Look before you sleep
Lesson from Japan

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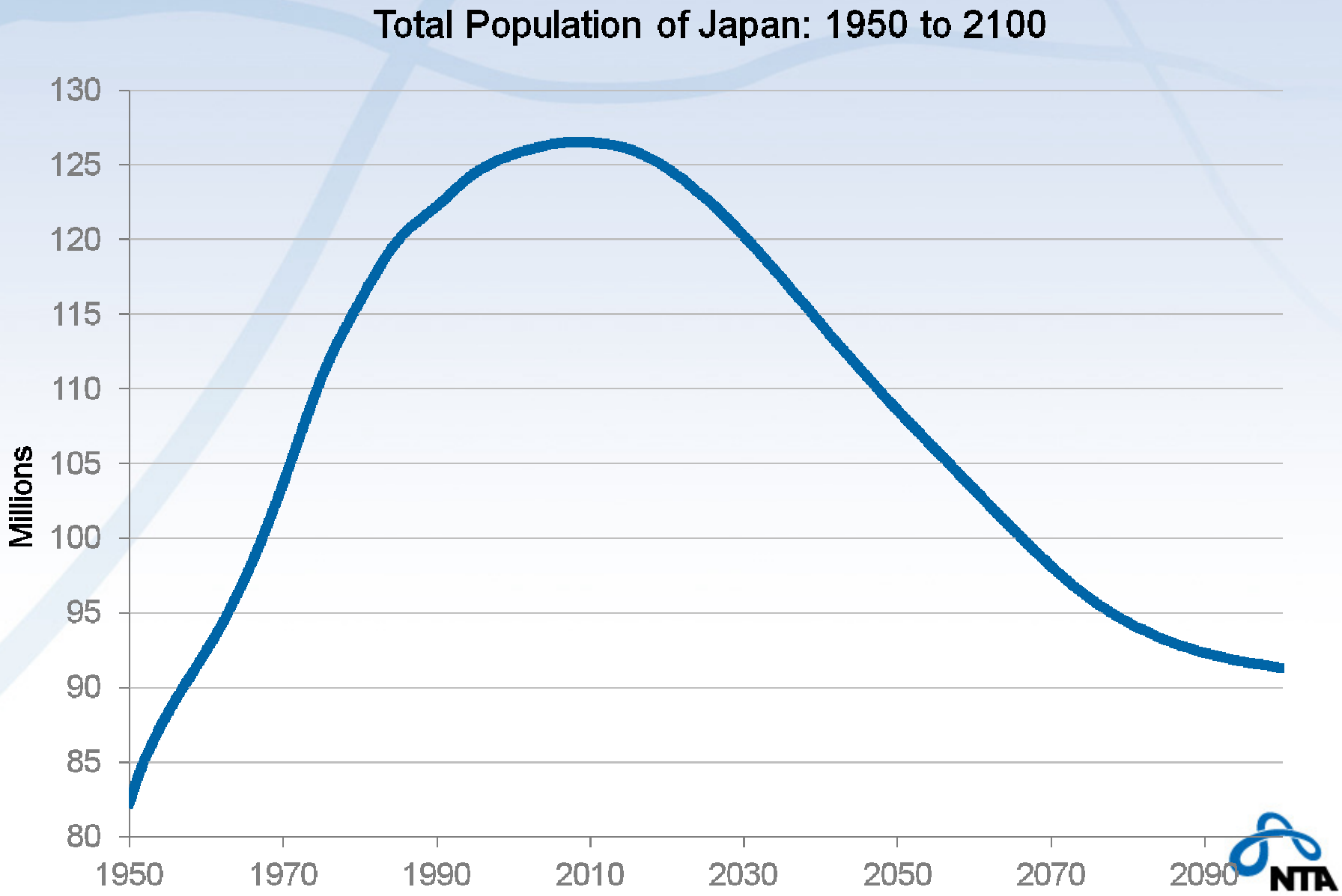
United Nations Economic Commission for Latin America and the Caribbean

Part 1.

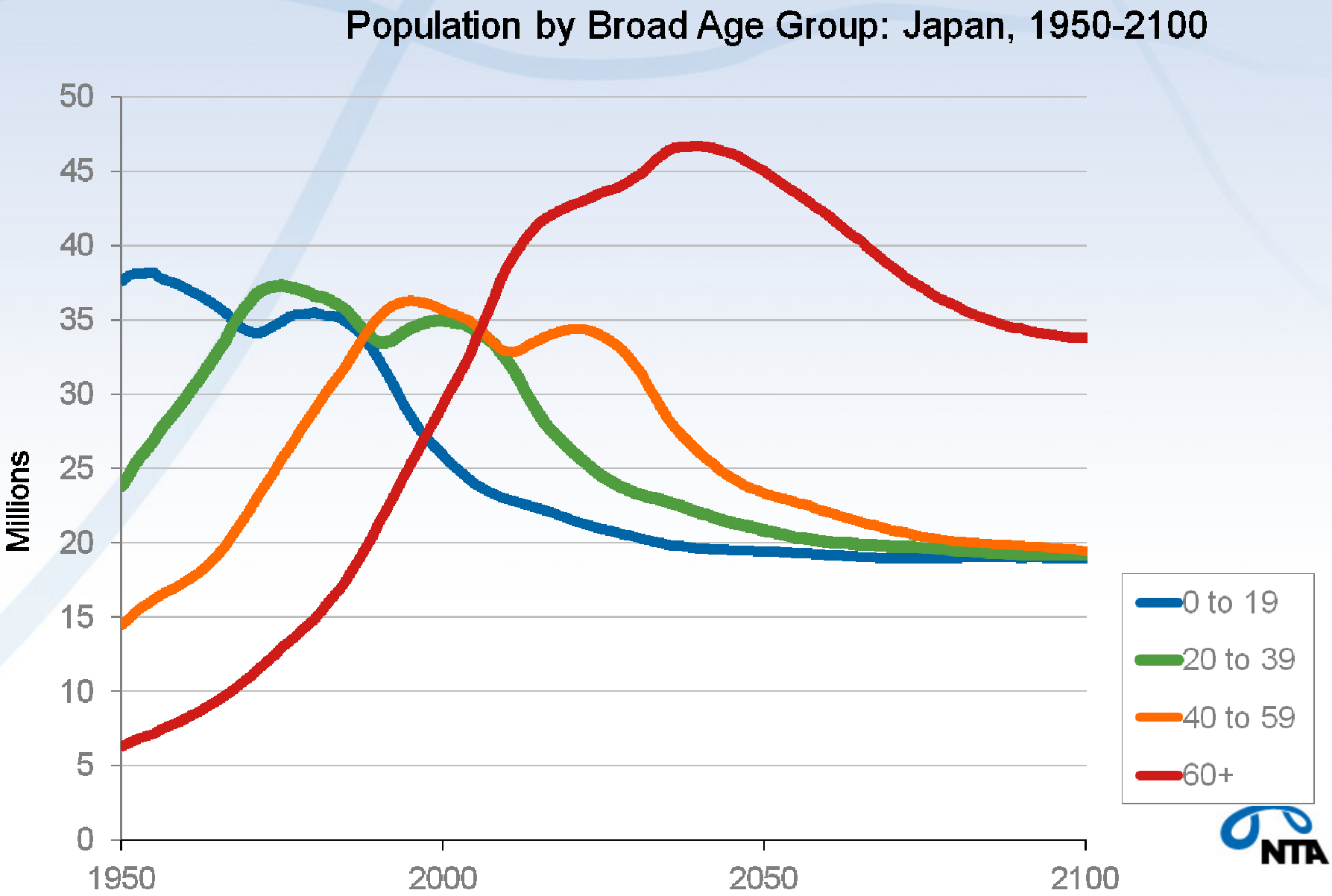
Population Forecasts are based on latest projections from the United Nations.

- The UN forecast differs from national forecast in that it assumes a higher level of fertility in the very long run.

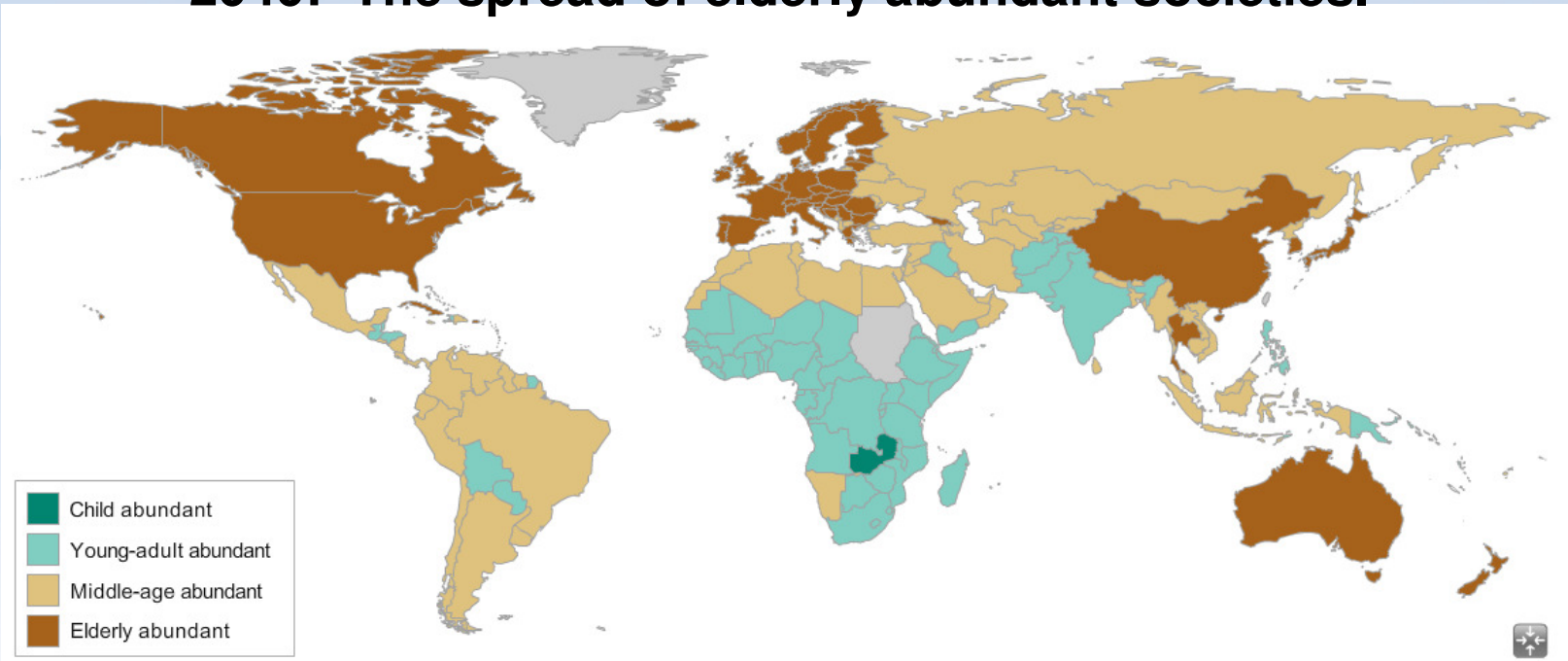
Declining population this century, eventually stabilizing at about 90 million.



