

Section Chapter 11: Population

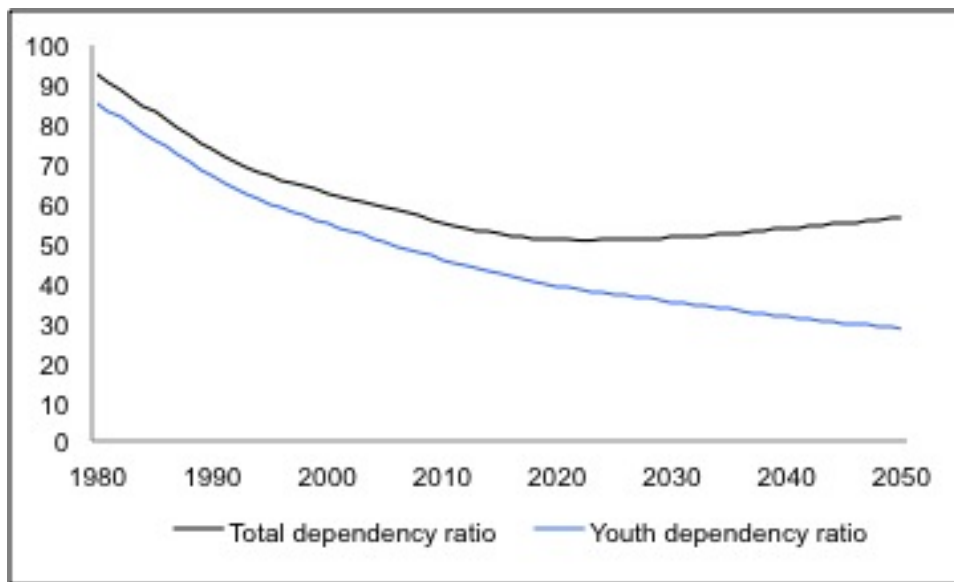
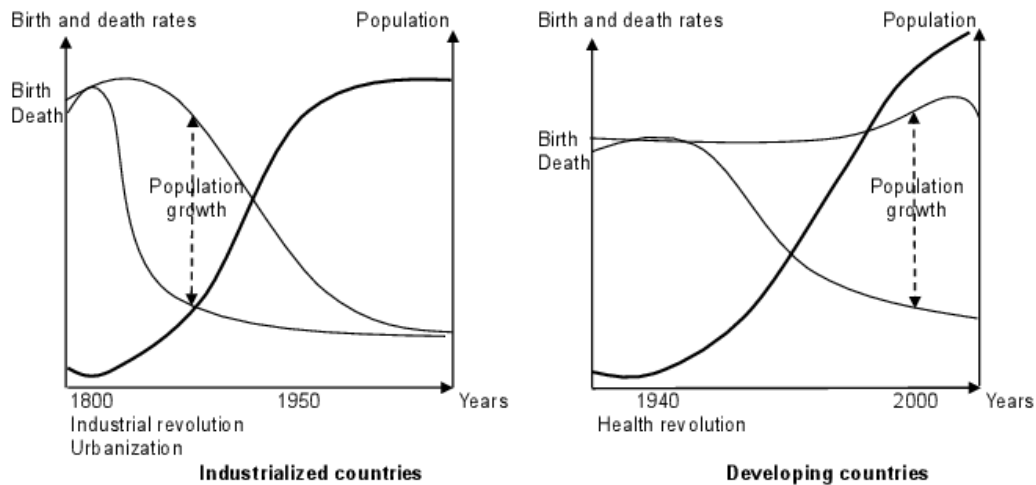
1 Demographics and the Big Picture:

What do demographic trends imply for the well-being of your children?

- Population equilibrium? →Population is expected to stabilize at 9 bn people in 2045. *How might we reach a pop. equilibrium and what assumptions are we making?*
- Population geographic distribution? →84% of the global population lives in the developing world. *What does this mean for migration and geopolitics of the future?*
- Population movement? – Urbanization is increasing rapidly, e.g. approximately 73% of population of Latin America lives in urban spaces. *How is urban poverty different from rural poverty and what does this imply for the future of global poverty?*

