Maritime Shipping

Marine Money – Dry Bulk Shipping Overview
Dry Bulk Carrier Market Analysis

- Strongest dry bulk shipping market in history began in 2002 and ended in 2008
  - Infrastructure investment/projects in China stimulated dry bulk demand
  - Iron ore production capacity growth in Australia and Brazil satisfied demand needs
  - Capesize spot charter rates hit all-time highs of over $200,000/day in 2007 & 2008

- Dry bulk market decline began in 2008 and market remained weak through 2016
  - Chinese transitioned away from infrastructure investment-led economic growth
  - Significant dry bulk shipyard deliveries created extremely oversupplied market
  - Capesize spot charter rates averaged less than $18,000/day between 2009-2016

**Global Dry Bulk Growth**

- Iron Ore: 4.7% CAGR
- Coal: 4.3% CAGR
- Grain: 1.2% CAGR
- Minor Bulks: 0% CAGR

**Dry Bulk Shipping Spot Charter Rates**

- Capesize
- Panamax
- Supramax

Source: Clarksons Research Services Limited (CRSL), Jefferies
Dry Bulk Carrier Market Analysis

- Dry bulk shipping market remains oversupplied by hundreds of dry bulk carriers
- Oversupply is reflected in continued practice of slow steaming (current average speed of ~12.0 knots/hr vs. historical average speed of ~14.0 knots/hr)
- Oversupply effectively limits charter rate strengthening potential as additional shipping capacity is added by dry bulk carriers simply speeding up
- Marginal improvements in supply/demand dynamics could lead to improvement in dry bulk shipping charter rates from the depressed levels of recent years
- Order of magnitude of improvement dependent on several variables, but essentially a function of exporters profit maximization calculations

![Average Dry Bulk Steaming Speed](chart1)

![Dry Bulk Shipping Demand Growth vs. Fleet Growth](chart2)
Dry Bulk Carrier Market Outlook – Demand Fundamentals

- Relevant dry bulk shipping demand statistics from 2016:
  - Chinese steel production increased ~1%; Chinese steel exports decreased ~3%
  - Chinese iron ore imports increased ~7%; Chinese iron ore production increased ~6%
  - Australian iron ore exports increased ~5%; Brazilian iron ore exports increased ~2%
  - Chinese seaborne coal imports increased ~20%

- Chinese iron ore and coal import demand remains significant wildcard

- Australian & Brazilian miners production growth trajectory looks set to improve

- Global seaborne dry bulk trade projected to increase ~2% in 2017 and in 2018

![Chinese Iron Ore & Coal Imports Graph](source: Bloomberg)

![Iron Ore Expansion (2012A-2018E) Graph](source: Company filings)
Dry Bulk Carrier Market Outlook – Supply Fundamentals

- Dry bulk carrier orderbook remains extremely small at ~9% of existing fleet
- Actual dry bulk carrier deliveries continue to fall well short of orderbook projections
- Slippage has averaged 35-40% from 2009-2016 pa and was 49% in 2016
- Scrappings have decelerated due to recent strength in charter rates in 2017
- Dry bulk carrier fleet unlikely to grow significantly and could actually shrink in size
- Projected dry bulk carrier net fleet growth of 2-3% in 2017 and 0-1% in 2018
## Dry Bulk Carrier Market Supply/Demand Model