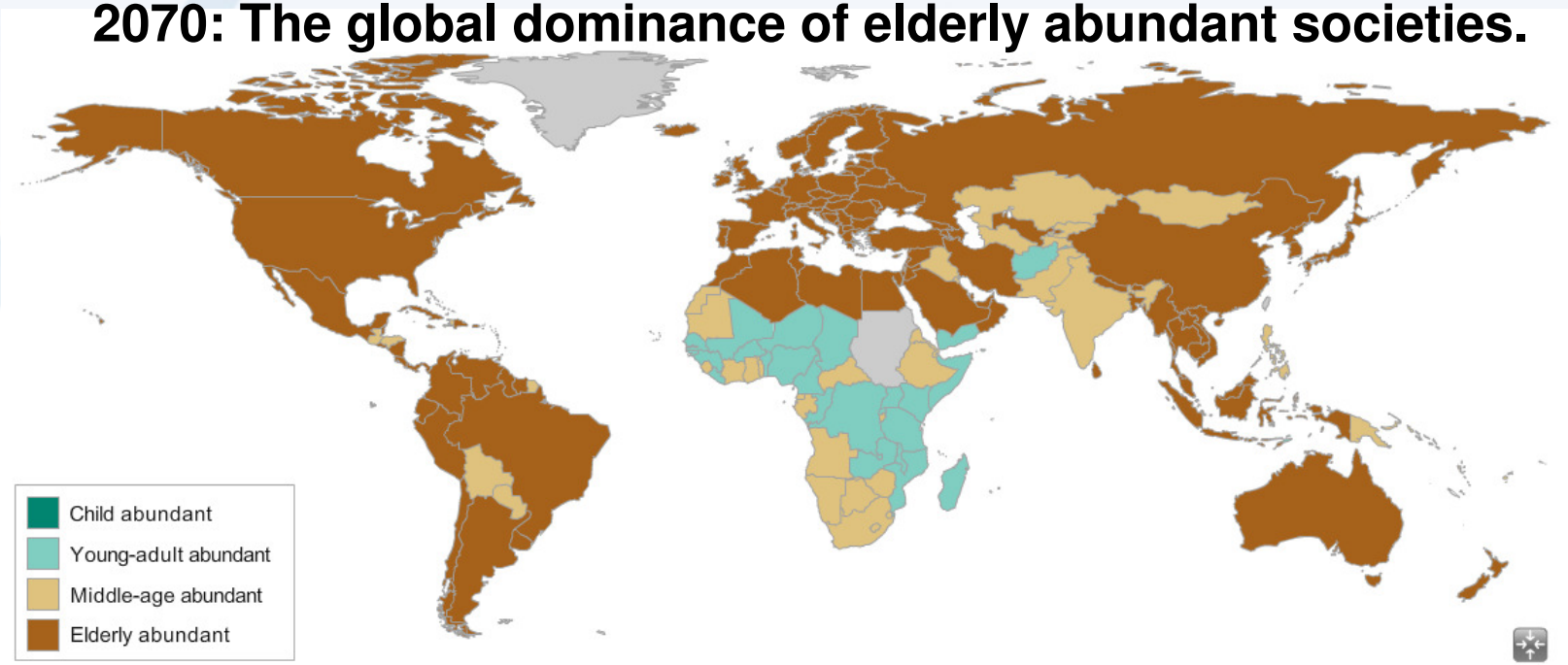
Japan became the world's first elderly abundant society in 2006.



2040: The spread of elderly abundant societies.



2070: The global dominance of elderly abundant societies.



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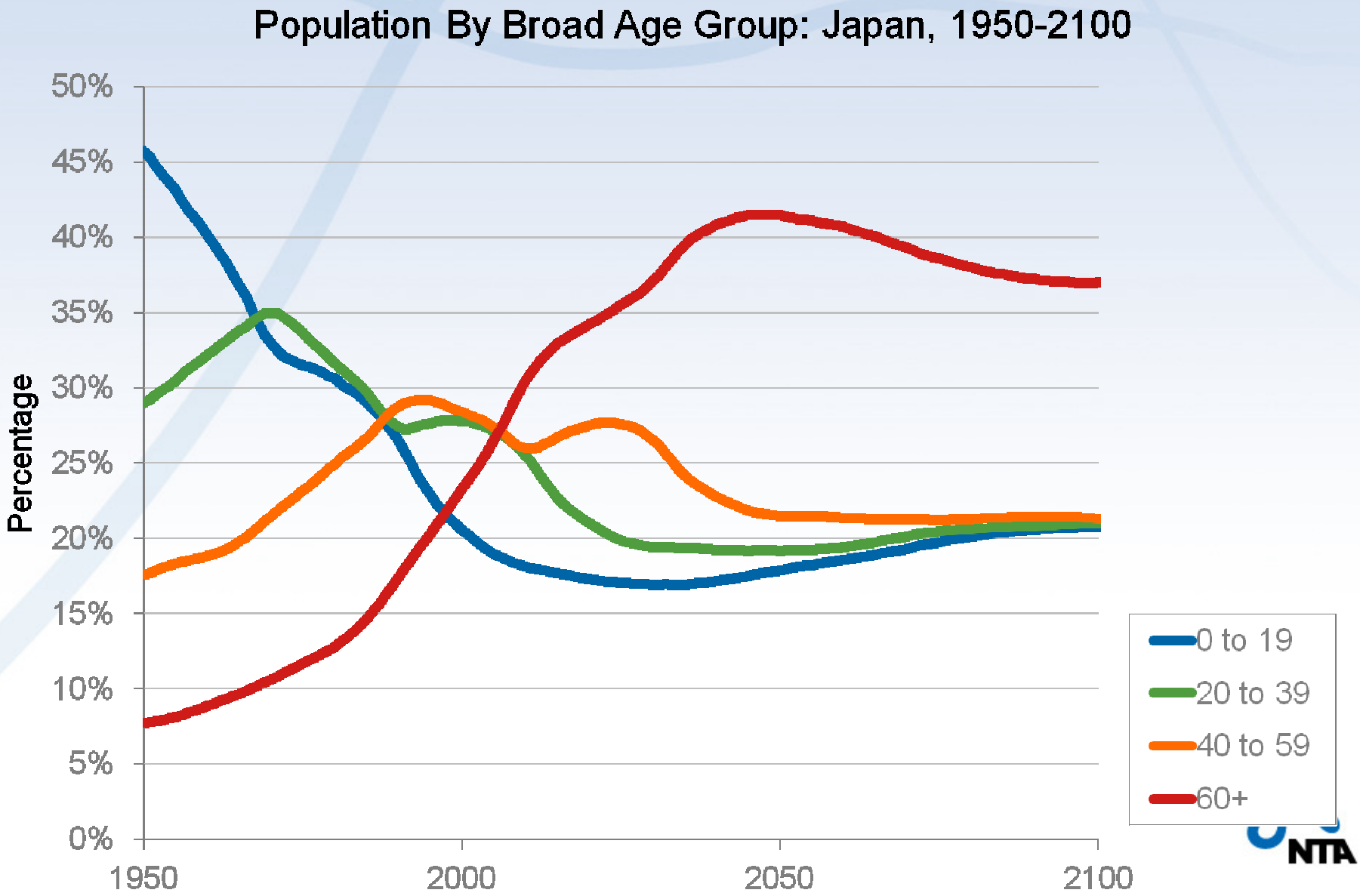
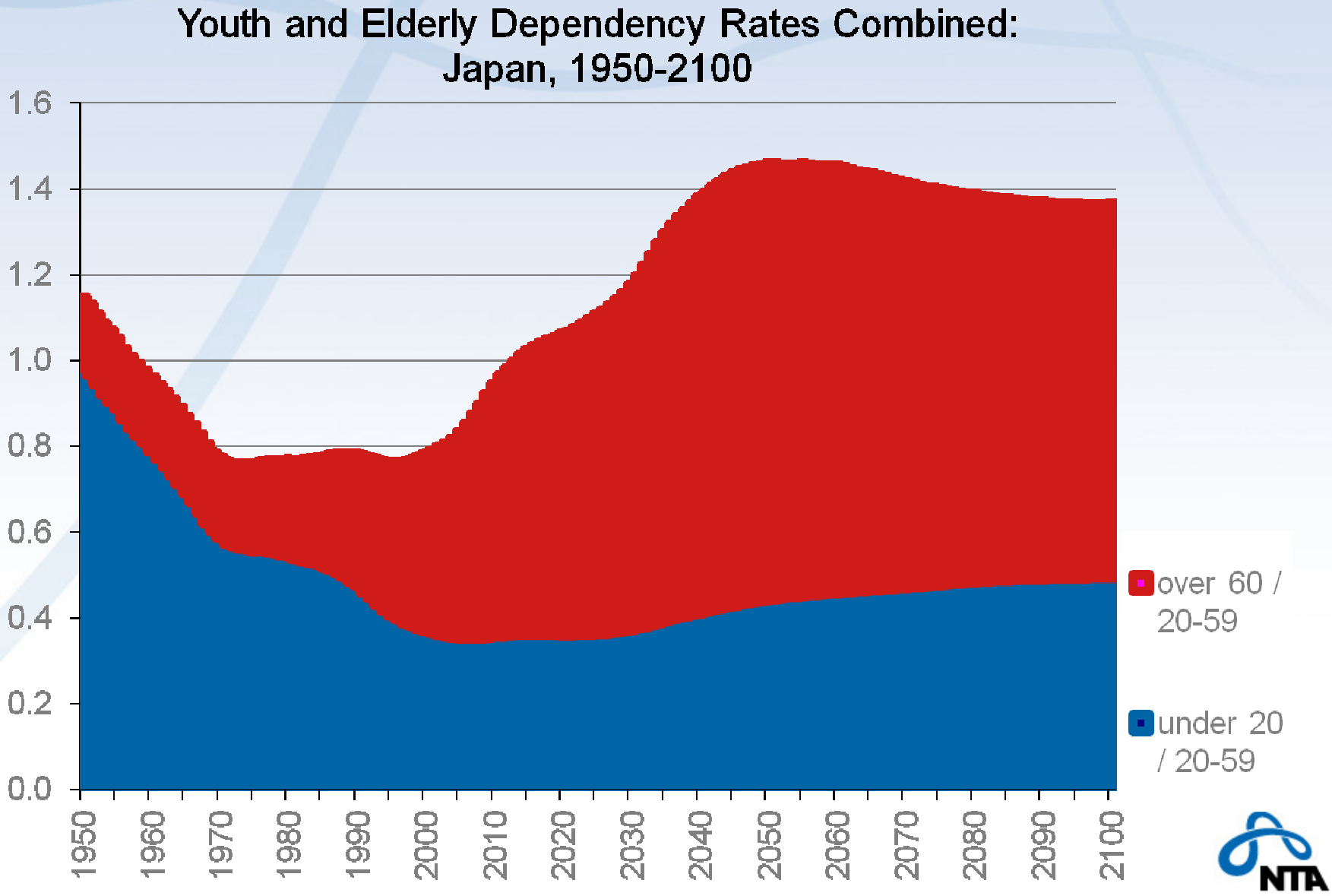
In 1960, youth represented 40% of Japan's population. By 2035, elderly will represent 40%.



