

WELCOME TO NTOU – IB MARINE DIGITALIZATION CONFERENCE

Giampiero Soncini
Daniele Bottazzi

Who am I

- **Giampiero Soncini**
 - **Italian Navy Officer** – 14 years
 - **NATO Ship Manager** – 13 years
 - **SpecTec** (29 years):
 - MD Italian office
 - VP South Europe
 - VP sales worldwide
 - **CEO from May 2005 to September 2016**
 - **RINA Digital Advisor**
 - **Investor with my own fund KZM**



MAESTRALE CLASS



- At that time, one of the most advanced Frigate in the world
- First one with a completely Integrated Machinery Automation System

NATO RV ALLIANCE



- Quietest vessel ever built
- 1st in the world with GPS
- 1st in the world with INS
- 1st in the world with DGPS
- 10th in the world with ECDIS
- One of the first with AMOS
- Complete CBM in 1988

NATO RV ALLIANCE – SISTER SHIP OF TA KUAN





NAVIGATING 1968 - 2018

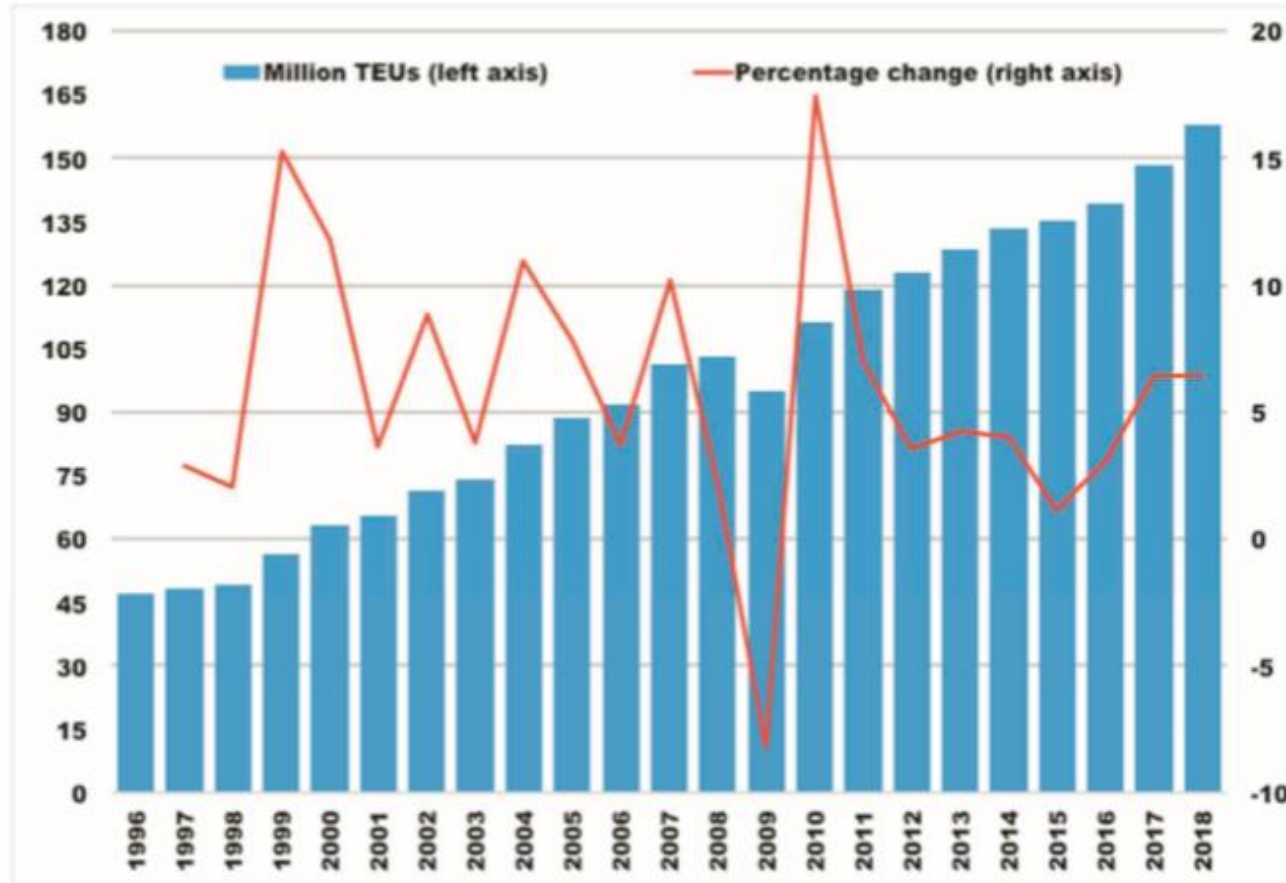
What happened in the last 50 years? What will happen in the next 50?

Some facts

- Oil & Gas transportation was **55%** of global marine trade in **1970**. It is now **30%**
- Total of all cargos went from 2.600 mt to 10.700mt, a 400% increase (or 8% a year)
- The increase in world trade over the last decades has to a large extent been driven by the **rise in trade between developing countries**.
- As of 2011, the value of trade between developing countries (South–South) is almost as high as that of trade between developed countries (North–North).
- South–South trade has risen from less than 10% in 1980 to almost 33% of world trade in 2011 (UNCTAD, 2013).
- North–North trade has declined over time, falling from 50% of world trade in 1980 to around 33% in 2011.

More and more Containers

Figure 2.3: Global container trade since 1996
(Million TEU and annual percentage change)

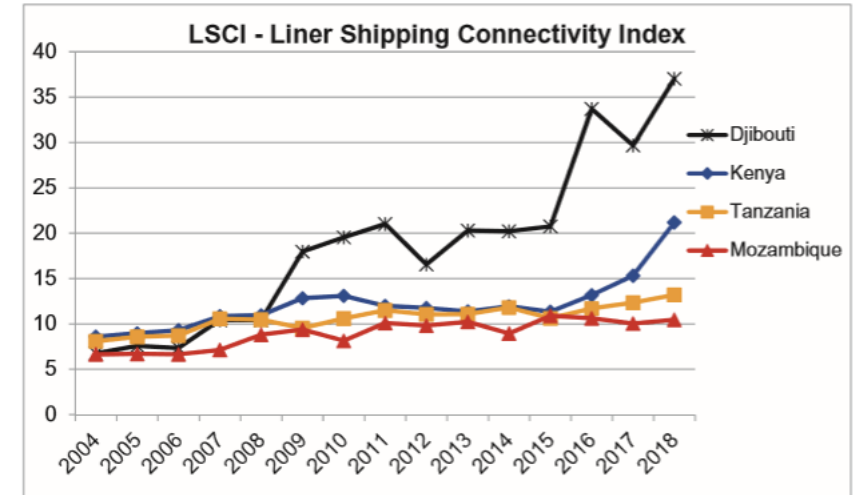


Source: UNCTAD. *Review of Maritime Transport 2018*.

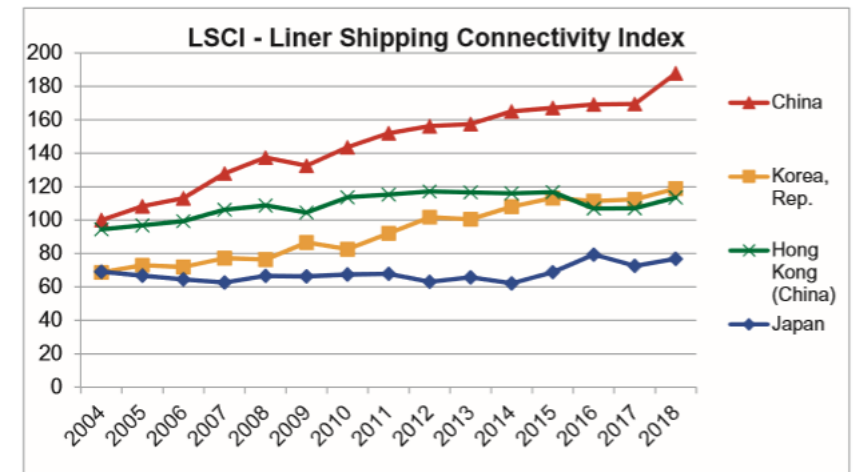
The **Liner Shipping Connectivity Index (LSCI)** aims at capturing a country's level of integration into the existing **liner shipping** network by measuring **liner shipping connectivity**. ... It reflects the strategies of container **shipping** lines seeking to maximize revenue through market coverage

Figure 2.4: Development of connectivity of East African and Far Eastern countries, 2004–2018

a. East Africa



b. Far East

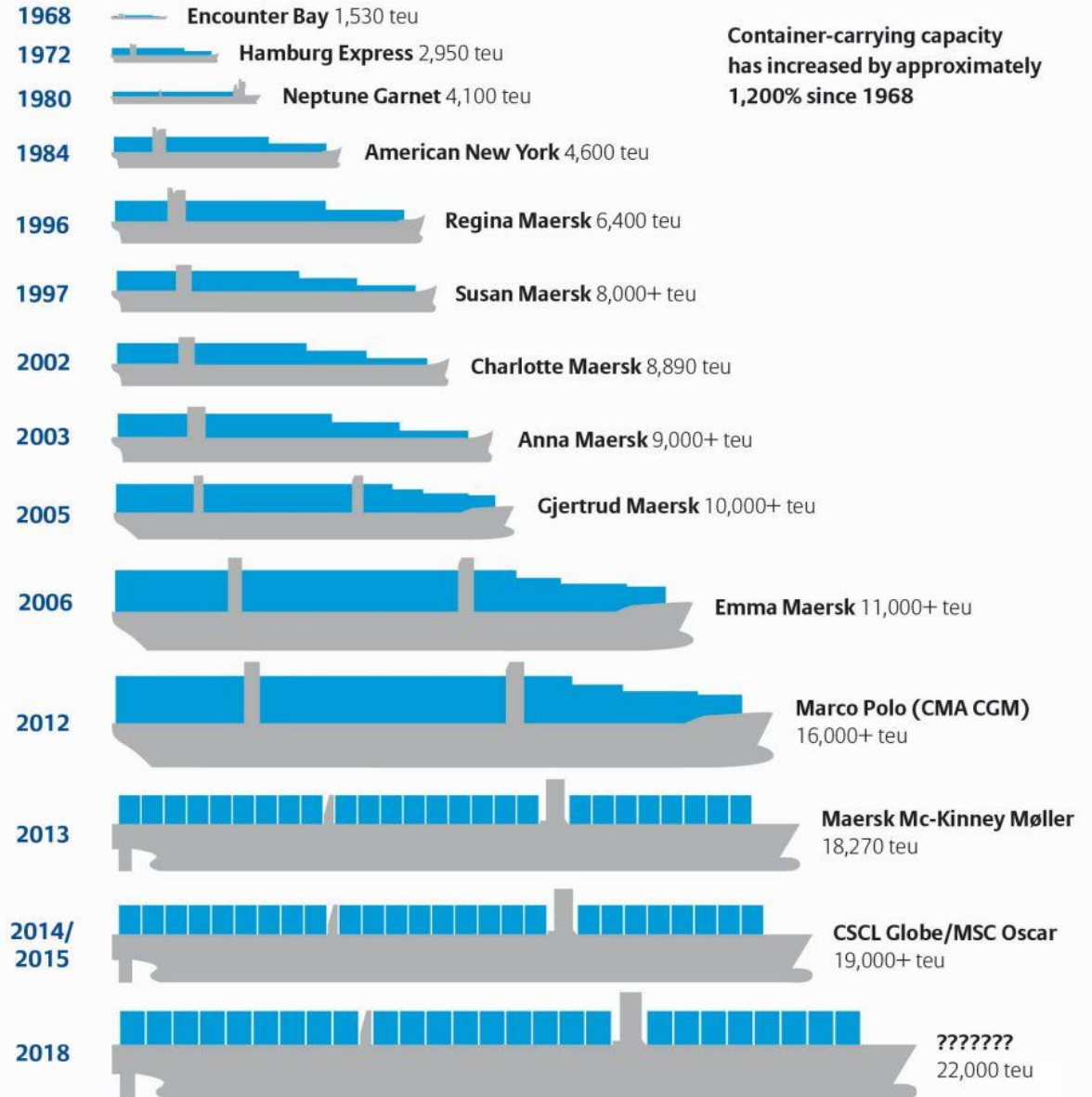


Source: UNCTAD, based on the LSCI as published by UNCTAD under <http://stats.unctad.org/LSCI>

Bigger and bigger Containers

The share of container tonnage is nearly 10 times what it was in 1980

50 years of Container Ship Growth



Graphic: Allianz Global Corporate & Specialty.
Approximate ship capacity data: Container-transportation.com

WORLD FLEET HAS BEEN GROWING, WHILE CHANGING

The total world fleet in 2017 stood at 93,100 ships with 1.86 billion dwt.

