

Discussion of

“Wage Volatility and Changing Patterns of Labor Supply”

by Hye Mi You, Jay Hong and Byoung Hoon Seok

Dirk Krueger

University of Pennsylvania, CEPR, and NBER

11th New York/Philadelphia Quantitative Macroeconomics Workshop

May 10, 2013

Objective of this Paper

- Explain why $\frac{h_s}{h_u} \uparrow$ despite $\frac{w_s}{w_u} \uparrow$ in last 30 years in the US.
- Note: if substitution effect dominates income effect, there is no puzzle.
- Proposed explanation: $\sigma(w_s) \uparrow$ and $\sigma(w_u) \uparrow$ but $\sigma(w_s)/\sigma(w_u) \uparrow$. Higher (relative) wage risk leads to increase in “precautionary labor supply”.
- Rest of paper: construct life cycle consumption-savings model with endogenous labor supply to quantify the importance of this channel.

The Facts

- $\frac{h_s}{h_u} \uparrow$ [Figure 4]
- $\frac{w_s}{w_u} \uparrow$ [Figure 1]
- $\sigma(w_s) \uparrow$ and $\sigma(w_u) \uparrow$ but $\sigma(w_s)/\sigma(w_u) \uparrow$ [Figure 2]

Average Weekly Hours Difference between Skill Groups

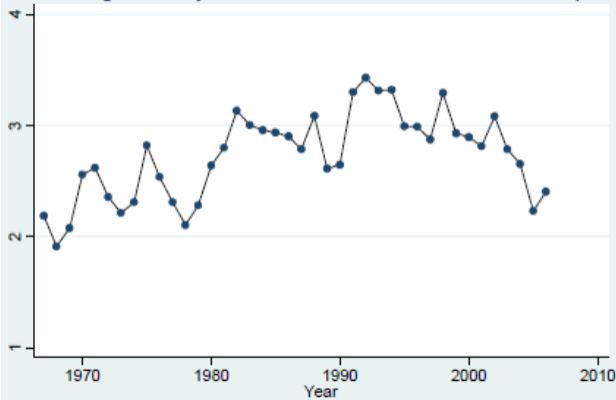


Figure 1: Trends in Skill Premium for U.S. Men between 1967 and 2006

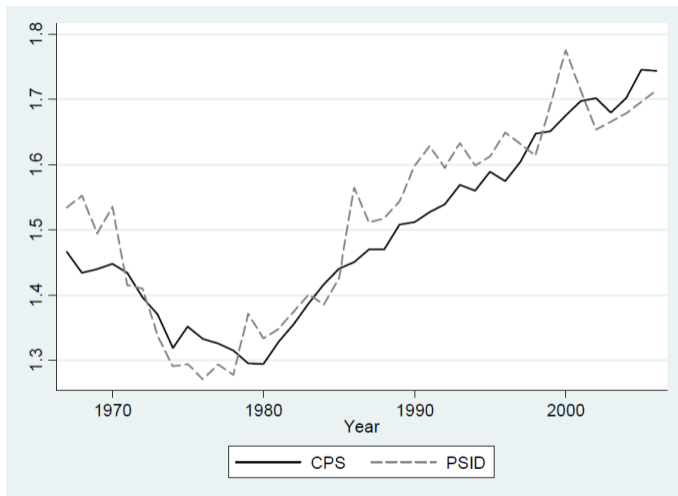
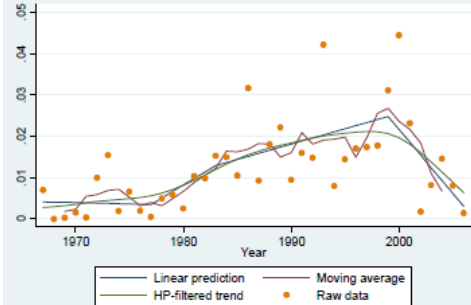
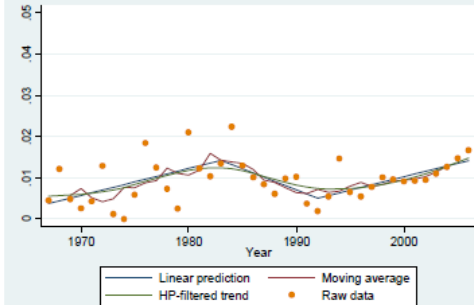


