MARKET DISTORTING FACTORS
The Role of Government Interventions in Shipbuilding

Document [C/WP6(2018)17]

OECD Workshop on Factors Impacting Costs and Distorting the Shipbuilding Market

Paris, November 29, 2018

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Outline

1. Background & Goal of the paper
2. Features of the shipbuilding industry
   i. Ship production process and the relevance of Time To Delivery (TTD)
3. The role of government interventions
   i. Preferential financing inconsistent with market conditions
   ii. Government Procurement (GP) policies
   iii. Non-enforcement of national bankruptcy law
4. Conclusion and further remarks
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Why are some industries more prone to excess capacity than others?

• Major reasons promoted in the literature:
  – Irreversibility of investment (i.e. capital stock as sunk costs)
  – Capital stock construction lags (i.e. yards, docks etc. are not built in one day), making capacity investments slow, and thereby rendering good times even more profitable for existing firms

➢ Cyclical excess capacity*: Firms delay exit decisions in anticipation of better times.

*”naturally” occurring market imbalance as a consequence of cyclical drop in demand.
What determines the extent of such market imbalances?

• Looking at the role of government support measures with market-distorting effects.

**Market-distortive factors** "[...] reinforce or counteract the allocative effects that the existing market would otherwise produce.“ [Rodrik, 2005]

• Importance of understanding the features of the shipbuilding industry in order to understand the channels through which government interventions work.
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Ship production process & the concept of Time To Delivery (TTD)

Illustrative example of a ship production process
Cumulative production share

Average Time to Delivery

Time to Delivery of a vessel increases during periods of high demand.

➢ Yards’ capacity constraints add queuing time for new orders.

Ships are investment products in an environment of demand uncertainty for transportation services. Buyers prefer shorter waiting times.

Note: Ship yards may organize their production processes differently. This graph aims to show only an illustrative example of the delivery time comprising “queuing time” and “net production time”. The production shares do not reflect actual numbers. 
Source: rhs: elaborated by OECD and based on information obtained through interviews with ship yards. Lhs: OECD based on Clarkson World Fleet Register, 2017
TTD as a smoothing factor to investment

Negative demand shock: Effect of elastic supply on production levels

Certain government measures distort the optimal investment behaviour of shipbuilders and ship buyers, and exacerbate the cyclical downturn.

Note: This reasoning would not change when the Supply_Gvt curve would additional shift downwards (implying reductions in production costs reflected in lower prices). Source: elaborated by OECD and based on information obtained through interviews with ship yards.
• **Shipbuilding**: the greater responsiveness of production levels to demand results in **higher order volumes of up to 16%**, a **twice more volatile ship production**, and **significantly lower ship prices**.

• Resulting in a **more severe situation of unused capacity** in shipbuilding.

• **Shipping**: under the pure construction time (i.e. no additional waiting time due to orders queuing at yards) the **fleet is larger** and **45% more volatile**, and **freight rates are** lower although **less volatile** (by around 2%).

• **Consumers (shippers)**: **higher consumer surplus** as a result of reduced freight rates (resulting from shorter delivery times).

Simulation results confirm these mechanisms (Kalouptsidi, 2014)
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Preferential financing inconsistent with market conditions

• Financing instruments usually featuring **interest rates below those available on the market** or by **longer grace periods**, or a combination of these (IMF, 2003).

• Focus on preferential loans for shipbuilders in the context of **working capital loans**.

*The paper discusses loans and guarantees for shipbuilders and ship buyers. Both investment and working capital loans. For the sake of time the presentation discusses only the example of working capital loans to shipbuilders.*
Importance of ship finance – accruing working capital requirements

Illustrative example of stage payments and cash expenditures

<table>
<thead>
<tr>
<th></th>
<th>Contract signing</th>
<th>Contract signing + 3M</th>
<th>Steel cutting - 4M</th>
<th>Steel cutting</th>
<th>Keel laying</th>
<th>Launch</th>
<th>Delivery</th>
<th>SUM</th>
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<tbody>
<tr>
<td>Cash expenditures (%)</td>
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<td>Stage/Advanced payments (%)</td>
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<td>Accumulated advanced payments (%)</td>
<td>Buyer’s market</td>
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<td>100</td>
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<tr>
<td>Sufficient/insufficient cash (%)</td>
<td>Buyer’s market</td>
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<td>-37 100</td>
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<td>20</td>
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</table>

- Buyers’ stage payments **hardly cover cash expenditures** for material, equipment, labour etc.
- **More so in a buyer’s market**, i.e. where major down-payment takes place at delivery of the vessel.