After 3 decades of virtually no change, demographic dependency ratio will increase sharply.

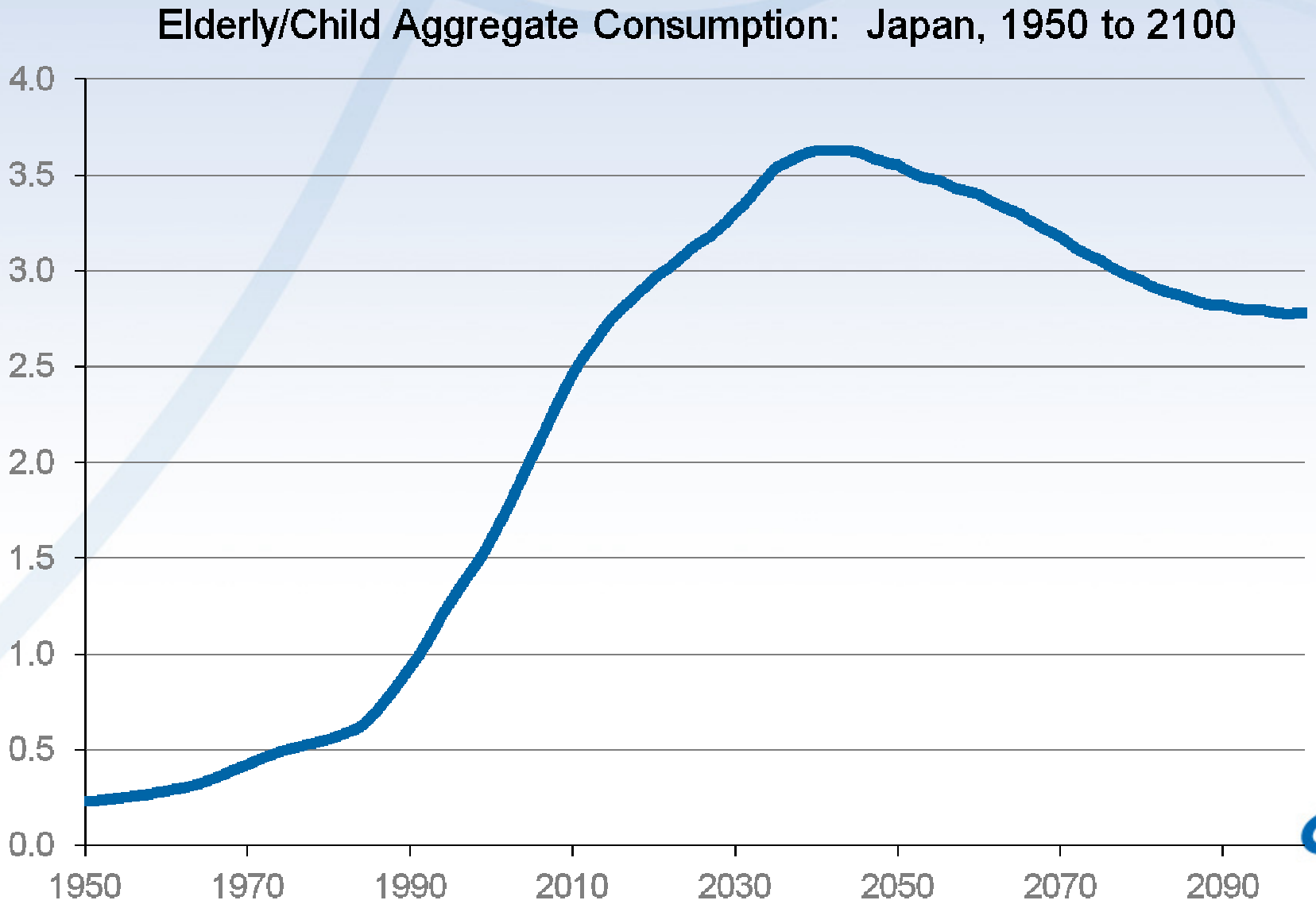


Part 2.

Forecasts based on Japan NTA data from 2004

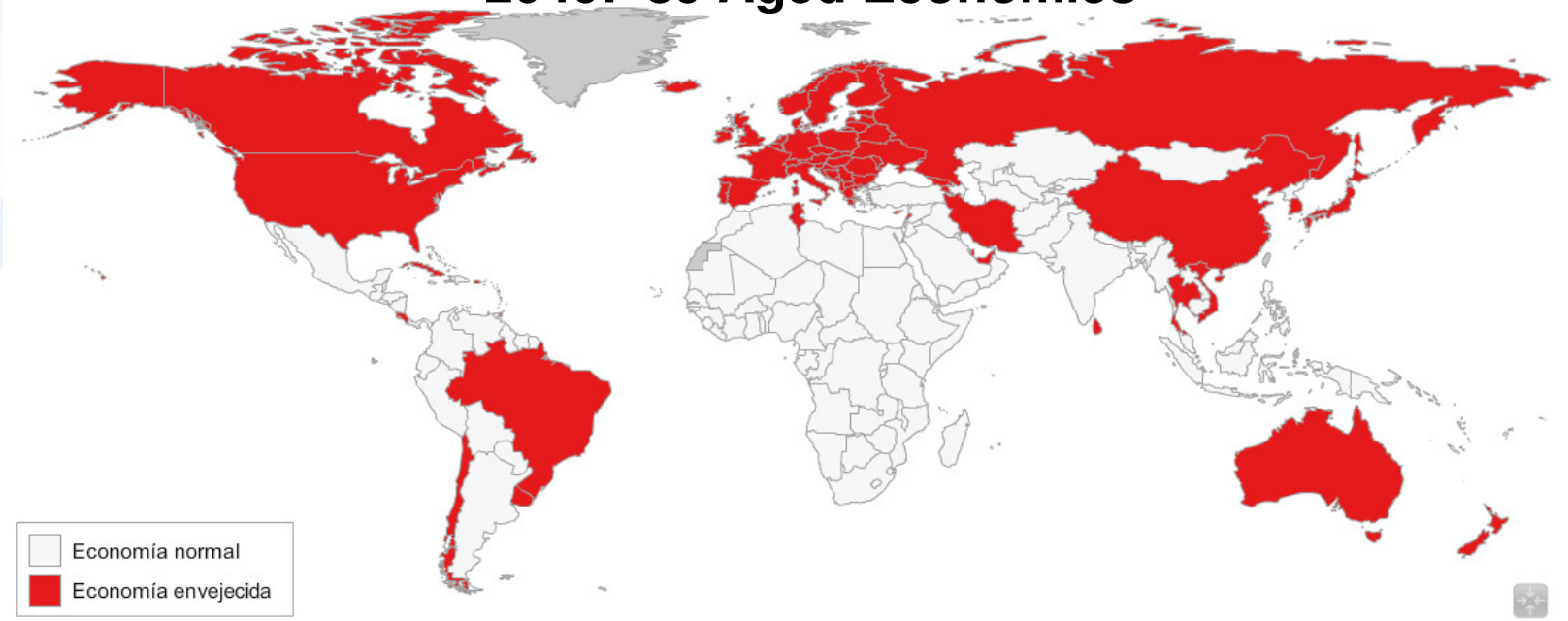
- Aggregate consumption by elderly versus children.
- Economic Support Ratios
- Family and Fiscal Support Ratios

Japan became the world's first Aged Economy in 1992, when consumption by elderly exceeded that by children.



