Life Cycle Decisions

Female vs. Male

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Outline

1. Two Models of Labor Supply
2. Motivation of the Papers
3. Research Question and Approach
4. Models
5. Results
6. Comments

Objective

1. Objective: compare two models of life-cycle decisions
   - One model for females one model for males
   - "Females Model": Keane and Wolpin (2010)
   - "Males Model": Keane and Wolpin (1997)
2. Learn about modeling decisions
3. Understand the main features of female and male life-cycle or career decisions

Outline

Motivation: Females

1. Large differences in economic and demographic characteristics of majority (white) compared to minority (black and Hispanic) women
2. NLSY79 in 1990 (Ages 25 to 33):
    - Mean schooling years: white 13.4; black 12.8; Hispanic 12.1
    - Marriage percentages: white 65%; black 32%; Hispanic 55%.
    - Children: white 1.2; black and Hispanic 1.7
    - Employment: white 74%, black 66%, Hispanic 67%
    - AFDC previous year: white 4%, black 20%, Hispanic, 11%

Motivation: Males

1. Analyze the "life-cycle" or career decisions of a core sample of white men

Outline

Research Question and Approach: Females

- Model labor supply, marriage markets, preference heterogeneity, and the welfare system to answer:
  1. How much observed of observed minority-majority differences in behavior can attributed to differences in labor market and marriage opportunities, and preferences?
  2. How does to welfare system affects augment the differences minority-majority differences?
  3. How will the new cohorts that grow up under the new welfare system (TANF) behaves compared to older cohorts?

Research Question and Approach: Males

- Combine the extensions to the basic Roy (1951) model in Heckman and Sedlaeck (1985) and Willis (1986) to asses self-selection in three dimensions, schooling, work, and occupational choice, and understand
  1. Human capital investment
  2. School attendance
  3. Work
  4. Occupational choices
  5. Future work decisions
  6. Wage patterns

Outline

Model: Females, Basics

- $j = 1, \ldots, J$ defines the types of women
- At each time a each women j decides to:
  1. work (if she gets an offer), h_a^p, h_a^f
  2. attend school to schoo, s_a
  3. be married (if someones proposes), m_a
  4. become pregnant (if at fecund age), p_a
  5. government help (if eligible)
- Life span: 14 to 62 (fecund stage: 14 to 45)
- Utility depends on:
  1. Past and current choices
  2. Number of children, N_a
  3. Consumption, C_a
  4. Completed level of Schooling, S_a

Model: Females, Utility and BC

$$
\begin{aligned}
U_a^j &= U_a\left(C_a, S_a, m_a, p_a, g_a, h_a^p, h_a^f; \varepsilon_a, \mathbf{1}(type = j), \Omega_a^a\right) \\
c_a &= y_a^o(1 - m_a)(1 - z_a) + \left[y_a^o + y_a^m\right] m_a \tau_a^m \\
&+ \left[y_a^o + y_a^z \tau_a^z\right] z_a + \beta_1 g_a - \left[\beta_3 \left(\mathbf{1}(S_a \geq 12)\right)\right] \\
&+ \beta_4 \left(\mathbf{1}(S_a \geq 16)\right)
\end{aligned}
$$

Model: Females, Job Offers and Wages

- Probabilities of receiving full and part time job offers: π^{wp}, π^{wf}
- Earnings: $y_a^o = 500 w_a^p h_a^p + 1000 w_a^f h_a^f$
- Hourly wage: $\ln w_a^k = r^k + \Psi_a(\cdot) + \varepsilon_a^w$, for $k = p, f$ and where r^k is rental rate and $\Psi_a(\cdot)$ is human capital stock
- Marriage:
  1. offers to marry married depend on age and welfare status, π_a^m
  2. offers to continue married depend on age and marriage current duration
- Husband's human capital: (conditional on marriage offer) drawn from a distribution that depends on woman's race/ethnicity, schooling, age, state of residence, type, Psi_a^m
- After marriage, husband's earnings are $\ln y_a^m = \mu^m + \Psi_{0m}^m + \varepsilon_a^m$