Figure 2: Estimated Variances of Persistent and Transitory Wage Shocks

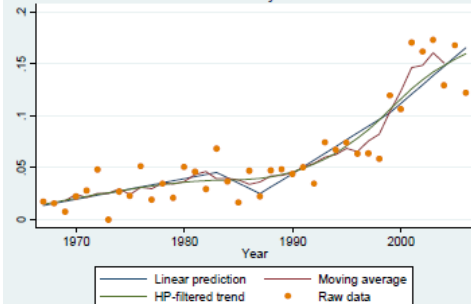
Variance of Persistent Shocks - Skilled



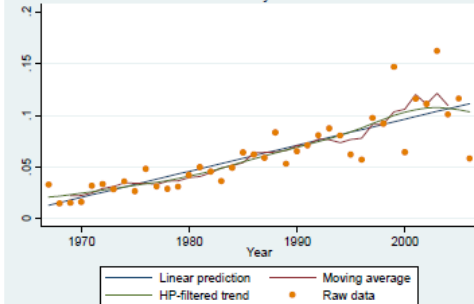
Variance of Persistent Shocks - Unskilled



Variance of Transitory Shocks - Skilled



Variance of Transitory Shocks - Unskilled



The Model

- Perpetual youth model: constant probability of dying λ . Fixed education type $e \in \{u, s\}$. Standard incomplete markets. Choices c_t, a_{t+1}, h_t . Stochastic wage process:

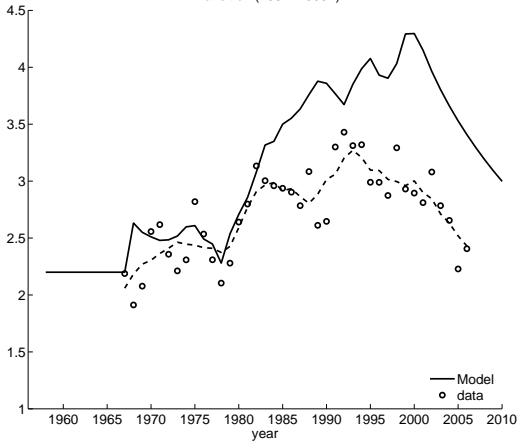
$$w_t^e \exp(\mu_t + \nu_t)$$
$$\mu_t = \rho^e \mu_{t-1} + \omega_t$$
$$\nu_t \sim N(0, \lambda_{\nu t}^e) \text{ and } \omega_t \sim N(0, \lambda_{\omega t}^e)$$

- Question: how does $\frac{h_t^s}{h_t^u}$ evolve over time as $\frac{w_t^s}{w_t^u}$ and $\frac{\lambda_{\nu t}^s}{\lambda_{\nu t}^u}$ and $\frac{\lambda_{\omega t}^s}{\lambda_{\omega t}^u}$ change?
- Remark: Not clear production side and GE needed to answer question.

Results

- Transition Dynamics [Figure 10(b)]

Transition (1967–2000+)



Is There a Puzzle? Income vs. Substitution Effect

- Abstracting from wage risk

$$-\frac{u_h(c, h)}{u_c(c, h)} = w$$

- Thus

$$\frac{u_h(c_t^s, h_t^s)/u_c(c_t^s, h_t^s)}{u_h(c_t^u, h_t^u)/u_c(c_t^u, h_t^u)} = \frac{w_t^s}{w_t^u}$$

Is There a Puzzle? Income vs. Substitution Effect

- Example 1: Greenwood-Hercowitz-Huffman preferences: $u(c, h) = \log \left(c - \frac{h^{1+\frac{1}{\psi}}}{1+\frac{1}{\psi}} \right)$. Then

$$\frac{h_t^s}{h_t^u} = \left(\frac{w_t^s}{w_t^u} \right)^\psi$$

and we are done!? What's wrong with this? Implausibly low (zero) income effect?

