Business Cycles and Household Formation: The Micro versus the Macro Labor Elasticity

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Claim: To understand labor market volatility for the young, we need to understand their living arrangements

- Certain demographic groups have much larger cyclical volatility of labor market variables than others: e.g. young, single people
- Account for very large share of overall labor market fluctuations
- Demographic trends may lead to changes in labor market volatility
- Demonstrate that one cannot understand the labor market outcomes of these groups without understanding their living arrangements.
Empirics: Heterogeneity and volatility in household structure

- The old: little cross-sectional variation, and little changes over time
- The young: heterogeneity and volatility in living arrangements
  - Differences in the number and type of people with whom young people live. Much, but not all, is due to parental coresidence
- Labor market variables differ by living arrangements
  - Young people living with their parents: low wages, low hours, high cyclical volatility hours and wages.
  - Young people living independently: high wages, high hours, low cyclical volatility, more like the old
- Average household size is volatile and counter-cyclical
Logic: Unearned income and Marshallian elasticities

- Demographic groups with high volatility (the young) have very little financial wealth for smoothing shocks.

- Without mechanisms for smoothing income fluctuations, Marshallian (not Frisch) elasticities drive labor market responses to wage changes.

- For a given Frisch elasticity, young should have lower labor market volatility than the old, if both groups face same labor demand shocks.

- Transfers and lower expenses when living with old lead to increased responsiveness of labor supply to wage changes.

- When labor market opportunities worsen:
  - Young people living with parents: might as well sit on parents couch.
  - Young people living independently:
    - Keep working to pay the bills, like the old guys, or
    - Move in with an old guy and sit on their couch.
Detour: A quick history of thought

- Pervasive view in productivity driven business cycles: everything boils down to the Frisch elasticity.

- Given the size of the capital stock, there is ample opportunity to smooth in a representative agent RBC model.

- Many researchers noticed that young have much higher cyclical volatility of hours than old, not due to industry composition. (Ríos-Rull (1996), Shimer (2001), Gomme et al. (2005)).

- Early papers implicitly explained this with different Frischs for young and old not necessarily due to different preferences. (Ríos-Rull (1994); Ríos-Rull (1996)).
Detour: A quick history of thought

- Jaimovich and Siu (2009) realized that this implies demographic trends have big implications for overall volatility. So it matters.

- Jaimovich et al. (2013): It can’t be due to different Frisch elasticities.
  Key insight: Wage volatility is also higher for young than old. Must be labor demand differences, not labor supply differences Technology with imperfect substitutability: higher volatilities for young than old for both wages and hours

- Problems with Jaimovich et al. (2013):
  1. Qualitative argument fails with Frisch elasticities for old are $< \infty$
  2. Quantitatively failure: closest they come requires Frisch for young $= 7-25$
  3. Living arrangements matter more than age: differences in volatility across living arrangements among young are larger than young vs old
This paper

- We want to provide a joint theory of living arrangements and labor market engagement including the business cycle.

- Accounts for the relative movements of hours and wages, at least the meager part that is associated to TFP movements.

- We also want to ask whether there is anything to the difference between the micro and macro labor elasticities.
Cyclical volatility of living arrangements

<table>
<thead>
<tr>
<th>Definition of Young</th>
<th>18-30</th>
<th>Never married</th>
<th>18-30 &amp; never married</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fraction young</td>
<td>32%</td>
<td>26%</td>
<td>19%</td>
</tr>
<tr>
<td>Fraction young live with old</td>
<td>50%</td>
<td>52%</td>
<td>67%</td>
</tr>
<tr>
<td>St Dev log fraction live with old</td>
<td>0.83%</td>
<td>0.80%</td>
<td>0.66%</td>
</tr>
<tr>
<td>Corr: log fraction young live with old log hours of 18-65</td>
<td>-0.33</td>
<td>-0.37</td>
<td>-0.48</td>
</tr>
</tbody>
</table>

