

Lecture 9

Population

(Based on Chapter 7 of Perkins et al.)

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Concepts

- Crude birth rate
- Crude death rate
- Rate of annual increase
 - Crude birth rate – Crude death rate
- Doubling time
- Replacement level of fertility.
- Age structure
 - Population pyramid
- Life expectancy

Present Demographic Situation

■ Trends

- Declining birth rates
 - Declining all the way as PPP GDP per capita rises from \$1000 to \$10,000 or more.
- Declining death rate
 - Declines as PPP GDP per capita rise to \$4000 and is insensitive after that.

■ Issues

- Age distribution (population aging).
- Spatial distribution (urbanisation).

Birth Rate

■ Determinants

- Age structure of the population.
- Share of population in the reproductive age who marry (includes long term relationships).
- Rate at which married couples reproduce.

■ Questions

- Is Europe at the receiving end of all three factors?
 - Is Europe trapped in a vicious circle of population aging?

Theories of Fertility 1

- Malthus.
 - “passion between the sexes”

- Socio-developmental theories.
 - Poverty.
 - Social security options.
 - Social norms.
 - Gender bias.
 - Infant mortality rates.
 - Women’s participation in labour force.
 - Income.

Theories of Fertility 2

- Becker

- Quality-quantity trade-off.

- Max $U(N, Q, C)$

- Sub (a) time constraint, (b) budget constraint

- N = number of children

- Q = quality of children

- C = other goods and services

Theories of Fertility 3

■ Example.

■ Assumptions:

- A parent lives three periods.
- Decides on number of children, extent of labour force participation, and savings for old age.
- Parent's utility depends on own labour and leisure, as well as the children's utility.

$$\blacksquare \max U^P = U(C_{II}^P, l) + \rho U(C_{III}^P, \bar{T}) + \rho n V(I_{III}^k)$$

■ sub to

- (1) $\bar{T} = t_w + t_K(n) + l$
- (2) $C_{II}^P = t_w \bar{w}_p - S^P - p_H q(n)n$

Theories of Fertility 4

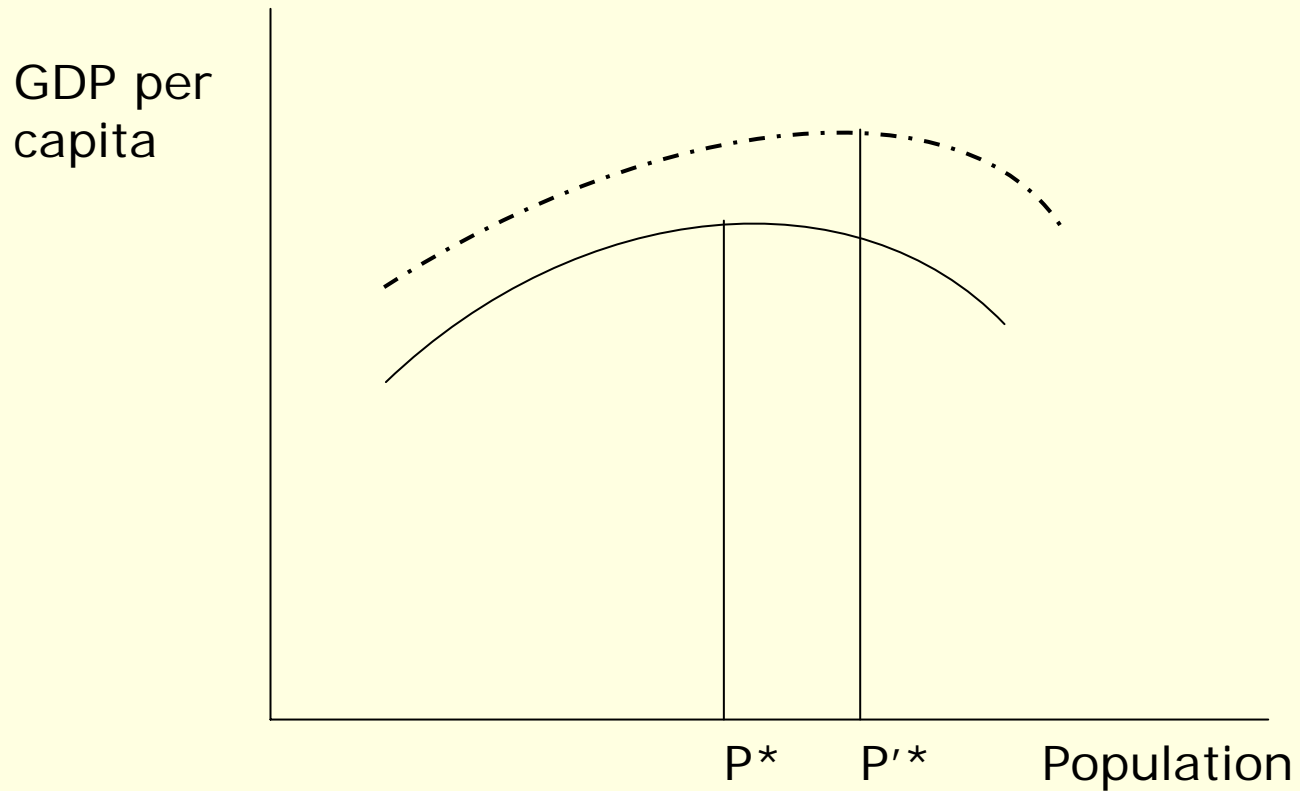
- Easterlin
 - Demand for children.
 - Taste
 - Natural fertility.
 - Biology
 - Culture

Optimum Population 1

- Population “too small”
 - \Rightarrow not enough people available to use the stock of capital and other resources.

- Population “too large”
 - \Rightarrow labour suffers from diminishing marginal returns.
 - Problem aggravated by slowdown in savings and investment as dependency ratio increases.
 - Further aggravated by slowdown in capital deepening.

Optimal Population 2



Population Issues

- Pensions
- Fiscal deficit
 - Lee and Edwards (FRB Boston, 2001)
 - Atkinson (FRB Boston, 2001)
- Capital market
- Labour force