Discussion of

"Consumption Inequality and Family Labor Supply"

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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

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

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

$$
\begin{aligned}
V(s) &= \max_{C,H_1,H_2,A'\geq 0} \left\{U(C, H_1.H_2, z, z_1, z_2) + \delta EV(s')\right\} \\
& \quad s.t. \\
C + \frac{A'}{1+r} &= Y_1 + Y_2 + T(Y_1, Y_2) + A \\
\log(Y_j) &= \log(H_j) + \log(W_j) \\
\log W_j &= G_j(t) + P_j + u_j \text{ for } j = \{1, 2\} \\
P_j' &= P_j + v_j
\end{aligned}
$$

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):

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

- $\kappa_{x,\epsilon}$ 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 $\kappa_{c,v_j} =$

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

Some Illustrative Calculations: Separable Case

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

	PIH	$s_j \neq 1$	$\eta_{h,w} \neq 0$	All
κ_{c,v_1}	1	0.69	0.41	0.40
κ_{c,v_2}	1	0.31	0.25	0.24

- 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

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

	PIH	$s_j \neq 1$	$\eta_{h,w} \neq 0$	All
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κ_{c,v_2}	1	0.31	0.23	0.22

- 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?

$$\begin{pmatrix} \Delta c \\ \Delta y_1 \\ \Delta y_2 \end{pmatrix} = \begin{pmatrix} 0 & 0 & \kappa_{c,v_1} & \kappa_{c,v_2} \\ \kappa_{y_1,u_1} & 0 & \kappa_{y_1,v_1} & \kappa_{y_1,v_2} \\ 0 & \kappa_{y_2,u_2} & \kappa_{y_2,v_1} & \kappa_{y_2,v_2} \end{pmatrix} \begin{pmatrix} \Delta u_1 \\ \Delta u_2 \\ v_1 \\ v_2 \end{pmatrix}$$

Comments: How Good are the Approximations?

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

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

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

- Even for $T = 10$, one has (with $r = 2\%$), $\kappa_{c,u_j} = 0.11$.

Comments: Interpretation

- What does π 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 β 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).

Some Illustrative Calculations: Separable Case

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

	PIH	$s_j \neq 1$	Own	Spouse	Both	$\pi \neq 0$	$\beta \neq 0$	All
κ_{c,v_1}	1	0.69	0.58	0.40	0.41	0.38	0.43	0.40
κ_{c,v_2}	1	0.31	0.36	0.17	0.25	0.23	0.26	0.24

- 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

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

	PIH	$s_j \neq 1$	Own	Spouse	Both	$\pi \neq 0$	$\beta \neq 0$	All
κ_{c,v_1}	1	0.69	0.53	0.36	0.40	0.37	0.42	0.39
κ_{c,v_2}	1	0.31	0.33	0.15	0.23	0.21	0.24	0.22

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

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