Source: CPS Basic monthly surveys, 1979:Q1-2010:Q3
Sample: Civilians aged 18-65 not in school
1. Household size and composition are cyclical

Correlation = −0.33

Filtered Log Hours Per Person
Filtered Log Persons Per Household

Log Hours Per Person
Log Persons Per Household

1980q1 1990q1 2000q1 2010q1

Correlation = −0.33

Filtered Log Hours Per Person
Filtered Log Persons Per Household
1. Household size and composition are cyclical

Correlation = −0.55

Log Parental Coresidence Rate, 18−30

Log Hours Per Person, 18−30

1980q1 1990q1 2000q1 2010q1

[Correlation = −0.55]
## Living arrangements and the labor market

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<thead>
<tr>
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<th>18-30</th>
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</thead>
<tbody>
<tr>
<td><strong>Av Hours</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All young</td>
<td>0.91</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Young alone</td>
<td>1.06</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Young with old</td>
<td>0.75</td>
<td></td>
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<tr>
<td><strong>Av Wages</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All young</td>
<td>0.57</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Young alone</td>
<td>0.72</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Young with old</td>
<td>0.43</td>
<td></td>
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<tr>
<td><strong>Var log hours</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>All young</td>
<td>2.74</td>
<td></td>
<td></td>
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<tr>
<td>Young alone</td>
<td>1.78</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Young with old</td>
<td>4.01</td>
<td></td>
<td></td>
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<tr>
<td><strong>Var log wages</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>All young</td>
<td>2.08</td>
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<tr>
<td>Young alone</td>
<td>2.21</td>
<td></td>
<td></td>
</tr>
<tr>
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<td>2.57</td>
<td></td>
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<td>0.89</td>
<td>0.84</td>
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<tr>
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<td>1.03</td>
<td>1.06</td>
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<tr>
<td>Young with old</td>
<td>0.75</td>
<td>0.75</td>
<td>0.73</td>
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<td>Av Wages</td>
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<tr>
<td>All young</td>
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<td>0.62</td>
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<td>0.82</td>
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<td>Young with old</td>
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<td>0.40</td>
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The need: the model with endogenous household formation

- Quantitatively the living arrangements margin matters more than age for labor market outcomes.

- Where do people live does not matter for their productivity. Young alone and young together are perfect substitutes in production, so it can not be only demand story as in Jaimovich et al. (2013).

- There is a need for a theory of living arrangements varying over the business cycle, which generates differential labor outcomes of young alone and young together.
Model: Quantifying importance of coresidence

- Simple model: minimal deviations from RBC and Jaimovich et al. (2013)

- Estimate based on the relevant data:
  - Relative hours, wage variances of old, young alone, young together
  - Measures of cyclicality of living arrangements
  - Match relative variances with reasonable Frisch for old (Frisch for young is not well-defined, action from Marshallian elasticity)
  - We ask the role of the living arrangement in determining the volatility of young hours. What if all home, all away, all in the same place.
How does this change the representative agent model:
The Micro versus the Macro Elasticity

- Micro studies often prune data (to get stable households) when estimating Frisch elasticity (always married, constant size), yet a lot of action in this margin. Heathcote et al. (2009), Chetty et al. (2011)

  - Micro elasticity is measured using panel data sets that where people with variable living arrangements are pruned.

  - In macro everybody counts.

- What is the Frisch of a RA model that replicates the aggregate volatility of a model with variable living arrangements?, yet its stable people have the elasticity that is measured by micro methods.: The macro elasticity.

- A 0.7 Frisch for the old translates into an RA Frisch of 1.19 ($\Delta65\%$)
The Model

It is a standard RBC model augmented with other agents.

