Lecture 7

Birth and Death
A model of fertility

• The family maximizes $U(c) + V(n)$, $U$ and $V$ are both increasing and concave.

• Subject to $c = (1-nl)w + a$, and $l$ is the cost of each pregnancy in terms of time, while $a$ is unearned income.

• What is the effect of increasing $a$ in this model on fertility?

• What is the effect of increasing $w$?
Dynamics of fertility

• Add the assumption $w(t+1) = w(n^*(t))$, where $n^*(t)$ is the average level of fertility at time $t$
• Since all families are identical all of them have $n^*(t)$ children.
• This generates the dynamic:
• $w(t+1)=w(n^*(t))=w(n^*(w(t))$
• What does this imply?
• What do we know about the relation between fertility and income?
  – In theory: on average and distributionally
  – In the data: cross-country, within country, twinning?
Determinants of fertility

- Unearned income: evidence, policy implication
- Women’s relative wages
- Women’s education
- Child mortality
- Contraception, control over births
- Child labor
- Schools for children
- Schools for mothers
- Old age care, security
- Son preference
- Increasing women’s bargaining power
Mortality

- Enormous decline in mortality
- 35-37 years in the 1700s
- 41 years in 1800s
- After 1870, climb begins: 50 years in the 1900s in UK, 47 years in USA.
- Now 77 years in the UK, 78 USA.
- Big declines in infant mortality: between 1841 life expectancy at birth went up by 30 years while life expectancy at age 10 went up by 15 years only.
Within country variation in mortality

- Lots of inequality though:
- Black infants die more often than white infants controlling for mother’s education
- White infants of mothers with less than high school are twice as likely to die as white infants of mothers with high school
- Whitehall civil servant studies
Determinants of Mortality

• Nutrition:
• Channels through which nutrition affects mortality
  – Nutrition affects immunity against diseases: Evidence?
  – GDP health link
  – Fetal origins (Barker): Evidence
  – Timing of birth
• Public health
• Channels
  – Water
  – Sanitation
  – Health practices (boiling bottles, not smoking)
  – Living conditions (urbanization)
Determinants of Mortality

• **Vaccines:**
  • Evidence?
  • However early childhood diseases
  • How about in developing countries?

• **Medical treatments**

• **Channels**
  – Antibiotics
  – Cardiovascular
Determinants of Mortality

- Maternal education
  - Channels?
  - Evidence?
- Social stress
  - Channels: allostatic load
  - Evidence?
- Health related behaviors
  - Channels
  - Evidence?
- Education?
  - Channels