Household Search or Individual Search: Does it Matter? Evidence from Lifetime Inequality Estimates.

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Motivation

• Search Model of the labor market are widespread and influential
  – theoretical survey [Rogerson, Shimer and Wright 2005]
  – empirical survey [Eckstein and van den Berg 2007]

• However they ignore that labor market decisions are often taken at the household level
  – all the contributions cited in the previous two surveys are individual search models
• Recent theoretical works have started to realize the importance of this omission:
  – Albrecht, Anderson and Vroman (2010)
  – Guler, Guvenen and Violante (2010)

• However we do not know if this theoretical relevance also translates in empirical relevance:
  – Only one published paper exists that estimate a household search model [Dey and Flinn 2008]
Our Contribution

• We develop and estimate an household search model to evaluate if omitting the household in standard search models of the labor market has relevant empirical consequences.

• We evaluate the empirical relevance by:

  1. comparing the parameters estimates with and without assuming household search

  2. using the parameters estimates on a relevant public policy issue: inequality in the US
• Inequality is a particularly interesting application because:

1. Big impact on welfare

2. Recent changes over-time still unexplained

3. We can improve on standard empirical measures of inequality:
   – Not only individual measures but also household measures [Gottschalk and Danziger (2006); Heathcote et al. (2009)]
   – Not only cross-sectional measures but also lifetime measures
• Providing lifetime measures of inequality is a particularly valuable contribution:

1. Lifetime measures are arguably more relevant than cross-sectional measures to describe overall individual welfare
   - cross-sectional measures fail to capture mobility across jobs, labor market states, positions in the wage distribution.

2. But they are extremely hard to find and all of them are from individual search models:
   - Flinn (2002); Bowlus and Robin (2004 and 2010); Flabbi and Leonardi (2010)
3. With our approach we can estimate the structural parameters of the model taking into account:

- Cross-sectional inequality;
- Mobility across labor market states;
- Employment and wage risk.

4. We can therefore assess if ignoring the household generates:

- an erroneous measure of lifetime inequality
- and a misleading pictures of its sources.
Model

Environment

- Stationary, continuous time.

- Workers labor market states: employed (part-time or full time) or unemployed.

- Workers sample the joint distribution of wages ($w$) and "hours requirement" ($h \in \{PT, FT\}$)
• Unitary model of the household with instantaneous utility:

\[ u(c_{ij}, l_i, l_j) = \]
\[ (1 - \alpha_H - \alpha_W) \frac{c_{ij}^\delta - 1}{\delta} + \alpha_H \frac{l_i^{\rho_H} - 1}{\rho_H} + \alpha_W \frac{l_j^{\rho_W} - 1}{\rho_W} \]

\text{where:}

\(i \in H\) denotes the husband; \(j \in W\) denotes the wife

\[ c_{ij} = Y + w_i h_i + w_j h_j \]
\[ l_i = 1 - h_i; l_j = 1 - h_j \]
- Mobility shocks:
  - Arrival rate of offers while U: \( \lambda^N_{H,W} \)
  - Arrival rate of offers while E: \( \lambda^E_{H,W} \)
  - Termination shock: \( \eta_{H,W} \)

- Common discount rate: \( \rho \)
Value Functions

• The household value function is:

\[ V(\tilde{w}_i, \tilde{h}_i, \tilde{w}_j, \tilde{h}_j) \]

generating four possible combination depending on the labor market state of both partners.

• If both unemployed:

\[
\left( \rho + \lambda_H^N + \lambda_W^N \right) V(0, 0, 0, 0) = u(c_{ij}, 1, 1) \\
+ \lambda_H^N \int \max \{ V(0, 0, 0, 0), V(w, h, 0, 0) \} \, dF_H(w, h) \\
+ \lambda_W^N \int \max \{ V(0, 0, 0, 0), V(0, 0, w, h) \} \, dF_W(w, h)
\]
• If H employed and W unemployed (or vice versa):

\[
\left( \rho + \lambda^E_H + \eta_H + \lambda^N_W \right) V \left( w_i, h_i, 0, 0 \right) = u \left( c_{ij}, l_i, 1 \right) \\
+ \eta_H V \left( 0, 0, 0, 0 \right) \\
+ \lambda^E_H \int \max \left\{ V \left( w_i, h_i, 0, 0 \right), V \left( w, h, 0, 0 \right) \right\} dF_H \left( w, h \right) \\
+ \lambda^N_W \int \max \left\{ V \left( w_i, h_i, 0, 0 \right), V \left( w_i, h_i, w, h \right), V \left( 0, 0, w, h \right) \right\} dF_W \left( w, h \right)
\]

