Heterogeneity, Macroeconomics, and Reality

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Heterogeneous Agent Macroeconomics
U.S. Department of the Treasury

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  - FT interview in 2011
    - In the crisis, standard macro models were useless
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  - Little progress since 2008 in modeling events like the crisis
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    - "Network analysis": No connections Lehmann to Israel
- Looking forward right now:
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  - At center of macroeconomics since Keynes ...
- "Identical Model-Consistent Expectations" ('IMC$\mathbb{E}$')
  - (Better description than "Rational")
  - For some model of the economy m:
    (... (Everybody believes (Everybody believes m)))
  - Usually: Identical circumstances (wealth, income, uncertainty)
    - $\Rightarrow$ Representative Agent (RA)
- IMC$\mathbb{E}$ has the great virtue that it can be rejected
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  - $\mathbb{E}$ *can be measured(!)*
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  - Idea: Test models of $\mathbb{E}$ by comparison to data!
- Discussion
  - No need for more papers that just reject IMC$\mathbb{E}$; a dead horse
  - But: Every new paper has its own unique new model of $\mathbb{E}$
  - Need to whittle down to *small* set of canonical models . . .
  - . . . with some reliable wisdom about when each works

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Most macro fluctuations reflect changes in "narratives"

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  - 1992 AEA session: "autonomous sharp decline in C"
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'The End of Alchemy'

Mervyn King (2016); 2017 Feldstein Lecture at NBER

- Views similar to Summers about benchmark models
- Views similar to A&S on centrality of "narratives"
  - Among bankers and central bankers:
  - Many more financial markets are "bank-like" than we thought
- Useful refinement:
  - Your narrative $\Rightarrow$ your behavior (decision rule/heuristic)

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Why don't all those papers rejecting IMC$\mathbb{E}$ test whether "Narrative Approach" does better?

- Unclear how to translate NA into practice. Needed:
  - Explicit, quantitative models...
  - ...that can be tested against the same data that rejects IMC$\mathbb{E}$
  - How to represent "narratives" quantitatively?
  - Nowhere to download "American Economic Narratives Survey"

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Quantitative Representation of A 'Narrative'?

One Idea

- Generate narratives from alternative IMC$\mathbb{E}$ models:
  - Experts have sharply different forecasts of pty growth γ
  - Generate forecasts that would arise for $\gamma \in [0.0, 2.5]$
- Given a person's measured expectations, impute to them the narrative that most closely fits those expectations
- So, in 1990-91, A&S story would be that C dropped because dominant 'narrative' changed to low pty scenario
- Begs the question: Why do narratives change?

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Quantitative Representation of A 'Narrative'?

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  - Generate forecasts that would arise for $\gamma \in [0.0, 2.5]$
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Assume "Narratives" spread like diseases ("contagion")

- Infection from "common sources": News media
- Communicable via "direct contact": Facebook
  - Friends may have had personal experiences
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Call this proposal 'Epidemiological Expectations' ($E\mathbb{E}$)

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We Need a Canonical Off-the-Shelf $\mathbb{EE}$ Model ...

One reason ABM's are resisted:

- Results depend sensitively on huge number of assumptions
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A Concrete Example: BDKS

Using Facebook data:

- Persons A and B live in Des Moines in 2008-10
- ... and are identical on 'observables'
- ... but person A has more friends in 'busting' markets

Then:

- Person A is more pessimistic about *Des Moines* house prices
- Is less likely to buy a house ✓
- If they buy a house, it will be cheaper ✓

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Use their data to construct:

- A benchmark network structure for friends
- A benchmark person-to-person infection rate

Use other data to construct:

- Infection rate from 'common sources': News media

Make that a plug-and-play module:

- Don't invent new model of expecations for every paper!
- At most, recalibrate 'infectiousness'
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Connection to Heterogeneous Agent (HA) macro models

HA model starting point: Microeconomic models

- Constructed to match measured heterogeneity
- For example, a consumption model that matches
  - Income dynamics, income inequality, [illegible]
  - MPC
- $\Rightarrow$ decision rules contingent on expectations ('narrative')

Macro outcomes:

- Generated by simulating populations of micro agents
- Taking account of feedbacks from macro back to micro
- Expectations are standard IMCE
- HA do much better than RA models on important questions
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My Proposal: A Hybrid

