The Dry cargo Markets – Dry Bulk and Containers – Sector Review and Outlook

Shanghai – 10th May 2016

Jan-Olaf Probst, Director Business Development – Executive Vice President
Content

- Market trend
  - Container shipping freight rate
  - Container fleet and sea borne trade development

- Consolidation at the container market
  - Merger of companies
  - Forming of new container alliance’s

- Bigger, bolder better?
  - Where are the limits for Container Ships?
  - Where are harbor limitations?
  - $2 \times 10,000 = 20,000$?

- Conclusion
Content

- Market trend
  - Container shipping freight rate
  - Container fleet and sea borne trade development

- Consolidation at the container market
  - Merger of companies
  - Forming of new container alliance’s

- Bigger, bolder better?
  - Where are the limits for Container Ships?
  - Where are harbor limitations?
  - $2 \times 10.000 = 20.000$?

- Conclusion
The container shipping freight rates have declined since 2009

The Shanghai Containerized Freight Index (SCFI) represents the freight rate for export container from Shanghai. The SCFI gives a clear trend for the global container freight rates.

Source: Clarksons, Bloomberg
From end 2010 to end 2015 the container fleet development had been:

- increase of 311 vessels
- increase of 5.7 mTEU capacity
- this would be equal to 311 vessels with a capacity of each 18,300 TEU
- A trend of larger but reduced number of vessel could be detected at all major liner
Containerships – Idle fleet/lay-ups

Idle Fleet [number of vessels]

Idle Fleet [mio TEU]

Source: Alphaliner
The container trade volume has been increased only by 2% in 2015.

The forecast of 2016 with a container trade volume of plus 4% is too optimistic and a positive value in 2016 would be beneficial for the container market.

The cargo volume on both legs (westbound/eastbound) are far from in balance:
- Large amount of empty container on one trade, which could not be charged.
- Larger vessels could compensate this effect as well as seasonal deviation.

Source: IHS Fairplay
Content

- Market trend
  - Container shipping freight rate
  - Container fleet and sea borne trade development

- Consolidation at the container market
  - Merger of companies
  - Forming of new container alliance’s

- Bigger, bolder better?
  - Where are the limits for Container Ships?
  - Where are harbor limitations?
  - $2 \times 10,000 = 20,000$?

- Conclusion
The first five (5) companies hold a market share of close to 49%
New ranking of present top 17-20 liner companies – 1/3

Top 20 Containership Operator as at 1 February 2016

Orderbook
Operated fleet as at Feb 2016

APM-Maersk
MSC
CMA CGM
COSCO
Evergreen
Hapag-Lloyd
COSCO
CSCL
Hamburg Sud
Hanjin Shg
OOCL
MOL
UASC
APL
Yang Ming
NYK Line
Hyundai M.M.
K Line
Zim
PIL
Wan Hai

ALPHALINER
New ranking of present top 17-20 liner companies – 2/3
New ranking of present top 17-20 liner companies – 3/3
Merger of HALO + UASC not considered

- In less than 18 month three liner companies will/has disappear from the market

Global Container Shipping Companies in TEU capacity
- Capacity in T-TEU
- Based on April 2016 including delivered vessels
- Outstanding deliveries not included
- Own and charter tonnage

Source: citi and Alphaliner
Illustration of liner alliances changes due to merger activities
Based on Far East – Europe trade

Today

2M
Expiration date: January 2025

Ocean 3
Expiration date(1): September 2016

G6
Expiration date: March 2017

CKYHE
Expiration date(2): February 2018

Tomorrow

Expenses and MAERSK

Source: Citi and Alphaliner
Illustration of TEU capacity changes due to merger activities A
Based on Far East – Europe trade
Content

- Market trend
  - Container shipping freight rate
  - Container fleet and sea borne trade development

- Consolidation at the container market
  - Merger of companies
  - Forming of new container alliance’s

- Bigger, bolder better?
  - Where are the limits for Container Ships?
  - Where are harbor limitations?
  - $2 \times 10,000 = 20,000$?

- Conclusion
Different nominal container capacity of current world largest Container Vessels with similar principal dimensions
Layout of 18.000++TEU Container Vessels

- Four (4), five (5) or six (6) 40’ bays behind the funnel
- Twenty-four (24) 40’ bays in total
- Number of 40’ bays forward of the deck house:
  - 8x 40’ in operation
  - 7x 40’ in production
  - 6x 40’ on order
  - 6x 40’ calculated by DNV GL
- Twin-Island design
Vessel deployment changes in 2015 [x 1,000 TEU]

-700 -600 -500 -400 -300 -200 -100 0 100 200 300 400 500 600 700 800

EUR to N. America
FE to N. America
Europe - FE
ME/ISC related
Africa related
Latin America related
Oceania related
Intra FE
Intra Europe
Others
idle

