal operating company, a part of the APMM Group.

bonanza for final and intermediate demand. These ports are also a gateway to reach the emerging economies of Eastern Europe, attracting growing traffic of components and semi-finished products from Asian countries, mainly China. This range of ports is located at the convergence of the deep sea services linking Europe with the US and Asia and it also comprises a dense network of North and South trades (Parola and Musso, 2007).

4.3.6 DATA ANALYSIS

As Taylor and Bogdan (1984) stress, data are never 'self-explanatory' and all researchers draw on their theoretical hypotheses and cultural knowledge to make sense out of them. Miles and Huberman (1994) argue that few researchers, if any, start a study with 'empty minds' and the choice of what to observe and what not to is guided by some pre-existing conceptual tags. In the view of Miles (1979) research studies that pretend to begin without any assumption usually encounter many difficulties. Similarly, in their description of case studies Nisbet and Watt (1978: p. 49) write that "*without hypotheses, (case-studies) become merely a formless and uninformative rag-bag of observations*".

Benefiting from the aforementioned discussions regarding data analysis, and inspired by the procedures provided in Miles and Huberman (1994) study, the process followed by this study can be separated into three, interactively fed, sets of activities: data reduction, data display, and conclusion drawing/ verification. Firstly, as early as the data collection process a somewhat preliminary data analysis started: attempts were made to begin making sense out of data.

The second group of analysis activities in the data was 'data display'. According to Miles and Huberman (1994: p. 21) it implies the organising and assembly of information into a form that "*permits conclusion drawing and action taking*". It involved actions like arranging policy developments and interest representation activities in a chronological order, so that it was possible to determine which events preceded, or are followed by other events (Yin, 1989). The final step, incorporated noting regularities, causal flaws, and patterns in the actions of the actors under investigation, evaluating the plausibility of the tentative hypotheses, and testing them through the data. This phase has operated in two stages. Initially, searching for within-case analysis conclusions, and, then, looking for cross-case data analysis. This involved the explanatory assessment of the working

hypotheses on the basis of the patterns identified in the within-case analysis and attempts to leap beyond the data. The latter is always an important process as there cannot be interesting hypotheses unless researchers generalise beyond the data, in what has been described as a 'creative leap' (Mintzberg, 1979).

4.3.6.1 NOTIFIED MERGERS TO THE EUROPEAN COMMISSION

Notified mergers to the Commission have been classified to four categories (Chapter 5): 1) vertical mergers, 2) liners' horizontal mergers with vertical effects, 3) container seaport's horizontal mergers, and 4) conglomerate mergers. Their data analysis concerns the engaged companies and the number of partners, the decision date, the engaged terminals, the concerned geographic area (EU/Non-EU area), the direction of investment (forward/ backward), the way of merger (purchase of shares, share swap etc.), the relevant market definition, the methodology of calculation of market shares. The notified mergers are also classified according to their applied procedure of clearance: simplified procedure, phase I and phase II procedure. The provided information of the merger decision depends on the type of the applied procedure.

4.3.6.2 REAL TRANSACTIONS

The real transactions data in the Hamburg – Le Havre port range permit the analysis of market structure. The real liners' entries in container terminals allow the calculation of market shares on equity basis in throughput and capacity terms, as well as the concentration level. The time-series on market shares demonstrate the trends of the seaport container market. The analysis also includes the different strategy of each liner and country in terms of number and type of partners of container terminal, type of acquired control (joint, sole or passive minority shareholdings).

4.3.6.3 MARKET SHARES ESTIMATION

In the market of container terminal services, the market shares are calculated in terminal basis, including the minority shareholdings and the captive capacity and throughput of vertical integrated operators.

Regarding the market of container liner shipping services, the precise liners' shares estimation, as it will be analysed in Chapter 6, is a difficult job. Consequently, for the

purposes of this research it is adopted the estimations of the Commission as they are mentioned in the Commission's cases, although it is known that it is not the most accurate approach. Anyway, any changes of the market shares do not affect the results of the research.

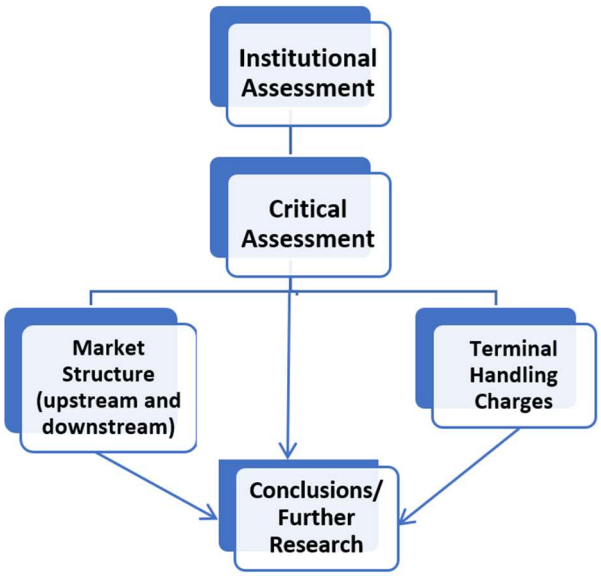
4.3.6.4 THE ANALYSIS OF THCs

TCHs data analysis includes measures of central tendency and statistical averages. It also includes measures of relationship as it examines the degree of the association and correlation between the liners entry and the height of THCs. It also compares the THCs of integrated and non-integrated liners.

4.3.7 FINDINGS

Figure 4.1 synopsises the research. The critical assessment of institutional perspectives, follows the institutional assessment and imposes the need for market shares estimation.

Figure 4.1 The structure of the research



The market structure of both upstream and downstream markets combined with the analysis of Terminal Handling Charges shows that competition does not work. Specifically, there are two major findings: first, the market shares of LTVICs are increasing through the time. Second, although the entry of liners in terminals operation is increasing, no efficiencies have been passed on to shippers. Vertically integrated firms

not only enjoy cost savings, but they also increase the prices offered to their customers. Consequently, the entry of liners in container terminal services has not favoured consumers welfare. The THCs which are paid by shippers keep increasing since the abolition of conferences in 2008 by both integrated and not integrated liner companies. In addition shippers keep complaining about choice and quality of services.

4.4 ENHANCING THE QUALITATIVENESS OF THE RESEARCH PROCESS

Following the detailed presentation of the activities that composed this research process it is worth considering how the employed techniques have improved the quality of this research. In the following section the recommended criteria for judging research quality and the ways to enhance the qualitativeness of case study research projects are introduced. Then, the specific steps taken to ensure the validation and reliability of the research process and findings are surveyed.

4.4.1 CRITERIA FOR JUDGING RESEARCH QUALITY

Critics of the qualitative paradigm claim that findings have the danger of being insubstantial and trivial and that the research conclusions have a very fragile nature that lacks objectivity. How can qualitative researchers in the realm of flexible research designs and interpretative methods of analysis make sure that they provide valid information about the phenomena under scrutiny? Reliability and validity, "*the extent to which a measurement procedure yields the same answer however it is carried out" and "the extent to which the research gives the correct answer*" respectively (Kirk and Miller 1986: p. 19) have been the stereotype tests of any given research design. The former focuses on the meaning and meaningfulness of the collected data, and the latter focuses on the consistency of the research results (Patton, 1980).

4.4.1.1 ESTABLISHING VALIDITY AND RELIABILITY

According to Kothari (2010) research methodology is a way to systematically solve the research problem. Therefore, the good research is empirical as it is related basically to one or more aspects of a real situation and deals with concrete data that provides a basis for external validity to research results. Validity is the most critical criterion and indicates the degree to which an instrument measures what it is supposed to measure. Validity can also

be thought of as utility. In other words, validity is the extent to which differences found with a measuring instrument reflect true differences among those being tested. Three types of validity may be considered: (i) Content validity; (ii) Criterion-related validity and (iii) Construct validity. Kothari adds that good research is replicable when allows research results to be verified by replicating the study and thereby building a sound basis for decisions.

The test of reliability is another important test of sound measurement (Kothari, 2010). A measuring instrument is reliable if it provides consistent results. Reliable measuring instrument does contribute to validity, but a reliable instrument need not be a valid instrument.

This case study is to be considered with analytical and statistical generalisations. The replication of the research process and the consequent accumulation of several studies on related issues can enable researchers to draw conclusions with regard to larger samples and wider issues. As regards the construct validity of the study, this is enhanced mainly by the fact that multiple sources of evidence have been used, EC cases, academic literature, mass and specialised press. Two additional tactics have contributed towards that enhancement. First, that during the data collection the researcher attempted to establish a chain of evidence. Second, papers regarding the progress of the study were presented by the researcher at academic symposiums and conferences, or published in refereed academic journals, so a number of key informants and experienced academics had the opportunity to comment on them (see: Kollia and Pallis, 2018; Kollia 2018; Kollia and Pallis, 2019).

Regarding the notion of reliability, the goal is to minimise the errors and biases of the studies. Two steps have been followed to achieve this. A case study protocol containing an overview of the project field procedures and data collection techniques to be employed and a guide for the case studies has been used. The contents of this protocol have been addressed in detail in the preceding sections. Moreover, a case-study database has been developed where materials were indexed and can be retrieved both by the researcher and by other readers who are able to check the interpretations offered in the final analysis. The EC cases as well as all the used papers and publications, for instance, have been kept and organised chronologically.

4.4.1.2 EPISTEMOLOGICAL TIES: RELATIVISM

The aforementioned design of this research is, inevitably, tied to a specific epistemological position. The task of the research is to interpret its data and generate knowledge regarding this reality. Thus, as in any qualitative research, this study comes closer to hermeneutics than to positivism. Hermeneutics focuses on an interpretative subjective understanding of the subjects, whilst positivism favours the scientific method which stresses the need to seek universal laws that explain observable phenomena (von Wright, 1993). Positivism embraces the scientific paradigm of quantitative research and its features include control of predetermined variables as well as replication and generalisation of results. Examples of such studies consist of experiments that seek knowledge which can be proved, verified and predicted. The underlying assumption about knowledge in the positivist paradigm is that there is a reality out there to be studied, captured and understood (Guba, 1990) this is to say it takes an outer perspective separating the researcher from the objects researched. Qualitative research on the other hand is related to interpretative inquiry and assumes that knowledge is situated in a context and is dependent on the researcher's skills to produce the data analysis and conclusions (Taylor and Bogdan, 1984).

4.4.1.3 ORIGINALITY/VALUE

The research consists the first approach of the estimation of the competition effects of the vertical integration between liners and terminals. While there is considerable theoretical work describing potential anticompetitive effects as described in Chapter 3, there is only limited empirical evidence supporting that finding in real markets and, moreover, none empirical study concerning liners and terminals. In addition, there is not any in depth analysis of competition effects in EC level.

Thus, the research also contributes to the further development of appropriate empirical research strategies for the estimation of competition effects.

CHAPTER 5:

ANALYSIS OF THE INSTITUTIONAL APPROACH: THE DECISIONAL PRACTICE OF THE EUROPEAN COMMISSION

5.1 INTRODUCTION

European institutions monitor vertical integration trends in all sectors of the EU economy, in order to assess the resulting competition effects. The European Commission carries out two types of assessment 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.

The first stage of evaluation methodology is common for both *ex ante* and *ex post* type of assessment and concerns the relevant market definition and the calculation of the market shares. As expected, there is a difference between the assessment of *ex ante* and *ex post* estimation of effects. During the *ex ante* estimation the Commission examines (a) the possible non-coordinated effects (the ability, the incentive and the potential effect of the VIC to foreclose its competitors), as well as (b) the possible coordinated effects. Coordinated effects arise where the merger changes the nature of competition in such a way that firms that previously were not coordinating their behaviour, are significantly more likely to coordinate to raise prices or otherwise harm effective competition. During an *ex post* estimation, the Commission examines the real effects, according to the Articles 101 or/and 102 of the EU Treaty. Specifically, it examines all the possible and direct evidence of an anticompetitive behaviour as a result of the abuse of dominant position or coordinated behaviour.

In both *ex ante* and *ex post* cases, the precondition for the further assessment of the competition effects are the high market shares in the defined relevant market.

This Chapter examines the Commission's decisional practice according to the assessment of the competition effects of liner – terminal vertical integration through the examination of the relevant EC merger, antitrust and cartel cases for the period 1996 – 2017.

5.2 THE NOTIFICATION PROCESS

Mergers are generally distinguished in three categories: horizontal, vertical and conglomerate. Horizontal mergers involve companies that are competitors or potential competitors in the same relevant market. Vertical mergers involve companies operating at different levels of the supply chain, as suppliers or customers. Conglomerate mergers are mergers between firms that are in a relationship which is neither horizontal (as competitors in the same relevant market) nor vertical (as suppliers or customers). An *ex ante* assessment of vertical integration takes place after a notification of a vertical merger or a notification of a horizontal merger with vertical effects.[65]

5.2.1 WHICH TRANSACTIONS SHOULD BE NOTIFIED[66]

The Commission must be notified of any merger with a EU dimension, prior to its implementation. EU dimension means that the merging firms reach certain turnover thresholds. There are two alternative ways to reach turnover thresholds for EU dimension:[67]

(a) a combined worldwide turnover of all the merging firms over €5.000 million, and (ii) an EU-wide turnover for each of at least two of the firms over €250 million, or

(b) a worldwide turnover of all the merging firms over €2.500 million, and (ii) a combined turnover of all the merging firms over €100 million in each of at least three Member States, (iii) a turnover of over €25 million 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 million.

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 one and the same member state. In such case mergers have to be notified to that member state.

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[65] In our case a horizontal merger with vertical effects is a merger between liner companies which have equity interests in container terminals.

[66] For more details see: (a) Council Regulation (EC) No 139/2004 of 20 January 2004 on the control of concentrations between undertakings (the EC Merger Regulation), (b) Commission Consolidated Jurisdictional Notice under Council Regulation (EC) No 139/2004 on the control of concentrations between undertakings (2008/C 95/01), (c) Commission Notice on a simplified procedure for treatment of certain concentrations under Council Regulation (EC) No 139/2004 (2005/C 56/04).

[67] Smaller mergers which do not have an EU dimension may fall instead under the remit of Member States' competition authorities.

In assessing a notified merger, the Commission applies three types of procedure: (a) simplified procedure, (b) phase I procedure, and (c) phase II procedure. A simplified procedure involves a routine check. It is applied when the merging firms are not operating in the same or related markets, or when they have only very small market shares not reaching specified market share thresholds. A phase I procedure involves requests for information from the merging companies or third parties, as well as questionnaires to competitors, customers and other market participants, aimed at clarifying the conditions for competition in a given market or the role of the merged companies in that market. During the phase I investigation, the Commission has 25 working days to analyse the deal. More than 90% of all cases are resolved in phase I.

Phase II is an in-depth analysis of the merger's effects; from its opening, the Commission has 90 working days to make a final decision. It is opened when the Commission has concerns that the transaction could restrict competition in the internal market and involves more extensive information gathering. In phase II the Commission also analyses claimed efficiencies that the companies could achieve when merged together. If the positive effects of such efficiencies for consumers would outweigh the negative effects, the merger can be cleared. In order to be taken into account, efficiencies must fulfil strict conditions and it is for the merging companies to prove that they are met. First, the claimed efficiencies must be verifiable. Second, the efficiencies, as the concerns, must be merger specific (i.e. they cannot be achieved by other means than by a merger). Third, the efficiencies must be likely passed on to consumers, and not only recapped by the merging companies alone.

The market share thresholds in order the markets to be considered as affected are: 20% combined market shares on any market where they both compete, or 30% market shares on vertically related markets.[68]

All joint ventures performing on a lasting basis all the functions of autonomous economic entities, to the extent that their creation has as its consequence an appreciable restriction of competition between undertakings that remain independent, are considered as mergers.

[68] The thresholds raised respectively from 15% to 20% for horizontal mergers and from 25% to 30% for vertical mergers on the 5th of December 2013 (see Regulation (EU) No 1269/2013).

The entry of a new shareholder in a jointly controlled undertaking - either in addition to the already controlling shareholders or in replacement of one of them - also constitutes a notifiable concentration, although the undertaking is jointly controlled before and after the operation. However, the entry of new shareholders only results in a notifiable concentration if one or several shareholders acquire sole or joint control by virtue of the operation. The entry of new shareholders may lead to a situation where joint control can neither be established on a de jure basis nor on a de facto basis as the entry of a new shareholder leads to the consequence that changing coalitions between minority shareholders are possible.

A reduction in the number of controlling shareholders constitutes a change in the quality of control and is thus to be considered as a concentration if the exit of one or more controlling shareholders results in a change from joint to sole control. Decisive influence exercised alone is substantially different from decisive influence exercised jointly, since in the latter case the jointly controlling shareholders have to take into account the potentially different interests of the other party or parties involved. Where the operation involves a reduction in the number of jointly controlling shareholders, without leading to a change from joint to sole control, the transaction will normally not lead to a notifiable concentration.[69] Acquisition of non-controlling minority shares is not considered as a merger.

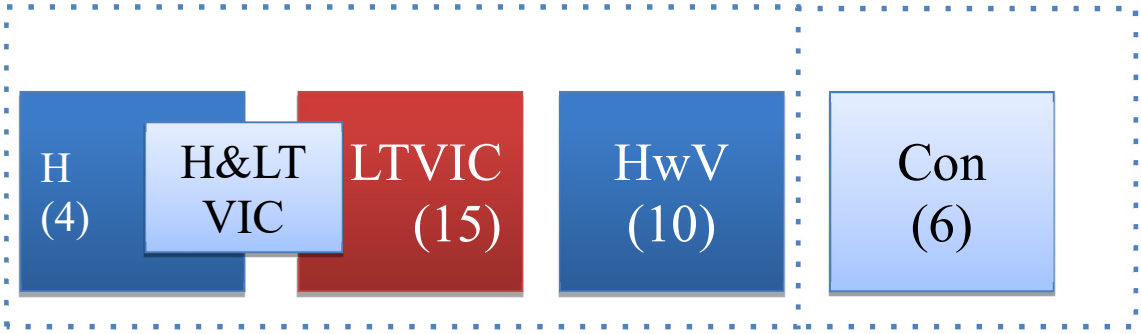
5.2.2 THE NOTIFIED MERGERS

As shown in the **Figure 5.1**, during the examined period, thirty-five (35) mergers related to seaport container terminals have been notified to the Commission; fifteen (15) mergers concern vertical integration between liners and container terminals (LTVIC); four (4) mergers concern horizontal integration (H), ten (10) mergers concern horizontal integration between liners with vertical effects as the engaged liners have interests in container terminals (HwV), and six (6) mergers concern conglomerate mergers (Con).[70] Finally, one (1) merger concerns horizontal and vertical integration (H&LTVI).

[69] Commission Consolidated Jurisdictional Notice under Council Regulation (EC) No 139/2004 on the control of concentrations between undertakings (2008/C 95/01).

[70] All conglomerate container terminal mergers concern non-European ports, therefore are not further mentioned.

Figure 5.1 Seaport container terminal mergers notified to the EC (1996 – 2017)



5.2.2.1 VERTICAL MERGERS BETWEEN CONTAINER TERMINALS AND LINER COMPANIES

In vertical mergers, the liner company (downstream firm) enters in a container terminal (upstream firm) which is used by the liner as a dedicated terminal or as a common user terminal meaning that it offers terminal services to the third liner companies as well. During the examined period, fifteen (15) vertical mergers between terminal operators and liner companies have been notified to the Commission. All of them concern joint ventures which involve directly or indirectly at least one liner company, creating a partially vertical integrated company: Maersk and its subsidiaries or members of the group (APMT, APMM and SOCIMAC), HAPAG LLOYD, PONL (which was acquired by Maersk in 2005), ZIM, Evergreen, Cosco, CMA CGM, MOL and MSC. Two (2) out of the fifteen (15) joint ventures involve two liner companies, both Maersk and Cosco.

Fourteen (14) vertical joint ventures should also be considered as horizontal mergers or vertical mergers with horizontal effects in the upstream market, as at least one notifying party, is a pure terminal operator too: ECT, HHLA, Eurogate, DPWL, HUTCHISON, QPGL, BOLLORE and PSA. There is only one joint venture between a liner company (MOL) and a non-terminal operator (Brookfield).[71] There is also a horizontal merger between container terminals which would be considered as vertical too, as the one container

[71] Case M.7192 - BROOKFIELD/MOL/ITI (05.03.2014). Brookfield is a global alternative asset manager with approximately $150 billion in assets under management. It has had over a 100-year history of owning and operating assets with a focus on property, renewable power, infrastructure and private equity. Brookfield is one of the three shareholders of Euroports Holding S.à.r.l. (EUROPORTS) which operates ports in Belgium, France, Germany, Spain, Finland, Bulgaria and Italy. The other two shareholders of EUROPORTS are Antin Infrastructure Partners ("Antin IP") and Arcus Infrastructure Partners (see the official site of EUROPORTS http://www.euroports.com/site/overview/structure, dated 19.08.2017).

terminal was jointly controlled by TIL (MSC) and after the merger both terminals are jointly controlled by TIL.[72]

Table 5.1 Seaport container terminal vertical mergers notified to the EC (1996–2017)

No.	Case	Decision Name	Date	Port	Country	Terminal	Way
1.	M.1674	MAERSK/ECT	27/09/99	Port Said	Egypt	Not Mentioned	Creation of JV for construction & operation
2.	M.2422	Hapag-Lloyd/Hamburger Hafen-Und Lagerhaus/HHLA-CTA	22/08/01	Hamburg	Germany	Altenwerder	Purchase of shares
3.	M.3576	ECT/PONL/EUROMAX	22/12/04	Rotterdam	The Netherlands	Euromax	Creation of JV for construction & operation
4.	M.5066	Eurogate/APMM	05/06/08	Wilhelmshaven	Germany	Jwp Ct	Purchase of shares
5.	M.5163	DPWL/ZIM/CONTARSA	27/06/08	Tarragona	Spain	Contarsa	Purchase of shares
6.	M.5398	HUTCHISON/EVERGREEN	17/12/08	Taranto	Italy	Tct	Share swap
7.	M.6017	APMT/DPW/COSCO/QPGL/QQCT	13/12/10	Qingdao	China	Qingdaoqianwan Container Terminal	Purchase of shares
8.	M.6019	APMT/BOLLORE/MERIDIAN PORT SERVICES	10/03/11	Tema Port	Ghana	Mps Container Terminal	Purchase of shares
9.	M.6030	BOLLORE/CMA CGM/TERMINAL DU GRAND OUEST	15/12/10	Nantes (Montoir)	France	Terminal Du Grand Ouest	Purchase of shares
10.	M.6120	APMT/PSA/COSCO/DPPC/DPCT	21/03/11	Dalian	China	Dalian Port Container Terminal	Purchase of shares
11.	M.6200	APMM/BOLLORE/DOUALA INTERNATIONAL TERMINAL JV	04/08/11	Duala	Cameroon	Duala International Terminal	Purchase of shares in a newly created company
12.	M.6328	SOCIMAC/BOLLORE/SOCIETE D'EXPLOITATION DU TERMINAL DE VRIDI	09/12/11	Abidjan	Ivory Coast	Abidjan Terminal	Purchase of shares
13.	M.6346	APMT/BOLLORE/CONGO TERMINAL	12/04/12	Pointe Noire	Congo	Congo Terminal	Purchase of shares
14.	M.7192	BROOKFIELD/MOL/ITI	05/03/14	Los Angeles & Oakland	USA	Not mentioned	Purchase of shares

[72] It is noted that TIL (Terminal Investment Limited) is a terminal operating company indirectly jointly controlled by MSC Mediterranean Shipping Company Holding SA and certain financial investment vehicles managed by Global Infrastructure Management, LLC and relevant funds controlled by Global Infrastructure Partners (see case M.8459 – TIL/PSA/PSA DGD (31.07.2017)).

15.	M.8459	TIL/PSA/PSA DGD	31/07/17	Antwerp	Belgium	Deurganckdok West	Purchase of shares

Source: Assessment based on DG Competition merger cases (http://ec.europa.eu/competition/elojade/isef/index.cfm?clear=1&policy_area_id=2)
** Document type is always "non-opposition".*
*** The control is always joint control.*

Concerning the method of transaction, the most popular way is the purchase of shares, although there is a case in which share swap exists (M.5398 - HUTCHISON/ EVERGREEN). All these transactions were notified to the Commission, as the control upon the target company is joint control, even in cases with minority shareholders. For example, in case M.2422, Hapag Lloyd acquired joint control of Altenwerder container terminal by obtaining just 25.1% of the shares and in case M.5066, Maersk acquired joint control of JWP CT container terminal by obtaining 30% of the shares. Concerning the timing, most of the notified transactions (nine cases) took place in the period 2008 – 2011.

Only seven (7) of the fifteen (15) notified vertical mergers concern terminals in ports of the European Union area. The rest of the mergers concern ports in the USA, Egypt, China (2 cases), Ghana, Cameroon, Ivory Coast and Congo.

All vertical container terminal mergers have the same direction concerning investments from liner companies to container terminals. Therefore, all vertical container terminal mergers reflect a backward vertical integration.[73]

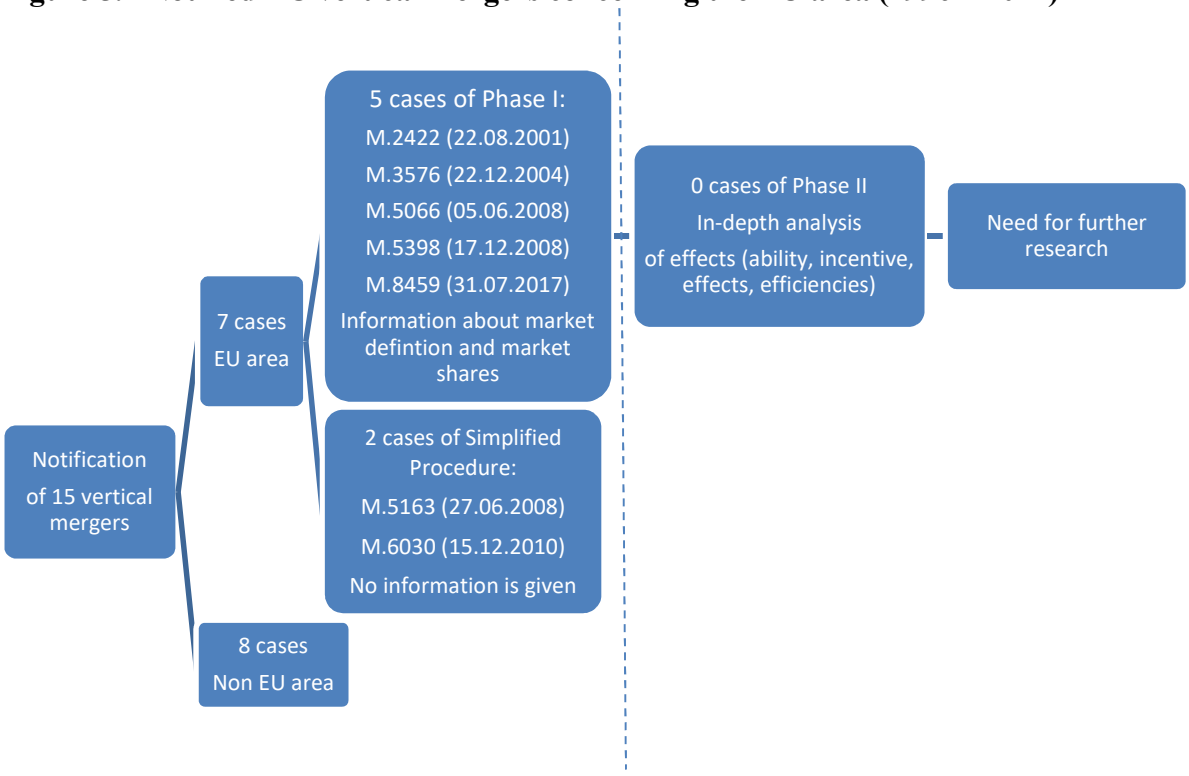
Concerning the assessment of competition effects, in general, the notified vertical mergers, as well as the horizontal with vertical effects mergers, do not raise any competition concerns due to the estimated limited market shares. Markets of container terminal services are considered as vertically affected if (i) one or both parties hold a 30% market share on the container terminal services market or the container liner shipping services market, and (ii) one or both parties are active on the respective upstream (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 a trade including the concerned terminal).[74]

In most of the EC decisions (nine cases), a simplified procedure has been applied. First phase procedure has been applied in six cases (five of them concern EU area). For three of

[73] For the distinction between forward and backward vertical integration see Chapter 3.
[74] See case M.7908 - CMA CGM/NOL (29.04.2016), p.34.

them, in particular those concerning the mergers of Euromax[75], JWPCT[76] and MPET[77] terminals respectively, a limited information is given.

Figure 5.2 Notified EC vertical mergers concerning the EU area (1996 – 2017)



Source: Assessment based on DG Competition merger cases (http://ec.europa.eu/competition/elojade/isef/index.cfm?clear=1&policy_area_id=2)

As shown in **Figure 5.2**, phase II procedure has not been applied to any case. Therefore, the related decisions do not provide extended information about the competition effects of the LTVIC. Even in a case with high market shares (M.8459), no competition concerns were raised.

5.2.2.2 HORIZONTAL MERGERS OF LINER COMPANIES WITH VERTICAL EFFECTS

Horizontal mergers with vertical effects, are the mergers between liner companies which affect the upstream market of container terminal services as the engaged in transactions

[75] Case M.3576 - ECT/PONL/EUROMAX (22.12.2004).
[76] Case M.5066 - Eurogate/APMM (05.06.2008).
[77] Case M.8459 - TIL/PSA/PSA DGD (31.07.2017).

liner companies operate, fully or partially, container terminals. These mergers concern mainly acquisitions. Although these cases do not demonstrate any competition concerns related to vertical integration, and therefore they do not include any specific analysis, they give significant information about the relevant market and the market shares in both upstream and downstream markets.

Table 5.2 Horizontal mergers of liner companies with vertical effects notified to the EC (1996 – 2017)

No.	Case No	Decision Name	Decision Date
1.	M.831	P&O/ROYAL NEDLLOYD	19/12/96
2.	M.3379	P&O/ROYAL NEDLLOYD/P&O NEDLLOYD	29/03/04
3.	M.3829	MAERSK/PONL	20/07/05
4.	M.7268	CSAV/HGV/KÜHNE MARITIME/HAPAG-LLOYD AG	11/09/14
5.	M.7523	CMA CGM/OPDR	29/06/15
6.	M.7908	CMA CGM/NOL	29/04/16
7.	M.8120	HAPAG-LLOYD/UNITED ARAB SHIPPING COMPANY	23/11/16
8.	M.8330	MAERSK LINE/HSGC	10/04/17
9.	M.8472	NIPPON YUSEN KABUSHIKI KAISHA / MITSUI OSK LINES / KAWASAKI KISEN KAISHA & JV	28/06/17
10.	M.8594	COSCO SHIPPING/OOIL	05/12/17

Source: Assessment based on DG Competition merger cases (http://ec.europa.eu/competition/elojade/isef/index.cfm?clear=1&policy_area_id=2)

5.2.2.3 HORIZONTAL CONTAINER TERMINAL MERGERS

Horizontal mergers in the upstream market of container terminal services are mergers between terminal operators. They may be joint ventures meaning that two terminal operators acquire joint control on a third company (target firm) which operates container terminal(s) or acquisitions, meaning that a terminal operator acquires the control of another terminal operator.

During the examined period three (3) upstream horizontal mergers have been notified: two (2) joint ventures and one (1) acquisition. One transaction would also be considered as a vertical merger as MSC, via TIL, is entering a second terminal in Antwerp by acquiring joint control.

The contribution of horizontal port mergers to our research is significant due to the second phase procedure of the JV.55, the unique second phase procedure in port mergers so far.

Table 5.3 Seaport horizontal container terminal mergers notified to the EC (1996 – 2017)

No	Case No	Decision Name	Decision Date	Document type	Port	Terminal	Category	Control	Way
1.	JV.55	HUTCHISON/ RCPM/ECT	03/07/01	Non-opposition with commitments	Rotterdam	Terminals in Rotterdam & other European ports (MAERSK DELTA, EUROMAX, MAASVLAKTE ETC)	JV	JOINT	Through a single-purpose holding company
2.	JV.56	HUTCHISON/ ECT	29/11/01	Non-opposition with commitments	Rotterdam		ACQ/TION	SOLE	Purchase of shares
3.	M. 5581	EUROPORTS HOLDINGS/BENELUX PORT HOLDINGS	19/08/09	Non-opposition			ACQ/TION	SOLE	Purchase of shares
4.	M.8459	TIL/PSA/PSA DGD	31/07/17	Non-opposition	Antwerp	DEURGANCKDOK WEST	JV	JOINT	Purchase of shares

Source: Assessment based on DG Competition merger cases (http://ec.europa.eu/competition/elojade/isef/index.cfm?clear=1&policy_area_id=2)

5.3 METHODOLOGY OF EVALUATION PROCEDURE

In the evaluation procedure of container terminal mergers, the Commission follows the standardised procedure. Specifically, the followed methodology in evaluation of notified mergers by the Commission consists of three parts: (a) market definition, (b) calculation of market shares, and (c) assessment of transaction competition effects, only in cases that the market shares of the parties raise competition concerns.[78]

As mentioned above, the provided information of vertical mergers, as well as the horizontal mergers with vertical effects is limited, not only because they are few, but also because they do not raise any competition concerns. The provided information concerns market definition and calculation of market shares. Such information is also given by horizontal mergers.

5.3.1 MARKET DEFINITION

In order for the Commission to appraise concentrations within the scope of the Merger Regulation, it has to assess whether or not a concentration would significantly impede effective competition, in particular as a result of the creation or strengthening of a dominant

[78] For more details see "Guidelines on the assessment of non-horizontal mergers under the Council Regulation on the control of concentrations between undertakings", 2008/C 265/07. All references to Article 82 EC have been replaced to the current Article of 102 of the Treaty on the Functioning of the European Union, as renamed by the Treaty of Lisbon, which entered into force on 1 December 2009.

position in the common market or a substantial part of it. The Commission has therefore to estimate the market shares of the notifying parties in the relevant market before and after the merger. Consequently, the Commission first defines the relevant market(s) (which includes the geographic market(s)) in which the notifying parties operate and will operate after the merger.

