Discussion of "A Behavioral Heterogeneous Agent New Keynesian Model" by Oliver Pfäuti and Fabian Seyrich

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Two important frontiers in monetary economics

- Heterogenous-agent NK literature
  - Takes micro data on balance sheets and income risk seriously
  - Derives implications for GE effects on monetary and fiscal policy
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$$\textbf{HANK} + \textbf{BANK} \rightarrow \textbf{BHANK}$$

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BHANK: the future of monetary economics

... maybe not this BHANK!

HANK and the countercylical income risk problem

- Important theme of rational expectations HANK:

  countercyclical income risk

- In micro data, recessions appear to make income risk rise
  [Storesletten-Telmer-Yaron, Guvenen-Ozkan-Song...]

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  2. Any policy action that mitigates the future recession delivers large spending boost today: "forward guidance puzzle" for both MP and FP

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- Very powerful force, **major ongoing challenge** for the literature
  [Ravn-Sterk, McKay-Nakamura-Steinsson, Werning, Acharya-Dogra, Bilbiie...]

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  - Answer: yes

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  - Answer: yes ... but are we sure?

Paper in one table

Facts	RANK	HANK w cc. risk	BANK w cog. discount	BHANK
High MPCs	✗			
Countercyclical income risk	✗			
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Currently missing Fact 5...	✗	✗	✗	✓

Contrast with Farhi and Werning

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- Why does BANK alone not solve the FG puzzle under level-k?
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  - Level-k: agents perfectly understand forward guidance announcements. Just cannot reason through all the GE consequences.
  - Cognitive discounting: agents discount forward guidance directly.
- Which is more reasonable?

How the paper proves that BHANK $\Rightarrow$ Facts 1-4

1. Tractable HANK (THANK) to prove Facts 1-4 hold analytically
   - "Bilbiie meets Gabaix"
2. "Full" HANK to show that the result is more general
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- Please help the literature by using consistent acronyms! It's simple:

	THANK	HANK
Micro data	✗	✓
Analytical solutions	✓	✗

Rest of discussion

1. How robust is the main result to calibration?
2. Alternative microfoundations?
3. Amplification of supply shocks?

Discounted Euler equations

- Bilbiie's THANK model Euler equation:

$$y_t = \delta \mathbb{E}_t \left[y_{t+1} \right] - \mathrm{Cst} \cdot \sigma \cdot r_t$$

where σ is the EIS and $\delta > 1$ with countercylical income risk

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- BTHANK model Euler equation turns out to be:

$$y_t = m \delta \mathbb{E}_t \left[y_{t+1} \right] - \text{Cst} \cdot \sigma \cdot r_t$$

Nice!

Resolving the puzzle

- Iterate forward:

$$y_t = -\text{Cst} \cdot \sigma \cdot \mathbb{E}_t \left[\sum_{k \geq 0} (m\delta)^k \, r_{t+k} \right]$$

  - $m\delta > 1 \Rightarrow$ Forward guidance puzzle, indeterminacy (at constant r)
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- So we can get Facts 1–4 when $m\delta < 1$. When is that true?
  - Clearly a calibration question!

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- Assume $s = 0.95$ and $\lambda = 0.33$ (reasonable?)
- We still need to know

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  - Questionable microfoundation for countercyclical income risk...

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- Turns out here $\mathrm{Cst} = \frac{1-\lambda}{1-\lambda\chi}$. Suppose we know $\mathrm{Cst} = 1.2$
- Then:

$$\delta = 1 + (1-s)\left(\frac{\mathrm{Cst}-1}{\lambda}\right) = 1 + 0.05 \cdot \frac{1.2-1}{0.33} = 1.03 < \frac{1}{m} = 1.17$$

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  - e.g. $\lambda = 0.1$, $\mathrm{Cst} = 1.5$ implies $\delta = 1.25 > 1.17$...

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  - e.g. $\lambda = 0.1$, $\mathrm{Cst} = 1.5$ implies $\delta = 1.25 > 1.17$...
  - Cst in Patterson? Multiplier there is for fiscal, not monetary policy!
  - λ not easy to map to real world data (virtual $\neq$ actual share of HTM)

Broader issue with this model

- Relation between δ and Cst is special!
  - Strategy does not get around the questionable microfoundation
- Same microfoundation in (quantitative) HANK $\Rightarrow$ same issue
  - Calibration is version of "find reasonable μ^D" (by income state)

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- Two main issues with this type of "first-generation" HANK:
  1. Cyclicality of profits inconsistent with the data [Broer-Hansen-Krusell-Öberg]
  2. MPEs in the model inconsistent with the data [Auclert-Bardoczy-Rognlie]

