Scientific Journals
of the Maritime University of Szczecin

Zeszyty Naukowe
Akademii Morskiej w Szczecinie

2019, 58 (130), 105–112
ISSN 1733-8670 (Printed)
ISSN 2392-0378 (Online)
DOI: 10.17402/342

Received: 07.05.2019
Accepted: 18.06.2019
Published: 25.06.2019

The evolution of the ship owner profile in global container shipping

Aneta Oniszczuk-Jastrząbek[1], Ernest Czermański[2]

University of Gdańsk Faculty of Economics, Institute of Maritime Transport and Seaborne Trade
119/121 Armii Krajowej St., 81-824 Sopot, Poland
e-mail: [1]ekoao@ug.edu.pl; [2]e.czermanski@gmail.com
corresponding author

Key words: cooperation, alliances, container shipping, capital concentration, evolution, ship owner

Abstract
Globalization poses new challenges, while also providing development opportunities for strong and dynamic enterprises and new sectors which shape the world markets and economy and contribute to a more global approach to business activities. The business activities undertaken in each country depend on a number of factors, and these factors are often similar due to globalization, though their impacts appear to vary. In addition, changes in economies progress at different speeds, thus this article aims to determine how the impact of change in the global economy influences transformations in ownership in container shipping. The organization and operation of global container shipping is shaped by numerous external factors, i.e. economic, geographical, and political factors. The impact of these factors varies depending on the specific aspect of the container shipping industry being discussed. This paper was motivated by the need to determine the container fleet size and ownership structure in container shipping, and whether these are changing as the industry evolves. The stated aim of this research requires the use of statistical methods and a literature review to allow for a comparative study of the size and ownership relations in container shipping.

Introduction

In container shipping, globalization has brought about the rise of a new competitive model, which includes global competition. Economic and political liberalization, modern technology, capital concentration, transnational corporations (TNCs), and global markets are major factors impacting the container shipping market by modifying the competitive models that operators use. In that sense, the term 'global competition' adequately captures the market situation that has emerged in the international economy over the last ten to fifteen years. In the shipping sector, competition means not only a rivalry for cargo transports (and possibly other associated services) all over the world, but also a struggle against other global enterprises.

The network of compatible links between commercial partners and freight carriers, whose emergence followed rapid advances in technology, especially in computer science, has allowed individual businesses to become connected by a single worldwide network. The IT sector never ceases to offer increasingly sophisticated and refined operating systems to closely cooperating business groups and international consortia with offices abroad. In a word, computer science provides businesses with tools that allow them to bypass traditional communication channels to interact with potential clients. This has facilitated more tight-knit and considerably more dynamic cooperation. Instant connectivity shortens order placement and billing processes, while also reducing the time needed to manufacture and ship goods. These possibilities and developments allow shippers and operators to connect through a network to plan supply and demand as well as organize logistics.

The polarization of revenues and positions is a development that has arisen from economic

liberalization and global competition. As container shipping enterprises consolidate their financial and organizational clout, they assert their dominance over other businesses. This phenomenon is known as position polarization whereby major operators grow in strength through mergers, alliances, and other related measures to the detriment of medium to small businesses that are gradually absorbed or displaced from the market. The only way for the smaller companies to continue on a viable path is to find a market niche, such as feeder or specialized shipping.

The nature and scope of cooperation between enterprises

Partnerships have emerged in response to the business environment and other factors that determine the manner in which contemporary enterprises operate, such as economies of scale, specialist skills, and risk limitations. A partnership is a special type of business activity that covers the following areas of cooperation (Bembenek, 2006):

- start-up and efficient pursuit of business activities under conditions of collaboration, competition, and risk;
- responding to changing realities through creative, innovative, and flexible problem-solving techniques;
- perceiving, seeking, and exploiting market opportunities;
- comprehensive decision-making and action throughout the cooperation period;
- efficiency-boosting mechanisms;
- driving innovation in various areas of the enterprise's activities.

