Shipping lines create a trinity: digitalisation, globalisation, monopolisation

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During the course of the past decade, the EU market in containerised liner shipping services has drifted into a state of legal uncertainty. This is attributable to the powerful concurrence of two factors: (i) the ever-increasing digitalisation of the shipping industry; and (ii) the absence of tools that are sufficiently adequate and effective for enabling EU and national anti-trust authorities to measure, evaluate and neutralise the anti-competitive effects of the underlying technology. This legal uncertainty is being reinforced by the impending expiration of the consortia block exemption regulation on 25 April 2020 and the question of how, if it is prolonged at all, in what manner and on what terms it should be prolonged.

In parallel with (and possibly caused by) this chain of events, shipping lines have set out to create what well may turn out to be a trinity of digitalisation, globalisation and monopolisation. The major building blocks of this trinity are big data and the ensuing business intelligence and analytics systems. These phenomena provoke a move from supply chain models to commodity-driven logistics solutions. They enable a shipping line to provide end-to-end services by linking ports and terminals, customs authorities, third-party logistics, inland transportation, shippers and other actors simultaneously.

The contract a line makes with a customer crucially determines its arrangements with other actors that it has to engage for the fulfilment of its contractual obligations. These arrangements require an absolutely rigorous coordination of the organisational decision processes in the entire logistics chain. As a result, the business intelligence and analytics system a line uses for governing these processes and the computer programs used by the actors it has engaged must be semantically interoperable in order for all data exchanged to be automatically interpreted in a meaningful and accurate way.

Major lines including Maersk and CMA CGM have all but staked their undertakings on the shift to this logistics technology. Other major lines have followed suit. The huge investments which lines are prepared to make in regard of the (further) development of business intelligence and analytics technology, together with the necessity for other actors to follow suit with regard to their computer programs, is likely to increase the already cut-throat competition between lines, as well as between other actors who can (or might) and those who cannot (or do not) wish to follow this flow of events. This trend is reinforced by the cooperation between lines and information technology (IT) providers and the protection of their joint business intelligence and analytics systems through the deployment of intellectual property (IP) rights.

To date, the EU Commission does not possess tools that are sufficiently adequate and effective to guarantee fair and undistorted competition and a level playing field for all of the stakeholders in the competitive environment of containerised liner shipping services, now unlocked by big data and business intelligence and analytics systems. The ensuing legal vacuum

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creates a complex legal border area, which is still uncharted territory. It seems doubtful that the revision of the consortia block exemption regulation, if at all, will remedy the situation. The consultations that are being conducted do not pertain to amendments that are sufficiently far-reaching to that effect.

The present circumstances, however unfortunate they may be, do not absolve undertakings from the obligation to assess whether the agreements and/or arrangements to which they are party, directly or indirectly, in isolation or in combination with other factors under their control, have as their object or effect distortions of competition that emerge in the realm of the major parameters that govern the business intelligence and analytics systems which underlie the logistics chain of their services. This implies that, apart from prices, account should be taken of common IT standards, engagement of actors in the implementation of services, implementation of services as such, and trust. Irrespective of the consortia block exemption regulation being prolonged and, if at all, in what manner, this assessment should be made in light of the impact business intelligence and analytics systems – with their current and anticipated state-of-the-art features, together with the surrounding big data – will have on the promotion of competition that must be generated in order for agreements and/or arrangements to be considered for an exemption from the prohibition of Article 101(1) of the TFEU.

Introduction

As enshrined in Articles 101 and 102 of the Treaty on the Functioning of the European Union (TFEU), EU anti-trust law is addressed to undertakings. Article 101 of the TFEU also applies to associations of undertakings, insofar as their own activities or the activities of the undertakings of which they are composed have as their object the prevention, restriction or distortion of competition.[1] The definition of the term undertaking is a comprehensive one. It includes all undertakings without distinction, whether they be large or small, private or public or resident or non-resident. According to this definition, the term undertaking includes all natural or legal persons engaged in an independent commercial activity, either as suppliers of goods or commercial services or as customers. Such activity must have a certain regularity and duration.[2] The pursuit of profit is not essential.[3]

In EU law, liner shipping is subject to the general basic anti-trust rules. Although these basic rules have applied for a long time, the maritime sector has benefited from a special regulatory regime, including block exemptions and guidelines. However, this regime has gradually been repealed. With the introduction of Regulation 1/2003[4] on 1 May 2004, the general procedure applicable to anti-trust investigations became fully applicable to the maritime sector. Under this new system, not only the prohibition of cartels contained in Article 101(1) of the TFEU but also the possible exemptions to this prohibition contained in Article 101(3) of the TFEU became – and remain – directly applicable. This implies that self-assessment by companies and their advisers constitutes the true cornerstone of the system. The block exemption regulations and notices issued by the Commission on the substantive criteria for the application of the EU anti-trust rules provide guidance.

Article 101(1) of the TFEU prohibits agreements between two or more independent market operators which restrict competition. This provision covers both horizontal agreements (between actual or potential competitors operating at the same level of the supply chain) and vertical agreements (between firms operating at different levels, eg agreement between a manufacturer and its distributor). Only limited exceptions are provided for in the general prohibition. The most flagrant example of illegal conduct infringing Article 101 is the creation of a cartel between competitors, which may involve price fixing and/or market sharing.

[1] See eg Case 71/74 *Frubo v Commission* ECLI:EU:C:1975:61 (15 May 1975).
[2] See Case 94/74 *IGAV v ENCC* ECLI:EU:C:1980:100 (17 March 1980).
[3] See Joined Cases 209–215 and 218/78 *Van Landewijk and Others v Commission* ECLI:EU:C:1980:248 (29 October 1980).
[4] Council Regulation (EC) No 1/2003 of 16 December 2002 on the implementation of the rules on competition laid down in Articles 81 and 82 of the Treaty (Text with EEA relevance).

Article 102 of the TFEU prohibits firms that hold a dominant position on a given market to abuse that position, for example by charging unfair prices, by limiting production, or by refusing to innovate to the prejudice of consumers.

The first imperative for a careful assessment of existing and future agreements and/or arrangements under EU anti-trust law is that all contractual parties are jointly and severally liable if they lead to a deterioration of competition on the market in question. Liability includes fines up to a maximum of 10 per cent of the annual turnover of the undertaking concerned, multiplied by the number of years and months the infringement lasted. If the parent company exercised a decisive influence over the company's operations during the infringement period, fines may be increased up to 10 per cent of the annual turnover of the group of undertakings to which it belongs. In addition, private individuals may sue for recovery of damages resulting from infringements. The costs of these claims may well be in excess of the fines themselves.

The second imperative is that the prohibition of Article 101(1) of the TFEU also has severe legal consequences. It implies that the agreement and/or arrangement concerned is not binding; nor can it be asserted in relation to third parties.[5] By the same token, it cannot be asserted before the courts either. Nullity for the purpose of Article 101 (1) of the TFEU means complete invalidity. It is absolute in nature, especially as anyone can invoke it,[6] and unlimited in time, thereby catching all the past and future effects of the agreement and/or arrangement concerned.[7] Apart from the European Courts and the Commission, national courts are also obliged of their own accord to draw the legal and economic inferences from infringements of Articles 101(1) and 102 of the TFEU.

Arrangements caught by the prohibition of Article 101(1) of the TFEU are exempted in the event that they satisfy the conditions of Article 101(3) of the TFEU, no prior decision to that effect being required. Such arrangements are valid and enforceable from the moment that these conditions are satisfied and for as long as this remains the case.[8] For different contract types the EU Commission has adopted a so-called block exemption regulation. A block exemption regulation includes a list of contract-permitted terms and a list of hard-core restrictions having been usually also identified as such in Commission guidelines and notices. With regard to the maritime shipping industry, and for the time being, the most important block exemption regulation is the consortia block exemption regulation,[9] which should be interpreted in close conjunction with the Horizontal Guidelines.[10]

The consortia block exemption regulation will expire on 25 April 2020. The Commission will carry out consultations with all stakeholders to determine whether it should be prolonged and, if so, on what terms. I take the view that these consultations should focus on the imbalance between freedom of competition and freedom of commerce, which has been caused by the ever-increasing digitalisation of the industry. The resulting distortions of competition will exist for as long as it takes to redress the balance. To make that happen, the Commission needs to deploy tools that are sufficiently adequate and effective. As the current tools were formulated in an era when, within the maritime shipping industry, digitalisation was still a vision for the future, these tools are inadequate and no longer fit for purpose. The consultations appear to indicate that the consortia block exemption regulation should be repealed or substantively modified.[11]

It seems doubtful, however, whether modification of the consortia block exemption regulation will provide a solution. The consultations do not pertain to amendments that are sufficiently far-reaching

[5] Case 22/71 *Béguelin Imports v GL Import Export SA* ECLI:EU:C:1971:113, para 29.

[6] Case 319/82 *Société de Vente de Ciments et Bétons de L'Est v Kerpen & Kerpen GmbH* ECLI:EU:C:1983:374.

[7] Case 48/72 *SA Brasserie de Haecht v Wilkin-Janssen (Haecht II)* ECLI:EU:C:1973:11, para 89.

[8] Article 1(2) of Regulation (EC) No 1/2003 of 16 December 2002 on the implementation of the rules on competition laid down in Articles 81 and 82 of the Treaty [2003] OJ L1 (4 January 2003).

[9] [2009] OJ L 256 (29 September 2009) 31–34.

[10] Guidelines on the applicability of Article 101 TFEU to horizontal cooperation agreements [2011] OJ C11/1 (14 January 2011).

[11] See 'The impact of alliances in container shipping' (OECD/International Transport Forum Summit 2018 'Transport Safety and Security') 72 ff.

to that effect. Therefore, if modified, due account will need to be taken of digitalisation with its current and anticipated state-of-the-art features.[12] A decision should be taken as soon as possible. The volatility of the technology is such that the consequences of the current legal vacuum cannot be (fully) repaired ex post.