1. The additional agents are hand to mouth.
2. Their hours move.
3. Some of them move in with the standard households.
4. Incentives to move change with the cycle.
Demographics:

- **Old agents** Continuum of agents of measure \((\mu)\)
  - Live in groups of size \(\gamma\): there are \(\mu/\gamma\) households
  - Can be invaded by a young agent, but only after choice of consumption and hours has been made

- **Young agents** measure \((1 - \mu)\)
  - Can join (invade) a stable household after observing state and realization of an IID idiosyncratic shocks:
    - Individual productivity \(\varepsilon \sim F_\varepsilon\)
    - Disutility from living with the old \(\eta \sim F_\eta\)
  - Fraction of young who invade an old household: \(x\)

- At any point there are three types of agents:
  1. Old
  2. Young alone
  3. Young together (with old)
Timing

1. All shocks (aggregate technology shock $z$ and idiosyncratic shocks: productivity $\eta$ and disutility from living with the old $\varepsilon$) are realized.

2. Old make their labor and consumption choices. (This way history of young living at home is irrelevant)

3. Young choose where to live and how much to work.

4. Production and consumption take place.
Old agents: Expected utility over being invaded

\[ u(c^o, h^o, x) = \left[ 1 - \frac{x(1 - \mu)\gamma}{\mu} \right] \left[ \log \frac{c^o}{\zeta^{oo}} - \psi^o \frac{(h^o)^{1 + \frac{1}{\nu^o}}}{1 + \frac{1}{\nu^o}} \right] + \frac{x(1 - \mu)\gamma}{\mu} \left[ \log \left( \frac{c^o}{\zeta^{oo} + \zeta^o} \right) - \psi^o \frac{(h^o)^{1 + \frac{1}{\nu^o}}}{1 + \frac{1}{\nu^o}} \right] \]

- Economies of scale among old: \( \zeta^{oo} \)
- Frisch elasticity: \( \nu^o \)
- (Meager) economies of scale from young: \( \zeta^o \)
- Discount future at rate \( \beta \)
Young agents

- Young alone

\[ u(c^{yA}, h^{yA}) = \frac{(c^{yA})^{1-\sigma^y}}{1 - \sigma^y} - \psi^y \frac{(h^{yA})^{1+\frac{1}{\nu^y}}}{1 + \frac{1}{\nu^y}} \]

- Young together

\[ u(c^{yT}, h^{yT}, \eta) = \frac{(c^{yT} + \zeta c^o)^{1-\sigma^y}}{1 - \sigma^y} - \psi^y \frac{(h^{yT})^{1+\frac{1}{\nu^y}}}{1 + \frac{1}{\nu^y}} - \eta \]

- Dislike of living with old: \( \eta \). This is an iid, shock across all young. Some hate living with their parents more than others.

- Economies of scale: \( \zeta c^o \)
Budget constraints

- Old have a standard budget constraint

\[ c^o + a' = w^o h^o + (1 + r) a, \]

- Young are hand-to-mouth with productivity \( \varepsilon \)

\[ c^{yT} = w^y h^{yT} \varepsilon \quad c^{yA} = w^y h^{yA} \varepsilon \]

- Idiosyncratic efficiency units \( \varepsilon \). This is an iid, shock across all young.
Nested CES with capital-experience complementarity (Jaimovich et al. (2013)) and labor productivity shocks

\[ F(z, K, N^y, N^o) = \left[ \mu_F (zN^y)^\sigma + (1 - \mu_F) (\lambda_F K^\rho + (1 - \lambda_F) (zN^o)^\rho)^{\sigma/\rho} \right]^{1/\sigma} \]

where \( N^y \) and \( N^o \) are labor inputs from the young and old.

As Jaimovich et al. (2013) show this technology allows the model to generate \( \text{var}(N^y) > \text{var}(N^o) \) and \( \text{var}(W^y) > \text{var}(W^o) \) jointly.
Aggregation

- Equilibrium indifference condition

\[
\eta^* (\varepsilon) = \frac{(c^yT + \zeta c^o)^{(1 - \sigma^y)}}{1 - \sigma^y} - \psi^y \left( \frac{(h^yT)^{1 + \frac{1}{\nu^y}}}{1 + \frac{1}{\nu^y}} \right) - \left[ \frac{(c^yA)^{(1 - \sigma^y)}}{1 - \sigma^y} - \psi^y \left( \frac{(h^yA)^{1 + \frac{1}{\nu^y}}}{1 + \frac{1}{\nu^y}} \right) \right]
\]