Partnerships are becoming a necessity in the face of mounting competition and changing market realities. Enterprises are joining forces with other entities that have complementary expertise and resources to obtain a more competitive edge. This also helps forge economic relations with other market players based on trust, profit-sharing, and synergy for superior competitive advantages (Seemann et al., 2000; Witkowski, 2003). Enterprises are cooperating among each other and with external entities at the regional, national, and international levels. However, this does not mean that cooperation precludes rivalry; on the contrary, it helps develop better solutions to bolster one's market position. Cooperation has an enlivening effect, while also improving competitive ability, and enterprises have various goals and expectations related to cooperation with outside entities (Popławski, Sudolska & Zastempowski, 2008). Cooperative relations enable newly formed enterprises to gain new expertise, conserve resources, share risk, expand more rapidly into new markets, and develop attractive investment strategies. The cornerstone of every alliance is social capital, which makes strategic success more likely, and partners trust each other and readily share resources. Added value in an alliance flows from a number of sources: economies of scale, efficient risk management, and mutual learning. Alliances also help reduce transaction costs, handle uncertainty, lessen dependence on resources beyond the allies' control, and adjust to dynamic markets (Ireland, Hitt & Vaidyanath, 2002; Grant & Baden-Fuller, 2004).

Clusters are socioeconomic units that combine people and enterprises of various profiles in close proximity which cooperate to market and deliver a product or service. As such, they are a fertile ground for cooperation (Morosini, 2004). A cluster is a type of community of specialized suppliers, service providers, and related institutions (e.g., universities, trade agencies, and associations) competing against and cooperating with each other. A cluster is a type of network in which the enterprises and institutions in close geographical proximity are bound into a community with more frequent and stronger interactions (Martin & Sunley, 2005). Clusters help improve regional competitiveness and build organizational quality, internal innovation, and growth dynamics thanks to a concentrated business presence. The cooperation can be bilateral or multilateral, and oriented either vertically (between suppliers and customers) or horizontally (between other enterprises) (Cappellin, 2004; Szymoniuk, 2008).

Another form of business-to-business cooperation is represented by strategic alliances whereby two or more enterprises, which are each other's actual or potential rivals, enter into a joint venture or undertake a specific type of activity to accomplish a common goal. An alliance can be a last resort in a time of economic downturn. They often form because they improve competitiveness by pooling resources, finances, and capabilities (Todeva & Knoke, 2005; Sznajder, 2009), while also facilitating access to a market, helping achieve economies of scale, and enhancing competence (Muthusamy & White, 2005).

Alliances and their impact on container shipping

The shipping market has seen dynamic evolution in the last twenty years. In response to the pressures

of globalization and in an effort to streamline their operations, shipping companies frequently outsource part of their business to separate entities that act as owners of vessels dedicated to operating activities. These entities are responsible for maintenance, travel planning, and recruitment. The specialization process in shipping, particularly in container shipping, has led to the emergence of highly specialized entities catering to increasingly narrow sections of the supply chain, or those dedicated solely to a single activity within the whole process. As a result, companies have appeared which specialize in bunkering, crewing, chartering, IT services, and vessel handling at port. This marks a shift away from activities related strictly to ship ownership and towards a more transport-oriented profile. Another outsourcing trend in shipping is represented by long-term business-to-business chartering (Seaspan, 2019), which has been increasingly in demand since the downfall of Hanjin Shipping in 2016 left a large fleet unoccupied. The only way to render the idle vessels serviceable again was to charter them to other companies, which gave the appearance of a market player that owned 100 vessels whilst not being engaged in the ship-owning trade. It seems that as time goes on, shipping companies will act as line operators rather than ship owners *per se*. Despite this, in business practice, entities providing deliveries by sea based on their own bills of lading are labelled as 'ship owners' regardless of their organizational or shareholding structure.

The world's container fleet is variously estimated to number from 5200 to 5300 vessels, depending on the classification criteria. According to Alphaliner, the container fleet as of 01 December 2018 consisted of 5293 vessels with 22.7 million TEU combined capacity (AXS Marine, 2019). This figure differs slightly from Maritime HIS data, and ISL of Bremen sets the fleet's size at 5606 vessels (ISL Bremen 1993–2018). For the purpose of the present study, it is sufficient to say that the hundred largest operators by fleet size have a TEU combined capacity of 22.3 million, represented by 5201 vessels, which accounts for 93% of the world's container fleet. In terms of capacity, the largest ten operators were responsible for almost 90% of the world's fleet, corresponding to 18.3 million TEU (Alphaliner, 2019).

There has been a noticeable increase in demand in the container shipping sector for many years, and this trend has recently increased in strength, and the largest ten ship owners have doubled their market shares compared with eight years ago. This market concentration, which has developed since the late 20th century, follows from the need to reduce per-unit costs of producing transport labor per 1 TEU (Ducret & Notteboom, 2012). The competitive pressure applied by the market is reflected by freight rates, which are determined by market forces as a matter of course. Line-operating costs to the ship owner are a potential area in which to build a competitive edge by increasing the packing capacity of ships. This calls for capacity consolidation, leading to market concentration on the service provider side, which is done mainly through mergers and takeovers. For example, APL was purchased by CMA-CGM (Knowler, 2016) in 2015, and joint-venture companies were formed in 2018 by NYK, MOL, and K-Line (Hecksher, 2018)).