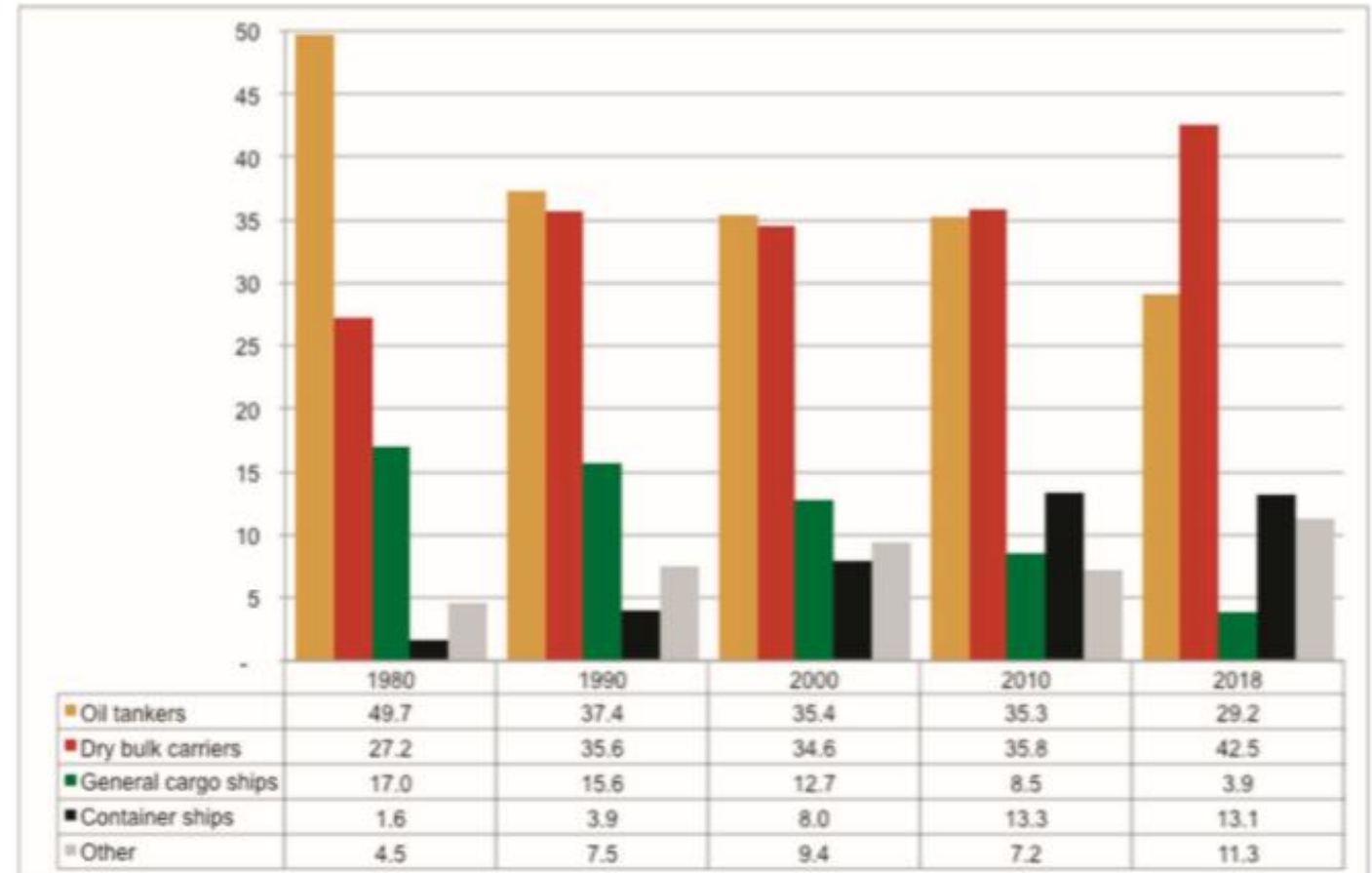
This compares to a fleet of:

- 1.28 billion dwt in 2010,
- 800 million dwt in 2000,
- 680 million dwt in 1980,
- 320 million dwt in 1970.

Hence the 1970s and the two decades of the new millennium were decades with the highest fleet growth.

These decades were also characterized by overcapacity in the shipping markets and consequent downward pressure on freight rates.

Figure 2.6: World fleet by principal vessel types (1980–2018) in %



Source: UNCTAD. Review of Maritime Transport 2018.

OWNERSHIP HAS ALSO CHANGED

Table 2.7: World fleet by countries of registration

Flag	1968	1980	1990	2000	2010	2017
Developed Countries	67.1	51.3	33.3	25.4	17.8	22.8
Developing Countries	7.4	10.0	21.2	19.2	25.2	34.5
of which						
Africa	0.4	1.0	1.1	0.7	0.7	0.9
America	2.7	3.2	3.9	4.2	1.8	6.4
Asia	4.3	5.7	13.6	14.0	22.4	26.7
Oceania	n.a.	0.0	0.5	0.1	0.4	0.5

Note: Data for 1968 on the basis of gross tonnage, later years on dwt; 2017 data for developing regions are deduced by subtracting the flags of Panama, Liberia and Marshall Islands from the respective regional shares.

In last 50 years:
Developed countries from 67mt to 23mt
Developing countries from 7,4mt to 34,5mt

2000: 40% of CT traffic in Ports in Europe/US
2017: 20% of CT traffic in Ports in Europe/US

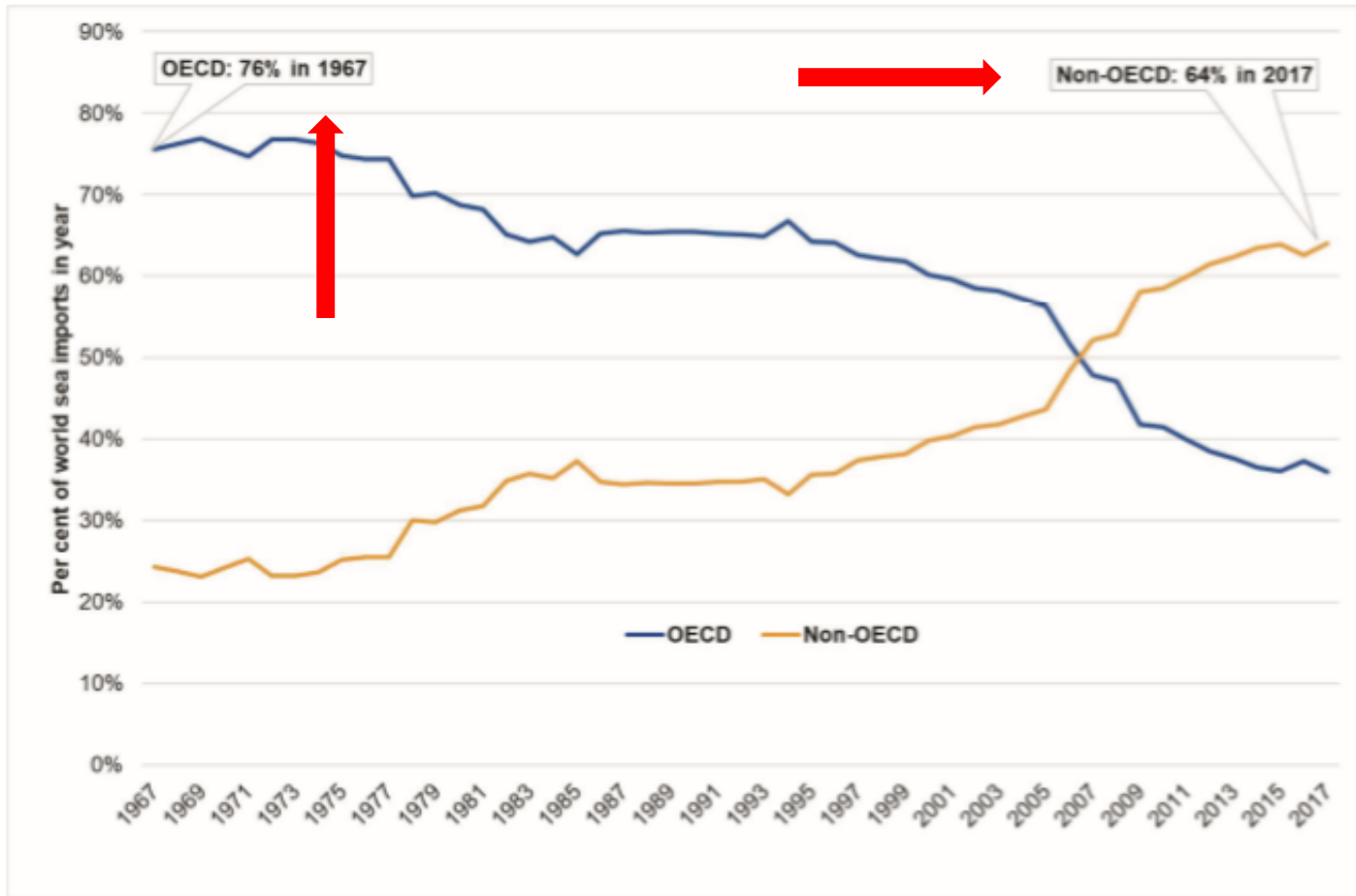
Table 2.8: Top 20 container ports 2000 and 2017

2000		2017	
Port	000 TEU	Port	000 TEU
Hong Kong	18,100	Shanghai	40,230
Singapore	17,040	Singapore	33,670
Busan	7,540	Shenzhen	25,210
Kaohsiung	7,426	Ningbo-Zhoushan	24,610
Shanghai	5,613	Busan	21,400
Rotterdam	6,275	Hong Kong	20,760
Los Angeles	4,879	Guangzhou (Nansha)	20,370
Shenzhen	3,994	Qingdao	18,260
Hamburg	4,248	Dubai	15,440
Long Beach	4,600	Tianjin	15,210
Top 10	79,715	Top 10	235,160
World share in %	35	World share in %	31
Antwerp	4,082	Rotterdam	13,600
Port Kelang	3,206	Port Klang	12,060
Dubai	3,558	Antwerp	10,450
New York	3,006	Xiamen	10,380
Bremerhaven	2,721	Kaohsiung	10,240
Felixstowe	2,800	Dalian	9,710
Manila	2,868	Los Angeles	9,340
Tokyo	2,960	Hamburg	9,600
Qingdao	2,120	Tanjung Pelepas	8,330
Gioia Tauro	2,488	Laem Chabang	7,760
Top 20	109,524	Top 20	336,630
World share in %	48.6	World share in %	44.8
World	225,294	World	752,714

Source: UNCTAD. Review of Maritime Transport 2002 and 2018.

BECAUSE THE MARKET HAS CHANGED

Figure 3.1: The changing world of regional seaborne imports 1967–2017



- | | | | |
|----------|---------------|------------------|-----------------|
| •Austria | •West Germany | •Luxembourg | •Sweden |
| •Belgium | •Greece | •The Netherlands | •Switzerland |
| •Canada | •Iceland | •Norway | •Turkey |
| •Denmark | •Ireland | •Portugal | •United Kingdom |
| •France | •Italy | •Spain | •United States |

Source: United Nations, UNCTAD and Clarkson Research.

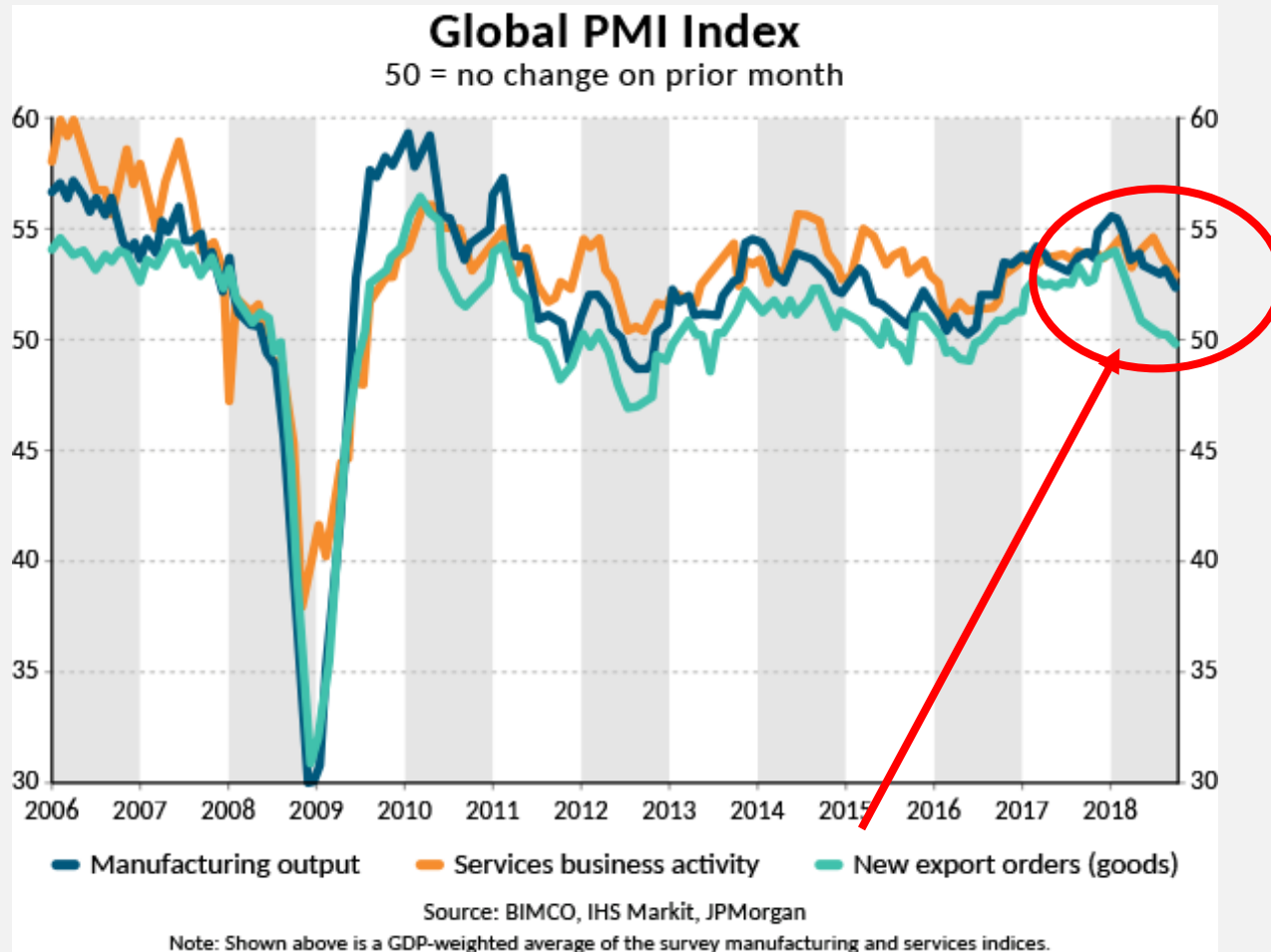
AND HOW DOES THE NEAR FUTURE LOOKS LIKE?

