

Sources of Lifetime Inequality Revisited

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Introduction

- Variables determined early in life have a great impact on the realized path of lifetime earnings, consumption and wealth.
- Initial conditions are determined by parental background (e.g. transfer of abilities and/or wealth)
- How much do initial conditions matter? Which variables have the greatest quantitative impact? How much does parental background and wealth matter to determine lifetime welfare?

The model

- Partial equilibrium, OLG, life-cycle and finite lives.
- Three stages in life: education, working, retirement.
- Parents are altruistic towards their children. They wealth saved in an illiquid account so that children can attend college, if desired.
- Agents heterogeneous in innate ability θ , human capital h and wealth a .
- Government collect taxes from a progressive tax schedule, finance social security system with proportional labor income tax, provide a constant pension benefit to retirees.
- Education:** College educated agents earn a wage w_H per unit of efficiency. The rest earn a wage w_L .
- Work:** Accumulate human capital with a Ben-Porath production function $h_{t+1} = z_{t+1}h_t(1 - \delta) + \theta(sh_t)^\alpha$, where s is time spent in human capital accumulation. Earnings $wh(1 - s)$.
- Retirement:** Agent live off a constant pension and their wealth.

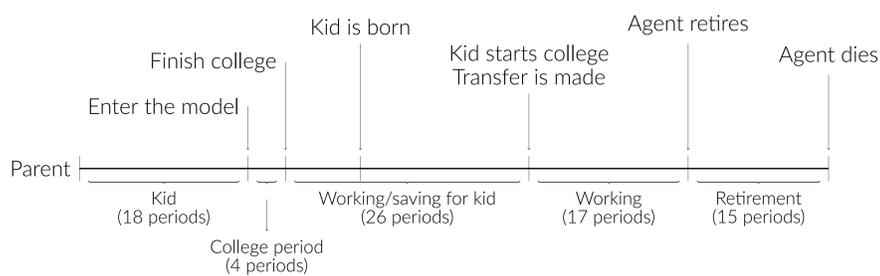


Figure 1. Timeline

Value function

$$V_j(a_j, b_j, h_j; \theta) = \max_{c_j, s_j, t_j} u(c_j) + \beta \mathbb{E}_z[V_{j+1}(a_{j+1}, h_{j+1}; \theta)] + \gamma \mathbb{E}_{\theta'}[V(b_{j+1}; \theta')]$$

$$\text{s.t. } c_j + a_{j+1} + t_j = a_j + \mu(ra_j + (1 - \tau_{ss})wh_j(1 - s_j))^{1-\tau}$$

$$h_{j+1} = \exp(z_{j+1})((1 - \delta)h_j + \theta(s_j h_j)^\alpha)$$

$$b_{j+1} = (1 + r)b_j + t_j$$

$$a_{j+1} \geq \underline{a}_{j+1}$$

Empirical Analysis (1)

Data Sources:

NLSY79, NLSY97, PSID

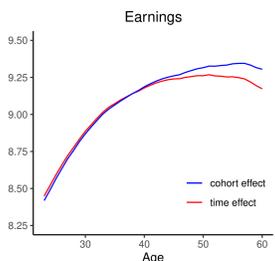


Figure 2. Earnings profile

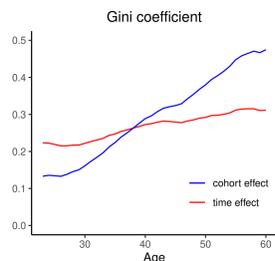


Figure 3. Gini coefficient

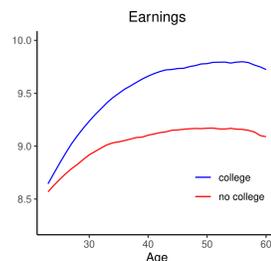


Figure 4. Earnings by educ

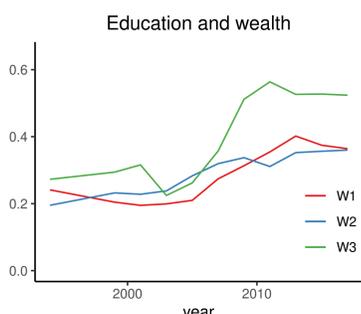


Figure 5. Wealth and Education

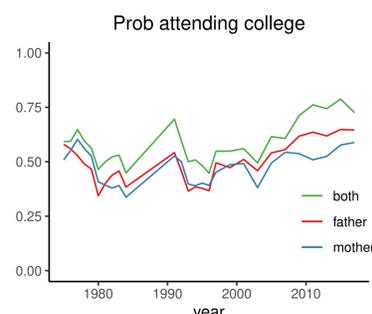


Figure 6. Education and Parents Educ

Empirical Analysis (2)

| Statistic | Cohorts | |
|---------------|---------|-------|
| | 1980 | 1981 |
| Q1 | 300 | 300 |
| Median | 750 | 850 |
| Mean | 3493 | 3292 |
| Q3 | 2200 | 2138 |
| Fraction Tr>0 | 39.4% | 39.9% |