Container ship operators may also enter into strategic alliances, which is a form of cooperation between shipping companies to create a common network of line connections. These connections are run by ship owners under a vessel sharing agreement (VSA), meaning that some part of a ship's cargo capacity is occupied by allied cargo. Each ally pursues its own tariff and cargo sourcing policy. This mode of cooperation comes in response to the proposed EU ban on shipping confederacies. The figures confirm market concentration: over the last ten years, the market share ratio of the largest ten to the largest hundred companies increased by 20%, which equals 15 % capacity-wise (Alphaliner, 2019).

Takeovers were frequent in the first phase (2000–2010), and the largest transactions included P&O and Nedloyd, which were taken over by Maersk Line, and Choyang by Hanjin Shipping. The 2000–2010 period marked a time of stability for ship owners. Three main alliances asserted their dominance on the market: Grand Alliance, CKYH, and New World Alliance. There were also many unattached ship owners, and the largest among them was Maersk Line until 2015. The following decade brought dynamic changes in the alliances, with an increasing number of mergers and takeovers. In 2015, following a failed attempt to form what was to be P3, the world's largest mega-alliance, the largest two operators at the time (MSC and Maersk) came together to form 2M. Further developments suggest that this gave rise to a coalition of alliances (Grand and New World Alliance) known as the G6 Alliance, and the 2016 collapse of Hanjin Shipping re-shuffled the market into the present-day system of alliances (SupplyChain247, 2017).

Since alliances are a global form of cooperation, they should be considered in any market concentration study. The market is currently dominated by

three alliances: 2M, Ocean Alliance, and The Alliance, and their share of the global market in terms of controlled capacity ranges from 17% to 30%. The largest alliance – 2M – is composed of the two largest ship owners – Maersk Line and MSC – as well as Hamburg Süd, a member of the Maersk group since 2017. The alliance operates 1300 ships with a combined capacity of 8.0 million TEU, while the second-largest alliance operates a fleet half that size. Ocean Alliance consists of COSCO Group, CMA-CGM, and Evergreen. The third alliance – the Alliance – with its umbrella covering Hapag-Lloyd, Yang Ming, and ONE Joint Venture – operates 550 vessels with combined capacity of 3.8 million TEU (Table 1).

The analysis of the container shippers market should now be extended to classify enterprises by their geographical reach. There are global operators and operators only focusing on regional markets or active within the geographical boundaries of a specific water body. Enterprises with a global dimension are not limited to a specific local market, but rather operate across a few or all component markets. In some cases, global ship owners use various trademarks, a case in point being Seago Line, an off-shoot of Intra-Europe shipping (Maersk group) (Alphaliner, 2019).

A look at the largest hundred operators in terms of fleet-size, classified by market, shows that corporations with a global reach definitely control the world's container shipping market. Among the top 100 enterprises, an 88% portion of the market is held by only 14 companies in terms of capacity and 62% in terms of fleet size. This occurs because global operators have ULCV-type vessels to service routes connecting Asia and Europe. However, it is important to point out that this trading route is not the sole or main market for any of the 100 largest ship-owning companies (Alphaliner, 2019).

A second group incorporates entities operating on the highly fragmented Intra-Asian market. Excluding global operators, the TOP100 group features 55 enterprises providing shipping services exclusively along the Intra-Asian route. Even though the Intra-Asian market accounts for only 8% of cargo transports, it engages close to 1/3 of the world's entire container fleet. The dense distribution of regionally important ports and the continent's geographical structure (numerous islands and peninsulas) favors the use of small vessels. In addition, many operators in that market specialize only in high-frequency tramp services. Operators focusing on other market components represent merely a fraction of the shipping market, accounting for less than 1% of the

Table 1. Fleet specifications for the largest ten ship owners in container shipping in the years 2007, 2010, 2015, and 2018 (the authors' own work based on Alphaliner data (Alphaliner, 2019))