(Following slides courtesy of BIMCO)

Exports of goods go down – shipping is hurt



BIMCO



The wider perspective on this trend is hurting shipping.

This is an indication of much lower trade growth in the medium term.

Let's hope it will stay positive



BIMCO



Dry bulk shipping is set for support from emerging and developing economies going forward.

Oil tanker shipping will see demand growth getting ever more biased towards 'East of Suez' as the growth is mainly happening in Asia. Trade lanes will change.

Container shipping is not likely to benefit much from this development.

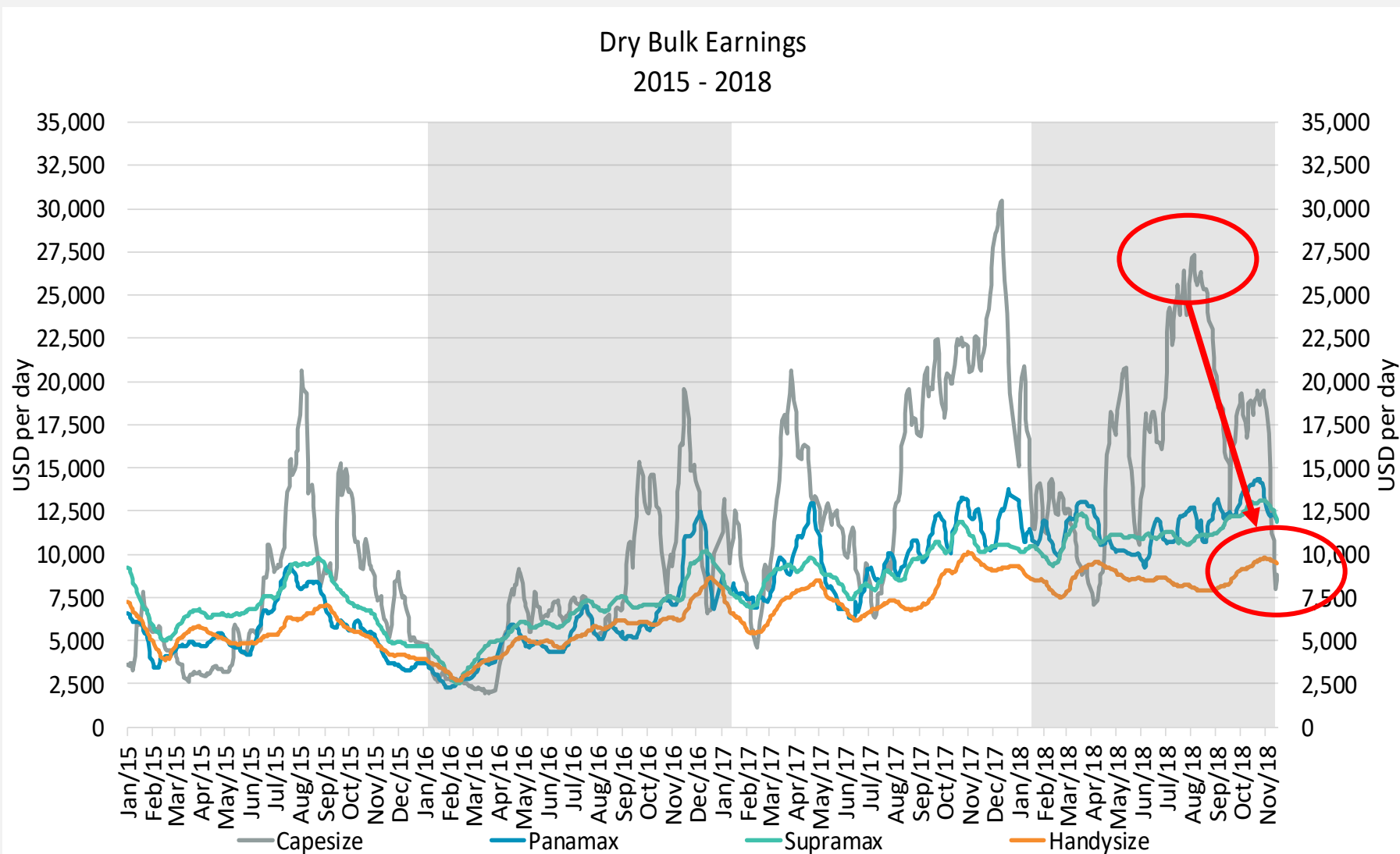
As GDP growth in advanced economies slows down, imports of containerised goods may follow suit.

BULK CARRIERS

The fragile recovery is stalling

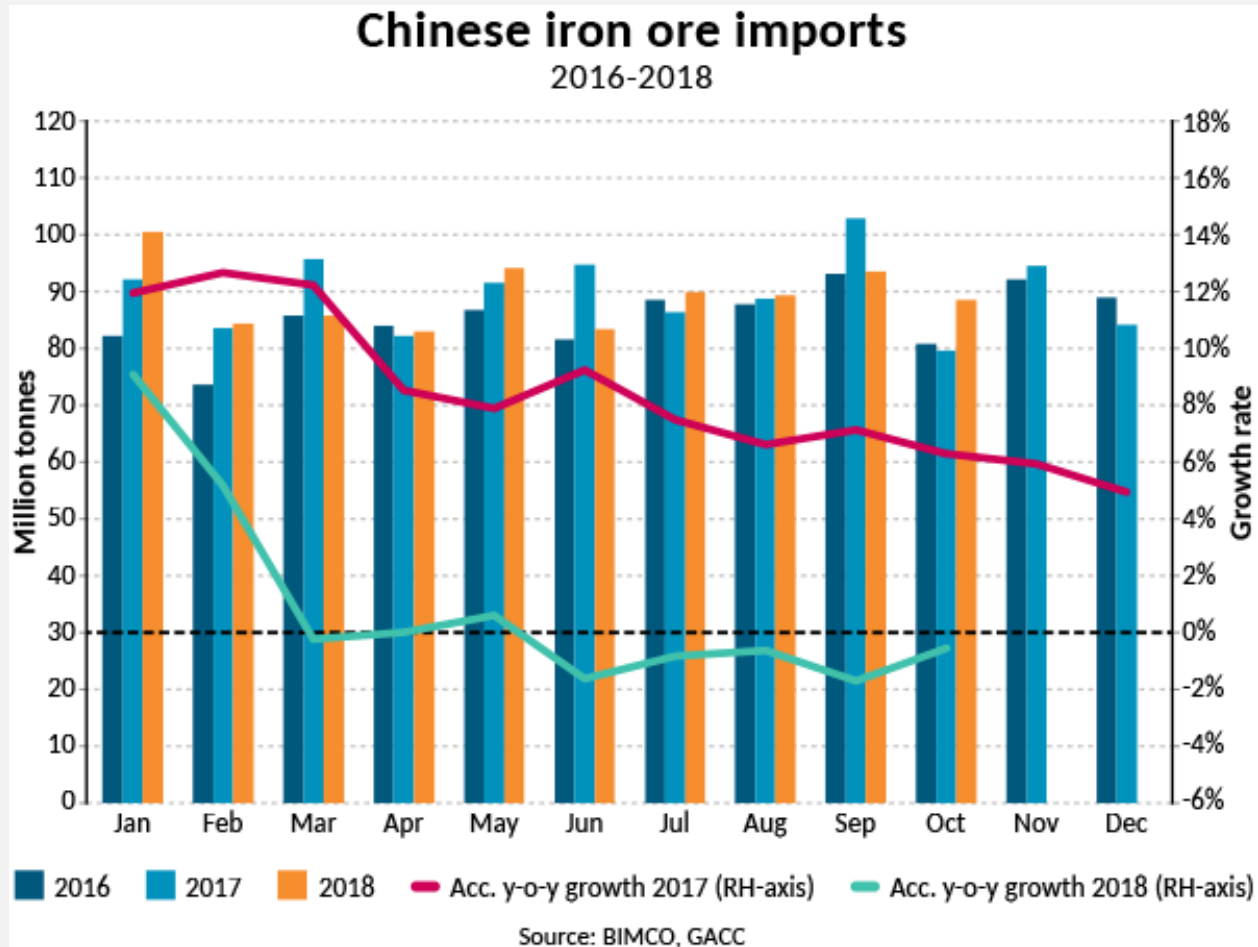


BIMCO



Source: BIMCO, Clarksons

If this trend continues, it will get bad



Iron ore imports down by 0.5%

Coal have stepped in to some extent to support Capesize and Panamax

Trend to continue in 2019?

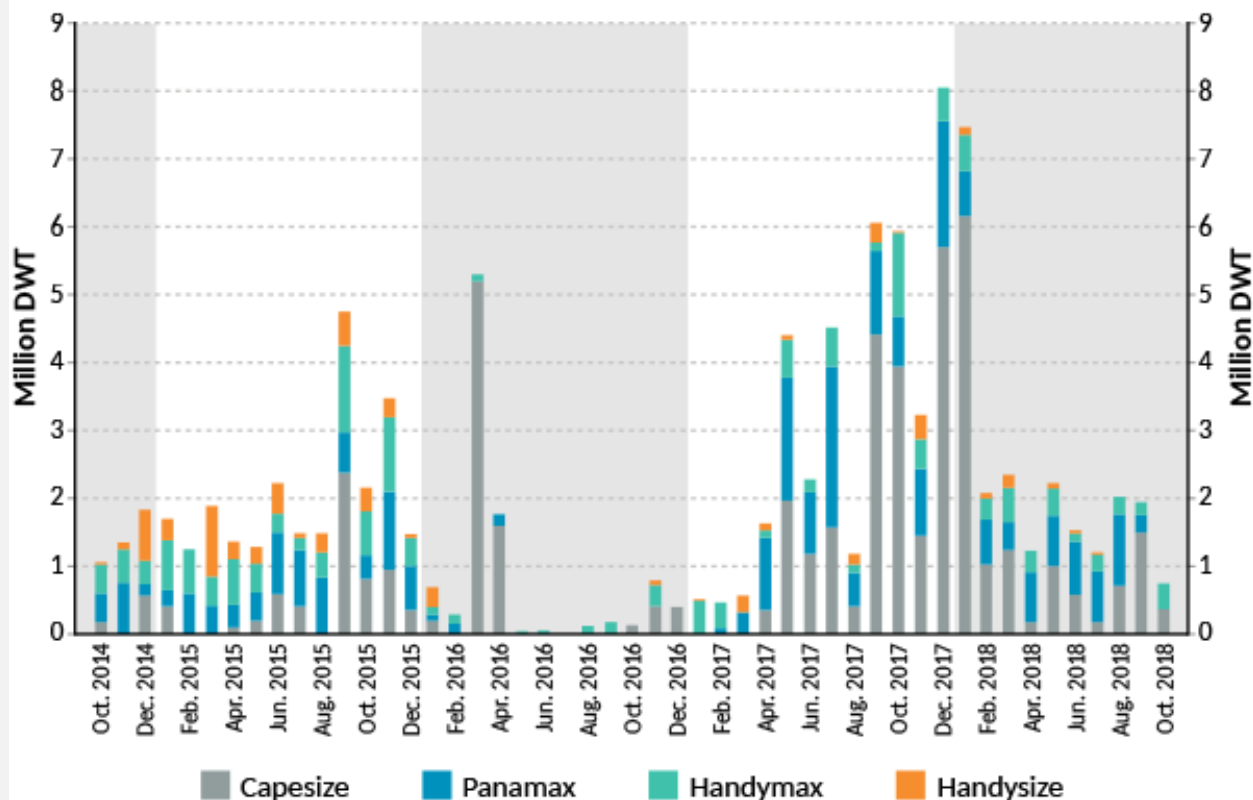
Limited NB interest, but high fleet growth