Model: Females, Welfare System

- The welfare system is time and state particular

$$b_t^s\left(N_{at}^{18}, y_{at}^o, y_{at}^z\right) = \begin{cases} b_{0t}^s + b_{1t}^s N_{at}^{18} - b_{3t}^s \beta_2 y_{at}^z z_{at}, & y_{at}^o < y_{at}^{s1}(\cdot) \\ b_{2t}^s + b_{4t}^s N_{at}^{18} - b_{3t}^s & \\ \times \left[y_{at}^o - y_{at}^{s1} + \beta_2 y_{at}^z z_{at}\right], & y_{at}^{s1}(\cdot) < y_{at}^o < y_{at}^{s2}(\cdot) \\ 0, & \text{otherwise} \end{cases}$$

- The parameters that define the welfare system evolve according to a VAR

$$\mathbf{b}_t^s = \lambda^s + \Lambda^s \mathbf{b}_{t-1}^s + \mathbf{u}_t^s \tag{1}$$

- (1) is estimated outside the model with simulated data

Model: Females, Dynamic Problem

$$V_a(\Omega_a) = \begin{cases} \max_{l \in \mathcal{L}} U_a^j + \delta \mathbb{E}\left(V_{a+1}(\Omega_{a+1} | l \in \mathcal{L}, \Omega_a)\right), & a < A \\ U_A^j, & a = A \end{cases}$$

- The value of option $l \in \mathcal{L}$ depends on the current state space: Ω_A, which includes residence, the WS rule parameters, preference shocks, own husband's earnings shocks, parental income shocks, labor market, marriage, and parental co-residence opportunities
- Solution: set of "Emax's" for all $l \in \mathcal{L}$ and all elements in Ω_a

Model: Males, Basics

- $k = 1, \ldots, J$ defines the types of men (by human capital at age 16)
- At each age a individuals choose among five mutually exclusive, exhaustive alternatives ($m = 1, \ldots, 5$):
  1. Blue collar job
  2. White collar job
  3. Military job
  4. Go to school
  5. Engage in household production
- Per period reward:

$$R(a) = \sum_{m=1}^{5} R_m(a) d_m(a)$$

where $R_m(a)$ is the per period reward in the m_{th} alternative and $d_m(a)$ indicates the choice of the m_{th} alternative

Model: Males, Utility

- For $m = 1, 2, 3$:

$$\begin{aligned} R_m(a) &= w_m(a) \\ &= r_m \exp[e_m(16) + e_{m1} g(a) + e_{m2} x_m(a) \\ &- e_{m3} x_m^2 + \epsilon_m(a)] \end{aligned}$$

- For $m = 4, 5$:

$$\begin{aligned} R_4(a) &= e_4(16) - tc_1 \mathbf{1}[g(a) \geq 12] - tc_2 \mathbf{1}[g(a) \geq 16] + \epsilon_4(a) \\ R_3(a) &= e_5(16) + \epsilon_4(a) \end{aligned}$$

- r_m, rental rate of human capital; completed schooling years, $g(a)$; work experience, $x_m(a)$; skill endowment, $e_m(16)$; tc_1, tc_2 college/grad school costs; $\epsilon_m(a)$ skill technology shock

Model: Males, Dynamic Problem

$$V(\mathbf{S}_a) = \begin{cases} R_m(\mathbf{S}_a) + \delta \mathbb{E}\left[V((S(a+1))|d_m(a), \mathbf{S}(a)\right], & a < A \\ R_m(\mathbf{S}_a), & a = A \end{cases}$$

- The value of option m depends on the current state space, $\mathbf{S}_a$: endowment at age 16 (occupation and type particular), $\mathbf{e}(16)$; completed schooling years, g_a, experience in each (labor) occupation, $\mathbf{x}(a)$; skill technology shocks (occupation particular), $\epsilon(a)$
- Solution: set of "Emax's" for $m = 1, \ldots, 5$ and all elements in $\mathbf{S}_a$

Model: Males, Dynamic Problem

- The model needs the following extensions to fit the data adequately:
  1.
  2.
  3.
  4.
  5.

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