Consumption & Income Inequality across Generations

Giovanni Gallipoli

University of British Columbia

Hamish Low

University of Oxford

Aruni Mitra

University of Manchester

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Cross-Sectional Inequality across Generations

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- Consider parental influences on **inequality of outcomes** in:
  (i) earnings, (ii) other income, (iii) consumption

Data

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- **Source**: PSID. Follows adult lives of parents and their children.

- **Period**: Annual 1967 through 1995; Biennial 1996 through 2016.

- **Sample**:
  - Parents born between 1909 & 1960 & below 65 years age
  - Children born between 1952 & 1981

- **Key Variables**:
  (1) Earnings: Labour earnings of male household head

  (2) Other Income: Transfer income (public + private) of head and wife + Labour earnings of wife

  (3) Consumption: Adult equivalent family expenditure

Panel Data on Consumption Expenditures

Measuring Consumption Expenditures

- Detailed consumption data starts in 1998 Expenditure Categories
- **Baseline:** Food expenditures - full sample since 1967
- **Robustness 1:** Total expenditure based on PSID-to-PSID imputation (Attanasio & Pistaferri, 2014) - full sample since 1967 Imputation Regression Quality of Fit
- **Robustness 2:** Total expenditure measure - smaller sample between 1997 and 2015

Summary Statistics

A. Sample Characteristics	Parent	Child	
Cohort Range	1909-1960	1952-1981	
Age Range (years)	25-65	25-62	
Mean Age (years)	47	37	
Mean no. of years of observations per person	12	9	
No. of unique households	574	761	
B. Summary Statistics	**Parental Variance**	**Child Variance**	**IGE**
Total Family Income	0.206	0.198	0.36
Head Earnings	0.291	0.249	0.33
Other Income	0.807	0.535	0.12
Food Consumption	0.097	0.114	0.26
Imputed Total Consumption	0.112	0.117	0.49

Note: The first two columns of Panel B report the cross-sectional variances of time-average log data purged of the year and birth-cohort effects for each generation. The decline in earnings inequality across generations occurs mechanically because parental income is observed at older ages when dispersion is higher (see mean ages in Panel A). The IGE column reports the reduced-form IGE computed as in Lee and Solon (2014), averaged over the 1990-2014 sample period.

Model

Income Processes: Earnings & Other Income

- **Parent (p)**

$$\textit{Head Earnings: } e^p_{f,t} = \bar{e}^p_f + \mathcal{E}^p_{f,t} + \varepsilon^p_{f,t} \quad \text{where} \quad \mathcal{E}^p_{f,t} = \alpha^p_e \mathcal{E}^p_{f,t-1} + \epsilon^p_{f,t}$$

$$\textit{Other Income: } n^p_{f,t} = \bar{n}^p_f + \Theta^p_{f,t} + \vartheta^p_{f,t} \quad \text{where} \quad \Theta^p_{f,t} = \alpha^p_n \Theta^p_{f,t-1} + \theta^p_{f,t}$$

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- **Child (k)**

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- **Intergenerational Persistence through Fixed Effects**

$$\bar{e}^k_f = \gamma\ \bar{e}^p_f + \rho_e\ \bar{n}^p_f + \breve{e}^k_f$$

$$\bar{n}^k_f = \rho\ \bar{n}^p_f + \gamma_n\ \bar{e}^p_f + \breve{n}^k_f$$

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$$\max_{\{C_{f,k}\}_{k=t}^{T}} \quad \mathbb{E}_t \quad \sum_{j=0}^{T-t} \beta^j u(C_{f,t+j})$$

$$s.t.$$

$$A_{f,t+1} = (1+r)\left(A_{f,t} + E_{f,t} + N_{f,t} - C_{f,t}\right)$$

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- Extension: Make family linkages explicit and model warm-glow motives for parental transfers Specification
- Robustness: Results are robust to excluding potentially credit-constrained families

Consumption Process

- $C_{f,t} \approx \frac{r}{1+r}\left[\mathbf{A}_{f,t} + \sum_{j=0}^{T}\left(\frac{1}{1+r}\right)^{j}\mathbb{E}_t\left(E_{f,t+j} + N_{f,t+j}\right)\right]$

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- In logs: $c_{f,t} \approx \mathbf{q}_{f,t} + \bar{e}_f + \bar{n}_f + \frac{r}{1+r-\alpha_e}\mathcal{E}_{f,t} + \frac{r}{1+r-\alpha_n}\Theta_{f,t} + \frac{r}{1+r}\left(\varepsilon_{f,t} + \vartheta_{f,t}\right)$

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- Assume:
  $\mathbf{q}^{p}_{f,t} = \bar{q}^{p}_{f} + \Phi^{p}_{f,t} + \varphi^{p}_{f,t}$ where $\Phi^{p}_{f,t} = \alpha^{p}_{q}\Phi^{p}_{f,t-1} + \phi^{p}_{f,t}$
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- **Intergenerational Persistence**: $\bar{q}^k_f = \lambda \bar{q}^p_f + \breve{q}^k_f$

Unobserved $q_{f,t}$ — What does it measure?