2010: 23 Aged Economies in the World

2040: 89 Aged Economies



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Market trend

Japan First Dividend (Support Ratio: Producers / Consumers)

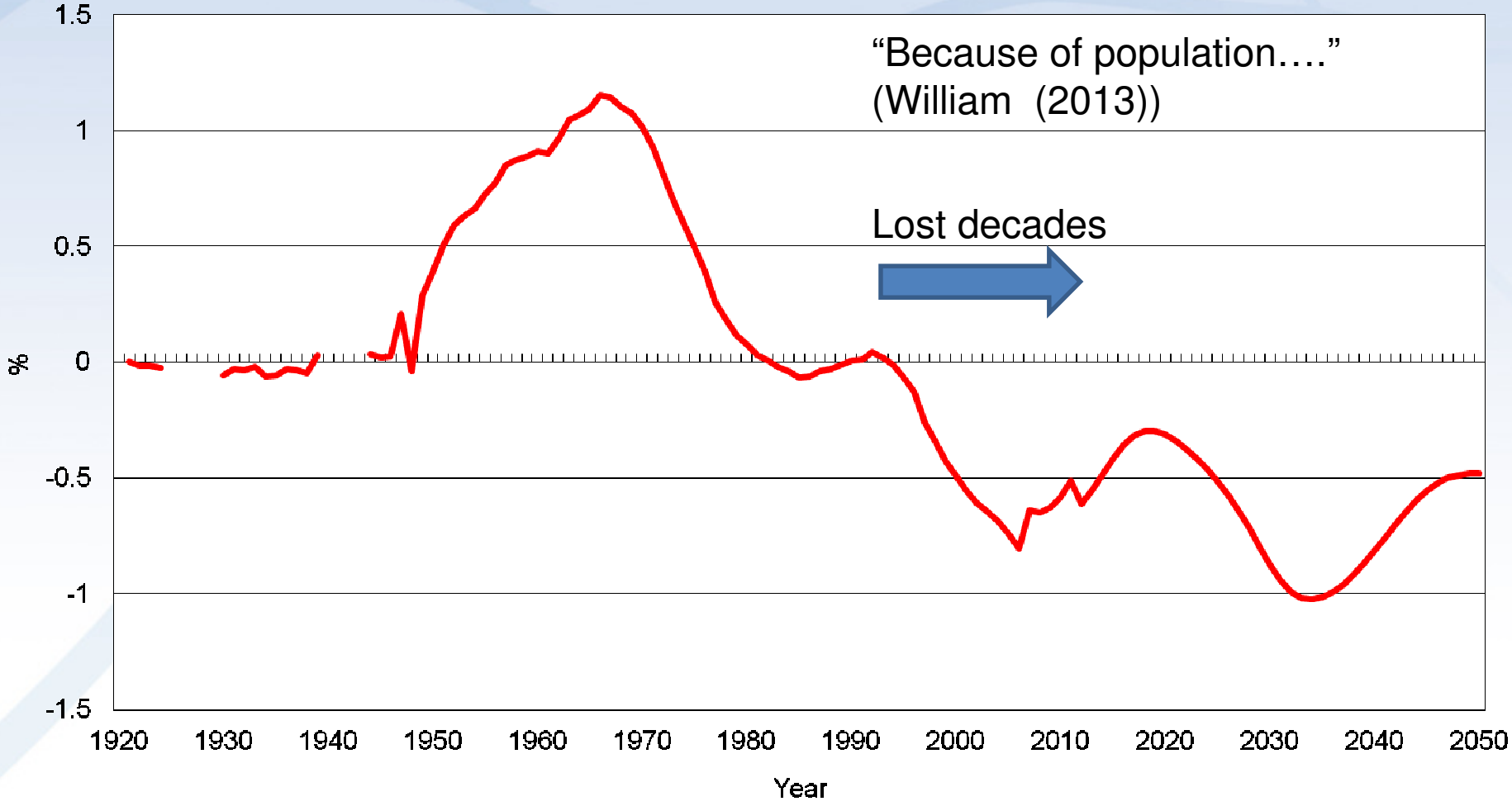
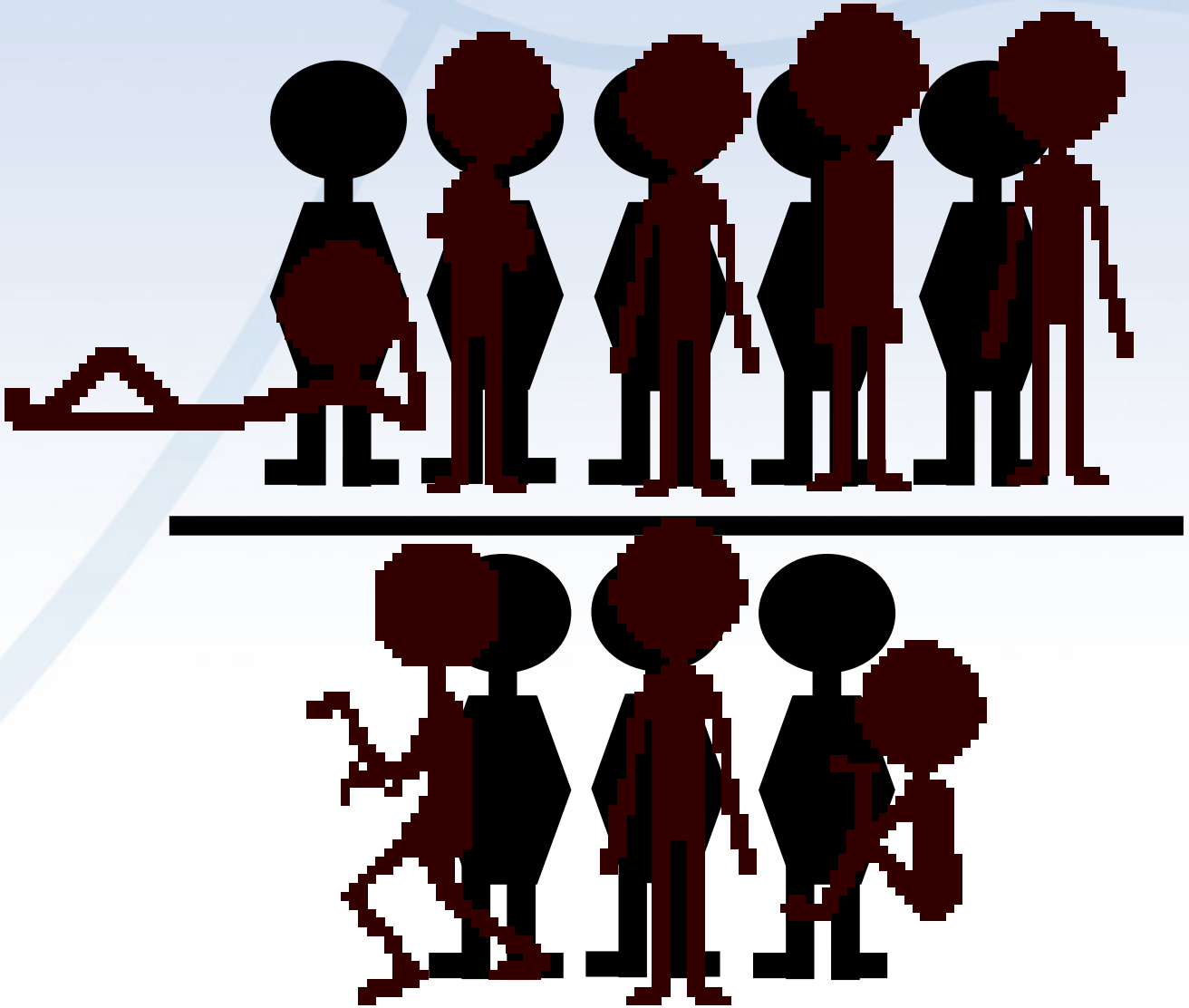
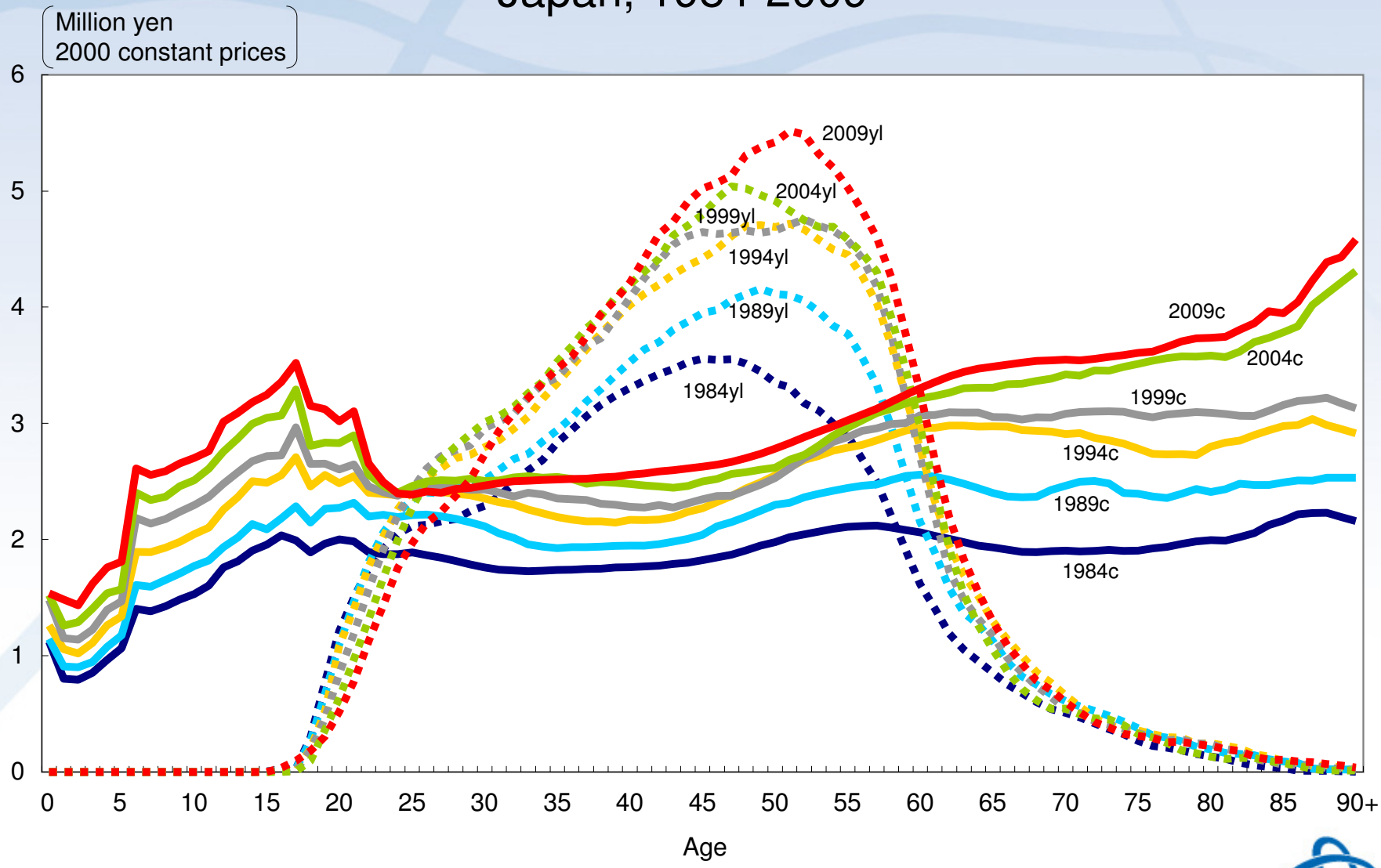