A relevant product market comprises all those products and/or services which are regarded as interchangeable or substitutable by the consumer, by reason of the products' characteristics, their prices and their intended use. The relevant geographic market comprises the area in which the undertakings concerned are involved in the supply and demand of products or services, in which the conditions of competition are sufficiently homogeneous and which can be distinguished from neighbouring areas because the conditions of competition are appreciably different in those areas. The relevant market is therefore established by the combination of the product and geographic markets.[79] Firms are subject to three main sources or competitive constraints: demand substitutability, supply substitutability and potential competition.

The Commission in order to define markets, including the geographic dimension, reviews the previous relevant cases and uses the following evidence: (a) past evidence of diversion of orders to other areas, (b) basic demand characteristics, (c) views of customers and competitors, (d) current geographic pattern of purchases, (e) trade flows / pattern of shipments.

5.3.1.1 RELEVANT PRODUCT/SERVICE MARKET

In the Commission's merger decisions, the product market of container terminal services has been defined as involving the loading, unloading, storage, and land-side handling ("stevedoring") for inland transportation of containerised cargo.[80] The Commission considers this market as distinct, as vessels carrying non-containerised cargoes and short-sea vessels have other requirements with regard to services and facilities than deep-sea container vessels. It is added that similarly, while it is customary to distinguish between

[79] For more details see the Commission Notice on the definition of relevant market for the purposes of Community competition law (97/C 372/03).

[80] See cases JV.55/2001, JV.56/2001, M.3576/2004, M.5066/2008, M.5398/2008, M.7268/2014, M.7523/2015, M.7908/2016, M.8120/2016, M.8459/2017.

different container traffic flows, the stevedoring service provided in respect of these different traffic flows is essentially the same.[81]

With respect to deep-sea traffic, a delineation of container terminal throughput has been envisaged as follows: (a) hinterland traffic, that is, containers transported directly onto/from a container vessel from/to the hinterland (via barge, truck or train), and (b) transhipment traffic, that is, containers destined for onward transportation to other ports. Transhipment traffic involves both feeder and relay movements. According to the Commission, there is insufficient evidence to justify a further breakdown of the transhipment market into discrete feeder and relay markets.[82,83]

In the Commission's decisions the product market for the provision of container liner shipping involves the provision of regular, scheduled services for the carriage of cargo by container and is distinguished in deep-sea and short-sea services. Container liner shipping services is distinguished from tramp shipping services because of regularity and frequency of the service. In addition, the use of container transportation separates it from other non-containerised (bulk) transport.[84,85]

5.3.1.2 GEOGRAPHIC MARKETS

According to the Commission, the relevant geographical dimension of container terminal services is determined by the geographic scope that the terminal generally serves

[81] See cases JV.55 - HUTCHISON/RCPM/ECT (03.07.2001), M.5093 - DP World/ Conti 7/Rickmers/DP World Breakbulk (18.11.2008), M.8459 - TIL/ PSA/PSA DGD (31.07.2017).

[82] See case JV.55 - HUTCHISON/RCPM/ECT (03.07.2001).

[83] According to the Commission in case JV.55, p.11 *"OSC distinguishes between the hub and spoke (that is to say, feeder) and relay sectors, but acknowledges that the two areas are blurred and that statistics are not fully comprehensive. This is confirmed by the Commission's own investigation, which has shown that individual operators (shipping lines and terminal operators) have differing interpretations of the terms feeder and relay. The investigation also shows that most terminal operators currently have difficulty in identifying and quantifying feeder and relay flows so that it could reasonably be argued that they would have difficulty in price discriminating between the two, should they wish to do so".*

[84] A possible narrower product market is that for the transport of refrigerated goods, which could be limited to reefer containers only or could also include transport in conventional reefer vessels. According to the Commission's decisional practice, in trades with a share of reefer containers in relation to all containerised cargo below 10% in both directions, transport in reefer containers is not assessed separately, but as part of the overall market for container liner shipping services (see case M.3829 - MAERSK/PONL (29.07.2005) par. 10).

[85] Nine (9) years later, the Commission's market investigation yielded mixed results concerning the definition of a narrower market for the transport of refrigerated goods. For more details see case M.7268 - CSAV/HGV/Kühne Maritime/Hapag-Lloyd AG (11.09.2014).

(catchment area). For example, that can be in its broadest scope regions, such as Northern Europe (for transhipment traffic), and in its narrowest possible scope the catchment area of the ports in a certain range, such as Hamburg-Antwerp (for hinterland traffic) or possibly even narrowed down to comprising ports of a single member state (such as Germany) only.[86] Recently, in 2017,[87] the Commission concluded that the relevant geographic market concerning transhipment would comprise at the very least the Hamburg-Le Havre range. The geographic market of container terminal services is never limited to individual ports,[88] even in a case concerning intraport merger.[89]

5.3.2 CALCULATION OF MARKET SHARES

Concerning the market shares estimation, the Commission in addition to the market shares when sole control exists (in capacity, throughput or even port calls[90]), considers that the capacity of a terminal has been apportioned between the owners in relation to their respective shareholdings when joint control exists.[91] Moreover, the Commission does not calculate the shares of minority shareholdings in case that they are not accompanied by joint control.[92]

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[86] See for example case M.5066 - EUROGATE/APMT (05.06.2008).
[87] Case M.8459 - TIL/PSA/PSA DGD (31.07.2017).
[88] There are port services such as towage which may have as geographic market a single port. In case M.3829 - MAERSK/PONL (20.07.05) par. 24, the notifying parties submitted that there is a separate market for harbour towage services and that its geographical dimension may be limited to a single port, even though there is likely to be competitive pressure from companies active in neighbouring ports as at least container carriers generally consider ports in a geographic range to be substitutes for one another. Nevertheless, such services are excluded from our analysis as they usually are not provided by the terminal operators.
[89] Case M.8459 - TIL/PSA/PSA DGD (31.07.2017).
[90] See case JV.55 - HUTCHISON/RCPM/ECT (03.07.2001) par. 60-62, where is mentioned that: *"Another indication of the parties market strength is provided by their high share of port calls by the major liner services on the Northern Europe Far East and Transatlantic trades".*
[91] See case JV. 55 - Hutchison/RCPM/ECT (03.07.2001) par. 72, where the Commission considers that the capacity in the year 2000 relating to the Maersk Delta terminal in the port of Rotterdam has been apportioned between the owners, Maersk and ECT, in relation to their respective shareholdings of Maersk 66.6% and ECT 33.3%. This allocation reflects the fact that although ECT has a minority shareholding it has joint control through veto rights in respect, inter alia, of pricing and a non-compete clause which ensures that Maersk Delta cannot compete with ECT for third part business before the year 2007. The Maersk portion should be regarded as captive capacity, on the basis that the terminal will be dedicated exclusively to Maersk Sealand until 2007. It should therefore be excluded both from the ECT market share and from total throughput. The ECT portion, which does not constitute captive capacity for ECT as ECT is a pure terminal operator, has been added to ECT capacity.
[92] In case M.3576 - ECT/PONL/EUROMAX (22.12.2004), is mentioned that there are not sufficient elements to establish that the acquisition of 25% by P&O in Royal Nedlloyd will give rise to a concentration under the Merger Regulation. Consequently, it must be assumed that P&O, which has interests in the ports of Le Havre (joint venture), Southampton (51%), in a terminal operator in Tilbury (34%), in the Antwerp Gateway

According to the Commission, in general, where integration exists between supplier and purchaser (intra-group supplies), the production in question (captive production) should not be included in the relevant market for the purpose of assessing market shares.[93] If captive production can be switched to non-captive production within the short-to-medium term, it may constitute potential competition. Concerning the container terminals and by answering parties' arguments that captive production and capacity should be including in the market as it (a) provides indirect competition through its benchmarking effect on prices, and (b) represents potential competition, the Commission considers that the prices set for captive production (internal sales) is unlikely to have a benchmarking effect, inasmuch as they are unlikely to be transparent and given that in-house pricing follows other principles than market pricing, that is to say, generally lower prices are set for inhouse sales.[94] It follows that even if competitors were in the unlikely position of being able to obtain information about the in-house prices, they could not readily determine the market prices the captive producer would have to ask. With regard to terminals with captive production, the benchmarking effect, if any, would be extremely limited, especially in a case of a captive producer which does not have sufficient capacity available to cater for third party needs.

Concerning the arguments that captive capacity represents potential competition, the Commission takes the view that conversion of captive production to third-party production in response to a price increase at competitive terminals is unlikely to occur to any significant extent. Displacement of liners' volumes from their hub port to other ports, even though assuming that this would be feasible in order to make available further capacity for third parties would cause liners serious inconvenience and cost to their liner shipping operations. This inconvenience and cost are likely to outweigh any benefit liners might derive from increased revenue from the provision of services to third parties. Nor is there any evidence that the capacity of a terminal could be expanded at short notice in order to

(67.5%) and in the port of Marseille (joint venture), has no controlling influence on PONL. P&O's container terminal activities can thus not be added to the parties' activities when examining their market power.

[93] See the Commission Consolidated Jurisdictional Notice under Council Regulation (EC) No 139/2004 on the control of concentrations between undertakings (2008/C 95/01) par. 167-168.

[94] The Commission considers that it is common practice within corporate groups to invoice internal services at cost price with no, or only an insignificant, mark-up.

meet increased demand from third parties.[95] Therefore, the Commission adopts notifying parties' estimations when they provide their respective annual market shares based on total non-captive capacity and throughput (i.e. volumes available for third parties) as well as on the total operational capacity and throughput (i.e. by allocating of 100% of the non-captive throughput and capacity in jointly controlled terminals to each controlling partner).[96] In other cases, the Commission estimates the market shares in two ways: excluding and including market shares in broad and narrower market definitions.[97]

According to the liner companies' alliances, the Commission has found that alliance members cannot be seen as captive customers of a terminal in which an alliance member have interests, even though based on shareholders' agreement all of the terminals' capacity is dedicated to the liner shareholder and its alliance partners.[98]

Finally, the Commission in most of the merger cases, states that it is not necessary to conclude on a precise definition of the relevant product and geographic market.[99]

5.3.3 ASSESSMENT OF COMPETITION EFFECTS

During the assessment of the above-mentioned notified mergers, the Commission found that the market shares of liners on container terminals are not high enough to raise competition concerns. Therefore, the given analysis on assessment of competition concerns by the EC merger cases is limited, as no case has been examined under the phase II procedure. A very limited analysis is met in cases in which phase I has been applied.[100] Consequently, there is no reference to the efficiencies gained by the vertical integration, as the efficiencies' analysis follows the concerns' analysis.

Therefore, by examining the merger cases it is concluded that the Commission considers that the operation of joint ventures between liners and terminal operators, will not significantly affect competition in the liner shipping market as the estimated market shares

[95] For more details see case JV.55 - HUTCHISON/RCPM/ECT (03.07.2001).
[96] For more details see case M.5066 - EUROGATE/APMM (05.06.2008).
[97] For more details see case M.3829 - MAERSK/PONL (20.07.2005).
[98] See case M.3576 - ECT/PONL/EUROMAX (22.12.2004).
[99] See case M.8459 - TIL/PSA/PSA DGD (31.07.2017), when the Commission mentions that the merger would not raise serious doubts as to its compatibility with the internal market under any of the plausible definitions of the markets for container terminal services.
[100] See cases M.3576 - ECT/PONL/EUROMAX (22.12.2004), M.5066 - EUROGATE/APMM (05.06.2008) and M.8459 - TIL/PSA/PSA DGD (31.07.2017).

of the notifying parties are not indicative of dominance in container terminal services and therefore will not enable the engaged liner company to foreclose competing carriers from the access to stevedoring services in the relevant markets.[101] Furthermore, the Commission considers that a creation of a new terminal will free capacities of the existing terminals in the same relevant market and when determining the extent to which input foreclosure may occur, it must be taken into account that the decision of the merged entity to rely on its upstream division's supply of inputs may also free up capacity on the part of the remaining input suppliers from which the downstream division used to purchase before.[102]

Competition concerns are not raised even in horizontal cases with vertical effects as the Commission also finds that the market shares are not high enough to affect competition.

However, even in a case of high shares, the Commission considers that the merger will not lead to any foreclosure of competing container liner shipping companies. In particular, the Commission states that it seems highly unlikely that the resulting vertically affected markets for container liner shipping services will lead to foreclosure of competing container liner shipping companies, despite the engaged liner's and its consortia partners' high market shares on certain trades to and from Northern Europe for the following reasons:[103] First, any high market share of the liner company (MSC in that case), including its consortia partners as the case may be, on an affected leg of trade does not mean that it can foreclose the remaining container liner shipping companies active on that trade because it has also a substantial market share in the market for terminal services in a given harbour. Instead, competing container liner shipping companies serving Northern Europe as one relevant end of a trade could procure port terminal services from several alternative providers in the Hamburg-Le Havre range, in particular from terminals in the port of Rotterdam, the closest competitor of the port of Antwerp, and to some extent the port of

[101] For more details see cases M.3576 - ECT/PONL/EUROMAX (22.12.2004), M.5066 - EUROGATE/APMM (05.06.2008), M.3379 - P&O/ROYAL NEDLLOYD/P&O NEDLLOYD (29.03.2004), M.7268 - CSAV/HGV/KÜHNE MARITIME/HAPAG-LLOYD AG (11.09.2014). Specifically in the case M.5066 the Commission states that shipping lines competing with APMM and its consortium partners will not be foreclosed from the access to the relevant port terminal services as a result of the creation of JWPCT, not only as the market share of the JWP CT will be [0-10]% with respect to the non-captive capacity (on any geographic ranges), and around 14% with respect to the total operational capacity, but also as APMM will have joint control (and obviously not sole) over JWPCT.
[102] See case M.3576 - ECT/PONL/EUROMAX (22.12.2004).
[103] See case M.8459 - TIL/PSA/PSA DGD (31.07.2017).

Zeebrugge. Second, even in the port of Antwerp four container terminals remain which are not controlled by the vertically integrated liner company (MSC). Furthermore, the port of Antwerp had already started an expansion project, the "Saeftinghe" terminal project, which was foreseeing the building of a new dock just north of Deurganckdok which would add a capacity of 6 to 7 million TEUs. This new dock would be able to accommodate mega vessels of 18,000 TEUs. However, according to the Commission, this expansion project was in its very early stages and would not be completed in the near future. The Commission adds that other ports in the region, including Rotterdam, also had expansion plans, which according to Dynamar would increase container terminal capacity in Northern Europe from 86 million TEUs as of the end of 2014 to nearly 143 million TEUs by the end of 2024.

According to the Commission's assessment, the transaction will not raise competition concerns in the market of container terminal services within the Hamburg-Le Havre range, nor under any of its narrower plausible (product or geographic) market definitions. First, four container terminals in the port of Antwerp were already prior to the transaction under the control of one of PSA DGD's parents, PSA. Common ownership of these terminals is therefore not "merger-specific". By the same token, already prior to the transaction, there was a link between PSA and TIL via MPET for both the port of Antwerp and the Hamburg-Le Havre range. Second, the market share increment brought about by the transaction is very small and comes solely from PSA DGD, as MPET was prior to the transaction already under joint control of the PSA and TIL (MSC). The increment under any of the plausible market delineations, including the narrowest market limited to the port of Antwerp remains always negligible and, in any case, below [0-5%].

Third, a market limited to the port of Antwerp only appears unduly narrow and unwarranted. A market definition limited to a single port clearly runs counter to the Commission's established decisional practice and was not upheld by the market investigation in this case either. The majority of respondents to the Commission's market test stated that at least the port of Rotterdam, which is also bigger and has correspondingly higher container throughput than the port of Antwerp, constitutes a valid alternative (in 2016 the container throughput of the port of Rotterdam was 12,385,168 TEUs, whereas the port of Antwerp handled containers of 10,037,341 TEUs). The Commission adds that if the assessment is based on a larger, regional market including the port of Rotterdam, the market

share would go down to [30-40%], with an increment of [0-5%]. On a market comprising the entire Hamburg-Le Havre range, the combined market share of the parties would be [20-30%] with an increment of [0-5%]. In the Hamburg-Le Havre range, there will remain numerous other credible competitors to the parties, such as Hutchinson in Rotterdam with a [10-20%] market share, HHLA in Hamburg with a [10-20%] market share, Eurogate (Bremerhaven, Hamburg, Wilhelmshaven) with a [10-20%] market share and APM Terminals (Bremerhaven, Wilhelmshaven, Rotterdam and Zeebrugge) with a [10-20%] market share.

Fourth, the customers of the terminal operators are global shipping companies such as Maersk, Hapag Lloyd, Hamburg Süd, OOCL, CMA CGM, bring in significant volumes which affords them significant bargaining power vis a vis the terminal operators and in particular in case of a threat of price increase. The bargaining power of container liner companies has even increased since most of them are part of consortia and global alliances. In this respect there is a certain grouping in the port of Antwerp. While the Ocean Alliance (CMA CGM/APL, Cosco, Evergreen) is using Antwerp Gateway as its main gateway, with two of its members, Cosco and CMA CGM having equity stakes in that terminal, THE Alliance (Hapag Lloyd, Yang Ming and One: MOL, NYK and K Line) uses the Noordzee/Europa terminals and 2M (Maersk and MSC) uses MPET and PSA DGD. Fifth, given that MPET was until now a non-full function joint venture, realising more than [≥80%] of its turnover with one of its ultimate parent companies, MSC, its market presence and therefore market shares have been significantly overstated as they include captive sales. Therefore, MPET's market share is likely to be substantially lower if these captive sales are excluded. Lastly, the majority of the respondents to the market investigation confirmed that the transaction will not change the competitive situation on the market for the provision of container terminal services.

5.4 THE *EX POST* ASSESSMENT OF COMPETITION EFFECTS

As already mentioned, the *ex post* assessment of vertical integration is carried out after a complaint or ex officio. In that case the Commission examines if there is any infringement according to the Articles of the Treaty 101, 102 (formerly Articles 81 and 82 and before

that 85, 86). Article 101 prohibits cartels and article 102 prohibits abuse of dominant position.

According to our research there isn't any antitrust or cartel case in the market of container terminal services, all the more so, there isn't any case concerning a vertically integrated container terminal in EC level for the examined period.[104,105] Specifically, there isn't any complaint of liner companies against terminal operators for excessive price of container terminal services, input or customer foreclosure, or collusion between container terminal operators in EC level.

Certainly, the absence of complaints does not mean that competition works. Increased terminal prices may, under special circumstances, benefit integrated or non-integrated liner companies. In addition, there are industry sectors in which collusion practices in the upstream market have been identified without the existence of any complaint. Such an example is the case of the car makers in Japan, which never report or complain about the price fixing and bid rigging of their suppliers.[106]

Furthermore, in practice, even if an increased price in terminal services exists, it is very difficult to find enough evidence to prove excessive pricing or foreclosure. For instance, in the two cases of the coastal shipping port of Helsingborg, the Commission, despite an extensive analysis, concludes that, there is not sufficient evidence that the port of Helsingborg charges prices that would have *"no reasonable relation to the economic value"* of the service provided.[107]

5.5 CONCLUSIONS

The Commission's *ex ante* approach in assessing competition effects of LTVI gives useful, but limited information. Firstly, the notified mergers are much fewer than the actual

[104] There are also some state aid cases which give limited information about the market structure of container terminal services. Such cases are a) State aid SA.44846 - Germany Investment aid for Berth 9 in Cuxhaven port (20.04.2016), b) State aid N 110/2008 - Germany - Port infrastructure - Public financing of the JadeWeserPort Project (10.12.2008), c) State aid SA.35905 (2016/C) (ex 2015/NN) (ex 2012/CP) – Belgium - Concessionaires active in the Port of Antwerp (without final decision yet).

[105] There is a complaint case of 1993 concerning the refusal to grant access to an essential facility or a network by a vertical integrating company which is active in both levels of passenger port and ferry transport services. It is the case IV/34.689 - Sea Containers v. Stena Sealink - Interim measures (21.12.1993).

[106] See Gu et al. (2018 and 2019) and also case AT.39748 – Automotive Wire Harnesses (10.07.2013).

[107] See cases A.36.568/D3 - Scandlines Sverige AB v Port of Helsingborg (23.07.2004) and A.36.570/D3 - Sundbusserne v Port of Helsingborg (23.07.2004).

mergers that have taken place into the Hamburg – Le Havre port range. This happens because not all transactions-including vertical transactions-are notified to the Commission, either because they are not considered as mergers according to the European law[108] or they are non-notified mergers. Specifically, there is a gap of vertical mergers' decisions (phase I) between 2008 and 2017. During this period not only, a lot of vertical mergers have taken place, but also the whole market changed dramatically. Secondly, the unnotified mergers are never assessed, as during the assessment of a notified merger every previous integration is considered as not 'merger specific'. Thirdly, an in-depth analysis (phase II) has not been applied to any case, due to the absence of competition concerns. The EC in-depth analysis is significant as it assesses the procompetitive and the anticompetitive effects of the proposed merger (ability, incentive, effect).

Specifically, only fifteen (15) container seaport vertical mergers have been notified to the EC during the examined period, seven (7) of them concern ports within the EU area and all of them are cleared under simplified or phase I procedure. Therefore, the given information is limited to the type of vertical integration, method of transaction, market definition and calculation of market shares. All of them concern partial and backward integration while the most common way of transaction is the purchase of shares. Competition concerns are not raised even in a case with high market shares which took place at the port of Antwerp.

In addition, there isn't any *ex post* assessment of the effects of vertical integration, due to the absence of relevant complaints in EC level. Therefore, the competition effects (procompetitive[109] and anticompetitive) of the liner-terminal vertical integration have not been estimated. Certainly, the absence of complaints, as shown by other sectors, does not mean that competition works.

[108] See Regulation 139/2004 on the control of concentrations between undertakings and Commission Consolidated Jurisdictional Notice under Council Regulation (EC) No 139/2004 on the control of concentrations between undertakings (2008/C 95/01).
[109] It is noted that procompetitive effects are also estimated in case of competition concerns.

Annex

Table 5.4 The Commission's upstream relevant market definition for the period 2001 - 2017

Definition	Cases
The service market of container terminal services involving the loading, unloading, storage, and land-side handling ("stevedoring") for inland transportation of containerised cargo concerning the deep-sea container vessels. It is distinguished in hinterland and transhipment traffic.	JV.55/2001, JV.56/2001, M.3576/2004, M.5066/2008, M.5398/2008, M.7268/2014, M.7523/2015, M.7908/2016, M.8120/2016, M.8459/2017

Table 5.5 The Commission's geographic market definition for Northern European ports

Year	Hinterland Market Definition	Transhipment Market Definition	Case
1999		The United Kingdom and Rotterdam container terminals belonged to the same geographic market concerning "the provision of stevedoring services to deep-sea container ships in Northern Europe".	M.1412
2001	A number of discrete regional hinterland markets within Northern Europe: (a) North Continent West: terminals range Rouen-Amsterdam (with competitive pressures primarily focused between Antwerp and Rotterdam, and additional capacity at Le Havre); (b) North Continent East: terminals range Bremerhaven - Hamburg; (c) The United Kingdom/Ireland market: encompasses the British Isles and includes the major United Kingdom gateway terminals (Felixstowe, Southampton and Thamesport); (d) Scandinavia/ Baltic market; the volumes involved do not however, as a rule, justify a direct call (an exception being the port of Gothenburg).	Gothenburg- Le Havre port range including Felixstowe, Thamesport and Southampton. Specifically, the relevant market of all main deep-sea ports in the Gothenburg- Le Havre range consists of the terminals: Hutchison Felixstowe, Hutchison Thamesport, ECT Rotterdam, Hessenatie Antwerp, Hessenatie Zeebrugge, Eurogate Bremerhaven and Eurogate Hamburg.	JV.55/2001, JV.56/2001
2001	-	Northern European port range	M.2422/2001
2004	Hamburg – Antwerp or Hamburg Le Havre	Northern European port range, i.e. all deep-sea ports in the Le Havre Gothenburg range including the ports in the UK and Ireland	M.3576/2004

2008	The port range Hamburg – Antwerp or the German ports	The market investigation has indicated: Hamburg – Antwerp port range or Northern European port range. Therefore, the geographic market definition was left open.	M.5066/2008
2014	Hamburg – Antwerp or German ports	Northern European ports	M.7268/2014 (VE)
2015	Hamburg – Antwerp or German ports	Northern European ports	M.7523/2015 (VE)
2016	Hamburg – Antwerp or German ports	Northern European ports	M.7908/2016 (VE)
2016	Hamburg – Antwerp range or German ports	Northern European ports	M.8120/2016 (VE)
2017	Open[110]	Open	M.8330/2017 (VE)
2017	Antwerp – Rotterdam or Hamburg – Le Havre range	Hamburg – Le Havre range	M.8459/2017

**VE: Vertical effects*

Table 5.6 The Commission's calculation of market shares

Year	Methodology	Case
2001	o The liner companies' portion is excluded from market shares as it is regarded as captive throughput. o The capacity relating to the Maersk Delta terminal in the port of Rotterdam has been apportioned between the owners, Maersk and ECT, in relation to their respective shareholdings of Maersk 66.6% and ECT 33.3%. This allocation reflects the fact that although ECT has a minority shareholding it has joint control. o The statistics provided by terminal operators count each transhipment container as two moves and each hinterland container as one move. o The Commission adopted the OSC's estimations for transhipment throughput. o The Commission recognises that terminal and port capacity statistics do not distinguish between hinterland capacity and transhipment capacity. These statistics can therefore provide at best only a very imperfect indication of the parties' current position and possible future position on the transhipment market. herefore, the Commission examines shares in throughput and capacity terms.	JV.55
2001	o The parties have submitted a preliminary overview of year 2000 transhipment traffic, prepared by OSC for the purpose of this notification. According to this overview, the parties have a combined market share of over 40%. The Commission considered that this share could be questioned.	JV.56

[110] The Commission considers that: *"it is not necessary to conclude on a precise definition of the relevant product and geographic market since the Transaction would not raise serious doubts as to its compatibility with the internal market under any of the plausible definitions of the markets for container terminal services".*

2004	○ The Commission does not include the shares of minority shareholdings in case that they are not accompanied by joint control. It is mentioned that there are not sufficient elements to establish that the acquisition of 25% by P&O in Royal Nedlloyd will give rise to a concentration under the Merger Regulation. Consequently, it must be assumed that P&O, which has interests in the ports of Le Havre (joint venture), Southampton (51%), in a terminal operator in Tilbury (34%), in the Antwerp Gateway (67.5%) and in the port of Marseille (joint venture), has no controlling influence on PONL. P&O's container terminal activities can thus not be added to the parties' activities when examining their market power. ○ Contrary to the parties' opinion, the Commission mentions that alliance partners of a shipping line engaged in a terminal operation cannot be seen as captive customers of the terminal. Commission firstly based on an agreement that partners are not obliged to use the terminal and secondly that the terminal is not solely but jointly controlled by the liner company PONL and the terminal operator ECT.	M.3576
2005	○ The market shares of the notifying parties are estimated for hinterland and transhipment traffic, for wider or narrower market definition, including and excluding the captive volumes. Therefore, market shares are calculated on throughput basis. New terminal developments within the market are considered.	M.3829
2008	○ The parties have provided their respective market shares in 2006 based on total non-captive capacity and throughput (i.e. volumes available for third parties) as well as on the total operational capacity and throughput (i.e. by allocating of 100% of the non-captive throughput and capacity in jointly controlled terminals to each controlling partner). This method is used as although it overstates the market power of each partner, it provides the worst case scenario for the market power of each of the parties, as it assigns them the control over the full capacity of each joint venture in which they are involved. ○ The Commission notes that only capacity figures were used for the calculations, both for 2006 and 2014, in order to have a common base for comparison and to eliminate the unpredictable element of throughput for 2014, the year that the terminal will become fully operational.	M.5066
2017	○ The Parties' market shares were calculated on the most conservative basis, i.e. on a non-equity allocated basis (taking into account the Parties' controlling stakes in full), including captive sales, and spare capacity and were calculated in TEUs, based on the Commission's decisional practice.	M.8459

**OSC: Ocean Shipping Consultants Ltd.*

CHAPTER 6:

CRITICAL ASSESSMENT OF THE EC MERGER DECISIONAL PRACTICE

6.1 INTRODUCTION

The European Commission, in its *ex ante* assessment of notified vertical mergers between liners and terminals has not applied an in-depth analysis (phase II) to any case, due to the absence of competition concerns. The absence of competition concerns is a result of the estimated low market shares. But are the real market shares so low? This chapter deals with the definition of the relevant market and the methodology of the market shares calculation in the market of container terminal services. In addition, it discusses the problems with the relevant market definition and therefore, the market shares' calculation of the downstream market of container liner shipping services. Furthermore, it describes the potential competition effects that would have been examined by the Commission in case of a phase II assessment.

6.2 DEFINITION OF RELEVANT MARKETS OF CONTAINER TERMINAL SERVICES AND DEEP-SEA CONTAINER LINER SHIPPING SERVICES

Concerning the definition of relevant market, the traditional considerations should be revised accordingly to the evolution of technology and to the new practices of both liner shipping and container terminals. Not only all container terminals in the same geographic market are not substitutes, but also not all liners which call at the same terminal are rivals. Additionally, the geographic dimension of the container terminal services market is a debate.

Specifically, the Commission distinguishes the container terminal services for deep sea traffic in hinterland and transhipment services markets. In general, hinterland and transhipment services are not so distinct, as ships call at a terminal in order to unload/load both hinterland and transhipment traffic containers, and also terminals can serve both hinterland and transhipment traffic. The difference between these two services is that two movements are calculated in transhipment traffic and therefore the terminal's throughput is increased. Moreover, as mentioned by the Commission, liner companies choose as a

transhipment port, a port which has sufficient hinterland volumes to justify a direct call by a container liner shipping service.[111] Therefore, the distinction between hinterland and transhipment container terminal service is important in geographic areas in which 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 aren't any efficient inland connections. In port ranges such as Rotterdam – Le Havre the distinction between hinterland and transhipment traffic is not applicable. In addition, the creation of hub and spoke networks of liners indicates that the transhipment traffic includes feeder traffic and the container terminal services cannot be distinguished to deep sea and feeder traffic services.

Recent technological developments in both ships and ports, indicate that the best distinction between container terminals should be made according to their size (quay length, depth), capacity and hinterland connections, as all container terminals are not substitutes. Large container terminals can serve mega ships, as well as feeder or short sea vessels, although the reverse is not true. The capable terminals to handle ships of 18,000 TEUs and more, would be defined as a submarket.[112] In addition, there are smaller terminals which serve only shortsea, feeder and barge sector. In October 2015 the ECT Home / City terminal in Rotterdam announced its closure as it wasn't capable of handling the new big ships.[113]

There are cases in which the Commission recognises the differences between terminals. Specifically, the Commission considers as another indication of the parties market strength, their high share of port calls by the major liner services on the Northern Europe - Far East and Transatlantic trades, not only because these trades are estimated to account for almost three quarters of total Northern European container trade, but also because these services deploy the newest and largest vessels.[114] In addition, a recent Commission's market investigation[115] shows that Zeebrugge is one of the least preferred alternatives amongst the

[111] Case JV.55 - HUTCHISON/RCPM/ECT (03.07.2001).
[112] At the start of this century the world's largest box ship was Maersk's "Cornelius Maersk", measuring 8,200 TEUs. In 2015, a vessel with nearly 2.5 times that capacity was delivered: UASC's 19,900 TEUs "Barzan" Container (Throughput & Terminal Capacity in North Europe II, Dynamar B.V. April 2015: https://www.dynamar.com/system/table_of_contents/140/original/Terminals%20North%20Europe%20II%20-%20Contents%20Overview%20and%20Preface.pdf).
[113] Source: http://abe2010.weebly.com/news/einde-van-de-ect-home-terminal, dated 02.10.2015.
[114] Case JV.55 - HUTCHISON/RCPM/ECT (03.07.2001).
[115] See case M.8459 - TIL/PSA/PSA DGD (31.07.2017).

respondents to the market investigation, due to hinterland connection issues and (related) cost considerations, size-related capacity constraints, draught restrictions for large vessels and customer preference for Antwerp and Rotterdam.

6.2.1 GEOGRAPHIC DIMENSION OF CONTAINER TERMINAL SERVICES MARKET

The geographic dimension of the container terminal services market changes. In 1999, concerning the transhipment traffic, the Commission considers that the United Kingdom and Rotterdam container terminals belong to the same geographic market.[116]

Two years later, the Commission notes that OSC's[117] Northern European regional hinterland markets are confirmed by the service patterns of the main liner companies and alliances, which generally provide for at least one direct call in each of the main hinterland regions: a. port range between Rouen and Amsterdam, b. the ports of Bremerhaven and Hamburg, c. United Kingdom gateway terminals (Felixstowe, Southampton and Thamesport), and d. Baltic market.[118] In 2008, the Commission considers that the German ports could be a distinct market for hinterland traffic, as they *"have generally the highest terminal handling charges, significantly higher than Rotterdam and Antwerp",* without any reference to the reasons of such difference in charges.[119]

In 2017 the Commission considers as a distinct market for both hinterland and transhipment market the Hamburg – Le Havre port range.[120] Nevertheless, liners' practices indicate that the market may be defined narrower. For example, in the same ship's schedule (MAERSK LOTA), Maersk provides a call at a port of Netherlands (Rotterdam/APM 2 Terminal Maasvlakte II), a call at a port of Germany (Bremerhaven/NTB North Sea Terminal), a call at a port of Belgium (Antwerp/MPET terminal) and a call at a port of France (Le Havre/Porte Oceane Terminal).[121] How can it be explained that the company provides four

[116] In case COMP/M.1412 – HUTCHISON WHAMPOA/RMRM/ECT. Finally, on 30 July 1999, the notifying parties informed the Commission that they withdrew their notification.
[117] Ocean Shipping Consultants Ltd (OSC).
[118] Case JV.55 - HUTCHISON/RCPM/ECT (03.07.2001). It is noted that ECT provides stevedoring services at certain European ports, foremost Rotterdam.
[119] Case M.5066 - EUROGATE/APMM (05.06.2008), p. 5.
[120] Case M.8459 - TIL/PSA/PSA DGD (31.07.2017).
[121] See the schedule of the ship MAERSK LOTA (8.700 TEUs) on January 2016, which includes the ports of Algeciras, Rotterdam, Tilbury, Bremerhaven, Antwerp, Le Havre, Algeciras (Maersk's official site, dated

calls in the same geographic area if all of these ports serve the same hinterland and are competitors of each other? Two of the above terminals (APM 2 and NTB) are vertical integrated with Maersk, one (Porte Oceane) was vertical integrated with Maersk until the July of 2014 and the last one (MPET) is vertical integrated with MSC, Maersk's alliance partner. Finally, hub and spoke networks design is dynamic as liners' schedules change.