- Then the fraction of the young living together with old is given by

\[
x = \int_0^\infty F_\eta \left( \eta^* (\varepsilon); \lambda^1_\eta, \lambda^2_\eta \right) dF_\varepsilon \left( \varepsilon; \lambda^1_\varepsilon, \lambda^2_\varepsilon \right)
\]
Wage densities of young workers

![Graph showing wage density distributions for young workers together and alone, with mean values indicated.]

- Young together
- Young alone
- Mean $\epsilon$
Partition of young workers

\[ \eta^*(\varepsilon) \]

Young alone

Young together
Aggregation cont.

\[
N^{yA} = \int_0^\infty \int_{\eta^*(\varepsilon)}^{\infty} h^{yA}(\varepsilon) \varepsilon \, dF_{\eta}(\eta; \lambda^1_{\eta}, \lambda^2_{\eta}) \, dF_{\varepsilon}(\varepsilon; \lambda^1_\varepsilon, \lambda^2_\varepsilon)
\]

\[
N^{yT} = \int_0^\infty \int_{\eta^*(\varepsilon)}^{\infty} h^{yT}(\varepsilon) \varepsilon \, dF_{\eta}(\eta; \lambda^1_{\eta}, \lambda^2_{\eta}) \, dF_{\varepsilon}(\varepsilon; \lambda^1_\varepsilon, \lambda^2_\varepsilon)
\]

\[
H^{yA} = \int_0^\infty \int_{\eta^*(\varepsilon)}^{\infty} h^{yA}(\varepsilon) \, dF_{\eta}(\eta; \lambda^1_{\eta}, \lambda^2_{\eta}) \, dF_{\varepsilon}(\varepsilon; \lambda^1_\varepsilon, \lambda^2_\varepsilon)
\]

\[
H^{yT} = \int_0^\infty \int_{\eta^*(\varepsilon)}^{\infty} h^{yT}(\varepsilon) \, dF_{\eta}(\eta; \lambda^1_{\eta}, \lambda^2_{\eta}) \, dF_{\varepsilon}(\varepsilon; \lambda^1_\varepsilon, \lambda^2_\varepsilon)
\]

\[
C^{yA} = \int_0^\infty \int_{\eta^*(\varepsilon)}^{\infty} w^y h^{yA}(\varepsilon) \varepsilon \, dF_{\eta}(\eta; \lambda^1_{\eta}, \lambda^2_{\eta}) \, dF_{\varepsilon}(\varepsilon; \lambda^1_\varepsilon, \lambda^2_\varepsilon)
\]

\[
C^{yT} = \int_0^\infty \int_{\eta^*(\varepsilon)}^{\infty} w^y h^{yT}(\varepsilon) \varepsilon \, dF_{\eta}(\eta; \lambda^1_{\eta}, \lambda^2_{\eta}) \, dF_{\varepsilon}(\varepsilon; \lambda^1_\varepsilon, \lambda^2_\varepsilon)
\]
The aggregate values for consumption \((C)\), labor inputs \((N^y, N^o)\), capital stock \((K)\) and hours \((H)\), are given by

\[
C = \frac{\mu}{\gamma} c^o + (1 - \mu) [C^yT + C^yA],
\]

\[
N^o = \frac{\mu}{\gamma} h^o
\]

\[
N^y = (1 - \mu) [N^yT + N^yA]
\]

\[
H = \frac{\mu}{\gamma} h^o + (1 - \mu) [H^yT + H^yA],
\]

\[
K = \frac{\mu}{\gamma} a
\]

Structure is on top of a standard RBC model

\[
C + K' = F(z, K, N^y, N^o) + (1 - \delta)K
\]

where \(z\) is an AR(1) productivity shock.
This structure achieves

1. Simplicity

- Equilibrium has same elements as standard RA model, but with different implications.