Image of NTA Support Ratio

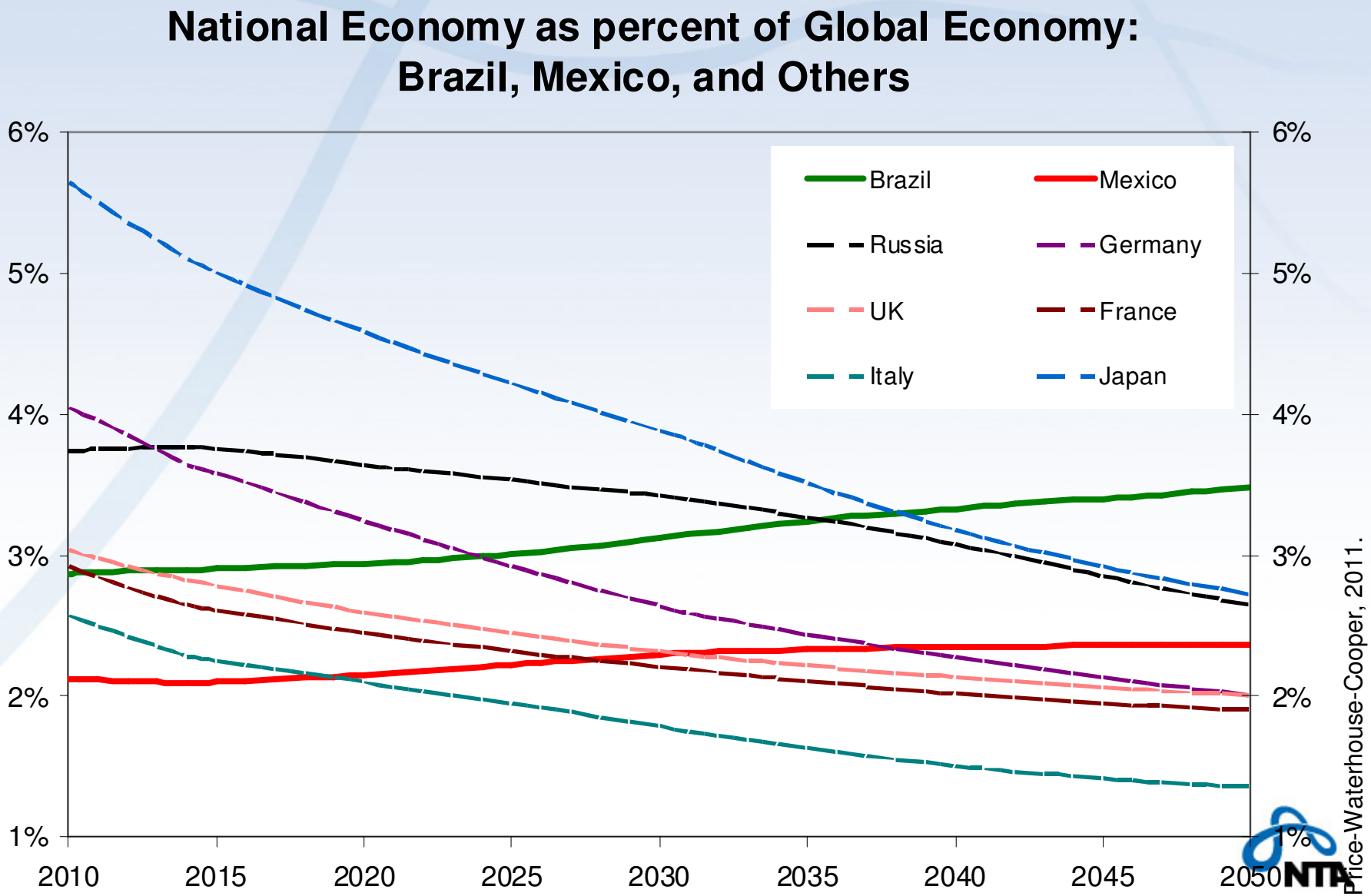


Per capita age specific profiles of consumption and labor income Japan, 1984-2009

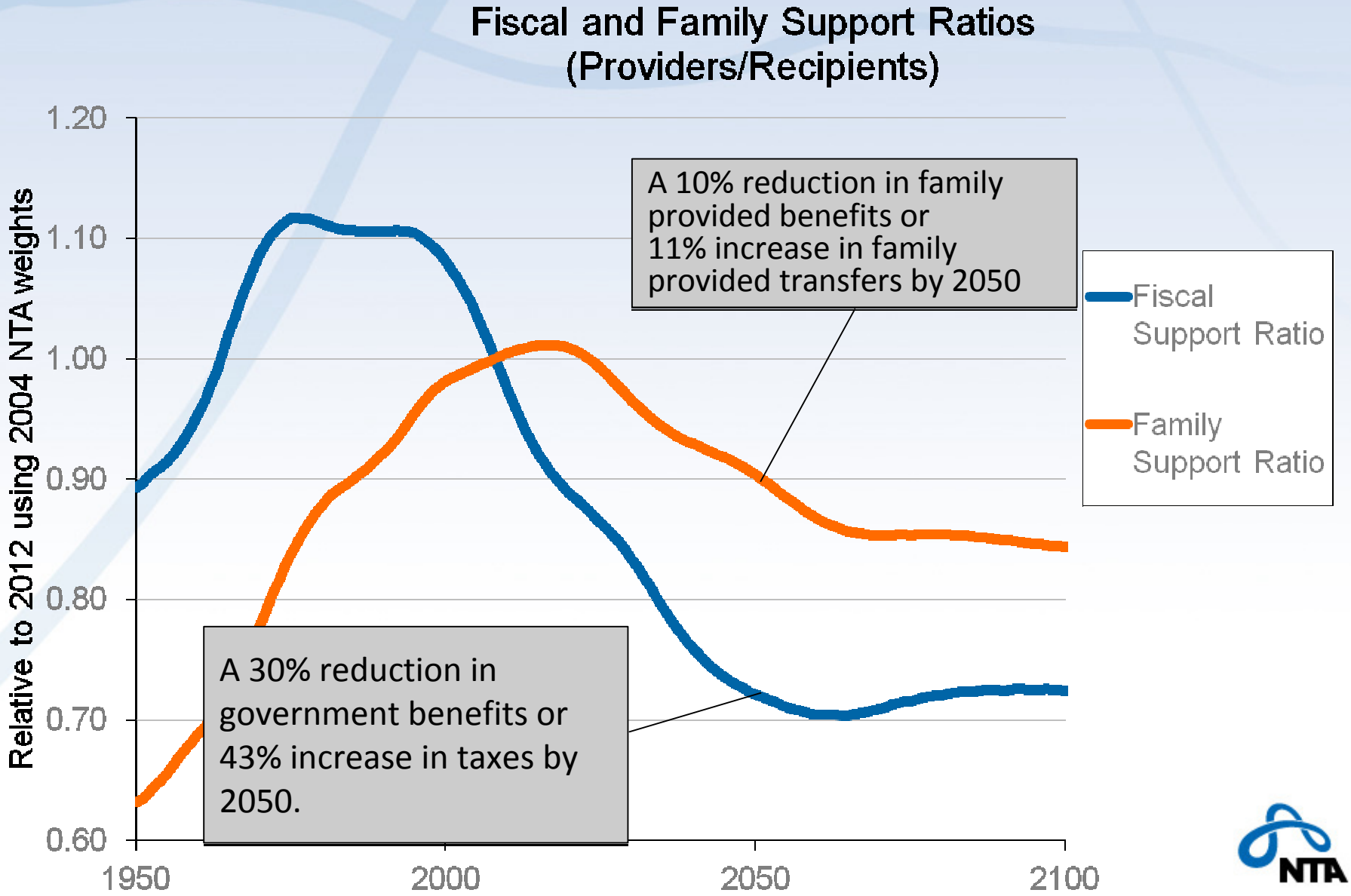


Note: “c” denotes consumption, and “yl” denotes labor income.