6.2.2 GEOGRAPHIC DIMENSION OF DEEP-SEA CONTAINER LINER SERVICES MARKET

In the Commission's decisions the product market for the provision of container liner shipping services involves the provision of regular, scheduled services for the carriage of cargo by container and is distinguished in deep-sea and short-sea services. Due to its characteristics, the market of container liner shipping services is distinguished from tramp shipping services and from other non-containerised (bulk) transport.

According to the Commission, the geographical dimension of container liner shipping services consists of single trades, defined by the range of ports which are served at both ends of the service. Each trade has specific characteristics depending on the volumes shipped, the types of cargo transported, the ports served and the length of the journey from the point of origin to the point of destination. Relevant trades are those from Northern European areas and back on the one hand, and from the Mediterranean to other non-European areas and back on the other hand. In addition, as the market conditions on the two directions of a trade can be different, in particular in case of trade imbalances or different characteristics of the products shipped, a distinction between the two directions of a trade is warranted. More specifically, the liner shipping trades and therefore the geographic markets, related to Northern European ports as stated in the EC cases are 12 (24 by reversing the direction), as follows:[122]

1. Northern Europe – East Asia (NE–EA)
2. Northern Europe – North America (NE–NA)
3. Northern Europe – Middle East (NE–ME)

22.07.2017). In case that such a schedule is considered as a short sea service, see also the Maersk's schedule AE1 EASTBOUND from Europe to Asia of 21.06.2016, including the calls of Rotterdam (Netherlands), Hamburg (Germany), Bremerhaven (Germany), Felixstowe (United Kingdom), Antwerp (Belgium), Le Havre (France), Port Tangier (Morocco), Salalah (Oman), Jebel Ali Dubai (U.A.E.) (Maersk's official site of 27.01.2007).

[122] Table 6.2 of Chapter's Annex shows the total of global trades.

4. Northern Europe – Indian Sub-Continent (NE–INSC)
5. Northern Europe – Central America & Caribbean (NE–CAC)
6. Northern Europe – South America West Coast (NE–SAWC)
7. Northern Europe – South America East Coast (NE–SAEC)
8. Northern Europe – Australasia & Oceania (NE–AO)
9. Northern Europe – Africa East Coast (NE–AEC)
10. Northern Europe – Africa South Coast (NE–ASC)
11. Northern Europe – Africa West Coast (NE–AWC)
12. Northern Europe – Australia/New Zealand (NE-ANZ)

In fact, the above discrimination consists an non accurate way of market definition. For example the trade North Europe – East Asia should not be defined as a geographic market, as not all ports at North Europe or at East Asia are substitutes, and therefore they do not belong to the same geographic market. In addition, liners, such as Maersk, organise more than one different routes for the same trade as shown in **Table 6.3** of the Chapter's Annex.

Considering the above, it is concluding that in defined markets by the Commission, the range of ports of calls is large, covering more than one actual trade of liner companies, meaning that the geographic market should be defined narrower. The routes of the biggest liner company Maersk are five (5) in the trade Northern Europe – East Asia (Maersk, 2017). Nevertheless, the routes of the companies cover different port ranges and therefore it is inappropriate to define the market per company's route. For example the trade AE5 of Maersk includes the ports of Sweden, Germany and Belgium and therefore it couldn't be defined, as e.g. trade Scandinavia – East Asia, either Northern Europe – East Asia. On the other hand, the above ports do not belong to the same geographic area at least from the side of hinterland traffic even they belong to the same market from the side of transhipment. The relevant market should be defined narrower than a trade, including only the substitutable trades which are defined by substitutable ports of origin/destination.

In the same line was the Commission in 1994[123] recognising that services provided by different trades between Northern Europe and the United States are not substitutable:

> *"The services in question are containerised liner shipping services between northern Europe and the United States, via the sea routes between ports in northern Europe and ports in the United States and Canada. The whole of northern Europe is served by the ports there, namely, for the major east—west trades, the ports of Hamburg, Bremen, Rotterdam, Antwerp, Le Havre and Felixstowe. The United States is served by all the ports on its east*

[123] Case IV/34.446 - Trans Atlantic Agreement (1994), par. 60-62.

and west coasts and on the Gulf coast and, for certain areas, the ports on the east coast of Canada, namely Halifax and Montreal. When examining maritime transport between Europe and the United States, the routes to be taken into consideration are therefore the sea routes between ports in northern Europe and ports in the United States and Canada. The services in question are not all substitutable on a two-for-two basis: for example, services via ports on the west coast and those via ports on the east coast of the United States are separate segments of the relevant market. Services via ports in the United Kingdom and those via the continental ports in northern Europe can likewise be regarded as separate market segments. Similarly, the Canadian ports can compete for transport services only on routes originating or ending in the north-east of the United States or in the Great Lakes region".

In a more recent case,[124] the Commission mentions that regarding to the Northern Europe - North America trade, it could be argued that the characteristics of the services between Northern Europe and Montreal via the St. Lawrence Seaway are different from the rest of the Northern Europe – North America trade possibly up to the point of constituting a separate market.

Nevertheless, in all other recent cases, the Commission in defining the geographic market, adopts the methodology of trades. In its most recent practice,[125] the Commission has concluded that container liner shipping services are geographically defined on the basis of the legs of trade (e.g. Northern Europe – North America eastbound). Nevertheless, each leg should be concluded more narrowly, as for example all container terminals of Northern Europe or North America are not rivals.

Moreover, the definition of the relevant market differs according to whether Article 101 TFEU or Article 102 TFEU is to be applied. For the purposes of Article 102 TFEU, the appropriate definition of the relevant market is a necessary precondition for any judgment concerning allegedly anticompetitive behaviour, since, before an abuse of a dominant position is ascertained, it is necessary to establish the existence of a dominant position in a given market, which presupposes that such a market has already been defined. On the other hand, it has consistently been held that, for the purposes of applying Article 101 TFEU, the reason for defining the relevant market is to determine whether the agreement in question is liable to affect trade between Member States and has as its object or effect the prevention, restriction or distortion of competition within the internal market. Thus, for the purposes

[124] Case M.8594 - COSCO SHIPPING/OOIL (05.12.2017).
[125] See case M.8380 - MAERSK LINE/HSDC (10.04.2017).

of applying Article 101(1) TFEU, a prior definition of the relevant market is not required where the agreement at issue has in itself an anticompetitive object, that is to say, where the Commission was able to conclude correctly, without first defining the market, that the agreement at issue distorted competition and was liable to have an appreciable effect on trade between Member States. If the actual object of an agreement is to restrict competition by 'market sharing', it is not necessary to define the markets in question precisely, provided that actual or potential competition was necessarily restricted.[126]

The definition of the geographic market in liner shipping cases has adopted the relevant definition of tramp shipping cases.[127] However, the adoption of the geographic market definition as a whole geographic area is inappropriate in case of liner shipping. The geographic dimension of tramp shipping services is distinguished from that of liner shipping, as the latter consists of the provision of regular and scheduled cargo transport on a specific route. Therefore, the operation and the structure of liner shipping not only allows but also imposes a narrower market definition which also leads to more precise definition of the geographic market of container terminal services. 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 on the basis of the point of origin / point of destination (O&D) pair approach or on the basis of hub-and-spoke network approach.[128]

Moreover, the liners that call at the same terminal are not necessarily rivals. The rival liners are engaged in the same routes. The other may be potential rivals. Such a distinction will affect the market shares of liners, which would be estimated in a more accurate way.

Concluding, the product and geographic market definition of both upstream and downstream markets should be revised, although the redefinition of a market as mentioned

[126] See Judgment of the General Court T-208/13 28.06.2016, Portugal Telecom v Commission, par. 175-176 and 178-180, as well as all the case-law mentioned in that Decision.

[127] See case IV/M.831- P&O / ROYAL NEDLLOYD (19.12.1996), p. 5, par. 27: *"In earlier decisions relating to maritime transport under Article 85 EC [e.g. TAA OJ 1994 L 376/1; FEFC OJ 1994 L 378/17] the Commission has defined the relevant market as a service supplied between a range of ports on either the northern European or the Mediterranean coast and a range of ports in another continent or region. Consequently, in the present case attention must be paid to both the definition of this service and to its geographic aspects".*

[128] See cases M.3280 – Air France/KLM (11.02.2004) and M.4439 – Ryanair/Aer Lingus (27.06.2007). During the Commission's market research, competitors submitted 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.

by Kaplow (2015) is not an easy task. The market redefinition is a subject for further research due to the following significant changes:

- Terminalisation leads to inter terminal competition (inter or intra port).
- Mega container ships can be served only by terminals with the adequate standards (quay length, draft, capacity). For this ship category the limited capacity terminals are not substitutes although the reverse is true.
- Mega-ships used by mega alliances carry large volumes of containers which intended to both hinterland and transhipment. The improved inland networks have enlarged the hinterland of each port and therefore, they may have reduced the needs for transhipment.[129] On the other hand, the restricted calls of mega-ships have made the transhipment necessary.
- According to geographic dimension, all ports are not rivals and all liners calling at the same port are not rivals too.

6.3 CALCULATION OF MARKET SHARES OF CONTAINER TERMINAL SERVICES

Calculation of market shares is based on the relevant market, meaning that the correct estimations presuppose a precise market definition. Moreover, the calculation of market shares faces additional difficulties:

(a) Terminal statistics. Market shares of container terminals are based on the throughput calculations of each terminal operator, which may include or not include feeder services. In that meaning, market shares in capacity terms is a more precise estimation.

(b) Exclusion of minority shareholdings. The fact that the Commission does not include the shares of minority shareholdings in case that they are not accompanied by joint control should be questioned due to their competition effects. For example, the effective PSA's share of 20% of Hutchison should not be underestimated due to the size of these two terminal operators and to the geographic market that they are operated in Northern Europe (Rotterdam – Antwerp). In addition, the Commission underestimates the fact that minority shareholdings are accompanied by shareholders' agreements and

[129] See for example the multimodal development of CMA CGM Group in France.

moreover, minority shareholdings of more liners on the same terminal may lead to the joint control of an alliance.

(c) Changes in capacity of each terminal and total relevant market. The Commission mentions that only capacity figures were used for calculations, both for 2006 and 2014, in order 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.[130] Nevertheless, the data research shows 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 and terminals were closed.

(d) Exclusion of capture capacity. According to the Commission, special care must be taken in contexts where vertically integrated companies supply products internally, as the intra group transactions are excluded from the calculation of market shares. In case of port mergers, this rule is expanded to the captive throughput and capacity, as market shares are calculated in this basis. Specifically, the Commission excludes the captive capacity and throughput from both terminals' market share and total market size. This practice gives an advantage to the LTVICs between shipping lines and container terminals as their throughput and capacity are considered captive and therefore are excluded from the calculation. On the other hand, the market shares of pure terminal operators are overestimated, as the remaining total throughput is limited. It is noted that this method concerns not only the shares of merger notifying parties, but also the shares of all VIC companies. It is a practice of great importance considering not only the portion of fully or partially integrated companies operating in the examined vertical markets, but also their absolute figures in throughput and capacity terms.[131]

[130] Case M. 5066 - EUROGATE/APMM (05.06.2008).

[131] See for example the analysis for Algeciras and Maersk in case JV. 55 - HUTCHISON/RCPM/ECT (03.07.2001), when the Commission considers that as the throughput of the main Algeciras container terminal which is controlled by the A.P. Møller group, is generated by its subsidiary Maersk Sealand, represents captive production and therefore is not included in the market by the Commission when determining market shares. It is noted that the Maersk Sealand terminal had an estimated capacity of 2.100.000 TEUs in 1999, while the other Algeciras terminal, Isla Verde, had an estimated capacity of 200.000 TEUs (for capacity estimations is mentioned as source the "Drewry, European Container Port Market Data", December 2000, page 24).

Apparently, the exclusion of capacity and captive throughput in the Commission's estimations of market shares is a projection of "internal" turnover exclusion. In fact, the first subparagraph of Article 5(1) of the Merger Regulation 139/2004 states that *"the aggregate turnover of an undertaking concerned shall not include the sale of products or the provision of services between any of the undertakings referred to in paragraph 4"*(the group to which the undertaking concerned belongs). The aim is to exclude the proceeds of business dealings within a group so as to take account of the real economic weight of each entity in the form of market turnover.[132] Thus, the "amounts" taken into account by the Merger Regulation reflect only the transactions which take place between the group of undertakings on the one hand and third parties on the other. In addition, Article 5(5)(a) of the Merger Regulation applies the principle that double counting is to be avoided specifically to the situation where two or more undertakings concerned in a concentration jointly have the rights or powers listed in Article 5(4)(b) in another company. According to this provision, the turnover resulting from the sale of products or the provision of services between the joint venture and each of the undertakings concerned (or any other undertaking connected with any one of them in the sense of Article 5(4)) should be excluded. As regards joint ventures between undertakings concerned and third parties, insofar as their turnover is taken into account according to Article 5(4)(b), the turnover generated by sales between the joint venture and the undertaking concerned (as well as undertakings linked to the undertaking concerned in accordance with the criteria set out in Article 5(4)) is not taken into account according to Article 5(1).

It is concluded that as the aggregate turnover is the total of turnovers of all the affiliated companies excluding the turnover between them, in order double counting to be avoided. Under the merger regulation the calculation of the turnover is used for the estimation of thresholds. Turnover is also used for market shares estimation, as the total of relevant markets companies' turnovers, gives the market size. In case of VIC the transactions between upstream and downstream divisions consist the turnover for the upstream market which there is no way to be double counting. If vertical "intrafirm"

[132] The exclusion of "intrafirm" transactions in turnover calculations is also mentioned in the previous Merger Regulation 4064/1989.

transactions are excluded under the risk of double counting, then the total transactions are not counted. Moreover, in case that turnover data are not available, market shares are estimated in terms of capacity or throughput. Nevertheless, if captive throughput or captive capacity are excluded, they are not calculated at all, meaning that both market size and market shares are wrong. In addition, that is the requested matter: the allocation of throughput and capacity to each liner company. For example if the captive throughput and capacity of Maersk in the upstream market of container terminal services is excluded, then a part of the total size of the upstream market in capacity and throughput will be lost, and therefore market shares will be estimated in a wrong way. Let as think which would be the market shares of the highly vertically integrated oil companies, if their captive sales are excluded. Captive sales should be excluded only in case of calculation of the free market, thus the market which may be used by non-integrated liner companies.

In addition to full or joint ventures the market structure is formed by minority interests and vertical agreements as well. Very often, in partial vertical integration, the terminal is dedicated to the liner company involved, even if it holds a minority share, e.g. 30%. A shareholders' agreement accompanies a minority or majority share. As such agreements, as well as vertical contracts are confidential, market shares of the upstream market of container terminal services in throughput and capacity (including captive) terms will be estimated, based on equity data of 2016. Most of the times, equity is the evolution of an existed by contract vertical relation.[133]

(e) Differences between hinterland and transhipment shares lead to wrong calculations, e.g. calculations based only on transhipment throughput shares, although the hinterland throughput and capacity shares of the notifying parties are much lower.[134]

In order to solve the problem with hinterland and transhipment measurements the Commission could ask each terminal operator to provide its own value sales in order to calculate total market size and market shares in the relevant market(s). Both volume and

[133] See case M.3576 - PONL/ECT (22.12.2004), p. 2: *"The business rationale of the transaction is to further develop the parties current supplier/customer relationship. At present ECT already handles PONL's volumes, as well those of its Grand Alliance partners, in the Port of Rotterdam in two different terminals, Delta and Home"*.
[134] See case JV.55 - HUTCHISON/RCPM/ECT (03.07.2001).

value sales provide useful information. In cases of differentiated products, sales in value and their associated market share will usually be considered to reflect better the relative position and strength of each supplier.[135] Anyway, terminal operators, like other companies, are obliged to provide such information to the Commission under the relevant request.

In general, the Commission leaves the geographic market definition open, adding that it is not necessary to conclude on a precise definition of the relevant product and geographic market since the merger would not raise serious doubts as to its compatibility with the internal market under any of the plausible definitions of the markets for container terminal services. In fact, concerns are raised only if there is a precise definition of a relevant market. For example, in case M.8459 - TIL/PSA/PSA DGD if the market for hinterland traffic consists of the ports of Antwerp and Rotterdam, then competition concerns are raised as PSA holds 20% shares of Hutchison, as it will be discussed in Chapter 7.

6.3 CALCULATION OF MARKET SHARES OF CONTAINER LINER SHIPPING SERVICES

As mentioned in the previous section concerning the market definition of container liner shipping services, the Commission defines the geographic markets according to trades. Therefore, the liners' market shares appeared lower than they actually are in specific geographic markets. For example, according to Maersk's schedules, some connections such as (a) connection to Korean main ports from Germany, Great Britain and Poland, (b) Great Britain to Chinese main ports and (c) from Aarhus and Gothenburg to Asian main ports, are stated in the company's site as unique,[136] meaning that in these connections the market share of the company is 100%.

The Commission in its decisions has considered that it was not appropriate to assess the effects of the concentration only on basis of the parties' individual market shares, but to

[135] See paragraph 55 of the Commission Notice on the definition of relevant market for the purposes of Community competition law.

[136] See also the schedule of Maersk AE20 EASTBOUND dated 25.11.2015, where the company argues that it is the 'Unique coverage from Italy, Spain and France to North Asia' (see the official site of the company on 27.01.2017).

examine also the shares of conferences, alliances and consortia.[137] The Commission acknowledges that although the cooperation of consortia members in jointly operating container liner shipping services is likely to restrict competition,[138] it also enables achieving certain efficiencies, by improving the productivity and quality of the available liner shipping services, by enabling the rationalisation of services and economies of scale, by offering greater frequencies, port calls, and, more generally, by promoting technical and economic progress. For customers to benefit from those efficiencies, however, sufficient competition should be maintained in the market. Block Exemption Regulations (BER) concerning the container liner shipping industry, have been put in place by the Commission since 1995.[139] Therefore, consortia and alliances may benefit from a block exemption if their market shares are below 30%[140] and the consortium agreement does not include features likely to significantly restrict competition, such as the fixing of prices, the limitation of capacity, and the allocation of customers or markets.[141] Although liners are obliged to self-assessment compliance to the Consortia BER Regulation, there are cases in which they are above the market threshold even though relevant market is defined in the way described above. But, even in such cases no competition concerns are raised.[142]

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[137] See cases M.8120 - Hapag Lloyd/UASC (23.11.2016) and M.7268 – CSAV/HGV/Kühne Maritime/Hapag-Lloyd (11.09.2014), recitals 68–75: *"the transaction may therefore lead to a decrease of competitive pressure and may create an incentive for the combined entity to reduce the capacity it offers or, in any event, compete less aggressively than today on the NE-NA and NE-ME trades. The combined entity would participate in more consortia than CMA CGM and NOL individually today and would generate profits from consortia that pre-Transaction were independent from one another. As a consequence, the combined entity could benefit from the effects of an increase in prices induced by a reduction in capacity in a consortium through the profits generated in a different consortium in which it participates. Thus, the structural links between competing consortia created by the Transaction, in particular on the trades where NOL is a member of G6, could potentially lead to non-coordinated horizontal effects".*

[138] See cases M.5066 - EUROGATE/APMM (05.06.2008), par. 47 and M.3829 - MAERSK/PONL (29.07.2005), par. 10 and 27.

[139] Commission Regulation (EC) No 906/2009 of 28 September 2009 on the application of Article 81(3) of the Treaty to certain categories of agreements, decisions and concerted practices between liner shipping companies (consortia), OJ L 256, 29.09.2009, p. 31 ("BER"), prolonged until the 25th of April 2020 by Regulation (EC) 697/2014 of 24 June 2014 amending Regulation (EC) No 906/2009, OJ L 184, 25.06.2014, p.3. The Commission is now evaluating its impact and relevance in order to determine whether it should be prolonged and, if so, under which conditions.

[140] Calculated on the basis of the method provided in the BER.

[141] Articles 5 and 6 of the BER.

[142] During the assessment of notified merger M.3576 – ECT/PONL/EUROMAX (22.12.2004), 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 that market share threshold of 30%, and hence these co-operations were not exempted under the consortia block exemption. See case M.3576 p.11.

The overall size of the trades will also be taken into account in the Commission's assessment, as small trades are less attractive to potential new entrants. In order to effectively compete with incumbent shipping companies, new entrants have to ensure that they can sell a minimum amount of volume enabling them to offer a weekly service as is the business standard. This is significantly more difficult in small trades, where demand is relatively low and therefore new entrants would not be in the position of exerting an effective constraint, should the parties decide to reduce the capacity they offer.

Even if the market would be defined accurately in a form of point of origin/ point of destination, the difficulties in market shares estimations remain:

- Although the Commission has the ability to 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 consultants (e.g. Drewry, Alphaliner etc.) or CTS[143]. Firms may give more accurate information to the Commission than to consultants in volume terms. In addition, firms are obliged, if they are questioned, to provide information to the Commission in value terms (turnover of the specific relevant markets). The most accurate way of market shares' calculation should be based on the turnover of liners concerning the relevant market.
- Sharing agreements such as consortia and alliances enhance the difficulties of market shares' calculations as a ship's call concerns cargo of different liners.[144]

6.5 EFFECTS

The real transactions are more than the notified ones and the unnotified transactions are never assessed. See for example case M.8459 where the Commission states that four container terminals in the port of Antwerp were already prior to the examined transaction under the control of one of PSA DGD's parents (PSA) and therefore common ownership of these terminals was not "merger-specific".[145]

[143] Container Trade Statistics Ltd (CTS) is the exclusive agent of World Liner Data Limited (WLDL), promoting and selling data on its behalf. The WLDL database is derived from data supplied by many of the world's major container shipping lines. CTS uses the TEU data provided to estimate total trade volumes for 447 global trades. Some 700 Aggregated Price Indices are also available for Dry and Reefer containers (see www.containerstatistics.com, dated 09.06.2019).
[144] See for example the relevant data of case CMA CGM which mentioned in Chapter 2.
[145] See case M.8459 - TIL/PSA/PSA DGD (31.07.2017).

If there was an in-depth analysis of effects during a phase II procedure, it would be examined the non-coordinated effects and the coordinated effects of a LTVIC by applying the Commission's Guidelines on the assessment of non-horizontal mergers[146].

6.5.1 NON-COORDINATED EFFECTS: FORECLOSURE

Two forms of foreclosure can be distinguished in case of LTVIC. The first is where LTVIC is likely to restrict access of liner companies to container terminal services (input foreclosure). The second is where the LTVIC is likely to foreclose container terminals by restricting their access to a sufficient liner company base or foreclose liners by restricting their access to shippers or to forwarders (customer foreclosure).[147] Therefore, input foreclosure may be applied to the liner rivals, although customer foreclosure may be applied to both terminal and liner rivals. These two types of foreclosure can function independently or can 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 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.

A. Ability of LTVIC to foreclose access to container terminal services or access to customer base

For input foreclosure to be a concern, the LTVIC must have a significant degree of market power in the container terminal services market. Market power in container terminal services depends not only in the market shares of the LTVIC in the upstream market but

[146] Commission Notice, Guidelines on the assessment of non-horizontal mergers under the Council Regulation on the control of concentrations between undertakings.
[147] Shippers are the direct and forwarders are the indirect customers of the liner companies.

also in the availability of extra capacity. Specifically, liner companies' foreclosure of container terminal services - full or partial- may occur in various forms, such us refusal to supply, raising rivals' cost, margin squeeze, price discrimination, exclusive dealing, and information exchange.

The LTVIC may decide not to deal with its actual or potential liner competitors in various ways: First, the vertically integrated firm might establish a reputation for an exclusive use dedicated terminal or for an exclusive service provision of mega ships which are operated by its downstream department or by its alliance partners; Second, the container terminal division of the LTVIC might develop and equip a terminal to be incompatible with the ships of liner competitors, e.g. specific choice of technology which is not compatible with the technologies of other liners;[148] Third, the LTVIC might reduce the quality of the terminal services or establish the reputation of a reduced quality of terminal services.

Alternatively, the merged firm may decide to restrict container terminal services and/or to raise the price it charges when serving competitors and/or to otherwise make the conditions of service less favourable (i.e. through service priority) than they would have been absent the merger. In addition, it may reduce costs of incumbent firms and thus putting entrants at a disadvantage. Even the terminal congestion fees may lead to foreclosure as the non-integrated liner companies are disadvantaged, as for a LTVIC the cost of the congestion fee for its liner department is a revenue for its container terminal department. The congestion fee which was imposed by CMA CGM at the container terminal of the Port of Thessaloniki just a few days after its acquisition in 2017 and even prior to the Hellenic Competition Commission's clearance, not only gives an advantageous position of the vertical integrated company but is also bound to lead to foreclosure of rivals.

The same is true and for the high prices charged. Special care must be taken as not all liner companies are real competitors of the LTVIC. The real competitors of the LTVIC are the liner companies which are engaged in the same trades, identically similar routes, with the merged company. The other may be potential competitors (presently acting in different routes) or feeder / short sea providers. That means that the LTVIC may have interests to

[148] APMM (Maersk) through its cooperation with IBM theoretically has the ability to exclude rivals from selected container terminals.

foreclose its real competitors and not all the liner companies. It would be interesting to be examined the provided services (routes, category, throughput) of the liner companies in common user integrated container terminals. High unified prices also would be used as a mean of foreclosure, as the VIC benefits of them due to internal transactions. In addition, internal transactions not only may be used to eliminate profits for avoiding taxes, but also to eliminate concerns for abuse of dominance position by showing limited profits. It could be added the advantageous position of the vertical integrated company related to independent companies concerning tax and other factors.

Another means for input foreclosure is price discrimination. Second-degree price discrimination (different customers paying different prices) and third-degree price discrimination (setting prices for different groups of customers) is an instrument for a forecloser as it generalises exclusivity or tying arrangements by favouring one or more liners over the others. Throughput discounts are an example of second-degree price discrimination, as large liners may pay different prices. For example, a loyalty program offered to all or rebates based on the rate of growth of throughput may target specific liners even though they formally are available to all liner companies. Not only large liner companies pay lower prices, but they also charge the same terminal handling costs (THCs) with other liners to shippers. A favoured specific customer may be a subsidiary or an alliance partner of the LTVIC which uses the vast majority of terminal services. In addition, third-degree price discrimination may be applied to the real competitors of its downstream competitors, meaning the liners which perform the same trade routes with the LTVIC. In case of relevant concerns, it should be examined to whom customers the price discrimination is applied.

Exclusive dealing is another way to foreclose access to container terminal services. It may be substitute to vertical integration, meaning that a terminal may be dedicated to a liner company by contract, without the existence of any equity interests. For a liner company with many calls at a terminal, a contract without exclusive dealing may is enough to foreclose the rivals, as they objectively can’t be served. In addition, large ships’ calls may restrict the provided services for the other ships.

Finally, through information exchange the terminal division of a LTVIC obtains information from the liner division about the other terminals in the same market such as prices, customers' behaviour which may be used in order the real liner competitors to be foreclosed.

Concerning the customer foreclosure, a vertical merger may affect upstream competitors by increasing their cost to access downstream customers or by restricting access to a significant customer base. In LTVI, customer foreclosure may take various forms. For instance, the LTVIC may decide to source all of its required terminal services from terminals in which has interests and, as a result, may stop using the terminals of its upstream competitors.[149] It may also reduce its use of upstream rivals' services, or use them on less favourable terms than it would have done absent the merger. In addition, the presence of exclusive contracts between the terminal division of the LTVIC and other downstream firms may limit the ability of container terminal rivals to reach a sufficient container throughput volume.

Customer foreclosure can lead to higher container terminal prices in particular if there are significant economies of scale or scope in the input market or when demand is characterised by network effects[150].

Customer foreclosure can lead to higher input prices when existing rival container terminals operate at or close to their minimum efficient scale. To the extent that customer foreclosure and the corresponding loss of output for the upstream rivals increases their variable costs of production, this may result in an upward pressure on the prices they charge to their customers operating in the downstream market. Basic requirement is the existence of excess capacity in the relevant market.

Further, when customer foreclosure primarily impacts upon the revenue streams of rival container terminals, it may significantly reduce their ability and incentive to invest in cost reduction, new technologies and development. This may reduce their ability to compete in

[149] See previous reference to the schedule of Maersk's ship MAERSK LOTA.
[150] For the Commission economies of scale or scope exist when an increase in scale or scope of production leads to a reduction in average unit cost. Network effects occur when the value of a product for a customer increases when the number of other customers also using it increases. Examples include communication devices, specific software programmes, products requiring standardisation, and platforms bringing together buyers and sellers.

the long run by operating efficiently and possibly even cause their exit from the market. In that case the terminal operator operates at higher costs or finds other uses (general cargo terminal services) or secondary markets (short sea container transport services) in order to be viable. In the Hamburg – Le Havre port range there are terminals which were closed (such as Amsterdam Container Terminal/Ceres Paragon) or others which restrict their services to other uses (Zeebrugge International Port[151]).

Finally, access to commercially sensitive information on its liner rivals and interfirm information exchange may be used for customer foreclosure in downstream market. For example, information such as requirements in quantities and frequency of service of liners customers (shippers) may be used by a LTVIC in order to obtain significant customers. In addition, a LTVIC by applying input foreclosure to an independent liner company, may apply and customer foreclosure if the shippers – customers of the liner company - do not want to change terminal for reasons such as proximity, special facilities etc. Therefore, shippers' demand may shift to the LTVIC.

B. Incentive to foreclose access to container terminal services or to downstream markets

The incentive to foreclose depends on the degree to which foreclosure would be profitable. The LTVIC will take into account how its provision of container terminal services to liner competitors will affect not only the profits of its container terminal, but also the profits of its liner division. Essentially, the merged entity faces a trade-off between the profit lost in the container terminal services market due to a reduction of liner customers and the profit gain, in the short or longer term, from expanding container liner shipping services or, as the case may be, being able to raise prices to shippers. The trade-off is likely to depend on the level of profits the LTVIC obtains upstream and downstream: the lower the margins upstream, the lower the loss from restricting terminal services. Similarly, the higher the downstream margins, the higher the profit gain from increasing market share in container liner shipping services at the expense of foreclosed rivals. Consequently, in periods with

[151] Specifically, the activities of PSA Zeebrugge NV (formerly Zeebrugge International Port NV), mainly involve general cargo handling, i.e., the handling of commodities such as wood pulp, iron and steel, forest products and other cargo and related Ro-Ro activity, while until 2016 it also conducted a limited amount of container handling (see case M.8459).

low freight prices in container liner shipping, the LTVIC has no incentive to foreclose. It might focus on the profits of the container terminal services market which are high and sustainable.

Therefore, the incentive for the LTVIC to raise liners rivals' costs further, depends on the extent to which downstream demand is likely to be diverted away from foreclosed liner rivals and the share of that diverted demand that the liner division of the LTVIC can capture. This share will normally be higher the less capacity constrained the merged entity will be relative to non-foreclosed downstream rivals and the more the services of the merged entity and foreclosed competitors are close substitutes (ships' capacity, routes etc.).

Input foreclosure may be one of the factors which lead to the increased prices or prevent of further falling of freight prices in the downstream market. The affected terminal services represent a significant proportion of liner rivals' costs. According to the Commission's research, average terminal's cost in 1994 was 27.1% of a total door to door transport cost for a liner company, while the average sea transport cost was 36.5%.[152] In that case the LTVIC has the option to keep its prices lower and be more competitive or to increase its prices to the same level with the competitors obtaining more profits. The followed strategy depends on the available idle capacity (both in transport and terminal services) and on the long-term motion of the LTVIC. May the LTVIC aims to the acquisition of its competitor(s). Input foreclosure may increase a liner company's profits without increasing the prices charged to consumers. The increased profits may occur by the increased sales (market share) as the rivals are foreclosed from a specific geographic market (partial foreclosure).

Respectively, concerning the incentive for customers foreclosure, the costs associated with less use of rival container terminals are higher, when the terminal division of the LTVIC is less efficient than the foreclosed terminals. Such costs are also higher if the terminal division of the LTVIC is capacity constrained or rivals' facilities are more attractive due to

[152] The Commission has analysed data supplied by ten (10) of the largest members of the Far Eastern Freight Conference (FEFC) in order to assess the importance of inland transport operations in relation to overall costs of providing multimodal transport services: CGM, Hapag-Lloyd, K Line, Lloyd-Triestino, Maersk, MISC, Mitsui, NYK, OOCL and P&O. The following data sets out an average for their cost structures on the North Europe/Far East trades: Sea 36.5 %, Inland 18.6%, Terminals 27.1 %, Sales 13.9% and Others 3.9 % (see case IV/33.218 - Far Eastern Freight Conference (21.12.1994)).

service differentiation. The customer foreclosure may be partial or temporary as a mean for the LTVIC to achieve better services terms in the future.

The incentive to engage in customer foreclosure further depends on the extent to which the upstream division of the LTVIC can benefit from possibly higher price levels in the upstream market arising as a result of upstream rivals being foreclosed. The incentive to engage in customer foreclosure also becomes higher, the more the downstream division of the integrated firm can be expected to enjoy the benefits of higher price levels downstream resulting from the foreclosure strategy. In this context, the greater the market shares of the merged entity's downstream operations, the greater the base of sales on which to enjoy increased margins. If the LTVIC partially provides services to liner competitors it may benefit from the ability to increase its market share, or as the case may be, to increase container terminal prices.

