Discussion:
Strategic Inattention, Inflation Dynamics, and the Non-Neutrality of Money
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Motivation

▶ Great paper:

▶ How do firms’ inflation expectations form and affect inflation dynamics?
  ▶ Very important for monetary policy given puzzling, extreme heterogeneity of firm expectations (NZ 2014)

▶ Particular contributions:
  ▶ Micro-founded, testable model of strategic behavior of rationally inattentive, oligopolistic competitors
  ▶ Highlights the role of the shock structure for the rational inattention literature
  ▶ Heterogeneous-firm literature in macro
Motivation

There is substantial heterogeneity in firms’ inflation expectations

- Aggregate vs. sector means
Main Idea

- Oligopolistically competitive, rationally inattentive firms have to split their attention between
  - a signal about an aggregate fundamental
  - a signal about mistakes of competitors in their sector

- Key insight: solution tied to this information structure
  - attention to the aggregate fundamental increases with the number of competitors
  - attention to the aggregate fundamental decreases with the degree of strategic complementarity

- Conventionally, rational inattention models include one source of uncertainty (e.g. representative, single-good firm case)
Comment 1: Information structures

- Which information structures are the relevant ones?

- Information structure of multi-product firms matters for rational inattention and monetary non-neutrality, Pasten and Schoenle (JME, 2016)
  - good-specific shocks vs. common shocks (e.g. monetary policy shocks)
  - economies of scope + N-good setting + limited information capacity
    - increasing attention to the aggregate shock
    - decreasing monetary non-neutrality as the number of goods increases

- Other information structures:
  - Multi-nationals: global versus local shocks (Andrade and Zachariades, 2016)
  - Supply side vs. demand side

- Incorporate into models, evaluate relevance
Comment 2: Size

- Important aspect of firm heterogeneity is size, e.g. Gabaix (2011)
  - Firms have equal size in the model here

- Compare 2 cases:
  - 2 firms, one has 50% market share, one 50% (1/K in the model)
  - 2 firms, one has 99% market share, one 1%

  What is the optimal attention to the small firm’s mistake?

- Conjectured linear solution: reweighted signals
Comment 3: Information capacity

- In most rational inattention models, pinning down aggregate information capacity $\kappa$ is crucial

- Here, $\kappa$ is convincingly calibrated from the data

- In the model, it is exogenously given

  But, should it be the same irrespectively of the number of competitors/degrees of strategic complementarity?

  One approach: Marginal effects of $\kappa$ on e.g. profits the same across (heterogeneous) firms? Increasing $\kappa$ relative to number of competitors (externalities)?

- Model should analyze effects on monetary non-neutrality when $\kappa$ is disciplined as a function of the information structure (number of competitors, strategic complementarity).
Evidence from the Data

- Two questions
  1. What is $\kappa$ using U.S. micro data?
  2. Is attention to the aggregate fundamental significantly related to the number of competitors?

- Model without strategic complementarity for sectors $i$ and random walk fundamental implies that

$$\pi_{i,t} = 2^{-2\kappa_i} \pi_{i,t-1} + (1 - 2^{-2\kappa_i}) u_t$$  \hspace{1cm} (1)

- Interpretation of sectors as islands
- More attentive sectors have less persistence in their inflation

Data:
- 325 U.S. PPI inflation series, 01/1947-12/2017
- Five aggregate factors from Boivin et al. (2009), plus FFR
- Number of goods and competitors per firm per sector (BLS, Census SUSB)
Evidence from the Data

- Estimate sectoral PPI inflation persistence from specification

\[ \pi_{i,t} = \rho_i \pi_{i,t-1} + e_t \]  

(2)

and obtain sectoral \( \kappa_i \) from \( \rho_i = 2^{-2\kappa_i} \)

- What are the implied mean and distribution of information capacity?
  - Estimate using unconditional PPI inflation series
  - Estimate using PPI inflation series conditional on FFR movements
  - Estimate using PPI inflation series conditional on 5 factors from Boivin (2009)
Evidence from the Data
Evidence from the Data
Evidence from the Data

**Table: Estimated information capacity**

<table>
<thead>
<tr>
<th></th>
<th>uncond.</th>
<th>FFR</th>
<th>cond. 1</th>
<th>cond. 2</th>
<th>cond. 3</th>
<th>cond. 4</th>
<th>cond. 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>3.32</td>
<td>-0.01</td>
<td>0.03</td>
<td>0.48</td>
<td>0.80</td>
<td>0.71</td>
<td>0.09</td>
</tr>
<tr>
<td>Median</td>
<td>3.15</td>
<td>0.00</td>
<td>0.03</td>
<td>0.07</td>
<td>0.70</td>
<td>0.53</td>
<td>0.10</td>
</tr>
</tbody>
</table>

- Overall estimated information capacity (excl. FFR): 0.42
- Paper uses 0.86
Evidence from the Data

What is the role of competitors?
Evidence from the Data

Number of largest firms vs. cond. information capacity

Log number of firms (2005)

Information Capacity
Evidence from the Data

- Regression evidence: role of the information structure
  - Estimate the following specification in the cross section:
    \[ \kappa_i = \beta_0 + \beta_1 \#\text{competitors}_i + \beta_2 \#\text{goods}_i + \epsilon_i \] (3)
  - Unconditional \( \kappa_i \)
  - Conditional \( \kappa_i \) (FFR, other common factors)
# Evidence from the Data

## Table: Role of information structure

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<tr>
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<th>uncond.</th>
<th>FFR</th>
<th>cond. 1</th>
<th>cond. 3</th>
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</thead>
<tbody>
<tr>
<td>number of competitors</td>
<td>0.050</td>
<td>-0.002**</td>
<td>0.002***</td>
<td>0.107***</td>
</tr>
<tr>
<td>number of goods</td>
<td>-0.015</td>
<td>0.010**</td>
<td>-0.001</td>
<td>-0.289**</td>
</tr>
<tr>
<td>intercept</td>
<td>3.013***</td>
<td>-0.009</td>
<td>0.015***</td>
<td>0.493*</td>
</tr>
<tr>
<td>Adj. R2</td>
<td>-0.01</td>
<td>0.03</td>
<td>0.20</td>
<td>0.09</td>
</tr>
</tbody>
</table>

- Significant effect of competitors for all factors
- Significant effect of multiproduct dimension for some factors
- Unaffected by simple industry fixed effects
- Effect of other structures?
Evidence from the Data

Table: Frequency of price changes and information structure

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<thead>
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<tbody>
<tr>
<td>number of competitors</td>
<td>-0.019**</td>
</tr>
<tr>
<td>number of goods</td>
<td>0.159***</td>
</tr>
<tr>
<td>intercept</td>
<td>0.018</td>
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<tr>
<td>Adj. R2</td>
<td>-0.14</td>
</tr>
</tbody>
</table>

- Frequency of price changes increases with the number of goods (Bhattarai and Schoenle 2014)
- Frequency of price changes decreases with the number of competitors
Conclusion

Great paper!