BIMCO

Dry bulk contracting activity

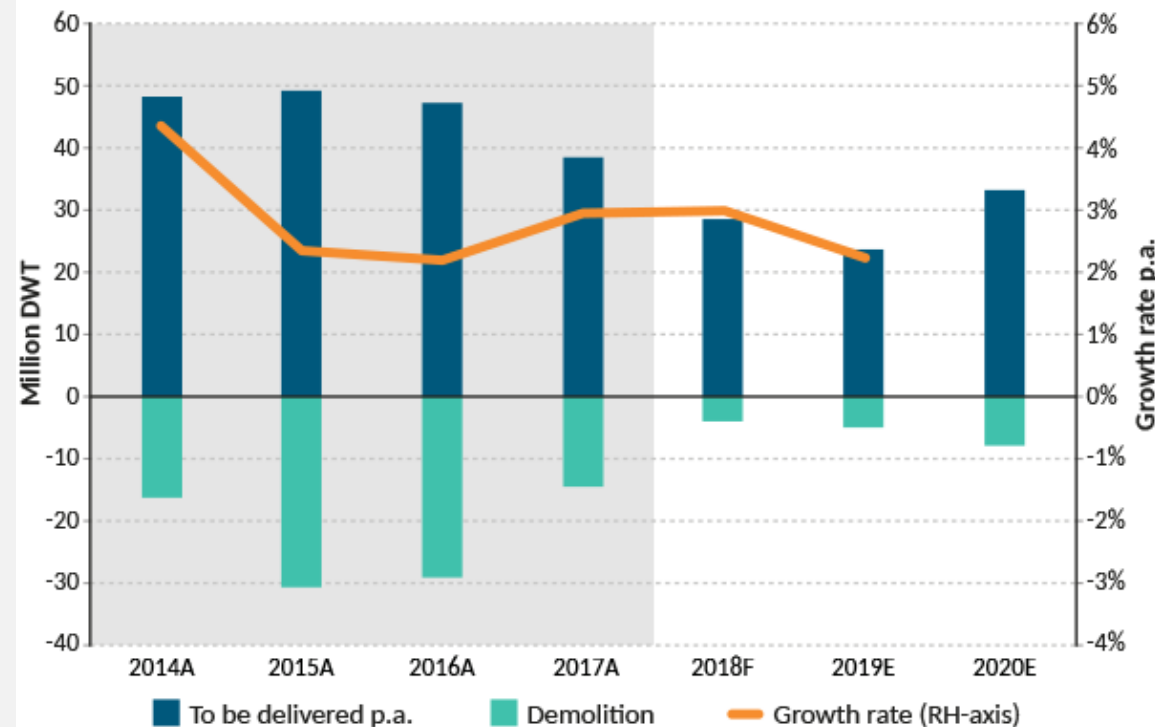
October 2014 - October 2018



Source: BIMCO, Clarksons

Dry bulk ship fleet growth

2014A-2020E



Source: BIMCO estimates on Clarkson's raw data

A is actual. F is forecast. E is estimate which will change if new orders are placed. The supply growth for 2018-2020 contains existing orders only and is estimated under the assumptions that the scheduled deliveries fall short by 10% due to various reasons and 35% of the remaining vessels on order are delayed/postponed.

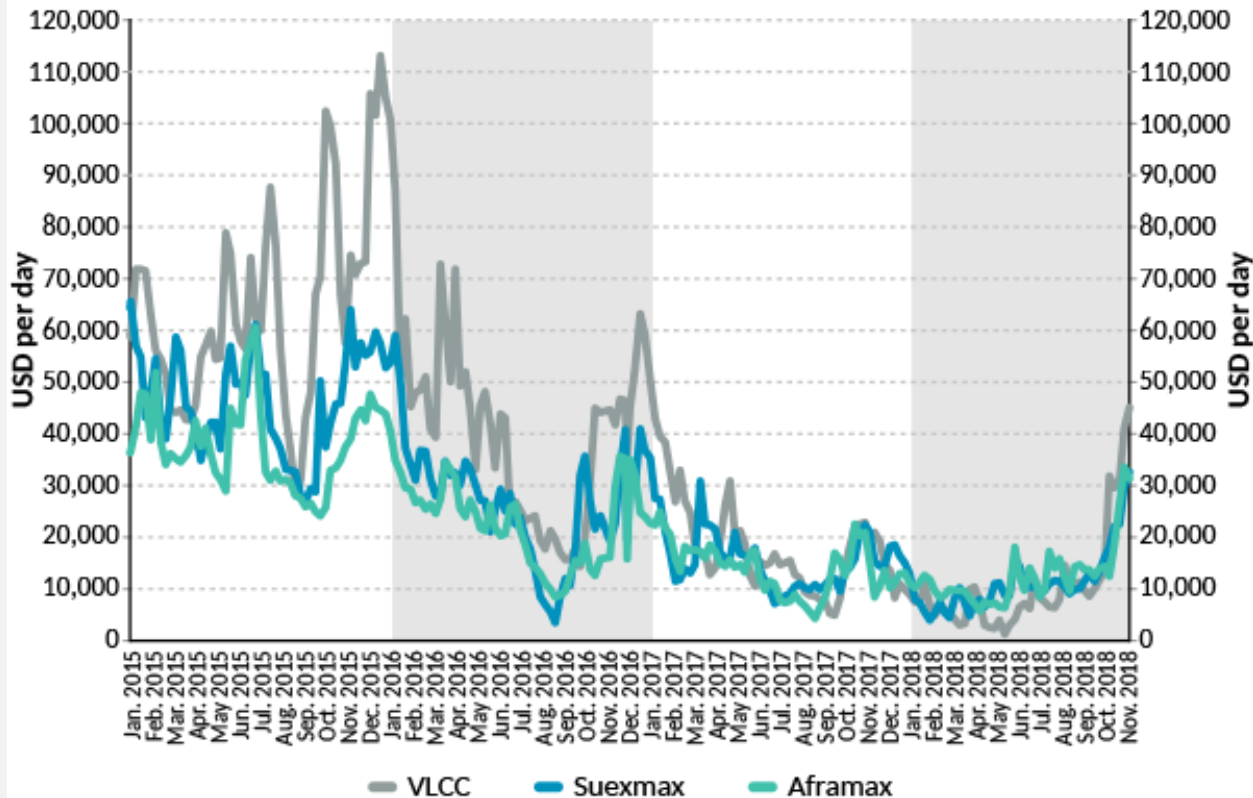
TANKERS

BETTER MOMENTS FOR TANKERS... BUT MAY BE SHORT LIVED



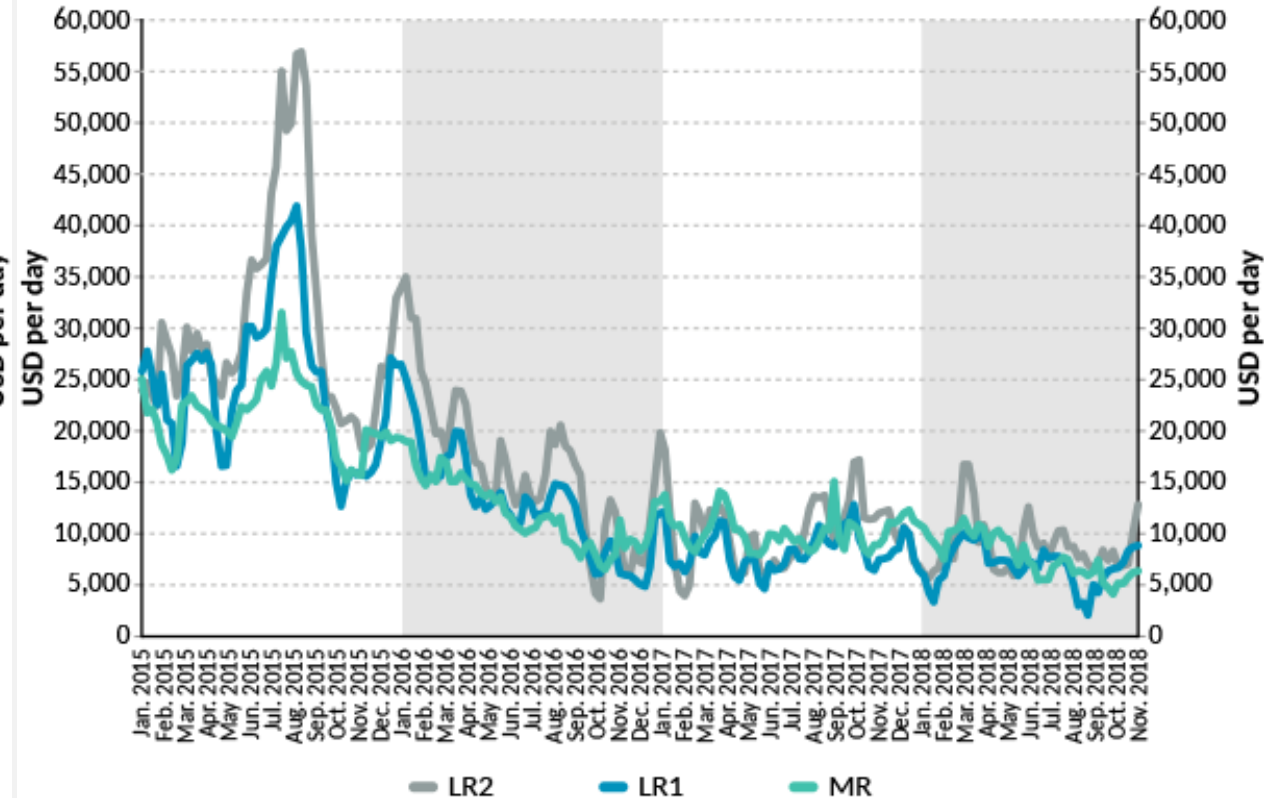
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Crude oil tanker earnings
2015-2018



