Demographic Dividends and Population Aging in Japan

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Total fertility rate (TFR) and ideal family size, Japan, 1947-2004

Is it too late?

Japanese Government was aware of it!
Stochastic forecast of TFR
Trend in life expectancy at birth in OECD countries, both sexes combined, 1960-2001
Change in average age of death among 50 oldest persons in Japan, by sex, 1950-2003

Forecast numbers of female centenarians

Number of centenarians (x10^3)

Year

Median forecasts
95% CI

UN
Government
The Japanese population has just become the oldest in the world and has started to decline!
Projected total population, 2000-2025
And massive age structural shifts!
Age structural change: 1950-2025

65+/15-64

0-14/15-64
Many ways to call gains derived from such age transformations
Demographic Bonus or Window of opportunity
(UNFPA, 1999; Birdsall and Singing, 2001; Merrick, 2002)

Demographic Gift
(Williamson, 2001)

Demographic Opportunity
(Fargues, 2001)

Demographic Golden Age
(Vallin, 2002)

Demographic Dividend
(United Nations, 2003)

Double Windows
(Chen and Lin, 2004)

First and Second Dividends
(Mason and Lee, 2005)
How big was Japan’s first demographic dividend?
Here comes

The most important graph in Japan!
Age specific profiles for labor income and consumption in Japan, 1999

Trend in first dividend in Japan, 1920-2025

Note: The first dividend is represented the support ratio which is defined as the difference between the annual growth rate of output per effective consumer and the annual growth rate of output per effective producer.
Trend in real GDP growth rate: Japan, 1948-2002

Note: Three-year moving average.

Another computation of demographic dividend, base on the Mason’s 2001 book
\[
\frac{\dot{y}}{y} - \frac{\dot{y}^l}{y^l} = l - n
\]

\[
l - n < 0
\]

\[
l - n > 0
\]
DEMOGRAPHIC BONUS!
DEMOGRAPHIC ONUS!
Difference is workers VS effective workers
Japan’s most important graph reflects a host of vital economic and social factors

Changing earnings profile

Hours worked

Women’s labor force participation

Sectoral allocation of the labor force
Child care and old age leave
Change in retirement age
Change in the remuneration system
Pension benefits
Enrollment rates in tertiary education
Parasite singles
Freeters and Neets
How was the first demographic dividend utilized during Japan’s postwar economic development?
Change in composition of the Japanese social security system
Longer life expectancy generated the second demographic dividend!
Change in the household savings rate in Japan, 1955-2003

Savings rate = Net saving ÷ (Disposable income + Changes in pension reserves in pension funds)

Growth of reserved funds for all public pension schemes combined, 1965-2002

Periodic revision of pension schemes

2004 revision:

DB to DC
Changing family support !
Percent of elderly aged 65 and older who coreside with children, Japan and other industrialized countries 1950-89
Change in the proportion of those 60+ living in three-generational households, selected countries, 1981-2001
<table>
<thead>
<tr>
<th>Age Group</th>
<th>Lower Limit</th>
<th>Upper Limit</th>
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</thead>
<tbody>
<tr>
<td>40-59</td>
<td>2.0</td>
<td>1.5</td>
</tr>
<tr>
<td>65-84</td>
<td>1.0</td>
<td>1.5</td>
</tr>
<tr>
<td></td>
<td>0.75</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>1.0</td>
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</table>
2000

40-59 Women

65-84

2.0-

1.5-2.0

1.0-1.5

0.75-1.0

0.5-0.75

0.5-
Trends in the family support ratio in selected countries, 1950-2050

Year

Ratio

Japan
Bulgaria
Belarus
Czech Republic
Hungary
Republic of Moldova
Poland
Romania
Russian Federation
Slovakia
Ukraine
United Kingdom
Channel Islands
Albania
Bosnia and Herzegovina
Croatia
Greece
Italy
Malta
Portugal
Serbia and Montenegro
Austria
Belgium
Switzerland
Australia
Austria
France
Germany
Greece
Lithuania
Luxembourg
Netherlands
United Kingdom
United States of America
Mexico