When the adoption of a specific conduct by the LTVIC is an essential step in foreclosure, are examined both the incentives to adopt such conduct and the factors liable to reduce, or even eliminate, those incentives, including the possibility that the conduct is unlawful.

C. Overall likely impact on effective competition

In general, the anticompetitive effects of mergers lead to increased prices. The higher the proportion of liner or container terminal rivals which are foreclosed (in terms of number, capacity and throughput), the more likely the vertical integration can be expected to result in a significant price increase in the downstream market and, therefore, to significantly impede effective competition therein. Even a specific liner or terminal with a relatively small market share compared to other players may play a significant competitive role because it is a close competitor of the LTVIC (e.g. liner operating in same routes, proximity of a terminal) or because it is a particularly aggressive competitor. In addition, raising barriers to entry to potential competitors may significantly impede effective competition.

The effect on competition on the downstream market must also be assessed in light of countervailing factors such as the presence of buyer power of liners and their alliances[153] or the likelihood that entry upstream would maintain effective competition.[154]

Further, the effect on competition needs to be assessed in light of efficiencies substantiated by the merging parties.[155] For the Commission to take account of efficiency claims in its assessment of the merger, the efficiencies have to benefit consumers, be merger specific and be verifiable. These conditions are cumulative.[156] The efficiencies gained by a liner – terminal integration are undeniable. Firstly, huge investments which increased the capacity and the efficiency could not have taken place without the collateral of the liners demand. The matter is if these efficiencies are passed on to consumers. The main source of efficiencies would be the internalisation of any pre-existing double mark-ups resulting from both parties setting their prices independently premerger.

6.5.2 COORDINATED EFFECTS: COLLUSION

Vertical integration may facilitate collusion in the following ways: (a) by interfirm information exchanges, (b) by enhancing 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, (e) by exclusive contracts.

Information exchange and transparency of pricing: Coordination effects may be a result of information exchange between firms at the same level of production. It is noted that the revised Consortia BER Regulation since 2009 has allowed carriers to engage in data sharing and exchange.[157] The downstream division of containerised transport of the LTVIC might share commercial information (throughput, prices etc.) of the container terminals with the upstream division of the container terminal services of the LTVIC, and vice versa.

[153] See Section V on countervailing buyer power in the Notice on Horizontal Mergers.
[154] Countervailing buyer power is the bargaining strength that the buyer has vis-à-vis the seller in commercial negotiations due to its size, its commercial significance to the seller and its ability to switch to alternative suppliers (see sections V and VI in the Notice on Horizontal Mergers).
[155] See Section VII on efficiencies in the Notice on Horizontal Mergers.
[156] See, more specifically, paragraphs 79 to 88 of the Notice on Horizontal Mergers.
[157] See Article 3, 4(a) of the Commission Regulation 906/2009, where the use of a computerised data exchange system is permitted.

The LTVIC potentially can use this information to monitor its upstream rivals' compliance with a collusive agreement.

Acquiring a disruptive firm or eliminating the incentives of a disruptive firm: a liner – terminal vertical merger can facilitate coordination in the market of container terminal services by eliminating the incentives of the downstream division of the LTVIC to act as a disruptive buyer that deters coordination by upstream firms. In addition, a liner - terminal vertical integration can facilitate coordination in the downstream market by weakening maverick or other disruptive competitive behaviour of a non-merging liner.

Symmetry in costs and punishment effect: liner – terminal vertical integration may facilitate collusion by creating more symmetry in costs or placing the LTVIC in a stronger position to punish defectors. Moreover, a liner – terminal vertical merger might facilitate coordination by reducing the costs of the LTVIC. First, if those lower costs could create more symmetry in costs and structure, it may lead to the firms' having similar desired prices. Second, obtaining lower costs also may place the LTVIC in a stronger position to punish defectors, which can deter defection.

Exclusive contracts: In general, an upstream firm might organise a cartel by contracting with a downstream industry to restrict output and prices to consumers. Liner – terminal vertical integration might facilitate an effective cartelisation of liners via exclusive contracts. Exclusive contracts could prevent liners from defecting by contracting with alternative container terminal operators.

6.6 CONCLUSIONS

The research shows that market definition and calculation of market shares have difficulties in both upstream and downstream markets. Given to that difficulties, there is a necessity to concentrate more on markets' structure and competition effects of horizontal and vertical integration. The characteristics of both upstream and downstream markets (oligopoly market structure, concentration, alliances, high barriers to entry, etc.) create the need to reverse the procedure of EC *ex ante* assessment of mergers: ability, incentive and effect (non-coordinated and coordinated). Not only the large vertical integrated companies have the ability and the incentive to foreclose their rivals, but they also increase their shares in global market. Even an increased market share may be an effect of anticompetitive

practices. Additionally, the high market shares become higher by the existence of alliances and consortia.

There is a need for further research concerning the competition effects of vertical mergers in the upstream market of the container terminal services, including all the transactions between liners and container terminals. By applying the European Commission's decisional practice and legislation, as well as the economic theory, we will analyse the potential competition effects of the LTVI. *"In seaports, as elsewhere",* as would have been said by R. Goss (see: Chapter 2), there are two main ways in which LTVICs may significantly impede effective competition: non-coordinated effects and coordinated effects. Above all, it is worth to examine the effect of LTVIC on consumers, thus on shippers. It is noted that what really matters the Commission is to protect an effective competitive process and not simply protecting 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 for example relevant tests applying during the examination of cases, e.g. less efficient competitor test). The matter is if any efficiencies gained have been passed on to consumers.

Annex

Table 6.2 Geographic markets of container liner shipping services according to the EC cases

1.	Northern Europe – East Asia (NE–EA)
2.	Mediterranean – East Asia (MED–EA)
3.	Northern Europe – North America (NE–NA)
4.	Mediterranean – North America (MED–NA)
5.	Northern Europe – Middle East (NE–ME)
6.	Mediterranean – Middle East (MED–ME)
7.	Northern Europe – Indian Sub-Continent (NE–INSC)
8.	Mediterranean – Indian Sub-Continent (MED–INSC)
9.	Northern Europe – Central America & Caribbean (NE–CAC)
10.	Mediterranean – Central America & Caribbean (MED–CAC)
11.	Northern Europe – South America West Coast (NE–SAWC)
12.	Mediterranean – South America West Coast (MED–SAWC)
13.	Northern Europe – South America East Coast (NE–SAEC)
14.	Mediterranean – South America East Coast (MED-SAEC)
15.	Northern Europe – Australasia & Oceania (NE–AO)
16.	Mediterranean – Australasia & Oceania (MED–AO)
17.	Northern Europe – Africa East Coast (NE–AEC)
18.	Mediterranean – Africa East Coast (MED–AEC)
19.	Northern Europe – Africa South Coast (NE–ASC)
20.	Mediterranean – Africa South Coast (MED–ASC)
21.	Northern Europe – Africa West Coast (NE–AWC)
22.	Mediterranean – Africa West Coast (MED–AWC)
23.	Northern Europe – Australia/New Zealand (NE-ANZ)
24.	Mediterranean – Australia/New Zealand (MED-ANZ)

Source: Author's assessment based on the EC cases

Table 6.3 Maersk's routes for the trade Northern Europe – East Asia in 2016

AE1 EASTBOUND
From ROTTERDAM (NETHERLANDS) – HAMBURG (GERMANY) – BREMERHAVEN (GERMANY) - FELIXSTOWE (UNITED KINGDOM) – ANTWERP (BELGIUM) – LE HAVRE (FRANCE) – PORT TANGIER (MOROCCO) – SALALAH (OMAN) – JEBEL ALI DUBAI (UNITED ARAB EMIRATES) to PORT TANGIER (MOROCCO) – SALALAH (OMAN) - JEBEL ALI DUBAI (UNITED ARAB EMIRATES) – NINGBO (CHINA) – SHANGHAI (CHINA) – HONG KONG (CHINA) – YANTIAN (CHINA).
AE1 WESTBOUND
From NINGBO (CHINA) – SHANGHAI (CHINA) – HONG KONG (HONG KONG) – YANTIAN (CHINA) – TANJUNG PELEPAS (MALAYSIA) – COLOMBO (SRI LANKA) to COLOMBO (SRI LANKA) – FELIXSTOWE (UNITED KINGDOM) – ROTTERDAM (NETHERLANDS) – HAMBURG (GERMANY) – BREMERHAVEN (GERMANY).
AE2 EASTBOUND
From FELIXSTOWE (UNITED KINGDOM) – ANTWERP (BELGIUM) – WILHELMSHAVEN (GERMANY) – BREMERHAVEN (GERMANY) – ROTTERDAM (NETHERLANDS) – COLOMBO (SRI LANKA) to COLOMBO (SRI LANKA) – SINGAPORE (SINGAPORE) – HONG KONG (CHINA) – YANTIAN (CHINA) – XINGANG (CHINA) – BUSAN (SOUTH KOREA) - SHANGHAI (CHINA) – NINGBO (CHINA). The Company considers this trade as a *"Unique gateway from Great Britain to Chinese main ports".*
AE2 WESTBOUND

From XINGANG (CHINA) – QUINGDAO (CHINA) – BUSAN (SOUTH KOREA) – SHANGHAI (CHINA) – NINGBO (CHINA) – YANTIAN (CHINA) – TANJUNG PELEPAS (MALAYSIA) to ALGECIRAS (SPAIN) – FELIXSTOWE (UNITED KINGDOM) – ANTWERP (BELGIUM) – WILHELMSHAVEN (GERMANY) – BREMERHAVEN (GERMANY).
AE5 EASTBOUND
From HAMBURG (GERMANY) – GOTHENBURG (SWEDEN) – AARHUS (DENMARK) - WILHELMSHAVEN (GERMANY) – BREMERHAVEN (GERMANY) – ANTWERP (BELGIUM) – ROTTERDAM (NETHERLANDS) to SINGAPORE (SINGAPORE) – SHANGHAI (CHINA) – XINGANG (CHINA) – QINGDAO (CHINA) – BUSAN (SOUTH KOREA) – NINGBO (CHINA). The Company considers this trade as a *"Unique service from Aarhus and Gothenburg to Asian main ports".*
AE5 WESTBOUND
From XINGANG (CHINA) – QUINGDAO (CHINA) – BUSAN (SOUTH KOREA) – NINGBO (CHINA) – SHANGHAI (CHINA) – YANTIAN (CHINA) – TANJUNG PELEPAS (MALAYSIA) to PORT TANGIER (MOROCCO) – BREMERHAVEN (GERMANY) – HAMBURG (GERMANY) – GOTHENBURG (SWEDEN) – AARHUS (DENMARK) – WILHELMSHAVEN (GERMANY) - BREMERHAVEN (GERMANY) – ANTWERP (BELGIUM) – ROTTERDAM (NETHERLANDS) to SINGAPORE (SINGAPORE) – SHANGHAI (CHINA) – XINGANG (CHINA) – QINGDAO (CHINA) – BUSAN (SOUTH KOREA) – NINGBO (CHINA).
AE6 EASTBOUND
From ANTWERP (BELGIUM) – LE HAVRE (FRANCE) – SOUTHAMPTON (UNITED KINGDOM) – FELIXSTOWE (UNITED KINGDOM) – PORT TANGIER (MOROCCO) to PORT TANGIER (MOROCCO) – SINGAPORE (SINGAPORE) – NANSHA NEW PORT (CHINA) – HONG KONG (CHINA) – YANTIAN (CHINA) – XIAMEN (CHINA).
AE6 WESTBOUND
From YOKOHAMA (JAPAN) – NINGBO (CHINA) – SHANGHAI (CHINA) – CHIWAN (CHINA) – YANTIAN (CHINA) – TANJUNG PELEPAS (MALAYSIA) to SINES (PORTUGAL) - ANTWERP (BELGIUM) – LE HAVRE (FRANCE) – SOUTHAMPTON (UNITED KINGDOM) – FELIXSTOWE (UNITED KINGDOM).
AE10 EASTBOUND
From GDANSK (POLAND), BREMERHAVEN (GERMANY) – FELIXSTOWE (UNITED KINGDOM) – ALGECIRAS (SPAIN) to ALGECIRAS (SPAIN) – TANJUNG PELEPAS (MALAYSIA) – SHANGHAI (CHINA) – DALIAN (CHINA) – BUSAN (SOUTH KOREA – KWANGYANG (SOUTH KOREA). The Company argues that this route is a *"Unique connection to Korean main ports from Germany, Great Britain and Poland".*
AE10 WESTBOUND
From DALIAN (CHINA) – BUSAN (SOUTH KOREA) – KWANGYANG (SOUTH KOREA) – SHANGHAI (CHINA) – NINGBO (CHINA) – XIAMEN (CHINA) – YANTIAN (CHINA) - TANJUNG PELEPAS (MALAYSIA) to ROTTERDAM (NETHERLANDS) – BREMERHAVEN (GERMANY) – GDANSK (POLAND).

Source: Maersk (2017)

CHAPTER 7:

VERTICAL INTEGRATION AND THE RESHAPING OF MARKET STRUCTURE: -HAMBURG - LE HAVRE

7.1 INTRODUCTION

As mentioned in Chapter 3, vertical integration does not always lead to increased efficiency. An important factor is the efficient scale of the company. Liner companies started to be vertically integrated when they had increased their transport volumes through the development of transhipment, horizontal mergers, alliances and consortia. In that way, they had ensured satisfactory terminal handling services and a captive demand which would secure upstream facilities' profits. On the other hand, such a market power in horizontal level enhances the competition effects of vertical integration. Therefore, increased efficiency may benefit only the engaged firms and not the consumers.[158] The degree of which vertical integration increases social welfare depends on the structure of the integrated markets. In order to understand vertical restraints of LTVI, it is necessary to understand at least the two relevant markets: a) the upstream market of container terminal services and b) the downstream market of container liner shipping services.

Therefore, this chapter describes the market structure of the upstream market of container terminal services in the Hamburg – Le Havre port range, as well as the downstream market of container liner shipping services. In particular it deals with the following:

(a) the definition of the upstream market of container terminal services, including the geographic market(s) of the Hamburg – Le Havre port range;

(b) the estimation of the total market size in throughput and capacity terms;

(c) the analysis of liners' entry;

(d) the estimation of market shares of terminal operators and liner companies in throughput and capacity terms;

(e) the concentration level of the upstream market of container terminal services;

[158] In EU competition policy social welfare is equal to consumer welfare although in US competition policy social welfare is the sum of consumer welfare and producer welfare.

(f) the description of the evolution of market shares;

(g) the definition of the downstream market of container liner shipping services;

(h) the discussion of liners' market shares;

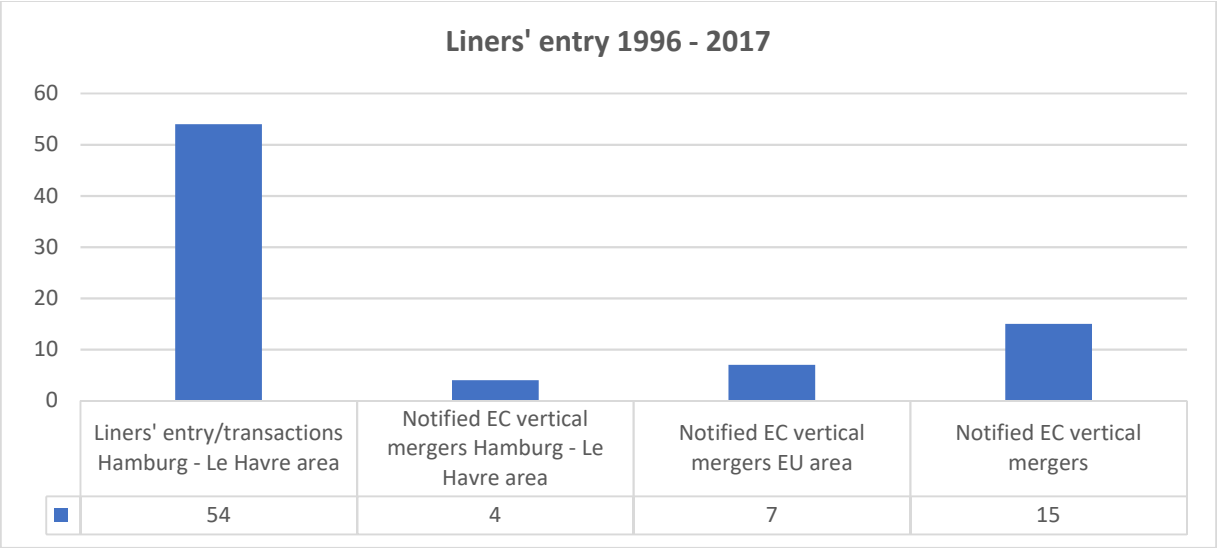
(i) the alliances and the concentration of the downstream market of container liner shipping services.

Moreover, it begins with the estimation of the real vertical transactions in the examined port range of Hamburg – Le Havre and their comparison with the notified mergers.

7.2 LINERS' ENTRY/TRANSACTIONS IN THE HAMBURG–LE HAVRE PORT RANGE

Although, at least 54 transactions have taken place concerning liner – vertical integration in the Hamburg – Le Havre port range during the period 1996 – 2017, only four of them have been notified to the Commission, as shown in the following figure.[159]

Figure 7.1 Liners' entry/transactions in the seaport container terminals of the Hamburg – Le Havre port range (1996 – 2017)



Source: Author data compilation on the basis of various sources

[159] In addition, there are some indirect transactions which are not included. These are the result of the downstream horizontal mergers with vertical effects, such as (a) the acquisition of NOL (APL) by CMA CGM, which led to the increase of CMA CGM's percentage at the Rotterdam World Gateway terminal from 10 to 30%, (b) the acquisition of China Shipping by Cosco which led to the entry of Cosco to the APM Terminals Zeebrugge.

The transactions concern (a) the first entry of liners in container terminal operations, mainly by purchase of shares 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 of shareholdings by purchasing or selling shares respectively, which may lead to change of control and/or exit of liners, (c) closure of terminal (only in two cases). The analysis shows that further empirical study in the market of container terminal services is needed in order to extract reliable conclusions.

7.3 THE STRUCTURE OF THE UPSTREAM MARKET OF CONTAINER TERMINAL SERVICES

7.3.1 MARKET DEFINITION

For the purposes of this study, the relevant market of container terminal services in the selected area is defined as the market of container terminal services concerning the deep-sea container vessels without distinction in hinterland and transhipment traffic. It is noted that such terminals can also serve feeder vessels and therefore feeder traffic may be included in their throughput. Multiple purpose and general cargo terminals are excluded. In addition are excluded the limited capacity terminals, such as the HHLA Unikai Container Terminal in Hamburg.

7.3.2 ESTIMATION METHOD OF MARKET SHARES IN THE MARKET OF CONTAINER TERMINAL SERVICES

The definition of the relevant market in both product and geographic dimensions determines the suppliers and the customers/consumers on that market. Therefore, the calculation of market shares depends critically on market definition. On that basis, a total market size and market shares for each supplier can be calculated on the basis of their capacity and their sales of the relevant products in the relevant area. Market shares and concentration levels provide the first useful indications of the market power of competitors. The estimation method of market shares is based on:

a) Portion of market shares. Market shares of the engaged companies (partners) in container terminals' operation are estimated in capacity and throughput basis. Both capacity and throughput are apportioned between the partners in relation to their respective shareholdings, irrespective of the existed type of control (joint, sole or

minorities). Such an estimation differs from the Commission's estimation as the Commission considers that the capacity of a terminal has been apportioned between the partners in relation to their respective shareholdings when joint control exists, meaning that minority shareholdings in case that they are not accompanied by joint control are not estimated. The allocation of capacity and throughput market shares according to partners' shareholdings irrespectively of the existed type control is not the worst case scenario, as a terminal may be dedicated to a liner even in the case of a minority shareholding or in the case without interests at all (vertical agreements).

b) Inclusion of captive shares. Captive throughput and capacity are not excluded of the estimation. Not only there is no risk for these shares to be doubled calculated, but also by excluding the captive shares, the real total size market is not estimated. Anyway, if the captive capacity is excluded, then the market size will be estimated only on non-integrated terminal operators' basis and therefore the market shares of the non-integrated terminal operators will be overestimated.

Based on the analysis of Chapter 5 and Chapter 6, the market shares are calculated in the Hamburg – Le Havre port range and in the three other narrower markets: (a) the German ports, (b) the ports of Rotterdam and Antwerp, and (c) the French ports.

7.3.3 THE HAMBURG – LE HAVRE PORT RANGE VERTICAL INTEGRATION

In the upstream market of (deep sea) container terminal services in the Hamburg – Le Havre port range, only six (6) terminal operators (Eurogate, HHLA, Hutchison, DP WORLD, PSA, Perrigault) act, by holding a total capacity of 35,884.1 thousand TEUs in 2016, which is 62.14% of the total range capacity.[160] Five (5) of them act on a national level: Eurogate and HHLA operate in Germany, Hutchison operates in the Netherlands, PSA operates in Belgium[161,162] and Perrigault operates in France. DP World is the unique operator which acts in three nations, the Netherlands, Belgium and France.

[160] Shanghai International Port Group (SIPG) was holding also a 25% share of the container terminal APM Terminals Zeebrugge (ATZ) which in 2017 was fully acquired by Cosco (sole control 100%).
[161] PSA also holds 20% share of Hutchison which is acting in the Netherlands.
[162] The share of SIPG was acquired by Cosco in 2017.

Moreover, thirteen liner companies (Hapag Lloyd, MSC, Maersk, MOL, HMM, Cosco, China Shipping[163], Hanjin[164], K Line, Yang Ming, CMA CGM, APL[165], Evergreen and NYK) have interests by holding a total capacity of 37.13%. Finally, three (3) others[166] have interests in container terminals by holding the total percentage of 0.73%. The data research shows that in the Hamburg – Le Havre port range the unique horizontal relation between terminal operators is the PSA's acquisition of 20% of Hutchison's shares.

Vertical integration ensures the input for liners and the customers for terminals. A representative example is the Memorandum of Understanding (MoU) which signed in 2006 between ECT and CKYH alliance (Cosco, K Line, Yang Ming and Hanjin) concerning the entry of liners in Euromax terminal:[167] *"The MoU anticipates the joint venture between the parties, which offers good future perspectives for the partners. The Euromax Terminal in Rotterdam will for example be one of the most important hubs in Europe which all the shipping companies in the alliance will be using. CKYH with this has secured handling capacity for the growing cargo flows in Rotterdam; a security that ECT can offer, also for a longer period of time. The Euromax Terminal has been designed as a 'high performance' terminal and can be considered to be part of the latest generation of automated terminals".* On the other hand according to the president of ECT:[168] *"We are pleased to enter into a partnership with the CKYH alliance. This long-term relationship will secure cargo volumes from CKYH for our new automated container terminal, which in turn will provide the alliance with ample capacity and excellent container handling services".*

The vertical relation between liners and container terminals is determined by contracts, minority interests, joint ventures, partially owned subsidiaries and wholly owned subsidiaries. The liner companies' interests are accompanied by sole or joint control. There

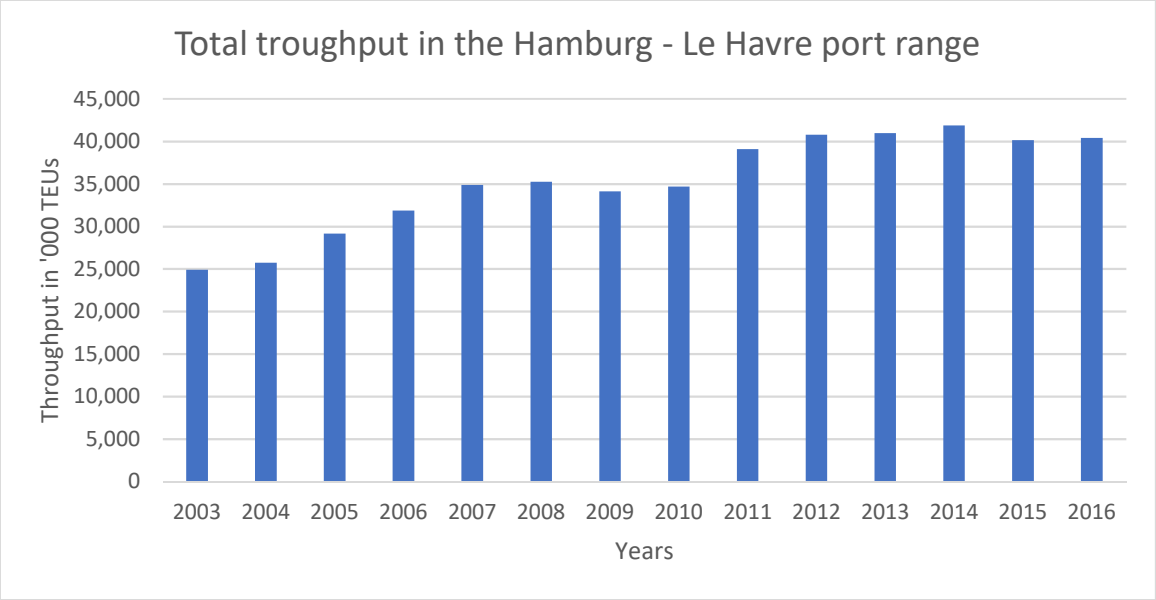
[163] China Shipping was acquired by Cosco in December 2015, after the approval of the Chinese Authorities.
[164]Hanjin Shipping filed for bankruptcy protection on 31.08.2016, after months of trying to raise liquidity and restructure its debt.
[165] APL which was acquired by CMA CGM in 2016, see case M.7908 – CMA CGM/NOL (29.04.2016).
[166] They are Stichting Werknemersaandelen (Union of port workers) in the Netherlands, Duisport (Logistics) Belgium and Port of Dunkirk (Port Authority) in France.
[167] See relevant Press Release of K Line (21.12.2006), http://www.kline.com/News-and-Press/2011-and-Older/061221-Memorandum-of-Understanding-Signed-Euromax.html, date of access 06.10.2018.
[168] See the statement of Jan Westerhoud, President of ECT (01.01.2007), http://www.arabianbusiness.com/euromax-terminal-deal-agreed-with-ckyh-alliance-214255.html, date of access 16.07.2017.

are also minority passive interests accompanied by secret or confidential agreements. Additionally, there are liner companies such as Maersk, MSC and CMA CGM which are also engaged in inland transport, logistics and forwarding.

Container terminals are operated under long time awarded concessions, e.g. Eurogate Container Terminal Wilhelmshaven (CTW) for 40 years, Antwerp International Terminal (Deurganckdok West development) for 40 years, Antwerp Gateway for 42 years and APM Terminals Zeebrugge (ATZ) for 36 years.

The data research shows (see **Figure 7.2**) that during the examined period there is a continuous growth of throughput at the Hamburg – Le Havre container terminals range, meaning that there is also a continuous growth of container transport as well as a growth of delivery and destination terminals at the other leg of the route (trade). A noticeable decrease of throughput is just 3.2% for the year 2009.

Figure 7.2 Total throughput in the Hamburg – Le Havre port range in '000 TEUs (2003 – 2016)



Source: Assessment based on Drewry's Reports

Therefore, the considered crisis by the liner companies is that the throughput climbed less than the forecasts, resulting in: (a) overcapacity of ships as new and bigger ships had been ordered, (b) overcapacity of container terminals (designed and operational), and (c) change or abandonment of new terminal projects. The designed capacity of MPET and

EUROMAX is 9,000 and 5,000 thousand TEUs respectively. Concluding, there is an excess supply but the demand is not weak. In addition, almost all liner companies operate not only owned but also chartered container ships (Alphaliner, 2018) and therefore, they have flexibility in supply.

Table 7.1 shows the shares of liners and terminal operators in equity capacity and throughput in the market of the Hamburg – Le Havre port range for the year 2016.

Table 7.1 Equity capacity and throughput shares of engaged companies in container terminals' operation in the Hamburg – Le Havre port range (2016)

Partner	Capacity		Throughput	
	TEUs (΄000)	%	TEUs (΄000)	%
EUROGATE	10330.0	17.89	5763.8	15.11
PSA	7945.5	13.76	4849.5	12.71
HHLA	7247.0	12.55	5778.9	15.15
HUTCHISON	6093.6	10.55	5563.0	14.58
DP WORLD	3405.0	5.90	1999.5	5.24
PERRIGAULT	510.0	0.88	432.5	1.13
SIPG	353.0	0.61	70.3	0.18
TOTAL TO	**35884.1**	**62.14**	**24457.4**	**64.11**
MSC	6425.5	11.13	4510.5	11.82
MAERSK	7734.1	13.39	4477.5	11.74
CMA CGM/APL	2974.0	5.15	1337.0	3.50
COSCO	1392.5	2.41	1300.0	3.41
HAPAG LLOYD	753.0	1.30	596.1	1.56
HMM	470.0	0.81	149.2	0.39
MOL	470.0	0.81	149.2	0.39
EVERGREEN	463.0	0.80	420.0	1.10
CHINA SHIPPING	338.9	0.59	67.4	0.18
NYK	208.4	0.36	189.0	0.50
HANJIN	70.0	0.12	63.0	0.17
K LINE	70.0	0.12	63.0	0.17
YANG MING	70.0	0.12	63.0	0.17
TOTAL LINERS	**21439.4**	**37.13**	**13385.0**	**35.09**
DUISPORT	250.0	0.43	192.2	0.50
SW*	92.6	0.16	84.0	0.22
PORT OF DUNKIRK	81.0	0.14	29.5	0.08
TOTAL OTHERS	**423.6**	**0.73**	**305.7**	**0.80**
GENERAL TOTAL	**57747.0**	**100.00**	**38148.1**	**100.00**

Source: Assessment based mainly on Drewry's Report 2017
**STICHTING WERKNEMERSAANDELEN*

The HHI index[169] for the Hamburg – Le Havre port range based on companies' shares in 2016 is 1.154 in terms of capacity and 1.167 in terms of throughput, which shows a rather low concentration level. Nevertheless, the port range of Hamburg – Le Havre is not considered as a whole market but it is a port range which includes the geographic markets of a) the ports of Germany, b) the Rotterdam and Antwerp ports, and c) the ports of France, which are analysed below.

7.3.4 THE PORTS OF GERMANY

Eight (8) main container terminals are located in Germany: four (4) container terminals are located in the port of Hamburg, three (3) container terminals are located in the port of Bremerhaven and one (1) container terminal is located in the port of Wilhelmshaven (Jadeweserport).[170] All of them are jointly or fully controlled by two German terminal operators: HHLA and Eurogate.[171] In particular, four (4) container terminals are operated by a single terminal operator (HHLA or Eurogate) and three container terminals are jointly operated by the terminal operator Eurogate and a liner company (MSC or Maersk (2 terminals)). There is also a joint venture between HHLA and the liner company Hapag Lloyd which both belong to the same parent company. Thus, the maximum number of partners in German container terminals is two. Two terminals in Bremerhaven port (MSC Gate and North Sea Terminal Bremerhaven (NTB)) of total capacity 6.080 thousand TEUs

[169] The Herfindahl-Hirschman Index (HHI) is applied in order the concentration levels to be measured. The HHI is calculated by summing the squares of the individual market shares of all the firms in the market. The HHI gives proportionately greater weight to the market shares of the larger firms. Although it is best to include all firms in the calculation, lack of information about very small firms may not be important because such firms do not affect the HHI significantly. The HHI ranges from close to zero (in an atomistic market) to 10 000 (in the case of a pure monopoly). In the market of container terminal services the HHI is calculated by summing the squares of the individual market shares of the firms and not the terminals (see Guidelines on the assessment of horizontal mergers under the Council Regulation on the control of concentrations between undertakings (2004/C 31/03) and case JV. 55 - Hutchison/RCPM/ECT, point 50).

[170] In addition, containers are handled in four (4) small multipurpose terminals having capacity from 50 to 250 thousand TEUs, which also are fully or jointly controlled by HHLA: (a) HHLA Unikai Container Terminal in Hamburg (HHLA/GRIMALDI), (b) HHLA Frucht Terminal in Hamburg (HHLA/Belgian New Fruit Wharf), (c) Lubeck Container Terminal in Lubeck port controlled 100% by HHLA, and (d) Cuxport Terminal in Cuxhaven (HHLA/RHENUS AG).

[171] Hamburger Hafen- und Lagerhaus-Aktiengesellschaft (HHLA) is controlled by the Freie und Hansestadt Hamburg. Eurogate was created in 1999 and it is jointly controlled by Eurokai KGaA (50%) and BLG Logistics Group AG & Co. KG (50%). Eurokai is a private firm owned by the Eckelmann family. BLG Logistics Group is majority owned by the City of Bremen (see case M.5066 – EUROGATE/APMM (05.06.2008)).

are dedicated to MSC and Maersk respectively, two liners that belong to the same alliance (2M).

Table 7.2 shows the equity capacity shares of the partners of German container terminals. Therefore, the total shares of the operators of the German container terminals, in terms of equity capacity, are as detail in **Table 7.3**. If the equity capacity belonging to liner companies was excluded as captive capacity, the shares would be 58.8% for Eurogate and 41.2% for HHLA.