2 Main concepts

- *The crude birth rate (b)* of a population is the number of births per 1000 people per year.
- *The crude death rate (d)* of a population is the number of deaths per 1000 people per year.
- *The annual rate of natural increase of a population (r)* is the difference between the birth rate and the death rate: $r = b - d$.
- *The annual natural increase of a population* is $r * N$, where N is population size at the beginning of the year. Observed population growth takes into account migration and for that reason differs from the natural rate of population growth.
- *Infant mortality rate* is the number of infant deaths, defined as those younger than 5 years old, per 100 people per year.
- *Life expectancy at birth* is the expected number of years for a new born child.
- *Total Fertility Rate (TFR)* is the number of children that will be born to a women during her reproductive ages (15-50).
- *Replacement Fertility Rate* is the TFR that will result in zero growth of the population and is approximately equal to 2.1.
- **Dependency ratio:** Ratio of population not in working age (0-14 and 65+) to working age population (15-65).
- **Demographic transition:** The transition from high to low fertility. It is associated with children losing their income and insurance function for parents, only maintaining their universal satisfaction function but increasingly through the quality as opposed to the quantity of children.
- **Demographic dividend:** The transition between having a lot of children and having a lot of old people generates a “demographic dividend”, a period during which we can enhance saving rates.



3 Causes of population growth:

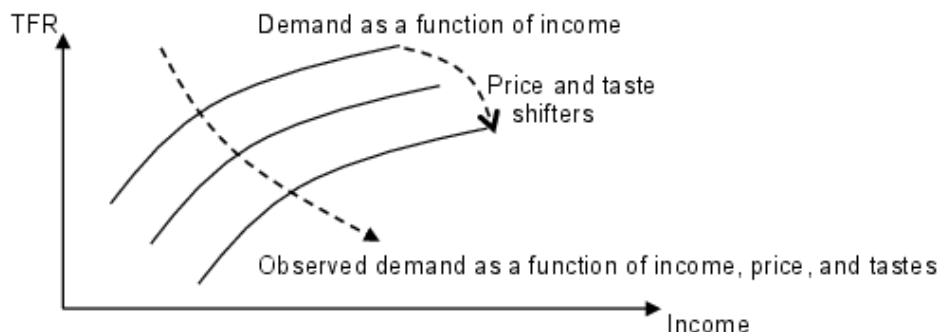
Calculus of economic advantage: income, insurance, & satisfaction

For Malthus, population growth was constrained by food availability and agricultural productivity. More contemporary thinking considers population dynamics from the perspective of the family level economic calculus in childbearing. In deciding how many children to have, parents are presumed to consider three function children fulfill for parents: they are sources of income, insurance, and satisfaction. Of course, **social norms** around family size, gender, etc. are slow to evolve to new economic conditions. If social norms are the main mechanism by which families change reproductive choices due to economic forces, there may be lag between economic and demographic changes.

3.1 Income

Empirical regularities point towards the fact that as income raises, TFR decreases. Does this mean that children inferior goods? No. Becker (1981) argues that as income raises, there is a price effect to be

considered as well: richer parents prefer “high quality” kids (more expensive). This trade-off allows us to think about children as normal goods.



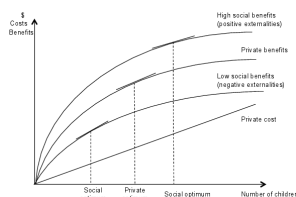
3.2 Insurance

The protection function of children implies that parents will want to have children to care for them when they are old. The risk that children will die will determine how many children parents should have to make sure that at least one child will be there to help. Say that P is the desired probability of having at least one child to look after you at old age, for example 95%. Let q be the probability that a child will die. If you have one child, the probability that he will be there to help at old age is $P = 1 - q$. If you have two children, the probability that at least one will be there to help is $P = 1 - q^2$. The optimum number of children n to have to achieve your protection objective P is thus $P = 1 - q^n$. Solution is $n = \frac{\ln(1-p)}{\ln(q)}$