- Annuitised value of non-earned resources, e.g., rental income, non-labour part of business income
- Higher order preference terms, e.g., prudence and other saving motives
- Consumption-shifters, e.g., taste for particular commodities, etc.
- Outflows: transfers to others and income and wealth taxes
- Measurement error in consumption

Head Earnings:

$$e^p_{f,t} = \bar{e}^p_f + \mathcal{E}^p_{f,t} + \varepsilon^p_{f,t}$$

$$e^k_{f,t} = \gamma \bar{e}^p_f + \rho_e \bar{n}^p_f + \breve{e}^k_f + \mathcal{E}^k_{f,t} + \varepsilon^k_{f,t}$$

Other Income:

$$n^p_{f,t} = \bar{n}^p_f + \Theta^p_{f,t} + \vartheta^p_{f,t}$$

$$n^k_{f,t} = \rho \bar{n}^p_f + \gamma_n \bar{e}^p_f + \breve{n}^k_f + \Theta^k_{f,t} + \vartheta^k_{f,t}$$

Consumption:

$$c^p_{f,t} = \overbrace{\bar{q}^p_f + \Phi^p_{f,t} + \varphi^p_{f,t}}^{q^p_{f,t}} + \overbrace{\bar{e}^p_f + \frac{r}{1+r-\alpha^p_e}\mathcal{E}^p_{f,t} + \frac{r}{1+r}\varepsilon^p_{f,t}}^{e^p_{f,t}} + \overbrace{n^p_f + \frac{r}{1+r-\alpha^p_n}\Theta^p_{f,t} + \frac{r}{1+r}\vartheta^p_{f,t}}^{n^p_{f,t}}$$

$$c^k_{f,t} = \overbrace{\lambda \bar{q}^p_f + \Phi^k_{f,t} + \varphi^k_{f,t}}^{q^k_{f,t}} + \overbrace{(\gamma + \gamma_n)\,\bar{e}^p_f + \breve{e}^k_f + \frac{r}{1+r-\alpha^k_e}\mathcal{E}^k_{f,t} + \frac{r}{1+r}\varepsilon^k_{f,t}}^{e^k_{f,t}}$$
$$\underbrace{+\,(\rho + \rho_e)\,\bar{n}^p_f + \breve{n}^k_f + \frac{r}{1+r-\alpha^k_n}\Theta^k_{f,t} + \frac{r}{1+r}\vartheta^k_{f,t}}_{n^k_{f,t}}$$

Examples of Moment Conditions

(a) **Variances**

$$Var\left(e^{k}_{f,t}\right) = \gamma^2\sigma^2_{\bar{e}^p} + \rho_e^2\sigma^2_{\bar{n}^p} + 2\gamma\rho_e\sigma_{\bar{e}^p,\bar{n}^p} + \sigma^2_{\breve{e}^k} + \frac{\sigma_{\epsilon^k}}{1-\left(\alpha_e^k\right)^2} + \sigma^2_{\varepsilon^k}$$

$$Var\left(c^{p}_{f,t}\right) = \sigma^2_{\bar{q}^p} + \sigma^2_{\bar{e}^p} + \sigma^2_{\bar{n}^p} + 2\left(\sigma_{\bar{e}^p,\bar{q}^p} + \sigma_{\bar{n}^p,\bar{q}^p} + \sigma_{\bar{e}^p,\bar{n}^p}\right) + \left(\frac{r}{1+r}\right)^2\left(\sigma^2_{\varepsilon^p} + \sigma^2_{\vartheta^p}\right) + \left(\frac{r}{1+r-\alpha_e^p}\right)^2\frac{\sigma^2_{\epsilon^p}}{1-\left(\alpha_e^p\right)^2} + \left(\frac{r}{1+r-\alpha_n^p}\right)^2\frac{\sigma^2_{\theta^p}}{1-\left(\alpha_n^p\right)^2} + \sigma^2_{\varphi^p}$$

(b) **Contemporaneous Covariances**

$$Cov\left(e^{p}_{f,t}, e^{k}_{f,t}\right) = \gamma\sigma^2_{\bar{e}^p} + \rho_e\sigma_{\bar{e}^p,\bar{n}^p}$$

$$Cov\left(e^{k}_{f,t}, n^{k}_{f,t}\right) = \left(\gamma\rho + \gamma_n\rho_e\right)\sigma_{\bar{e}^p,\bar{n}^p} + \gamma\gamma_n\sigma^2_{\bar{e}^p} + \rho\rho_e\sigma^2_{\bar{n}^p} + \sigma_{\breve{e}^k,\breve{n}^k}$$

(c) **Non-contemporaneous Covariances**

$$Cov\left(e^{p}_{f,t}, c^{p}_{f,t+1}\right) = \sigma^2_{\bar{e}^p} + \sigma_{\bar{e}^p,\bar{q}^p} + \sigma_{\bar{e}^p,\bar{n}^p} + \left(\frac{r}{1+r-\alpha_e^p}\right)\frac{\alpha_e^p\sigma^2_{\epsilon^p}}{1-\left(\alpha_e^p\right)^2}$$