What do expectations/narratives do? King (2016) is right:

- Determine your decision rule
  - If $\mathbb{E}_t[Ap_{t+1}] > x$, $p(\text{buy})$ is higher
  - If $\mathbb{E}_t[Ap_{t+1}] < x$, $p(\text{sell})$ is higher

Start with HA macro model, and change only one thing:

- Replace IMCE with $\mathbb{E}\mathbb{E}$
- Keep Rest of the HA Macro Structure
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  - Narratives (say, from analysis of news stories)
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No macro implications derived (say, about house price dynamics)
Steps to get there:

- Choose an existing HA macro model of house prices
- For each observed belief about $\mathbb{E}[\Delta p_h]$, find a scenario in the HA model that would produce that path (a narrative)
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- Already contains the HA Macro part
- Need to add ABM tools to construct $\mathbb{EE}$
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If there are listeners who want to help – please do!

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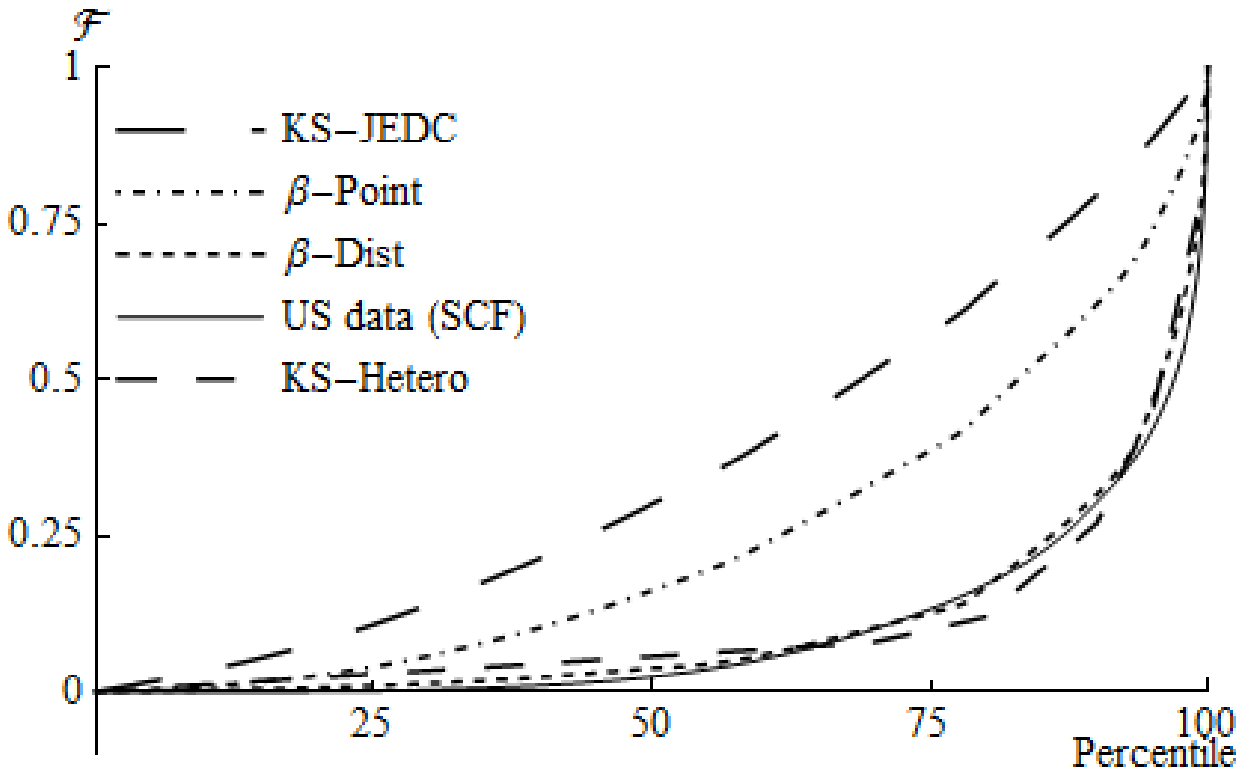
Wealth Inequality

Figure: Distribution of Net Worth (Lorenz Curve)



Solid curve:

Distribution of W in the 2004 SCF

Return

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