The trinity

Digitalisation

Business intelligence and analytics systems[13] store and process big data. They promote a move from supply chain models to commodity-driven logistics solutions by enabling a line to provide end-to-end services by linking ports and terminals, customs authorities, shipping lines, third-party logistics, inland transportation, shippers and other actors, all together. The advent of these systems has radically changed the competitive environment of the maritime shipping industry. Their impact is most clearly visible with regard to containerised liner shipping global end-to-end services. Particularly in these services, business intelligence and analytics systems would necessarily have to be semantically interoperable with the computer programs used by the actors a line has engaged in order to secure a proper and smooth operation of the logistics chain. The pilot studies that have been conducted in this area have proved to be very successful. As a result, all of the major lines are preparing to make huge investments regarding the (further) development of business intelligence and analytics systems governing the global services they offer. This trend is reinforced by their cooperation with IT providers and the protection of joint business intelligence and analytics products through IP rights.

Big data and the ensuing business intelligence and analytics systems have induced Maersk and CMA CGM to shift their focus to containerised liner shipping global end-to-end services. Their principal motivation is 'to mitigate cyclicality, create greater predictability of revenue, create value for customers and be compensated in kind, and defend against disruption by new forms of industry actors'.[14] The services will accommodate customers who want to agree and control their costs up-front and to receive a commitment for the global transport of their cargo from end to end with estimated times of arrival (ETA) at the various intermediate points, predicted as accurately as possible.

Typically, a line offers the deep-sea leg of global end-to-end services to or from a port in its home region and a wide range of ports in other parts of the world. Through arrangements with other lines – preferably with those that belong to its own alliance – it may also offer these services to or from ports that its own carriers do not serve. For this remaining part of its global services, a line engages ports and terminals, customs authorities, third-party logistics, providers of transportation to inland destinations through trucks, trains or barges, shippers and other means. The contract between the line and the customer provides the perspective and commercial yardstick for the (sub-)contracts that it makes with all the actors it engages for the implementation of these services.

One of the key problems in optimising global end-to-end services is the prediction of the ETA for carriers that are nearing container terminals. Uncertainty in this area is a major hindrance towards planning activities. This is particularly true for hinterland transportation, since vessel arrival is the starting-point for inland transportation of the cargo. The way the ETA is presently predicted by the representative of the line at the port-of-call has become obsolete. New information tools are being developed which address the ETA problem from the big data available from marine traffic providers.

[12] See A J Braakman 'Consortia BERexit?' *Splash* (1 April 2019).

[13] Business intelligence and analytics 'is often referred to as the techniques, technologies, systems, practices, methodologies, and applications to analyse critical business data to help an enterprise better understand its business and market and make timely business decisions'. See Hsinchun Chen and others 'Business intelligence and analytics: from big data to big impact' (2012) 36(4) *MIS Quarterly* 1165.

[14] Peter Tirschwell 'End-to-end logistics pursuit holds risks for major container lines' https://www.joc.com/maritime-news/container-lines/end-end-logistics-pursuit-holds-risks-major-container-lines_20181128.html.

For any line, process management is the most important object of the contract[15] and of crucial importance to its competitive position. The new information tools create an enhanced competitive advantage by enabling a line to provide more reliable services to the customer and having a more efficient connection with the hinterland.[16]

Absolutely rigorous coordination of the activities of all actors involved is a prerequisite for proper and smooth implementation of global end-to-end services.[17] Price is not the decisive element for the purchasing decisions of the customer; the key parameters are services features, quality of service and functionality.[18] Therefore, a line will primarily be interested in the ability of other actors it must engage to coordinate and harmonise their services so as to make them correspond best to what was agreed upon with the customer.

Maersk has entered into a joint venture with IBM for this purpose. The new company, TradeLens, which is jointly owned by Maersk (51%) and IBM (49%), provides a platform connecting all actors that implement a stage of the global end-to-end contract. More than 100 players have joined, 53 of which are terminals, while another 30 are currently in the process of joining. Most importantly, six of the world's largest carriers now support TradeLens, including Mediterranean Shipping Company SA (MSC), CMA CGM and Japan's Ocean Network Express (ONE). Together, these carriers have a capacity equivalent to more than one-third of the worldwide capacity. Only China Ocean Shipping Company (COSCO) has not joined. TradeLens will help companies move and track goods digitally across borders. To that end, the platform will allow participants to share information and ease collaboration across the shipping industry's supply chain.

TradeLens is a profit-orientated business. Its goal is to 'become a new source of income', says Maersk's CEO Søren Skou during a press meeting in connection with the presentation of the company's half-year interim report on 15 August 2019, which was reported upon in *Shipping Watch* on 20 August 2019.

Furthermore, Maersk is one of the founding members and investors of the New York Shipping Exchange (NYSHEX). Other members include CMA CGM, COSCO Shipping, HMM, Hapag-Lloyd and OOCL. NYSHEX is a computerised trading system, dealing with contract trading for shipping container contracts and management, delivery and closing of shipping container contracts for carriers and shippers.

Parallel to its support of TradeLens, on 16 April 2019 CMA CGM acquired 97.89 per cent of the outstanding shares and voting rights of CEVA Logistics. Furthermore, CMA CGM entered into a joint venture agreement with COSCO Shipping Lines, COSCO Shipping Ports, Hapag-Lloyd, Hutchison Ports, OOCL, Port of Qingdao, PSA International and the Shanghai International Port Group. Known as the Global Shipping Business Network (GSBN), the joint venture is a non-profit organisation that aims at accelerating the digital transformation of the shipping industry. Under the joint venture agreement, each signatory commits to provide resources to support preparatory work required to establish GSBN. That preparatory work includes obtaining all necessary regulatory, competition and anti-trust approvals required for the establishment of GSBN. CargoSmart will provide software solutions and services to GSBN once it is formed.[19] Furthermore, CargoSmart has joined forces with the Shanghai Shipping Exchange to establish a new shipping index.[20]

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[15] See Cheng-Chi Chung and Chao-Hung Chiang 'The critical factors: an evaluation of schedule reliability in liner shipping' (2011) 8(4) *International Journal of Operations Research* 3.

[16] See Ioannis Parolas 'ETA prediction for containerships at the Port of Rotterdam using machine learning techniques' (Master's thesis, Delft University of Technology 2016).

[17] See amongst others Rebecca Moore 'Collaboration essential to digitalizing cargo handling' *Rivera* (29 July 2019).

[18] Maria Maher and others 'Resetting competition policy frameworks for the digital ecosystem' (GSMA 2016) 3 http://www.gsma.com/publicpolicy/wp-content/uploads/2016/10/GSMA_Resetting_ Competition_Report_Oct-2016_60pp_WEBv2.pdf.

[19] 'CargoSmart and maritime industry operators commit to transforming the shipping industry' Press release (12 July 2019).

[20] 'Shanghai Shipping Exchange and CargoSmart join forces to establish a new shipping exchange' CargoSmart.ai (5 September 2019).

The above demonstrates that big data and business intelligence and analytics systems have resulted in core container service and logistics no longer being incompatible businesses. On the contrary. A survey of maritime leaders, conducted by Sea Asia in 2016, shows that 81 per cent of respondents recognise the importance of big data in the future of the shipping and maritime industry.[21] And yet, compared with other transport and logistics industries, the shipping industry is trailing behind badly.[22] Maersk and CMA CGM intend to bridge this gap at a fast pace. Lines and other actors on the market of containerised liner shipping services cannot afford to lag behind. All they can do is to match Maersk and CMA CGM's example. This is particularly the case since the ever-increasing impact of big data and business intelligence and analytics systems will fundamentally affect the modus operandi of the three global alliances. These alliances represent around 80 per cent of overall container trade and operate around 95 per cent of the total ship capacity on east–west trade lanes, where major containerised flows occur.[23] Inevitably, this jump into the cyber world will require some restructuring and a change of mindset. However, in my opinion, lines and other actors in the maritime shipping industry do not have a choice. It is a matter of death or glory.

Globalisation

The prerequisite for lines to offer containerised liner shipping end-to-end services on a global scale is a common foundation for technical interfaces and data. To that end, common IT standards should be developed. MSC has taken the initiative by establishing a standard-setting organisation (SSO): the Digital Container Shipping Association (DCSA).

The DCSA is a neutral, non-profit organisation for ocean carriers. Its purpose is to pave the way for digitalisation and standardisation in the industry. The work undertaken will be for the benefit of the entire industry, as all standards will be openly published and will be available free of charge to interested external parties. This implies that they qualify as open standards. The DCSA has no intention of developing or operating any digital platform and is not working on topics of a commercial or competitive nature. Having been notified to the US Federal Maritime Commission (FMC) and having been given approval by the FMC in March 2019, the DSCA was officially established in Amsterdam, the Netherlands on 19 April 2019.[24]

Common IT standards lie at the heart of business intelligence and analytics systems, which govern the entire decision-making process of global end-to-end services. All actors that are engaged in the implementation of these services must use computer programs that are semantically interoperable with these systems, which will give a boost to globalisation. This holds all the more true since lines will try and recoup the investments that have been made and are still to be made with regard to the application of business intelligence and analytics to global end-to-end services by applying their knowledge and experience acquired to all areas of the services they offer. This implies that the way in which business intelligence and analytics systems are applied in the area of global end-to-end services serves as a template for the way they are – and will be – applied in the area of non-global services.