- Aggregate states $s = \{z, K - \}$ are sufficient statistics for wealth and prices.

2. Equilibrium is not optimal

- Feelings of the old are not taken into account when household structure is decided.
Equilibrium

A set of functions for:

(i) consumption $\{c^Y_A(s), c^Y_T(s), c^0(s)\}$
(ii) hours worked $\{h^Y_A(s), h^Y_T(s), h^0(s)\}$
(iii) threshold for staying at home $\eta^*(s, \varepsilon)$; and
(iv) fraction of young that move in with their old $x(s)$,

such that:

(i) the young maximize given the choice of the old
(ii) the old maximize given the expected choices of the young
(iii) prices are competitive; and
(iv) fraction of households moving with their elderly satisfies

$$x = \int_0^\infty F^\eta \left( \eta^* (\varepsilon); \lambda^1, \lambda^2 \right) dF^\varepsilon \left( \varepsilon; \lambda^1, \lambda^2 \right)$$

where $\eta^*(s, \varepsilon)$ satisfies

$$u(c^Y_A(s, \varepsilon), h^Y_A(s, \varepsilon), \eta^*(s, \varepsilon)) = u(c^Y_T(s, \varepsilon), h^Y_A(s, \varepsilon), \eta^*(s, \varepsilon))$$

for all $\varepsilon$ i.e. the marginal young are indifferent.
Calibration Strategy

- Use technological (elasticities) estimates of Jaimovich et al. (2013), demographic structure, economies of scale, and microeconomicly measured Frisch of old (.7).

- Target

  1. Standard Aggregates \((r, I/Y, \text{capital share, Solow residual})\)
  2. Average hours of old, young alone, young together
  3. Average Wages of young together and alone
  4. Living Arrangement \(x\)
  5. Relative (to hours of old) volatilities of: hours of young alone, young together and fraction of young living with parents.
Calibration: Technology

Table: Technological Parameters and Targets

<table>
<thead>
<tr>
<th>Parameter Description</th>
<th>Target variable</th>
<th>Target</th>
<th>Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parameters set without solving the model</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\rho$</td>
<td>Elasticity parameter</td>
<td>Micro estimates JPS (2012)</td>
<td>.201</td>
</tr>
<tr>
<td>$\sigma$</td>
<td>Elasticity parameter</td>
<td>Micro estimates JPS (2012)</td>
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<td>Parameters that require solving the model</td>
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<tr>
<td>$\delta$</td>
<td>Depreciation rate</td>
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<tr>
<td>$\mu_F$</td>
<td>Weight of young</td>
<td>Capital Share</td>
<td>.36</td>
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<tr>
<td>$\lambda_F$</td>
<td>Weight of capital</td>
<td>Share of olds' income in total</td>
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<td>$\rho_z$</td>
<td>AR(1) prod shocks</td>
<td>Autocorr AR(1) RA Solow Res*</td>
<td>.94</td>
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<td>St Dev productivity shocks</td>
<td>Var Solow Res*</td>
<td>3.19</td>
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</table>

* Unfiltered series.
Calibration: Preferences of the old

**Table: Parameters of preferences of the old**

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<thead>
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<td>$\mu$</td>
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<td>Measurement</td>
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<td>$\beta$</td>
<td>Discount rate</td>
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<td>$\psi^y$ Weight of hours of Young</td>
<td>Hours of young together</td>
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<td>$\lambda^1$ Shape par of Gamma dist</td>
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</tr>
<tr>
<td>$\sigma^y$ Risk Aversion of young</td>
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<td>.30</td>
<td>0.65</td>
</tr>
<tr>
<td>$\lambda^2$ Scale par of Gamma dist</td>
<td>$Var(x)/Var(h^o)$</td>
<td>.46</td>
<td>0.17</td>
</tr>
<tr>
<td>$\nu^y$ Labor elasticity of Young</td>
<td>$Var(h^{yT})/Var(h^o)$</td>
<td>4.01</td>
<td>7.48</td>
</tr>
<tr>
<td>$\zeta^y$ Ec of scale of Young</td>
<td>$Var(h^{yA})/Var(h^o)$</td>
<td>1.78</td>
<td>.014</td>
</tr>
</tbody>
</table>
Findings

- Model tells us: even relatively modest amount of transfers to the young translates into a sizeable differences in labor market outcomes we observe in the data.

