Discussion of

“Consumption Inequality and Family Labor Supply”

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New Directions in Consumption Research with the PSID Workshop
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Objective of this Paper

- Use PSID data on earnings, hours, wealth and consumption to estimate how
  - household consumption responds to transitory and permanent shocks to wages of both spouses.
  - individual labor earnings (hours worked, really) respond to transitory and permanent shocks to wages of both spouses.

- Main question: how important is family labor supply for consumption insurance against wage shocks?
Conceptual Framework I

- Fundamental exogenous shocks to wages of both spouses \((W_1, W_2)\).

- Household cares about smooth consumption \(C\) (and hours \(H_1, H_2\), too).

- Household sequential budget constraint

\[
C + \frac{A'}{1 + r} = H_1W_1 + H_2W_2 + T(H_1W_1, H_2W_2) + A
\]
Conceptual Framework II: Sources of Consumption Insurance

\[ C = H_1 W_1 + H_2 W_2 + T(H_1 W_1, H_2 W_2) + A - \frac{A'}{1 + r} \]

- Self-insurance through precautionary saving \((A')\).
- Insurance through family income \((Y_1 = H_1 W_1, Y_2 = H_2 W_2)\), family labor supply \((H_1, H_2)\)
- Other forms of insurance through public and private transfers, \(T(.)\)
The Model:

- Life cycle consumption-savings model with *endogenous* labor supply.

- State space $s = (t, A, P_1, P_2, u_1, u_2, z, z_1, z_2)$. Dynamic programming problem

\[
V(s) = \max_{C,H_1,H_2,A' \geq 0} \left\{ U(C, H_1, H_2, z, z_1, z_2) + \delta EV(s') \right\}
\]

s.t.

\[
C + \frac{A'}{1+r} = Y_1 + Y_2 + T(Y_1, Y_2) + A
\]

\[
\log(Y_j) = \log(H_j) + \log(W_j)
\]

\[
\log W_j = G_j(t) + P_j + u_j \text{ for } j = \{1, 2\}
\]

\[
P'_j = P_j + v_j
\]
The Model:

- Main research question: how does \( C \) and \( H_1, H_2 \) respond to transitory and permanent shocks to wages \( (u_1, u_2, v_1, v_2) \)?

- Stochastic structure of wage shocks: \((u_i, v_i)\) iid over time, uncorrelated with each other. Potentially correlated across spouses: for \( j \in \{1, 2\} \).

\[
E(u_j u_{-j}) \neq 0 \text{ and } E(v_j v_{-j}) \neq 0
\]

- Preferences: additively separable or not:

\[
U(C, z) + v(H_1, z_1) + v(H_2, z_2) \text{ versus } U(C, H_1, H_2, z, z_1, z_2)
\]
Empirical Specification

- Assume interior solutions (especially $A' > 0$ and $H_2 > 0$). Take log-linearization of first order conditions, intertemporal budget constraint.

- Approximation (with $x = \log(X)$, after controlling for observables):

$$
\begin{pmatrix}
\Delta c \\
\Delta y_1 \\
\Delta y_2
\end{pmatrix} =
\begin{pmatrix}
\kappa_{c,u_1} & \kappa_{c,u_2} & \kappa_{c,v_1} & \kappa_{c,v_2} \\
\kappa_{y_1,u_1} & \kappa_{y_1,u_2} & \kappa_{y_1,v_1} & \kappa_{y_1,v_2} \\
\kappa_{y_2,u_1} & \kappa_{y_2,u_2} & \kappa_{y_2,v_1} & \kappa_{y_2,v_2}
\end{pmatrix}
\begin{pmatrix}
\Delta u_1 \\
\Delta u_2 \\
v_1 \\
v_2
\end{pmatrix}
$$

- $\kappa_{x,\varepsilon}$ are functions of the preference and wage process parameters.
With Additive Separability

- Suppose preferences are additively:

\[ U(C, z) + v(H_1, z_1) + v(H_2, z_2) \text{ versus } U(C, H_1.H_2, z, z_1, z_2) \]

- Then

\[
\begin{pmatrix}
\Delta c \\
\Delta y_1 \\
\Delta y_2
\end{pmatrix} =
\begin{pmatrix}
0 & 0 & \kappa_{c,v_1} & \kappa_{c,v_2} \\
\kappa_{y_1,u_1} & 0 & \kappa_{y_1,v_1} & \kappa_{y_1,v_2} \\
0 & \kappa_{y_2,u_2} & \kappa_{y_2,v_1} & \kappa_{y_2,v_2}
\end{pmatrix}
\begin{pmatrix}
\Delta u_1 \\
\Delta u_2 \\
v_1 \\
v_2
\end{pmatrix}
\]
Permanent Income Benchmark

• Standard permanent income model: infinitely lived households composed of single earner, quadratic utility, no borrowing constraints, $\beta(1 + r) = 1$ and exogenous labor supply. Model implies:

$$
\begin{pmatrix}
\Delta c \\
\Delta y
\end{pmatrix} =
\begin{pmatrix}
\frac{r}{1+r} & 1 \\
1 & 1
\end{pmatrix}
\begin{pmatrix}
\Delta u \\
v
\end{pmatrix}
$$

• Consumption responds to permanent shocks one for one.