Table 7.2 The deep-sea container terminals of Germany (2016)

Port	Container terminal	Capacity '000 TEUs	Partner 1	Share (%)	Partner 2	Share (%)
HAMBURG	EUROGATE Container Terminal Hamburg (CTH)	4100	EUROGATE	100.0	-	-
HAMBURG	HHLA Container Terminal Altenwerder (CTA)	3000	HHLA	74.9	HAPAG LLOYD	25.1
HAMBURG	HHLA Container Terminals Burchardkai (CTB)	5000	HHLA	100.0	-	-
HAMBURG	Tolleront (CTT)		HHLA	100.0	-	-
BREMERHAVEN	EUROGATE Container Terminal Bremerhaven (CTB)	2000	EUROGATE	100.0	-	-
BREMERHAVEN	MSC Gate	2380	EUROGATE	50.0	MSC	50.0
BREMERHAVEN	North Sea Terminal Bremerhaven (NTB)	3700	EUROGATE	50.0	MAERSK (APMT)	50.0
WILHELMSHAVEN (JADEWESERPORT)	EUROGATE Container Terminal Wilhelmshaven (CTW)	1700	EUROGATE	70.0	MAERSK (APMT)	30.0

Source: Assessment based mainly on Drewry's Report 2017

Table 7.3 The market shares in equity capacity and throughput terms in German container terminals (2016)

	Capacity '000 TEUs		Throughput '000 TEUs	
Partner	**TEUs**	**%**	**TEUs**	**%**
EUROGATE	10330	47.21	5763.8	39.49
HHLA	7247	33.12	5778.9	39.59
TOTAL TO	**17577**	**80.33**	**11542.7**	**79.08**
HAPAG LLOYD	753	3.44	596.1	4.08
MAERSK	2360	10.79	1692.2	11.59
MSC	1190	5.44	765.0	5.24
TOTAL LINERS	**4303**	**19.67**	**3053.3**	**20.92**
GENERAL TOTAL	**21880**	**100.00**	**14596.0**	**100.00**

Source: Assessment based on Drewry's Report 2017

Concerning the liner companies' entry in German ports, the pioneer, as always, is Maersk. Its first entry took place in 1998. In fact, North Sea Terminal Bremerhaven GmbH & Co. (NTB), was founded by the three proprietary companies, BLG Container GmbH, Maersk Deutschland GmbH and Sea-Land Service Inc. in mid-1998. Meanwhile, the shares are

held in equal parts by the joint venture of BLG and Eurokai, "Eurogate GmbH & Co. KGaA, KG", and by the "APM Terminals Deutschland Holding GmbH", the German subsidiary of the global terminal operating company APM Terminals International, a part of the APMM Group. In 2006 Eurogate awarded the concession for 40 years in Eurogate Container Terminal Wilhelmshaven and later Maersk obtained a share of 30%. Only two of the transactions related to German ports have been notified to the Commission.[172]

Since the first entry of liners in German container terminals, no other transactions have taken place, meaning that the partners and their equity shares remain stable. As it will be shown later, only in German container terminals from the examined port range, do the shareholders and their equity shares remain stable.

Table 7.4 Liners' entry in German ports

Liner Company	Year of entry		Germany		EC Decision
	Agr/ment	Operation	Port	Container Terminal	
MAERSK (APMT)	1998	1998	BREMERHAVEN	North Sea Terminal Bremerhaven (NTB)	WITHOUT EC NOTIFICATION
HAPAG LLOYD	2001	2001	HAMBURG	HHLA Container Terminal Altenwerder (CTA)	M.2422/22.08.2001 HAPAG-LLOYD/HAMBURGER HAFEN-UND LAGERHAUS/HHLA-CTA
MSC	2004	2004	BREMERHAVEN	MSC Gate	WITHOUT EC NOTIFICATION
MAERSK (APMT)	2008	2012	WILHELMSHAVEN	EUROGATE Container Terminal Wilhelmshaven (CTW)	M. 5066/05.06.2008 EUROGATE/APMM

Source: Author data compilation on the basis of various sources

The entry of liner companies in the market of container terminal services in Germany is limited, and therefore the market remained highly concentrated and dominated by two German terminal operators, Eurogate and HHLA. The HHI index for the market of German container ports is 3484 in terms of capacity and 3305 in terms of throughput.

German ports could be considered as a distinct market due to their higher prices as well as the elasticity of traffic volumes due to distance. The Commission's research in 2008,[173] showed that terminal charges for hinterland traffic appear to differ significantly in the

[172] See cases M.2422 - Hapag-Lloyd/Hamburger Hafen-Und Lagerhaus/HHLA-CTA (22.08.2001) and M.5066 - EUROGATE/ APMM (05.06.2008).

[173] Case M.5066 - EUROGATE/APMM (05.06.2008). Although the geographic market is left open, the Commission concludes that the possible geographic scope of the market for handling hinterland traffic could be considered as the Hamburg-Antwerp range, and might be possibly narrowed down to comprising the German ports only.

Hamburg-Le Havre range as German ports have generally the highest terminal charges, significantly higher than Rotterdam and Antwerp. In addition, the Commission's market investigation indicated that liners consider the level of stevedoring handling charges as one of the most important factors when selecting a port of call. It is also perceived as fairly difficult to switch from one port to another, especially between German and French ports, as hinterland volumes are often influenced by distance and hinterland links available. The Commission notes that switching is also problematic due to the lack of available capacity in ports and mentions as an example the available low capacity in Zeebrugge and Dunkirk. While Le Havre is perceived to be increasing its capacity, its substitutability with other ports in the above-mentioned range is limited due to the fact that it has a difficult industrial labour environment often resulting in delays, it is perceived by many respondents as providing inferior service and additional costs. According to the Commission's research, a further indication of this is that despite a number of customers switching mainly from Hamburg to Rotterdam or Antwerp, the terminal handling rates in German ports remained high. Many respondents indicated that they would not in any case switch their hinterland traffic to an alternative deep-sea port in Europe if their current provider of terminal services increased their prices by 5-10%. Lastly, switching ports might also depends on the willingness of liner's customers to follow its operational choices. Cargo owners consider the choice of port handling hinterland traffic by their provider of liner shipping services to be an important factor which influences their choice of shipping liner. The suitability of a port from the point of view of a cargo owner may depend on the distance and connection to the cargo owner's production site or the ultimate final destination. This is mainly due to costs which are caused by the inland haulage incurred, especially pre-carriage to a port. For the above reasons, Le Havre and Dunkirk are largely considered as no substitutes for German ports by liners operating in this range.

7.3.5 THE PORTS OF THE NETHERLANDS

Totally eight (8) deep-sea container terminals are located in the Netherlands, all of them vertically integrated, but, at the present, six (6) of them in operation, all in the port of Rotterdam.[174] As shown in Table 7.5, the main terminal operator in the Netherlands is

[174] In addition, there are two closed terminals: (a) Amsterdam Container Terminal (Ceres Paragon) operated by Hutchison (70.1%) and NYK (29.9%), which closed down in 2013, and (b) ECT – Home terminal operated

Hutchison, which operates as a majority shareholder with shares from 50% to 83.5% in three container terminals, in partnerships with different liners:[175] a) Euromax, which is operated by Hutchison and Cosco[176], b) ECT Delta, and c) Delta MSC Terminal. Two container terminals are solely controlled by the liner company Maersk: APM Terminals Rotterdam and Maasvlakte II - Phase I. APM Terminals Rotterdam is dedicated to Maersk, as it mainly handles containers shipped by Maersk, while Maasvlakte II - Phase I is operated as a common user terminal. The last terminal in Rotterdam is operated by DP World and four liner companies (APL, MOL, HMM and CMA CGM), which became three after the acquisition of APL by CMA CGM: Maasvlakte II - Phase II. The maximum number of partners of Rotterdam's container terminals is five.

Table 7.5 The deep-sea container terminals of the Netherlands (2016)

No	Container terminal	Capacity '000 TEUs	Partner 1	Partner 2	Partner 3	Partner 4	Partner 5
Closed	Ceres Paragon Terminal (Amsterdam)	1200	HUTCHISON (70.1%)	NYK (29.9%)			
1	APM Terminals Rotterdam	3570	APMT (100.0%)				
2	Delta Dedicated East & West Terminals, ECT Delta	4630	HUTCHISON (83.5%)	NYK (4.5%)	EVERGREEN* (10%)	STICHTING WERKN/LEN (2.0%)	
Closed	ECT Home Terminal	1500	HUTCHISON (93.5%)	NYK (4.5%)	STICHTING WERKN/LEN (2.0%)		
3	Delta Dedicated North Terminal, ECT Delta / Delta MSC Terminal (DMT)	1140	HUTCHISON (50.0%)	MSC (TIL) (50.0%)			
4	EuroMax Terminal Rotterdam (EuroMax)	2550	HUTCHISON (65.0%)	COSCO** (35.0%)			
5	Maasvlakte II - Phase II	2350	DP WORLD (30.0%)	APL (20.0%)	MOL (20.0%)	HMM (20.0%)	CMA CGM (10.0%)
6	Maasvlakte II - Phase I	1084	APMT (100.0%)				

Source: Author data compilation on the basis of various sources

**According to case M. 5398 - HUTCHISON/EVERGREEN (17.12.2008) concerning the Hutchison's acquisition of a controlling share (50%) in Taranto Terminal by share swap with Evergreen, Evergreen acquired a minority interest of the equity in ECT Delta Terminal B.V.*

*** Cosco acquired 35% in May 2016.*

by Hutchison (93.5%), NYK (4.5%) and STICHTING WERKNEMERSAANDELEN (2%), which closed in October 2015.

[175] Hutchison was the majority shareholder (70%) in the Amsterdam Container Terminal which closed in 2013. The minority shareholder was the liner company NYK. NYK was the only shareholder of the terminal from 2006 to 2008, when Hutchison entered through a share swap agreement by which NYK acquired minority interests in ECT Delta Terminal and ECT Home Terminal of Rotterdam. NYK's first entry in the Amsterdam Container Terminal took place in 2002 by acquiring 50%.

[176] Until 2016, it was operated by Hutchison and CHYH Alliance.

Table 7.6 shows the liner companies' entry in the ports of the Netherlands. Only one of them has been notified to the Commission.

Table 7.6 Liners' entry in ports of the Netherlands

Liner	Year of entry		The Netherlands		
Name	**Agreement**	**Operation**	**Port**	**Container Terminal**	**EC Decision**
MAERSK (APMT)	2000	2000	ROTTERDAM	APM Terminals Rotterdam	WITHOUT EC NOTIFICATION
NYK	2002	2002	AMSTERDAM	Amsterdam Container Terminal (Ceres Paragon)	WITHOUT EC NOTIFICATION
PONL	2004	2008	ROTTERDAM	EuroMax Terminal Rotterdam (EuroMax)	M.3576/22.12.2004 ECT/PONL/EUROMAX
COSCO	2006	2008	ROTTERDAM	EuroMax Terminal Rotterdam (EuroMax)	WITHOUT EC NOTIFICATION
HANJIN	2006	2008	ROTTERDAM	EuroMax Terminal Rotterdam (EuroMax)	WITHOUT EC NOTIFICATION
K LINE	2006	2008	ROTTERDAM	EuroMax Terminal Rotterdam (EuroMax)	WITHOUT EC NOTIFICATION
YANG MING	2006	2008	ROTTERDAM	EuroMax Terminal Rotterdam (EuroMax)	WITHOUT EC NOTIFICATION
EVERGREEN	2008	2009	ROTTERDAM	ECT Delta	WITHOUT EC NOTIFICATION **
NYK	2008	2009	ROTTERDAM	ECT Home - City Terminal	WITHOUT EC NOTIFICATION
NYK	2008	2009	ROTTERDAM	ECT Delta	WITHOUT EC NOTIFICATION
MSC	2011	2011	ROTTERDAM	Delta Dedicated North Terminal, ECT Delta / Delta MSC Terminal (DMT)	WITHOUT EC NOTIFICATION
APL*	2007	2015	ROTTERDAM	Maasvlakte II - Phase II	WITHOUT EC NOTIFICATION
CMA CGM (CMA TERMINALS)	2007	2015	ROTTERDAM	Maasvlakte II - Phase II (Rotterdam World Gateway)	WITHOUT EC NOTIFICATION
HMM	2007	2015	ROTTERDAM	Maasvlakte II - Phase II	WITHOUT EC NOTIFICATION
MOL	2007	2015	ROTTERDAM	Maasvlakte II - Phase II	WITHOUT EC NOTIFICATION

Source: Author data compilation on the basis of various sources

**APL was acquired by CMA CGM, as a subsidiary of NOL in 2016. Although in case M.7908 CMA CGM / NOL (29.04.2016) the share of APL in Maasvlakte (20%) is not mentioned, if it is added to 10% share of CMA CGM of Rotterdam World Gateway creates competition concerns as the total share of the merged company is 30%.*

***The information about the Evergreen's share is given by the case M.5398 - HUTCHISON/EVERGREEN (17.12.2008) which concerns other transaction. Evergreen's share has not been notified as it is a minority share.*

In addition to the above first entry of liners in the Netherlands' container terminals, some other transactions have taken place resulting in increases or decreases of liners' shares, as well as in their exit of the terminals.

The market shares of the Rotterdam's partners will be demonstrated later during the examination of the geographic market Rotterdam - Antwerp.

7.3.6 THE PORTS OF BELGIUM

Eight (8) container terminals in operation are located in Belgium in the two ports of Antwerp and Zeebrugge. The most popular terminal operator is PSA which operates six (6) container terminals (three (3) terminals are solely controlled and three (3) are jointly controlled with liners as partners). The maximum number of terminal shareholders, including DUISPORT, is five. There are only two terminals in which PSA is not active. One of them (APM Terminals Zeebrugge) was solely controlled by Maersk until 2017 (having as minority shareholders SIPG and Cosco), and since 2017 Cosco has obtained 100% of the terminal. The second one (Antwerp Gateway) is operated by DP World, three liner companies and a conglomerate company.

Table 7.7 The deep-sea container terminals of Belgium (2016)

No	Port	Container terminal	Capacity '000 TEUs	Partner 1	Partner 2	Partner 3	Partner 4
1	ANTWERP	Antwerp Gateway*	2500	DPW (42.5%)	COSCO (20.0%)	ZIM (20.0%)	CMA CGM (10.0%)
2	ANTWERP	Antwerp International Terminal	500	PSA (58.0%)	YANG MING (14.0%)	HANJIN (14.0%)	K LINE (14.0%)
3	ANTWERP	PSA Antwerp Europa Terminal	1800	PSA (100%)			
4	ANTWERP	PSA Antwerp Noordzee Terminal	1300	PSA (100%)			
5	ANTWERP	Churchill Dock (Berths 420-428) & Unitload (HNN)	400	PSA (100%)			
6	ANTWERP	MSC Home Terminal	3217	PSA (50.0%)	MSC (TIL) (50.0%)		
7	ANTWERP	MSC PSA European Terminal (MPET) Deurganckdok West	5094	PSA (50.0%)	MSC (TIL) (50.0%)		
Closed	ANTWERP	Deurganckdok West	2100	PSA (100.0%)			
Closed	ZEEBRUGGE	Container Handling Zeebrugge (OCHZ Terminal)	1100	PSA (65.0%)	CMA CGM (35.0%)		
8	ZEEBRUGGE	APM Terminals Zeebrugge (ATZ)	1000	APMT (51.0%)	SIPG (25.0%)	CHINA SHIPPING (24.0%)	
Closed	ZEEBRUGGE	Zeebrugge International Port (ZIP)	800	PSA (100.0%)			

Source: Assessment based on Drewry's Report 2017
** There is also a fifth partner, DUISPORT, which holds 7.5%.*

In addition, there are two small common user terminals in the port of Antwerp which are fully controlled by Euroports: (a) Euroports Terminals Left Bank with a capacity of 175,000 TEUs, and (b) Euroports Containers Right Bank with a capacity of 200,000 TEUs. It is a large logistics group that operates twenty two (22) port terminals in Europe and two (2) in China. Euroports is owned by three institutional shareholders: Brookfield Infrastructure, Antin Infrastructure and Arcus European Investment Fund. Brookfield has

owned 100% of PD Ports since November 2009. Arcus has owned 100% of Forth Ports since early 2011.

Although Maersk does not hold any shares in the port of Antwerp, it is one of the main customers. **Table 7.8** shows the total market shares in equity capacity and throughput terms in the port of Antwerp.

Table 7.8 The market shares in equity capacity and throughput terms in the port of Antwerp (2016)

	Capacity		Throughput	
Partner	**´000 TEUs**	**%**	**´000 TEUs**	**%**
PSA	7945.5	53.65	4871.0	49.22
DPW	1500.0	10.13	1153.2	11.65
Total TO	**9445.5**	**63.77**	**6024.2**	**60.87**
MSC	4155.5	28.06	2914.5	29.45
COSCO	500.0	3.38	384.4	3.88
CMA CGM/APL	250.0	1.69	192.2	1.94
YANG MING	70.0	0.47	63.0	0.64
HANJIN	70.0	0.47	63.0	0.64
K LINE	70.0	0.47	63.0	0.64
Total Liners	**5115.5**	**34.54**	**3680.1**	**37.19**
DUISPORT	250.0	1.69	192.2	1.94
Total Others	**250.0**	**1.69**	**192.2**	**1.94**
Total	**14811.0**	**100.00**	**9896.5**	**100.00**

Source: Assessment based on Drewry's Report 2017

By adding the port of Zeebrugge the shares do not change dramatically due to the fact that only one limited throughput terminal was in operation in 2016, the AMPT Zeebrugge terminal.

Therefore, the port operator PSA has a dominant position in container terminal services of Belgian ports as it holds a share of 64.00% in terms of equity capacity. The share of liner companies in total is 30.47%. The biggest liner shareholder in the Belgium ports is MSC, which holds 20.67% of equity capacity in the port of Antwerp. **Table 7.9** shows the liner companies' entry in the ports of Belgium. Only one of them has been notified to the Commission.

Table 7.9 Liners' entry in the ports of Belgium

Liner Company	Year of entry		Belgium		
Name	**Agreement**	**Operation**	**Port**	**Container Terminal**	**EC Decision**
PONL	2003	2005	ANTWERP	Antwerp Gateway	WITHOUT NOTIFICATION
MSC		2005	ANTWERP	MSC Home Terminal	WITHOUT NOTIFICATION
CMA CGM	2004	2005	ZEEBRUGGE	Container Handling Zeebrugge (OCHZ Terminal)	WITHOUT NOTIFICATION
CMA CGM	2005	2005	ANTWERP	Antwerp Gateway	WITHOUT NOTIFICATION
COSCO	2005	2005	ANTWERP	Antwerp Gateway	WITHOUT NOTIFICATION
MAERSK	2004	2006	ZEEBRUGGE	APM Terminals Zeebrugge (ATZ)	WITHOUT NOTIFICATION
HANJIN	2005	2006	ANTWERP	Antwerp International Terminal	WITHOUT NOTIFICATION
K LINE	2005	2006	ANTWERP	Antwerp International Terminal	WITHOUT NOTIFICATION
YANG MING	2005	2006	ANTWERP	Antwerp International Terminal	WITHOUT NOTIFICATION
ZIM	2007	2007	ANTWERP	Antwerp Gateway	WITHOUT NOTIFICATION
MAERSK	2007	2007	ANTWERP	Antwerp Gateway	WITHOUT NOTIFICATION
CHINA SHIPPING	2013	2014	ZEEBRUGGE	APM Terminals Zeebrugge (ATZ)	WITHOUT NOTIFICATION
MSC	2013	2015	ANTWERP	MSC PSA European Terminal (MPET) Deurganckdok	WITHOUT NOTIFICATION
MSC	2017	2017	ANTWERP	Deurgancdok West	M.8459/TIL/PSA/PSA DGD
COSCO	2017	2017	ZEEBRUGGE	APM Terminals Zeebrugge (ATZ)	WITHOUT NOTIFICATION

Source: Author data compilation on the basis of various sources

In 2017, relating to an intraport merger at the port of Antwerp,[177] the EC concluded that the relevant geographic market for hinterland traffic would at least comprise the ports of Antwerp and Rotterdam. Specifically, the Commission's market test showed that the majority of both customers and competitors considered at the very minimum the port of Rotterdam a clear alternative to the port of Antwerp for hinterland traffic.[178] Hapag Lloyd, which uses both ports of Antwerp and Rotterdam, indicated that, in case of a price increase of 5-10% in terminal services by PSA DGD at the port of Antwerp, it could envisage switching part of its shipment volumes to the port of Rotterdam. Concerning the port of Zeebrugge, it was one of the least preferred alternatives amongst the respondents to the market investigation, due to hinterland connection issues and the related cost considerations, size-related capacity constraints, draught restrictions for large vessels and customer preference for Antwerp and Rotterdam.

[177] Case M.8459 - TIL/PSA/PSA DGD (31.07.2017).
[178] The competitor DPW suggests the port of Antwerp as a distinct market.

The ports of Rotterdam and Antwerp are the third geographic market in the examined area. The total share of liners is the highest in the examined port range: 44,96% in capacity terms and 42,08% in throughput terms. This is due to the biggest development in terms of capacity and terminals in the port of Rotterdam in recent years as well as to the recent strategy of liners to invest in terminals. Eleven (11) liner companies have invested in the ports of Rotterdam and Antwerp.

Table 7.10 shows the total capacity and throughput shares of partners in capacity and throughput terms in 2016 in the market of Rotterdam and Antwerp.

Table 7.10 The market shares in equity capacity and throughput terms in the ports of Rotterdam and Antwerp (2016)

Partner	Capacity		Throughput	
	'000 TEUs	%	'000 TEUs	%
PSA	7945.5	26.37	4849.5	23.28
HUTCHISON	6093.55	20.22	5563	26.70
DP WORLD	2205	7.32	1377	6.61
TOTAL TO	**16244.05**	**53.90**	**11789.50**	**56.59**
MSC	4725.5	15.68	3313	15.90
MAERSK	4654	15.44	2642	12.68
COSCO	1392.5	4.62	1300	6.24
APL/CMA CGM	955	3.17	416	2.00
HMM	470	1.56	149.2	0.72
MOL	470	1.56	149.2	0.72
EVERGREEN	463	1.54	420	2.02
NYK	208.35	0.69	189	0.91
HANGIN	70	0.23	63	0.30
K-LINE	70	0.23	63	0.30
YANG MING	70	0.23	63	0.30
TOTAL LINERS	**13548.35**	**44.96**	**8767.40**	**42.08**
DUISPORT	250	0.83	192.2	0.92
SW*	92.6	0.31	84	0.40
TOTAL OTHERS	**342.60**	**1.14**	**276.20**	**1.33**
GENERAL TOTAL	**30135**	**100.00**	**20833.1**	**100.00**

*Source: Assessment based on Drewry's Report 2017 /**STICHTING WERKNEMERSAANDELEN

The HHI index for the market of Rotterdam – Antwerp is 1682 in capacity terms and 1762 in throughput terms. Nevertheless, the concentration level is higher considering the alliances between the liners terminal shareholders, as well as the relationship between the terminal operators PSA and Hutchison.

Considering that German ports belong to a different geographic market as they apply different prices and the demand is inelastic, as well as the fact that the French ports capacity is limited to be a significant competitor, the most competitive terminals of the examined port range are located in the Netherlands and Belgium, and specifically in the ports of Rotterdam and Antwerp. In the port of Rotterdam, Hutchison holds 6,093.55 thousand TEUs and in the port of Antwerp PSA holds 7,945.5 thousand TEUs in capacity terms. As the total capacity of the two ports is 30,135 thousand TEUs and PSA holds the 20% of Hutchison, the total share of PSA in the geographic area of Rotterdam – Antwerp is increasing from 26.37% to 30.41% (9,164.21 thousand TEUs). Both companies PSA and Hutchison hold 46.59% of the two ports' capacity (14,039 thousand TEUs).[179] Therefore, the PSA's minority but significant share of Hutchison eliminates or restricts market competition, according to economic theory.

7.3.7 THE FRENCH PORTS OF THE HAMBURG – LE HAVRE PORT RANGE

The Hamburg – Le Havre port range includes two French container ports, Dunkirk and Le Havre, which operate four (4) container terminals. Three of them are located in the port of Le Havre and one of them is located in the port of Dunkirk.[180]

Table 7.11 The deep-sea container terminals of Dunkirk and Le Havre (2016)

Port	Container terminal	Capacity '000 TEUs	Partner	Share (%)	Partner	Share (%)
DUNKIRK	Terminal des Frandres	900	CMA CGM	91.0	PORT OF DUNKIRK	9.0
LE HAVRE	Terminal de France (TDF)	2400	DP WORLD	50.0	CMA CGM	50.0
LE HAVRE	Port 2000 Generale de Manutention Portuaire (GMP) (Nord Terminals Quai des Amériques/Quai d' Europe)					
LE HAVRE	Port 2000 Terminaux de Normandie MSC (TNMSC)	1020	MSC	50.0	PERRIGAULT	50.0

Source: Author's estimations based mainly on Drewry's Report 2017

[179] It is noted that although Hutchison has acquired the sole control of ECT Beheer BV by obtaining the 60% of its shares, there are three more shareholders RMPM/RCPM, ABN and Star (employees trust) which respectively hold 10%, 28% and 2% of the share capital of ECT Beheer (see case JV.56- HUTCHISON/ECT (29.11.2001).

[180] The Terminal of Le Havre, Porte Oceane which is solely controlled (100%) by Perrigault, is excluded from our analysis, due to its limited capacity.

Table 7.12 shows total market shares of the operators in equity capacity terms and **Table 7.13** shows the entry of the liners in the ports of Dunkirk and Le Havre.

Table 7.12 The market shares in equity capacity terms in the ports of Dunkirk and Le Havre (2016)

CMA CGM	DP WORLD	MSC	PERRIGAULT	PORT OF DUNKIRK	TOTAL TO	TOTAL LINERS	TOTAL OTHERS	TOTAL
2019	1200	510	510	81	1710	2529	81	4320
46.74	27.78	11.81	11.81	1.88	39.59	58.55	1.88	100.00%

Source: Author's estimations based mainly on Drewry's Report 2017

CMA CGM holds the biggest share in container terminal services of the French ports of the selected area with a share of 46.74%. It follows DP World with a share of 27.78%. The total liners' market share in terms of capacity in the port of Le Havre is 58.55%. Therefore, the HHI index for the market of the ports of France of the examined port range is 3239 in capacity terms, showing a highly concentrated market. None liner's entry in Le Havre and Dunkirk has been notified to the Commission, as shows the **Table 7.13**.

Table 7.13 Liners' entry in the ports of Dunkirk and Le Havre

Liner Company	Year of entry		The French ports of the Hamburg - Le Havre port range		
Name	**Agreement**	**Operation**	**Port**	**Container terminal**	**EC Decision**
CMA CGM	2005	2005	LE HAVRE	Port 2000 Generale de Manutention Portuaire (GMP) (Nord Terminals Quai des Amériques)	WITHOUT NOTIFICATION
CMA CGM	2006	2006	DUNKIRK	Terminal des Frandres	WITHOUT NOTIFICATION
MAERSK*	2006	2006	DUNKIRK	Terminal des Frandres	WITHOUT NOTIFICATION
CMA CGM	2006	2006	LE HAVRE	Terminal de France	WITHOUT NOTIFICATION
MAERSK**	2004 or 2006	2007	LE HAVRE	Port 2000 Terminal de France Terminal Porte Océane (TPO)	WITHOUT NOTIFICATION
MSC	2007	2011	LE HAVRE	Port 2000 Terminaux de Normandie MSC (TN MSC)	WITHOUT NOTIFICATION

Source: Author data compilation on the basis of various sources

**Maersk sold its 61% share of the Terminal de Frandres to CMA CGM in 2010. Therefore, since then GMA CGM has increased its share to 81%.*

***Maersk sold its 50% share to Perrigault which acquired the sole control of the TPO in 2014.*

7.4 THE STRUCTURE OF THE DOWNSTREAM MARKET OF CONTAINER LINER SHIPPING SERVICES

7.4.1 MARKET DEFINITION

The product market for the provision of container liner shipping services involves the provision of regular, scheduled services for the carriage of cargo by container and is distinguished in deep-sea and short-sea services.

7.4.1.1 GEOGRAPHIC MARKET(S)

The geographic market(s) of container liner services, as mentioned in Chapter 6, is not an easy job. By taking as example data from the European Commission's research (EC, 2009), it is shown that all liners do not make calls at all ports and even if they do, they are not engaged in the same trades.[181] Specifically,

(a) At the German ports of Hamburg and Bremerhaven, nine (9) of the ten (10) big liner companies make calls, as shown in the **Table 7.14**. The real competitors are the liners which call at Hamburg or Bremerhaven and operate in the same trades, such as: i. in the trade Eur – Med four liners compete (Maersk, MSC, CMA CGM and Evergreen); ii. in the trade Eur – M.E. five liners compete (Maersk, CMA CGM, Hapag Lloyd, APL and China Shipping); iii. In the trade Eur - S. Afr two liners compete (Maersk and MSC); iv. in the trade F.E. – Eur, which represents the majority of the transported cargo, eight liners compete (Maersk, MSC, CMA CGM, Evergreen, Hapag Lloyd, APL, NYK and MOL); v. in the trade India – Eur four liners compete (Maersk, CMA CGM, Evergreen, Hapag Lloyd); vi. in the trade N. Atlantic two liners compete (Evergreen and NYK).

Table 7.14 Liners' calls at the port of Hamburg and Bremerhaven per trade in 2008

Trade	Maersk/SAF	MSC	CMA CGM	Evergreen	Hapag Lloyd	Cosco	APL	China Shipping	NYK	MOL
Eur-Med	✓	✓	✓	✓						
Eur-M.E.	✓		✓		✓		✓	✓		
Eur-S.Afr	✓	✓								
F.E.-Eur	✓	✓	✓	✓	✓		✓		✓	✓
India-Eur	✓		✓	✓	✓					
N. Atlantic				✓					✓	

Source: Assessment based on data from EC Research (2009)

(b) At the port of Antwerp, as shown in the **Table 7.15**, nine (9) of the ten (10) big liner companies make calls, the same as the German ports. The real competitors are the liners which call at Antwerp and operate at the same trades, such as: i. in the trade Eur – Med, four liners compete (Maersk, MSC, CMA CGM and Evergreen); ii. in the trade Eur – M.E. five liners compete (Maersk, CMA CGM, Hapag Lloyd, APL and China Shipping); iii. in the trade Eur - S. Afr two liners compete (Maersk and MSC); iv. in

[181] Although data are not recent, their validity is significant for the purpose of the specific hypothesis that not all liners are rivals in a defined relevant market.

the trade F.E. – Eur, which represents the majority of the transported cargo, eight liners compete (Maersk, MSC, CMA CGM, Evergreen, Hapag Lloyd, APL, NYK and MOL); v. In the trade India – Eur four liners compete (Maersk, CMA CGM, Evergreen, Hapag Lloyd); vi. In the trade N. Atlantic three liners compete (MSC, Evergreen and NYK).

Table 7.15 Liners' calls at the port of Antwerp per trade in 2008

Trade	Maersk/SAF	MSC	CMA CGM	Evergreen	Hapag Lloyd	Cosco	APL	China Shipping	NYK	MOL
Eur-Med	✓	✓	✓	✓						
Eur-M.E.	✓		✓		✓		✓	✓		
Eur-S.Afr	✓	✓								
F.E.-Eur	✓	✓	✓	✓	✓		✓		✓	✓
India-Eur	✓		✓	✓	✓					
N. Atlantic		✓		✓					✓	

Source: Assessment based on data from EC Research (2009)

(c) At the port of Zeebrugge, as shown in the **Table 7.16**, eight (8) of the ten (10) big liner companies make calls. The real competitors are the liners which call at Zeebrugge and operate at the same trades, such as: i. in the trades Eur – Med and Eur – M.E. no liners call at Zeebrugge; ii. in the trade Eur - S. Afr two liners compete (Maersk and MSC); iii. in the trade F.E. – Eur which represents the majority of the transported cargo, eight liners compete (Maersk, MSC, CMA CGM, Evergreen, Hapag Lloyd, APL, NYK and MOL); iv. in the trade India – Eur four liners compete (Maersk, CMA CGM, Evergreen, Hapag Lloyd); v. in the trade N. Atlantic three liners compete (MSC, Evergreen and NYK).

Table 7.16 Liners' calls at the port of Zeebrugge per trade in 2008

Trade	Maersk/SAF	MSC	CMA CGM	Evergreen	Hapag Lloyd	Cosco	APL	China Shipping	NYK	MOL
Eur-Med										
Eur-M.E.										
Eur-S.Afr	✓	✓								
F.E.-Eur	✓	✓	✓	✓	✓		✓		✓	✓
India-Eur	✓		✓	✓	✓					
N. Atlantic		✓		✓					✓	

Source: Assessment based on data from EC Research (2009)

(d) At the port of Rotterdam, as shown in the **Table 7.17**, nine (9) of the ten (10) big liner companies make calls. The real competitors are the liners which call at Rotterdam and operate at the same trades, such as: i. in the trade Eur – Med four liners compete

(Maersk, MSC, CMA CGM and Evergreen); ii. in the trade Eur – M.E. five liners compete (Maersk, CMA CGM, Hapag Lloyd, APL and China Shipping); iii. in the trade Eur - S. Afr two liners compete (Maersk and MSC); iv. in the trade F.E. – Eur eight liners compete (Maersk, MSC, CMA CGM, Evergreen, Hapag Lloyd, APL, NYK and MOL); v. in the trade India – Eur four liners compete (Maersk, CMA CGM, Evergreen and Hapag Lloyd); vi. In the trade N. Atlantic, two liners compete (Evergreen and NYK).

Table 7.17 Liners' calls at the port of Rotterdam per trade in 2008

Trade	Maersk/SAF	MSC	CMA CGM	Evergreen	Hapag Lloyd	Cosco	APL	China Shipping	NYK	MOL
Eur-Med	✓	✓	✓	✓						
Eur-M.E.	✓		✓		✓		✓	✓		
Eur-S.Afr	✓	✓								
F.E.-Eur	✓	✓	✓	✓	✓		✓		✓	✓
India-Eur	✓		✓	✓	✓					
N. Atlantic		✓		✓					✓	

Source: Assessment based on data from EC Research (2009)

(e) At the port of Le Havre, as shown in the **Table 7.18**, nine (9) of the ten (10) big liner companies make calls. The real competitors are the liners which call at Le Havre and operate at the same trades, such as: i. in the trade Eur – Med three liners compete (Maersk, MSC and CMA CGM); ii. in the trade Eur – M.E. five liners compete (Maersk, CMA CGM, Hapag Lloyd, APL and China Shipping); iii. in the trade Eur - S. Afr two liners compete (Maersk and MSC); iv. in the trade F.E. – Eur eight liners compete (Maersk, MSC, CMA CGM, Evergreen, Hapag Lloyd, APL, NYK and MOL); v. in the trade India – Eur four liners compete (Maersk, CMA CGM, Evergreen and Hapag Lloyd); vi. in the trade N. Atlantic three liners compete (MSC, Evergreen and NYK).