Monopolisation

In July 2019, the members of the DCSA were MSC, AP Møller-Maersk, Hapag-Lloyd, CMA CGM and ONE. Membership for Evergreen Line, Hyundai Merchant Marine, Yang Ming Marine Transport Corporation and ZIM Integrated Shipping Service was pending regulatory approval. Once regulatory approval has been acquired, apart from COSCO-OOCL all major container lines that are involved in one of the three global alliances – 2M, Ocean Alliance and the Alliance – will have joined. Members will represent 70 per cent of the market. This indicates that the DSCA standards have – or soon will have – become signatory to and endorsed by the industry.

[21] arshipping.com/knect365.com/marinelink.com/knect365.com/worldmaritimenews.com.

[22] Mandeep Virk and Vaishali Chauhan 'Big data and shipping: managing vessel performance' (2018) 2(2) *International Journal on Information Visualization* 74.

[23] 'The impact of alliances in container shipping' (n 11) 7.

[24] https://www.msc.com/nld/news/2019-april/msc-to-pioneer-digital-industry-standards-in-new-c?lang=tr-tr.

The DCSA members support TradeLens. At the above-mentioned presentation of Maersk's half-year interim report Mr Skou said: 'It was very important to get the majority of the big carriers on board. We now have a capacity committed to TradeLens equivalent to more than a third of the world-capacity'.

The DCSA standards being signatory for the industry implies that no actor who wants to do business with a DCSA member can afford not to join TradeLens. Mr Skou offered a telling indication for this theory when he stated that providers of services on the deep-sea and the inland legs of global end-to-end services are not in a position to refuse to join TradeLens if they want to do business with one of the lines that support it: 'So we can basically force them to join the platform. Because if they want to do business with us they have to supply data'.

TradeLens is a profit-orientated business. Therefore, joining it will come at a price. It stands to reason that, in some form or another, TradeLens will remunerate the lines for the introduction to the platform of the actors they engage for implementation of a stage of their services. This implies that lines that support TradeLens have a vested financial interest in preventing new forms of industry actors from creating standards that – by virtue of their characteristics, prices and intended use – are interchangeable with and substitutable for DCSA standards. This will further strengthen the market position of TradeLens. Furthermore, particularly once DCSA standards have become signatory for the industry, the dependence of the actors a member-line of the DCSA engages will increase progressively. The purchase of the required technology, retraining of IT personnel and company-wide implementation of one and the same ecosystem will make it very difficult for these actors to switch to other standards and thereby to another platform. This holds particularly true since they may be forced to join TradeLens and have to pay a price for its services.

Considering all of the above, I take the view that the capacity, which is currently committed to TradeLens, is likely to rise from one-third of world capacity to a much higher percentage, sooner rather than later. This development may well lead to monopolisation of the trade by the DCSA and TradeLens.

Anti-trust issues

Identification

The anti-trust issues emanating from the so-called trinity must be identified from the perspective of both the technical and legal characteristics of the business intelligence and analytics systems that are used by the participating lines.

The technical perspective

In order for a line to manage the entire logistics chain of global end-to-end services properly and make timely and well-informed business decisions with regard to all stages of the transportation process, all actors involved must use the same IT standards and computer programs that are semantically interoperable with the business intelligence and analytics system in use by that line. This would imply that all computer programs should either be written in the same language or be able to process each other's standardised output.

The data that is exchanged is both structured and unstructured. Structured data follows a model that defines the various stages of the global transportation process, the type of data these stages contain and how they relate to each other. Traditional platforms for the aggregation of structured data are electronic data interchange (EDI), enterprise resource planning (ERP) systems and extensible mark-up language (XML). Unstructured data does not conform to a specific model. It flows outside the normal channels and is mined from multiple sources. As a rule, structured data is confidential, whereas unstructured data is not, unless bound by strict confidentiality

provisions.[25] Business intelligence and analytics systems blend structured data with unstructured data: 'The holy grail is to present the data in high-quality visualisation formats that help laypersons understand what they're looking at, and (ideally) make the better decisions based on hard information'.[26]

The vital elements for translating data into a computer program are the source code and the object code. A source code is the list of human-readable instructions that a programmer writes when she is developing a programme. An object code is the translation of the source code into a language that a computer can understand and execute. In essence, the object code consists of 1s and 0s – and, in more contemporary versions, of binary encoding schemes like hexadecimals or base 64 – and is not human-readable. Source codes can be open and free to anyone to download from the internet ('open source') or proprietary software.

Most companies closely guard their source codes and protect them by IP rights wherever possible. Other means for protecting the source code are: (i) use of non-English based programming languages; (ii) encryption of the source code; and (iii) protection of the source code and any IP rights based on this code through largely inaccessible jurisdictions. Users can use the object code, usually in the form of a computer executable, but cannot see or modify the underlying source code.

Actors who solicit for implementation of a stage of a global end-to-end contract must fit in to perfection with one another. To that end, a line provides each actor it engages with the required data by way of a source code licence agreement. This agreement covers source codes, object codes, link libraries, utility programs, project files and scripts related to the software listed in the agreement. The agreements vary from one actor to another since the required data varies from stage to stage. Partition between the overall data can be realised by the use of so-called views. These views enable a line to make only that part of the overall data accessible that is required for enabling an actor to perform its part of the global contract. As a result, this 'need-to-know' data is both individual and highly confidential. This holds all the more true since IP rights usually protect the code in which it is written.

The combined effect of common IT standards in the entire industry and source code licence agreements that link the computer programs of the actors that have been engaged to the business intelligence and analytics system a line uses for governing the entire logistics chain of global end-to-end services raises the issue of the impact this may have on fair and undistorted competition. To establish this impact, it must be assessed whether the combined effect leads to conditions of competition that do not correspond to normal conditions of competition, taking into account the nature of the services provided, the size and number of the actors and the volume of the market.[27]

The legal perspective

It is well established in the case law that, for there to be an agreement within the meaning of Article 101(1) of the TFEU it is sufficient for the undertakings to have expressed their joint intention to behave on the market in a certain way.[28] Although Article 101(1) of the TFEU draws a distinction between the concept of agreements and concerted practices, the object is to bring within the prohibition of this article a form of coordination between undertakings by which – without having reached the stage where an agreement properly so-called has been concluded – they knowingly

[25] See Jim Harris 'Bridging the divide between unstructured and structured data' https://datascience.berkely.edu/structured-unstructured-data/; Stephen Pritchard 'How to manage unstructured data for business benefit' *Computer Weekly* (5 October 2012) https://www.computerweekly.com/feature/How-to-manage-unstructured-data-for-business-benefit/; Bill Schoonmaker 'Unstructured data can create chaos' *Forbes* (11 July 2013) www.forbes.com/sites/emc/2013/07/11/unstructured-data-can-create-chaos/.

[26] Mark B Solomon 'Big data, analytics could be a welcome tonic for the beleaguered liner shipping trade' *Velocity* (24 October 2016) http://www.dcvelocity.com/articles/20161024-big-data-analytics-could-be-a-welcome-tonic-for-the-beleaguered-liner-shipping-trade/.

[27] Case C-238/05 *Asnef-Equifax v Asociación de Usarios de Servicios Bancarios (Ausbanc)* ECLI:EU:C:2006:734, para 52 and in Case C-49/92 P *Commission v Anic Partecipiazioni* ECLI:EU:C:1999:35, paras 116 and 117.

[28] Joined Cases T-305/94 to T-307/94, T-313/94 to T-316/94, T-318/94, T-325/94, T-328/94, T-329/94 and T-335/94 *Limburgse Vinyl Maatschappij and Others v Commission* ECLI:EU:T:1999:80.

substitute practical cooperation between them for the risks of competition.[29] This case law indicates that Article 101(1) of the TFEU catches containerised liner shipping global end-to-end contracts, both with regard to the horizontal aspects where a line makes agreements on the deep-sea leg of the contract and also with regard to the vertical aspects where a line concerts the agreements it has made on the inland leg of the contract.

Competition issues must be assessed within the framework of the 'relevant market'. The definition of the relevant market establishes 'the framework within which competition policy is applied by the EU Commission. [Its objective is] to identify those actual competitors of the undertakings involved that are capable of constraining those undertakings' behaviour and preventing them from behaving independently of effective competitive pressure'.[30]

Once the relevant market of containerised liner shipping global end-to-end services has been identified, the areas where the arrangements a line makes with other actors on the performance of these services must be identified. In my view the major areas are: (i) common IT standards, (ii) engagement, (i) implementation, (iv) confidential data and (v) trust.

The relevant market

The relevant market[31] within which to assess a given competition issue is established by the combination of the *product* and the *geographic* market:[32] 'The relevant *product* market comprises all those products and/or services which are regarded as interchangeable or substitutable by the consumer, by reason of their characteristics, their prices and their intended use'.[33] The Commission and the ECJ held that the relevant product market comprises containerised liner shipping services.[34] The decisions and judgments relate to maritime transport in deep-sea trades:

> 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.[35]

With regard to maritime transport services, the Commission and the ECJ held that the relevant geographic market consists of the area in which these services are marketed. The decisions and judgments determine that the EU-end of the catchment areas that were investigated consist of a range of ports in northern Europe and a range of ports in the Mediterranean.[36] The ECJ specified that this definition of the geographic market is commensurate with the scope of an inland tariff. This case law implies that there are different relevant geographic markets for global end-to-end services, namely the relevant market for inland transport services – which shippers acquire together with other services as part of a multimodal transport operation for the carriage of containerised cargo – and the relevant market for maritime transport services.[37] The General Court held that this distinction leads

[29] Joined Cases 40–48/73, 50/73, 54–56/73, 111/73, 113/73 and 114/73 *Suiker Unie and Others v Commission* ECLI:EU:C:1975:174 and Joined Cases C-89/85, C-104/85, C-114/85, C-116/85, C-117/85 and C-125–129/85 *A Ahlström Osakeyhtiö and Others v Commission* ECLI:EU:C:1988:447 (*Woodpulp*).

[30] Commission Notice on the definition of relevant market for the purpose of Community competition law [1997] OJ C372, 5–13 point 2 (9 December 1997).