• Carroll (2001): $\kappa_{c,v} \in [0.79, 0.92]$. Blundell et al. (2008): $\kappa_{c,v} \approx 0.64$. 
Main Results: How Much Consumption Insurance?

With separable preferences consumption response to $v_j$ given by:

$$
\kappa_{c,v_j} = s_j \frac{\eta_{c,p} \left(1 + \eta_{h,w_j}\right)(1 - \pi)(1 - \beta)}{\eta_{c,p} + \bar{\eta}_{h,w}(1 - \pi)(1 - \beta)}
$$

- Consumption insurance mechanisms:
  - Family income insurance: $s_j < 1$.
  - Own labor supply and that of other family members: $\eta_{h,w} \neq 0$.
  - Self-insurance: $\pi > 0$. Additional forms of insurance $\beta > 0$. 
Main Results: How Much Consumption Insurance?

- Importance of these channels (qualitatively and quantitatively) depends on presence and size of nonseparabilities in preferences:

\[ \eta_{c,w_j}, \eta_{c,w_{-j}}, \eta_{h_j,p}, \eta_{h_{-j},p}, \eta_{h_{-j},w_j}, \eta_{h_j,w_{-j}} \neq 0 \]

- With nonseparabilities \( \kappa_{c,v_j} = \)

\[
\eta_{c,w_j} + \frac{(\eta_{c,p} - (\eta_{c,w_j} + \eta_{c,w_{-j}}))}{(\eta_{c,p} - (\eta_{c,w_j} + \eta_{c,w_{-j}}))} \left[ (1 - \pi)(1 - \beta) \left( s_j + \tilde{\eta}_{h,w_j} - \eta_{c,w_j} \right) \right] + (1 - \pi)(1 - \beta) \left( \tilde{\eta}_{h,w_j} + \tilde{\eta}_{h,w_{-j}} + \tilde{\eta}_{h,p} \right)
\]
Some Illustrative Calculations: Separable Case

\[ \kappa_{c,v_j} = \frac{\eta_{c,p}(1 - \pi)(1 - \beta)s_j(1 + \eta_{h,w_j})}{\eta_{c,p} + (1 - \pi)(1 - \beta)\bar{\eta}_{h,w}} \]

<table>
<thead>
<tr>
<th></th>
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<tr>
<td>( \kappa_{c,v_1} )</td>
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- Note: used parameter estimates of nonseparable case for these calculations. Estimates for separable case look "strange" (especially \( \hat{\beta} = 0.741 \)).
Some Illustrative Calculations: Nonseparable Case

\[ \eta_{c,w_j} + \frac{\left(\eta_{c,p} - (\eta_{c,w_j} + \eta_{c,w_{-j}})\right) \left[(1 - \pi)(1 - \beta) \left(s_j + \bar{\eta}_{h,w_j} - \eta_{c,w_j}\right)\right]}{\left(\eta_{c,p} - (\eta_{c,w_j} + \eta_{c,w_{-j}})\right)} + (1 - \pi)(1 - \beta) \left(\bar{\eta}_{h,w_j} + \bar{\eta}_{h,w_{-j}} + \bar{\eta}_{h,p}\right) \]

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- Key insight: spousal income (responses) dominant force of consumption insurance against wage shocks.

- Nonseparabilities don’t matter for insurance decomposition.
Comments: How Good are the Approximations?

- Corners?
  - Extensive margin of labor supply?
  - Borrowing constraints?

\[
\begin{pmatrix}
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\end{pmatrix}
\begin{pmatrix}
\Delta u_1 \\
\Delta u_2 \\
v_1 \\
v_2 \\
\end{pmatrix}
\]
Comments: How Good are the Approximations?

- Finite horizon considerations? If planning horizon is finite and $T$, then even for the simple PIH:

$$\kappa_{c,u_j} = \frac{r}{(1+r)(1-\frac{1}{(1+r)^{T+1}})}$$

- Thus for $T = 0$, one has $\kappa_{c,u_j} = 1$.

- Even for $T = 10$, one has (with $r = 2\%$), $\kappa_{c,u_j} = 0.11$. 
• What does $\pi$ really measure? Impact of past savings decisions:

$$\pi_{it} = \frac{Assets_{it}}{Assets_{it} + PDV(Y_{it})}.$$ 

Not clear it is a good measure of consumption smoothing through precautionary saving. Might only partially capture effects of binding $A' \geq 0$.

• What does $\beta$ really measure? Like the Solow residual in RBC theory, it is a measure of our ignorance (of the importance and sources of insurance beyond self-insurance). However, $\hat{\beta} \approx 0$ (at least in the nonseparable case).
Conclusion

- Paper with a wealth of results, bound to stimulate much follow-up work.

- Would not have been possible for the U.S. prior to new PSID consumption data!
Most Immediate Follow-up Questions: __________

- Use the structural life cycle model above to assess
  - How good is the approximation in the presence of potentially binding corners?
  - In the context of an estimated version of that model, how good is consumption insurance? How does it vary over the cycle?
  - Welfare benefits of these insurance channels (especially those that can be affected by public policy).
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\[ \kappa_{c,v_j} = \frac{\eta_{c,p}(1 - \pi)(1 - \beta)s_j(1 + \eta_{h,w_j})}{\eta_{c,p} + (1 - \pi)(1 - \beta)\tilde{\eta}_{h,w}} \]

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