3 Sets of Parameters of Interest

- **Intergenerational Elasticities**
  1. Parental earnings on child earnings: γ
  2. Parental other income on child other income: ρ
  3. Parental earnings on child other income: γ_n
  4. Parental other income on child earnings: ρ_e
  5. Parental consumption-shifters on child consumption-shifters: λ
- **Second Moments of Fixed Effects**
  1. Variances: $\sigma^2_{\bar{e}^p}$, $\sigma^2_{\breve{e}^k}$, $\sigma^2_{\bar{n}^p}$, $\sigma^2_{\breve{n}^k}$, $\sigma^2_{\bar{q}^p}$, $\sigma^2_{\breve{q}^k}$
  2. Covariances: $\sigma_{\bar{e}^p,\bar{q}^p}$, $\sigma_{\breve{e}^k,\breve{q}^k}$, $\sigma_{\bar{n}^p,\bar{q}^p}$, $\sigma_{\breve{n}^k,\breve{q}^k}$, $\sigma_{\bar{e}^p,\bar{n}^p}$, $\sigma_{\breve{e}^k,\breve{n}^k}$
- **Persistent & Transitory Shock Parameters**
  1. Innovation to AR(1) shocks: $\sigma^2_{\epsilon^p}$, $\sigma^2_{\epsilon^k}$, $\sigma^2_{\theta^p}$, $\sigma^2_{\theta^k}$, $\sigma^2_{\phi^p}$, $\sigma^2_{\phi^k}$
  2. AR(1) persistence: α^p_e, α^k_e, α^p_n, α^k_n, α^p_q, α^k_q
  3. Transitory shocks: $\sigma^2_{\varepsilon^p}$, $\sigma^2_{\varepsilon^k}$, $\sigma^2_{\vartheta^p}$, $\sigma^2_{\vartheta^k}$, $\sigma^2_{\varphi^p}$, $\sigma^2_{\varphi^k}$

Empirical Steps

1. Regress log variables on year & cohort dummies; **use residual variation**
2. Minimize distance between empirical and theoretical moments **(GMM)**
   - Equally weighted moments
   - Bootstrap standard errors
3. **Over-identification**
   - Panel Variation: 75 moment conditions & 35 parameters
   - Cross-Section Variation: 21 moment restrictions & 17 parameters

Results

Estimates: Intergenerational Persistence

Variables	Parameters	Estimates (1)
Earnings	γ	0.229 (0.028)
Other Income	ρ	0.099 (0.027)
$\bar{e}_f^p$ on $\bar{n}_f^k$	γ_n	0.208 (0.035)
$\bar{n}_f^p$ on $\bar{e}_f^k$	ρ_e	0.055 (0.019)
Consumption Shifters	λ	0.153 (0.037)
No. of Parent-Child Pairs	N	761

Note: Bootstrap standard errors with 100 repetitions in parentheses. Average age for parents is 47 years, for children is 37 years.

Variance Covariance Fit of Moments

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Variance Covariance Fit of Moments

Parental Impact on Variance of Child Outcomes

- **Head Earnings**

$$\underbrace{Var\left(\bar{e}_f^k\right)}_{0.249} = \underbrace{\gamma^2\sigma^2_{\bar{e}^p} + \rho_e^2\sigma^2_{\bar{n}^p} + 2\gamma\rho_e\sigma_{\bar{e}^p,\bar{n}^p}}_{\text{Parental contribution: } 7.9\%} + \sigma^2_{\breve{e}^k}$$

- **Other Income** Decomposition: Marital Selection

$$\underbrace{Var\left(\bar{n}_f^k\right)}_{0.535} = \underbrace{\rho^2\sigma^2_{\bar{n}^p} + \gamma_n^2\sigma^2_{\bar{e}^p} + 2\rho\gamma_n\sigma_{\bar{e}^p,\bar{n}^p}}_{\text{Parental contribution: } 4.4\%} + \sigma^2_{\breve{n}^k}$$

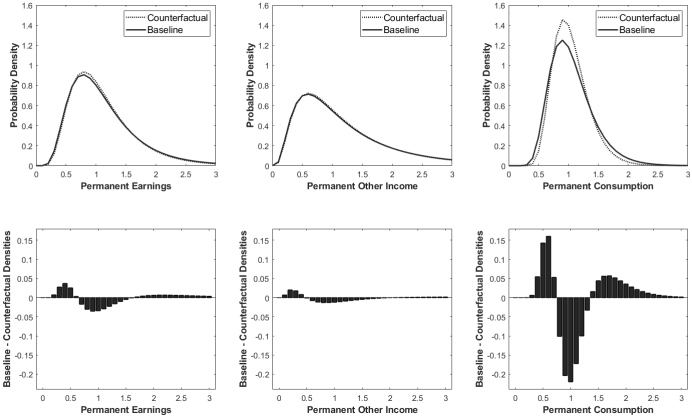
- **Consumption**

$$\underbrace{Var\left(\bar{c}_f^k\right)}_{0.114} = \lambda^2\sigma^2_{\bar{q}^p} + \left(\gamma+\gamma_n\right)^2\sigma^2_{\bar{e}^p} + \left(\rho+\rho_e\right)^2\sigma^2_{\bar{n}^p}$$

$$+ \underbrace{2\left[\left(\gamma+\gamma_n\right)\lambda\sigma_{\bar{e}^p,\bar{q}^p} + \left(\rho+\rho_e\right)\lambda\sigma_{\bar{n}^p,\bar{q}^p} + \left(\rho+\rho_e\right)\left(\gamma+\gamma_n\right)\sigma_{\bar{e}^p,\bar{n}^p}\right]}_{\text{Parental contribution: } 30.1\%}$$

$$+ \sigma^2_{\breve{q}^k} + \sigma^2_{\breve{e}^k} + \sigma^2_{\breve{n}^k} + 2\left(\sigma_{\breve{e}^k,\breve{q}^k} + \sigma_{\breve{n}^k,\breve{q}^k} + \sigma_{\breve{e}^k,\breve{n}^k}\right)$$