Is There a Puzzle? Income vs. Substitution Effect

- Example 2: Separable preferences with constant Frisch labor supply elasticity: $u(c, h) = \frac{c^{1-\sigma}}{1-\sigma} - \gamma \frac{h^{1+\frac{1}{\psi}}}{1+\frac{1}{\psi}}$. Then

$$\frac{h_t^s}{h_t^u} = \left(\frac{w_t^s / (c_t^s)^\sigma}{w_t^u / (c_t^u)^\sigma} \right)^\psi.$$

Attanasio-Davis (1996): In data over longer time horizon $\% \Delta \left(\frac{c_t^s}{c_t^u} \right) \approx \% \Delta \left(\frac{w_t^s}{w_t^u} \right)$. Then $\frac{h_t^s}{h_t^u} = \left(\frac{w_t^s}{w_t^u} \right)^{(1-\sigma)\psi}$. Puzzle starts to open up if $\sigma \geq 1$. For parameters from paper $(1 - \sigma)\psi = -0.2$, and thus $\frac{h_t^s}{h_t^u} \downarrow$ by about 7%.

Is There a Puzzle? Income vs. Substitution Effect

- This paper $u(c, h) = \frac{c^{1-\sigma_c}}{1-\sigma_c} + \gamma_e \frac{(1-h)^{1-\sigma_h}}{1-\sigma_h}$ with $\sigma_c = 1.5, \sigma_h = 4.24$.
Then

$$\frac{1 - h_t^s}{1 - h_t^u} = \left[\frac{\gamma_u w_t^s / (c_t^s)^{\sigma_c}}{\gamma_s w_t^u / (c_t^u)^{\sigma_c}} \right]^{-\frac{1}{\sigma_h}}$$

Again presuming Attanasio-Davis are right on consumption, then

$$\frac{1 - h_t^s}{1 - h_t^u} = \kappa \left(\frac{w_t^s}{w_t^u} \right)^{\frac{\sigma_c - 1}{\sigma_h}}$$

and thus $\frac{h_t^s}{h_t^u}$ should go down as $\frac{w_t^s}{w_t^u}$ goes up (but not by that much since $\sigma_c > 1$, but only moderately so). Now we have a puzzle. What if $\sigma_c = 4$.

Is There a Puzzle? Income vs. Substitution Effect

- What does data say about size of income vs. substitution effects? Large literature in empirical public finance (see Keane 2010, Saez, Slemrod and Giertz 2012) on Marshallian (uncompensated), Hicksian (compensated) labor supply elasticity.
- Results vary (a lot!): depend on whether static or dynamic (w/o or with human capital) model is estimated. Paper needs to engage with that literature, since even qualitative results depend on it.
- Noe: model has predictions about $\left\{ \frac{c_t^s}{c_t^u}, \frac{a_{t+1}^s}{a_{t+1}^u} \right\}$. Evaluate them.

Right Mechanism?

- s -households face stronger increase in wage risk, increase level of labor supply for precautionary reasons.
- Do households in fact respond to wage shocks by adjusting labor supply (as their model envisions) in order to insure consumption?
- Yes, absolutely (Blundell, Pistaferri and Saporta-Eksten, 2013). But....
- It's all about labor supply adjustment of the wife! Why the obsession (in model, data) with boring prime-age males? Look inside the household!