Table 7.18 Liners' calls at the port of Le Havre per trade in 2008

Trade	Maersk/SAF	MSC	CMA CGM	Evergreen	Hapag Lloyd	Cosco	APL	China Shipping	NYK	MOL
Eur-Med	✓	✓	✓							
Eur-M.E.	✓		✓		✓		✓	✓		
Eur-S.Afr	✓	✓								
F.E.-Eur	✓	✓	✓	✓	✓		✓		✓	✓
India-Eur	✓		✓	✓	✓					
N. Atlantic		✓		✓					✓	

Source: Assessment based on data from EC Research (2009)

Therefore, the precise definition of liners relevant geographic markets is a difficult job as firstly must be defined the relevant geographic markets of the two legs of the route, meaning that: a) all Northern European ports do not belong to the same relevant market, and b) all liners which call at the Northern European ports are not engaged in the same route, and therefore are not rivals.

7.4.2 MARKET SHARES IN THE MARKET OF CONTAINER LINER SHIPPING SERVICES

Concerning the market shares, as mentioned in the upstream market of container terminal services, their calculation depends critically on market definition. The inaccurate market definition does not permit an accurate estimation of market shares. In addition, there are not any available data related to liners' calls per trade. The liners consortia and alliances (i.e. use of the same ship) enhance the difficulties. Therefore, given the absence of such information, published data on liners' market shares are used. Such data can be found in the EC merger decisions as well as in maritime consultants and press editions. On that basis, a total downstream market size of container liner shipping services and market shares for each liner company are calculated according to their sales in the relevant market. Given a narrower geographic definition, market shares are higher. For example, in Maersk's published schedule three connections are stated as unique, meaning that in these connections the market share of the company is 100%. In particular, they are the connections (a) from Germany, Great Britain and Poland to Korean main ports, (b) Great Britain to Chinese main ports and (c) from Aarhus and Gothenburg to Asian main ports (Maersk, 2017).

In global terms, the downstream market of container liner shipping services is like a pyramid. Data show that although in 2017 there were 379 different vessel operators, apart from 31 liner companies at the top of this upside down pyramid, none of the rest have more than 0.1% market share (Knowler, 2018a). After the merger of Cosco / OOCL and the bringing of the three Japanese lines under Ocean Network Express, the leading seven liner companies control 80% of the active container shipping fleet (ibid).

An example of concentration in downstream market is given by the history of liner company PONL (P&O Nedlloyd Container Line Ltd), which was created as a 50/50 joint

venture by Royal Nedlloyd and the Peninsular and Oriental Steam Navigation Company (P&O) in 1996.[182] In 2004, Royal Nedlloyd acquired sole control over the company PONL[183] and finally, in 2005, Maersk acquired sole control of PONL.[184]

Table 7.19 Main horizontal mergers in the downstream market of container liner shipping services (2015 – 2017)

No	Case No	Decision Name	Decision Date	Document type	Vertical effects
1.	M.7523	CMA CGM /OPDR	29.06.2015	Non-Opposition	✓
2.		COSCO/CHINA SHIPPING	11.12.2015	Approved by Chinese Authorities	✓
3.	M.7908	CMA CGM/NOL	29.04.2016	Non-Opposition with commitments	✓
4.	M.8120	HAPAG LLOYD/UNITED ARAB SHIPPING COMPANY	23.11.2016	Non-Opposition with commitments	✓
5.	M.8330	MAERSK LINE/HSDG	10.04.2017	Non-Opposition with commitments	✓
6.	M.8472	NIPPON YUSEN KABUSHIKI KAISHA/MITSUI OSK LINES/KAWASAKI KISEN KAISHA	28.06.2017	Non–Opposition	✓

Source: Author's assessment based on DG Comp data and press

Since then, many significant mergers have taken place in the downstream market, some of them with vertical effects, as shows **Table 7.19**. The total of liner mergers have been notified to the Commission, except the acquisition of China Shipping by Cosco in 2015, which approved by the Chinese Authorities.

In addition, maritime economists have observed that the increase of the fleet capacity was moving in line with the alliancing activities (Tang, 2018). Between 2000 and 2010, as the combined capacity of the fleet capacity of the top 30 carriers has been multiplied by 2, reaching 10.81 million TEUs, three main alliances, Grand Alliance (NYK, Hapag-Lloyd and OOCL), CKYH Alliance (Cosco, K Line, Yang Ming and Hanjin) and New World Alliance (APL, MOL and HMM), have controlled almost 50% of the fleet capacity as of 2010 (Sanchez and Mouftier, 2017). By April 2017, three main alliances, The Alliance, Ocean Alliance and H2M, controlled a total fleet of 15,862,743 TEUs, representing at least 76.6% of the operational market before including the fleet capacities of APL and CSCL in

[182] See case M.831 - P&O/ROYAL NEDLLOYD (19.12.1996).
[183] M.3379 - P&O/ROYAL NEDLLOYD / P&O NEDLLOYD (29.03.2004).
[184] Case M.3829 - MAERSK/PONL (29.07.2005).

TEUs terms (Alphaliner TOP 100, 2017). Besides, two new associations were formed in 2017, namely, Cosco merged with CSCL and CMA CGM acquired APL (NOL); with a decreasing number of companies integrating into fewer but larger alliances, the HHI will be expected to rise exponentially. During these 25 years, Zim remained the only major liner that had not joined any alliance, and it has maintained its profitable position by forming partnerships on various routes to avoid the most important trades where the alliances operate, such as Asia–North Europe.

Knowler (2018a) mentions that according to shipping analyst SeaIntel, the niche liners are affected by the consolidation and capacity injection by the alliances and lose ground. The larger liners expand their fleets rapidly and therefore they have the ability to design an ever more granular network. A more granular network is a competitive threat to niche liners from a product design perspective. At the same time, the niche liners reduce their operated vessels as they increase their vessel sizes in pursuit of scale advantages. This, however, reduces their ability to field a detailed granular network, further exposing them to competitive pressure from the larger liners.

At the same time the European Commission has extended the validity of the existing legal framework exempting, if certain conditions are met, liner shipping consortia from EU antitrust rules by another five years, until April 2020.[185] The Commission has concluded that the exemption has worked well, providing legal certainty to agreements which bring benefits to customers and do not unduly distort competition, and that current market circumstances warrant a prolongation. The maritime consortia block exemption regulation allows shipping lines with a combined market share of below 30% to enter into cooperation agreements to provide joint cargo transport services (so-called "consortia"). Such agreements usually allow liners to rationalise their activities and achieve economies of scale. If consortia face sufficient competition and are not used to fix prices or share the market, users of services provided by consortia are usually able to benefit from improvements in productivity and service quality. The Commission has therefore exempted such agreements from the prohibition of anticompetitive agreements in Article 101 of the

[185] Commission Regulation (EU) No 697/2014 of 24 June 2014 amending Regulation (EC) No 906/2009 as regards its period of application. The first consortia block exemption regulation was adopted in 1995 and prolonged several times.

Treaty on the Functioning of the European Union (TFEU). In that case the matter of the relevant market definition including the geographic relevant market recurs.

According to the Commission's Press Release for consortia and alliances, exceeding the market share threshold established in the block exemption regulation, dated 24.06.2014, it is the responsibility of the companies themselves to make sure that their agreements comply with Article 101 TFEU, and the Commission can decide to intervene if necessary. The Commission will continue to closely monitor market developments and the conduct of companies to ensure that markets remain open and competitive. In particular, in the context of the recent developments in the sector, the Commission will remain vigilant as regards any risks for competition that may arise from the implementation of maritime consortia and might intervene if necessary.

Alliances, consortia and other cooperation agreements increase the market power of the liner companies not only in the downstream but also in the upstream market: a) the agreements of liner companies increase their bargaining power as customers of container terminal services, and b) in case that liners have interests in container terminals, customers are ensured through their agreements, as liners' partners use their equity integrated terminal.

Until the 18th of October 2008, not only there was a price fixing between liners through conferences, but also this practice was legal. With the EC Regulation 1419/2006, shipping conference activities such as price fixing and capacity control were no longer legal under the EU legal regime – shipping conferences can no longer engage in any anticompetitive practice on freight rate maintenance on trades to/from ports of the EU since 18.10.2008.

The new system suggested by the European liners were consolidated into the European Liner Affairs Association Proposal (ELAA Proposal, European Commission, 2004). The contents of information sharing include:

- Exchange and discussion between lines of aggregated capacity utilisation and market size data by trade and on a region/zone to region/zone basis (historic data with a month's delay);
- Exchange, discussion and evaluation of commodity developments by trade (based on data aggregated with a month's delay);

- Discussion and evaluation of aggregate supply and demand data by trade/commodity. Forecasts of demand by trade and commodity would be published;
- Lines will obtain their own market share by trade, by region and by port (data aggregated with a month's delay);
- Price index differentiated by type of equipment (e.g. reefer, dry) and/or trade (data aggregated with a quarterly delay). This information would be made publicly available;
- Surcharges and ancillary charges based on publicly available and transparent formulae; the details of which would be discussed with shippers.

The ELAA submits that in the specific case of liner shipping, the benefits of information exchange far outweigh any risk of collusion. But, as mentioned in Chapter 3 information exchange facilitates collusion and in the downstream market many cartel cases are met. Specifically, the Commission closed the case AT. 39850 Container Shipping (07.07.2016), where although inspections took place, no evidence was found concerning collusive practices among liner companies. The inspections had started in May 2011 at the premises of 12 carriers, thus the initiation of proceedings in November 2013 against 14 carriers: Hapag Lloyd, Cosco, China Shipping, Maersk, MSC, Evergreen, K Line, MOL, OOCL, UASC, ZIM, HMM, NYK, CMA CGM. The investigated conduct was the public announcement of future price increase intentions made by carriers on their websites, via the press, or in other ways, since 2009. In the Preliminary Assessment the Commission raised the concern that the engaged companies' practice may allow them to explore whether other companies also intend to increase prices and to coordinate their behaviour. The Commission raised the preliminary concern that the practice may enable the companies to "test" whether they can reasonably implement a price increase without incurring the risk of losing customers, thereby reducing strategic uncertainty for the engaged companies and diminishing incentives to compete. In 2015 the Commission adopted the Preliminary Assessment[186] which set out the Commission's competition concerns and was notified to the engaged companies. The engaged liners submitted commitments to the Commission in response to the Preliminary Assessment. As the commitments were adequate to meet the competition concerns, the Commission published the Commitment Decision in 2016,

[186] As referred to in Article 9(1) of Regulation (EC) No 1/2003.

where the companies have committed to bring the practice subject to the proceedings to an end and not to make announcements of price increases indicating only the amount of the intended increase. After all, the Commission considers that there were no longer grounds for action on its part and the proceedings in this case should therefore be brought to an end. Alliances and consortia in which the most of the above fourteen liners belong, are not mentioned in the decision, although, in general, in the Commission's merger decisions there is an extensive analysis.[187] In addition, in a received response from a shippers' association in the Commission's Notice[188] during the proceedings of the assessment stated that there is already a high degree of cooperation in the market through the "mega alliances".[189] Certainly a possible notice about the power of alliances in the Commission's decision could not change the results of the decision as there wasn't any evidence such as a signed agreement between the parties.

Although the case was closed due to the short of evidence, the continuous increases of prices during the examined by the Commission period, demonstrate that there isn't any competitive pressure in the market of container liner shipping services. It is noted that the future price increase intentions started in 2009, after the conferences abolition and the relevant pricing differentiation, when the freight prices were in limit down. In addition, the competition authorities of other states, such as the Russia's Federal Antimonopoly Service (FAS), in December 2015 announced that five carriers (Maersk, CMA CGM, Hyundai Merchant Marine, OOCL, and Evergreen) had broken the law by publishing general rate increases on their websites in a form of price signalling. According to FAS, *"they exercised prohibited concerted actions that led to fixing mark-ups (extra payments) to freight rates on the market of liner container shipping on the Far East/Southeast Asia–Russian Federation (St Petersburg, Ust-Luga) routes in 2012-2013"* (Porter, 2016).[190] Although

[187] See for example cases M.7908 - CMA CGM/NOL (29.04.2016), M.7268 - CSAV/HGV/KÜHNE MARITIME/HAPAG-LLOYD AG (11.09.2014) and the more recent case M.8120 - Hapag Lloyd/UASC (23.11.2016).
[188] According to Article 27 p. 4 of the Regulation 1/2003 (16.12.2002) on the Implementation of the rules on competition laid down in Articles 81 and 82 of the Treaty.
[189] See case AT.39850 - Container Shipping (07.07.2016), p. 73.
[190] According to the Federal Law On Protection of Competition such concerted actions are prohibited for competitors, whose consolidated share of a relevant market exceeds 20% and the market share of each entity exceeds 8%.

the carriers appealed the FAS's decision, the Moscow Arbitration Court threw out their appeals and confirmed the competition authority's decision (MLex, 2016).

Moreover, there are several complaints, through the decades, of shippers against liner companies. The sea transport cost for shippers is equal to freight price, plus terminal handling charges (THCs)[191], plus other costs (local fee, surcharges etc.). In 1989 was demonstrated a complaint of shippers related, among others, to the common THCs charged of liner companies.[192] Specifically, the complaint concerns certain price-fixing activities of the members of the Far Eastern Freight Conference (FEFC)[193] relating to multimodal transport. According to the complainants the following five elements make up a door-to-door, or multimodal, transport service: (a) inland transport to the port; (b) cargo handling in the port (transfer from the mode of inland transport to the vessel); (c) sea transport (maritime transport from one port to another); (d) cargo handling in the port of destination (transfer from the vessel to the mode of inland transport); (e) inland transport from the port of destination to the place of final destination. The complainants add that the block exemption for liner conferences, contained in Article 3 of Regulation (EEC) No 4056/86, covered only the third of these five elements, namely sea transport, but that the members of the FEFC agreed between themselves prices not only for sea transport but also for inland transport and cargo handling operations. The Commission was not placed on the subject of THCs by stating that *"this Decision does not address the question whether price-fixing agreements relating to port handling services fall within the scope of application of Article 3 of Regulation (EEC) No 4056/86".*[194] Finally, the Commission demonstrated that the members of the Far Eastern Freight Conference (FEFC) had infringed the provisions of Article 85 of the EC Treaty and Article 2 of Regulation (EEC) No 1017/68 by agreeing prices for inland transport services supplied within the territory of the European

[191] Terminal handling charges (THCs) are effectively charges collected by shipping lines to recover from the shippers the cost of paying the container terminals for the loading or unloading of the containers and other related costs borne by the shipping lines at the port of shipment or destination. There is no transparency between the commercial stevedoring cost and the pricing of the terminal handling charges (see "Terminal handling charges during and after the liner conference era", European Commission 2009).
[192] See case IV/33.218 - Far Eastern Freight Conference (21.12.1994) relating to a proceeding pursuant to Article 85 of the EC Treaty. The complaint was demonstrated in 1989 but the year of the decision is 1994.
[193] The members of FEFC were: CGM, Hapag Lloyd, Croatia Line, Kawasaki Kisen Kaisha, Lloyd Triestino di Navigazionie, Maersk, Malaysian International Shipping Corporation Berhad, Nedlloyd, Neptune Orient Lines, NYK, Orient Oversea Container Line, P&O Containers, Mitsui OSK Lines, Wilh Wilhelmsen.
[194] See p. 2 par. 9.

Community to shippers in combination with other services as part of a multimodal transport operation for the carriage of containerized cargo between northern Europe and the Far East.[195] The Commission imposed fines to the members of the FEFC. In addition, they were required to put an end to this infringement.

The continuous complaints of shippers which lead to the relevant Commission's decisions demonstrate that at least the downstream market of the container liner shipping services, is otherwise conducive to horizontal collusion, which constitutes a precondition for coordinated effects of LTVIC. Specifically,

- In 1994 the Commission considered that the Trans-Atlantic Agreement (TAA), in so far as it included agreements to fix prices for maritime and inland transport, and to limit the utilisation of capacity in maritime transport, was an agreement restrictive of competition falling within the scope of Article 85 (1) of the EC Treaty. The TAA, which has permitted such a considerable and rabid increase in freight rates could not be regarded as allowing consumers a fair share of the benefit.[196]
- In 1999 the Commission considered that the capacity non-utilisation agreement and the exchange of information between the Europe Asia Trades Agreement (EATA) parties did not contribute to improving production or distribution of maritime transport services. Therefore, that agreement constituted an infringement of Article 85(1) of the Treaty. Each of the undertakings was required to abstain from any similar agreement or practice in the future which would have the object or was capable of having a similar effect.[197]
- In 2000 the Commission found that the parties to the Far East Trade Tariff Charges and Surcharges Agreement (FETTCSA) infringed Article 81(1) of the EC Treaty and Article 2 of Regulation (EEC) No 1017/68 by agreeing not to discount from published tariffs

[195] Inland carriage by or on behalf of shipping lines is known as 'carrier haulage' and inland carriage arranged by shippers, or by freight forwarders acting on behalf of shippers, is known as 'merchant haulage'. The choice between merchant haulage and carrier haulage is left open to shippers.
[196] Case IV/34.446 - Trans-Atlantic Agreement (19.10.1994). The members of the TAA agreement were: Sea Land, Maersk, ACL, Hapag Lloyd, Nedlloyd, P&OCL, MSC, OOCL, POL, DSR/Senator, Cho Yang, NYK, NOL, TMM and Tecomar.
[197] Case IV/34.250 - Europe Asia Trades Agreement (30.04.1999). The members of EATA were: CGM, Hapag Lloyd, K Line, Maersk, MISC, MOL, Nedlloyd, NOL, NYK, OOCL, P&OCL, Cho Yang, DSR, Evergreen, Hanjin, Hyundai, Senator, Yang Ming.

for charges and surcharges. The agreement not to discount was not capable of exemption under Article 81(3) and Article 5 of Regulation (EEC) No 1017/68. The Commission imposed fines for the infringement.[198]

Additionally, the Commission found that the Japanese carriers K Line, MOL and NYK with two other firms (CSAV and WWL-EUKOR) participated in a cartel concerning intercontinental maritime transport of vehicles for almost 6 years, from October 2006 to September 2012, and imposed a total fine of €395 million.[199,200] In particular, the Commission's decision concerns a single and continuous infringement covering the deep sea shipments of new motor vehicles to and from the EEA (European Economic Area), in order to maintain the existing balance of business between the carriers and to avoid price decline. The cartel consisted of a series of anti-competitive contacts relating to: (a) price coordination, i.e. coordinated rates for certain customers, coordination concerning the BAF (Bunker Adjustment Factor) and CAF (Currency Adjustment Factor) for certain routes and for certain customers; they aimed to preserve their position in the market and to maintain or increase prices, including by coordinating to resist requests for price reduction from certain customers, (b) allocation of business and customers, i.e. that the car carriers would keep their respective businesses for certain customers and/or certain routes; the parties' conduct followed the so-called 'rule of respect', according to which shipments of new motor vehicles related to already existing businesses on certain routes for certain customers would continue to be carried by the traditional carrier (the incumbent), (c) coordination of capacity reductions, (d) exchange of commercially sensitive information.

Shippers keep complaining about liners' practices. Recently, the EC decided not to open an investigation after having 'carefully assessed' a complaint lodged in June of 2018 by the European Shippers Council (ESC) related to new freight surcharges and specifically

[198] Case IV/34.018 - Far East Trade Tariff Charges and Surcharges Agreement (16.05.2000). The members of FETTCSA were initially 20: 14 were members of the Far Eastern Freight Conference (FEFC) whilst six were independent shipping lines operating in the same trades. The FEFC members were: Ben Line, CGM, EAC, Hapag-Lloyd, K Line, Maersk, MISC, MOL, Nedlloyd, NOL, NY, OOCL, P&O and POL. The independent members were Cho Yang, DSR, Evergreen, Hanjin, Senator and Yang Ming.
[199] See case AT.40009 – Maritime Car Carriers (21.02.2018).
[200] In addition the engaged carriers face lawsuits for compensation brought by Daimler and BMW before a court in London (see Crofts, 2018).

to the emergency bunker surcharge on liners' freight rate. Among liners which introduced such surcharge are Maersk, CMA CGM and MSC (Acton, 2018).

7.5 CONCLUSIONS

By applying the portion of shareholdings as well as the inclusion of captive capacity and throughput in calculation of market shares, the market of container terminal services is less concentrated in the Hamburg – Le Havre port range. Nevertheless, highly concentrated remains the market of German container terminals, where two operators (HHLA and Eurogate) act with high percentages and the entry of liners is limited.

The ports of the Netherlands are mainly operated by Hutchison and the ports of Belgiun are mainly operated by PSA, but PSA holds 20% of Hutchison shares. Such a share is significant as Rotterdam and Antwerp are rival ports which belong to the same geographic market.

In addition, DP World has a significant presence in French container port of Le Havre, which is characterised by limited capacity.

Concerning the equity of liner companies in 2016, the biggest shares are held by MSC and Maersk. MSC has a geographical presence in four countries (Germany, the Netherlands, Belgium and France) and Maersk is met in three countries (Germany, the Netherlands and Belgium) after the sale of its 50% share of the container terminal Porte Oceane in the port of Le Havre to Perrigault. In terms of terminal capacity, Maersk holds 7,734.1 thousand TEUs and MSC holds 6,425.5 thousand TEUs. Therefore, the total capacity of the two companies, which have created the 2M alliance, in the market of container terminal services is 14,159.6 thousand TEUs or 24.52% of the total capacity in the Hamburg – Le Havre port range. Specifically, in the market Rotterdam - Antwerp, the two companies hold total capacity of 9,379.5 thousand TEUs (31.12%) and total throughput of 5,955 thousand TEUs (28.53%).

In most of the terminals, even though liners hold a minority stake they enjoy a dedication of 50% or 100% of the terminal. For example, in Eurogate Container Terminal Wilhelmshaven (CTW), although APMM holds 30% and Eurogate holds 70%, the

Partners' Agreement provides that APMM will have up to 49% of the JWP CT's total operational capacity dedicated to itself and/or its affiliates.[201]

The existence of alliances, consortia and other cooperation agreements increases the bargaining power of liner companies not only as customers of the container terminal services,[202] but also as potential investors (competition to the market). Liner companies which have interests in container terminals have ensured customers through their agreements. Alliances led to larger vessels and greater terminal capacity not only in TEUs handling, but also in terms of quay length and port depth. Terminals have been expanded or new bigger terminals have been constructed, while others have closed or have changed their use exclusively to feeder or to short sea services. As a result, these terminals may not be considered as competitive to large capacity terminals. In addition, the requirements of inland handling have been changed.

The data research shows that even though there is no excess capacity in operation terms there is definitely excess capacity in design terms of terminals.

The above analysis of the two vertical related markets shows that they both have all these factors that lead to anticompetitive effects: concentrated and oligopoly structure (mergers, alliances, consortia), barriers to entry, scarce and essential input, excess capacity. The last necessary condition for vertical integration to produce anticompetitive effects, which is *'at least one of the upstream and downstream markets is conducive to horizontal collusion'* is covered by the downstream market of container liner shipping services as shown by relevant EC cases. Therefore, further research is needed.

[201] See case M.5066 – EUROGATE/APMM (05.06.2008).

[202] Soppé et al. in 2009 mentioned that within the CKYH (Cosco, K LINE, Yang Ming, Hanjin) and the Grand Alliance (Hapag Lloyd, NYK, OOCL, MISC) a reciprocal co-operation is evident in port operations, as the partners often resort to using facilities where other members have financial interests.

CHAPTER 8:

THE COMPETITION EFFECTS OF LINER – TERMINAL VERTICAL INTEGRATION ON SHIPPERS IN THE HAMBURG – LE HAVRE PORT RANGE

8.1 INTRODUCTION

As mentioned in Chapter 2, the vertical integration between liners and terminals served common interests and reshaped the market structure. Although the container ports' search for funds had already been covered by the first and second wave of entrants (terminal operators), the LTVI by ensuring the input for liners and the customers for terminals, led to the further increase of investment, improvement of technology and innovation, which have consequently increased the designed and operational capacity of both terminals and ships.

Chapter 8 examines the existence of other procompetitive effects of the LTVI, such as the elimination of double marginalization, or anticompetitive effects, which affect the shippers. More specifically this Chapter compares the evolution of THCs that are charged to shippers by integrated and non-integrated liners. In addition, it discusses the effects on choice of services and quality of the provided services.

8.2 THE EFFECT ON PRICES (THCs)

As analysed in Chapter 3, the increase of sale price may be a result of non-coordinated (input and/or customer foreclosure) or coordinated (collusion) effects. Moreover, the higher prices may be justified by the increased investments and the relevant pay off of them, but under a competition pressure, the excess capacity should have led to lower prices. Motta (2004) argues that in order to estimate the effects of a vertical merger, should be estimated the effects on the input price paid by the independent downstream firms and on the price paid by the consumers. As the input prices, which in our case are the port dues paid by the independent liners before and after the mergers, are not available,[203] the research is limited to the price paid by the consumers, which in our case is the terminal

[203] Even though port dues were available, comparisons may be impossible due to their complication. See EC cases COMP/A.36.568/D3 (23.07.2004) Scandlines Sverige AB v Port of Helsingborg and COMP/A.36.570/D3 Sundbusserne AS v Port of Helsingborg (23.07.2004).

handling charges (THCs) paid directly or indirectly (through forwarders) by shippers. Specifically, THC is the price which is charged to shippers by liners and concerns the terminal costs, one of the two basic elements of the sea transport cost. The other is the freight price, which is the price which is charged to shippers by liners and concerns the sea transport of containers.

The present TCHs data analysis includes measures of central tendency and statistical averages. It also includes measures of relationship as it examines the degree of the association and correlation between the liners entry and the height of THCs. It also compares the THCs of integrated and non-integrated liners.

8.2.1 THE THCs UNTIL THE 18TH OF OCTOBER 2008

Until the 18th of October 2008, when the Regulation 4056/86[204] was valid, the THCs were common and sustainable for all liner companies for fifteen years (EC, 2009). Thus, for ten years after the first entry of liners in the market of container terminal services in the Hamburg – Le Havre port range, no efficiencies were passed on to shippers, due to the regulated prices under the system of liner conferences. Until 2008 the following liner entries had taken place: (a) CMA CGM at the ports of Antwerp (2005), Le Havre (2005), Zeebrugge (2005) and Dunkirk (2006); (b) Cosco at the ports of Antwerp (2005) and Rotterdam (2008); (c) Hanjin at the ports of Antwerp (2006) and Rotterdam (2008); (d) Hapag Lloyd at the port of Hamburg (2001); (e) K Line at the ports of Antwerp (2006) and Rotterdam (2008), (f) Maersk at the ports of Bremerhaven (1998), Rotterdam (2000), Dunkirk (2006), Zeebrugge (2006) and Le Havre (2007); (g) MSC at the ports of Bremerhaven (2004) and Antwerp (2005); (h) NYK at the port of Amsterdam (2002); (i) PONL at the ports of Antwerp (2005) and Rotterdam (2008); (j) Yang Ming at the ports of Antwerp (2006) and Rotterdam (2008); (k) Zim at the port of Antwerp (2007).[205] **Table 8.1** shows the THCs charged in the Hamburg – Le Havre port range until the 18th of October 2008, per trade route.

[204] The Regulation (EEC) No 4056/86 was exempting from the prohibition of Article 81(1) of the Treaty agreements, decisions and concerted practices of all or part of the members of one or more liner conferences which were fulfilling certain conditions. Although the Regulation 4056/86 was repealed by the Regulation 1419/2006, it is defined a two years transitional period from the date of 18 October 2006.

[205] When there is a time difference between the agreement and the operation year, the mentioned year is that of the terminal operation under the liner's entry.

Table 8.1 THCs in the Hamburg - Le Havre port range by trade route in Euros (1993 -2008)

Port / Trade	Size	F.E.- Eur	India – Eur	Eur-Med	Eur-M.E.	N. Atlantic	Eur-S. Afr
Hamburg	20ft	152	153	159	153	170	127
	40ft	152	153	159	153	170	254
Bremerhaven	20ft	152	153	159	153	170	127
	40ft	152	153	159	153	170	254
Antwerp	20ft	112	89	109	89	140	79
	40ft	112	89	109	89	140	158
Zeebrugge	20ft	112	89			140	79
	40ft	112	89			140	158
Rotterdam	20ft	138	136	120	136	156	113
	40ft	138	136	120	136	156	226
Le Havre	20ft	123	123	122	123	143	117
	40ft	123	123	122	123	143	234

Source: Assessment based on European Commission's research (2009)

As shown, THCs are the same between the ports, and therefore the terminals, of the same country but different per trade route, irrespective of whether the liner company is a conference member or not, until 2008. As the above table demonstrates, the charges in Northern European ports vary per container by route, irrelevant of size (20 or 40 ft), except for the trade route Europe – South Africa, where the charge for the 40 ft container is double for all the ports.

Given the virtual stability of the THCs (linear flat pricing), albeit at varying levels according to trade routes, as freight rates are driven by the relationship of supply and demand for shipping and the available capacity, combined with the state of the global economy, the ratio of the THC to the sea freight rate has been variable. During high freight rates, the THCs are an insignificant part of the total cost, but during a freight rate collapse, such as in 2009, they are a higher percentage of the total transport cost. For example, in 1994, the terminal cost was 27.1% of the total transport cost on the north Europe/Far East trades. Sea transport cost was 36.5%, inland transport was 18.6%, sales 13.9% and others 3.9%.[206]

[206] See Case IV/33.218 – Far Eastern Freight Conference, the Commission's decision of 21 December 1994 relating to a proceeding pursuant to Article 85 of the EC Treaty. According to the decision, conference price fixing for maritime transport - the tariff - was extended to inland rates by the FEFC in a general manner at the outset of containerisation, in around 1971.

8.2.2 THE THCs AFTER THE 18TH OF OCTOBER 2008

With the Regulation 1419/2006,[207] the Commission considered that liner shipping is not unique as its cost structure does not differ substantially from that of other industries and therefore there is no evidence that the industry needs to be protected from competition.[208] Following the abolition of the conferences in October of 2008, THCs changed almost overnight. After October 2008, the THCs are the same per trade route and different per liner company. Table 8.2 demonstrates the applied THCs post October 2008 at the Hamburg – Le Havre port range in Euros.

Table 8.2 THCs in the Hamburg – Le Havre port range for the ten largest liner companies post October 2008 for 20 & 40ft boxes in Euros

Liner Company	Hamburg	Bremerhaven	Antwerp	Zeebrugge	Rotterdam	Le Havre
Maersk/SAF	190	190	155	155	185	195
MSC	180	180	150		175	150
CMA CGM	185	185	150	150	160	160
Evergreen	200	200	140	140	160	170
Hapag Lloyd	210	210	160	160	200	175
Cosco	180	180	115	115	140	152
APL	210	210	170	170	190	225
China Shipping	200	200	150	150	170	170
NYK	200	200	150	150	160	190
MOL	210	210	160	160	200	215

Source: Assessment based on European Commission's research (2009)

By comparing the THCs before and after the abolition of conferences in 2008, it is concluded that the charges increased from 18.42% to 38.16% for the German ports of Hamburg and Bremerhaven. For the Belgian ports Antwerp and Zeebrugge the increase range is higher, varying from 2.68% to 51.79%. Respectively, the increases at the ports of the Netherlands extend from 1.45% to 44.93%. Finally, the increase of the French port Le Havre varies from 21.95% to 82.93%.

[207] Council Regulation (EC) No 1419/2006 of 25 September 2006 repealing Regulation (EEC) No 4056/86 laying down detailed rules for the application of Articles 85 and 86 of the Treaty to maritime transport, and amending Regulation (EC) No 1/2003 as regards the extension of its scope to include cabotage and international tramp services.

[208] In particular, the Commission considered that liner shipping conferences no longer fulfilled the four cumulative conditions for exemption under Article 81(3) of the Treaty and therefore the block exemption in respect of such conferences would be abolished.

Table 8.3 THCs before and after the abolition of conferences for the trade F.E. – Eur in Euros

Port	Until Oct. 2008	Post Oct. 2008 min	Post Oct. 2008 max	min increase	max increase	min (%)	max (%)
Hamburg	152	180	210	28	58	18.42	38.16
Bremerhaven	152	180	210	28	58	18.42	38.16
Antwerp	112	115	170	3	58	2.68	51.79
Zeebrugge	112	115	170	3	58	2.68	51.79
Rotterdam	138	140	200	2	62	1.45	44.93
Le Havre	123	150	225	27	102	21.95	82.93

Source: Assessment based on European Commission's research (2009)

It is noted that big liner companies such as Maersk, CMA CGM, MSC and Cosco applied less increases. The larger liner companies are able to negotiate better terminal prices with terminal operators. It is interesting to note that Hapag Lloyd charges one of the highest THCs in Hamburg, not only because it has joint control of a terminal in the port of Hamburg, but also because it belongs to the same parent company (HGV) with HHLA, one of the two terminal operators in Germany.

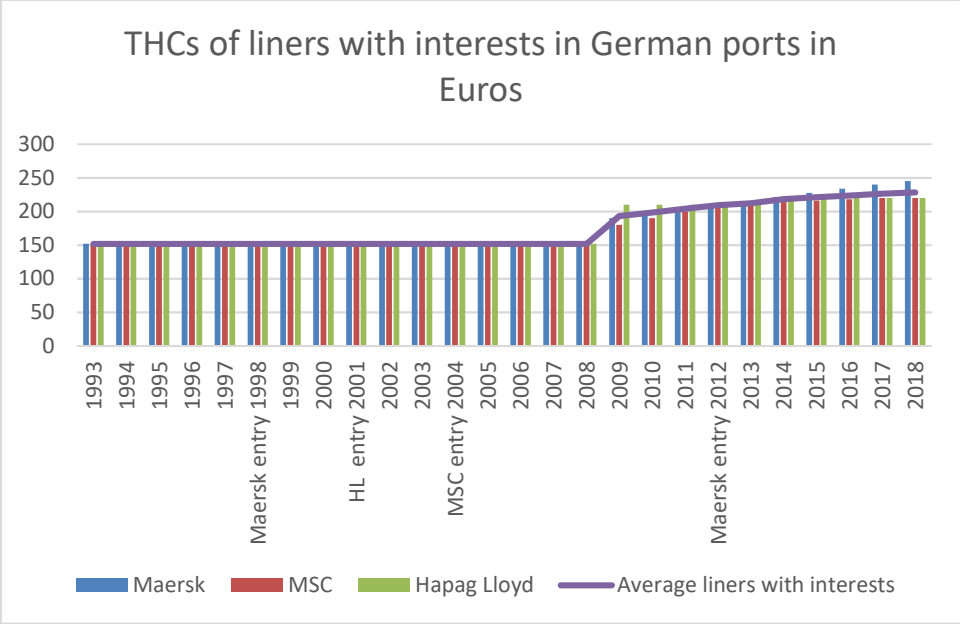
Not only the increase of THCs after the abolition of conferences in 2009 was not expected, but also the upward trend of THCs has continued until at least 2018 and concerns both integrated and unintegrated liners. It follows the analysis of the evolution of THCs for each engaged country of the Hamburg – Le Havre port range.