- Key mechanism: transfers make the labor market elasticities of young together and alone different which is responsible for their business cycle behavior.

- Labor market elasticity of young together is **82%** larger, relative to the young alone.

- Coresidence volatility channel contributes **3%** to the aggregate hours volatility.
Three measures of implicit transfers
Three measures of implicit transfers

1. Fraction of average consumption of young together:

\[ \Delta_c = \left( \frac{\zeta c^o}{c_y^T} \right) \times 100 = 4.8\% \]

Small, more later.

2. Additional hours to be worked on the market by young together \( h^{yT} \) to compensate the transfer from the old:

\[ \Delta_h = \left( \frac{h^{yT} - h^{yT}}{h^{yT}} \right) \times 100 = 22.4\% \]

where \( h^{yT} \) is mean hours worked in baseline model.

3. Additional productivity of young together \( \bar{\varepsilon} \) to compensate the transfer from the old:

\[ \Delta_{\varepsilon} = \left( \frac{\bar{\varepsilon} - \varepsilon}{\varepsilon} \right) \times 100 = 14.4\% \]

where \( \varepsilon \) is mean productivity in baseline model.
A tale of two elasticities

- Marshallian elasticity of labor supply for young alone

\[ \eta_{wy}^{h_y} = \frac{(1 - \sigma^y) \nu^y}{1 + \sigma^y \nu^y} \]

- Marshallian elasticity of labor supply for young together

\[ \eta_{wy}^{h_y^T}(\varepsilon) = \eta_{wy}^{h_y^A} \left[ 1 + \left( \frac{\zeta^c}{\varepsilon^W h_y^T} \right) \left( \frac{1}{1 - \sigma^y} \right) \right] \left[ 1 + \left( \frac{\zeta^c}{\varepsilon^W h_y^T} \right) \left( \frac{1}{1 + \sigma^y \nu^y} \right) \right] \]

Two useful properties:

- If only \( \sigma^y < 1 \), \( \forall \varepsilon \) we have \( \eta_{wy}^{h_y^T}(\varepsilon) > \eta_{wy}^{h_y^A} \)

- \( \eta_{wy}^{h_y^T} \) is increasing in \( \zeta \) and for \( \zeta = 0 \) we have \( \eta_{wy}^{h_y^A} = \eta_{wy}^{h_y^T}(\varepsilon) \quad \forall \varepsilon. \)
Quantifying the impact of transfers for elasticities

- The coresidence channel, modeled through the consumption externality, endogenously creates a wedge between labor elasticities of young alone and young together.

- Relevant elasticities for the business cycle movements of labor markets outcomes are:
  - Frisch of the old: \( \nu^o = 0.72 \)
  - Marshallian of young alone: \( \eta^{h_A}_{wy} = 0.51 \)
  - Mean Marshallian of young together: \( E \left[ \eta^{h_T}_{wy} (\varepsilon) \right] = 0.93 \)

- Recall, JPS in their demand story require:
  - Frisch of the old: \( \nu^o = \infty \)
  - Frisch of the young: \( 7 - 25 \)
Comovements between family size and hours worked

