Privatized bankruptcy: a study of shipping financial distress

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The changing landscape of bankruptcy law

A world-wide trend towards Ch. 11 type legislation
- expanding the powers of courts
  - from enforcing contract $\Rightarrow$ substantial discretion

What's wrong with *freedom of contracting*?
- coordination failures among creditors
  - Jackson’s (1986) common pool
- contracts: not adaptable, not sophisticated
- fires-sale markets are illiquid: “assets in liquidation fetch prices below value in best use ...[Hence,] automatic auctions ... without the possibility of Chapter 11 protection, is not theoretically sound.” (Shleifer and Vishny)
Freedom of contracting in action: shipping

“There is only one law in shipping: there is no law in shipping”

- Sami Ofer (shipping magnate, Zim went bust, June 2014)

Ex-territorial assets:
- detachment from on-shore legislation
- but how does the industry establishes rule of law?
  - unintended consequences
- Scandinavian auctions: Stromberg (2000), and Eckbo and Thorburn (2008)
  - is competition possible, let alone desireable?
- Fire sale discounts: Campbell et. al. (2011) and Coval and Stafford (2007)
(1) Contracts/institutions adapt $\Rightarrow$ rule of law

- Ultimate remedy against default: arrest/repossession of vessel
- Many ports are hopelessly corrupt/inefficient

Hypothesis: $\text{duration}|_{\text{spec.}} = \text{duration}|_{\text{other}}$

- rejected, $\chi^2$-stat: 42.92, significant at 1%
- Since crew (physical control of vessel) is senior to mortgage
  - if owner is default, and in arrears to crew
  - a banks promise to pay crew is credible
- Since every vessel is owned by (single vessel) subsidiary
  - banks take a security interest in both vessel and equity
  - can repossess on the high seas

Formal test: regress number of arrests on volume of traffic
- $i$: country index

$$N - arrets_i = c + 0.30 \times volume_i + 2.97 \times D - specialized_i + \varepsilon_i$$

(2.34)  
(8.46)
### Ports: arrests and traffic

<table>
<thead>
<tr>
<th>Country</th>
<th>N arrests</th>
<th>Arrest (%)</th>
<th>Traffic (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gibraltar</td>
<td>33</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>19</td>
<td>4</td>
<td>1.7</td>
</tr>
<tr>
<td>Netherlands</td>
<td>37</td>
<td>7.8</td>
<td>3.5</td>
</tr>
<tr>
<td>Singapore</td>
<td>37</td>
<td>7.8</td>
<td>3.3</td>
</tr>
<tr>
<td>South Africa</td>
<td>19</td>
<td>4</td>
<td>1.2</td>
</tr>
<tr>
<td>UK</td>
<td>42</td>
<td>8.9</td>
<td>2.8</td>
</tr>
<tr>
<td>Australia</td>
<td>9</td>
<td>1.9</td>
<td>5.1</td>
</tr>
<tr>
<td>China</td>
<td>5</td>
<td>1.1</td>
<td>15.8</td>
</tr>
<tr>
<td>Germany</td>
<td>6</td>
<td>1.3</td>
<td>2.3</td>
</tr>
<tr>
<td>Japan</td>
<td>2</td>
<td>0.4</td>
<td>6.6</td>
</tr>
<tr>
<td>South Korea</td>
<td>4</td>
<td>0.8</td>
<td>5.8</td>
</tr>
<tr>
<td>USA</td>
<td>23</td>
<td>4.9</td>
<td>11.9</td>
</tr>
</tbody>
</table>
Coordination failures are rare and implosion related
Proxy: arrest

- In a (second best) Coasian world, companies that run out of capital
  - would lose their assets to better capitalized ones
  - but transfer of ownership should not disrupt operation
    - and cash generation

- Anecdotal evidence: most de-leveraging is obtained under threat of repossession
  - with very little actual repossession
  - much space for attempted recovery
Eastwind: immobilization relative to capacity