*Note:* The numbers are made up for illustrating the example only. *Source:* OECD derived from exchanges with shipbuilding contacts.
Potential effect of preferential financing on supply primitives

<table>
<thead>
<tr>
<th>Direct</th>
<th>Indirect</th>
<th>Through cost factors</th>
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<tbody>
<tr>
<td>A: Output</td>
<td>B: Company income</td>
<td>C: Cost of intermediate inputs</td>
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</table>

- Reduced ship prices (i.e. keeping profit margin stable) may lead to increased demand – **increased firm output**.
- Stable ship prices (i.e. increasing the profit margin rather than passing through the cost reductions to the buyer) – **increased firm income**.
- In the long-term, possibility to use such financial advantages for **land or capital expansions**.

**Source:** OECD based on OECD (2018__).
OECD Taxonomy of GP group or practices:

1. Market access restrictions,
2. Domestic price preferences,
3. Local content requirements (LCR),
4. Others (including Collateral restriction/restrictive effects, Conduct of procurement, Qualification criteria, Evaluation criteria, Review/complaint system, Transparency and information)
Example of market access restrictions

OECD GP Taxonomy: Market Access Restrictions

<table>
<thead>
<tr>
<th>Subgroup</th>
<th>Sub-category</th>
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<tbody>
<tr>
<td>M1: Market access restriction</td>
<td>M11: To national supplier</td>
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<td>M12: To local supplier</td>
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<td>M13: To joint ventures with national supplier</td>
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<td>M14: Access based on reciprocity</td>
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<td>M15: Commercial presence required</td>
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<td>M16: Exclusion for national security or safety reasons</td>
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<td>M17: Thresholds</td>
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</table>

Source: Gourdon, Bastien and Folliot-Lalliot (2017[32]).

Potential effect of market access restrictions on supply primitives

<table>
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<tr>
<th>Direct</th>
<th>Indirect</th>
<th>Supply</th>
<th>Through cost factors</th>
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<tbody>
<tr>
<td>(A) Output</td>
<td>(B) Company income</td>
<td>(C) Cost of intermediate inputs</td>
<td>(D) Labour</td>
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</table>

Source: OECD based on OECD (2018[19]).

- National firms **increase their production and thereby income** not on the basis of market principles but of government protection.
Government intervention in national insolvency proceedings

Government designed rescue systems ("bail-outs")

"Too Big To Fail" argument:

• To prevent a financial contagion to other parts of the economy, resulting in large economic costs.
• To solve the financial distress of systemically important firms.

Incentive problems of stakeholders – moral hazard

• creditors may extend their funding volume beyond what they would have otherwise.
• managers may deliberately fail to prepare for bankruptcy and continue with high risk projects.
• potential acquirer of the distressed firm may argue for taxpayer assistance as a prerequisite for completing the deal.
~9% of capital stock is sunk in theoretically insolvent yards in 2013

Share of insolvent firms by turnover, capital stock and employment

- 18% lower productivity (TFP) levels of these “zombie firms” on average.

Note: Please note that we do not have any information available about whether or not the firms follow insolvency proceedings. The statistics provided are descriptive only and do not judge whether a bankruptcy proceeding is necessary or not.

In line with other OECD work we define insolvent firms as those with an interest coverage below 1 in three consecutive years and of age equal or above ten years McGowan, Andrews and Millot (2017[39]). The analysis is based on countries highlighted in green in Table A D.1. Due to a limited sample period for China the analysis covers only the years up to 2013.

Source: based on ORBIS; Kalouptsdi and Barwick (Fall 2017[11])
Potential effect of non-enforcement of national bankruptcy law

<table>
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<tr>
<th>Direct</th>
<th>Indirect</th>
<th>Through cost factors</th>
<th>G: Knowledge</th>
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<tr>
<td>A: Output</td>
<td>B: Company income</td>
<td>C: Cost of intermediate inputs</td>
<td>D: Labour</td>
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</table>

|          |                  |                      |              | x | x | x | x |

- Labour, yard area, and capital (physical and financial) get sunk in these unprofitable and unproductive firms.
- **Congestion of market**, i.e. preventing more profitable firms to enter the market and forcing more productive firms to exit.