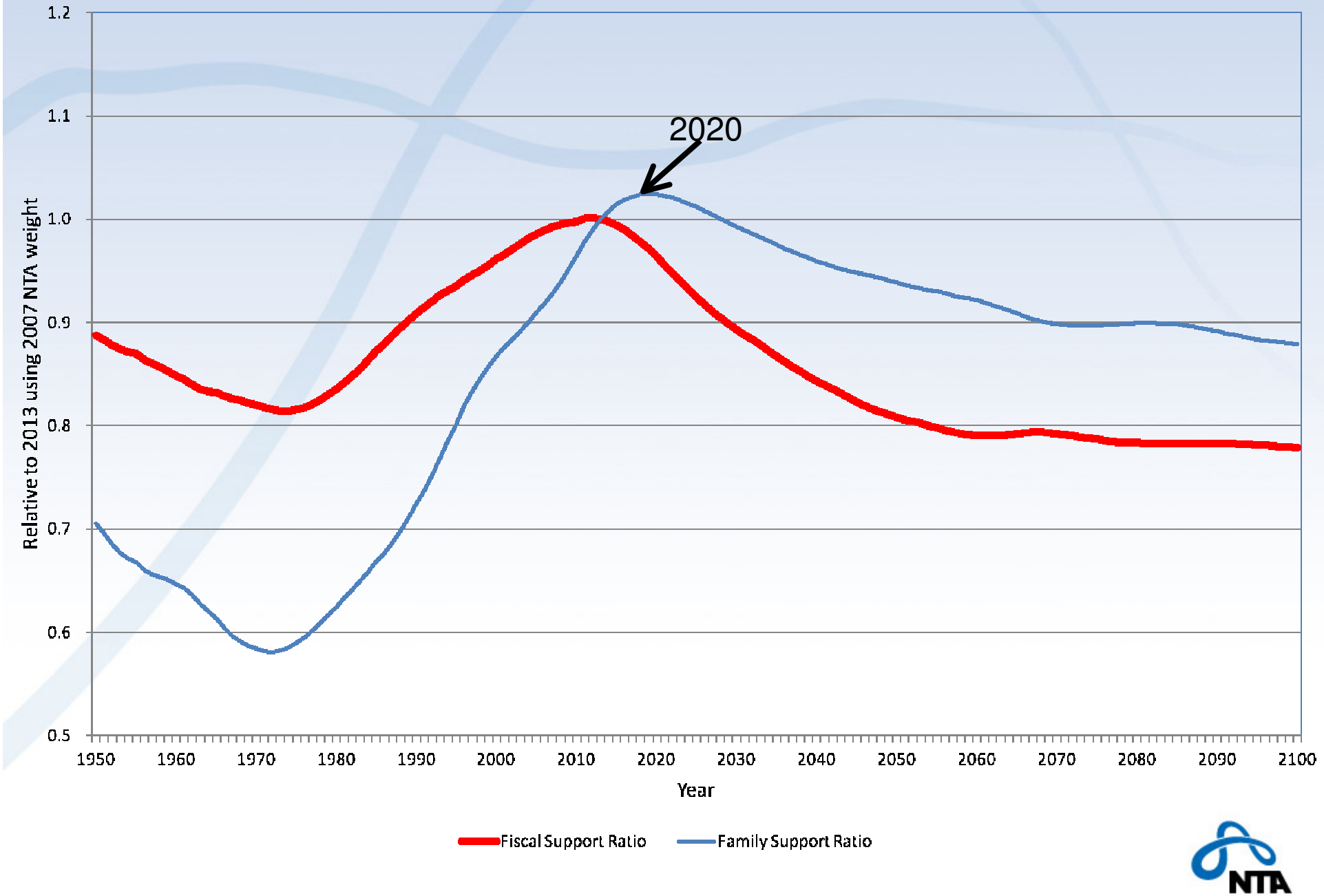
Based largely on demographic trends, the economy of Japan is likely to continue to decline as share of world economy. Surpassed by Brazil within 30 years.



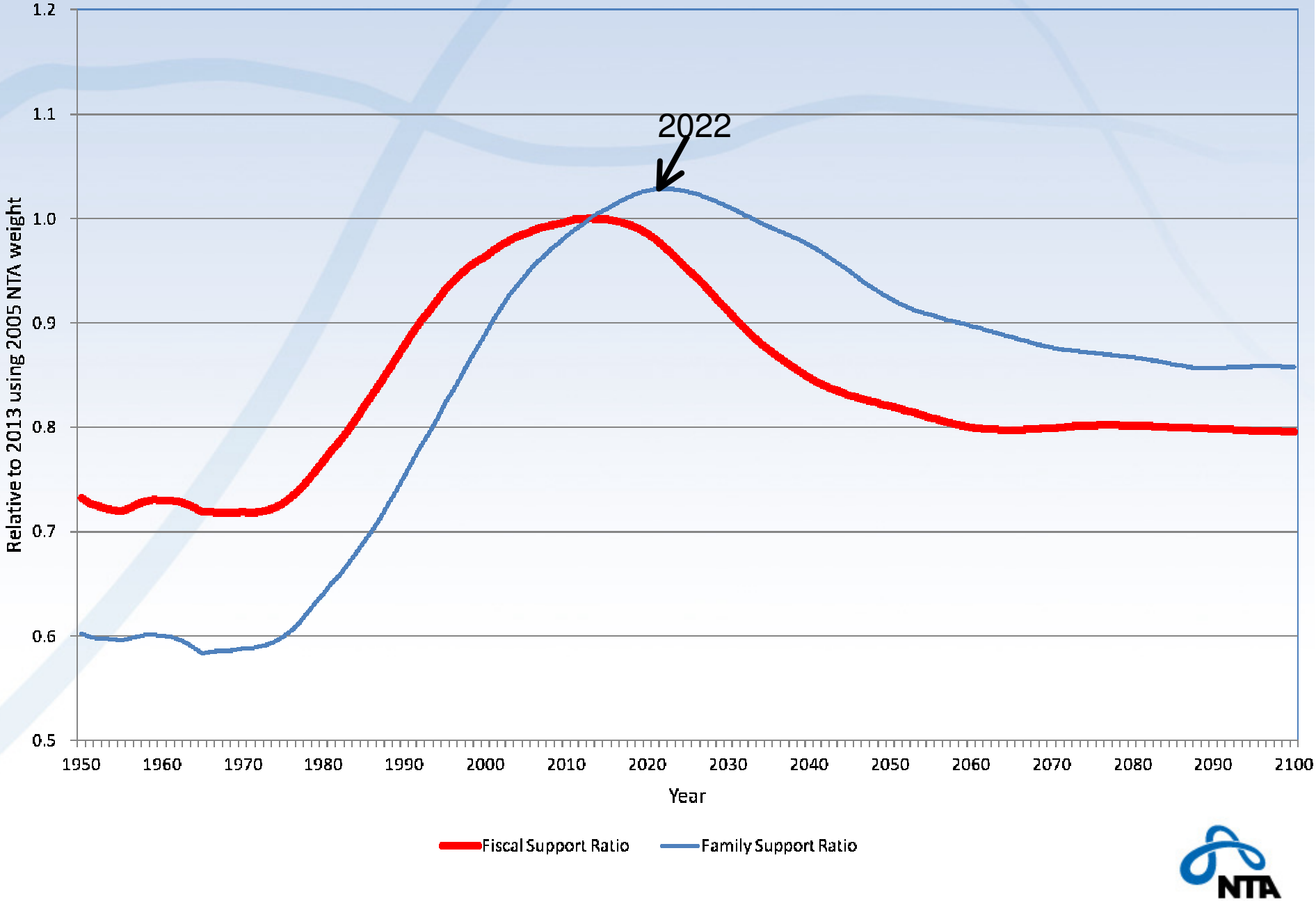
Japan to face double crisis:
Decline in both fiscal and family support ratios.