Source: BIMCO, Clarksons

Oil product tanker earnings
2015-2018

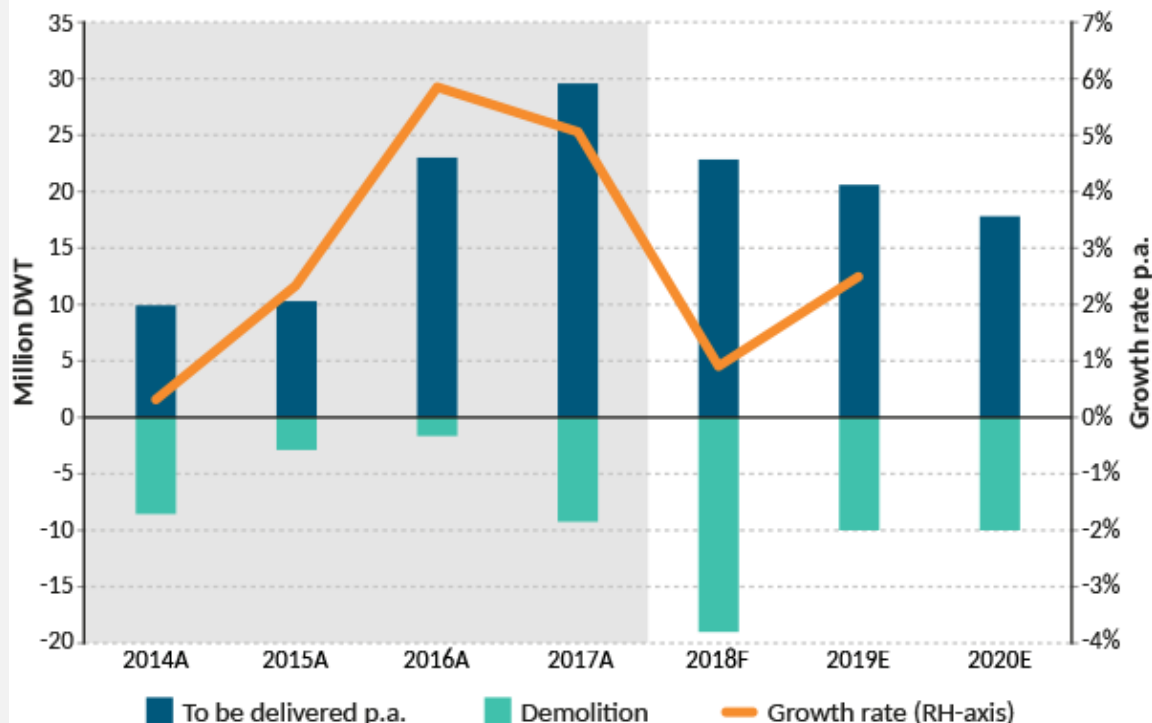


Source: BIMCO, Clarksons

The low fleet growth wasn't enough

Crude oil tanker fleet growth

2014A-2020E

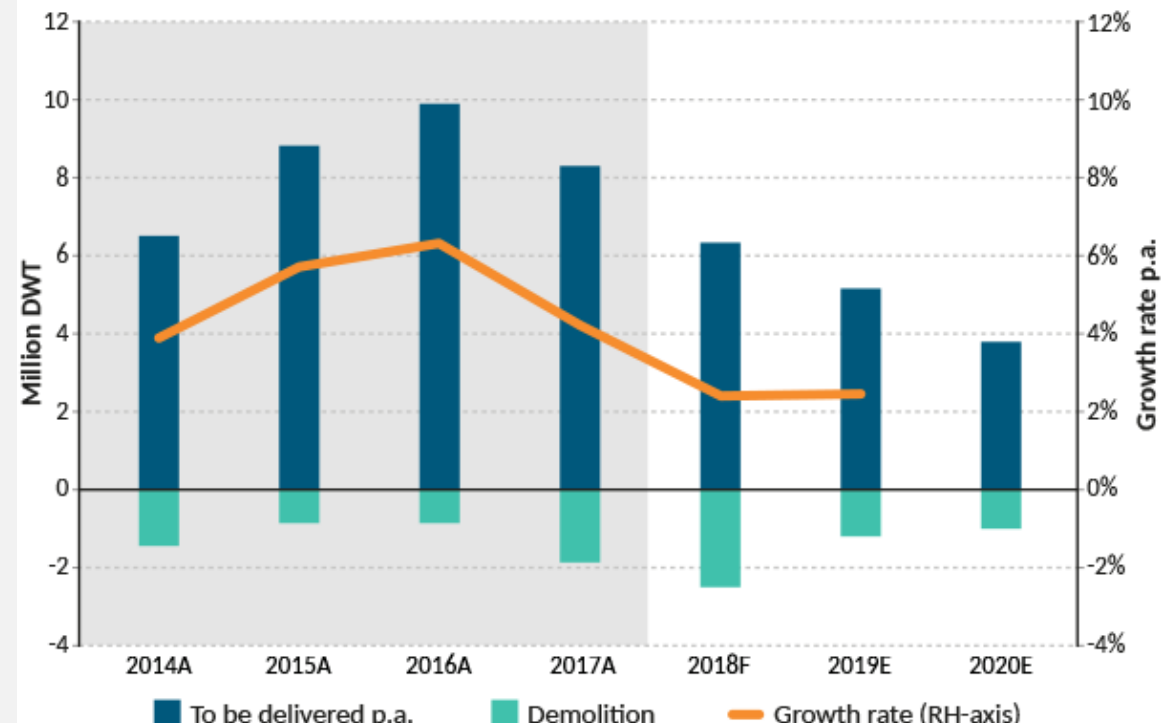


Source: BIMCO estimates on Clarkson's raw data

A is actual. F is forecast. E is estimate which will change if new orders are placed. The supply growth for 2018-2020 contains existing orders only and is estimated under the assumptions that the scheduled deliveries fall short by 10% due to various reasons and 30% of the remaining vessels on order are delayed/postponed.

Oil product tanker fleet growth

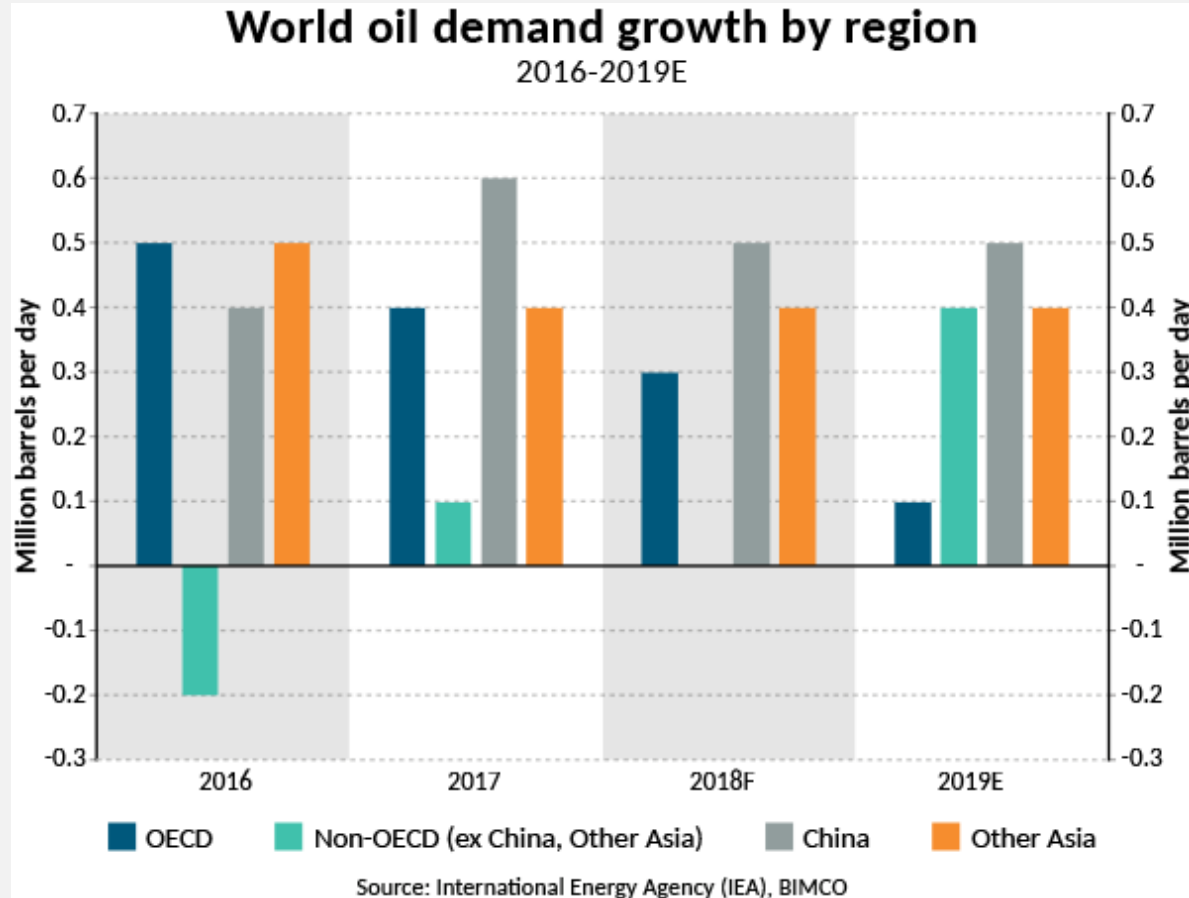
2014A-2020E



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China and 'Other Asia' dominates



Long-term is pretty clear.
Asia continuously grow

Short to medium term:
Winter season?
US sanctions on Iran?
Trade war between US and China