*Source: OECD based on OECD (2018).*
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Need for a horizontal policy approach

- **Allowing** free market entry and more importantly **exit of yards**;
- Upgrading the general level of labour skills and human capital through **strong training policies and education programs**;
- **Ensuring efficient capital markets** rather than targeted financial interventions inconsistent with market conditions;
- Enabling **resources** (i.e. capital stock and labour) to **move easily between sectors**

> Part of the project for the next PWB 2019-2020
THANK YOU

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Shipbuilding – A cyclical industry

Shipbuilding output across time

Note: *Data during wartime construction is not covered by HIS.
Source: OECD based on IHS Seaweb and Clarkson World Fleet Register.
Shipbuilding – a global customer base

Note: Export shares are calculated as the shares of a given country's production sold to a foreign owner. EU28's export share is calculated as the share of EU28's production sold to non-EU28 countries. Source: OECD based on Clarkson World Fleet Register, 2018.
Identical ship production mix of Chinese and Japanese ship yards

Product mix analysis – Finger-Kreinin index (in %)

Note: There may exist differences at lower levels of product aggregation. The calculation is based on the following 13 product categories: bulker, cruise ships, containerships, gas carrier, offshore services, pure car carriers, passenger, reefer, ro-ro, tankers, other dry cargo, other non-cargo, miscellaneous.

Source: OECD based on Clarkson World Fleet Register, 2018.
Shipping demand – four distinct markets

Four distinct markets for ship demand

- **Tourism market**
- **Freight market**
- **Newbuilding market [Shipyards]**
- **Second-hand market**
- **Scrap market**

- **Cruise ships**
- **Passenger ships**
- **Dry bulk [dry market]**
  - Capesize
  - Panamax/Kamsarmax
  - Handymax/Supramax
  - Handysize
- **Oil tanker [wet market]**
  - VLCC
  - Suezmax
  - Aframax
  - Panamax
  - Handysize
- **Container**
  - Feeder
  - Intermediate
  - Neo-Panamax
  - Post-Panamax
- **Specialized ships, e.g. LNG/LPG**
- **Offshore service**
  - Anchor Handling Tugs & Supply
  - Dredgers
  - Other Offshore

*Source: OECD based on Karakitsos and Varnavides (2014)*
Data coverage

Number of companies per year and country

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<thead>
<tr>
<th>Country</th>
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<td>total sample of # of firms of included countries</td>
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<td>756</td>
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<td>865</td>
<td>876</td>
<td>930</td>
<td>101</td>
<td>985</td>
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</table>

*China from Kalouptsidi and Barwick (Fall 2017).*

Note: The results do not change if we restrict the sample only to those firms or analyse the shipbuilding market by including all available firms as in the table above. This sample has no missing data on interest coverage, employment and capital stock. I used the ORBIS version with the highest number of firms for each country, and only with firms in the shipbuilding sector as primary industry.

Source: based on ORBIS version 2016-1 and 2016-2; *China is based on Kalouptsidi and Barwick (Fall 2017).
Yards are multi-product firms

Share of firm’s output by number of ship types
During contract years 1990-2016

Note: 13 product categories: bulker, cruise ships, containerships, gas carrier, offshore services, pure car carriers, passenger, reefer, ro-ro, tankers, other dry cargo, other non-cargo, miscellaneous.
Source: OECD based on Clarkson World Fleet Register, 2018.
Negotiation aspects of shipbuilding contracts for new buildings

Determinants of new building prices

Part I

Price

Further negotiation points influencing newbuilding price:
- Stage payments
- Vessel specifications (e.g. design)
- Newbuilding finance
- Contractual terms and conditions

Demand side factors

Supply side factors

1. Time to Build (TTB)
   - Changes with order book (backlog)
   - Determined via capacity (capital stock)
   - Short-term labour or outsourcing reducing production time

2. Production costs
   - Material
   - Labour
   - Capital
   - Productivity
   - Exchange rates
   - Economies of Scale
   - Financing

Part II

Role of government support measures

Source: OECD based on Stopford, 2008.
Yard capacity indicators

Shipbuilding capacity indicators by country

Number of dry docks

Average capital stock index

Source: Lhs based on monthly publication of Clarkson Shipyards Monitor; rhs based on ORBIS 2016-1 and 2016-2, and Kalouptsidi and Barwick (Fall 2017).
Capital stock adapts only sluggishly to a negative demand shock

Median yard utilisation rates of capital stock
Indexed at 2000=100

Note: For another approach estimating yard capacity see the report by the OECD on Imbalances in the Shipbuilding industry (OECD, 2016[14]).
Source: based on ORBIS 2016-1 and 2016-2, and Kalouptsidi and Barwick (Fall 2017[11]).