

L13: Fertility in LDCs: Determinants and Policy Implications

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Recap of Previous Lecture

- Effects of high population growth on development: generally believed this is a negative effect
- Reviewed facts concerning growth of population
- Demographic transition: population growth accelerates in second stage owing to drop in mortality rates, but decelerates thereafter as fertility rates drop
- Eventually population growth returns to low positive, zero or negative levels

Importance of Fertility Behavior

- Fertility behavior is key
- Variations in fertility overwhelm variations in mortality
- Why poor countries have higher population growth rates
- Why population growth rates fall in later stages of demographic transition

Determinants of Fertility (read Schultz essay, Ch 9 in UPP)

- Economic theory of fertility: Becker's theory
- Sociological determinants: Easterlin's theory
- Other determinants important in LDCs

Economic Theory of Fertility (Becker)

- Becker's theory views children as 'consumption' by parents
- Parents derive joy from having children, and satisfaction from their children's success
- Make sacrifices in order to bear, rear and educate children
- Costs: Take time off work, clothe and feed children, education and health expenses

Economic Theory of Fertility (Becker), contd.

- Parental utility depends on:
 - number of children
 - 'quality' of children
 - other consumption good
 - leisure
- Each of the above is costly; parents trade off benefits and costs
- Parental resources: wealth, time and skill/education

Parental Choice Problem

- Maximize utility function $U(n, e, c, l)$
- Subject to budget constraint

$$c + n.e.t = w(e_p)(1 - l - nr) + W$$

- c is household consumption, n is number of children, e is education chosen for children, t is tuition cost
- $w(e_p)$ is parental wage rate (education), l is parental leisure, r is child-rearing time away from work, W is parental wealth

Determinants of Parental Choices

- Fertility n , child education e , consumption c and leisure l are increasing in parental wealth W
- Effect of higher wage rate $w(e_p)$ on fertility?
 - income effect (positive)
 - substitution effect (negative)
- If substitution effect dominates (more likely for mothers), more educated parents will have fewer children
- More educated parents select more education for their children

Implications

- Suppose human capital is the primary source of wealth ($W = 0$), i.e., for vast majority of population which excludes landlords or capitalists
- Then rising income/education of parents (particularly women) likely to induce them to have fewer but better educated children
- Shift from 'quantity' to 'quality'

Some Other Implications

- Fertility falls if child-rearing costs r rise
- If education cost t falls, parents are induced to switch to the 'high quality-low quantity' strategy, and fertility falls
- Urbanization likely to be associated with fall in fertility rates: lower education costs, higher childcare costs

Sociological Theories of Fertility (Richard Easterlin)

- Sociological Factors that affect fertility: social norms concerning
 - age at marriage
 - family size and use of contraceptives
 - education
 - women's labor force participation

Empirical Evidence

- Strong and robust evidence that rising women's education (above 4 years of schooling) is associated with a decline in fertility
- Countries with TFR 6 and above have female illiteracy rates of 60% and above; those with TFR 5 and below have average female illiteracy rate of 23%
- Father's education has comparatively negligible (and often positive) effect on fertility
- Family wealth and p.c.i. has positive effect, controlling for parental education
- Urbanization has negative effect

Table : Cross-Country Regression of Total Fertility Rate (Schultz)

Years Female Education	-0.551***
Years Male Education	0.179
Log GDP per capita	0.517**
% population urban	-.008?
% population agri.	.019
% population Catholic	.012**
% population Protestant	.024**
% population Muslim	.012**
family planning cost	-.000
intercept	5.79
R^2	0.722

Additional Determinants Important in Developing Countries (Kotwal, UP, Ch. 10)

- Children as Income Earners: Child Labor
- Children as Old-Age Security
- Son-Preference
- Infant Mortality
- Women's Empowerment

Child Labor

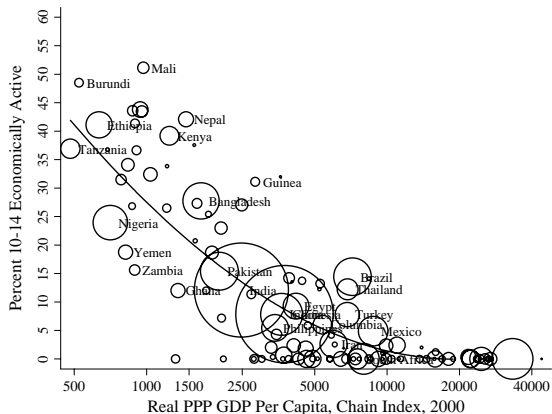
- Household tasks: collecting firewood, water; grazing cattle; care of younger siblings
- Working for wage for employers; often work longer hours than parents (e.g. Himalayan foothills)
- Mead Cain study for Bangladesh: boys earn by age of 15 sufficient to cover all expenditures incurred by parents on their behalf