### ALL BULK COMMODITIES

*(in millions of tons)*

<table>
<thead>
<tr>
<th>Year</th>
<th>Coal</th>
<th>Iron Ore</th>
<th>Grains</th>
<th>Other Minor Bulks</th>
<th>Total</th>
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<tbody>
<tr>
<td>2009</td>
<td>808</td>
<td>928</td>
<td>321</td>
<td>1,402</td>
<td>3,459</td>
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<tr>
<td>2010</td>
<td>932</td>
<td>1,013</td>
<td>343</td>
<td>1,578</td>
<td>3,866</td>
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<tr>
<td>2011</td>
<td>1,001</td>
<td>1,060</td>
<td>345</td>
<td>1,682</td>
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<tr>
<td>2012</td>
<td>1,120</td>
<td>1,112</td>
<td>375</td>
<td>1,736</td>
<td>4,343</td>
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<tr>
<td>2013</td>
<td>1,182</td>
<td>1,183</td>
<td>392</td>
<td>1,824</td>
<td>4,581</td>
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<tr>
<td>2014</td>
<td>1,215</td>
<td>1,318</td>
<td>432</td>
<td>1,841</td>
<td>4,806</td>
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<tr>
<td>2015</td>
<td>1,142</td>
<td>1,356</td>
<td>459</td>
<td>1,862</td>
<td>4,819</td>
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<tr>
<td>2016</td>
<td>1,140</td>
<td>1,385</td>
<td>476</td>
<td>1,862</td>
<td>4,863</td>
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<tr>
<td>2017E</td>
<td>1,170</td>
<td>1,399</td>
<td>499</td>
<td>1,896</td>
<td>4,964</td>
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<tr>
<td>2018E</td>
<td>1,184</td>
<td>1,446</td>
<td>520</td>
<td>1,913</td>
<td>5,064</td>
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### Additional Panamaxes Required

*(in millions of dwt)*

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<tr>
<td>Begining balance</td>
<td>419.7</td>
<td>462.5</td>
<td>541.2</td>
<td>621.8</td>
<td>687.5</td>
<td>726.7</td>
<td>758.4</td>
<td>776.5</td>
<td>793.8</td>
<td>817.0</td>
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<tr>
<td>Deliveries</td>
<td>53.7</td>
<td>86.0</td>
<td>105.5</td>
<td>100.4</td>
<td>63.0</td>
<td>48.2</td>
<td>49.3</td>
<td>47.2</td>
<td>33.2</td>
<td>18.2</td>
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<tr>
<td>Deletions, Repair &amp; Congestion</td>
<td>(10.8)</td>
<td>(7.2)</td>
<td>(25.0)</td>
<td>(34.6)</td>
<td>(23.8)</td>
<td>(16.4)</td>
<td>(31.2)</td>
<td>(30.0)</td>
<td>(10.0)</td>
<td>(10.0)</td>
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<tr>
<td>Ending Balance</td>
<td>462.6</td>
<td>541.3</td>
<td>621.7</td>
<td>687.6</td>
<td>726.7</td>
<td>758.4</td>
<td>776.5</td>
<td>793.8</td>
<td>817.0</td>
<td>825.2</td>
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<tr>
<td>Fleet Growth</td>
<td>42.9</td>
<td>78.8</td>
<td>80.5</td>
<td>65.8</td>
<td>39.2</td>
<td>31.8</td>
<td>18.1</td>
<td>17.3</td>
<td>23.2</td>
<td>8.2</td>
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### Additional Panamaxes Delivered

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<tr>
<td>613</td>
<td>1,126</td>
<td>1,150</td>
<td>940</td>
<td>560</td>
<td>454</td>
<td>258</td>
<td>247</td>
<td>332</td>
<td>117</td>
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### Vessel (Shortage)/ Surplus

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</tr>
</thead>
<tbody>
<tr>
<td>906</td>
<td>(3)</td>
<td>533</td>
<td>231</td>
<td>(99)</td>
<td>(172)</td>
<td>221</td>
<td>124</td>
<td>51</td>
<td>(161)</td>
<td></td>
</tr>
</tbody>
</table>

Demand Growth = trade growth converted into Panamaxes based on 65,000t cargoes x 6 trips per year
Supply Growth = net change in bulk fleet divided by 70,000 dwt

Source: Clarksons Research Services Limited (CRSL), Jefferies LLC
Dry Bulk Carrier Market Analysis & Outlook - Summary

- Dry bulk shipping market likely to remain volatile in 2017 and improve in 2018
- Short-term demand spikes could lead to short-term spot charter rate spikes this year
- Unpredictable nature of Chinese stimulus measures, iron ore/coal production restrictions, etc. makes forecasting dry bulk shipping demand extremely difficult
- Most likely dry bulk shipping demand growth driver in 2017 is Vale’s $14 billion S11D mine in Brazil with exports expected to expand ~5% in 2017 and ~1.5% in 2018
- Minimal dry bulk shipping supply growth (and possible dry bulk shipping supply contraction) sets stage for spot charter rate spikes based on demand spikes
- Increased dry bulk shipping charter rate volatility likely to transition to sustainable increased dry bulk shipping charter rates
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