[31] For a good explanation see Christian A Melishek *The Relevant Market in International Economic Law: A Comparative Antitrust and GATT Analysis* (Cambridge University Press 2013) 274.

[32] Commission Notice on the definition of relevant market for the purpose of Community competition law (n 30) point 5.

[33] ibid point 7.

[34] Commission Decision 1999/485/EC of 30 April 1999 (Case IV/34.250—*Europe Asia Trades Agreement*) [1999] OJ L193, 23 (26 July 1999); Commission Decision 94/980/EC of 19 October 1994 in Case IV/34.446—*Trans-Atlantic Agreement* [1994] OJ L376, 1 (31 December 1994) and Commission Decision 1999/243/EC of 16 September 1998 (Case IV/35.134—*Trans-Atlantic Conference Agreement*) (TACA Decision) [1999] OJ L95, 1 (9 April 1999) paras 60–84. The market definition in the TACA decision was confirmed by the General Court in its judgment in Joined Cases T-191/98, T-212/98 to T-214/98 *Atlantic Container Line AB and Others v Commission* ECLI:EU:T:2003:245, paras 781–883.

[35] Commission Notice on the definition of relevant market for the purpose of Community competition law (n 30) point 8.

[36] Revised TACA Decision 2003/68/EC [2003] OJ L26, 53 at para 39 (31 January 2003).

[37] Decision 1999/243/EC relating to a proceeding pursuant to Articles 85 and 86 of the EC Treaty (TACA Decision) (n 34) para 519.

to the application of a different legal regime for assessment of anti-competitive behaviour in each of these geographic areas.[38]

The above case law on the definition of the relevant product and geographic market relates to a time when lines could not yet avail themselves of business intelligence and analytics systems; certainly not of business intelligence and analytics systems with the current level of technical sophistication. The question, therefore, is whether this definition is still valid with regard to containerised liner shipping global end-to-end services in respect of the way these services are being brought about and implemented. In my view, this question must be answered in the negative.

A line determines the port-of-call; not policy-makers or regulators.[39] The same goes for determination of a container marine terminal operator. This is the entity for transhipment of containers in the port-of-call and for negotiation on the demurrage,[40] detention[41] and *per diem*[42] charges for the use of terminal space and equipment. Customers, shippers, consignees and drayage providers cannot independently select a terminal operator or negotiate the charges for its services. Consequently, they depend on the arrangements the line has made with the terminal operator.

These market characteristics provide a line with a genuine stranglehold over all of the stages of the global end-to-end services that relate to the deep-sea leg, inclusive of the transhipment phase. This stranglehold is tightened even more by the use of common IT standards and the interoperability of the business intelligence and analytics system of the line and the computer programs of the actors that have been engaged.

However, global end-to-end contracts oblige a line to transport the containerised cargo to its inland destination. Therefore it must be ensured: (i) that the providers of the inland services use the same IT standards as the providers of the deep-sea services; (ii) that the source code that lies at the heart of the business intelligence and analytics system the line uses for making its overall business decisions relates to both the activities concerning the deep-sea and the inland leg; and (iii) that the required rigorous harmonisation of the activities of the actors involved in the activities concerning both legs is guaranteed by the semantic interoperability of the computer programs of all actors involved with the business intelligence and analytics system of the line. If this cannot be guaranteed, a line will not be able to meet its contractual obligations, and the phenomenon of containerised liner shipping global end-to-end services will be dead in the water.

I therefore have no problem whatsoever in arguing that a line that enters into a global end-to-end contract with a customer must be in full control of the implementation of every leg of the contract, both deep-sea and inland. Therefore, I take the view that *the relevant product market* is the market of containerised liner shipping global end-to-end services.[43]

The definition of the relevant *geographic* market is based on the definition of the relevant *product* market.[44] The most important factor for assessment of the relevant geographic market is the customer's situation and the transport and distribution possibilities a line is able to offer.[45]

On the market of containerised liner shipping global end-to-end services, a customer orders transport of its containerised cargo from its loading location to the location where he takes possession, and this at a price that has been agreed up-front and at a timetable that predicts the ETA as accurately as possible. A line will only be able to meet these demands if it has full control over every stage of the transportation process and over the coordination of the activities of all actors involved,

[38] Case T-395/94 *Atlantic Container Line and Others v Commission* ECLI:EU:T:2002:49 (28 February 2002).

[39] V Flitsch 'Port cooperation between European Seaports: Fundamentals, Challenges and Good Practices' Frauenhofer Center for Maritime Logistics and Services CML (23 September 2016) para 2 www.guengl.eu.

[40] Demurrage is the charge assessed for cargo occupying terminal space.

[41] Detention is the charge to shippers and consignees for use of ocean containers and other equipment (eg the chassis).

[42] *Per diem* is the daily charge to drayage providers for use of ocean containers and equipment.

[43] See eg 'The impact of alliances on container shipping' (n 11) 89.

[44] Joined Cases T-191/98, T-212/98 to T-214/98 *Atlantic Container Line AB and Others v Commission* (n 34).

[45] Commission Notice on the definition of relevant market for the purpose of Community competition law (n 30) para 50.

both deep-sea and inland. This implies that a customer is not in a position to decide which undertaking a line should use for the implementation of a certain stage of the contract. Even if it could be argued that the services offered by the undertaking favoured by the customer were interchangeable with, or substitutable for the services offered by the actor engaged by the line, customer preferences, just by reason of the characteristics, price and intended use of these services cannot be put before those of a line, as the latter is ultimately responsible for the proper implementation of the contract.

Considering the above, I take the view that the geographic catchment area of global end-to-end services, ie the area in which these services are marketed, extends from the location where the containers are loaded to the location where they are unloaded for delivery to the customer. This implies that, in the geographic market of containerised liner shipping global end-to-end services, the EU-end of the market is not a range of ports either in Northern Europe or in the Mediterranean, but the inland terminal where the customer takes possession of the cargo.

The ECJ held that the relevant geographic market comprises all areas in which the conditions of competition are similar or sufficiently homogenous and more or less the same in regard to the services in question.[46] Whilst organising global end-to-end services, a line must decide on the type and number of carriers, the cargo mix[47] and the IT standards and business intelligence and analytics system to be used. These factors vary from one trade lane to another. Therefore, the relevant geographic market must be subdivided into eligible global trade lanes.

In identifying the eligible global trade lanes, the maritime trade lanes that have been identified by the World Shipping Council (WSC) may well serve as a benchmark. In all likelihood, these trade lanes will not be fundamentally altered by the extension of an inland leg.

According to the WSC and based on behaviour assessed in 2017, the top eight maritime trade lanes are:

1. Asia–North America: 26.57 million TEU shipped
2. Asia–Northern Europe: 15.06 million TEU shipped
3. Asia–Mediterranean: 7.91 million TEU shipped
4. Asia–Middle East: 4.74 million TEU shipped
5. Northern Europe–North America: 5.40 million TEU shipped
6. Asia–East Coast South America: 2.07 million TEU shipped
7. Northern Europe/Mediterranean–East Coast South America: 1.68 million TEU shipped
8. North America–East Coast South America: 1.27 million TEU shipped.[48]

Considering the above, I take the view that the *relevant geographic market* of containerised liner shipping global end-to-end services consists of the trade lanes used for end-to-end transportation of containers from the location where they are loaded to the inland location where they are unloaded and delivered to the customer and where the conditions of competition are similar or sufficiently homogenous and more or less the same in regard to the services in question.

The proposed definition of the relevant *product* and *geographic market* entails that, in assessing competition issues, no distinction can be made between the deep-sea and the inland leg of the services. Both services relate to one and the same relevant market. Therefore, assessment of competition issues must be made from the perspective of one and the same legal regime. This implies that the judgment of the General Court, making a distinction between the legal regimes that govern deep-sea and inland services, has become obsolete with regard to containerised liner shipping global end-to-end services.

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[46] Case 27/76 *United Brands Company and United Brands Continental BV v Commission* ECLI:EU:C:1978:22, paras 11 and 44.

[47] J Mulder and R Dekker 'Optimization in container liner shipping' (Econometric Institute Report Erasmus University 2016).

[48] Source: *Container News* (2 August 2019).

Apart from the product and the geographic dimension, the relevant market also has a *temporal* dimension. The temporal dimension is usually considered a factor in the relevant product dimension; not an independent dimension in itself.[49] Although the relevant temporal market is not mentioned in the EU Commission notice,[50] the ECJ discussed it in a few cases.[51] The question now is whether, in defining the relevant market of containerised liner shipping global end-to-end services, the temporal dimension should not only be considered a factor in the relevant product dimension, but also an independent dimension in itself.

I take the view that this question should be answered in the affirmative. The variety, volume and velocity of big data (the so-called three Vs),[52] and therefore of business intelligence and analytics systems, are extremely volatile and change rapidly.[53] In the market of containerised liner shipping global end-to-end services these changes may well affect demand and supply. Therefore, time and again this market must be defined in light of the three Vs in their then current capacities. As a consequence, in defining the relevant market for these services it is important to consider the temporal dimension as an independent dimension in itself. I feel encouraged in this view by the decision of the Commission relating to the *ABG Oil* case. In this decision, the Commission considered the time dimension of the oil market and defined it only at the time of the world oil crisis in the 1970s.[54]

Considering the above, the definition of the relevant market should be completed by an assessment of the interconnection between the services that are offered and the big data and business intelligence and analytics systems that are used for their implementation. In that way, the logistics areas can be identified where conditions of competition are sufficiently homogenous for a customer to regard the services that are offered as interchangeable or substitutable, all by reason of their characteristics, price and intended use. Only then will the basic prerequisites for assessing anti-competitive conduct on this market have been fulfilled.