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- Basic solution is well accepted: flip assn. to flex-price/sticky-wage

Benefits of simple flex-price/sticky-wage model

- In tractable HANK, the δ can be expressed as a sufficient statistic: elasticity of relative income in bottom state relative to top state

  [see my lectures notes on HANK with Rognlie and Straub]

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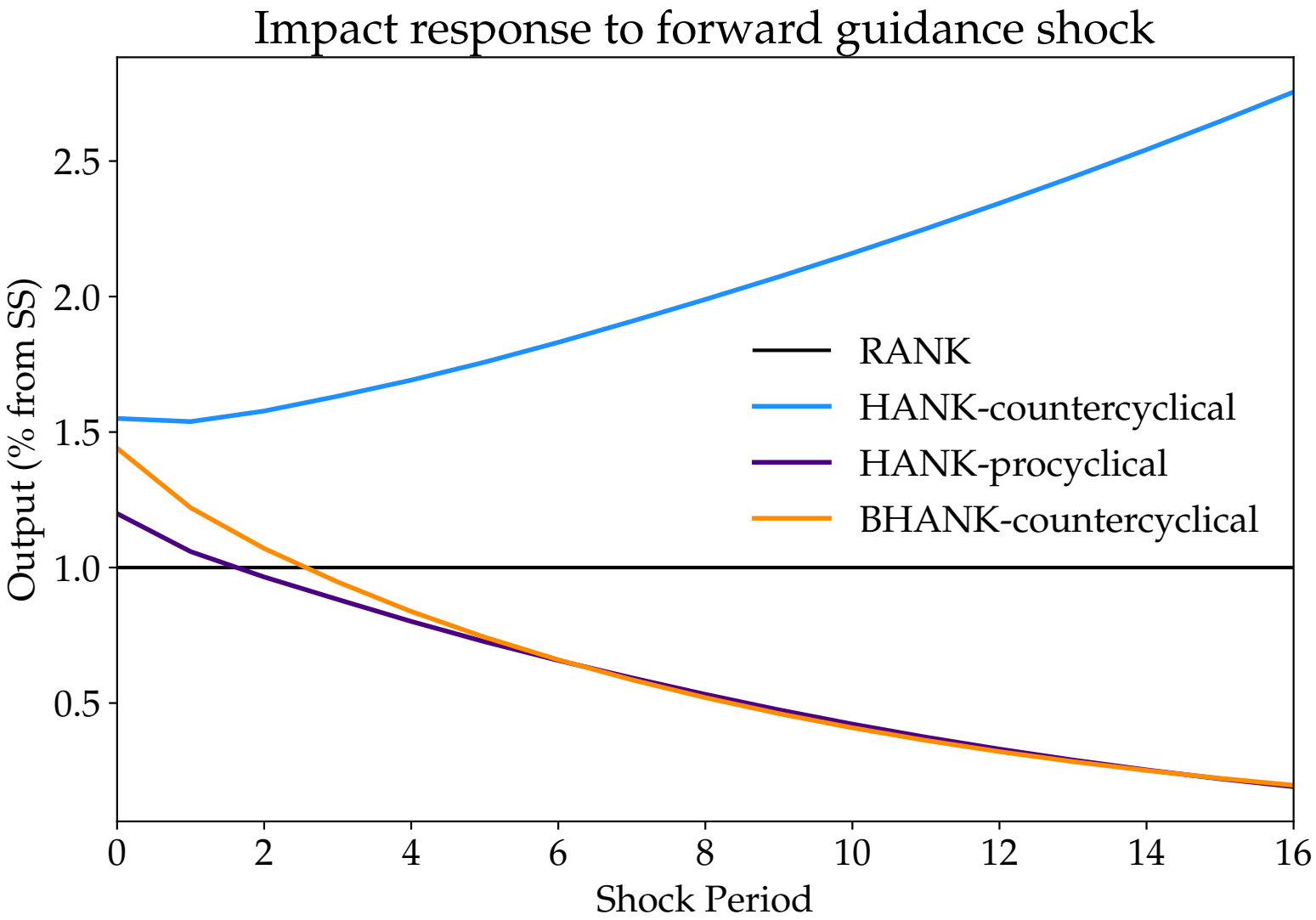
- Also if you implement quantitative HANK with our class material:

  - It will take an hour to move your quantitative model over
  - You won't have to rely on a very inefficient algorithm
  - Cognitive discounting is very simple to implement in sequence space!