Fiscal and Family Support Ratios (Providers/Recipients) in China



Fiscal and Family Support Ratios (Providers/Recipients) in Korea



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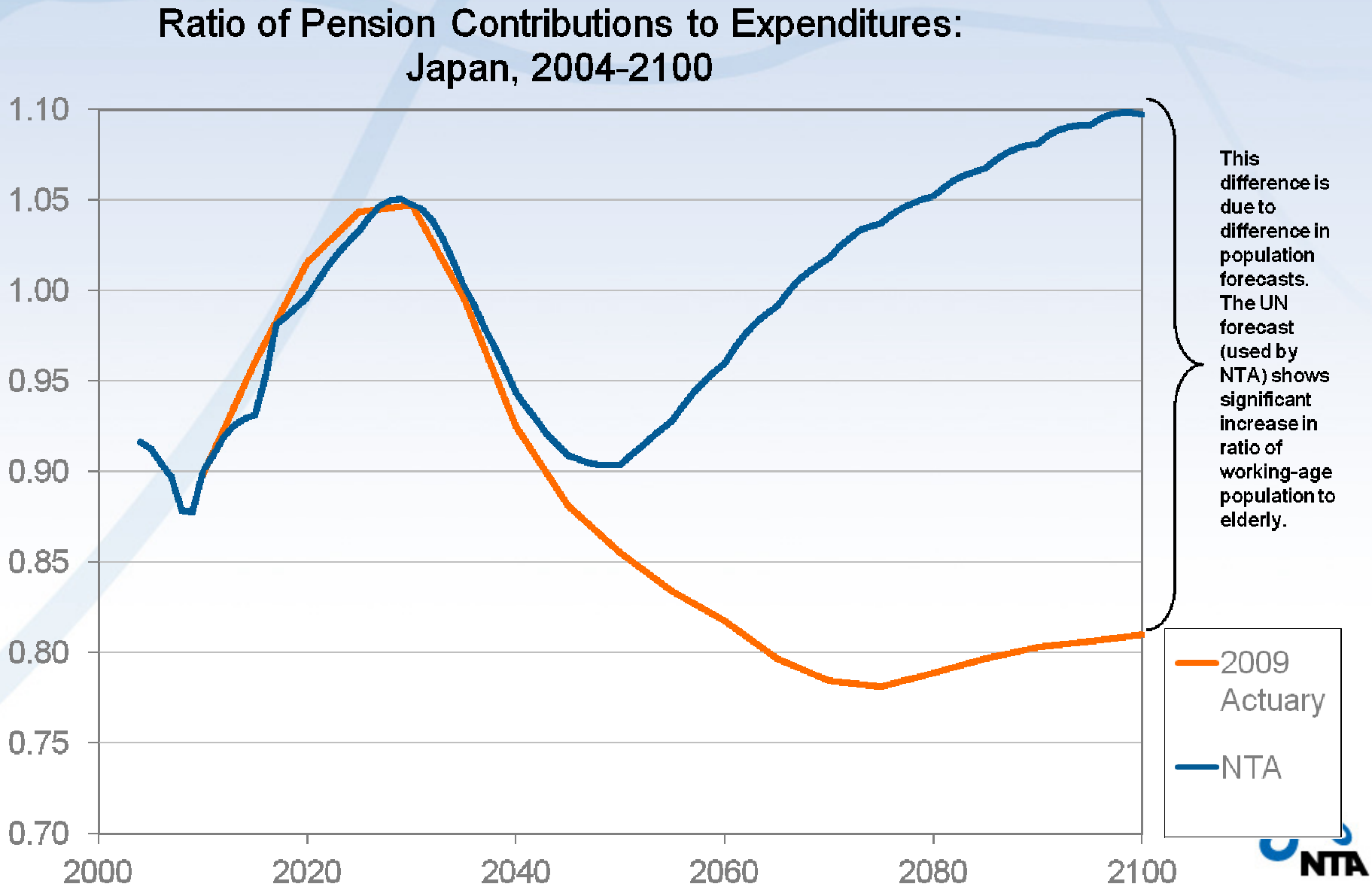
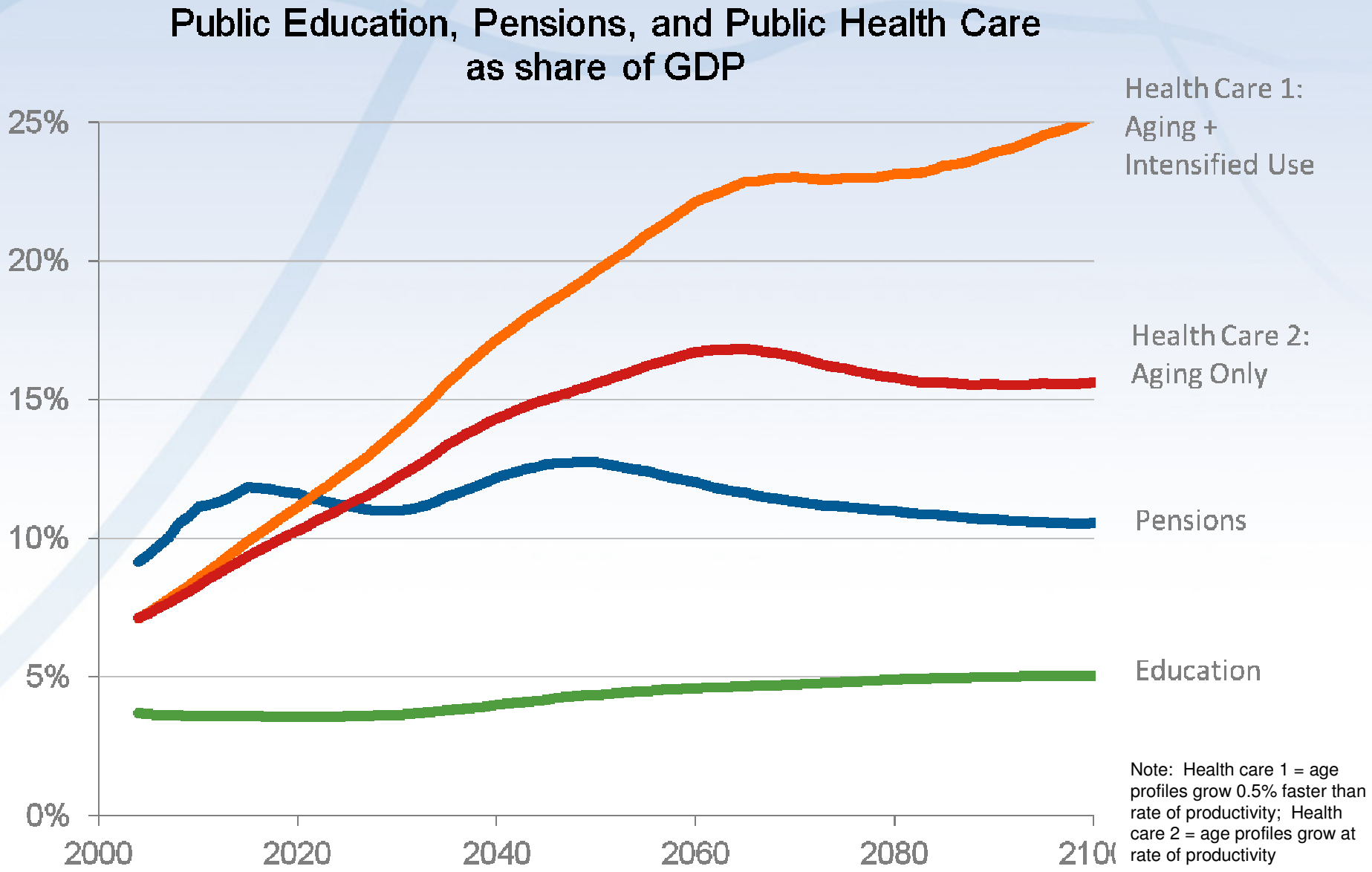
Part 3.
Fiscal forecasts based on Japan NTA data from 2004

- Pensions and impact of reforms.
- Fiscal impact of health care to exceed that of pensions.

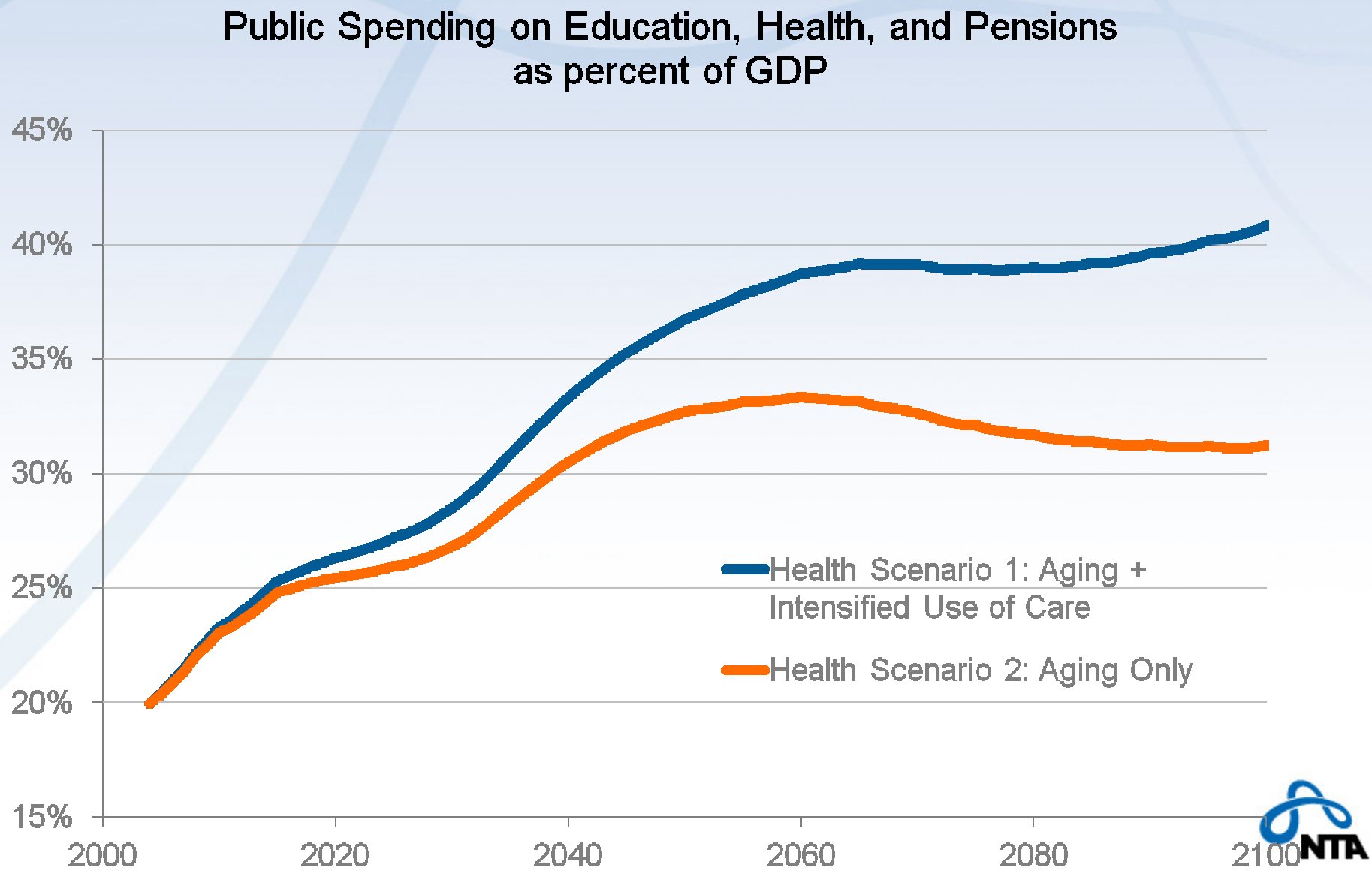
Our simple NTA pension projection model closely matches official projections over the short run.