Operator	2007			2010			2015			2018		
	Position	TEU	Vessel count	Position	TEU	Vessel count	Position	TEU	Vessel count	Position	TEU	Vessel count
APM-Maersk	1	1 852 058	525	1	2 056 742	542	1	2 986 049	580	1	4 048 308	708
Mediterranean Shg Co	2	1 155 450	356	2	1 496 139	388	2	2 681 981	488	2	3 319 884	524
COSCO Container L.	7	421 970	140	7	453 876	135	6	852 501	162	3	2 782 328	467
CMA CGM Group	3	843 784	356	3	1 032 087	355	3	1 816 974	463	4	2 705 430	520
Hapag-Lloyd	5	485 538	141	6	471 779	113	4	935 907	172	5	1 638 015	227
ONE (Ocean Network Express)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	6	1 516 788	217
Evergreen Line	4	606 410	173	4	556 289	149	5	931 849	192	7	1 175 412	201
Yang Ming Marine Transport Corp.	15	258 073	78	15	312 962	77	12	537 712	100	8	636 228	98
PIL (Pacific Int. Line)	19	161 281	106	20	195 695	111	18	364 531	147	9	425 670	133
Hyundai M.M.	18	191 018	45	18	274 529	53	17	381 566	56	10	414 468	70
CSCL	6	444 680	140	8	450 337	124	7	695 866	129	N/A	Merged with Cosco	N/A
OOCL	11	337 864	79	13	340 439	73	10	561 522	104	N/A	Merged with Cosco	N/A
NYK	9	361 692	124	10	409 137	107	15	495 723	99	N/A	Joint-venture ONE	N/A
Hanjin / Senator	10	341 409	81	9	433 464	97	9	627 657	103	N/A	Bankruptcy	N/A
Hamburg Süd Group	17	230 558	91	16	309 570	103	8	645 889	134	N/A	Purchased by Maersk Line	N/A
APL	8	374 028	117	5	544 764	138	13	534 090	84	N/A	Purchased by CMA CGM	N/A

world's cargo capacity and around 1.5% of its fleet size.

Methodology

The research presented in this paper is based on statistical methods and elements of decision-making theory. The distribution of variables was obtained by the following methods: arithmetic mean of central tendency, standard deviation of dispersion, and the skewness coefficient of asymmetry distribution. The statistical measures used in this paper are common enough to skip any detailed explanation of research methodology applied here. This section exclusively includes statistical data analysis carried out for the global container fleet to determine technical parameters (linear, volumetric, and weight) to be adopted for container ships in the later sections of this work.

A survey of fleet size and ownership structure

The purpose of this section is to evaluate the potential in container shipping. The research examined 5293 database records stating vessel type, total length, draught, lateral height, main engine total output, power generator output, cargo capacity, fuel type and consumption, drive type, technical speed, and ship owner. The data was valid as of 1 December 2018. The research distinguishes between container ship operators, ship owners, and ship managers.

The variables analyzed for the largest 20 operators are presented in Table 2, which records the highest mean values for Hyundai Merchant Marine Co Ltd., for the following variables: cargo capacity (8293.25 TEU), deadweight tonnage (88885.62 DWT), total length (289.33 m), and width (39.73 m). The highest mean values were been determined as follows: draught (13.50 m) for Ocean Network Express Pte Ltd; lateral height (22.68 m) for Hapag-Lloyd AG; technical speed (23.03 kn) for Yang Ming Marine Transport; main engine total power output (45,007.89 kW) for Ocean Network Express Pte Ltd; total fuel consumption per ship for Evergreen Marine Corp (26.12 t/day; 33.01 t/day, respectively); and power generator output (11,089.87 kW) for Hapag-Lloyd AG. Pacific International Lines had the lowest mean values for almost all variables: cargo capacity (3763.79 TEU); deadweight tonnage (47,118.87 DWT); length (221.01 m); draught (11.53 m); lateral height (17.63 m); width (32.08 m);

Table 2. Mean values of basic ship parameters measured across the largest 20 container fleet operators in the world