Trends in average days of hospitalization in OECD countries, 1960-2003

Change in the place of deaths among the elderly in Japan, 1965-2003

Sudden Value Shift
Trends in norms and expectations about care for the elderly: Japan, 1950-2004

"Good Custom" or "Natural Duty"

Expect to Depend on Children

Proportion of high school students willing to take care of parents under any circumstances, when their parents get older and need some help in their daily lives due to poor health, Japan, United States and China, 2005

Source: Japan Youth Research Institute, High School Students' Lifestyle Survey, 2005.
Declining Quality of Young Human Capital
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>1</td>
<td>Japan</td>
<td>557</td>
<td>Hong Kong-China</td>
<td>550</td>
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<tr>
<td>2</td>
<td>Korea</td>
<td>547</td>
<td>Finland</td>
<td>544</td>
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<td>3</td>
<td>New Zealand</td>
<td>537</td>
<td>Korea</td>
<td>542</td>
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<td>Finland</td>
<td>536</td>
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<td>5</td>
<td>Australia</td>
<td>533</td>
<td>Liechtenstein</td>
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<td>6</td>
<td>Canada</td>
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<td>Japan</td>
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<td>Switzerland</td>
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<td>Canada</td>
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<td>Belgium</td>
<td>520</td>
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<td>9</td>
<td>France</td>
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<td>Macao-China</td>
<td>527</td>
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<td>12</td>
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<td>Iceland</td>
<td>515</td>
</tr>
<tr>
<td>15</td>
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<td>503</td>
<td>Denmark</td>
<td>514</td>
</tr>
<tr>
<td>16</td>
<td>Norway</td>
<td>499</td>
<td>France</td>
<td>511</td>
</tr>
<tr>
<td>17</td>
<td>Czech Republic</td>
<td>498</td>
<td>Sweden</td>
<td>509</td>
</tr>
<tr>
<td>18</td>
<td>United States</td>
<td>493</td>
<td>Austria</td>
<td>506</td>
</tr>
<tr>
<td>19</td>
<td>Germany</td>
<td>490</td>
<td>Germany</td>
<td>503</td>
</tr>
<tr>
<td>20</td>
<td>Hungary</td>
<td>488</td>
<td>Ireland</td>
<td>503</td>
</tr>
</tbody>
</table>

Average hours spent for homework by 8th graders in selected countries
Average hours spent for watching TV by 8th graders in selected countries
How can Japan cope with its rapid population aging?
Policy options available to Japan:

(1) raising fertility and facilitating higher labor force participation of women,
(2) better utilization of aged workers and extension of the retirement age,
(3) labor-saving technology and more efficient use of young workers,
(4) international migration,
(5) direct foreign investment,
(6) social security reform and limits to family support, and
(7) effective utilization of the demographic dividends.
Option 1
Retire later
Are they healthy enough?
Data

- Nihon University Japanese Longitudinal Study of Aging
  - wave 1 in 1999 and wave 2 in 2001
  - nationally representative sample of non-institutionalized population aged 65 and over in 1999
  - face to face interview survey using structured questionnaire
Definition of Health State

Healthy/Active

- no difficulty performing 7 ADLs and 7 IADLs

Unhealthy/Inactive

- unable to perform at least 1 ADL/IADL
  - ADL: bathing, dressing, eating, moving from bed to a chair and vice versa, walking in the home, going outside, and toileting
  - IADL: preparing own meals, shopping for personal items, managing money, making a phone call, doing light house work, doing out alone by using public transportation, and taking medication
Estimating Ingredients

- **Prevalence rates**
  - average of prevalence rates in 1999 and 2001

- **Transition probabilities**
  - IMaCh

[Diagram showing transitions between Active, Inactive, and Dead states]
Estimated annual transition probabilities in Japan