Response of Consumption to a 10% Permanent Decrease in the Male's Wage Rate

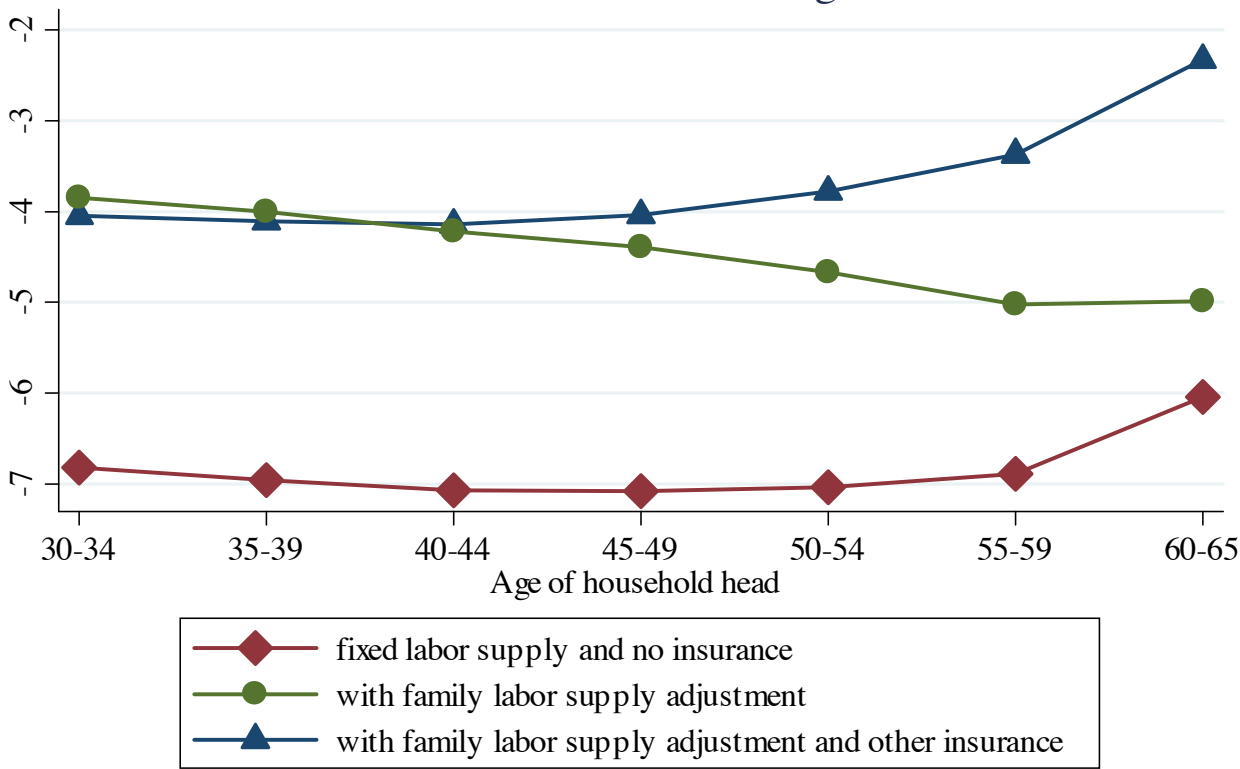


Figure 4: Decomposition of consumption smoothing by age.

Remarks about Model Elements I: Life Cycle _____

- No explicit life cycle.
- Precautionary savings motive important for young households, not so much for older households (see e.g. Gourinchas and Parker, 2002).
- Same likely true for precautionary labor supply mechanism.
- Strong prediction: change in relative hours ought to be more important for young than for old households? Is that true in the data?

Remarks about Model Elements II: Expectations

- Timing in changes of hours depends strongly on when households learn about the changes in wage structure.
- Not entirely clear in paper...But I believe households are initially (1967) surprised about these changes, but then have perfect foresight about $\{w_t^e, \lambda_{\nu t}^e, \lambda_{\omega t}^e\}_{t=1967}^{t=2000}$.
- What if they gradually learn about future changes in wage risk?
- In general this is a hard problem since one has to make assumptions and they matter (I presume a lot) for the timing of the transition path.

Concluding Remarks

- Paper addresses an important empirical observation with state of the art quantitative analysis.
- Mechanism is plausible and wage data suggests it is quantitatively promising.
- Solidify argument that income effect is large relative to substitution effect. Otherwise there is no puzzle (and thus no paper).
- Broaden the focus to family labor supply.