Ship operator	Cargo capacity	Dead weight tonnage	Length	Draught	Lateral height	Width	Technical speed	Main engine total power	Total fuel consumption per ship	Power generator output
	[TEU]	[DWT]	[m]	[m]	[m]	[m]	[kn]	[kW]	[t/day]	[kW]
APL LLC	7871.11	93197.06	302.75	13.85	24.57	40.90	23.68	52357.34	10.27	10958.85
CMA CGM SA The French Line	5565.20	65300.01	247.94	12.29	19.93	35.23	21.74	35241.35	8.73	8057.14
COSCO Shipping Lines Co Ltd	7171.59	81768.36	283.80	13.12	22.23	38.53	22.87	43287.56	7.03	8882.51
Evergreen Marine Corp	6767.19	78392.69	273.25	12.64	19.17	38.68	22.67	34747.62	33.01	8725.82
Hamburg Sudamerikanische	4811.58	62759.56	251.04	12.75	20.88	36.91	21.84	30480.95	13.56	11243.05
Hapag-Lloyd AG	6940.55	81917.44	283.35	13.39	22.68	39.32	22.65	42867.15	22.53	11089.87
Hyundai Merchant Marine Co Ltd	8293.25	88885.62	289.33	13.42	23.12	39.73	22.46	38677.21	3.29	8215.12
Korea Marine Transport Co Ltd	2061.74	26224.30	179.14	9.89	14.43	27.48	19.72	15716.11	4.25	3872.20
Maersk Line A/S	6387.32	75009.35	269.18	13.06	21.30	37.62	22.28	38828.35	6.88	10233.99
MCC Transport Singapore Pte	2258.13	29371.18	189.50	10.51	15.66	29.42	20.25	17681.09	10.71	5269.25
MSC Mediterranean Shipping Co	7059.27	84168.71	277.48	13.37	22.23	38.97	22.37	43156.65	24.49	9273.17
Ocean Network Express Pte Ltd	6850.55	78643.27	287.55	13.50	22.29	39.41	23.28	45007.89	5.83	10347.04
Orient Overseas Container Line	6931.11	77838.21	280.73	13.22	22.11	38.00	23.06	44259.98	13.23	10696.36
Pacific International Lines	3763.79	47118.87	221.01	11.53	17.63	32.08	20.82	24186.50	4.30	6767.13
Sinokor Merchant Marine Co Ltd	1342.14	17594.63	157.11	9.01	12.80	24.06	18.54	11894.78	10.20	3070.22
SITC Container Lines Co Ltd	1487.81	19075.37	157.18	8.75	12.60	24.89	18.16	10968.34	1.70	2923.64
Wan Hai Lines Ltd	2497.03	32728.96	169.77	8.85	13.32	24.72	20.66	18166.45	9.18	4425.26
X-Press Feeders	1461.49	19154.80	164.33	9.12	12.72	24.78	19.19	12890.24	7.50	3435.01
Yang Ming Marine Transport	6616.37	76296.25	273.44	13.10	20.71	38.49	23.03	38431.66	16.53	8503.89
Zim Integrated Shipping	5042.62	62603.81	265.49	12.76	20.23	34.30	23.36	39731.21	21.36	7708.83

Table 3. Mean values of basic ship parameters measured across the largest 20 container ship fleet operators in the world

Shipping owner	Cargo capacity	Dead weight tonnage	Length	Draught	Lateral height	Width	Technical speed	Main engine total power	Total power consumption per ship	Power generator output
	[TEU]	[DWT]	[m]	[m]	[m]	[m]	[kn]	[kW]	[t/day]	[kW]
All Oceans Transportation Inc	4724.08	57676.92	252.64	12.28	19.45	35.22	23.10	39826.88	7.91	7503.20
China Navigation Co Pte Ltd	1953.52	26871.40	182.72	9.98	14.86	28.67	16.93	12382.36	4.25	2839.24
COSCO Shipping Development	5473.45	67090.47	276.43	13.47	21.47	36.82	23.57	42671.10	0.00	7308.57
COSCO Shipping Lines Co Ltd	7925.67	85864.13	289.34	12.45	21.88	37.28	22.69	39405.67	2.92	7806.67
Evergreen Marine Corp	5453.34	68183.45	267.92	12.43	20.46	38.58	22.78	38236.14	4.59	9430.00
Evergreen Marine Singapore	6104.00	74291.87	300.91	13.10	23.26	39.58	24.59	49923.13	103.43	8882.55
Greencompass Marine SA	5254.66	62850.17	263.79	12.34	17.01	37.16	23.16	31807.34	83.90	6580.00
Hapag-Lloyd AG	8087.53	95407.70	312.43	13.85	24.52	41.82	23.92	49161.51	47.65	13783.12
Maersk Line A/S	10786.11	116494.55	327.56	14.43	25.06	45.47	22.12	52127.95	0.00	16448.26
Maersk Shipping Hong Kong Ltd	4363.87	57081.52	237.40	12.24	19.56	34.57	21.39	30171.21	10.13	8811.21
Moller Singapore AP Pte Ltd	5637.34	69827.84	260.84	13.09	21.81	37.63	22.51	35535.31	14.63	10058.99
Owner Unknown	4648.58	53349.11	219.31	11.36	18.52	35.01	20.86	20952.58	0.00	14000.00
Pacific International Lines	2280.42	30779.46	190.95	10.28	15.00	28.13	19.44	16406.56	5.38	4795.64
Regional Container Lines Pte	1166.36	15949.23	150.47	8.72	12.12	24.33	18.06	9786.09	22.57	2570.90
Salam Pacific Indonesia Lines	1198.00	16547.28	150.17	8.17	11.75	23.25	16.89	9396.15	7.35	2227.73
Seaspan Corp	6197.20	73228.70	283.86	13.40	21.75	36.76	23.70	45904.74	16.28	8729.34
Shoei Kisen Kaisha Ltd	13227.13	145069.57	346.77	15.20	8.19	50.12	23.10	14106.52	0.00	14000.00
Tanto Intim Line PT	708.40	10844.63	131.89	6.83	9.46	22.05	13.93	5674.86	13.01	1366.42
TEMAS Line	797.97	11885.59	130.22	6.24	9.41	21.61	12.83	4928.62	1.24	1241.07
Wan Hai Lines Singapore Pte	2443.76	32208.94	152.24	7.89	11.91	22.44	20.65	16008.43	6.78	4336.68