Family Background & Distribution of Outcomes



Long Run Inequality

$$
\begin{aligned}
e^{k_1} &= \gamma \bar{e}^p + \breve{e}^{k_1} \\
e^{k_2} &= \gamma^2 \bar{e}^p + \gamma \breve{e}^{k_1} + \breve{e}^{k_2} \\
&\vdots \\
e^{k_t} &= \gamma^t \bar{e}^p + \sum_{j=1}^{t} \gamma^{t-j} \breve{e}^{k_t}
\end{aligned}
$$

$$
Var(e^*) = \lim_{t \to \infty} \left[\gamma^{2t} \sigma^2_{\bar{e}^p} + \sum_{j=1}^{t} \gamma^{2(t-j)} \sigma^2_{\breve{e}^k} \right] = \frac{\sigma^2_{\breve{e}^k}}{1-\gamma^2}
$$

Similarly, $Var(n^*) = \frac{\sigma^2_{\breve{n}^k}}{1-\rho^2}$.

$$
Var(c^*) = \frac{\sigma^2_{\breve{q}^k}}{1-\lambda^2} + \frac{\sigma^2_{\breve{e}^k}}{1-\gamma^2} + \frac{\sigma^2_{\breve{n}^k}}{1-\rho^2} + \frac{2\sigma_{\breve{e}^k,\breve{n}^k}}{1-\gamma\rho} + \frac{2\sigma_{\breve{n}^k,\breve{q}^k}}{1-\lambda\rho} + \frac{2\sigma_{\breve{e}^k,\breve{q}^k}}{1-\lambda\gamma}.
$$

Long Run Steady State Inequality

Table: Steady-state inequality vs. current inequality

Variable	Parental Inequality	Child Inequality	Steady-state Inequality
Earnings	0.183	0.260	0.265
Other Income	0.876	0.631	0.638
Consumption	0.090	0.117	0.129

Note: Estimates based on sample of 404 unique parent-child pairs with age restricted between 30 and 40 years.

What matters more? Parental inequality or persistence?

Table: Varying Persistence γ

Set γ to: (1)	$\widehat{\sigma^2_{\breve{e}^k}}$ (2)	$\widehat{Var(\bar{e}^p)}$ (3)	$\widehat{Var(\bar{e}^k)}$ (4)	$\widehat{Var(e^*)}$ (5)	$\frac{\gamma^2 \widehat{Var(\bar{e}^p)}}{\widehat{Var(\bar{e}^k)}}$ (6)
0.10	0.258	0.185	0.260	0.262	0.9%
0.19	**0.253**	**0.183**	**0.260**	**0.265**	**2.7%**
0.50	0.221	0.153	0.260	0.298	14.9%
0.90	0.175	0.104	0.260	0.955	32.7%

Conclusions:

1. Persistence matters more, role of parental inequality is secondary.
2. Persistence is not large enough for large increase in inequality due to family.

Implications for Consumption Insurance

- Income fixed effect follows an AR(1) process across generations: $\bar{y}_f^k = \eta_y \bar{y}_f^p + \breve{y}_f^k$

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- Pass-through of the idiosyncratic child income fixed effect to the consumption growth over generations: $\bar{c}_f^k - \bar{c}_f^p = \mu . \breve{y}_f^k$
- Intergenerational counterpart of pass-through measure in Blundell, Low, Preston (2013) with persistent income shocks:

$$\mu = \frac{Var\left(\bar{c}_f^k\right) - Var\left(\bar{c}_f^p\right)}{Cov\left(\bar{c}_f^k, \bar{y}_f^k\right) - \eta_y Cov\left(\bar{c}_f^p, \bar{y}_f^p\right)}$$

Consumption Pass-though Measures by Parental Income Quartile

$\mu = \frac{Var\left(\bar{c}_f^k\right) - Var\left(\bar{c}_f^p\right)}{Cov\left(\bar{c}_f^k, \bar{y}_f^k\right) - \eta_y Cov\left(\bar{c}_f^p, \bar{y}_f^p\right)}$	*All*	Q-1	Q-2	Q-3	Q-4
Head Earnings	0.39	0.11	1.15	0.50	0.46
Total Family Income	0.38	0.12	0.90	0.88	0.48

- Substantial insurance against risk in the child generation
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Head Earnings	0.39	0.11	1.15	0.50	0.46
When $\eta_y = 0$	0.22	0.09	1.11	0.50	0.31
Total Family Income	0.38	0.12	0.90	0.88	0.48
When $\eta_y = 0$	0.22	0.10	0.87	0.89	0.37

- Substantial insurance against risk in the child generation
- Insurance is largest at the bottom and top of the income distribution
- Switching off parental influence on income matters most at the top

Robustness

Robustness & Extensions

- Explicitly model warm-glow motives for parental transfers to children: Importance
  No additional importance of parents captured through motives behind transfers.

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  Parental importance increases for earnings inequality.
- Random matching between parents and children:
  Placebo test validates our findings.
- Imputed consumption instead of food expenditure:
  Parents matter more for consumption inequality, but this estimate is likely inflated.
- Use panel variation:
  Qualitatively similar estimates for persistence and inequality

Conclusion

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4. Intergenerational persistence would have to be much higher to induce, by itself, further substantial increases in inequality
5. Cross-generational persistence in permanent income and consumption *levels*. No evidence of persistence in *contemporaneous shocks*.