In conclusion, I take the view that the relevant market of containerised liner shipping global end-to-end services is established by the *combination of the product* and the *geographic* and *temporal* market.

Common IT standards

Common IT standards that are signatory for the entire maritime industry can have significant pro-competitive benefits. They enable actors involved in the implementation of services to exchange data and interconnect services. Their main advantages are efficiency, cost reduction and the possibility of monitoring the entire logistics service chain. This is the reason why the DCSA expects a close collaboration between its members and the entire industry.[55]

Engagement

A line can only achieve proper implementation of a global end-to-end contract by obliging all actors involved to use the same IT standards *and* by ensuring the semantic interoperability of the business intelligence and analytics system it uses and the computer programs that are used by the actors it engages. The requirements that applicants have to meet must be identified in the phase where they solicit for implementation of a stage of the global contract. To that end, a document must be written that lists these requirements. This is the *solicitation document*.

[49] Alison Jones and Brenda Sufrin *EU Competition Law; Texts, Cases, and Materials* (5th edn Oxford University Press 2014) 331.
[50] Commission Notice on the definition of relevant market for the purpose of Community competition law (n 30).
[51] See eg Case 27/76 *United Brands Company and United Brands Continental BV v Commission* (n 46).
[52] See P Zikopoulos and others *Harness the Power of Big Data: The IBM Big Data Platform* (McGraw-Hill Professionals 2012) and J J Berman 'Introduction' in Jules Berman *Principles of Big Data* (Morgan Kaufman 2013) xix–xxvi.
[53] Study by the French and German antitrust authorities on competition law and Data 44. The study was published on 10 May 2016 (Franco/German Study) www.bundeskartellamt.de/SharedDocs/Publication/DE/Berichte/Big%20Data%20Paper.html?nn=3591568.
[54] Commission Decision 77/327/EEC of 19 April 1977 relating to a proceeding under Article 86 of the EEC Treaty (IV/28.841—*ABG/Oil companies operating in the Netherlands*) [1977] OJ L117 1 (May 1977).
[55] https://www.msc.com/uga/news/2019-may/five-new-members-join-the-digital-container-shipping-association-dcsa.

The requirements of the solicitation document must be written from the perspective of the object code that lies at the heart of the business intelligence and analytics system that governs the implementation of the global end-to-end contract. This code links the line/alliance, third-party carriers, ports and terminals, customs authorities, third-party logistics, inland transportation providers, shippers and other actors, all together. It is essential that the elements of the object code, which are referred to in the solicitation document, are human-readable; also, if these elements are confidential and – as the case may be – protected by IP rights. Only then will applicants be in a position to verify the way in which the line has taken account of the applicable anti-trust laws.[56]

Implementation

If cargo utilisation is to be improved, the customer, the line and the other actors need to share data, particularly data that is of a confidential nature and, as the case may be, protected by IP rights.[57] This data must be exchanged during the validity of the contract.

It is clear that the willingness to share this data is measured by the confidence that each and every actor disposes of the technological infrastructure that is required properly to implement the data and is not only prepared but also capable, financially and otherwise, of continuously updating this technology to meet the latest developments in big data and business intelligence and analytics systems.

Confidential data

More often than not, confidential data, particularly if protected by IP rights, constitutes an 'essential facility' for enabling an applicant to meet the requirements of the solicitation document. The ECJ held that an 'essential facility' exists if the data: (i) is indispensable for meeting the requirements of the solicitation document; (ii) prevents the emergence of a new service for which there is a potential customer demand; (iii) is not justified by objective considerations; and (iv) is likely to exclude competition in the secondary market.[58] In other words, data qualifies as an 'essential facility' if the applicant can demonstrate that it is truly unique, that there are no alternatives and that there are technical, legal or economic obstacles that make it impossible or unreasonably difficult to develop it, even in possible cooperation with other companies.[59,60]

Trust

The implementation of container liner shipping global end-to-end contracts is based on trust. The customer, the line and the actors that have been engaged must have full confidence that the data that was included in the solicitation document and the data that is being exchanged during the validity of the contract will only be used in regard to the implementation of the contract and not for other purposes, neither during the validity of the contract nor after its expiry. This holds particularly true if the data is confidential and – as the case may be – protected by IP rights.

Antitrust concerns

Managing the impact on competition brought about by the proposed definition of the relevant market and possible controversy between the way in which a line shapes the four other factors that determine the conditions of competition on this market on the one hand, and the guarantee of fair and undistorted competition and a level playing field for all stakeholders on the other, represents an unprecedented challenge to the EU Commission. The Commission must address this challenge in

[56] P Mendelts 'Case note: ECLI:NL:RVS:2017:1259 AB 2017/313' (2017) 36 *AB Rechtspraak Bestuursrecht* paras 14.3 and 14.4.
[57] Tirschwell (n 14).
[58] Case T-201/04 *Microsoft v Commission* ECLI:EU:T:2007:289 (29 April 2004); Case C-418/01 *IMS Health GmbH & Co OHG v NDC Health GmbH & Co KG* ECLI:EU:C:2004:257, para 37 (29 April 2004) and Case C-7/97 *Bronner* ECLI:EU:C:1998:569 (26 November 1998).
[59] Case C-7/97 *Bronner* (n 58) paras 44–45.
[60] Damien Gerardin and Monika Kuschewsky 'Competition and personal data: preliminary thoughts on a complex issue' (2013) http://pares.ssrn.com/sol3/papers.cfm?abstract id=2216088 15.

accordance with the principles of open and competitive markets that are firmly rooted in the TFEU. The question is whether the legal tools that are presently at its disposal are sufficiently adequate and effective to meet this challenge.

The relevant market

The proposed definition of the relevant geographic market implies an extension of the application of EU anti-trust law to areas outside the geographic scope of the EU. Conduct of entities that are neither nationals of an EU Member State nor physically or legally present in the Union may produce an effect in the EU market: 'That is the case, for example, of a number of provisions governing transactions in financial instruments or other types of economic conduct'.[61,62] EU anti-trust law catches such conduct if it has immediate, substantial and foreseeable effects in the EU market.[63] It is consistent case law that a restriction of competition between global container liner shipping companies may very well meet this criterion.[64] The *situs* of the anti-competitive conduct is irrelevant; it is the effect that must be accounted for.[65] This is the so-called qualified effects doctrine.

The litmus test for assessing whether containerised liner shipping global end-to-end services satisfy the qualified effects doctrine is whether they make it possible for lines and/or the actors that have been engaged 'to foresee with a sufficient degree of probability on the basis of a set of objective factors of law or fact, future developments that may have an influence, direct or indirect, actual or potential, on the pattern of trade between Member States',[66] thus forming 'a sufficient basis for the participating undertakings to concert their market conduct and thus substitute practical cooperation between them for competition and the risks that that entails'.[67] It must be assessed, therefore, whether the entire process, from the drafting of the solicitation document and the identification of the requirements through to the implementation of the global contract, distorts fair competition in a way that has an influence, direct or indirect, actual or potential, on the pattern of inter-state trade.

I take the view that the qualified effects doctrine catches containerised liner shipping global end-to-end services. The data that are being exchanged may very well enable the actors involved in the implementation of a stage of these services in a particular case to foresee with a sufficient degree of probability future developments that may have an influence, direct or indirect, actual or potential, on the pattern of trade between Member States. Therefore, apart from cases where one or more of the intermediate locations in the transportation process is situated in the Union, also cases that concern conduct of entities that are neither nationals of a EU Member State nor physically or legally present in the Union should be assessed on the possible direct, substantial, and reasonably foreseeable effect thereof on interstate trade, in the shape of either direct or non-direct import or export, that gives rise to an anti-trust claim.[68] This approach fits in well with the approach in the US, in which international cartels, even when they operate entirely abroad, fall within the scope of US anti-trust law as soon as the anti-competitive effects thereof harm US consumers.[69]

The definition of the relevant market as provided by the Commission Notice of 1997 has become obsolete, particularly in regard to the market of containerised liner shipping global end-to-end

[61] For an overview of those provisions and a critical assessment see J Scott 'The new EU "extraterritoriality"' (2014) 51 *Common Market Law Review* 1343.

[62] Case C-413/14 *Intel Corporation Inc v European Commission* ECLI:EU:C:2017:632; Opinion of A-G Wahl in Case C-413/14 *Intel Corporation Inc v European Commission* ECLI: EU:C:2016:788, para 298 (20 October 2016).

[63] Case T-102/96 *Gencor v Commission* EU:T:1999:65, para 243 (25 March 1999).

[64] Joined Cases T-24–26, 28/93 *Compagnie maritime belge and Others v Commission* ECLI: EU:T:1996:139, paras 202 and 203; Case T-395/94 *Atlantic Container Line and Others v Commission* (n 38) paras 72, 73 and 74; Case COMP/37.396/D2—*Revised TACA*, paras 73, 74 and 75.

[65] Joined Cases C-89/85, C-104/85, C-114/85, C-116/85, C-117/85 and C-125–129/85 *A Ahlström Osakeyhtiö and Others v Commission* (*Woodpulp*) (n 29); Case T-102/96 *Gencor v Commission* (n 63).

[66] Case 42/84 *Remia and Others v Commission* ECLI:EU:C:1985:327, para 22.

[67] Case C-8/08 *T-Mobile Netherlands* ECLI:EU:C:2009:343, para 59.

[68] Foreign Trade Antitrust Improvements Act (FTAIA) 15 USC para 6a.

[69] HR Rep No 97-686, 10 (1982), reprinted in 1982 USCCAN 2487, 2495.

contracts.[70] This notice should be amended by including a definition of the temporal market as an independent dimension, and by tailoring the definitions of the relevant product, the geographic market and the temporal market to the developments in the field of big data and business intelligence and analytics.