8.2.3 THE EVOLUTION OF THCs IN THE PORTS OF GERMANY

The upward trend of THCs characterises both integrated liners (Maersk, Hapag Lloyd, MSC) and non-integrated liners in German ports (CMA CGM, Cosco, NYK, MOL, Evergreen, APL). As shown in **Figure 8.1**, the entry of liners in container terminal services did not affect the upstream trend of THCs, and therefore did not eliminate the double marginalisation.

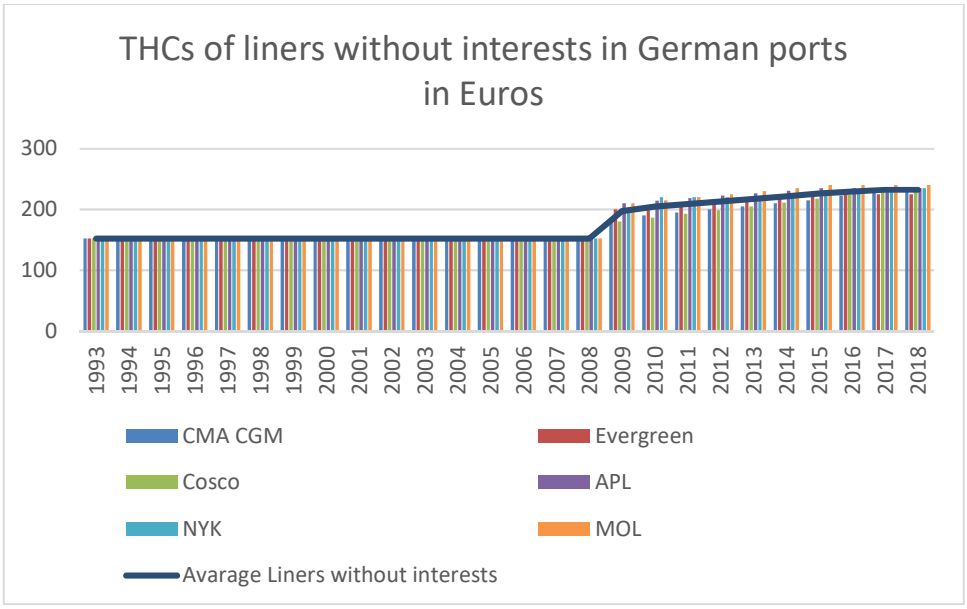
Figure 8.2 shows the THCs of liners without interests in the ports of Germany. The trend remains the same for both types of liners, meaning that the entry of liners in the market of container terminal services has not led to the fall of THCs, not only during the period of conferences, as expected, but also after the abolition of conferences. **Figure 8.3** compares the average THCs of liners with and without interests in German ports.

Figure 8.1 The evolution of THCs of liners with interests in the ports of Germany (1993 – 2018)



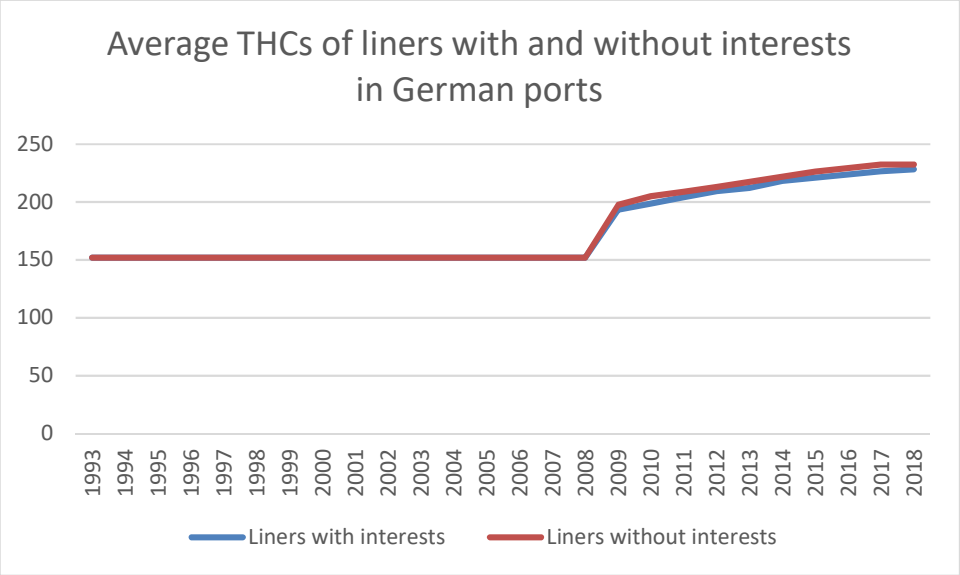
Source: Author data compilation on the basis of various sources

Figure 8.2 The evolution of THCs of liners without interests in the ports of Germany (1993 – 2018)



Source: Author

Figure 8.3 The comparison of average THCs of liners with and without interests in German ports (1993 – 2018)



Source: Author

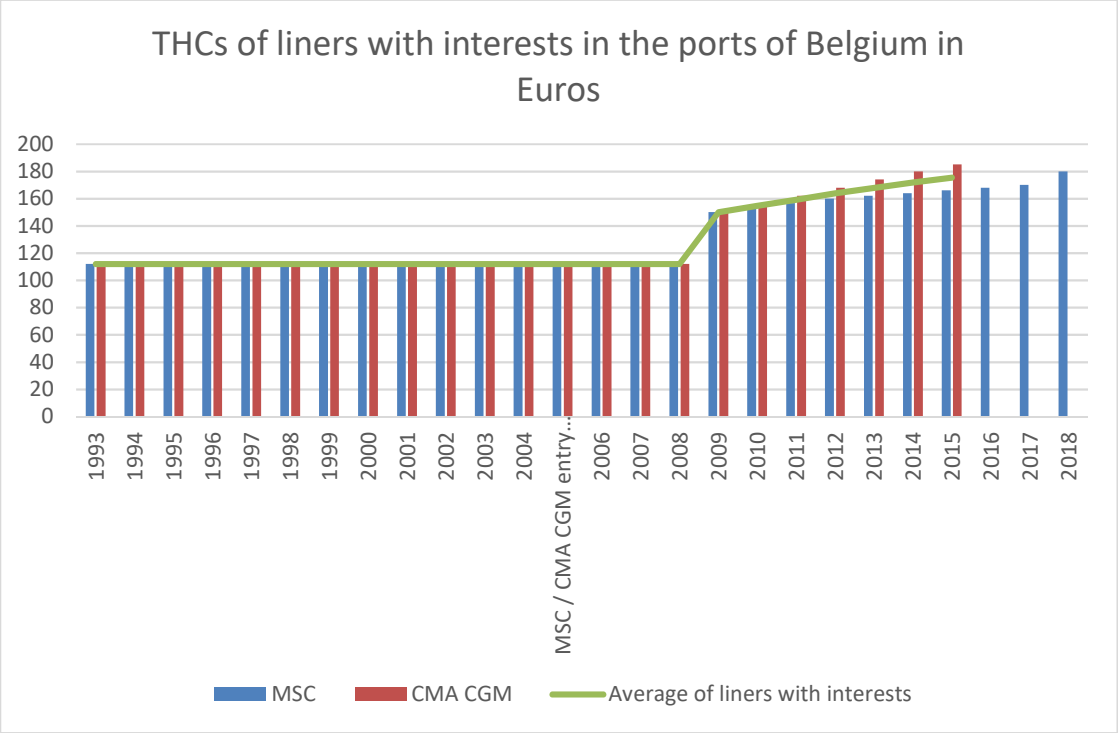
The same trend is also met in the ports of the other countries of the selected port area.

8.2.4 THE EVOLUTION OF THCs IN THE PORTS OF BELGIUM

The upward trend of THCs characterises both integrated liners which have interests in the ports of Belgium (MSC, CMA CGM, Cosco, K LINE, Yang Ming, Zim) and non-integrated liners which do not have interests in the ports of Belgium (MOL, Evergreen, Hapag Lloyd). As shown in **Figure 8.4**, the entry of MSC and CMA CGM in container terminal services of Belgium in 2005, did not affect the upstream trend of THCs, and therefore did not eliminate the double marginalisation, even after the abolition of conferences and the regulated THCs period.

The same trend is also observed in the remaining integrated liners of the terminals of Belgium. The THCs of Cosco is €115 in 2009 and €190 in both 2017 and 2018. Respectively, Maersk charges €155 in 2009 and €205 in 2018. Finally, K Line charges €180 in both 2017 and 2018.

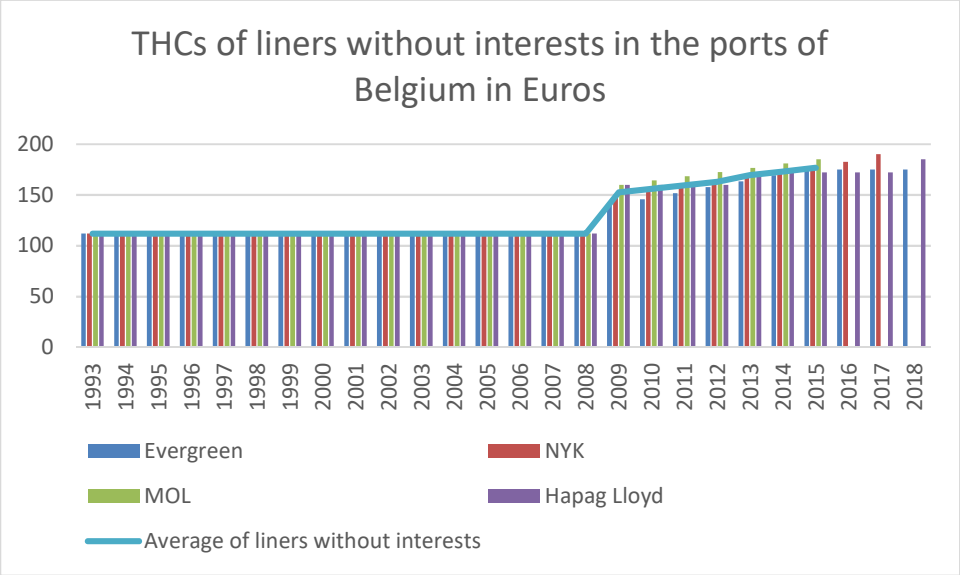
Figure 8.4 The evolution of THCs of liners with interests in the ports of Belgium (1993 – 2018)



Source: Author

Figure 8.5 shows the THCs of liners without interests in the ports of Belgium. The trend remains the same for both types of liners, meaning that the entry of liners in the market of container terminal services has not led to the fall of THCs, not only during the period of conferences (regulated prices), but also after the abolition of them.

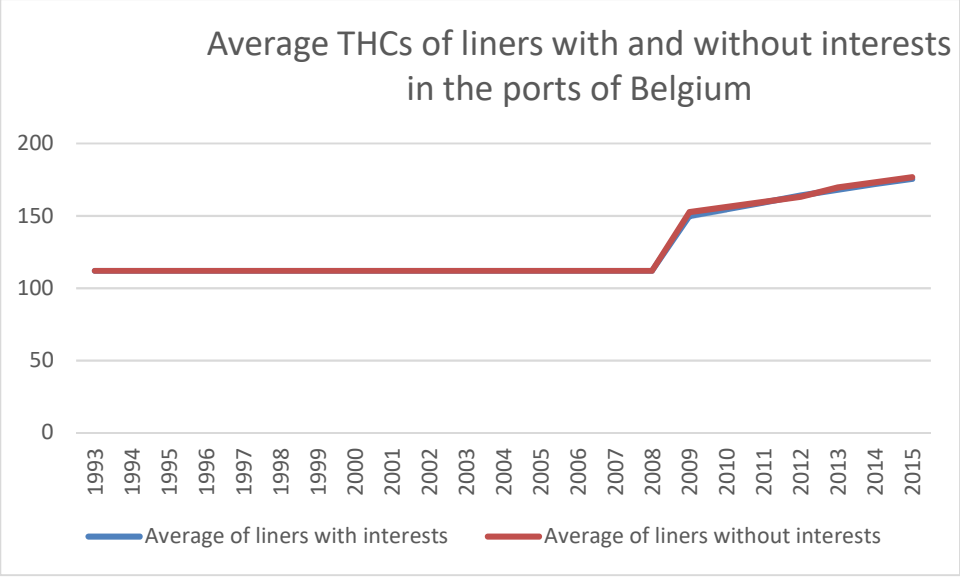
Figure 8.5 The evolution of THCs of liners without interests in the ports of Belgium (1993 – 2018)



Source: Author

Figure 8.6 compares the average THCs of liners with and without interests in the ports of Belgium.

Figure 8.6 The comparison of average THCs of integrated and non-integrated liners in the ports of Belgium (1993 – 2018)



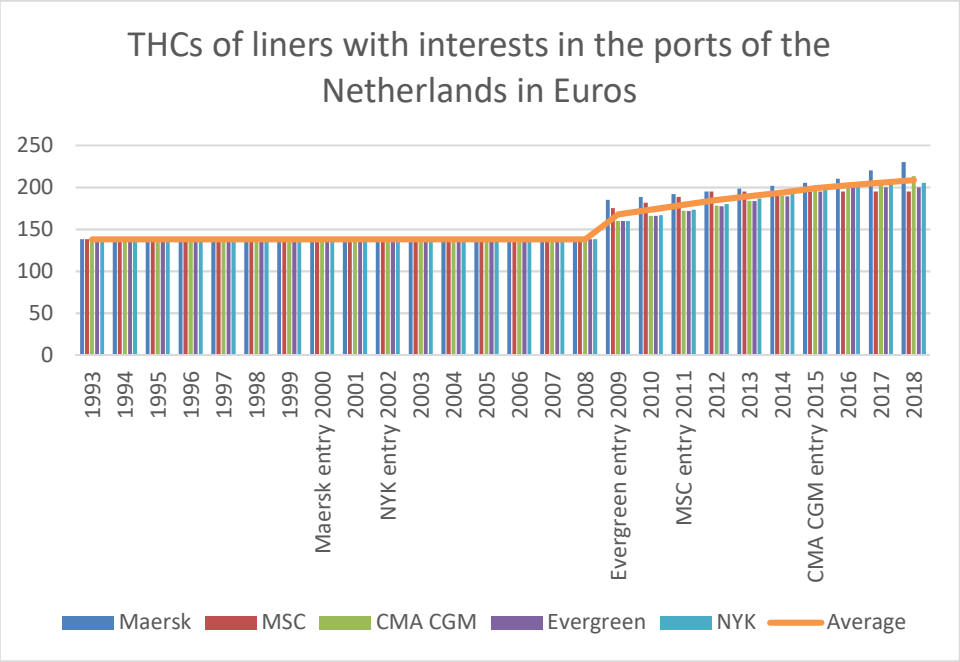
Source: Author

Figure 8.6 by comparing the average prices of integrated and non-integrated prices shows the same linear pricing structure, even after the abolition of conferences in 2008.

8.2.5 THE EVOLUTION OF THCs IN THE PORTS OF THE NETHERLANDS

As shown in Chapter 7 most of the examined liners are vertically integrated in the port of Rotterdam. Nevertheless, **Figure 8.7** shows that the THCs in the Netherlands are always increasing.

Figure 8.7 The evolution of THCs of liners with interests in the ports of the Netherlands (1993 – 2018)



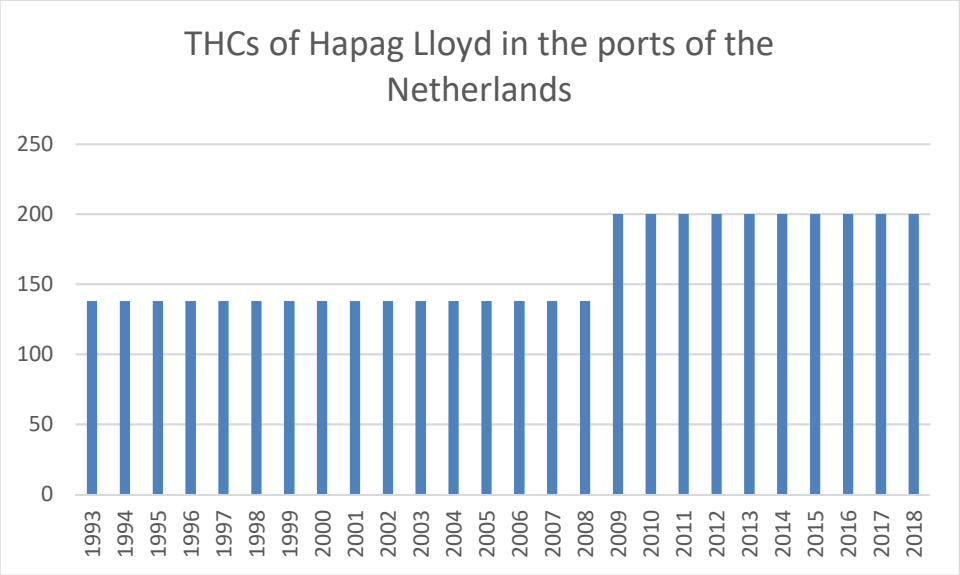
Source: Author

Figure 8.8 shows the THCs of the non-integrated liner Hapag Lloyd in the ports of the Netherlands. Since their increase in 2009 they remain stable at the price of €200.

Figure 8.9 compares the average of THCs of the liners with interests with the THCs of the non-integrated liner Hapag Lloyd. Since 2015 the average of THCs of integrated liners in the port of Rotterdam is higher than THCs charged by the non-integrated liner.

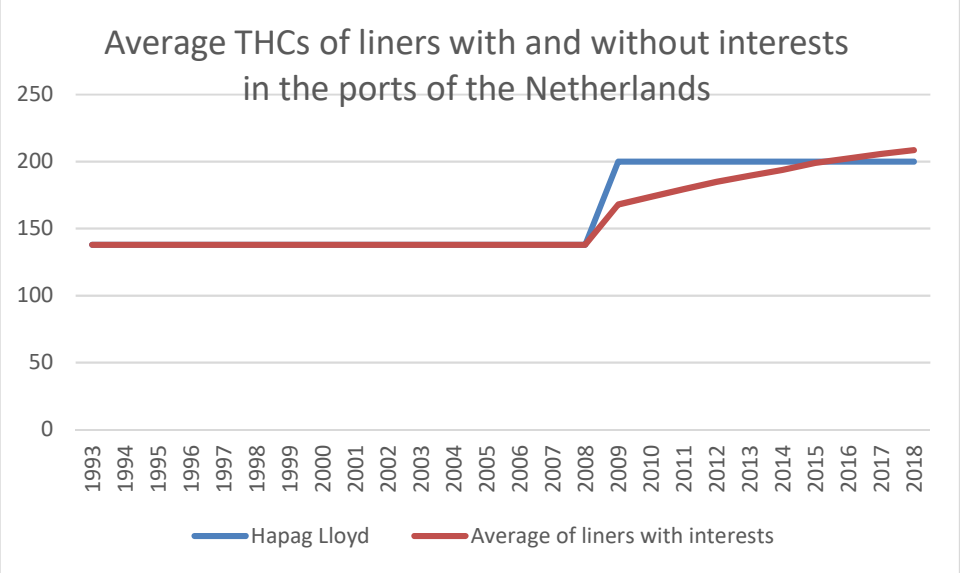
In addition two THCs prices are known concerning Cosco which its first entry at the port of Rotterdam took place in 2008. Cosco's prices are €140 for the year 2009 and €200 for the year 2018 in the ports of the Netherlands, same price with Hapag Lloyd.

Figure 8.8 The evolution of THCs of Hapag Lloyd in the ports of the Netherlands (1993 – 2018)



Source: Author

Figure 8.9 The comparison of average THCs of liners with and without interests in the ports of the Netherlands (1993 – 2018)



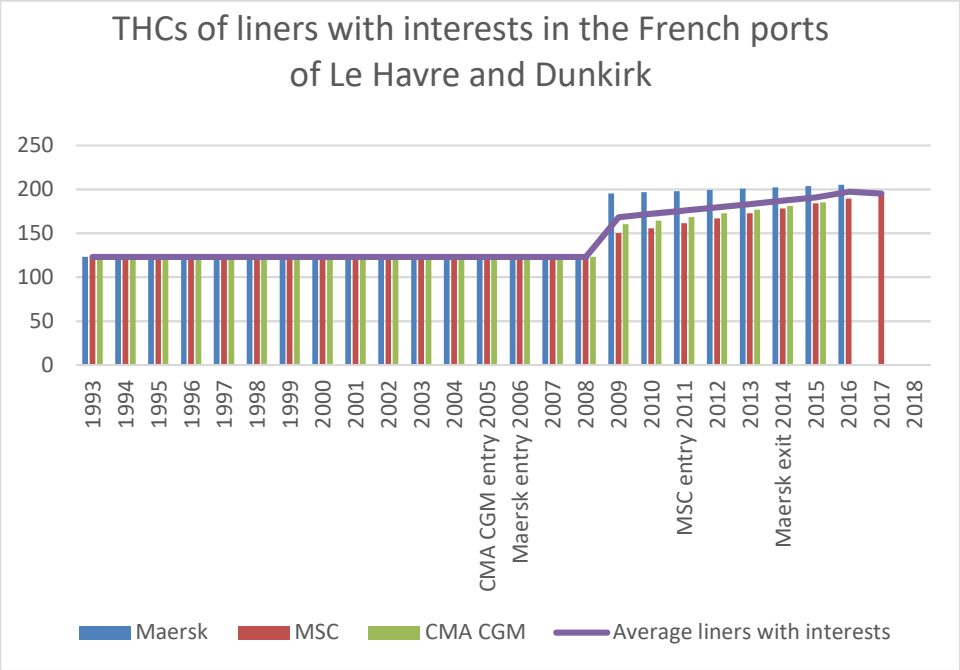
Source: Author

It is noted that Amsterdam Container Terminal, the integrated terminal with the liner NYK, was closed down in 2013.

8.2.6 THE EVOLUTION OF THCs IN THE PORTS OF FRANCE

The upward trend of THCs characterises both integrated liners which have interests in French ports (Maersk, MSC, CMA CGM) and non-integrated liners which do not have interests in French ports (NYK, Evergreen, Hapag Lloyd). As shown in **Figure 8.10,** the entry of liners in container terminal services did not affect the upstream trend of THCs, and therefore did not eliminate the double marginalisation.

Figure 8.10 The evolution of THCs of liners with interests in the French ports (1993 – 2018)



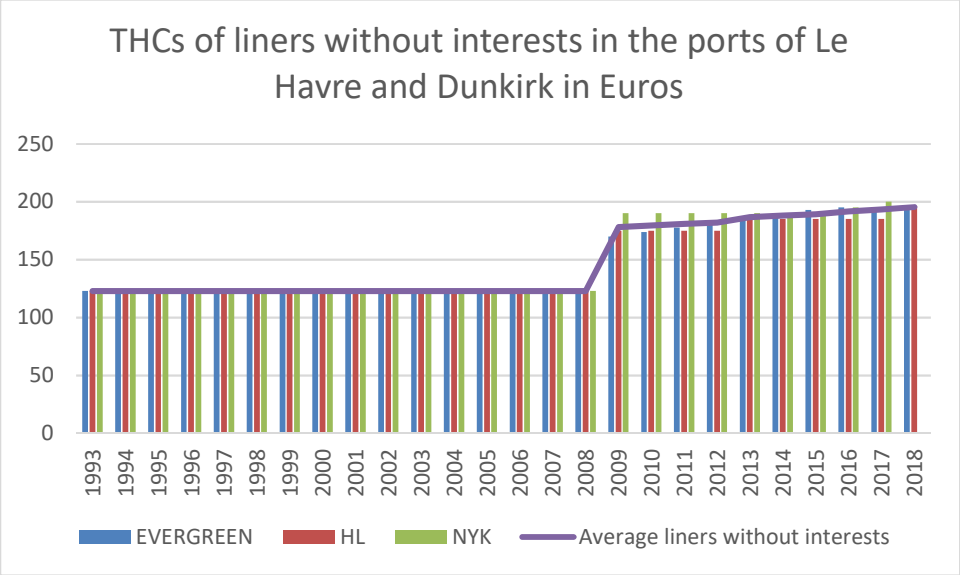
Source: Author

As mentioned in Chapter 7, Maersk sold its 50% share of the Terminal Porte Océane (TPO) of the port of Le Havre to Perrigault in 2014. Maersk also sold its majority share of 61% of the Terminal de Frandres to CMA CGM with the later to increase its share to 91% in 2010. As the Port of Dunkirk holds the remaining minority share of 9% it is supposed that CMA CGM has the sole control of the terminal. Therefore even then, as shows **Figure 8.10**, CMA CGM continues to increase the THCs. Not only the entry but also the exit of liners of the container terminals do not affect THCs.

Figure 8.11 shows the THCs of liners without interests in the ports of France. The trend remains the same for both types of liners, meaning that the entry of liners in the market of

container terminal services has not led to the reduction of THCs, not only during the period of conferences, but also after the abolition of them. **Figure 8.12** compares the average THCs of liners with and without interests in French ports. In most years the two prices are identical.

Figure 8.11 The evolution of THCs of liners without interests in the French ports (1993 – 2018)

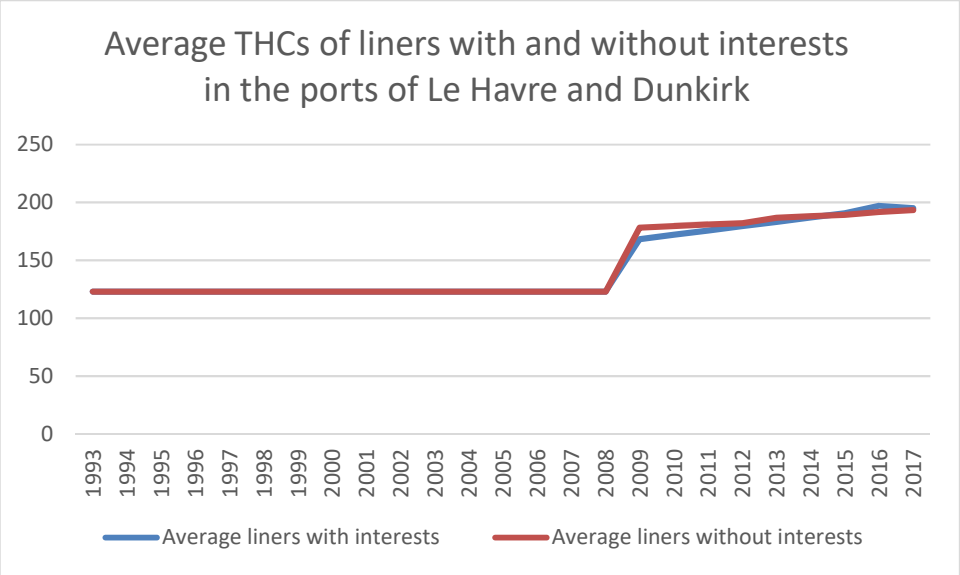


Source: Author

Figure 8.12 compares the average THCs of integrated and non-integrated liners. The estimation of THCs is not transparent and gives liners a relevant flexibility. A survey on THCs (MEL, 2005) shows, among others, that: (a) terminal operators have limited knowledge of the terminal handling charges liners invoice to their customers, despite the fact that this is "freely" available information, (b) all shippers and consignees (nine) answered that they do not understand the multi-trade terminal handling charging structure, (c) five (5) terminal operators out of six (6) answered that they see the differences between terminal contracts and THCs charged out to the market as extra income for the liners, (d) four (4) terminal operators out of six (6) answered that they think that they face a

competitive disadvantage as a result of the level of terminal handling costs charged by liners.[209]

Figure 8.12 The comparison of average THCs of liners with and without interests in the ports of Le Havre and Dunkirk (1993 – 2018)



Source: Author

Moreover, Fung et al. (2003) found that the separation of ocean freight rates from terminal charges has increased the overall shipping charges. In addition, even if there are small differences in liners' THCs, they are smoothening. The sale price which liners charge to shippers is constituted mainly by transport price (freight, fuel surcharges) and port price (THC, documentation fees, ISPS). Terminal Handling Charge (THC) is the price representing the terminal fees which is charged to the shippers. The documentation fees and ISPS are additional port costs which are charged by liners to the shippers. Although these costs are not significant, they are often determinant, as added to the THCs, they lead to the same or similar final port price. Examples of port charges charged by liners to the shippers are the following:[210] MSC: 100 EUR THC + 40 EUR docs + m / h 1940 EUR +

[209] Survey on terminal handling charges and currency and bunker adjustment factors. A project done for the European Liner Affairs Association Center for Maritime Economics and Logistics (MEL) Erasmus University Rotterdam. Rotterdam, 7 November 2005.

[210] See http://www.kkfreight.com/shipping-surcharges.html, dated 31.07.2018. ISPS or SEC are security charges. Administrative Fee or B / LFee or DocsFee (available in other notation) are fees charged by the liner's local agent for paperwork. They may be applied for a bill of lading or container.

ISPS 15 EUR = 195 EUR; MAERSK: 120 EUR THC + 35 EUR ddf + 6 EUR ISPS + 1930 EUR m / h = 191 EUR.

In the absence of adequate competition in international shipping, higher port productivity is not necessarily reflected in lower transport costs. In addition, high terminal handling charges may be used as a barrier to entry for newcomer liners. This may be a reason for the absence of complaints when high terminal charges exist.

8.3 CHOICE OF SERVICES AND QUALITY OF SERVICES

In maritime transport, horizontal mergers and alliances permit the use of large ships and increase the profits of the liner companies by gaining economies of scale.[211] On the other hand, alliances of liner companies and larger ships have a negative result on stowage planning, meaning that in order to fill a larger ship, a liner calls at more loading ports than would be warranted by the economics of a hub-and-spoke system, in order to pick up containers even at the last minute before departure[212] (Haralambidis, 2017). According to Guan et al. (2017), a 1% growth in ship size and its auxiliary industry operations increases time in port by nearly 2.9% and creates diseconomies of scale at ports, indicating that economies of scale that are gained at sea are lost at ports.

The following analysis is mainly based on a series of interviews with shippers on the behalf of ITF's research on the impacts of alliances on shippers (ITF, 2018).[213] Although such effects cannot be exclusively explained by alliance formation and vertical integration, at least it can be concluded that LTVI, reorganised the schedules but has not led to the improved quality of service.

[211] For example, Triple-E 18,000 TEUs container ships of Maersk that was expected to save the company around £750,000 per typical voyage from Shanghai to Rotterdam (Alexandrou et al., 2013).

[212] The author adds the argument of a terminal operator that the terminal does 150 moves per hour for a major independent carrier but only 100 for an alliance ship. Moreover, slot swaps among alliance members do not make things easier as the shippers book containers with one company and they find out that they landed at the other end on the ships of another carrier.

[213] These were semi-structured interviews on the supply chain of the shipper, their supply chain policies, their perspective on container shipping and their assessment of the role of alliances within this context. The focus of these interviews was on shippers with considerable activity and employment in Europe. The representatives of the shippers interviewed are in charge of the maritime supply chain and ocean shipping procurement in their company. The selection of companies was diverse, providing a snapshot of European manufacturing and trading activity, presented here on an anonymised basis.

The choice of services is related to the quality of services. On the one hand the quality of services is affected by the choice of services and on the other hand the decreased quality (i.e. reliability) creates the need for more choices, as in order to avoid delays and disruption in the supply chain, shippers are used to spread risk. Vertical integration could mean that whole transport chains are operated by a few players. Moreover, alliances have contributed to lower service frequencies and direct port to port connections and therefore they have frustrated the risk diversification strategies of shippers and freight forwarders (ITF, 2018). Table 8.4 demonstrates the opinion of interviewed shippers related to the choice of provided service.

Table 8.4 Shippers' opinion on choice of service

Shipper	Choice of Service
Case Study 3: Multinational, Construction and insulation, Demand for sea transport 10,000 TEUs per year.	o Alliances have led to rapidly decreasing schedule options. Although the shipper declares that five-six different schedules would be desirable, only three are available per trade lane due to consolidation of cargo volumes on bigger vessels.
Case Study 4: Multinational, Recyclable and finished materials, demand for sea transport 90,000 TEUs.	o There is a reduction of direct connections.
Case Study 5: Large multinational, Food products, Demand for sea transport 100,000 TEUs per year.	o There is a steady decrease in choice over time, which makes it increasingly difficult to spread volumes (and hence risk) among different liners. Distinction of services becomes difficult since the shipper might not always know on which vessel the cargo is transported, given the slot sharing agreements between carriers.
Case Study 6: Large multinational, Chemicals, Demand for sea transport 300,000 TEUs per year.	o Lower availability of direct connections. For example, the number of direct calls from European Ports to Dalian went down from three in 2016 to one in 2018. o On trade lanes where the choice of high quality service products is limited, it is not possible to reduce the risks by spreading the volumes between carriers.
Case Study 7: Large multinational, Chemicals, Demand for sea transport >700,000 TEUs per year.	o The choice of carriers for EMEA (Europe, Middle East and Africa) trade lanes were reduced from 20 to 15. The shipper uses a wide range of them to spread risks. o Mid-range or small carriers had offered to provide a service from a closer port not called by bigger carriers.

