Chapter 6

Population Growth and Economic Development: Causes, Consequences, and Controversies
Questions, Data, Answers

1. The History of World Population
2. The Great Demographic Transition
3. How does Economic Development affect Population Growth?
4. How does Population Growth affect Economic Development?
1. World Population History

[Graph showing world population history with a rapid increase to 6 billion in the late 20th century.]
Table 6.1 Estimated World Population Growth

<table>
<thead>
<tr>
<th>Year</th>
<th>Estimated Population (millions)</th>
<th>Estimated Annual Increase in the Intervening Period (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10,000 B.C.E.</td>
<td>5</td>
<td>0.04</td>
</tr>
<tr>
<td>1 C.E.</td>
<td>250</td>
<td>0.04</td>
</tr>
<tr>
<td>1650</td>
<td>545</td>
<td>0.29</td>
</tr>
<tr>
<td>1750</td>
<td>728</td>
<td>0.45</td>
</tr>
<tr>
<td>1800</td>
<td>906</td>
<td>0.53</td>
</tr>
<tr>
<td>1850</td>
<td>1,171</td>
<td>0.65</td>
</tr>
<tr>
<td>1900</td>
<td>1,608</td>
<td>0.91</td>
</tr>
<tr>
<td>1950</td>
<td>2,576</td>
<td>2.09</td>
</tr>
<tr>
<td>1970</td>
<td>3,698</td>
<td>1.76</td>
</tr>
<tr>
<td>1980</td>
<td>4,448</td>
<td>1.73</td>
</tr>
<tr>
<td>1990</td>
<td>5,292</td>
<td>1.48</td>
</tr>
<tr>
<td>2000</td>
<td>6,090</td>
<td>0.45</td>
</tr>
<tr>
<td>2050 (projected)</td>
<td>9,036</td>
<td>0.45</td>
</tr>
</tbody>
</table>

Figure 6.1 World Population Growth, 1750-2050

Figure 6.3 The Population Map
Questions, Data, Answers

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The Great Demographic Transition

- **www.gapminder.org**
  - Load Gapminder World
  - X=Children per Woman
  - Start at 1960 (or 1950)

- **We**: Small Family & Long Life

- **Them**: Large Family and Short Life
**Table 6.3**  Fertility Rate for Selected Countries, 1970 and 2009

<table>
<thead>
<tr>
<th>Country</th>
<th>1970</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bangladesh</td>
<td>7.0</td>
<td>2.3</td>
</tr>
<tr>
<td>Colombia</td>
<td>5.3</td>
<td>2.5</td>
</tr>
<tr>
<td>Indonesia</td>
<td>5.5</td>
<td>2.4</td>
</tr>
<tr>
<td>Jamaica</td>
<td>5.3</td>
<td>2.4</td>
</tr>
<tr>
<td>Mexico</td>
<td>4.9</td>
<td>2.3</td>
</tr>
<tr>
<td>Thailand</td>
<td>5.5</td>
<td>1.8</td>
</tr>
<tr>
<td>Zimbabwe</td>
<td>7.7</td>
<td>3.9</td>
</tr>
</tbody>
</table>


*aAverage number of children born to women who live beyond age 49.*
The Demographic Transition

• Stage I: High birthrates and death rates
• Stage II: Continued high birthrates, declining death rates
• Stage III: Falling birthrates and death rates, eventually stabilizing
Figure 6.6 The Demographic Transition in Western Europe
Population Growth—Past, Present, and Future

• The Hidden Momentum of Population Growth
  – Previous high population growth =>
  – High proportion of young people in population =>
  – High birth rate, given total fertility rate
Figure 6.4 Population Pyramids: Ethiopia and the United States, 2005

Figure 6.5 The Hidden Momentum of Population Growth

![Figure 6.5 The Hidden Momentum of Population Growth](image)

Questions, Data, Answers

1. The History of World Population
2. The *Great Demographic Transition*
3. How does Economic Development affect Population Growth?
4. How does Population Growth affect Economic Development?
Household Models of Fertility

Demand for Children Equation

\[ C_d = f (Y, P_c, P_x, t_x), x = 1, \ldots, n \]

Where

- \( C_d \) is the demand for surviving children
- \( Y \) is the level of household income
- \( P_c \) is the “net” price of children
- \( P_x \) is price of all other goods
- \( t_x \) is the tastes for goods relative to children
Household Models of Fertility