From the perspective of the proposed definition of the relevant market, the qualified effects doctrine should provide the Commission with an adequate and effective tool for acting against distortions of competition that originate from conduct outside the EU, even if such application of EU anti-trust law were to be in conflict with anti-trust laws of other jurisdictions.[71] However, the ECJ adopted the doctrine only on 6 September 2017, and the past has shown that the Commission is very parsimonious when it comes to relying upon this doctrine.[72] I am not overly optimistic about this attitude changing at short notice.

Common IT standards

Common IT standards lie at the heart of the semantic interoperability of the business intelligence and analytics system that a line/alliance uses for governing containerised liner shipping global end-to-end services and the computer programs of the actors that have been engaged for the implementation thereof. It is important to assess whether common industry-wide standards and the way in which they are deployed would raise anti-trust concerns.

Anti-trust concerns are among those that may emerge if common standards are developed and managed exclusively by lines. Other actors on the market of containerised liner shipping services can register – possibly even free of charge as is the case with the DCSA – for the purpose of receiving the data required for using the standards, but they will have no say in the further development of the underlying technology. This will increase their dependence, particularly if new standards have been developed in which valuable data and processes have been encoded that were used in standards that governed previous global end-to-end contracts. If the latter standards had defects and quirks and/or technical limitations, new forms of industry actors will be obliged to replicate them in order to maintain interoperability. As this pattern may reassert itself, the market will not be inclined to switch to alternative standards. Thus, lines may use common, industry-wide standards as a defence against the disruption of the current structure of the maritime industry by new forms of industry actors.

Anti-trust concerns may also emerge from the need for new forms of industry actors to have access to the technical data underlying the common, industry-wide standards in order to be able to research and develop new standards that by virtue of their characteristics, prices and intended use are interchangeable and substitutable. Particularly if common, industry-wide standards are protected by IP rights, lines may prevent access by demanding unreasonable royalties or exorbitant licensing terms. Such conduct is often called 'patent hold-up'.[73]

A patent hold-up may have severe anti-trust implications for new forms of industry actors. These implications will be fostered in a situation where common, industry-wide standards cover topics outside the legitimate standard-setting activity. This may well be the case. Containerised liner shipping services have far-reaching impacts on the whole maritime industry and its stakeholders.[74] Therefore, an exclusion of new forms of industry actors could easily extend to the entire industry. The anti-trust implications thereof may be severe, particularly if high-tech giants are involved.

[70] See A J Braakman 'Brexit and its consequences for containerised liner shipping services' (2017) 23 *Journal of International Maritime Law* 1.

[71] Guidelines on the application of the EC Treaty to maritime transports services [2008] OJ C245/2 (26 September 2008).

[72] See A J Braakman 'The anti-competitive effects of a globally concentrated, oligopolistic maritime market: from explicit to tacit collusion – an analysis based on the P3 network' (2013) 19 *Journal of International Maritime Law* 419.

[73] For a discussion on this problem in the US see Laura A Wilkinson and Brianne L Kucerik 'Standard-setting and antitrust' (2010) *The Practical Lawyer* 55.

[74] See the excellent Report of the International Transport Forum (ITF) entitled 'The Impact of Alliances in Container Shipping' (n 11).

Over the past few years the number of new forms of industry actors offering high-level technologies for optimising ship operations has increased dramatically. Companies such as Eniram Oy and ABB are pioneers in this field. In addition, sophisticated software produced by companies such as Laros and GreenStream have paved the way for the growing ship data market. Also, Ericsson has increased its focus on the shipping sector. It has collaborated with Cobham Satcom to enter the market and signed a strategic agreement with Inmarsat to promote data sharing in the maritime industry.[75] Last but not least, Amazon and Alibaba too demonstrate a huge interest in securing a piece of the cake. These companies are not just other pieces in the power game of lines and alliances; they are the most important and strongest voices within the high-tech world. Their interest comes as no surprise. According to a Drewry estimate, container shipping was a US$185 billion (revenue) business in 2018[76] and generates roughly 100–120 million data points every day from different sources, including ports and vessel movements.[77]

Last but not least, anti-trust concerns may emerge from the fact that common, industry-wide standards progressively increase the dependence of their users on one and the same ecosystem. The purchase of the required technology, retraining of IT personnel and company-wide implementation of the ecosystem will make it very difficult to switch to another system.

It has been argued above that the DCSA standards have or soon will have become signatory for the industry. The starting-point for assessing the anti-trust implications thereof must be the agreements underlying the development and deployment of these standards. These agreements are the result of exchanges of information between competing lines and consensus on the deployment of the standards that were agreed upon. Traditionally, this raises concerns regarding anti-competitive conduct, like unfair or deceptive conduct related to disclosure/licensing obligations, market allocation or conduct establishing appropriate levels of output of downstream services. These concerns gain considerable importance owing to the fact that the lines that develop and/or manage the DCSA standards share a vested interest in preventing high-tech giants from disrupting the current structure of the maritime industry.

It is particularly once the DCSA standards have become common and industry-wide that lines must carefully assess whether the way in which they are managed remains within lawful limits. However, this assessment should not be made only by lines in their capacity as the ones who are entitled to deploy the IP rights by entering into the source code licence agreements that lie at the heart of the global end-to-end services, but also by the actors they choose to engage. The reason is that the DCSA standards constitute an indissoluble part of these agreements. The scope of the cooperation between a line and the actors that have been engaged is one of the determining factors; perhaps the only one for assessing whether topics are being covered that lie outside the legitimate standard-setting activity. The outlines of this scope are drawn by the manner in which a line and the actors conjointly implement the global end-to-end services. The duty for each actor to include this competition issue in its self-assessment and compliance report cannot be offset, or even be alienated by the fact that it is the line that has developed and manages the DCSA standards and/or is entitled to deploy the IP rights.

For a start, in guaranteeing fair and undistorted competition, the Commission should take appropriate measures in order to ensure that the DCSA standards do not cover topics outside the area of legitimate standard-setting activity. Subsequently, within this area, possible patent hold-ups and dependence should be prevented from distorting fair competition and impeding technical innovation.

Considering the above anti-trust concerns, I take the view that the tools the Commission currently has at its disposal for taking such measures are not sufficiently adequate and effective for taking appropriate decisions. It is of utmost importance that the Commission provides clarity as soon

[75] Source: shipping-2030.com/shipandbunker.com/shippingwatch.com.

[76] Tirschwell (n 14).

[77] See arishipping.com/knect365.com/marinelink.com/knect365.com/worldmaritimenews.com.

as possible; not only to the stakeholders in the market of these services, but also to the entire maritime industry. In doing so, the Federal Maritime Commission (FMC) Information Resources Management Strategic Plan[78] could be used as a model. This comes with one caveat: policies that have been adopted under other jurisdictions must be treated with extreme caution. Each jurisdiction has its own objectives and must develop its own means to achieve them, particularly in anti-trust matters.

Engagement

Transparency is a prerequisite for achieving fair competition in the market of containerised liner shipping global end-to-end services. Applicants for the implementation of a stage of these services must be provided with sufficient details to determine if they are qualified to compete. They should be able, among other things, to determine the nature of the requirements, their scope and the evaluation and selection criteria. Most importantly, they should be able to assess the need for association with others and the type of association they would need to form, given their qualifications and the requirements of the solicitation document.

A solicitation document must be dependable and free of ambiguities and bias. Offers must be considered on the basis of their compliance with the stipulations of the document and should not be rejected for reasons other than those specifically stated. Applicants should have the right to challenge the outcome of the solicitation procedure whenever they feel they have been unfairly treated. Such challenges should be based on the solicitation document. Furthermore, the algorithms underlying the solicitation document should not be biased. Algorithm bias may occur, for example, by awarding an applicant marks for past and/or future services. This will give rise to anti-trust concerns, particularly if this component of the solicitation procedure has not been mentioned in the solicitation document.

A solicitation document will contain confidential data. This data must be prevented from being used outside the scope of the solicitation procedure, particularly if protected by IP rights. However, it must also be human-readable in order to enable an applicant to identify the requirements that must be met and to verify whether the solicitation document and the way it is applied is in conformity with the applicable anti-trust laws. To that end, the Commission should adopt a set of objective and transparent criteria that must be observed whilst going through the solicitation procedure. For as long as these criteria are lacking, the door to arbitrariness and unfair competition remains open.

Implementation

A line/alliance has complete control over the entire logistics chain of a global end-to-end contract. All actors involved in the implementation of the contract must use the same IT standards in order to effectuate the interoperability of the business intelligence and analytics system which the line uses and the computer programs of the various actors it engages. This implies that the same or similar algorithms must be used. Apart from promoting close cooperation, these algorithms could also be used to monitor and punish deviations from the prescribed course of conduct.[79]

The close cooperation between a line and the actors it has engaged, the need for sharing sensitive and confidential data and the collection and sharing of new, also potentially sensitive and confidential data during the implementation of a global end-to-end contract provides a line with an important database. Even if the data of other actors that have been engaged is confidential and possibly protected by IP rights, the line must be made privy to this data in order to secure a proper and smooth implementation of the contract. The ensuing database may well give it an important competitive advantage over other lines equipped with different data access.

[78] www.fmc.gov/FMC-IRMStrategicPlanFinal.pf.

[79] Franco/German Study (n 53) 13.

The competitive advantage that a line gains from the implementation of a global end-to-end contract and the ensuing database may be self-reinforcing: access to a larger and/or more sophisticated amount of data may support better services, in turn attracting more customers – and more data:

> As the gap in market share increases, so might the gap in data collection, which could further increase the gap in the quality of services proposed to the customer. Finally, the higher revenues earned by larger undertakings could fuel higher investments (such as new algorithms, new functionalities, entry on adjacent markets, etc) thereby attracting even more customers and more data. This trend could harm competition by converging towards a monopolization of data-related markets.[80]

It cannot be excluded that a line would decide to extend, for strategic rather than commercial reasons, the competitive advantage gained from its database by providing an actor it engages with confidential data that is not strictly necessary for this actor to be able to play its role with regard to a global end-to-end contract. This could result in distortion of competition, particularly if IP rights protect the data.