Projected elderly population by health status, Japan 2000-2025

(based on health status transition rates)
Mandatory retirement age is another serious constraint
Trends in reasons for quitting job for persons aged 65 and over: Japan, 1950-2004

Change in retirement age at large-scale businesses and life expectancies at age 20 for men and women: Japan, 1965-2002
Labor force participation rates for men and women aged 65 and over in selected countries, 2000

Two simulations

(1) All healthy persons work

(2) Retirement age from 60 to 65
Simulation exercises for alternative labor force participation among the elderly in Japan, 2005-2025

<table>
<thead>
<tr>
<th>NUPRI Model projection (Base run)</th>
<th>Simulation 1</th>
<th>Simulation 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Potential GDP (Trillion yen)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2005</td>
<td>561.2</td>
<td>653.8 (16.5%)</td>
</tr>
<tr>
<td>2015</td>
<td>600.6</td>
<td>747.2 (24.4%)</td>
</tr>
<tr>
<td>2025</td>
<td>619.1</td>
<td>791.3 (27.8%)</td>
</tr>
<tr>
<td><strong>Potential GDP per capita (Million yen)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2005</td>
<td>4.4</td>
<td>5.1 (16.5%)</td>
</tr>
<tr>
<td>2015</td>
<td>4.8</td>
<td>5.9 (23.9%)</td>
</tr>
<tr>
<td>2025</td>
<td>5.1</td>
<td>6.5 (26.7%)</td>
</tr>
<tr>
<td><strong>Labor force (1000 persons)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2005</td>
<td>66958</td>
<td>86803 (29.6%)</td>
</tr>
<tr>
<td>2015</td>
<td>62827</td>
<td>89107 (41.8%)</td>
</tr>
<tr>
<td>2025</td>
<td>59172</td>
<td>87880 (48.5%)</td>
</tr>
</tbody>
</table>

Simulation 1: We assume that all healthy persons aged 65 and over will participate with labor force throughout the projection.

Simulation 2: We assume (1) that the labor force participation rates of those aged 60-64 are raised to those of 55 to 59 and (2) that the participation rates of those aged 65 and over are raised by 10 percentage points above the current rates.
Earnings profile changes and demographic dividends will be also changing.
Option 2

Effective use of accumulated wealth owned by the elderly
Financial assets
Real assets
Public pension wealth
Evaluated in 1999
Public pension wealth

Discount rate 1.25%  
(average interest of long-term government bonds)
Age profile of assets and pension wealth in Japan, 1999

![Graph showing the age profile of assets and pension wealth in Japan, 1999. The graph includes financial assets, real assets, and the present value of future pension benefits.](image)
Accumulated wealth for those aged 60-90

1637 trillion yen

US $16.37 trillion
Accumulated wealth can be invested abroad
Caution

OECD’s warning!

71% of Japanese adults have no knowledge about investment in equities and bonds
Caution

OECD’s warning!

57% of Japanese adults have **no** knowledge of financial products in general.
Financial education is urgently needed
Future Japanese elderly persons will be wealthy!
Future Japanese elderly persons will be not only wealthy but healthy!
Future Japanese elderly persons will be wealthier, healthier and cleverer!
Future Japanese elderly persons may save Japan!

- Even fertility may recover!!!
Similar studies in Japan

1990 study done by Takayama and his associates
Takayama’s Study, Age profile of assets and pension wealth, Japan 1984

![Graph showing the age profile of assets and pension wealth in Japan in 1984. The graph displays the accumulation of financial assets, real assets, and pension wealth across different age groups.]
Age profile of assets and pension wealth, based on Takayama’s approach, Japan 1999 (adjusted for 1984 prices)
Age profile of assets and pension wealth, Japan 1984 and 1999

1984

1999 (adjusted for 1984 prices)
First Familial Transfer in the History of Mankind
Australopithecus aphaeresis