Appendix

Consumption Expenditure Categories

Back

Consumption: 11 categories observed in different PSID-waves

(A1.) food (1968-2015 except 1973, 1988 and 1989)
(A2.) housing (1968-2015 except 1978, 1988 and 1989)

(B1.) child-care (1970-1972, 1976, 1977, 1979, 1988-2015)

(C1.) education (1999-2015)
(C2.) transportation (1999-2015)
(C3.) healthcare (1999-2015)

(D1.) recreation and entertainment (2005-2015)
(D2.) trips and vacation (2005-2015)
(D3.) clothing and apparel (2005-2015)
(D4.) home repairs and maintenance (2005-2015)
(D5.) household furnishings and equipment (2005-2015)

Consumption Imputation (Attanasio & Pistaferri, 2014) Back

Step 1:

$$ln\left(N_{it}\right) = Z_{it}'\omega + p_t'\pi + g(F_{it};\lambda) + u_{it}$$

Step 2:

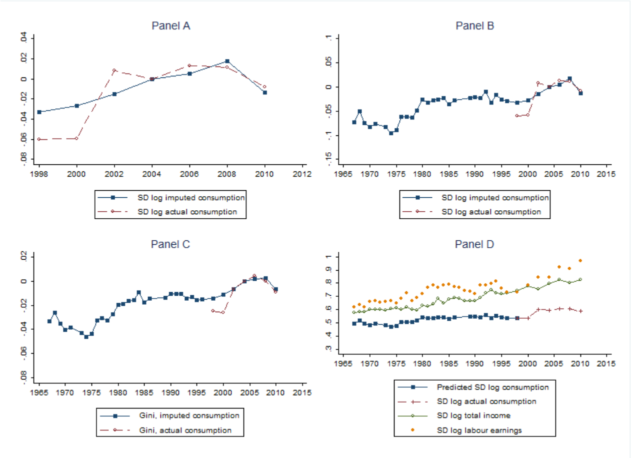
$$\hat{C}_{it} = F_{it} + exp\left\{Z_{it}'\hat{\omega} + p_t'\hat{\pi} + g\left(F_{it};\hat{\lambda}\right)\right\}$$

Notations:

- $\hat{C}_{i,t}$: Imputed total consumption
- $N_{i,t}$: Total consumption net of food expenditure
- $Z_{i,t}$: Set of socio-economic controls List
- p_t: Relative prices — overall CPI, and CPI for food at home, food away from home and rent
- $g(.)$: A polynomial function
- $F_{i,t}$: Total food expenditure
- $u_{i,t}$: Error term

Goodness of Imputation

Back



List of controls, $Z_{i,t}$

Back to regression Back to main

1. Age Dummies
2. Education Dummies
3. Marital Status Dummies
4. Race Dummy
5. State of Residence Dummies
6. Employment Status Dummy
7. Self-Employment Dummy
8. Hours worked by household head
9. Homeownership Dummy
10. Disability Dummies
11. Family Size Dummies
12. Number of children in the household
13. Household Income (allows for non-homothetic preferences)

Intergenerational Mobility: Matrices

Definition Back

Earnings

Child \ Parent	$Q_{p,1}$	$Q_{p,2}$	$Q_{p,3}$	$Q_{p,4}$
$Q_{c,1}$	45.98	27.88	17.29	9.56
$Q_{c,2}$	25.41	29.64	27.17	15.93
$Q_{c,3}$	19.75	24.80	30.44	23.10
$Q_{c,4}$	8.86	17.69	25.10	51.41

Consumption

Child \ Parent	$Q_{p,1}$	$Q_{p,2}$	$Q_{p,3}$	$Q_{p,4}$
$Q_{c,1}$	53.02	27.79	9.75	4.95
$Q_{c,2}$	26.53	32.04	25.65	13.65
$Q_{c,3}$	16.28	26.51	35.40	23.55
$Q_{c,4}$	4.17	13.67	29.20	57.84

Mobility Matrix

A cell $c_{i,j}$ in a mobility matrix at the intersection of the i^{th} row and the j^{th} column $\forall i, j = 1(1)4$ is given by

$$c_{i,j} = Prob\left[child \in Q_{k,i} \middle| \, parent \in Q_{p,j}\right] \times 100$$

where $Q_{k,i}$ denotes the i^{th} quartile of the child distribution and $Q_{p,j}$ denotes the j^{th} quartile of the parental distribution. Back Back to Main

Alternative Model (Blundell, Pistaferri & Preston, 2008) Back

Parents

- $e^p_{f,t} = \bar{e}^p_f + P^p_{f,t} + u^p_{f,t}$; where $u^p_{f,t} \overset{iid}{\sim} \left(0, \sigma^2_{u^p}\right)$
- $P^p_{f,t} = P^p_{f,t-1} + v^p_{f,t}$; where $v^p_{f,t} \overset{iid}{\sim} \left(0, \sigma^2_{v^p}\right)$

Children

- $e^k_{f,t} = \bar{e}^k_f + P^k_{f,t} + u^k_{f,t}$; where $u^k_{f,t} \overset{iid}{\sim} \left(0, \sigma^2_{u^k}\right)$
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- $\Delta e^p_{f,t} = v^p_{f,t} + \Delta u^p_{f,t}$

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- $\Delta e^k_{f,t} = \rho v^p_{f,t} + \varepsilon^k_{f,t} + \Delta u^k_{f,t}$; Estimate of $\rho = 0.242$ (0.16)