Table : Child Labor in 36 LDCs (UNICEF survey, 2000)

	Part. Rate 5-9	Part. Rate 10-14	Hrs/Wk 10-14
Market Work:	15	35	29
Paid	1	4	33
Unpaid	4	7	31
Family Bus./Farm	12	30	29
Household Tasks:	51	79	19

Child Labor Incidence Across Countries, 2000

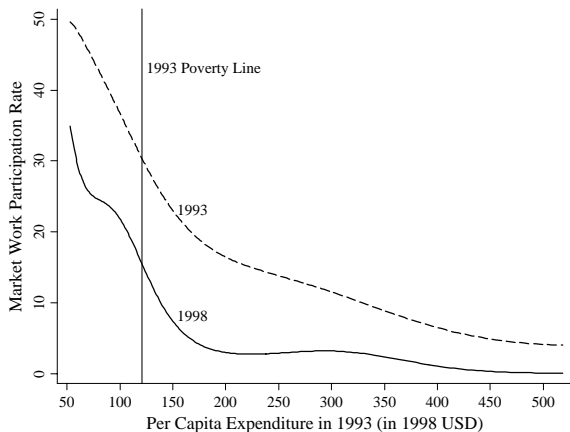
Figure 1: The Relationship between Economic Status and Economic Activity, 2000



Source: Economic Activity for 2000 from LABORSTA (<http://laborsta.ilo.org>), GDP per capita from Penn World Tables 6.1, and Population aged 10-14 weights from UNStat.

Child Labor Incidence within Vietnam, 2000

Figure 2: Living Standard Improvements and Child Labor in Vietnam in the 1990s



Source: General Statistical Office (1994, 1999): Vietnam Living Standards Survey, Rural Panel, 1993 & 1998

Children as Old-Age Security

- LDCs lack financial assets in which working adults can save for their old age
- Poor health care services: old parents are cared for by their children at home (in India 80% of old parents live with adult sons; as against 15% in the US)
- Widows in Bangladesh ability to hold on to land assets owned depends on whether they have a grown son living with them (study by Mead Cain)
- Fertility decline in mid-19th century UK related to emigration of children to the US (Jeff Williamson study)

Son-Preference

- Strong preference for sons rather than daughters in patrilineal societies
- Sons are needed to look after family property and parents in old age
- Dowry: bride's parents pay son's parents
- Urge to guarantee there will be sons: raises fertility
- 7-8% 'missing women' in China and India, sex-ratio imbalance getting worse in last two decades

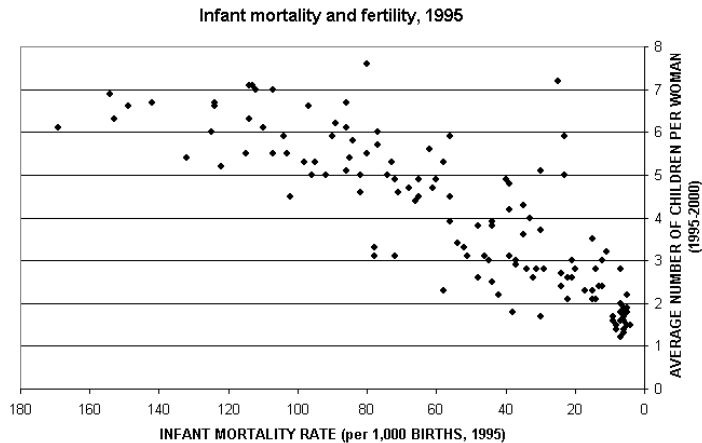
Infant Mortality

- If risk of child mortality (or emigration) is high, self-insurance motive leads to 'hoarding'
- Risk: a child born may not be male, a male child born may not survive beyond age 5 owing to infant mortality, and a male child that survives may emigrate
- Let r denote this risk (bigger than a half, maybe .7)
- How many children must you give birth to, to ensure you will have a adult son who will be around to look after you with 95% probability?

