Asymmetric Information and Sovereign Debt: Theory Meets Mexican Data
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Discussion by Carlo Galli (Sciences Po)

BGSE SF Information Asymmetries in Financial Markets: Applications to Macro and Finance

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The paper in a nutshell

▶ Novel (awesome) dataset, Mexico short-term treasury auctions 2001-17

▶ “Surprising” empirical facts: largest buyer at auction has (vs. rest)
  ▶ much higher fill ratios
  ▶ no significant difference in cost (overpayment)

▶ Model
  ▶ wealth or risk heterogeneity don’t work
  ▶ asymmetric information accounts for the facts
  ▶ rare disasters distribution performs best quantitatively

Brilliant paper! Cool data, clear motivation, tight model and exposition
Empirical Motivation

Define

- “Winner” $\equiv$ bidder with highest level of filled orders
- “Overpayment” $\equiv \frac{AP_i}{MP_i}$

Facts on averages

- $\text{fill ratio}(\text{winner}) > \text{fill ratio}(\text{rest})$
- $\text{overpayment}(\text{winner}) \approx \text{overpayment}(\text{rest})$
Assumptions

- Discriminatory-price auction
- Expected payoff of bond is \((1 - \kappa) - P\)
- \(n\) informed agents know \(\kappa\), \((1 - n)\) uninformed think \(\begin{cases} \kappa_g \text{ w.p. } f_g \\ \kappa_b \text{ w.p. } (1 - f_g) \end{cases}\)
- Market clearing

\[nP^i B^i + (1 - n) \sum_j P^u_j B^u_j = D\]

Consider risk neutrality:

- Informed are indifferent at \(P(\kappa) = 1 - \kappa \rightarrow\) Informed always (pay MP, buy) in both states
- Uninformed only buy “high” if \(P(\kappa_g) = 1 - \bar{\kappa} \rightarrow\) Uninformed (pay MP, buy) only if \(\kappa = \kappa_b\)

With risk aversion \(\rightarrow P(\kappa_g) \uparrow n\)
Illustration

Graphs showing the relationship between the informed mass \( n \) and various metrics:

- \( P_g \)
- \( P_b \)
- \( B^l(P_g) \)
- \( B^l(P_b) \)
- \( B^u(P_g) \)
- \( B^u(P_b) \)
- (fill ratio)\(^U\)(\(P_g\))

The graphs illustrate how these metrics change as the informed mass \( n \) varies from 0.00 to 1.00.
Data

Pro: much larger sample size than literature

<table>
<thead>
<tr>
<th>Country</th>
<th>No. Maturities</th>
<th>Size</th>
<th>Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hortaço Kastl Zhang (AER 2018)</td>
<td>8</td>
<td>(n_m &lt; 222)</td>
<td>2009-13</td>
</tr>
<tr>
<td>Hortaço McAdams (JPE 2010)</td>
<td>1</td>
<td>(n = 130)</td>
<td>1991-93</td>
</tr>
<tr>
<td>Hortaço Kastl (ECTA 2012)</td>
<td>2</td>
<td>(n_m = 116)</td>
<td>1998-03</td>
</tr>
<tr>
<td>this paper</td>
<td>4</td>
<td>(n_m \approx 800)</td>
<td>2001-17</td>
</tr>
</tbody>
</table>

Contra:

- no bidder information or tracking
- regime changes?
“Slicing” the data

Authors choose to focus on largest buyers, fill ratios, average overpayment

Data is very rich, can we learn more?
Bidders’ identities (Hortaçsu Kastl Zhang (AER 2018))

**Table 2—Description of Bids**

<table>
<thead>
<tr>
<th>Maturity</th>
<th>Bid</th>
<th>Within auction SD[Bid]</th>
<th>Percent of issue size</th>
<th>Percent of tender won</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Primary</td>
<td>Direct</td>
<td>Indirect</td>
<td>Primary</td>
</tr>
<tr>
<td>CMBs</td>
<td>0.1501</td>
<td>0.1389</td>
<td>0.1185</td>
<td>0.0244</td>
</tr>
<tr>
<td>4 week</td>
<td>0.0943</td>
<td>0.0699</td>
<td>0.0463</td>
<td>0.0254</td>
</tr>
<tr>
<td>13 week</td>
<td>0.1119</td>
<td>0.0866</td>
<td>0.0683</td>
<td>0.0248</td>
</tr>
<tr>
<td>26 week</td>
<td>0.165</td>
<td>0.1368</td>
<td>0.1254</td>
<td>0.0275</td>
</tr>
<tr>
<td>52 week</td>
<td>0.2617</td>
<td>0.2356</td>
<td>0.227</td>
<td>0.0299</td>
</tr>
<tr>
<td>2 year</td>
<td>0.5604</td>
<td>0.5231</td>
<td>0.4927</td>
<td>0.0397</td>
</tr>
<tr>
<td>5 year</td>
<td>1.5627</td>
<td>1.4902</td>
<td>1.4384</td>
<td>0.0682</td>
</tr>
<tr>
<td>10 year</td>
<td>2.7229</td>
<td>2.6482</td>
<td>2.5906</td>
<td>0.0732</td>
</tr>
</tbody>
</table>

Notes

- Primary = primary dealers; Direct ≈ other banks; Indirect = funds via primary dealers
- stdev is across bidders; percent of issue size related to bids submitted
- Uniform price auction!
More Questions

1. Cetes data
   - Is there a size-price-bidding behaviour relationship?

2. Are all bidders price-takers?
   Paper discusses wealth/size heterogeneity
   - but maintains price-taking assumption

HKZ18 find evidence of bid shading
   - primary dealers bid lower because of market power, given valuation
   - valuation includes information advantage due to bid intermediation
Conclusion

Super interesting paper

- Great data (thank you, Daniel!)

- Brings primary auctions (divisible good + discriminatory pricing) to sovereign default + time series dimension

- Tractable model, very clear explanation of results and mechanisms