The related effect of the implementation of containerised liner shipping global end-to-end contracts may well be that, owing to differentiated data access, the market position of lines and stakeholders that cannot or do not wish to participate in these contracts will be put at a disadvantage and may even be marginalised. In order to prevent this from happening as a consequence of conduct that constitutes an infringement of EU anti-trust law, the Commission should provide guidance on the way in which fair and undistorted competition must be guaranteed in the implementation phase of these contracts.

Confidential data

In cases where there would be an obligation to grant access to data that constitutes an essential facility, the ECJ has held that the owner of the data must be fully compensated by being allowed to allocate an appropriate portion of the investment costs to the supply and to make an appropriate return on this investment, having regard to the risk level involved.[81]

The question now is whether this general rule would also apply with regard to an applicant who has successfully challenged the technical arguments underlying the rejection of its solicitation for a stage in the implementation of the global end-to-end services. The applicant will argue that acceptance implies that it must be treated in the same way as the others. The line will argue that, although its arguments for rejection have been overruled, they still offer sufficient justification for imposing conditions, financially or otherwise, that differ from those that other applicants have to meet.

Companies whose applications have been forced on lines to accept must weigh up carefully whether the conditions that must be met in order to gain access to essential facilities data would be proportional to the benefits of implementing a stage of the global end-to-end contract. Without proper guidance from the Commission this will be a tall order, particularly as these conditions may be substantial if IP rights protect the underlying data. As long as guidance is lacking, the door to arbitrariness and unfair competition remains open in this area as well.

Trust

The implementation of container liner shipping global end-to-end contracts is based on trust, as customers, lines and actors need to share confidential and IP-protected data if cargo utilisation is to be improved.[82] Here, too the question concerns the possible arguments for rejection of an applicant's

[80] ibid.

[81] See the excellent opinion of A-G Jacobs in Case C-7/97 *Bronner* ECLI:EU:C:1998:264 pt 39. See also Case 53/87 *CICRA and Others v Renault* ECLI:EU:C:1988:472.

[82] See Moore (n 17).

solicitation. A line will argue that the required data that is of a confidential nature – particularly if protected by IP rights – is in itself enough for excluding an applicant in whom it has no confidence. An applicant will argue that a refusal of access qualifies as dissimilar treatment of actors who offer equivalent services, and that such discrimination entails competitive disadvantages for it. The Commission and the ECJ held that disputes like these must be assessed in light of the general clause of Article 101(1) of the TFEU.[83]

The litmus test is whether, in the case in question, the lack of confidence can be substantiated by the existence of substantial objective differences between the applicant who requires access to data, and applicants who have been granted this access. A refusal of access should contain plausible evidence that an obligation would actually serve to bring about an invasion of confidentiality, which would not only prevent the line from recouping the investments it made, but also encourage it to refrain from further research and innovation. It is extremely important to get the balance right. Even the slightest imbalance would pave the way for unwarranted economic loss. For a line, this loss would imply not being able to recoup its investments and chilling further research and innovation. For an applicant, it would imply being prevented from doing business owing to subjective and perhaps irrational arguments.

The Commission should provide guidance in this respect, particularly as the various aspects of the dispute have to be assessed on a case-by-case basis. Special attention should be paid to the question of whether discrimination in providing access to data that constitutes an essential facility should be treated as a separate violation originating from a refusal to access. Refusal of access presupposes that the line has a dominant position on the relevant market, so that it must be assessed under Article 102 of the TFEU. Discrimination may or may not emanate from a dominant position. In case it does, it must be treated on the basis of Article 102. As yet, EU case law does not provide clear points of reference for solving the question as to whether Article 101(1)(d) of the TFEU applies in the absence of a dominant position.[84]

I take the view that discrimination should be treated on the basis of Article 101(1)(d) of the TFEU in case it cannot be established that the line has a dominant position on the relevant market of containerised liner shipping global end-to-end services. The ever-increasing frequency and importance of these services and thereby of the volume of ensuing databases entail that discrimination cannot be made conditional upon the question of whether a line has a dominant position on the relevant market. In the interest of transparency and consistent application of the law, the Commission should adopt guidelines on how this issue should be dealt with from an anti-trust point of view. Again, for as long as guidance is lacking, arbitrariness and unfair competition loom larger every day.

The consortia block exemption regulation

The consortia block exemption regulation expires on 25 April 2020. The Commission is carrying out consultations with all stakeholders concerned in order to determine whether it should be prolonged and, if so, on what terms. In the general introduction I indicated that, in my opinion, the consortia block exemption regulation should be repealed or substantively modified in light of the current and anticipated state-of-the-art business intelligence and analytics features and the surrounding big data. This opinion may be underpinned by the following arguments.

The consortia block exemption regulation provides for an exemption from the cartel prohibition for agreements and/or arrangements that restrict freedom but which have the sole effect of promoting competition. Within the present context, the main exemptions relate to the following activities:

[83] See Commission Decisions *ASPA* [1970] OJ L148, 9, 10; *Papier peints de Belgique* [1974] OJ L237, 3, confirmed by Case 73/74 *Papier peints v Commission* ECLI:EU:C:1975:160.

[84] The Franco/German Study (n 53) only cites the case of Cegedim, which concerned a dominant position.

1. the joint operation of liner shipping services, including:
   (a) the coordination and/or joint fixing of sailing timetables and the determination of ports of call
   (b) the exchange, sale or cross-chartering of space or slots on vessels
   (c) the pooling of vessels and/or port installations;

and

4. any other activity ancillary to those referred to above which is necessary for their implementation, such as:
   (a) the use of a computerised data exchange system.

The consortia block exemption regulation contains a per se prohibition for 'hard core' restrictions of competition. These restrictions include activities, which, directly or indirectly, in isolation or in combination with other factors under the control of the parties, have as their object:

- the fixing of prices when selling liner shipping services to third parties
- the limitation of capacity or sale, except for capacity adjustments in response to fluctuations in supply and demand
- the allocation of markets or customers.

Application of Article 101(1) of the TFEU presupposes that the prevention, restriction or distortion of competition is an 'object or effect'.

The 'hard core' prohibition of the fixing of prices when selling liner shipping services to third parties laid down in the consortia block exemption regulation only refers to arrangements that have this as their *object*. Pursuant to the established case law of the ECJ, the circumstances surrounding its attainment may also be used in interpreting the wording of arrangements for those areas, which are unclear.[85] As a result, not only the fixing of prices but also price recommendations and tariff impositions by any per person on transport users fall within the scope of the 'hard core' prohibition of the consortia block exemption regulation, provided they have a similar anti-competitive impact.[86]

Arrangements that do not have a restriction on competition as their *object* may also be caught by the prohibition on cartels because they have it as their *effect.* This effect does not need to have actually occurred. It is sufficient for it to appear to be likely to occur in the near future.[87] This second alternative for application of the prohibition therefore permits the Commission to intervene to prevent distortions of competition at an early stage.

The competition-limiting effect of an arrangement may be the result of it alone or of the interaction between it and the accompanying economic circumstances.[88] Special importance may, in particular, be attached to the fact that an agreement is part of a network of similar agreements that the party has also completed with other undertakings and the fact that the market contains other networks of agreements which have been built up by other undertakings.[89]

In view of the above, it should be assessed whether the prohibition of Article 101(1) of the TFEU catches the competition-limiting effects of the above-mentioned activities that are exempted from the cartel prohibition in combination with the computerised data exchange system that is being used. This assessment should focus on whether the prohibition of Article 101(1) of the TFEU applies or is likely to apply in the near future, once business intelligence and analytics systems with their current state-of-the-art features have been incorporated into existing agreements/ arrangements that benefit

[85] See Case 56/65 *Société Technique Minière v Maschinenbau Ulm GmbH* ECLI:EU:C:1966:38.

[86] lawinsider.com.

[87] See Joined Cases 142 and 156/84 *BAT and Reynolds v Commission* ECLI:EU:C:1987:49.

[88] See eg Case C-234/89 *Delimitis v Henninger Bräu* ECLI:EU:C:1991:91; Joined Cases 40–48/73, 50/73, 54–56/73, 111/73, 113/73 and 114/73 *Suiker Unie and Others v Commission* (n 29); Case T-7/93 *Langnese Iglo GmbH v Commission of the European Communities* ECLI:EU:T:1995:98; and Case T-9/93 *Schöller Lebensmittel GmbH & Co KG v Commission of the European Communities* ECLI:EU:T:1995:99.

[89] See Case 23/67 *Brassserie de Haecht* ECLI:EU:C:1967:54; Case 47/76 *De Norre v Brouwerij Concordia* ECLI:EU:C:1977:11.

from the exemption under the consortia block exemption regulation. This assessment should include possible anti-competitive effects of the semantic interoperability of these systems with the computer programs of other actors that have been engaged for the implementation of the agreements and/or arrangements.

Lines take the view that alliances are full-blooded vessel-sharing agreements and that participation will not affect mutual competition.[90] In general terms, the use of big data and business intelligence and analytics systems with their current state-of-the-art features makes this position no longer tenable. The basic rationale for alliances is the facilitation of low rates and broad service coverage.[91] The deployment of data that is permitted to be exchanged under the consortia block exemption regulation gives a line the possibility of attaining these objectives in a way that seriously threatens fair and undistorted competition if the exchange takes place within the context of a business intelligence and analytics system with current state-of-the-art features which is semantically interoperable with the computer programs used by the parties that have been engaged for the implementation of its services. I have the following arguments.