Table 4. Mean values of basic ship parameters measured across the largest 20 container fleet operators in the world

Ship management	Cargo capacity	Dead weight tonnage	Length	Draught	Lateral height	Width	Service speed	Main engine total power	Total fuel consumption per ship	Power generator output
	[TEU]	[DWT]	[m]	[m]	[m]	[m]	[kn]	[kW]	[t/day]	[kW]
Arkas Denizcilik ve Nakliyat	1913.67	26130.53	174.76	9.52	14.19	26.25	19.76	14862.67	10.07	4180.13
CMA CGM SA The French Line	8861.02	99867.01	297.21	13.80	23.96	41.90	22.35	48971.15	4.95	11257.78
Contchart Hamburg Leer GmbH	2225.32	29949.40	195.10	10.68	15.80	28.29	20.69	19836.91	5.42	5289.19
COSCO Shipping Development	7008.69	82461.68	289.84	13.72	22.70	39.55	23.39	46209.73	0.00	8481.93
COSCO Shipping Lines Co Ltd	9516.46	103902.02	312.97	13.56	24.37	42.00	23.04	48559.21	1.74	10266.79
Costamare Shipping Co SA	7182.81	86501.80	283.46	13.58	22.94	40.79	22.64	44121.02	5.67	10932.36
Danaos Shipping Co Ltd	5833.55	69740.40	273.30	13.25	21.95	37.10	23.87	46860.64	26.52	8510.30
Evergreen Marine Corp	5680.19	67600.82	254.45	11.85	14.96	36.65	22.30	26612.17	30.27	7653.25
Hanseatic Unity Chartering HU	3444.29	44462.09	217.23	11.76	18.13	32.50	20.77	25337.46	9.08	6589.09
Hapag-Lloyd AG	7534.14	89530.20	307.52	13.68	23.80	40.41	23.94	48376.23	40.62	13583.14
Lomar Shipping Ltd	2290.24	29796.98	191.89	10.36	15.58	28.89	20.20	17535.57	7.67	5001.03
Maersk Line A/S	8180.35	93446.01	294.40	13.73	23.17	41.29	22.33	43989.42	4.70	12980.85
MSC Mediterranean Shipping Co	8765.10	101781.97	302.33	14.05	24.09	41.96	22.42	48921.60	23.47	10434.50
NYK Line	8006.65	88896.98	307.18	14.03	23.35	40.63	23.32	43913.35	0.00	12595.15
Orient Overseas Container Line	8901.06	97674.92	314.63	14.20	24.46	41.54	23.89	52848.89	16.52	12889.54
Pacific International Lines	3494.90	43931.18	214.58	11.26	17.05	31.26	20.48	21813.93	3.28	6444.97
Peter Doehle Schiffahrts-KG	3754.95	47338.08	225.40	11.77	18.22	32.08	22.04	29511.01	19.23	7634.06
Seaspan Ship Management Ltd	9154.65	103119.19	318.27	14.68	25.25	43.70	23.23	48683.61	17.42	11397.72
Wan Hai Lines Ltd	2394.12	31610.46	159.13	8.24	12.40	23.31	20.56	16414.96	8.07	4228.78
Yang Ming Marine Transport	4748.45	58051.56	250.28	12.27	19.68	35.52	23.18	38227.19	19.14	7553.37

technical speed (20.82 kn); main engine total power (24,186.50 kW); and power generator output (6767.13 kW). For the remaining variables, total fuel consumption per ship for Hyundai Merchant Marine Co Ltd was 3.29 t/day.