Table 1. Descriptive statistics transfers

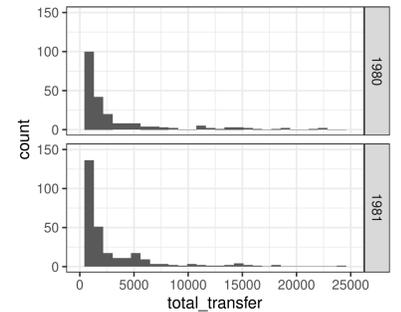


Figure 7. Histogram of transfers

| | Dependent variable: | | | | | | | |
|-----------------|------------------------|----------------------|------------------------|----------------------|------------------------|----------------------|------------------------|----------------------|
| | educ | | | | | | | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| total_transfer | 0.0001*** (0.00002) | | 0.0001*** (0.00002) | | 0.0001*** (0.00003) | | 0.0001*** (0.00003) | |
| received | | 1.019*** (0.104) | | 0.994*** (0.105) | | 0.757*** (0.121) | | 0.927*** (0.140) |
| gender | | | 0.398*** (0.105) | 0.461*** (0.105) | 0.567*** (0.120) | 0.611*** (0.120) | 0.560*** (0.138) | 0.601*** (0.139) |
| race | | | 0.244*** (0.050) | 0.238*** (0.051) | 0.100* (0.060) | 0.107* (0.060) | 0.067 (0.075) | 0.091 (0.076) |
| log(fam_income) | | | | | 0.532*** (0.105) | 0.509*** (0.107) | 0.356*** (0.135) | 0.363*** (0.138) |
| fam_wealth | | | | | 0.003*** (0.0005) | 0.003*** (0.0005) | 0.003*** (0.001) | 0.003*** (0.001) |
| college_res_p | | | | | | | 0.803*** (0.174) | 0.890*** (0.175) |
| Constant | -0.989*** (0.055) | -1.288*** (0.073) | -2.416*** (0.248) | -2.791*** (0.255) | -4.610*** (0.458) | -4.834*** (0.461) | -3.904*** (0.601) | -4.462*** (0.614) |
| Observations | 1,867 | 1,867 | 1,867 | 1,867 | 1,635 | 1,635 | 1,139 | 1,139 |

Note:

*p<0.1; **p<0.05; ***p<0.01

Table 2. Logit model

Model Fit

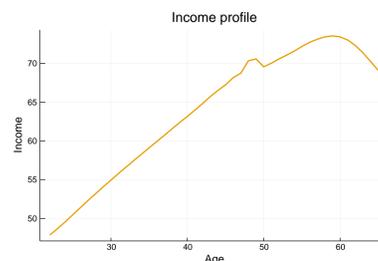


Figure 8. Earnings

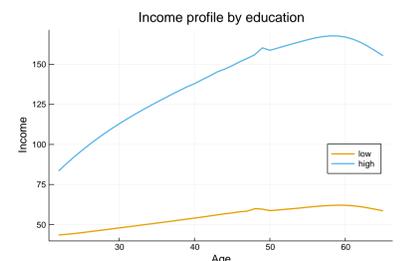


Figure 9. Earnings by Educ

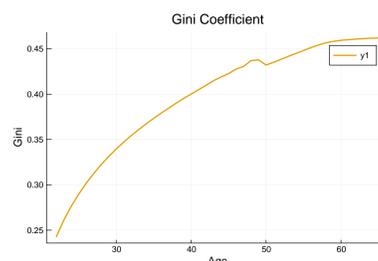


Figure 10. Gini Coefficient

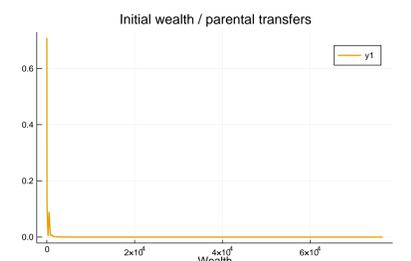


Figure 11. Parental transfers

Lifetime Inequality: Variance Decomposition

| Y | percentage of variance due to initial conditions |
|------------------|--|
| Lifetime income | 18.6% |
| Lifetime wealth | 21.6% |
| Lifetime utility | 11.2% |

Table 3. Variance decomposition

Conclusions

- Quantitative macroeconomic model to explain the evolution of cohort inequality over the life cycle.
- It takes into account the interplay of borrowing constraints and parental wealth transfers in the human capital accumulation process.
- Initial conditions matter for the observed inequality. About 20% of the variance of lifetime income and wealth is explained by initial conditions.
- Initial wealth inequality impacts lifetime welfare and income.