Alternative Model (Blundell, Pistaferri & Preston, 2008) Back

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- $\Delta n^k_{f,t} = \lambda \nu^p_{f,t} + \theta^k_{f,t} + \Delta \zeta^k_{f,t}$; Estimate of $\lambda = 0.097$ (0.07)

Alternative Model (Blundell, Pistaferri & Preston, 2008) Back

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- $e^p_{f,t} = \bar{e}^p_f + P^p_{f,t} + u^p_{f,t}$; where $u^p_{f,t} \overset{iid}{\sim} \left(0, \sigma^2_{u^p}\right)$
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Estimates: Variance

Back

Explanation	Parameters	Estimates (1)
Parental Outcomes: Variances		
Permanent Earnings	$\sigma^2_{\bar{e}^p}$	0.296 (0.020)
Permanent Other Income	$\sigma^2_{\bar{n}^p}$	0.805 (0.058)
Permanent Consumption Shifters	$\sigma^2_{\bar{q}^p}$	1.027 (0.064)
Child Idiosyncratic Shocks: Variances		
Permanent Earnings	$\sigma^2_{\breve{e}^k}$	0.229 (0.014)
Permanent Other Income	$\sigma^2_{\breve{n}^k}$	0.511 (0.041)
Permanent Consumption Shifters	$\sigma^2_{\breve{q}^k}$	0.733 (0.058)

Note: Bootstrap standard errors with 100 repetitions are reported in parentheses.

Estimates: Covariance

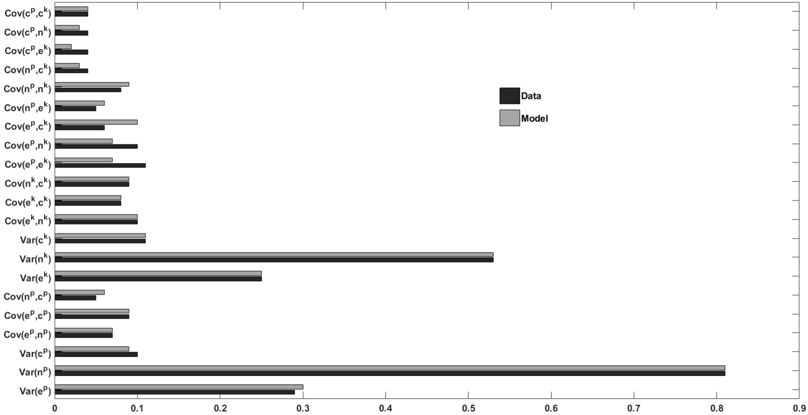
Back

Explanation	Parameters	Estimates (1)
Parental Outcomes: Covariances		
Consumption Shifters & Earnings	$\sigma_{\bar{e}^p,\bar{q}^p}$	-0.270 (0.026)
Consumption Shifters & Other Income	$\sigma_{\bar{n}^p,\bar{q}^p}$	-0.816 (0.060)
Earnings and Other Income	$\sigma_{\bar{e}^p,\bar{n}^p}$	0.069 (0.017)
Child Idiosyncratic Shocks: Covariances		
Consumption Shifters & Earnings	$\sigma_{\breve{e}^k,\breve{q}^k}$	-0.250 (0.024)
Consumption Shifters & Other Income	$\sigma_{\breve{n}^k,\breve{q}^k}$	-0.523 (0.046)
Earnings & Other Income	$\sigma_{\breve{e}^k,\breve{n}^k}$	0.076 (0.017)

Note: Bootstrap standard errors with 100 repetitions are reported in parentheses.

Fit of Moments

Back



'Other Income' Decomposition: Role of Marital Selection

Back

Variable	Role of Parents under Alternative Models			
	Baseline I 761 Pairs (1)	**Baseline II** 459 Pairs (2)	**Model B** 459 Pairs (3)	**Model C** 459 Pairs (4)
Head Earnings	7.9% [3.5%, 12.4%]	10.6% [4.8%, 16.4%]	14.6% [8.6%, 20.6%]	5.7% [1.1%, 10.4%]
Wife Earnings	-	-	8.1% [2.7%, 13.4%]	3.8% [0.9%, 6.7%]
Transfer Income	-	-	-	0.4% [-0.8%, 1.5%]
Wife Earnings + Transfer Income	4.4% [1.4% 7.4%]	3.5% [0.1%, 6.8%]	-	-
Consumption	30.1% [19.7%, 40.5%]	24.6% [14.0%, 35.2%]	22.8% [12.6%, 33.0%]	34.8% [18.1%, 51.5%]

Note: Models differ in the definition of *other income*. Baseline model uses the sum of wife earnings and transfer income as the measure of other income. Model B uses wife earnings only, while Model C uses three separate income processes for head earnings, wife earnings and transfer income. All models use food expenditure as the measure of consumption, and use only cross-sectional variation from time-averaged variables. 95% confidence intervals are reported in parentheses.

Liquidity Constraint I: High Consumption Growth

Back

Following the theoretical result in Crossley & Low (2014), we classify a household as constrained in year t if its growth rate in food expenditure between years t and $t+2$ is greater than 50% or the growth rate between years $t-2$ and t is less than -25% (i.e., a decrease of more than 50%).