CONTAINERS

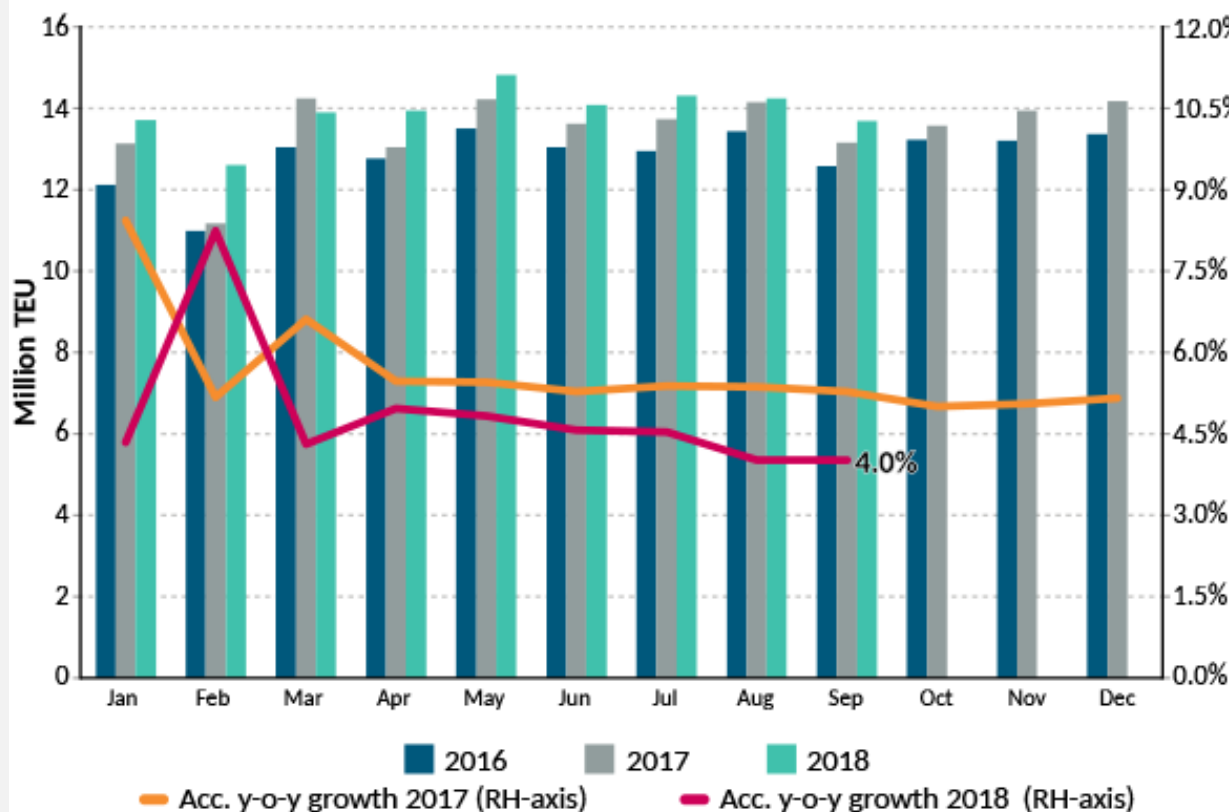


BIMCO

Weaknesses are found below the surface

Global demand

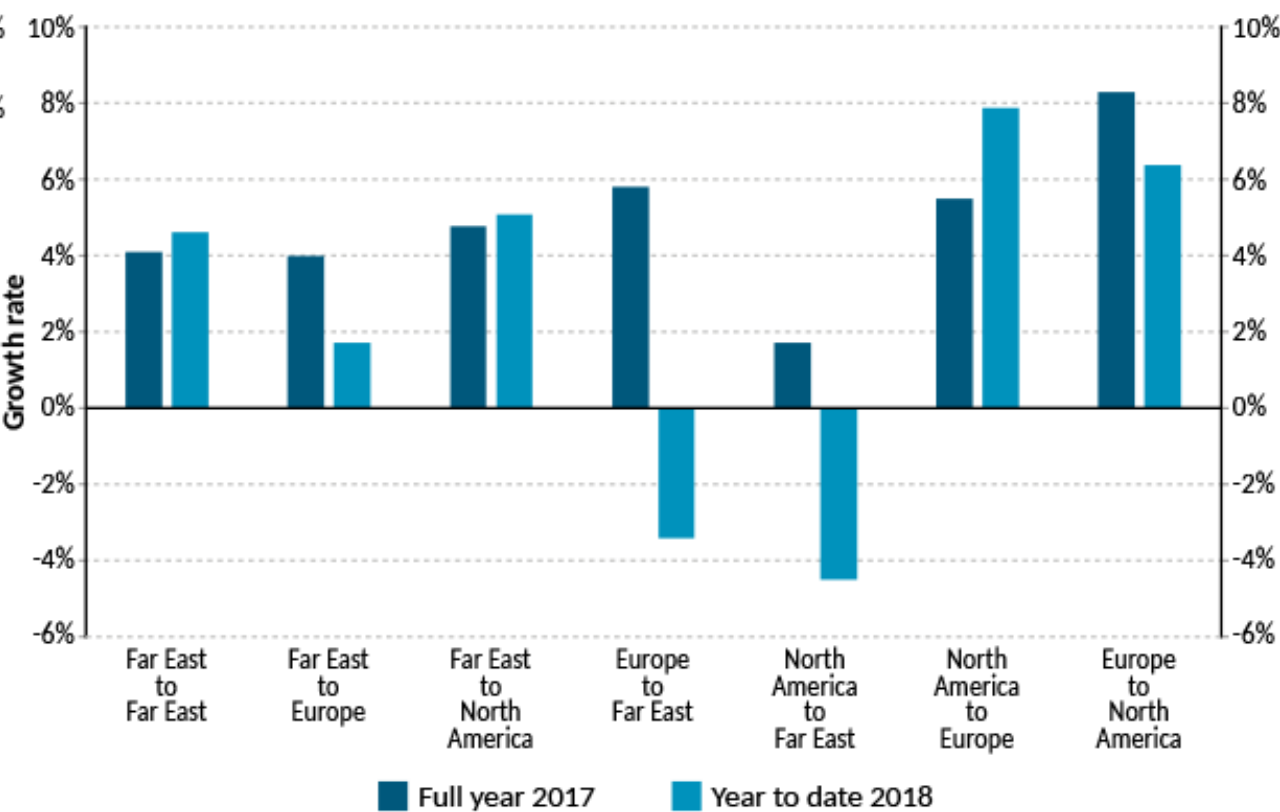
2016-2018



Source: BIMCO, CTS

Container demand growth rates

2017-2018



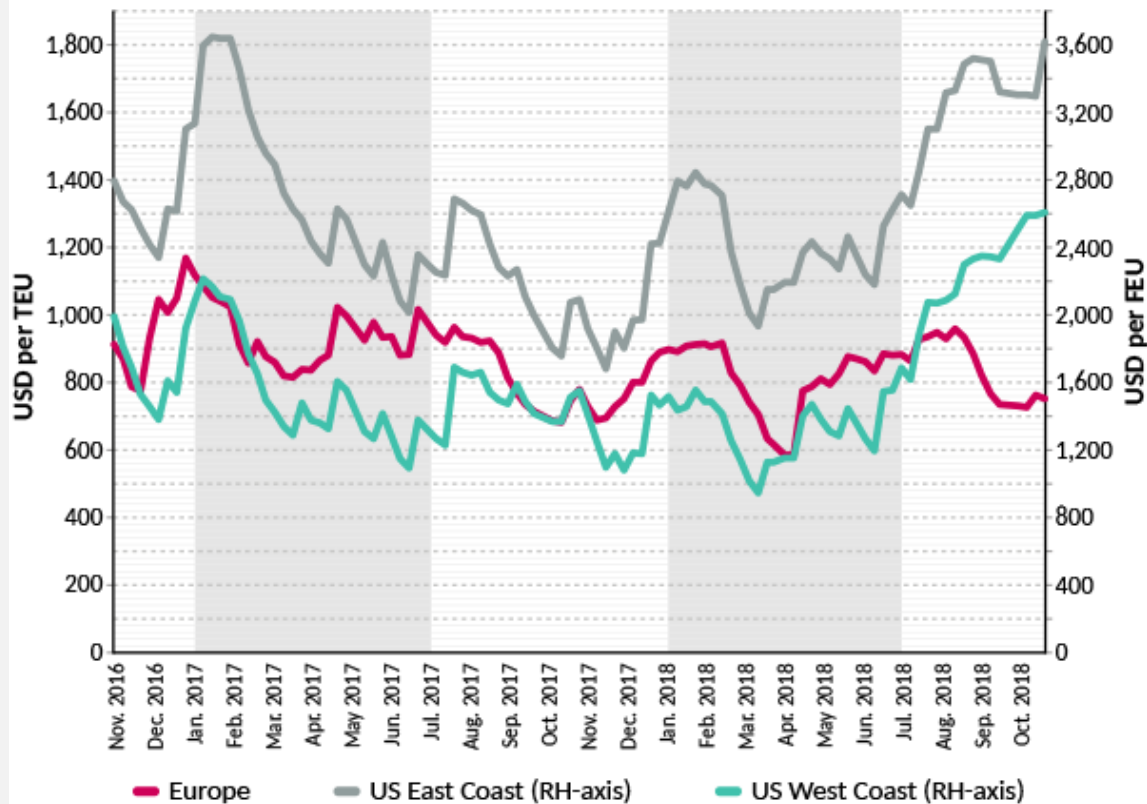
Source: BIMCO, CTS

The trade war is the joker in the deck



BIMCO

Shanghai Containerized Freight Index
2016-2018



Source: BIMCO, Shanghai Shipping Exchange

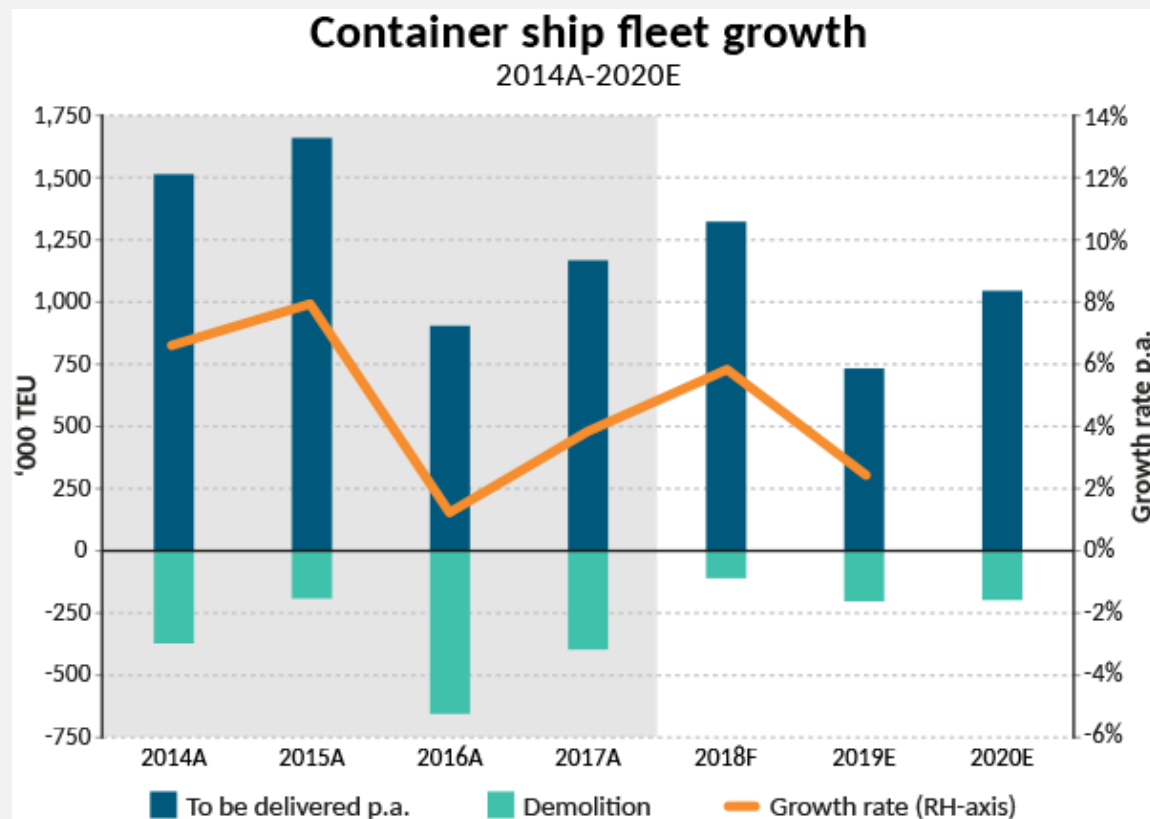


Chappatte The New York Times

Fleet growth too high for fundamental improvements in 2018



BIMCO



Source: BIMCO estimates on Clarkson's raw data

A is actual. F is forecast. E is estimate which will change if new orders are placed. The supply growth for 2018-2020 contains existing orders only and is estimated under the assumptions that the scheduled deliveries fall short by 10% due to various reasons and 25% of the remaining vessels on order are delayed/postponed.

The pure split between choosing either a feeder or and ultra-large ship has been exaggerated since 2016

Deployment of the many ULCS has caused suffering on the Far East-Europe trade lane

2019 – will it stay low?

**BUT WHAT ELSE HAS HAPPENED IN
THE LAST 50 YEARS IN SHIPPING?**

SHIPPING HAS BECOME A VERY REGULATED INDUSTRY

- **SOLAS** (International Convention for the Safety of Life at Sea, 1974)
- **MARPOL** (International Convention for the Prevention of Pollution from Ships, 1973/1978)
- **COLREG** (Convention on the International Regulations for Preventing Collisions at Sea, 1972)
- **LOADLINE** (International Convention on Loadlines, 1966)
- **ISPS** (The International Ship and Port Facility Security Code, 2002)
- **ISM** (The International Safety Management Code, 1993) Dealing with the seafarer
- **STCW** (International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978/1995/2010)
- **ILO 147** (The ILO Merchant Shipping (Minimum Standards) Convention, 1976), superseded by the [ILO Maritime Labour Convention, 2006](#) which entered into force on 30 August 2013.

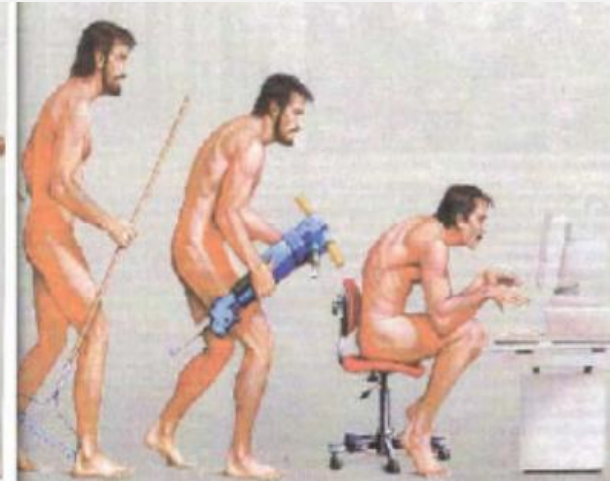
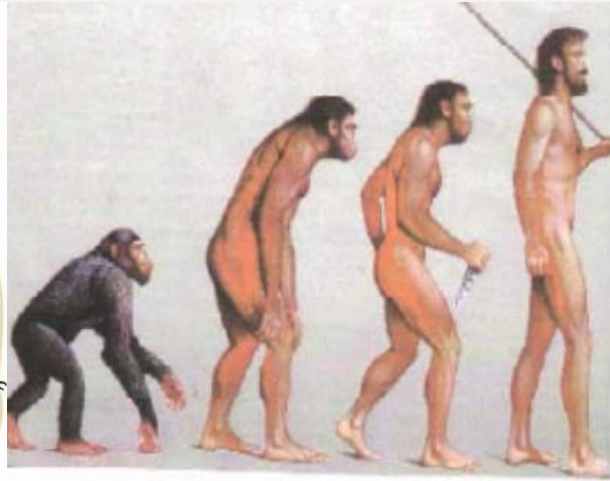
SHIPPING HAS BECOME MORE MODERN

MODERNIZED THE WAY WE SAIL

- GPS
- UMS AND AUTOMATION SYSTEMS
- OMBO AND INTEGRATED NAVIGATION SYSTEMS
- ECDIS
- SATELLITE COMMUNICATIONS

MODERNIZED THE WAY WE MANAGE

- ISM
- ISPS
- FLEET MANAGEMENT SOFTWARE
- E-PROCUREMENT



BUT THIS HAS NOT ALWAYS MADE OUR LIFE EASIER

- 1) IMDG Code(International Maritime Dangerous Goods)
- 2) IMSBC Code(International Maritime Solid Bulk Cargo Code)
- 3) IGC Code(International code for construction and equipment of ships carrying liquefied gases in bulk)
- 4) International Grain Code
- 5) IBC Code(International code for construction and equipment of ships carrying dangerous chemicals in bulk)
- 6) ISPS Code(International Ship and Port Facility Security code)
- 7) ISM Code(International Safety Management Code)
- 8) INF Code(International code for Safe Carriage of Packaged Irradiated Nuclear Fuel)
- 9) IS Code(International Code for Intact Stability)
- 10) TDC Code(Code of safe practices for ships carrying Timber Deck Cargo)
- 11) Casualty Investigation Code
- 12) CSS Code(Code of Safe Practice for Cargo Stowage and securing)
- 13) SPS Code(Code for the safety of Special Purpose Ships)
- 14) STCW Code(Seafarer's training, certification and Watch keeping)
- 15) OSV Code(Code of safe practices for Offshore Supply Vessel)
- 16) MODU Code(Mobile Offshore Drilling Unit code)
- 17) HSC Code(High-Speed Craft code)
- 18) LSA Code(International Life Saving Appliances Code)
- 19) FSS Code(International Fire Safety System Code)
- 20) FTP Code (Fire Test Procedure code)
- 21) Polar Code
- 22) Code of Safe Working Practices for Merchant Seafarers
- 23) Code of Conduct for the Merchant Navy

IS THERE A LINK BETWEEN INCREASED REGULATIONS AND DIGITALIZATION?

- For sure, there are no so many parameters to check, to monitor, to verify, to comply with, that working without the help of IT has become virtually impossible
- At the same time, the marketplace has become confused and confusing:
 - What exactly is digitalization?
 - What does the shipping community think of digitalization?
 - Where are we going to go in the next 50 years?