• Increases in Women’s Education and Employment Opportunities:
  – Increase the opportunity cost of pregnancy and child raising
  – Make it easier to understand and use family planning technology

• Result in lower fertility
Household Models of Fertility

• As Economic Activity shifts from Traditional Agriculture to Industry,
  – Children are less valuable as “Raw Labor”
  – Incentives to invest in child “Quality” (Education) increase
  – Thus, Quality is increasingly favored over Quantity in Family Planning
Development and Fertility

• Conclusion: Economic Development Reduces Fertility
Questions, Data, Answers

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The Malthusian population trap

• Any increase in income above subsistence =>
  – Increase in population =>
  – Decrease in land/person =>
  – Back to subsistence income level

• Writing about 1800
  – Was reality so far in the world
Criticisms of Malthus - 1

• Are we at Subsistence level of income?
• No, We are Rich and Healthy!
• Malthus assumed that the means of production (land and its productivity) increased slowly
• In reality, productivity has increased rapidly (now feed 7 billion people and can feed many more)
Criticisms of Malthus - 2

• Technology
  – Malthus assumed that the means of production (land and its productivity) increased slowly
  – In reality, Agricultural and Industrial Productivity have increased Rapidly
Wheat yields in developing countries, 1950-2004

Source: FAO

Criticisms of Malthus - 3

- Malthus saw restraints on population as famine, disease, wars, etc
- *In reality* population growth has slowed because people now *choose* smaller families
- Malthus did not foresee family planning technology
The Consequences of Population Growth: Conflicting Views

Neo-Malthusians

Paul R. Ehrlich author of *The Population Bomb* (1968) and *New Statesman* (1967) article:

“[T]he battle to feed all of humanity is over ... In the 1970s and 1980s hundreds of millions of people will starve to death in spite of any crash programs embarked upon now."

"India couldn't possibly feed two hundred million more people by 1980," or "be self-sufficient in food by 1971."

The Consequences of Population Growth: Conflicting Views

Population growth isn’t a real problem

1. The real problems are: Underdevelopment, World resource depletion and environmental destruction, Population Distribution, Subordination of Women

2. Overpopulation is a deliberately contrived false issue (Genocide of third world peoples)

3. Population growth is a desirable phenomenon => technological advances (Julian Simon)
The Consequences of Population Growth: Doug’s Views

• Malthus and Ehrlich were fundamentally wrong, because
  1. They did not foresee technological advances in agricultural production and family planning
  2. They did not understand that development creates incentives for smaller families
The Consequences of Population Growth: Doug’s Views

• **But, Population Growth is a Problem**
  
  – To the extent that a country continues to rely on traditional agricultural production
  
  – (Some would say that continued reliance on traditional ag is *the* problem, *which is true*, but in the meantime, farmers work with less and less land per capita.)
  
  – Population growth in LDCs may strain environmental carrying capacity (deforestation, declining fish/animal stocks, water pollution), *when property rights and/or government regulation are weak* (*Chapter 10*).
The Consequences of Population Growth: Doug’s Views

• Population Growth is a problem
  – Solow Growth Model: Higher rates of population growth reduce the capital-labor ratio, which in turn => lowers income per capita
  – Similarly, higher rates of population growth reduce human capital formation for given rates of investment
  – Both: Higher rates of saving and investment are required just to maintain K/L and H/L when population grows more rapidly
The Consequences of Population Growth: Doug’s Views

• **But:** Population growth is MUCH LESS of a problem than it was thought to be, because of …

1. The Great Demographic Transition
2. Advances in Technology
Case Study: China
China’s Population Policies

• Mao: More is better

• 1980’s: One child
  – Ask neighborhood committee for permission to get pregnant
  – Priority in housing, etc if <= 1 child
  – >1 child: Fines up to 10x income, deny promotions
China’s Population Policies

- Consequences of One child policy:
  - Males are preferred, so selective abortion of females, neglect of girl children, infanticide
  - Sen (1992): 44-50 million women “missing” in China’s population
  - Total fertility now 1.9 births/woman
Case Study: India
India’s Population Policies

• 1949: First country to implement a family planning program (ineffective)
• 1975-77: Forced vasectomies
• Now: Voluntary reductions in fertility
  – Measurable effect of spread of cable TV
• “Missing” girls exacerbated by spread of sonogram technology