Source: Alphaliner
Number of vessels larger than 13,300 TEU calling at each port
Year 2015

Source: Alphaliner
Harbour operation and number of gantry cranes
## Gantry crane facilities

<table>
<thead>
<tr>
<th>Port</th>
<th>Outreach (m)</th>
<th>SWL (t)</th>
<th>Number of crane</th>
<th>Delivered month-year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evergreen Kaohsiung</td>
<td>65</td>
<td>65</td>
<td>4</td>
<td>11-14</td>
</tr>
<tr>
<td>Evergreen Kaohsiung</td>
<td>65</td>
<td>65</td>
<td>2</td>
<td>02-15</td>
</tr>
<tr>
<td>Evergreen Kaohsiung</td>
<td>63</td>
<td>50/65</td>
<td>3</td>
<td>12-15</td>
</tr>
<tr>
<td>Evergreen Los Angeles</td>
<td>63</td>
<td>50</td>
<td>3</td>
<td>02-15</td>
</tr>
<tr>
<td>LBCT Long Beach</td>
<td>69</td>
<td>65</td>
<td>8</td>
<td>03-14</td>
</tr>
<tr>
<td>LBCT Long Beach</td>
<td>69</td>
<td>65</td>
<td>8</td>
<td>03-19</td>
</tr>
<tr>
<td>Port of Miami</td>
<td>68</td>
<td>65</td>
<td>4</td>
<td>06-14</td>
</tr>
</tbody>
</table>
What does the development of ship sizes mean for a terminal? What does that mean for the hinterland?

<table>
<thead>
<tr>
<th>Vessel size</th>
<th>Number of TEU per call (average)</th>
<th>Total TEU moves annual based on vessel</th>
<th>Total TEU moves annual based on terminal</th>
</tr>
</thead>
<tbody>
<tr>
<td>8,600 TEU vessel</td>
<td>4.000</td>
<td>208.000</td>
<td>337,000</td>
</tr>
<tr>
<td>14,000 TEU vessel</td>
<td>6.500</td>
<td>325.000</td>
<td>526,500</td>
</tr>
<tr>
<td>19,000 TEU vessel</td>
<td>8.800</td>
<td>440.000</td>
<td>712,800</td>
</tr>
</tbody>
</table>

- Example for a 19,000 TEU Container Ship with 8,800/14,250 TEU moves

<table>
<thead>
<tr>
<th>Carrier</th>
<th>Number of TEU per carrier</th>
<th>TEU / carrier</th>
<th>Number of carrier (approximately)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feeder Vessel</td>
<td>4.795</td>
<td>800</td>
<td>6</td>
</tr>
<tr>
<td>Train</td>
<td>4.735</td>
<td>90</td>
<td>53</td>
</tr>
<tr>
<td>In-Land Water Vessel</td>
<td>290</td>
<td>96</td>
<td>3</td>
</tr>
<tr>
<td>Truck</td>
<td>4.225</td>
<td>1,6</td>
<td>2,640</td>
</tr>
</tbody>
</table>
### 2 x 10,000 TEU < 1 x 20,000 TEU?

<table>
<thead>
<tr>
<th>Size</th>
<th>Price (USD)</th>
<th>Main Engine (kW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10,000 TEU</td>
<td>89,000,000</td>
<td>36,000</td>
</tr>
<tr>
<td>20,000 TEU</td>
<td>145,000,000</td>
<td>51,000</td>
</tr>
</tbody>
</table>
2 x 10,000 TEU < 1 x 20,000 TEU?
Are we talking about overcapacity?

- Transportation cost of a 20’ container (TEU) of 1000 nautical miles
- Main parameter for the calculation:
  - Same total cargo carry capacity in the year
  - CAPEX
  - OPEX:
    - Bunker + lube oil + auxiliary energy
    - Dry docking + maintenance + spares
    - Crewing + provision + freshwater + else
    - Insurance

<table>
<thead>
<tr>
<th>Vessels</th>
<th>2 x 10,000 TEU</th>
<th>20,000 TEU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Utilisation</td>
<td>100 %</td>
<td>77%</td>
</tr>
</tbody>
</table>
Content

- Market trend
  - Container shipping freight rate
  - Container fleet and sea borne trade development

- Consolidation at the container market
  - Merger of companies
  - Forming of new container alliance’s

- Bigger, bolder better?
  - Where are the limits for Container Ships?
  - Where are harbor limitations?
  - 2x10.000 = 20.000?

- Conclusion
The Dry cargo Markets – Dry Bulk and Containers – Sector Review and Outlook

Jan-Olaf Probst, Executive Vice President
jan-olaf.probst@dnvgl.com
Mobile: +49-172 419 2102

www.dnvgl.com