Table: Parental Impact on Variance of Child Outcomes

Variables	**Baseline**	**No Constrained Parent**		**No Constrained Parent or Child**	
		Drop Observations	**Drop Households**	**Drop Observations**	**Drop Households**
	(1)	(2)	(3)	(4)	(5)
Head Earnings	7.9%	8.2%	8.2%	7.8%	8.0%
Other Income	4.4%	4.2%	5.7%	4.0%	6.2%
Consumption	30.1%	29.9%	32.7%	29.6%	38.9%
Parent-Child Pairs	761	761	421	761	198

Liquidity Constraint II: High Consumption Volatility

Back

We drop the top decile of households based on the ratio of variance of food expenditure to the variance of head earnings over the life-cycle. The idea is that high volatility of consumption relative to that of income is indicative of lack of effective consumption smoothing, and such households are more likely to be liquidity constrained.

Table: Parental Importance for Child Inequality

Variables	**Baseline Sample** (1)	**No Constrained Parent** (2)	**No Constrained Parent or Child** (3)
Head Earnings	7.9%	9.2%	9.2%
Other Income	4.4%	4.1%	3.8%
Consumption	30.1%	28.7%	29.5%
Parent-Child Pairs	761	648	576

Liquidity Constraint III: Young Parents Back

If there are considerable binding credit constraints when the parents are younger and their children are still living with them, then the intergenerational persistence would be higher for that period than in the later stages of parental life when these constraints are generally relaxed. However, we do not find any evidence of decreasing parental importance as we keep studying progressively older parents.

Table: Parental Importance for Child Inequality (573 pairs)

Variables	$Parent \mid Age^k < 35$ (1)	$Parent \mid Age^k < 30$ (2)	$Parent \mid Age^k < 25$ (3)	$Parent \mid Age^k < 20$ (4)
Earnings	9.9	9.5	8.3	8.1
Other Income	4.7	4.9	5.1	4.3
Consumption	30.6	30.0	31.6	32.9

Parental Importance in Child Inequality by Child Birth-Cohort Back

Variables	**All Cohorts** (1)	**1952-1966 Cohort** (2)	**1967-1981 Cohort** (3)
Earnings	7.9%	8.0%	8.3%
	[3.5%, 12.4%]	[3.2%, 12.7%]	[3.0%, 13.6%]
Other Income	4.4%	3.2%	8.3%
	[1.4%, 7.4%]	[0.2%, 6.2%]	[0.5%, 16.1%]
Consumption	30.1%	33.6%	23.9%
	[19.7%, 40.5%]	[21.2%, 46.6%]	[14.6%, 33.2%]
No. of Parent-Child Pairs	761	467	294

Robustness Checks: Intergenerational Persistence

Back

Parameters	**Baseline** (1)	**Random Match** (2)	$\boldsymbol{\gamma_n = \rho_e = 0}$ (3)	**Imputed Consumption** (4)	**All Marital Status** (5)
Earnings: γ	0.229	-0.018	0.340	0.256	0.217
	(0.028)	(0.028)	(0.027)	(0.024)	(0.029)
Other Income: ρ	0.099	-0.039	0.120	0.096	0.103
	(0.027)	(0.025)	(0.028)	(0.028)	(0.035)
$\bar{e}_f^p$ on $\bar{n}_f^k$: γ_n	0.208	-0.007	0	0.237	0.239
	(0.035)	(0.035)		(0.031)	(0.039)
$\bar{n}_f^p$ on $\bar{e}_f^k$: ρ_e	0.055	-0.015	0	0.052	0.058
	(0.019)	(0.023)		(0.015)	(0.015)
Consumption Shifters: λ	0.153	-0.048	0.108	0.127	0.170
	(0.037)	(0.034)	(0.029)	(0.033)	(0.042)
No. of Parent-Child Pairs: N	761	761	761	761	1038

Note: Bootstrap standard errors with 100 repetitions are reported in parentheses.

Robustness Checks: Parental Importance in Child Inequality

Back

Table: Robustness: Importance of Parental Heterogeneity for Child Inequality

Variables	**Baseline** (1)	**Random Match** (2)	$\gamma_n = \rho_e = 0$ (3)	**Imputed Consumption** (4)	**All Marital Status** (5)
Earnings	7.9%	0.1%	13.5%	9.3%	6.4%
	[3.5% 12.4%]	[-0.8% 1.0%]	[9.4% 17.6%]	[6.0% 12.6%]	[3.4% 9.4%]
Other Income	4.4%	0.2%	2.2%	5.0%	2.5%
	[1.4% 7.4%]	[-0.4% 0.9%]	[0.2% 4.1%]	[2.2% 7.8%]	[0.9% 4.2%]
Consumption	30.1%	0.2%	19.6%	47.6%	26.1%
	[19.7% 40.5%]	[-0.9% 1.3%]	[13.5% 25.7%]	[35.4% 59.8%]	[17.2% 35.0%]
No. of Parent-Child Pairs	761	761	761	761	1038

Note: All numbers are in percentage terms. 95% confidence intervals are reported in parentheses.