Table 3 presents mean parameter values for the 20 largest ship owners. The table recorded the highest values for Shoei Kisen Kaisha Ltd, for the following variables: cargo capacity (13,227.13 TEU); deadweight tonnage (145,069.57 DWT); length (346.77 m); draught (15.20 m); and width (50.12 m). For the other variables, the highest mean values were as follows: lateral height (25.06 m) for Maersk Line A/S; technical speed (23.70 kn) for Seaspan Corp; main engine total power (52,127.95 kW) for Maersk Line A/S; total fuel consumption per ship for Evergreen Marine Singapore (103.43 t/day); and power generator output (14,000.00 kW) for Shoei Kisen Kaisha, Ltd. The lowest mean values were recorded for Tanto Intim Line PT for cargo capacity (708.40 TEU) and deadweight tonnage (10,844.63 DWT). Most of the lowest mean values were recorded for TEMAS Line for: length (130.22 m); draught (6.24 m); lateral height (9.41 m); width (21.61 m); technical speed (12.83 kn); and power generator output (1241.07 kW). The lowest mean value for main engine total power (42,671.10 kW) was recorded for COSCO Shipping Development.

Table 4 presents mean parameter values of the largest 20 shipping operators. The table shows that the highest mean values were recorded for COSCO Shipping Lines Co., Ltd. for cargo capacity (9516.46 TEU) and deadweight tonnage (103,902.02 DWT). Next were length (318.27 m); draught (14.68 m); lateral height (25.25 m); width (43.70 m) for Seaspan Ship Management Ltd. The highest mean values for the other variables were recorded for: technical speed (23.94 kn) for Hapag-Lloyd AG; main engine total power (52,848.89 kW) for Orient Overseas Container Line; total fuel consumption per ship (40.62 t/day) and power generator output (13,583.14 kW) for Hapag-Lloyd AG. The lowest mean values were recorded for Arkas Denizcilik ve Nakliyat for: cargo capacity (1913.67 TEU); deadweight tonnage (26,130.53 m); length (174.76 m); technical speed (19.76 kn); main engine total power (14,862.67 kW); and power generator output (4180.13 kW). The lowest mean values for Wan Hai Lines Ltd were recorded for draught (8.24 m); lateral height (12.40 m); width (23.31 m), and for COSCO Shipping Lines Co., Ltd for total fuel consumption per ship (1.74 t/day).

Conclusions

The research has revealed large differences in the technical parameters of ships depending on which of the three legal titles they are operated under: deed of ownership, charter agreement, or ship management agreement. This distinction is the product of the specific nature of the container shipping sector which draws a clear line between operator and manager functions, although the two are not mutually exclusive. Increasing specialization has led to the splintering off of enterprises which act in separate capacities as owners, managers, and operators of ships.

To ensure flexibility, ship owners usually arrange ownership relations within their fleets in such a way as to act as owners of the core fleet and lease/charter out the remaining part for better management in a crisis. For example, the largest shipping company Maersk owns 43.7% of its ships and charters out the rest (Alphaliner, 2019). In extreme cases, as with ZIM, the owned stake may amount to only 5% of the fleet. Ships are designed with different operating parameters by owner operators and non-owning operators because each group has different goals. Ships operated and owned by their users are better aligned with the owner's needs, and are very often narrowly designed to operate in specific areas or routes. Vessels intended for rent should have more universal parameters to allow their utilization by a larger group of market users, and our research captures these differences. Ships also display different parameters depending on the user profile.

There is also a group of companies that play all these roles on their own. In contrast, there are others which lend their business name to another entity or subcontract some tasks to specialized contractors under common ownership with a ship owner. This group includes Maersk Line, MSC, COSCO, CMA CGM, Evergreen, and Hapag Lloyd.

To summarize, the container shipping market is dominated by companies with a global presence, and the consolidation that has occurred over the last 10 years has put approximately 80% of available tonnage in the hands of a handful of global shipping corporations. Among the entities from the Intra-Asian market which are locally fragmented and held by companies with only a national dimension, only a few enterprises focus their operations on single trade routes.