Source: ITF, 2018

Very often a price increase is accompanied by a better service for which shippers are willing to pay more. Harris and Winston (1983), in their research related to railways, show that shippers are willing to pay more in order to have a better service. Nevertheless, Heaver

(2015) argues that efficiencies in container terminal services had occurred without the vertical integration, and Haralambides (2017) argues that the turnaround time of a container has increased through the liners' alliances and the use of huge ships. As mentioned in Chapter 2 examples show that the design and operation of a well-coordinated service does not require common ownership: In 2006, APL Logistics was the first line to offer a port-to-door time guaranteed less-than-container (LCL) service; this was from China into the US, with APL as the ocean carrier and Con-Way Freight performing the inland carriage. Japan, South Korea, Singapore and Taiwan were added as origins in 2007 and Mexico was added as a destination in 2009. In 2008, a full-container guaranteed service was introduced from China to the US. In 2009, Hanjin and MOL introduced time-guaranteed services on routes from Asia to the US West Coast with distribution in the US being handled by Old Dominion Freight Line and the railway company BNSF (Heaver, 2015). It is also noted that some terminals were already dedicated to liner companies through contracts before their equity vertical integration.

According to shippers, alliances have declined liners' schedule reliability as liners' service levels fell to woeful levels through the peak season in 2018, with September's schedule reliability tumbling to the mid-50% level on Asia-Europe trades (Knowler, 2018c). In fact, the average schedule reliability of liners over 2017 ranged from 71%-81% which was considerably lower than the range of 82%-85% achieved in 2016 (SeaIntel, 2018; 360). Liners in alliances have a reliability score between 71%-81%, whereas the scores for non-alliances liners is more differentiated: ranging from almost fully reliable to very unreliable. The best performing liners on all trade routes are without exception non-alliance liners. Overall schedule reliability of liners has decreased to 66.4% in the first quarter of 2018, 6% lower than in the first quarter of 2017 (SeaIntel, 2018; 360). This has been the lowest performance documented since the first data record in 2011. The analysis includes a breakdown of on-time performance for alliances, which show that the best performing alliance could guarantee on-time arrival (including one day deviance of schedule) in only 55.5% of the cases. The alliances have also increased the waiting time. This has increased total transport time and delivery uncertainty for various shippers, leading to higher inventory and buffer costs (ITF, 2018). Table 8.5 demonstrates the opinion of interviewed shippers related to the quality of service.

Table 8.5 Shippers' opinion on quality of service

Shipper	Quality of Services
Case Study 2: Small Medium Enterprise (SME), Wholesale, Demand for sea transport 7,000 TEUs per year.	o Reliability (i.e. frequent delays in schedules and omissions) has decreased in the last ten years. The cargo will not be discharged at the foreseen port and will miss feeder service. Most of the time, delays are discovered later and there is a great lack of visibility where the cargo is located. The shipper claims to be unable to develop reliable Key Performance Indicators (KPIs) because of this visibility gap and has issues identifying the most reliable services, as the shipments are mainly managed by intermediary freight forwarder.
Case Study 3: Multinational, Construction and insulation, Demand for sea transport 10,000 TEUs per year.	o A decrease in direct voyages and more transhipment calls, which tend to increase the risks of late delivery because delays reduce the time available in a transhipment port to shift the cargo to a different vessel. If the cargo misses the vessel, it might have to wait one week in the transhipment port. The shipper sees a link between alliances and increasing ship size, leading to growing congestion in ports.
Case Study 4: Multinational, Recyclable and finished materials, demand for sea transport 90,000 TEUs.	o There is a drop in service quality.
Case Study 5: Large multinational, Food products, Demand for sea transport 100,000 TEUs per year.	o The decline of direct port-to-port connections has increased transhipment and decreased the reliability of schedules since the alliance restructuring in April 2017 (schedule reliability dropped to 65% in 2018 according to the shipper's KPIs) and parallel delivery of ultra-large vessels. This has made it more and more difficult for the shipper to book reefer cargo on direct calls. The company experiences rollover of cargo and rescheduling without prior notification on a daily basis. The shipper notes that a reason for this is the high transit time, which increases the risk of missing the feeder service, or frequent spontaneous cancellations of calls to main ports, which leads to cargo being discharged at a different port. Due to the general tendency of increasing ship size and volume peaks in the ports of call, often because of congestion, the cargo, delivered by truck or barge, cannot make it into the port on time and needs to wait for the next vessel. This is particularly striking in Rotterdam where barges line up to deliver cargo to the mega-ship. The shipper observes similar issues in ports of destination where it becomes increasingly difficult for cargo pick-up.
Case Study 6: Large multinational, Chemicals, Demand for sea transport 300,000 TEUs per year.	o Lower availability of direct connections has increased the risk of delays for the company. o Difficult information flow especially in feeder ports. In many cases, they are not even aware of transhipment delays when they occur. o Consequences could then be a slow-down of a client's production, or that the customer seeks for alternative products that are available locally.

	○ In trade lanes such as from Europe to the Caribbean, reliability reaches only 50%-60%. ○ Delays of more than one week can become problematic for all shippers and customers, especially as global supply chains become leaner and safety stocks lower. ○ In the past the company discovered a continuous drop of customer service performance and accountability. Nevertheless, for a few years some core liners started to focus back on customer relationship management and customer service. The shipper welcomes that trend while acknowledging a lot of room for improvement.
Case Study 7: Large multinational, Chemicals, Demand for sea transport >700,000 TEUs per year.	○ While the company frequently uses the top six biggest liners, some smaller, mid-range liners are seen as much more reliable. ○ Some negative service experiences have occurred mainly with outsourced service centres that were unable to deliver practical solutions. ○ In terms of reliability, internal KPIs of the company show that on-time delivery (OTD) figures are declining. ○ The consequence of not delivering on time to customers could mean that they would have to temporarily shut down a factory which generates significant costs. ○ Port congestion related to bigger and fuller vessels as a consequence of alliances. ○ As transhipment further increases the risk of delay, the company also attempts to avoid unnecessary transhipments and allocates more volume to liners that – according to their own experience – have proved to deal efficiently with transhipments. ○ The shipper sees liners with their own terminals not necessarily advantaged, as their terminals might be more expensive and less productive than nearby competing terminals.

Source: ITF, 2018

Quality of services is related to the choice of service and both of them affect the generalised cost of transport. The following table gives some points of shippers related to the generated costs.

Table 8.6 Shippers' opinion related to the generated costs

Shipper	Prices
Case Study 2: Small Medium Enterprise (SME), Wholesale, Demand for sea transport 7,000 TEUs per year.	○ To counteract decreased reliability, the shipper must evaluate shipping lines according to reliability as well as for price, and in many cases pay a premium to assure that shipping schedules are kept.
Case Study 3: Multinational, Construction and insulation, Demand for sea transport	○ Increased concentration on the liner shipping industry increasingly affects small and medium-sized shippers' bargaining power, leading to imbalances. ○ Global carriers have become more adept at managing capacity (supply of vessels and space) and can thus influence prices much more than two or three years ago.

10,000 TEUs per year.	○ Mediterranean, Baltic and Intra-Europe trades are also relatively competitive due to smaller carriers present but not as much as intra-Asia trades. The Intra Asia market is an exception, as there is strong competition for a multitude of very small liners. ○ The prices for a service between main hubs are becoming more similar, as well as those for connections with smaller ports. ○ The shipper declares to be willing to accept higher prices if this would lead to a healthier shipping sector that refrains from "undercutting each other".
Case Study 5: Large multinational, Food products, Demand for sea transport 100,000 TEUs per year.	○ As there is less free time acknowledged in the contract, the shipper receives additional bills for storage and container rental costs depending on product value and interest rates, even though the responsibility for exceeding cargo dwell time in ports is in most cases the responsibility of the shipping company. ○ Generally, longer transit time also generates additional costs for the shipper, particularly in terms of working capital. Bargaining power vis-à-vis shipping companies has eroded, as experienced by the shipper. ○ Coupled with a decrease in reliability, the shipper is confronted on a daily basis with an increase in local costs at cargo's destination of around 5% to 10%. ○ Worldwide, the shipper deals with additional costs generated by congestion at least once a week.
Case Study 6: Large multinational, Chemicals, Demand for sea transport 300,000 TEUs / year.	○ Liners would need to differentiate themselves by factors other than comprehensive alliance networks, such as service quality and customer orientation, since shippers would prefer to pay more for increased service, reliability and visibility.
Case Study 7: Large multinational, Chemicals, Demand for sea transport >700,000 TEUs / year	○ The company commits to a fixed delivery date estimated with sufficient time to cover eventual delays.

Source: ITF, 2018

One of the shippers interviewed for the study of ITF, has reported that, at least once a week, cargo does not reach the originally scheduled vessel because of congestion in a major European port. In that case, the container is rolled to the next vessel and shipping companies may apply additional detention and demurrage charges. In the reverse situation, important delays occur for containers at Rotterdam bound for inland Europe. In April 2018, the logistics company Contargo reported waiting times for barges of up to 48 hours at the port of Rotterdam (Knowler, 2018b).

In order to face the risk of delays, the costs of stock holding and inventory management have increased for some of the shippers. In order to avoid fluctuations and delays in

deliveries to the customer, shippers need to increase inventories and provide additional warehousing at destinations (ITF, 2018).

8.4 CONCLUSIONS

Although LTVI served the interests of both liners and terminals, its effects on shippers are questionable. The evolution of THCs in the Hamburg – Le Havre port range firstly shows the effect of the deregulation after the abolition of conferences in 2008 on pricing structure of the liners. Secondly, the evolution of THCs shows the absence of the procompetitive effect of the elimination of double marginalization or the existence of anticompetitive effects that lead to the increase of prices.

The increased trend of THCs remains the same for integrated and non-integrated liners. Integrated liners continue to increase the THCs irrespectively of the type of control (sole or joint) upon the terminals. In addition, quality of services has been declined and choice of services has been limited. Declined quality and limited choice in transport lead to higher costs. Certainly, such effects cannot be exclusively explained by alliance formation and vertical integration, but at least it can be concluded that vertical integration has not led to reduced prices as well as to improved quality of service.

Summing up, according to the research,[214] no efficiencies potentially gained by the liner - terminal vertical integration have passed to shippers. Additionally, price deflation does not affect the outcome, as the trend remains the same.

Returning to Goss and to his question *"Who earns the economic rent?"*,[215] it is mentioned that in 2002 the Commission concluded that exclusive dealing agreements between car manufacturers and car dealers as well as the exclusive sales territories granted by the manufacturers to the dealers were not justified on grounds of efficiency as the consumers

[214] May there are decreased THCs for shippers with bargaining power, but such agreements between liner companies and shippers are confidential.

[215] Goss R. (1999), "On the Distribution of Economic Rent in Seaports", Maritime Economics and Logistics Palgrave Macmillan; International Association of Maritime Economists (IAME), vol. 1(1), pages 1-9. Goss (p. 7) concludes that: *"If we are going to rely on competition to ensure that ports are efficient and that their benefits are widely-distributed then it is necessary to ensure that competition actually exists – within ports and between them".* He claims that a necessary condition is that there is competition in the chains of transport providers, brokers and others lying beyond the port, thus at vertical and horizontal level.

were *"not getting a fair share of the resulting benefits"*.[216] Finally, examples show that the design and operation of a well-coordinated service does not require common ownership.

[216] "Commission adopts comprehensive reform of competition rules for car sales and servicing" IP/02/1073 of 17/07/2002 available at http://europa.eu/rapid/pressReleasesAction.do?reference=IP/02/1073&format=HTML&aged=0&language=EN&guiLanguage=en.

CHAPTER 9:

CONCLUSIONS

9.1 INTRODUCTION

The intention of this study was to generate knowledge on the competition effects of liners' entry in the operation of container terminals. Taking into account the theoretical strands examining the effects of liners' entry in the upstream market (Chapter 2) and the attempts to explain the various competition effects of vertical integration in several markets (Chapter 3), a mixture of qualitative and quantitative case-study research was selected as the most appropriate method for testing the outlined tentative hypotheses (Chapter 4). Equipped with the assumption that competition effects of vertical integration depend on the structure of the engaged markets, the study proceeded to the examination of the institutional approach in EC level (Chapter 5) and the analysis of the structure of the upstream market of container terminal services and the downstream market of liner shipping services in the Hamburg – Le Havre port range (Chapter 7). Having distilled the main findings of each of these exercises (Chapters 6 and 8 respectively), this final chapter considers the general picture they adduce. First, it assesses the relevance of the conducted research for understanding of the answers to the research questions set. It does so detailing the conclusions of the study regarding the theorising of competition effects of LTVI and reflects on the theoretical discussions. The study concludes with a consideration of its possible limitations and suggestions for further research.

9.2 COMPETITION EFFECTS OF VERTICAL INTEGRATION

The entry of liner shipping companies in container terminals' operations dates back to the late 1990s. Liner companies are the second type of entrants, following the terminal operators, some of which are global, like Hutchison, PSA, DPW (P&O ports) to name some. Although the entry of terminal operators increased the efficiency, by introducing a new frame of operation, the entry of liner companies reshaped the market structure, as terminals have been integrated vertically with liners. The factors that lead to liners' integration strategy are mainly the protection of their interests and the recovery of a surplus generated by the operation of the port. On the other hand, ports need capital and securing

customers: terminals require huge investments and the participation of liners guarantees the demand for container terminal services.

However, as the conducted review of existing studies of the maritime world revealed, the competition effects of vertical integration have not been sufficiently evaluated by researchers and institutions. Yet, the review of a different research stream, i.e. competition analysis, emphasised that competition effects of vertical integration could be primarily distinguished in procompetitive and anticompetitive, although these two categories in general co-exist.

On the one hand, procompetitive effects of vertical mergers include the 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. Research shows that in all new terminal projects within the examined port area, participates at least one liner company, otherwise such projects should have been abandoned or even never designed.

On the other hand, anticompetitive effects harm consumers and social welfare. Such effects of vertical integration are mainly distinguished in non-coordinated (foreclosure) and coordinated (collusion) ones, although it seems that foreclosure is encountered more often. Foreclosure, full or partial, may be input or customer foreclosure. It can be performed in various ways, such us raising rivals' cost, margin squeeze, price discrimination, exclusive dealing, and information exchange. Foreclosure can be substantial even if rivals remain into the market and even if they can achieve minimum efficient scale of production. Collusion, express or tacit, may be facilitated by vertical integration in the following ways: (a) by interfirm information exchanges, (b) by enhancing 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. The VIC has the power to make the collusion agreement sustainable, 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. There is no information about the existence of foreclosure or collusion of the LTVICs, due to the lack of *ex post* assessment of the

competition effects of LTVI at EC level, as a consequence of the lack of relevant complaints of non-integrated liners. However, as evidenced by other EC vertical integration cases (e.g. EC case AT. 39748 - Automotive Wire Harnesses (10.07.2013)), the lack of complaints does not mean that competition works - which underscores the necessity and importance for further research. Moreover, in case AT. 39850 - Container Shipping (07.07.2016) all the engaged liners are vertically integrated companies.

Economic analysis demonstrates that competition effects of vertical integration depend on the structure of the markets in which a VIC operates. 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. The downstream market of container liner shipping not only is conducive to collusion over time, but is also characterised by many EC cartel cases. Second, if firms coordinate on prices and/or output, excess capacity is a necessary condition for such a coordination to have taken place. Both markets (upstream and downstream) are characterised by excess capacity in which led the huge investments in ships and terminal facilities. Not only the designed capacity is not exploited but also the operational capacity is idle.

In general, vertical integration enhances problems rather than creates them. So long as horizontal merger standards are met, vertical mergers cannot have any 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; existence of barriers to entry; existence of scarce and essential input; the portion of the foreclosed market; the efficiencies gained; the status of the foreclosed rival (equal efficient rivals or not). The structure of both markets -liners and terminals- is characterised by oligopoly, concentration and barriers to entry. The characteristics of both markets (e.g. capital intensive, long-time concessions, liner service characteristics) consist barriers to entry for newcomers. Moreover, container terminals offer an essential input to the container liner shipping.

Concerning partial vertical integration (joint ventures, minority shareholdings), which mainly characterises the LTVIC, although researchers recognise the potential efficiency benefits, they state that vertical partial acquisitions can raise competition 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. The entailed information may give the partially integrated firms the ability to foreclose or coordinate. Anticompetitive effects differ between forward and backward integration, controlling and non-controlling minority interests. Economic theory shows that when the partial backward integration, which is the integration form of the LTVICs, gives the integrated downstream firm control over the upstream supplier, the price at which the input is sold to the non-integrated downstream firm increases. In most of the terminals, even though liners hold a minority stake they enjoy a dedication of 50% or 100% of the terminal. For example, in Eurogate Container Terminal Wilhelmshaven (CTW), although APMM holds 30% and Eurogate holds 70%, the Partners' Agreement provides that APMM will have up to 49% of the JWP CT's total operational capacity dedicated to itself and/or its affiliates.

Further to vertical minority shareholdings, horizontal minorities are met in the upstream market of container terminal services. The ports of the Netherlands are mainly operated by Hutchison and the ports of Belgium are mainly operated by PSA, but PSA holds 20% of Hutchison shares. Such a share is significant as Rotterdam and Antwerp are rival ports that belong to the same geographic market.

Vertical integration enhances problems rather than creates them; meaning that vertical integration coupled with horizontal power can impair competition to a greater extent than the exercise of horizontal power would do so alone. The market power of the downstream market is enhanced by alliances and consortia and it becomes higher under a precise geographic relevant market definition. The existence of alliances, consortia and other cooperation agreements increases the bargaining power of liner companies not only as customers of the container terminal services, but also as potential investors (competition to the market). Liner companies which have interests in container terminals have ensured customers for terminals through their agreements. Alliances led to larger vessels and greater terminal capacity not only in TEUs handling, but also in terms of quay length and port depth. Terminals have been expanded or new bigger terminals have been constructed, while others have closed or have changed their use exclusively to feeder or to short sea

services. As a result, these terminals may not be considered as competitive to large capacity terminals. In addition, the requirements of inland handling have been changed.

The examined case study confirms maritime economists research about the concessions of container terminals in global basis. In fact, in the Hamburg – Le Havre port range concessions are held by consortia of between two and six strategic investors, as well as changes are met in the originally awarded ownership structure. Exemption is the German terminals, in which no changes are met since liners' first entry.

Concerning the equity of liner companies in 2016, MSC and Maersk hold the biggest shares. MSC has a geographical presence in four countries (Germany, the Netherlands, Belgium and France) and Maersk is met in three countries (Germany, the Netherlands and Belgium) after the sale of its 50% share of the container terminal Porte Oceane in the port of Le Havre to Perrigault. In terms of terminal capacity, Maersk holds 7,734.1 thousand TEUs and MSC holds 6,425.5 thousand TEUs. Therefore, the total capacity of the two companies, which have created the 2M alliance, in the market of container terminal services is 14,159.6 thousand TEUs or 24.52% of the total capacity in the Hamburg – Le Havre port range.

According to the institutional approach and specifically the EC decisional practice, the *ex ante* assessment of competition effects of liner – terminal vertical integration suffers. The research shows that the notified to the European Commission container port vertical mergers are limited in relation to the real transactions, and therefore the estimation of competition effects is limited too. Additionally, none of the four vertical liner – terminal notified mergers is examined under an in-depth analysis (phase II). Given the absence of obligation for the Commission's notification of the minority shareholdings when they are not accompanied by joint control, the effects of partial mergers, which in some cases are more significant than the effects of full mergers, are ignored. In addition, each equity interest (minority or majority) is accompanied by a hidden or confidential shareholders' agreement, which enhances the anticompetitive effects. Furthermore, there is not any *ex post* assessment of LTVI due to the absence of complaints, as mentioned earlier.

Moreover, market definition and calculation of market shares have difficulties in both upstream and downstream markets. Given to those difficulties, there is a necessity to

concentrate more on markets' structure and competition effects of horizontal and vertical integration. The characteristics of both upstream and downstream markets (e.g. oligopoly structure, concentration, alliances, high barriers to entry, excess capacity) create the need to reverse the procedure of EC *ex ante* assessment of mergers: ability, incentive and effect (non-coordinated and coordinated). Not only the large vertical integrated companies have the ability and the incentive to foreclose their rivals, but they also increase their shares in global market. Even an increased market share may be an effect of anticompetitive practices. Additionally, the high market shares become higher by the existence of alliances and consortia. As port competition is competition between alternate intermodal systems; and competition between carrier-controlled terminals arises as a result of primary shipping activities, it is important to examine not only if non-integrated shipping companies have access on an equal basis to the terminal facilities, but also if they operate in the same trade routes as integrated ones. In other words, to examine whether third liners using an integrated terminal constitute real competitors to the liner(s) with interests on the terminal.

It is noted that what really matters the Commission is to protect an effective competitive process and not simply protecting 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 for example relevant tests applying during the examination of cases, e.g. less efficient competitor test). The matter not only is if any efficiency gained has been passed on to consumers, but also if the efficiencies are merger specific. Although LTVI served the interests of both liners and terminals, its effects on non-integrated liners and shippers are questionable.

The research examined the competition effects of the LTVI on shippers. Specifically, it examined the effects, concerning the price, thus the terminal handling charges (THCs), the choice of services, and the quality of service. The evolution of THCs in the Hamburg – Le Havre port range firstly shows the effect of the deregulation on pricing structure of the liners after the abolition of conferences in 2008. Secondly, it shows the absence of the procompetitive effect of the elimination of double marginalisation or the existence of anticompetitive effects which lead to the increase of prices. The empirical research shows that any efficiency gained from the vertical integration has not been passed on to shippers.

Shippers do not benefit from the liners' entry in container terminal services in terms of THCs, irrelevantly if such an entry is a profitable business or not.

The increasing trend of THCs remains the same for integrated and non-integrated liners. Integrated liners continue to increase the THCs irrespectively of the type of control (sole or joint) upon the terminals. In addition, quality of services has been declined and choice of services has been limited. Declined quality and limited choice in transport lead to higher costs. To that direction, a study on rail market (Harris and Winston, 1983) shows that shippers are willing to pay more if they have better service and the same argues an interviewed shipper, user of liners in the study of ITF (2018). Moreover, integrated liners, such as Maersk and Cosco, report profits of the terminal operations' division and losses of the liner shipping division.

Certainly, such effects cannot be exclusively explained by alliance formation and vertical integration, but at least it can be concluded that vertical integration has not led to reduced prices as well as to improved quality of service. Summing up, according to the research, no efficiencies potentially gained by the liner - terminal vertical integration have been passed on to shippers. Additionally, price deflation does not affect the outcome as the trend remains the same.

Higher prices is also the competition concern of maritime economists, although their limited studies on port competition are focused on either inter-port or intra-port competition without considering liners' involvement. No empirical study has been performed to assess competition effects of the vertical integration between liners and container terminals, although there are a few studies for other modes of transport, namely rail and air.

Specifically, maritime economists argue that vertical integration may result in less competition, which may be conducive to higher prices. They mention that the power concentration of the liner companies, through horizontal (mergers, consortia, alliances) and vertical integration, may lead to abuse of their market position. Specifically, researchers 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.

Moreover, researchers include exclusive contracts to vertical integration, as they may have the same competition effects with equity integration. Considering liners' interests in intermodal transport, the port competition changed from competition between individual ports to competition between supply chains.

Maritime economists suggest that when container terminal concessions first began to be competitively awarded, it was quite common for shipping lines to be excluded from the tendering process in order to avoid competition effects, such as foreclosure of third shipping lines or abuse their access to confidential information. However, later shipping lines were much sought after as terminal operators or consortium partners because of the large volumes of traffic they control, and their ability to switch some of this particularly transhipment traffic to terminals in which they have a financial interest. The case study of the Hamburg – Le Havre port range, shows that in all new terminal projects within the examined port area, participates at least one liner company, otherwise such projects have been abandoned or even never designed.

Researchers recognise the efficiencies gained by vertical integration: in the maritime sector vertical integration reaps all of the benefits of intermodal transport, allows liners to provide a better service, increases the efficiency of cargo movement, minimises transactions costs, reduces operational time for cargo handling, and ensures security and service quality standards which will certainly be beneficial for shippers.

Nevertheless, examples show that the design and operation of a well-coordinated service does not require common ownership: APL Logistics was the first line to offer a port-to-door, time-guaranteed, less-than-container (LCL) service in 2006. This was from China into the US, with APL being the ocean carrier and Con-Way Freight performing the inland carriage. Japan, South Korea, Singapore and Taiwan were added as origins in 2007 and Mexico was added as a destination in 2009. In 2008, a full-container guaranteed service was introduced from China to the US. In 2009 Hanjin and MOL introduced time-guaranteed services on routes from Asia to the US West Coast with distribution in the US being handled by Old Dominion Freight Line and the railway operator BNSF.

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 (i.e. 40 years) 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 gained 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, which prevent competition in order to protect the interests of the contractor, i.e. the agreement between Cosco and PPA. There are cases in which the competition authorities, namely the Indonesian Competition Commission, consider that such clauses restrict competition.

In driving factors of vertical integration firm's strategy as they analysed in Chapter 3 (to reduce costs, to secure an input, to obtain high profits, to solve the hold-up problem, to prevent others from doing it to them) it would be added the search of capital and the ensuring of customers which is the driving factor of terminal operators' strategy.

The research shows that horizontal merger standards are not met in both the upstream and downstream markets and therefore LTVICs can exert anticompetitive effects. Although, it is unknown if there are foreclosure or collusion practices of the LTVICs due to the absence of the EC *ex post* assessment or an empirical research on competition effects, the precise definition of the upstream and downstream relevant markets, leads to high market shares capable to create competition concerns. Moreover, the study shows that LTVI has all the necessary conditions to produce anticompetitive effects (downstream market conducive to collusion, excess capacity, oligopoly, concentration and barriers to entry).

The LTVIC and its alliance partners have the ability and the incentive to foreclose their competitors. It is likely to restrict access of liner companies to container terminal services (input foreclosure) or to foreclose container terminals by restricting their access to a sufficient liner company base or foreclose liners by restricting their access to shippers or to forwarders (customer foreclosure).

Foreclosure may be partial, when the LTVIC favours some liners or terminals in the adjacent market to the detriment of other competitors. Anticompetitive practices such as raising rivals' cost will be targeted at selected industry competitors rather than applied uniformly to all. Therefore, it is important to be determined not only whether

anticompetitive conduct is likely to occur, but also where it is likely to be directed. In addition, as analysed, all liners are not rivals.

A LTVIC by applying input foreclosure to an independent liner company, may apply and customer foreclosure if the shippers – customers of the liner company - do not want to change terminal for reasons such as proximity, special facilities etc. Therefore, shippers' demand may shift to the LTVIC.

The incentive to foreclose depends on the degree to which foreclosure would be profitable. The LTVIC will take into account how its provision of container terminal services to liner competitors will affect not only the profits of its container terminal, but also the profits of its liner division. Essentially, the merged entity faces a trade-off between the profit lost in the container terminal services market due to a reduction of liner customers and the profit gain, in the short or longer term, from expanding container liner shipping services or, as the case may be, being able to raise prices to shippers. The trade-off is likely to depend on the level of profits the LTVIC obtains upstream and downstream: the lower the margins upstream, the lower the loss from restricting terminal services. Similarly, the higher the downstream margins, the higher the profit gain from increasing market share in container liner shipping services at the expense of foreclosed rivals. Consequently, in periods with low freight prices in container liner shipping, the LTVIC has no incentive to foreclose. It might focus on the profits of the container terminal services market which are high and sustainable.

Input foreclosure may increase a liner company's profits without increasing the prices charged to consumers. The increased profits may occur by the increased sales (market share) as the rivals are foreclosed from a specific geographic market (partial foreclosure).

In addition, LTVI may facilitate collusion by: (a) interfirm information exchanges, as the downstream division of the merged firm might share commercial information (sales, throughput, prices etc.) of the upstream firms with the upstream division of the merged firm, and vice versa and uses this information to monitor its upstream rivals' compliance with a collusive agreement, (b) acquiring a disruptive firm or eliminating the incentives of a disruptive firm: a vertical merger can facilitate coordination in the upstream market by eliminating the incentives of the downstream division of the merged firm to act as a

disruptive buyer that deters coordination by upstream firms. A vertical merger can facilitate coordination in the downstream market by weakening maverick or other disruptive competitive behaviour of a non-merging downstream firm, (c) symmetry in costs and punishment effect: vertical integration may facilitate collusion by creating more symmetry in costs or placing the merged firm in a stronger position to punish defectors, (d) exclusive contracts: vertical integration might facilitate an effective cartelisation of a downstream industry via exclusive contracts. Generally, an upstream supplier might organise a cartel by contracting with a downstream industry to restrict output and prices to final consumers. Exclusive contracts could prevent downstream participants from defecting by contracting with alternative upstream suppliers.

The effect on competition on the downstream market must be assessed in light of countervailing factors such as the presence of buyer power of liners and their alliances or the likelihood that entry upstream would maintain effective competition. Further, the effect on competition needs to be assessed in light of efficiencies substantiated by the merging parties. According to competition economics theory, a vertical merger does not necessarily results in market foreclosure of non-integrated producers, but when no foreclosure occurs, a vertical merger unambiguously causes the price of the final good to decrease. Moreover, in order an efficiency to be merger specific, it must: (i) be a direct result of the vertical integration, (ii) be demonstrable; and (iii) be likely that the benefit will be passed on to consumers.

Nevertheless, the study shows that not only the prices offered by integrated liners to shippers have not decreased after the vertical integration, but also the efficiencies are not merger specific, as they have been gained since the first and second entry of the pure terminal operators in container terminal market and before the entry of liners.

Returning to Goss and to his question *"Who earns the economic rent?"*,[217] it is mentioned that in 2002 the Commission concluded that exclusive dealing agreements between car manufacturers and car dealers as well as the exclusive sales territories granted by the

[217] Goss R. (1999).

manufacturers to the dealers were not justified on grounds of efficiency as the consumers were *"not getting a fair share of the resulting benefits"*.[218]

Vertical integration is beneficial in highly competitive markets but not quite so much in oligopoly or monopoly markets. There is a need to be concentrated on effects, even if relevant evidence for anticompetitive practices of firms or between firms is not found. As one of the recent EC cases (of liners AT. 39850 Container Shipping 07.07.2016) advocated and as (Goss, 1999: p. 7) stated: *"If we are going to rely on competition to ensure that ports are efficient and that their benefits are widely-distributed then it is necessary to ensure that competition actually exists – within ports and between them"*.

Nonetheless, the case study of the Hamburg – Le Havre port range confirms that the competition effects of vertical integration should be assessed case by case, as generally a "one-size-fits all" approach to predicting and assessing the anticompetitive practices is inadequate.

9.3 POSSIBLE METHODOLOGICAL LIMITATIONS

This study rightly examined the Le Havre – Hamburg port region as it is an important region to compare the EC decisional practice and actual developments in the market (notified and non-notified mergers). Eight major ports, including 26 deep-sea container terminals are located within a distance of about 850 kilometres, handling more than 45 million TEUs per year and, thus standing as the main port region in Europe and among the main ones in the world. Most importantly for the present study, this is also a port range with history in vertical integration. The first LTVI took place in Bremerhaven, Germany in 1998. However, any seaport cases (merger-antitrust-cartel) of national competition authorities of the engaged member-states (Germany, Belgium, the Netherlands and France) have not been examined.

The present research is based on the published equity shares of liners' and reported THCs on the internet sites of liners and agents. Confidential shareholders' agreements or vertical agreements about service, pricing etc., which also affect competition, are not

[218] "Commission adopts comprehensive reform of competition rules for car sales and servicing" IP/02/1073 of 17/07/2002 available at http://europa.eu/rapid/pressReleasesAction.do?reference=IP/02/1073&format=HTML&aged=0&language=EN&guiLanguage=en.

included. Thus, the study is limited to the estimation of competition effects of vertical integration on shippers by examining the evolution of THCs. The lack of data on terminal prices charged on non-integrated liners before and after the vertical mergers prevented the estimation of the competition effects of vertical integration on non-integrated liners.

Concerning the downstream market, the difficulty of the precise market definition of liner shipping market on the base of point of Origin/point of Destination or hub and spoke network system prevented the precise calculations of market shares which are expected to be higher than the published ones.

Finally, other port regions exist with different market structures, vertical integration forms, institutions or competition legislation and decisional practices, and above all, different data. Thus, it cannot be assumed that the findings can be generalised before further research is conducted regarding the conditions in other geographic markets. This study develops some finding to be crossed-checked and compared with the situation in other relevant geographic markets.

9.4 SUGGESTIONS FOR FURTHER RESEARCH

During the study new topics for further research have arisen. An indicative list would include:

- The profitability of liners by investing in container terminals,
- The competition effects of vertical integration on non-integrated liners, e.g. the evolution of terminal prices before and after the entry of liners,
- The estimation of procompetitive effects of LTVI, e.g. the evolution of ship turnaround time,
- The calculation of market shares in the market of liner shipping services under the precise definition of relevant markets including the geographic dimension.

9.5 EPILOGUE

On a final note, the present study discusses the competition effects of the LTVI based on the competition economics theory and the available empirical data of the Hamburg – Le Havre port range, concerning the THCs, thus the price paid by the consumers (shippers).

However, Motta (2004) argues that in order to estimate the effects of a vertical merger, should be estimated the effects on the input price paid by the independent downstream firms (thus, the terminal dues paid by the non-integrated liners) and on the price paid by the consumers. Definitely, competition authorities have access to non-reported and unpublished data such as shareholders' agreements or vertical agreements. A comparison between the terminal prices charged to non-integrated liners before and after the vertical merger, would permit a better approach on estimation of competition effects of vertical mergers. Nevertheless, the basic requirement for such an in-depth analysis is the creation of competition concerns.

The research conclusions can provide a useful background to the researcher who will seek to shed light on the competition effects of vertical integration in the relevant markets of the Hamburg – Le Havre port range, or other relevant geographic markets. The conclusions might also be helpful at a practical level. Competition policy makers and interests representatives might use this analysis of the selected case study.

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