4 Population Policy

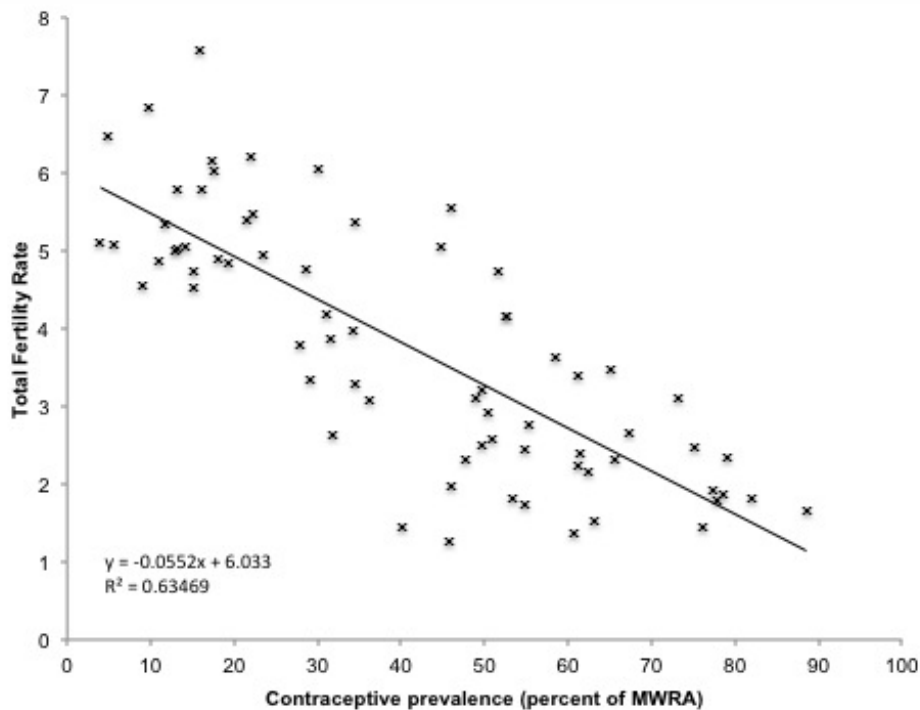
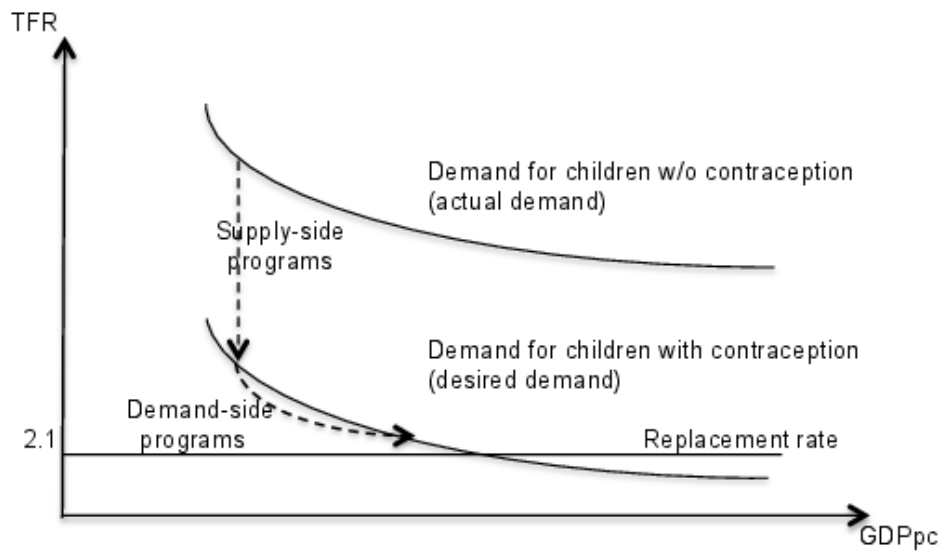
4.1 Theory

So far we’ve discussed private demand for children as it reflects private costs and benefits. As you can see below, social benefits may differ from private benefits when there are positive or negative externalities. *How would the private or socially optimum TFR change if we allow increasing or decreasing marginal costs?*



4.2 Supply Side vs. Demand Side Policies

Contraception availability also shifts the demand for children. Contraception can reduce fertility even at low levels of income. *How do historical examples from Bangladesh and Europe offer contradictory evidence about the need for supply vs demand side focused policies?*



5 Interesting Population Related Papers

- Jayachandran and Kuziemko. (QJE, 2011). “Why Do Mothers Breastfeed Girls Less Than Boys? Evidence and Implications for Child Health in India.”
- Miguel. (REStud, 2005). “Poverty and Witch Killing.”
- Pitt, Rosenzweig, and Hassan. (AER, 2012). “Human Capital Investment and Gender Division of Labor in a Brawn-Based Economy.”

- Young. (NBER, 2004). “The Gift of the Dying: The Tragedy of AIDS and the Welfare of Future African Generations.”

6 Examples of exam question related Population from previous exams:

1. Define and illustrate the demographic transition? Definition and figure
2. Define and illustrate the demographic dividend? Definition and figure
3. What is the benefit of a demographic dividend? Will it last forever?
4. Because we see the total fertility rate decline as income rises, we can conclude that children are inferior goods for parents ----- (True/False)? Explain your answer.

7 Worksheet

What is the demographic dividend?

DRAW Two Population Pyramids: Impact of AIDs on SSA Demographics

How might we reach a pop. equilibrium and what assumptions are we making?

What does this mean for migration and geopolitics of the future?

How is urban poverty different from rural poverty and what does this imply for the future of global poverty?