Log Persons Per Household

Log Hours Per Person

Time
Contributions to asymmetric labor market outcomes

<table>
<thead>
<tr>
<th>Moments</th>
<th>Data</th>
<th>Baseline</th>
<th>Ec 1 with fixed living arrangements</th>
<th>Ec 2 with no transfers to young together</th>
<th>Ec 3 with no hetero. in $\varepsilon$</th>
<th>Ec 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Ec 1</td>
<td>Ec 2</td>
<td>Ec 3</td>
<td></td>
</tr>
<tr>
<td>Means</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>$h^y_A$</td>
<td>0.297</td>
<td>0.291</td>
<td>0.291</td>
<td>0.293</td>
<td>0.333</td>
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<tr>
<td>$h^y_T$</td>
<td>0.210</td>
<td>0.213</td>
<td>0.213</td>
<td>0.261</td>
<td>0.333</td>
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</tr>
<tr>
<td>$w^{y_A}/w^o$</td>
<td>0.720</td>
<td>0.731</td>
<td>0.731</td>
<td>0.728</td>
<td>0.572</td>
<td></td>
</tr>
<tr>
<td>$w^{y_T}/w^o$</td>
<td>0.430</td>
<td>0.422</td>
<td>0.422</td>
<td>0.410</td>
<td>0.572</td>
<td></td>
</tr>
<tr>
<td>Second moments</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\text{var}(h^{y_A})/\text{var}(h^o)$</td>
<td>1.777</td>
<td>1.777</td>
<td>1.718</td>
<td>1.734</td>
<td>1.781</td>
<td></td>
</tr>
<tr>
<td>$\text{var}(h^{y_T})/\text{var}(h^o)$</td>
<td>4.013</td>
<td>4.013</td>
<td>4.564</td>
<td>1.734</td>
<td>1.781</td>
<td></td>
</tr>
<tr>
<td>$\text{var}(x)/\text{var}(h^o)$</td>
<td>0.458</td>
<td>0.454</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>$\text{var}(h^y)/\text{var}(h^o)$</td>
<td>2.742</td>
<td>2.902</td>
<td>2.706</td>
<td>1.734</td>
<td>1.781</td>
<td></td>
</tr>
<tr>
<td>$\text{var}(w^{y_A})/\text{var}(w^o)$</td>
<td>2.211</td>
<td>1.519</td>
<td>1.747</td>
<td>1.762</td>
<td>1.752</td>
<td></td>
</tr>
<tr>
<td>$\text{var}(w^{y_T})/\text{var}(w^o)$</td>
<td>2.573</td>
<td>1.561</td>
<td>1.747</td>
<td>1.762</td>
<td>1.752</td>
<td></td>
</tr>
<tr>
<td>$\text{var}(h)$</td>
<td>2.026</td>
<td>0.192</td>
<td>0.187</td>
<td>0.158</td>
<td>0.143</td>
<td></td>
</tr>
</tbody>
</table>

Targeted moments in the Baseline economy only.
Implications for the Frisch Elasticity in the RA models

- In the standard RA RBC model all what matters for the volatility of the aggregate hours is Frisch elasticity.

- Setting Frisch to 0.72 and imposing the aggregate TFP shock to have the properties as the Solow residual in the data, model generates $\text{var}(h) = 0.086$, which accounts for 4.3% of the data.

- Given the same restrictions on the Solow residual properties, our baseline economy generates $\text{var}(h) = 0.192$, which accounts for 9.5% of the data.

- To capture the existence of the coresidence margin and heterogeneity of young in terms of productivity one would require a Frisch elasticity of 1.19 in the RA RBC model, which is a 65% increase.
What’s next

- The size of the implicit transfer to the young is way too small. Changing units does not reduce it.

- The problem is that for larger transfers the volatility of the living arrangement shoots up.

- We are expanding the model to include adjustment costs to difficult the movements in living arrangement in between periods. But no results yet. Kydland and Prescott (1991)
Conclusions

- Young and old have different labor market behaviors. Jaimovich et al. (2013) show that so do their wages which has to be part of the story.

- We have documented the central role of the living arrangement in shaping the behavior of the young.

- We have also documented the cyclical movements of the living arrangements.

- We have provided a theory of how it works and mapped it to the data. This theory accounts for the average and cyclical behavior of the young and the old.

- As a bonus we have provided a logical theory of the differences between the micro and the macro (which is 65% larger) Frisch elasticities.


