Emergence of aged economies in the 21st century: Use of long run population projections for economic forecasts

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Why make long-run economic and fiscal projects?

• Demography is one of the most important drivers of economic and fiscal change... but you won’t see that in short-run projections.

• Short-run focus leads to mistaken policy choices: too little invested in activities with long-run payoffs like education and preventative health measures.

• Long-run focus promotes small course-corrections in public policy which are politically more feasible to implement and unlikely to unfairly burden any particular generation.
Age-Based Long-run Economic and Fiscal Projections

- Need population by age -> UN World Population Projection, 2010 Revision.
- Need economic activity by age -> National Transfer Accounts project.

\[ E(t) = \text{Sum} \left( P(x,t) \times B(x,t) \right) \]
Part 1

The Demographic Story:

Dramatic changes in age structure
Bo Malmberg’s
4 Stages of the
Demographic Transition

- Child abundant societies (Ages 0-19)
- Young adult abundant (Ages 20-39)
- Middle-age adult abundant (Ages 40-59)
- Elderly abundant (Ages 60+).
1950: All societies are child abundant.

1980: The emergence of young adult abundant societies.
2010: The emergence of middle-age adult abundant societies.

2040: The emergence of elderly abundant societies.
2070: The global spread of elderly abundant societies.

2100: The global dominance of elderly abundant societies.
Part 2

The Economic Story:

Economic activity varies by age.  

Shifts in age structure change the economy.
The National Transfer Account (NTA) Project measures economic activity by age.
Examples of age-based economic projections
Example 1.

THE DEMOGRAPHIC DIVIDEND

All populations pass through a period in which the population is concentrated among working-age adults.

This period is particularly favorable to economic growth as the potential workforce grows more rapidly than the population dependent on it. The demographic dividend lasts for a few decades. At its peak, it can contribute in excess of 1% to the annual growth in GDP per capita.
1950-1980: Percent change in GDP/capita due to age structure change.

1980-2010: Percent change in GDP/capita due to age structure change.
2010-2040: Percent change in GDP/capita due to age structure change.

2040-2070: Percent change in GDP/capita due to age structure change.
2070-2100: Percent change in GDP/capita due to age structure change.
Example 2.
THE EMERGENCE OF AGED ECONOMIES

Definition
In an Aged Economy, consumption by the elderly exceeds consumption by children.
The National Transfer Account (NTA) Project measures economic activity by age.
1980: No Aged Economies in the World
2010: 23 Aged Economies
2040: 89 Aged Economies
2070: 155 Aged Economies
2100: 193 Aged Economies in the World
Example 3.
EDUCATION EXPENDITURES
Education Expenditures as share of GDP =

\[
\frac{\text{Expenditure}}{\text{School-age Person}} \times \frac{\text{School-age Population}}{\text{Working-age Population}}
\]

\[
\frac{\text{Expenditure}}{\text{School-age Person}} \times \frac{\text{School-age Population}}{\text{Working-age Person}} \times \frac{\text{GDP}}{\text{Working-age Person}}
\]
Education Expenditures as share of GDP =

DEMOGRAPHY \times POLICY
Educational Spending as Percent of GDP (around 2005)

Education benefit per youth (as share of GDP per worker)

School-age population as percent of working-age population
Educational Spending as Percent of GDP (around 2005)

- Japan: 5%
- Russian Federation
- Uganda

Y-axis: Education benefit per youth (as share of GDP per worker)
X-axis: School-age population as percent of working-age population
Declines in school-age population ->
Doubling or tripling investments per child.
Example 4.

HEALTH EXPENDITURES

We are still working on this... but 2 interesting facts...
Relative health spending per older person much higher in high income countries.
Both probabilistic and scenario-based population projections will be useful for long-run economic and fiscal forecasts.

• **Probabilistic projections:**
  – Measuring uncertainty about future based on variability observed in the past.
  – Overcoming bias.

• **Scenario-based projections:**
  – Huge increases in schooling in developing countries.
  – Chronic disease epidemic.
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