All lines that participate in one of the three mega-alliances – 2M, Ocean Alliance and the Alliance – also participate in one or more of the vast number of conference and discussion agreements that exist worldwide. These agreements serve as vehicles for exchanging strategically sensitive data. They are exempt from the application of anti-trust laws in the United States and some Asian countries, including Singapore, although they were never exempt from application in the EU.[92] In light of the global coverage of global end-to-end services, there can be no doubt that the data exchanged between members of an alliance on the key parameters of the rates for the non-EU leg of the route provides an important indicator, indeed, if not the basis for the pricing policy adopted for the global services inclusive of the EU leg of the route. Business intelligence and analytics systems with their current state-of-the-art features offer a major improvement for analysing this data. As a result, the deployment of these systems may seriously aggravate the anti-competitive effects of the data exchanged.

These anti-competitive effects are particularly apparent if the exchange of data takes place within the context of services that are being implemented by a line together with other actors and the business intelligence and analytics system used by the line has been made semantically interoperable with the computer programs of the latter. It has been argued in this article that proper and smooth implementation of the services requires a line to be privy to data of actors it engages for their implementation, even if this data is confidential and possibly protected by IP rights.[93] In that case, the anti-competitive effects of the data exchange will be multiplied disproportionately.

The deployment of business intelligence and analytics systems with their current state-of-the-art features on the idiosyncratic market of containerised liner shipping services[94] may well result in pushing exchanges of information that conform to the exemption conditions of the consortia block exemption regulation in its current version into the area of hard core restrictions. This may be illustrated by the following, hypothetical example. Suppose that an alliance, either directly or indirectly through one of the participating lines, acquires exclusive rights on a new business intelligence and analytics product protected by IP rights. This product substantially improves the joint coordination of sailing timetables within the alliance and thereby the determination of ports-of-call. As such, these activities fall within the exemption of the consortia block exemption regulation. However, the alliance offers the new product to third parties as part of its liner shipping services at

[90] See registration of the 2M alliance with the Chinese Ministry of Transport under the 'Bei-An' or 'filing for the record' procedure.

[91] 'The impact of alliances in container shipping' (n 11) 11.

[92] See Competition issues in liner shipping: Note by the Secretariat. Document DAF/COMP/WP(2015)3. Organisation for Economic Cooperation and Development, Paris, 10 June 2015. Available at: http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=DAF/COMP/WP2(2015)3&docLanguage=En.

[93] See p. 20 under tools.

[94] 'The impact of alliances in container shipping' (n 11) 88.

a price that was fixed by the parties to the alliance who conjointly own the product in mutual consultation. In doing so, the alliance and the participating lines violate the hard-core restriction of Article 4(1) of the consortia block exemption regulation. Furthermore, if other lines or alliances cannot come up with a timely response by introducing a product that 'leapfrogs' the new business intelligence and analytics product, this may cause shippers disproportionally to opt for the services offered by the alliance that disposes of this latter product. As a result, other lines and alliances will lose their competitiveness for the duration of the validity of this new product's IP rights. This will give the alliance that disposes of the new product entrenched market power,[95] which, in turn, may well encourage it to raise the price of its services, arguing that it has the right to do so in order to recoup the investment that had to be made.

In this hypothetical situation, the new business intelligence and analytics product transforms the coordination of sailing timetables within the alliance disposing of this product into conduct that has immediate, substantial and foreseeable anti-competitive effects on the EU market. Such conduct falls within the prohibition of Article 101(1) read together with Article 4(1) of the current consortia block exemption regulation and/or Article 102 of the TFEU, at least during the validity of the IP rights.

It has been argued above that an effective and smooth implementation of a global end-to-end contract requires a line or alliance to be made privy to confidential data – possibly protected by IP rights – owned by actors that have been engaged for their implementation. Thus, within the framework of these contracts the free pass for exchanges of information as provided by the current consortia block exemption regulation extends to data that has been developed and protected by actors whose activities relate to sections of the shipping industry where market and competitive conditions fundamentally differ from those that lines are confronted with in the context of their core business. The inclusion of this data in a new business intelligence and analytics product that substantially improves the coordination of sailing timetables will further reinforce the market position of the alliance that disposes of this product and, as such, the ensuing anti-competitive issues.

Repeal or substantive modification of the consortia block exemption regulation prevents lines from relying on alliances and thereby on sector-specific exemptions of the cartel prohibition that are outdated and obsolete. This implies that, in making its self-assessment and compliance report, each party to an alliance must take account of data being exchanged on all the issues covered by their agreement, and the possible effects of these exchanges on fair and undistorted competition on EU markets. This holds particularly true in cases where exchanges of information take place via business intelligence and analytics products that cover an entire global trade lane. These 'new style' self-assessments will put the Commission in a far better position to monitor infringements of EU anti-trust law properly.

Self-assessments from the perspective of the global market in which lines operate should also relate to data on issues that are allowed under some jurisdictions, but prohibited under EU anti-trust law. Thus, the possibilities for the Commission to monitor distortions of competition from the perspective of the extra-territorial application of EU anti-trust law and the qualified effects doctrine would be improved. This could facilitate other actors in the maritime transport in their attempts to challenge agreements implying undesirable market effects.[96]

I take the view that the uncertainty as to the correct assessment of anti-competitive conduct emanating from the use of big data and business intelligence and analytics systems in the maritime shipping industry, the absence of adequate and effective tools for the Commission to address such conduct and the technical possibilities of insulating the related competition issues from an in-depth examination in accordance with the basic principles of EU anti-trust law cause a high degree of

[95] This example is based on the decision of the Commission of 4 September 2012 in Case COMP/M.6314—*Telefonica, Vodafone and Everything Everywhere* (JV).

[96] 'The impact of alliances in container shipping' (n 11) 88.

imperfect competition. The Commission should take appropriate measures, consisting of the repeal or a substantive modification of the consortia block exemption regulation in light of big data and business intelligence and analytics systems, with their current and anticipated state-of-the-art features.[97] In doing so, account should be taken not only of arrangements that have a restriction of competition as their object but also of those that have this as their effect, and not only of effects that have actually occurred but also of those that are likely to occur in the near future.[98] This implies that account must also be taken of business intelligence and analytics features, which as yet are not current but which are anticipated.

In drafting these measures, the Commission should not draw too heavily on the Horizontal Guidelines. As Federal Trade Commissioner Thomas Rosch has pointed out, the Horizontal Guidelines 'cut too broad a swathe', in that they are so detailed that neither the Guidelines nor consumers may be able to realise the pro-competitive effects of information exchanges.[99] Particularly in view of the variety, volume and velocity of big data and business intelligence and analytics systems the Horizontal Guidelines seem to obscure the demarcation between what is and what is not allowed in this area.

Conclusion

Big data and business intelligence and analytics systems are here to stay. The ways in which lines deploy the trinity they have created (or are about to create by using these phenomena) may pose a serious threat to fair and undistorted competition and a level playing field for all stakeholders on the market of containerised liner shipping global end-to-end services. However, this threat will not remain solely limited to that market. Lines will try and recoup the investments that have been made and are still to be made by applying the acquired knowledge and experience to all areas of the services they offer.

Lines – and the actors who are being engaged for the implementation of a stage of their services – should be aware of this threat. In particular, the possible coercion of these actors to join TradeLens weighs heavily on the legitimacy of both TradeLens and the DCSA. In case these associations or their performance, individually and/or conjointly, would not fully comply with EU anti-trust law, not only the lines but also the actors may find themselves being complicit in an infringement of that law with all the bad financial consequences that would follow.

The tools the Commission possesses for measuring, evaluating and neutralising the anti-competitive effects of big data and business intelligence and analytics systems have been formulated in an era when these phenomena were still a vision for the future. Therefore, the current tools are unfit to do the job. However, the ensuing legal vacuum does not absolve undertakings from the obligation to assess whether the agreements and/or arrangements to which they are party, directly or indirectly, in isolation or in combination with other factors under their control, have as their object or effect distortions of competition in one or more of the areas where such distortions must be assessed, ie in the areas of the relevant market, common IT standards, engagement, implementation, confidential data and trust. In each of these areas the impact of big data and the ensuing business intelligence and analytics systems on the competitive environment of containerised liner shipping services must be accounted for, not only in light of their current but also of their anticipated state-of-the-art features. The assessment should be made in light of a comparison with the competitive position that would have existed in the absence of the (anticipated) technology.[100]

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[97] See Braakman 'Consortia BERexit?' (n 12).

[98] See n 87.

[99] J Thomas Rosch 'Antitrust issues related to benchmarking on other information exchanges' ABA Section of Antitrust Law and ABA Center for continuing Legal education's Teleseminar on Benchmarking and Other Information Exchanges Among Competitors (3 May 2011) 14.

[100] See Case 56/65 *Société Technique Minière v Maschinenbau Ulm GmbH* (n 85); Case 22/71 *Béguelin Imports v GL Import Export SA* (n 5); Case 42/84 *Remia and Others v Commission* (n 66).

Big data and the ensuing business intelligence and analytics systems have created a complex legal border area. It seems doubtful whether the possible revision of the consortia block exemption (block exemption regulation), which expires on 25 April 2020, will provide a solution. The consultations that are being conducted do not pertain to amendments that are sufficiently far-reaching to that effect. Brexit, and particularly a no-deal Brexit, is likely to exacerbate this unfortunate state of affairs even further.

Continuance of the present situation is unacceptable. The variety, volume and velocity of big data and business intelligence and analytics systems is so swift and drastic that infringements of competition may well turn out to be not only irreversible but also unpunishable. It is essential that the EU Commission take action soon by creating tools that are sufficiently adequate and effective for measuring, evaluating and neutralising the ensuing effects on freedom of competition. Competition authorities in other parts of the world should follow suit. Idleness might turn big data and business intelligence and analytics systems into a curse rather than a blessing for the maritime industry.