Optimal Parental Transfers: Specification Back

$$
\begin{aligned}
\max_{\{C_{f,s},\mathcal{T}_{f,s}\}_{s=t}^{T}} \quad & \mathbb{E}_t \quad \sum_{j=0}^{T-t} \beta^j \left[\frac{C_{f,t+j}^{1-\sigma}}{1-\sigma} + \mu_1 \cdot \frac{\mathcal{T}_{f,t+j}^{1-\mu_2}}{1-\mu_2} \right] \\
s.t. \quad & \\
A_{f,t+1} \quad & = \quad (1+r)\left(A_{f,t} + E_{f,t} + N_{f,t} - C_{f,t} - \mathcal{T}_{f,t}\right)
\end{aligned}
$$

Optimal Parental Transfers: Specification Back

$$\max_{\{C_{f,s},\mathcal{T}_{f,s}\}_{s=t}^{T}} \quad \mathbb{E}_t \quad \sum_{j=0}^{T-t} \beta^j \left[\frac{C_{f,t+j}^{1-\sigma}}{1-\sigma} + \mu_1 . \frac{\mathcal{T}_{f,t+j}^{1-\mu_2}}{1-\mu_2} \right]$$

$$s.t.$$

$$A_{f,t+1} \quad = \quad (1+r)\left(A_{f,t} + E_{f,t} + N_{f,t} - C_{f,t} - \mathcal{T}_{f,t}\right)$$

- $\mathcal{T}_{f,t}^{-\mu_2} = C_{f,t}^{-\sigma}/\mu_1$ implies *consumption is a sufficient statistic for transfers.*

Optimal Parental Transfers: Specification Back

$$\max_{\{C_{f,s},\mathcal{T}_{f,s}\}_{s=t}^{T}} \quad \mathbb{E}_t \quad \sum_{j=0}^{T-t} \beta^j \left[\frac{C_{f,t+j}^{1-\sigma}}{1-\sigma} + \mu_1 \cdot \frac{\mathcal{T}_{f,t+j}^{1-\mu_2}}{1-\mu_2} \right]$$

$$s.t.$$

$$A_{f,t+1} \quad = \quad (1+r)\left(A_{f,t} + E_{f,t} + N_{f,t} - C_{f,t} - \mathcal{T}_{f,t}\right)$$

- $\mathcal{T}_{f,t}^{-\mu_2} = C_{f,t}^{-\sigma}/\mu_1$ implies *consumption is a sufficient statistic for transfers.*
- Transfers affect child earnings through human capital investment (λ_e) and child other income through inter-vivos transfers (λ_n)

Optimal Parental Transfers: Specification Back

$$\max_{\{C_{f,s},\mathcal{T}_{f,s}\}_{s=t}^{T}} \quad \mathbb{E}_t \quad \sum_{j=0}^{T-t} \beta^j \left[\frac{C_{f,t+j}^{1-\sigma}}{1-\sigma} + \mu_1 \cdot \frac{\mathcal{T}_{f,t+j}^{1-\mu_2}}{1-\mu_2} \right]$$

$$s.t.$$

$$A_{f,t+1} = (1+r)\left(A_{f,t} + E_{f,t} + N_{f,t} - C_{f,t} - \mathcal{T}_{f,t}\right)$$

- $\mathcal{T}_{f,t}^{-\mu_2} = C_{f,t}^{-\sigma}/\mu_1$ implies *consumption is a sufficient statistic for transfers.*
- Transfers affect child earnings through human capital investment (λ_e) and child other income through inter-vivos transfers (λ_n)

$$\begin{aligned}
\bar{e}_f^k &= (\gamma + \lambda_e)\,\bar{e}_f^p + (\rho_e + \lambda_e)\,\bar{n}_f^p + \lambda_e \bar{q}_f^p + \breve{e}_f^k \\
\bar{n}_f^k &= (\rho + \lambda_n)\,\bar{n}_f^p + (\gamma_n + \lambda_n)\,\bar{e}_f^p + \lambda_n \bar{q}_f^p + \breve{n}_f^k \\
\bar{c}_f^k &= (\lambda + \lambda_e + \lambda_n)\,\bar{q}_f^p + (\gamma + \gamma_n + \lambda_e + \lambda_n)\,\bar{e}_f^p + (\rho + \rho_e + \lambda_e + \lambda_n)\,\bar{n}_f^p \\
&+ \breve{q}_f^k + \breve{e}_f^k + \breve{n}_f^k
\end{aligned}$$

Optimal Parental Transfers: Results

Back

Variables	Baseline Model (1)	Optimal Transfers (2)
Earnings	7.9%	7.8%
	[3.5%, 12.4%]	[4.3%, 11.3%]
Other Income	4.4%	4.3%
	[1.4%, 7.4%]	[1.6%, 7.0%]
Consumption	30.1%	32.4%
	[19.7%, 40.5%]	[23.7%, 41.3%]

Effect of Income Tax

Variables	**Pre-tax** (1)	**Case A** (2)	**Case B** (3)	**Case C** (4)
Head Earnings	8.0%	4.2%	7.0%	8.9%
	[4.4%, 11.6%]	[1.5%, 6.9%]	[4.0%, 10.1%]	[4.7%, 13.1%]
Other Income	4.2%	4.3%	3.4%	2.0%
	[1.4%, 7.1%]	[1.3%, 7.4%]	[0.7%, 6.1%]	[-0.7%, 4.7%]
Consumption	29.4%	22.3%	25.6%	17.4%
	[20.3%, 38.4%]	[14.6%, 29.9%]	[17.4%, 33.8%]	[8.9%, 25.8%]
No. of Parent-Child Pairs	755	755	755	700

Note: The sample size in columns (1) through (3) is smaller by 6 parent-child pairs from our baseline sample because of non-availability of tax data for those households. Case C leads to negative other income for some families, and they are dropped from the analysis. This leads to the loss of 55 parent-child pairs in column (4). Numbers in parentheses are 95% confidence intervals, calculated using bootstrap standard errors with 100 repetitions.