Infant Mortality, continued

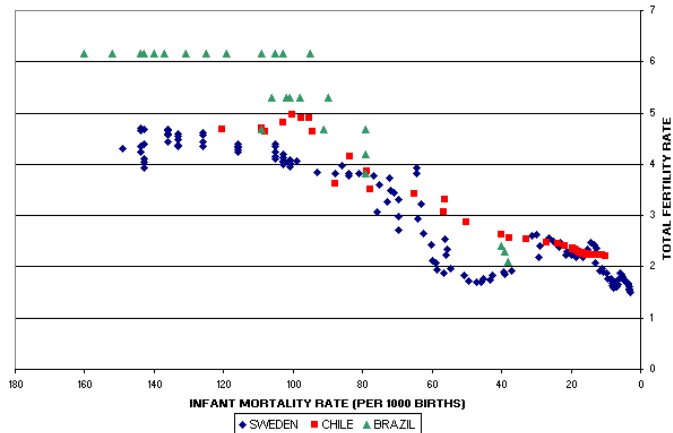
- Solve for smallest integer n for which $1 - r^n \geq 0.95$
- If $r = 0.5$, need at least 5 children
- If $r = 0.7$, need at least 8 children
- Hence higher infant mortality or emigration rates raise fertility rate

Cross Country Regression: Infant Mortality and Fertility Rates



Longitudinal Evidence: Infant Mortality and Fertility Rates

INFANT MORTALITY AND TOTAL FERTILITY, SWEDEN (1855-2000), BRAZIL (1950-2000), AND CHILE (1960-2000)



Female Empowerment

- Women empowerment strongly associated with higher labor force participation of women and higher women's wages, which directly lower fertility
- Additional factor: enhanced bargaining power of women within households associated with more spending on children health and education, and lower fertility
- Mothers have a higher relative preference for quality over quantity of children compared to fathers
- South Indian states with matrilineal societies have substantially lower fertility, infant mortality rates and higher school enrollment rates compared with North Indian states

Property Inheritance Laws

- If death of parents results in equal division of property across all children, large families dissipate their wealth
- Hence equal division laws discourage parents from have too many children
- Conversely, if property goes to eldest son or sibling, there is no disincentive to have more children
- This matters less in societies where bulk of wealth is in the form of human capital since it cannot be bequeathed

Role of Social Norms

- Strong social norms concerning how many children to have, and whether to use contraceptives
- Particular norms in sub-Saharan Africa which encourage higher fertility:
 - ancestor cult
 - polygyny
 - extended family/kinship ties
 - communal land tenure

Summary of Reasons why Fertility Declines with Development

- Rising access to schooling
- Higher education, labor force participation rates, wages and empowerment of women
- Fall in child labor
- Parents old age security: children emigration, financial development, social security
- Falling infant mortality
- Urbanization: Nuclear families, rising childcare costs, cheaper birth control methods

Policy Implications

- Wide variations in fertility even within any given p.c.i. category (recall cross-country regression from previous lecture)
- Role of policies:
 - human development
 - child labor
 - women's empowerment
 - old-age security
 - urbanization
 - subsidized family planning services

Are Coercive Methods Warranted?

- Coercive Policies: China's One Child Policy; Forced Sterilizations in India 1975-77
- Very unpopular, cause great hardship to poor households (given absence of social security)
- No evidence these are necessary to lower fertility rates, if other policies of human development and modernization are in place

Some Recent Research Findings

- Fertility decline in Brazil: TFR was 6.3 in 1960, 5.8 in 1970, 4.4 in 1980, 2.9 in 1991, 2.3 in 2000
- However government did not follow any policy to control population growth rates directly
- Education levels still quite low in 2000: 39% in urban and 73% in rural areas had less than 4 years of schooling
- One factor related to fertility decline: rise in TV ownership (8% in 1970 to 81% in 1991)
- Whats the connection?

Some Recent Research Findings, contd.

- Exposure to TV *novelas* or soap operas of Rede Globo channel explains part of the decline (La Ferrara, Chong and Duryea, *American Economic Journal: Applied*, 2012)
- The soap operas portrayed successful, happy rich/middle class female characters with no or one child
- In contrast to women in poor families who had many children and were very unhappy
- Exposure to Globo channel explains statistically significant 5% fertility decline especially among poor, less educated women

Some Recent Research Findings, contd.

- One month electricity blackout during May-June 2008 in island of Zanzibar (Burlando, 'Power Outages, Power Externalities and Baby Booms,' *Demography*, 2014)
- 17% rise in births 8-10 months later
- Only in areas with electricity; no effect on areas that had no electricity at all
- The blackout induced adult males and females to spend more time at home in the evenings