    [see Auclert-Rognlie-Straub 2020, 2022]

Figure 1 redone with flex-price/sticky-wage model



- General conclusions likely to carry over to this more credible setting

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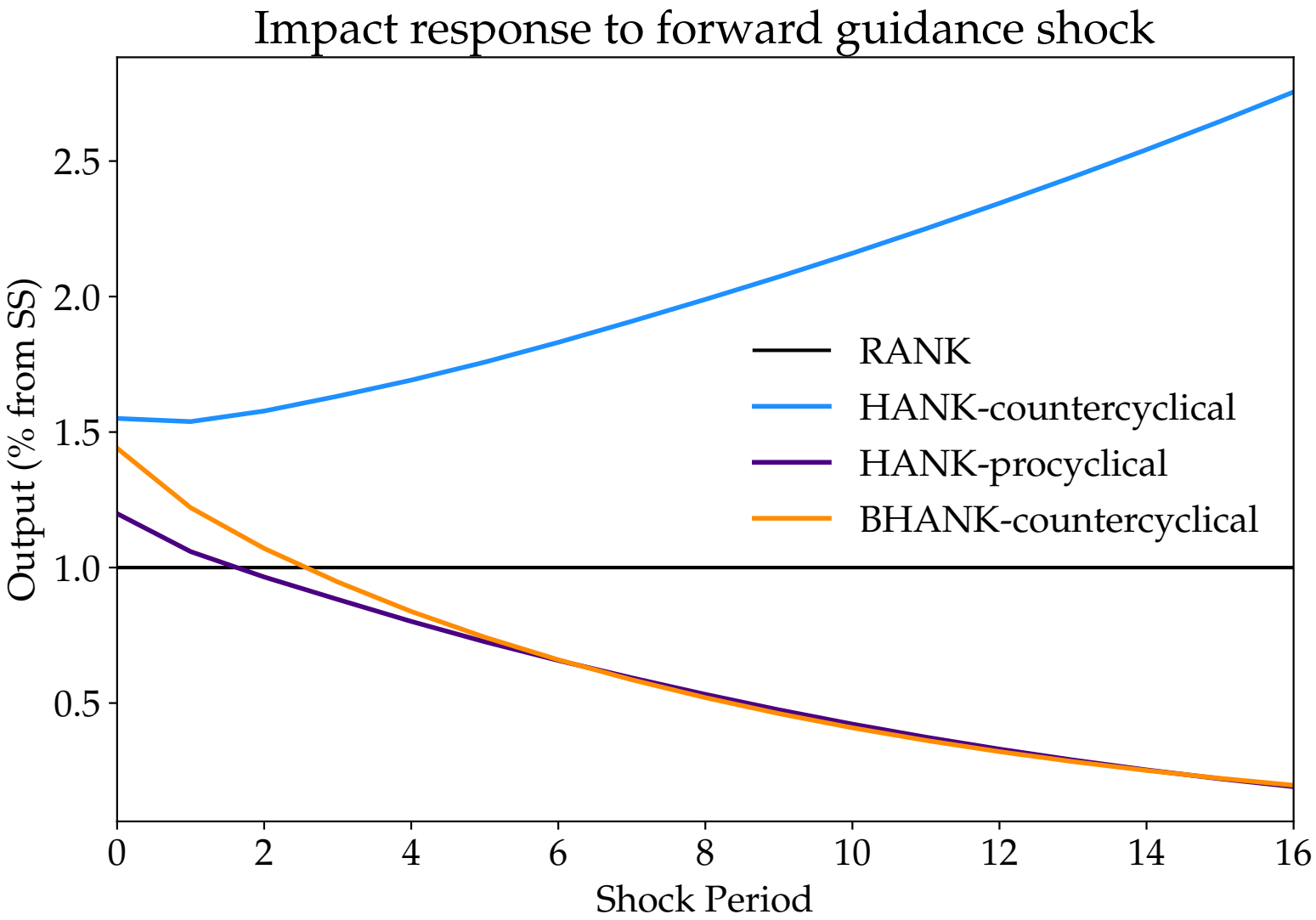

- Why doesn't your orange line *not* start below the blue?

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1. What's a credible microfounded model of cc. income risk?
   - Need a better model of the labor market (eg unemployment)
   - Need careful discipline to micro data/sufficient statistics
2. What behavioral model best fits the data?
   - Many alternatives to cognitive discounting: level-k, lack of CK...
   - How do we choose between them?

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  - Relies on the short-run debt assn. Longer term debt mitigates both!
- Ideas here very similar to Challe AEJ Macro, McKay Wolf WP
  - Would be interesting to study optimal policy (as these papers do)

Concluding thoughts

- Exciting paper at edge of an important research agenda
- Main result depends on calibration: explain why $m\delta < 1$
- Use flex-price/sticky-wage rather than the other way around
- Looking forward to seeing the BHANK literature grow!