• If both employed:

\[
\left( \rho + \lambda^E_H + \eta_H + \lambda^E_W + \eta_W \right) V \left( w_i, h_i, w_j, h_j \right) = u \left( c_{ij}, l_i, l_j \right) \\
+ \eta_H V \left( 0, 0, 0, 0 \right) \\
+ \lambda^E_H \int \max \left\{ V \left( w_i, h_i, w_j, h_j \right), V \left( w, h, w_j, h_j \right), V \left( w, h, 0, 0 \right) \right\} dF_H \left( w, h \right) \\
+ \eta_W V \left( 0, 0, 0, 0 \right) \\
+ \lambda^E_W \int \max \left\{ V \left( w_i, h_i, w_j, h_j \right), V \left( w_i, h_i, w, h \right), V \left( 0, 0, w, h \right) \right\} dF_W \left( w, h \right)
\]
Equilibrium Results

- Reservation value property on wages
  (Different from Blau (1991) set in a nonstationary environment but similar to Flabbi and Moro (2010) set in a stationary environment with bargaining)

- Reservation wage of one partner depends on the labor market status of the other partner
  (This dependency may also induce endogenous job termination)

- Unless risk-neutral preferences are assumed
  (In this case, under the unitary model assumption, the household search problem reduces to two independent individual search problems. Dey and Flinn (2008); Guler, Guvenen and Violante (2010))
Data

  - collect monthly information on labor market activity
  - link detailed spousal labor market information across time

- Estimation sample restrictions:
  - married couples
  - each aged 25-50
  - trimming on top and bottom wage distributions

- Final sample consists of 1,992 couples.
Estimation

- Estimation by Simulated Methods of Moments

- Moments we match are build from point-in-time samples spaced 3 months apart for 24 months.

- They are extracted from:
  - Wage distribution, conditional on part-time and full-time status
  - Distributions on labor market status, conditional on partner’s labor market status
  - Transition matrixes between labor market status over time
  - Wage growth over time, conditional on part-time and full-time status
Parameters Estimates

Main results: the Individual search model with respect to the Household search model

1. Overestimates wives’ mobility rates

2. Overestimates husbands’ location parameter of wage distributions

3. Underestimates wives’ probability of receiving part-time offers

4. Provides similar estimates of preference parameters
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Inequality

Main results:

• Earnings inequality: cross-sectional higher for wives; lifetime higher for husbands

• Utility inequality: always higher for wives.

• Under the household search specification:
  1. Same ranking between husband and wives both on cross-sectional and lifetime measures
  2. Gender differentials significantly reduced both on cross-sectional and lifetime measures
<table>
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Note: Coefficient of Variation reported
• Implications:

1. Ignoring household search has a significant (but not huge) impact on inequality measures

2. Interestingly, the direction of the impact implies that:
   
   Model’s mispecification due to ignoring the household may explain part of the gender differentials in the labor market
Conclusion

• We develop and estimate an household search model to evaluate if omitting the household in standard search models of the labor market has relevant empirical consequences.

• We find that it does:

  Ignoring household search overestimates the gender differential in lifetime earnings inequality by about 65%.

• Therefore, an interesting implication is that:

  a portion of the estimated gender wage differentials may be due to ignoring the household in the model.
Future Work

- Complete estimation:
  - standard errors (bootstrap)
  - robustness (utility function specification, nonlabor income)

- Look at change over-time to determine its sources. [Flabbi and Leonardi (2010)]

- Beyond unitary model: cooperative household decision making

- Endogenous household formation and dissolution [Flabbi, Flinn, Guner and Mabli (2010)].