EastWind's cycle of distress: total and grounded capacity

Franks, Sussman & Vig
Privatized bankruptcy
Immobilization/capacity, all arrests, entire fleet

Franks, Sussman & Vig

Privatized bankruptcy
Generalizing the analysis

We produce a panel (annual frequency)

- $i$: company index, $t$: time index
- regression

\[
\frac{imobi_{i,t}}{capacity_{i,t-1}} = \alpha + \beta \frac{capacity_{i,t} - capacity_{i,t-1}}{capacity_{i,t-1}} + \varepsilon_{i,t}
\]

- Additional variables
  - $Dbust$: a dummy variable for the bust year
  - $Dbust(+1)$: a forward $Dbust$
## Panel A

<table>
<thead>
<tr>
<th>Δcap</th>
<th>sample</th>
<th>[-0.1,0)</th>
<th>[-0.2,-0.1)</th>
<th>[-0.3,-0.2)</th>
<th>[-0.4,-0.3)</th>
<th>[-0.5,-0.4)</th>
<th>&lt;-0.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Δcap</td>
<td>0</td>
<td>-0.049</td>
<td>-0.063</td>
<td>-0.088</td>
<td>0.091</td>
<td>-0.074</td>
<td>-0.638</td>
</tr>
<tr>
<td></td>
<td>(-0.01)</td>
<td>(-2.06)</td>
<td>(-1.87)</td>
<td>(-1.98)</td>
<td>(1.07)</td>
<td>(-1.08)</td>
<td>(-16.85)</td>
</tr>
<tr>
<td>intercept</td>
<td>0.007</td>
<td>0</td>
<td>-0.005</td>
<td>-0.017</td>
<td>0.04</td>
<td>-0.023</td>
<td>-0.381</td>
</tr>
<tr>
<td></td>
<td>(19.77)</td>
<td>(-0.11)</td>
<td>(-1.05)</td>
<td>(-1.51)</td>
<td>(1.35)</td>
<td>(-0.72)</td>
<td>(-13.61)</td>
</tr>
<tr>
<td>N</td>
<td>76,471</td>
<td>2,163</td>
<td>1,740</td>
<td>1,361</td>
<td>1,088</td>
<td>972</td>
<td>2,145</td>
</tr>
<tr>
<td>R²</td>
<td>0</td>
<td>0.002</td>
<td>0.002</td>
<td>0.003</td>
<td>0.001</td>
<td>0.001</td>
<td>0.117</td>
</tr>
<tr>
<td>( \Delta \text{cap} )</td>
<td>sample</td>
<td>[-0.1,0)</td>
<td>[-0.2,-0.1)</td>
<td>[-0.3,-0.2)</td>
<td>[-0.4,-0.3)</td>
<td>[-0.5,-0.4)</td>
<td>&lt; -0.5</td>
</tr>
<tr>
<td>----------------------------------------</td>
<td>--------</td>
<td>-----------</td>
<td>-------------</td>
<td>-------------</td>
<td>-------------</td>
<td>-------------</td>
<td>--------</td>
</tr>
<tr>
<td>( \Delta \text{cap} )</td>
<td>0</td>
<td>-0.03</td>
<td>-0.016</td>
<td>-0.091</td>
<td>0.09</td>
<td>-0.079</td>
<td>-0.009</td>
</tr>
<tr>
<td></td>
<td>(-0.01)</td>
<td>(-1.39)</td>
<td>(-0.56)</td>
<td>(-2.12)</td>
<td>(1.07)</td>
<td>(-1.19)</td>
<td>(-0.21)</td>
</tr>
<tr>
<td>( Dbust(+) \times \Delta \text{cap} )</td>
<td>-5.085</td>
<td>-2.366</td>
<td>-0.595</td>
<td>-0.111</td>
<td>-0.409</td>
<td>-0.266</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-22.67)</td>
<td>(-27.95)</td>
<td>(-9.48)</td>
<td>(-1.49)</td>
<td>(-6.77)</td>
<td>(-3.85)</td>
<td></td>
</tr>
<tr>
<td>( Dbust \times \Delta \text{cap} )</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-0.501</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(-22.44)</td>
</tr>
<tr>
<td>intercept</td>
<td>0.007</td>
<td>0</td>
<td>0</td>
<td>-0.019</td>
<td>0.039</td>
<td>-0.026</td>
<td>0.004</td>
</tr>
<tr>
<td></td>
<td>19.77</td>
<td>0.25</td>
<td>0.1</td>
<td>-1.72</td>
<td>1.34</td>
<td>-0.86</td>
<td>0.15</td>
</tr>
<tr>
<td>( R^2 )</td>
<td>0</td>
<td>0.194</td>
<td>0.312</td>
<td>0.065</td>
<td>0.003</td>
<td>0.046</td>
<td>0.287</td>
</tr>
<tr>
<td>Long term effect</td>
<td>0.77</td>
<td>0.91</td>
<td>0.69</td>
<td>0.55</td>
<td>0.77</td>
<td>0.85</td>
<td></td>
</tr>
</tbody>
</table>
Fire-sale discount - standard method