SURVEY FROM RMT (REVIEW MARITIME TRANSPORT)

Table 4.1: Technologies for RMT

Top 4 Response Rate

1. Alternative fuels to bunker / traditional fossil fuels (LNG, etc., plus alternative fuel standards)
2. Increased port automation, Internet of Things (IoT)
3. Autonomous vessel technology (MASS)
4. Blockchain technology
5. 3-D printing (reduced need for transport of basic manufacturing bulk products and intermediate parts and machinery)
6. Robotics in manufacturing resulting in near-shoring
7. Hyperloop and alternative methods of dealing with landside cargo transport
8. Cryptocurrencies

Table 4.2: Impacts and time frames for new technologies (percentage of respondents)

Technology	Impact on Trade Patterns				Time Frame		
	Significant impact	Some impact	Very limited impact	No impact	Within next 5 years	5–19 years	20+ years
Alternative fuels to bunker / traditional fossil fuels (LNG, etc. plus alternative fuel standards)	52	33	7	7	56	40	4
Increased port automation, Internet of Things	52	35	7	6	57	43	0
Blockchain technology	53	36	8	4	50	50	0
Autonomous vessel technology (MASS)	35	39	20	6	9	65	26
3-D printing (reduced need for transport of basic manufacturing bulk products and intermediate parts and machinery)	26	50	22	2	22	61	17
Robotics in manufacturing resulting in near-shoring	28	52	19	2	26	61	13
Hyperloop and alternative methods of dealing with landside cargo transport	13	4.3	36	8	11	39	50
Cryptocurrencies	14	31	46	10	45	35	20

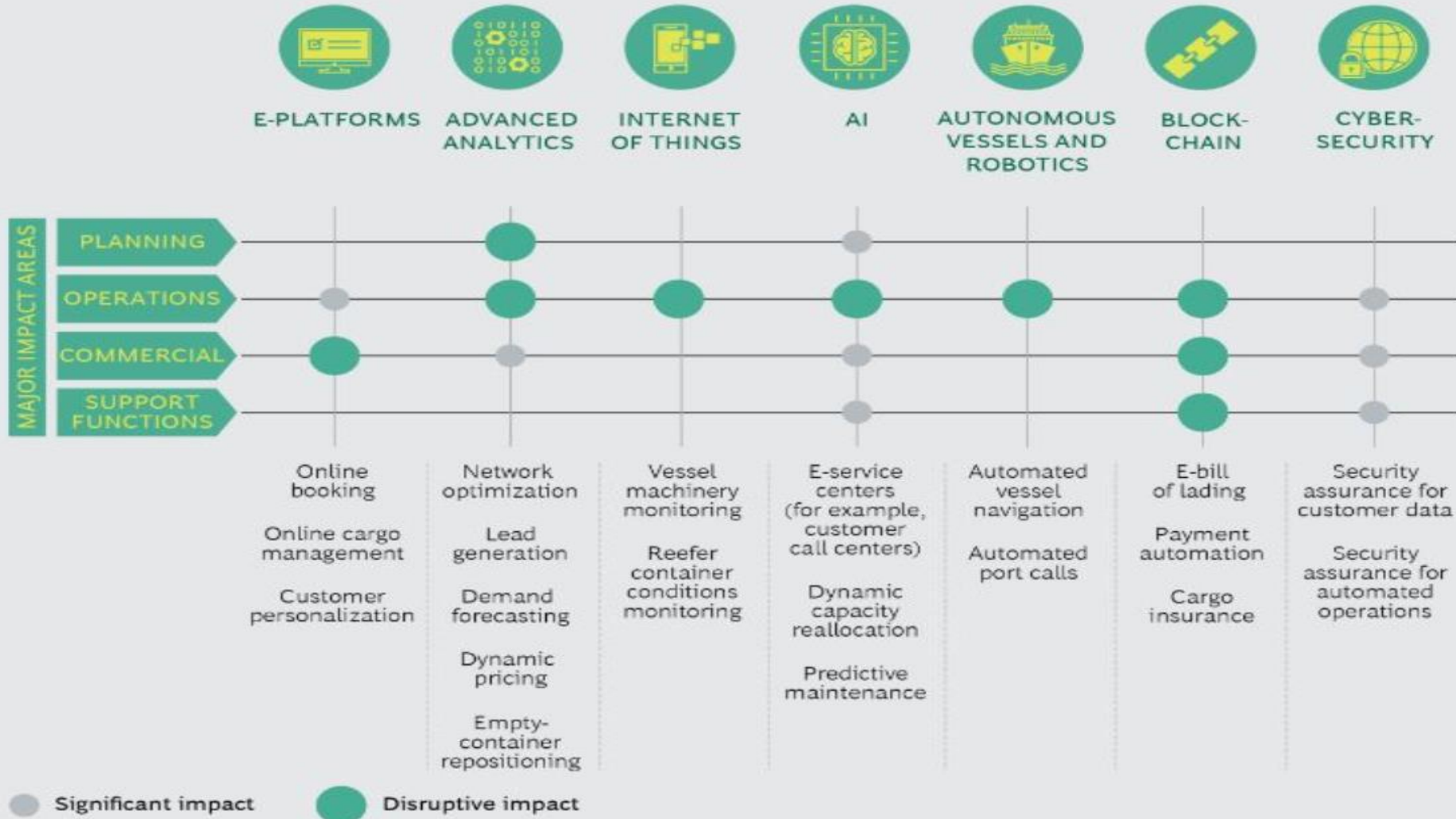
SO WHAT EXACTLY IS DIGITALIZATION



Digitalization is the use of digital technologies to change a business model and provide new revenue and value-producing opportunities; it is the process of moving to a digital business.

FOR INSTANCE

EXHIBIT 2 | Seven Digital Trends Will Transform Container Shipping



Source: BCG analysis.

MASS – Maritime Autonomous Surface Ships

IMO terminology (MSC99)

Ship with automated processes and decision support:

Seafarers are on board to operate and control shipboard systems and functions. Some operations may be automated.

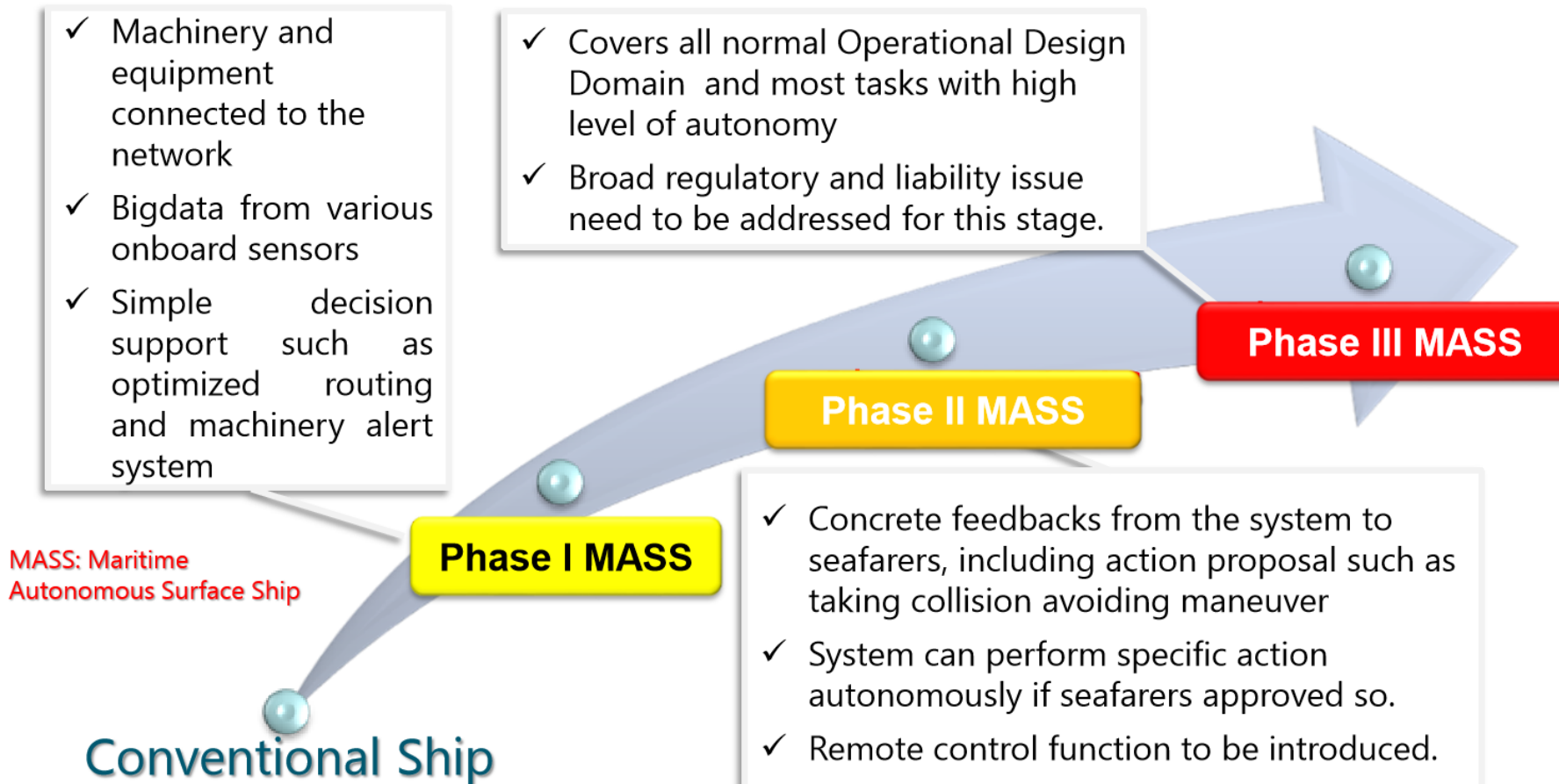
Remotely controlled ship with seafarers on board: The ship is controlled and operated from another location, but seafarers on board.

Remotely controlled ship without seafarers on board: The ship is controlled and operated from another location. There are no seafarers on board.

Fully autonomous ship: The operating system of the ship is able to make decisions and determine actions by itself.

MASS – Main Steps

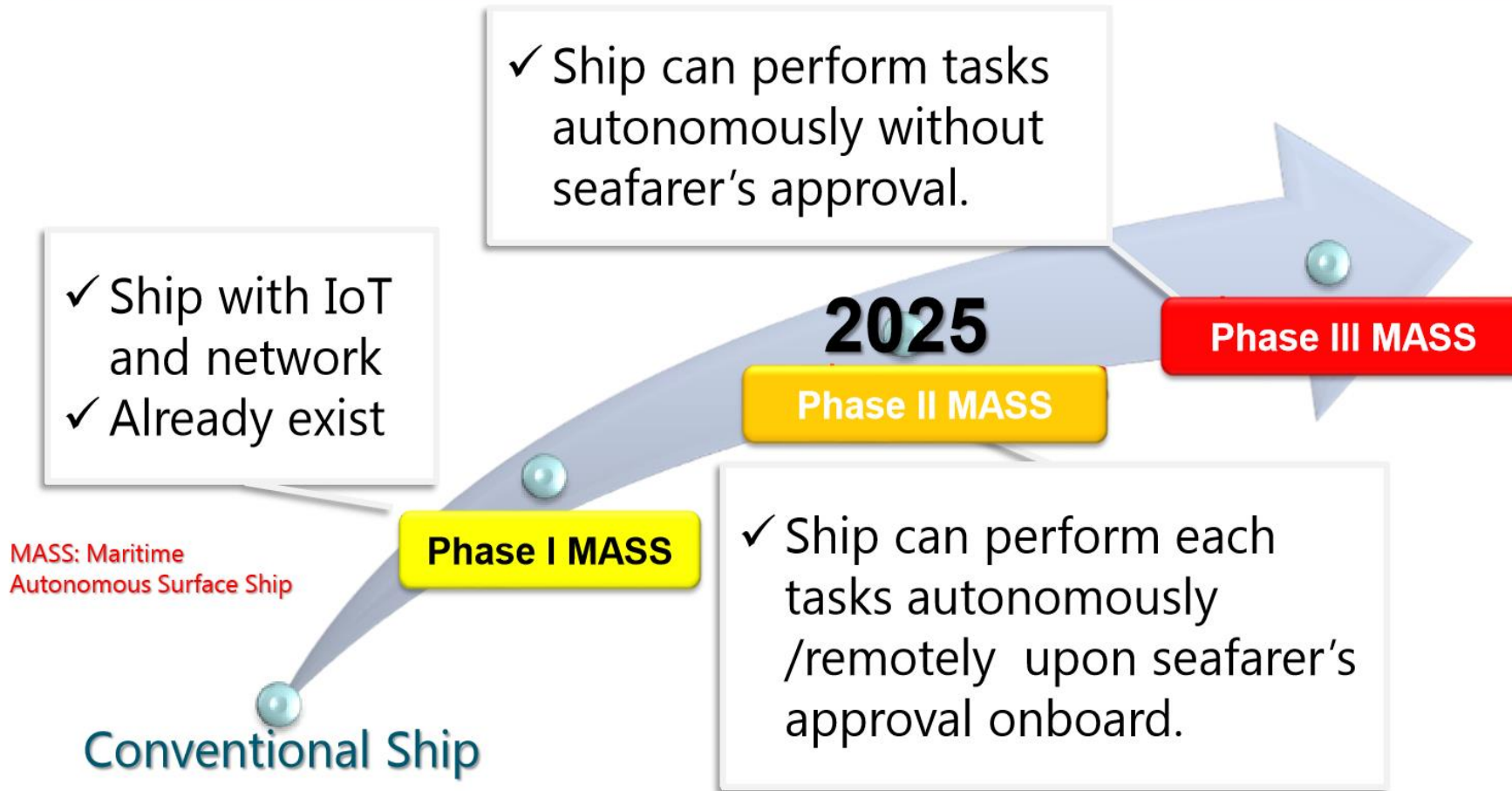
- From technology development perspective, the ship will make evolution gradually from conventional ship towards autonomous ship.
- In foreseeable future, such shiptype as bulker, tanker and container ship would be still be manned.