References:

1. Alphaliner (2019) *The World References in Liner Shipping*. [Online] Available from: www.alphaliner.com [Accessed: May 06, 2019].
2. AXS Marine (2019) *Alphaliner TOP 100*. [Online] Available from: alphaliner.axsmarine.com/PublicTop100/ [Accessed: May 06, 2019].
3. Bembenek, B. (2006) Partnerstwo przejawem przedsiębiorczości. In: Kaleta A. et al. (Eds) *Przedsiębiorczość i innowacyjność. Wyzwania współczesności*. Prace Naukowe Akademii Ekonomicznej im. Oskara Langego we Wrocławiu 1116, Wrocław, pp. 227.
4. Cappellin, R. (2004) International knowledge and innovation networks for European integration, cohesion, and enlargement. *International Social Science Journal* 56 (180), pp. 207–225.
5. Ducruet, C. & Notteboom, T. (2012) The worldwide maritime network of container shipping: spatial structure and regional dynamics. *Global Networks* 12, 2, pp. 395–423.
6. Grant, R.M. & Baden-Fuller, C. (2004) A Knowledge Accessing Theory of Strategic Alliances. *Journal of Management Studies* 41, 1, pp. 61–84.
7. Hecksher (2018) *New Japanese carrier ocean network express gets final approval*. [Online] Available from: www.hecksher.com/news/new-japanese-carrier-ocean-network-express-gets-final-approval/ [Accessed: May 06, 2019].
8. Ireland, R.D., Hitt, M.A. & Vaidyanath, D. (2002) Alliance Management as a Source of Competitive Advantage. *Journal of Management* 28 (3), pp. 413–446.
9. Knowler, G. (2016) *CMA CGM completes takeover of NOL*. [Online] Available from: www.joc.com/maritime-news/container-lines/apl/cma-cgm-completes-takeover-nol_20160905.html [Accessed: May 06, 2019].
10. Martin, R. & Sunley, P. (2003) Deconstructing Clusters. Chaotic Concept or Policy Panacea? *Journal of Economic Geography* 3, 1, pp. 5–35.
11. Martin, R. & Sunley, P. (2005) Deconstructing clusters: chaotic concept or policy panacea? In: Breschi, S. & Malerba, F. (Eds) *Clusters, Networks and Innovation*. Oxford, New York: Oxford University Press, pp. 433–438.
12. Morosini, P. (2004) Industrial Cluster, Knowledge Integration and Performance. *World Development* 32, 2, pp. 305–326.
13. Muthusamy, S.K. & White, M.A. (2005) Learning and Knowledge Transfer in Strategic Alliances: A Social Exchange View. *Organization Studies* 26 (3), pp. 415–441.
14. Popławski, W., Sudolska, A. & Zastempowski, M. (2008) *Współpraca przedsiębiorstw w Polsce w procesie budowania ich potencjału innowacyjnego*. Toruń: Towarzystwo Naukowe Organizacji i Kierownictwa „Dom Organizatora".
15. Seaspan (2019) *Operating fleet*. [Online] Available from: www.seaspancorp.com/fleet-summary/operating-fleet/ [Accessed: May 06, 2019].
16. Seemann, P., De Long, D., Stucky, S. & Guthrie, E. (2000) Building Intangible Assets. A Strategic Framework for Investing in Intellectual Capital. In: Morey, D., et al. (Eds) *Knowledge Management: Classic and Contemporary Works*. Chapter 1. Cambridge: MIT Press.
17. SupplyChain247 (2017) *Hanjin Shipping is Officially Bankrupt* [Online] Available from: https://www.supplychain247.com/article/hanjin_shipping_is_officially_bankrupt [Accessed: May 06, 2019].
18. Sznajder, A. (2009) Alianse marketingowe szansą na zwiększenie konkurencyjności. *Marketing i Rynek* 6.
19. Szymoniuk, B. (2008) Korzyści lokalizacji w budowaniu globalnej przewagi konkurencyjnej. Doświadczenia polskich klastrów gospodarczych. In: Rymarczyk, J., Drelich-Skulska, B & Michalczyk W. (Eds) *Regionalizacja globalizacji. Tom 2*. Wrocław: Akademia Ekonomiczna.
20. Todeva, E. & Knoke, D. (2005) Strategic Alliances & Models of Collaboration. *Management Decision* 43, 1, pp. 123–148.
21. Witkowski, J. (2003) *Zarządzanie łańcuchem dostaw. Koncepcje – procedury – doświadczenia*. Warszawa: Polskie Wydawnictwo Ekonomiczne.