- Run an hedonic-price regression

\[ P_i = \alpha + \beta X_i + \varepsilon_i \]

- where
  - \( i \): transaction index
  - \( P \): transaction price (in log)
  - \( X \): an index of characteristics
    - age, size, type, time fixed effects
  - \( \varepsilon \): error term

- Then run

\[ \varepsilon_i = \bar{\alpha} + \bar{\beta} D_{fire} \]

- Pulvino (1998): the discount is up to 30% (in recession). We agree.
Anecdotal evidence: arrested vessels are in miserable condition

- From Lloyd’s narratives
  - “auxiliary engines and boiler trouble”
  - “ingress of water into engine-room; hull in bad condition; cargo holds water contaminated”
  - “cracks in hull”
  - “survey revealed unseaworthiness”
  - “bottom damage requiring considerable steel renewal”
  - “sold to Bangladeshi breakers”

- Myers (1977) under-investment problem applied to maintenance
Hypothesis: $\text{hazard}_{\text{arrest}} = \text{hazard}_{\text{no-arrest}}$

rejected: z-stat 6.28, significant at 1%,
Interpretation: the vertical distance between the graphs
- a vessel, say, 17 years old, under arrest
- is 3% more likely to “die”
- relative to a non arrested vessel

Interpretation: the horizontal difference between the graphs
- to find the break-up probability of the above vessel
- add 3 “effective” years to its “nominal” age

If a vessel depreciates at, say, 5% $PA$, then 15% of the “raw” fire-sale discount is explained by low maintenance
More formally: use hazard rates as as instrumental variable

- Identification: let
  - $X$: characteristics, excluding age
  - $D$: dummy variable for arrest
  - $AGE$: registered age
  - $\delta$: extra effective age per arrest

Then it is easy to show that the following system is identified

$$p_i = \alpha_p + \beta_p X_i + \gamma_p (AGE_i + \delta D_i) + \lambda D_i + \epsilon_{p,i}$$

$$h_i = \alpha_h + \beta_h X_i + \gamma_h (AGE_i + \delta D_i) + \epsilon_{h,i}$$
<table>
<thead>
<tr>
<th></th>
<th>without quality correction</th>
<th>with quality correction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arrested</td>
<td>-0.259***</td>
<td>-0.134***</td>
</tr>
<tr>
<td></td>
<td>(-7.4)</td>
<td>(-3.8)</td>
</tr>
<tr>
<td>observations</td>
<td>9,673</td>
<td>9,673</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.011</td>
<td>0.003</td>
</tr>
</tbody>
</table>
Further possible effects: corruption and valuation
Shipping is not a frictionless industry; we find evidence:

- under investment in maintenance
- dysfunctional owners
  - many dubious characters

Yet, these are not the kind of frictions that are used to justify Ch. 11

Europe is obsessed with harmonization of insolvency law

- EC Regulation 1346/2000
- is it really necessary?