Deutsche Bundesbank's 9th Spring Conference:
"Microdata Analysis and Macroeconomic Implications"
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Harald Uhlig
(Humboldt Universtät zu Berlin & Deutsche Bundesbank)

**Discussion of „Inferring Labour Income Risk from Economic Choices:
An Indirect Inference Approach"
by Anthony A Smith and Fatih Guvenen**

http://www.bundesbank.de

What the paper does
Income, consumption and learning
Suggestions and Summary

Guvenen-Smith: Inferring Labor Income Risk...
Discussion

Harald Uhlig[1]

[1]Humboldt Universität zu Berlin
uhlig@wiwi.hu-berlin.de

Bundesbank Spring Conference 2007

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Outline

1. What the paper does

2. Income, consumption and learning

3. Suggestions and Summary

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What the Paper does

- Labor Income y_t^i: RIP or PIP?
-
$$
\begin{aligned}
y_t^i &= \text{stuff}_t + \alpha_i + \beta^i t + z_t^i + \epsilon_t^i \\
z_t^i &= \rho z_{t-1}^i + \eta_t^i \ \text{(unobserved)}
\end{aligned}
$$

- RIP: $\beta^i \equiv 0$, $\rho = 1$ ("unit root")
- PIP: β^i agent-specific, $\mid \rho \mid < 1$ ("time trend")
- Use theory and indirect inference to tell RIP from PIP ...

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Theory: an Example

- Consider

$$\max U = E\left[\sum_{t=0}^{\infty} \delta^t(c_t - \bar{c})^2\right]$$
$$s.t. \quad c_t + a_t = y_t + Ra_{t-1}, \text{ where } R\delta = 1$$

- Hall: c_t will be a random walk.
- RIP: $y_t = y_{t-1} + \eta_t$. Solution: $c_t - c_{t-1} = \eta_t$
- HIP: $y_t = \eta_t$. Solution: $c_t - c_{t-1} = (1 - \delta)\eta_t$
- Different responses!
- (Comment: But not much. Thus: learning! Circumvential reason, though.)

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Telling PIP from RIP

This paper:

- Panel for income **and** consumption.
- Theory for RIP vs PIP: consumption response differs.
- Lots of work: agent learn about β^i, z_t^i.
- Dynamic programming delivers tough likelihood problem.
- Thus, estimate per indirect inference.
- Monte Carlo: this works well. First empirical results: reasonable.

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Notice: Two literatures

Time Series literature:

1. `Univariate`. Christiano-Ljungqvist: "Unit roots in GDP: do we know and do we care?" (no and may be not).

2. `Bivariate`. Cochrane: C and Y cointegrate.

3. `Multivariate`. Lettau-Ludvigson: "cay", cointegration of cons., assets, income.

4. `Trend Breaks`. Hard to distinguish from unit roots!

Income Panels: literature on panel unit roots.

1. `Univariate`: (why do we care?)

2. `Bivariate`: **this paper**. Idea: Theory restricts impulse response of C.

3. `etc.`: Moe to come?

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First assessment

- Creative way to make progress on a topic many care about.
- Nice to see serious combination of data-driven theory and theory-driven empirics.
- This is progress, breaking new grounds. We will learn much from it.
- ... but let me add some (hopefully not too critical-sounding) remarks and caveats ...

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Key Questions

Key Question 1

What is a good income process specification?

Key Question 2

What is a good decision problem?

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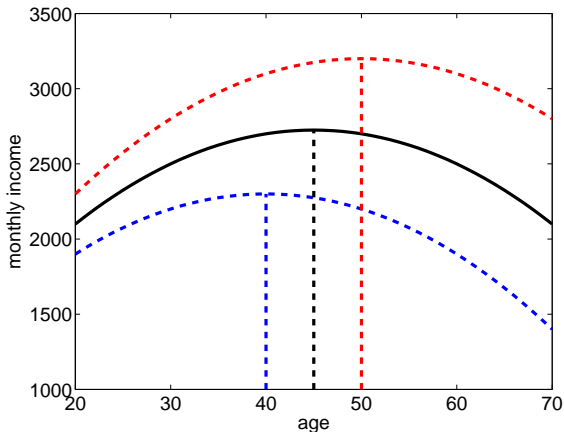
What is a good income process spec.?

Specification ...

$$
\begin{aligned}
y_t^i &= \text{stuff}_t + \alpha_i + \beta^i t + z_t^i + \epsilon_t^i \\
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\end{aligned}
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1. ... versus waiting-time ("trend-breaks") examples:
   - Ph.D. students: Income jumps, but when?
   - football player: Income drops, but when?
   - blue-collar worker: two states, employed and unemployed, with random transitions.

2. Why no idiosynchratic `quadratic` term, $\gamma_i t^2$?

H. Uhlig   Guvenen-Smith: Discussion

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Variations in β only

$y_t^i = \beta^i t - t^2 + 700$, for $\beta^i = \{80, 90, 100\}$. Peak location!

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What is a good decision problem?

Specification ...

$$V(\omega, s) = \max\{u(c) + \delta E[V(\omega', s')]\}$$
$$\text{s.t.} \quad c + a = \omega$$
$$\omega' = (1 + r)a + y(s')$$
$$a \geq \underline{a}$$

... versus:

- Durable goods? Purchase of house?
- Family size?
- Endogenous leisure / labor? Nonseparability with consumption?
- Variety of assets? Stocks? Credit card debt?
- Endogenous borrowing constraint? Recursive contracts?
- Habits? Retirement?

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Learning

- Lot of effort for agents `learning` about β^i and z_t^i.
- **Comment 1:** Example:
    - Truth: $x_t = \rho x_{t-1} + \epsilon_t$. Agent learns ρ.
    - Kalman Filter:

$$
\begin{aligned}
x_t &= \hat{\rho}_t x_{t-1} + \hat{\epsilon}_t \\
\hat{\rho}_t &= \hat{\rho}_{t-1} + \lambda \hat{\epsilon}_t
\end{aligned}
$$

    - So: take this as your original system. Everything is now observable. Advantage: e.g. clearer, what is "permanent".
- **Comment 2:** No more "learning", when doing inference. So: why do you need it all? (To make the consumption response more interesting?)

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Some suggestions

- skip learning. Or explain convincingly, why you really, really need it.
- Instead:
    - Think hard about income process.
    - Think hard about decision problem.
- HIP / RIP: parallel to unit root lit. could be clearer.
- Why not focus on an encompassing model?
- Describe estimation so that grad. stud. can replicate.
- ... and send papers to discussants early ...

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Much to like:

- Bring econ. theory to bear on estimating income process ...
- ... in a feasible way: indirect inference.
- Creative and useful.
- Empirical results will surely be interesting.
- Paper could break even more new ground, see suggestions.
- Thanks for your attention.

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