Akihiro Tamura
Maritime Bureau,
MLIT Japan

MASS – Main Steps

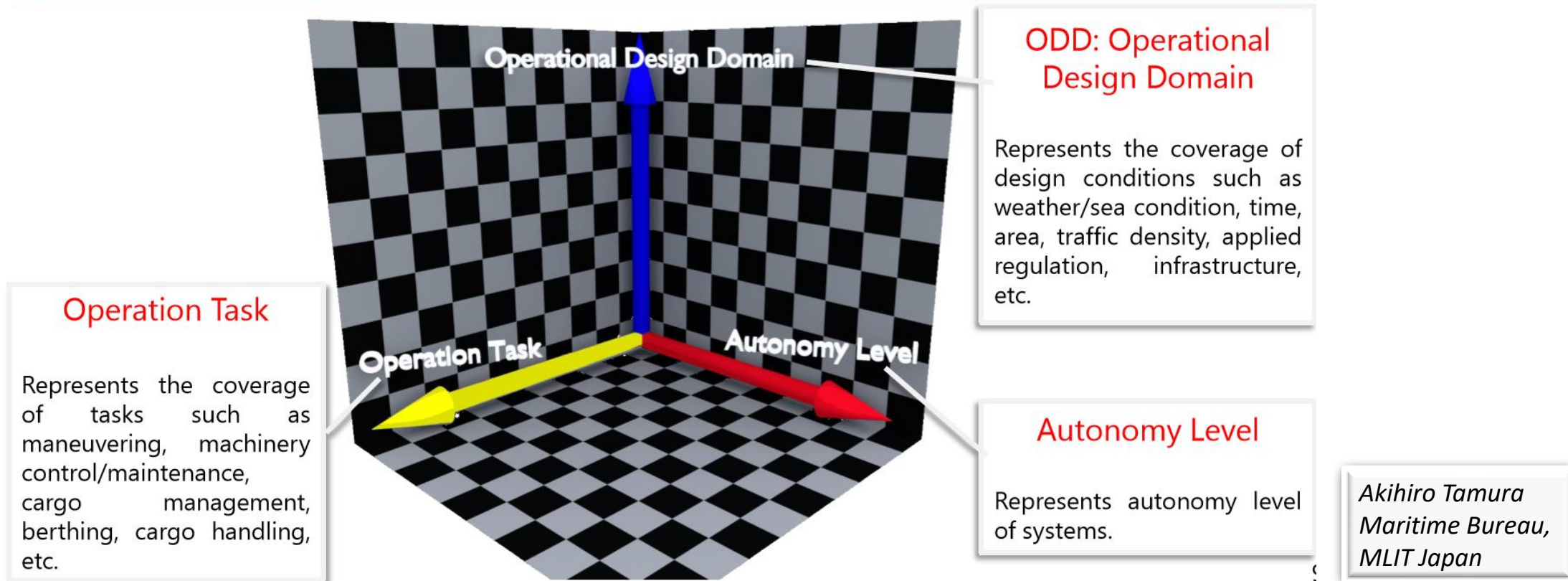
■ In short....



Akihiro Tamura
Maritime Bureau,
MLIT Japan

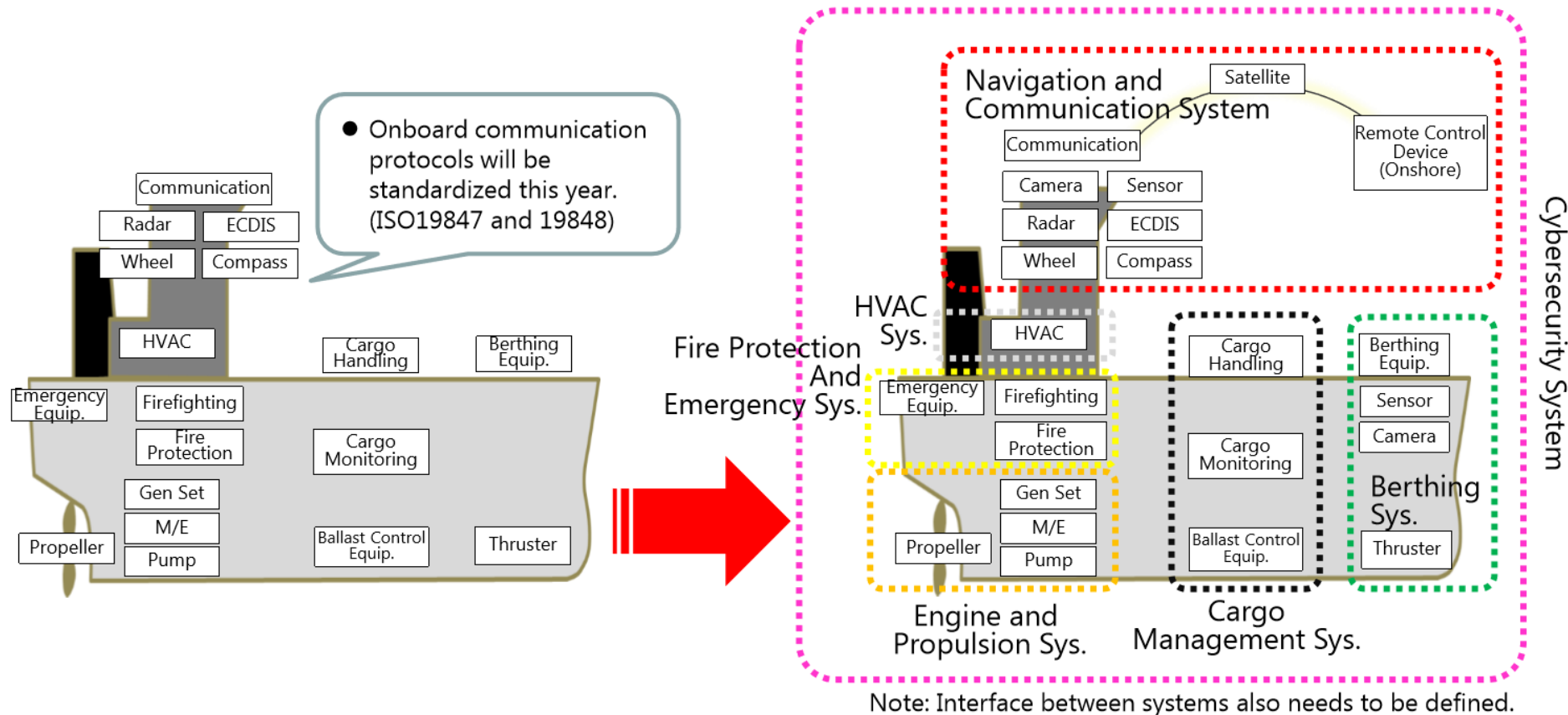
MASS – Main Steps

- Development of Autonomous ship could be represented conceptually by three axis, i.e. Autonomy Level, Operation Task and Operational Design Domain.
- From macro perspective, autonomous ship will be developed in such manner as expanding coverages in all three axis.
- The speed of expansion in each axis could be varied.



MASS – Main Steps

- As ship develops towards the autonomous ship, the architecture of ship will be changed to more systemized or modularized one.
- In such an architecture, ship's total performance and its value tends to be determined by each module's or system's performance.



Akihiro Tamura
Maritime Bureau,
MLIT Japan

ONE MAIN ISSUE: DATA QUALITY

Shipping community is facing the big challenges of **Internet of Things** and **Big Data Management**. These challenges introduce the need to **produce, re-use** and **manage** a huge amount of data both on-board and ashore.

Taking advantage of the huge amount of data requires a different way of thinking: **How data is built and used?** How much of it we can handle? How fast we can process and analyse it? Where and how decisions are made?



Anyhow a huge amount of “reliable” data is required !

IMPROVEMENT OF THE WHOLE LIFE-CYCLE EFFICIENCY AND COST PREDICTION

Big Data allows to manage large volumes of data like:

- Text
- Audio
- Video
- Animation
- Simulation
- Data collected by equipment sensors
- Reliability information
- etc



The ultimate goal is to:

- Reduce the risks
- Improve safety on-board
- Improve performance
- Reduce costs
- Automate operations and navigation
- Integrate systems
- etc

A huge amount of “reliable” data is required !

For All IT remains on Golden Rule

Input wrong
data

+



= Output Decision
Disaster

Only “reliable” data from the manufacturer can
derive to the right Output Decision !

INTRODUCING SHIPDEX WWW.SHIPDEX.ORG

Shipdex is an independent and non-proprietary standard protocol,
open to all shipping players who wish to adopt it

Shipdex is a collection of business rules and writing rules developed
to standardize and improve the production and the exchange of
technical information

Shipdex is based on the international **S1000D** specification

Steering
Committee

SPSC

Maintenance
Group

SPMG

SPTG-001

SPTG-002

SPTG-003

Task Groups in charge to implement new
features

The Shipdex Executive Members:

- BIMCO
- G&C Shipping (*chair*
- MAN Energy Solutions
- Mastermind Shipman
- Rolls-Royce Marine
- Shipdex Consulting Ltd. (*technical manager*)
- Winterthur Gas & Diesel
- Yanmar





The SHIPDEX™ Protocol



The International specification to standardize the development and the exchange of technical and logistic data within the shipping community

Issue 3.2
1st June 2018



International specification for technical publications

utilizing
a common source database



Issue 2.3, 2007-02-28



Shipdex is the S1000D (www.s1000d.org) customization for the shipping community

- ❑ Shipdex™ makes use of the following information sets:
 - ❖ **Description and operation** (The “Descriptive” and/or the “Procedural” schemas shall be used)
 - ❖ **Maintenance procedure** (The “Procedural” xml Schema shall be used)
 - ❖ **Troubleshooting** (The “Descriptive ” Schema shall be used to contain the troubleshooting information)
 - ❖ **Illustrated parts data** (The “Descriptive” Schema shall be used to contain the Manufacturers List information and The “IPD” Schema shall be used to contain the Parts Data information)
 - ❖ **Service Bulletin** (The relevant xml schemas shall be used depending on the Service Bulletin content)
 - ❖ **Maintenance Planning** (The “schedule” Schema shall be used to contain the maintenance planning information)
 - ❖ **Learning** (The relevant xml schemas shall be used depending on CBT content)

- ❑ Contracts between manufacturers and ship-owners can define which information sets are required (and more ..)

BUT WHY ALL THIS?

- The main scope of digitalization is the one of becoming more efficient, while spending less.
- Easy to write, difficult to achieve, as it encompasses every aspect of ship management, including:
 - Voyage operations
 - Fleet maintenance
 - Port Operations
 - Cargo Operations
 - Capacity (bookings) management
 - Intermodal Operations
 - Commercial activities
 - Customers online
 - Sales force effectiveness
 - Dynamic pricing
 - Procurement
 - Shared Services – Support
- Still, whoever will be able to adopt the full concept of Digitalization, will be able to compete with a much lower cost base.
- Recognizing the opportunity, e-commerce giant Amazon has obtained a license to operate as an assetless cargo forwarder between China and the US.

The potential of an industry outsider – February 2018

- WASHINGTON — Amazon has received a license from the Federal Maritime Commission to operate as a non-vessel operating common carrier of cargo from China to the United States, the latest sign of how the e-commerce giant is taking a more active role in transporting its own freight.
- The granting of the license, which was first noted by Flexport, a San Francisco-based logistics startup, allows Amazon China to sell ocean freight services via its Beijing-based subsidiary, Beijing Century JOYO Courier Service Co. The move comes after reports of Amazon considering entering into the air cargo business and its purchase of thousands of trailers for U.S. delivery. As an NVOCC, Amazon would carry its cargo under its own bill of lading.
- “With ocean freight itself so low, a considerable portion of logistics costs come through labor costs—particularly compliance and coordination of cargo handoffs between different players in the chain,” Flexport CEO Ryan Petersen wrote in a blog. “It’s here that automation, something no traditional freight forwarding company can do even one percent as well as Amazon can, becomes the key competitive advantage over legacy freight forwarders.”

TO CONCLUDE MY PRESENTATION:

Shipping is still not out of its most painful period ever.

Nevertheless, it is probably at a strong changing moment: low charter rates, high availability of ships, consolidation amongst largest companies, and digitalization, may completely change the way we see shipping.

So, remember Darwin: in times of evolution, it is not the strongest who will survive, but the one who will better adapt to changes.



THANK YOU