Health care expenditures: great uncertainty about speed of increase, but will become main driver of government expenditures.



Public transfers > 1/3 of economy by 2050



Thank you!

Not NTA

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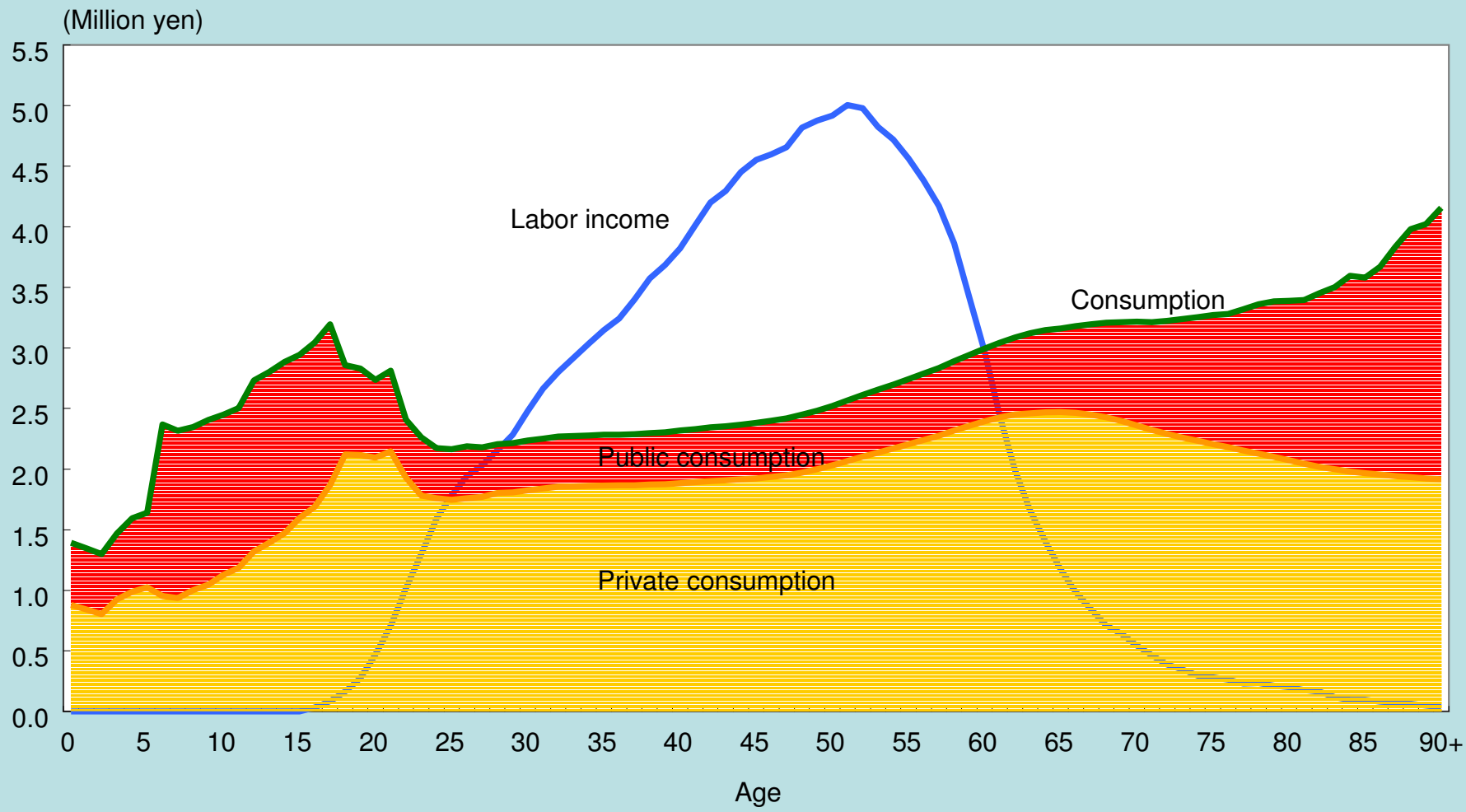
Japan's Most Important Graph

Per capita lifecycle: Japan (2009)



Japan's Most Important Graph

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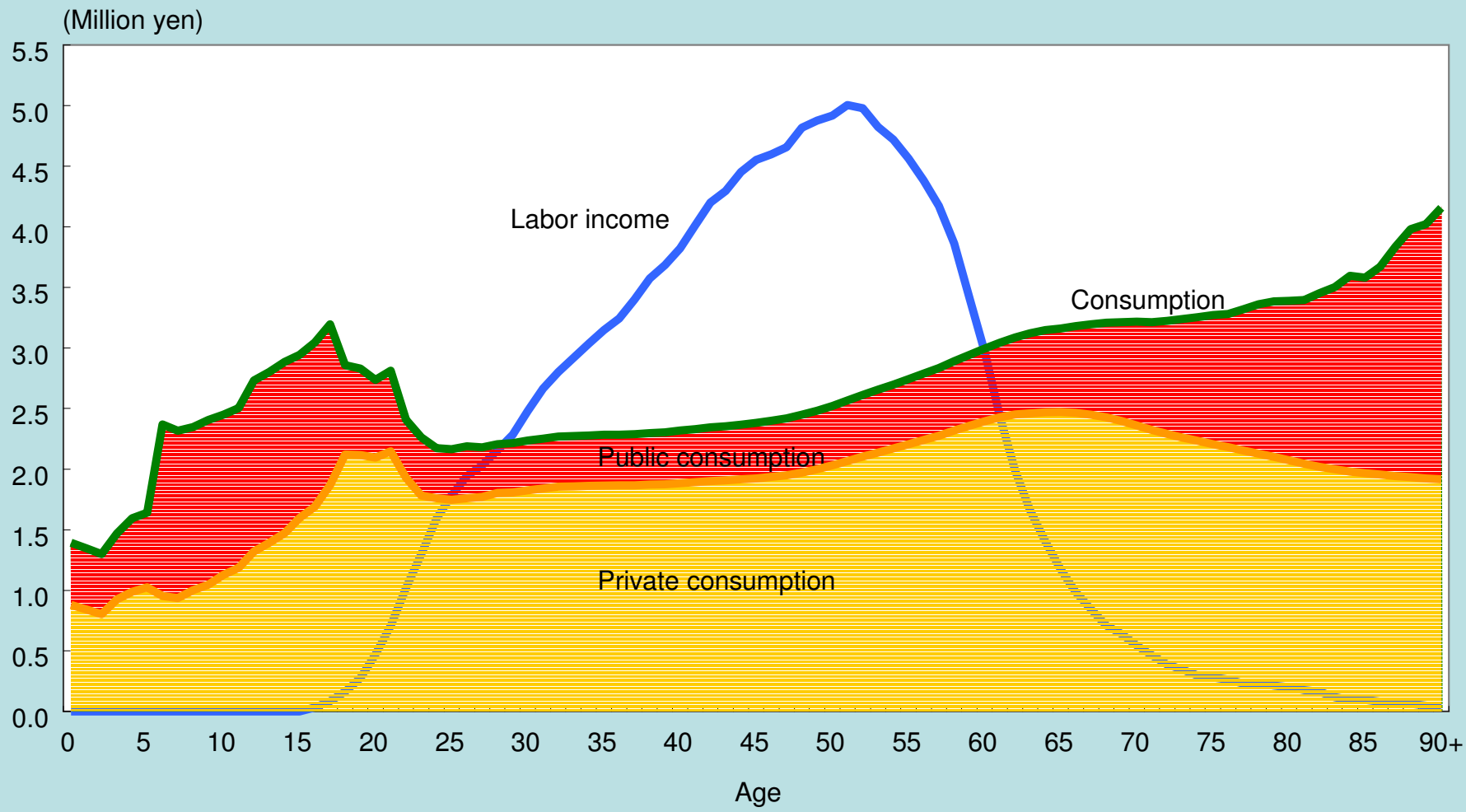
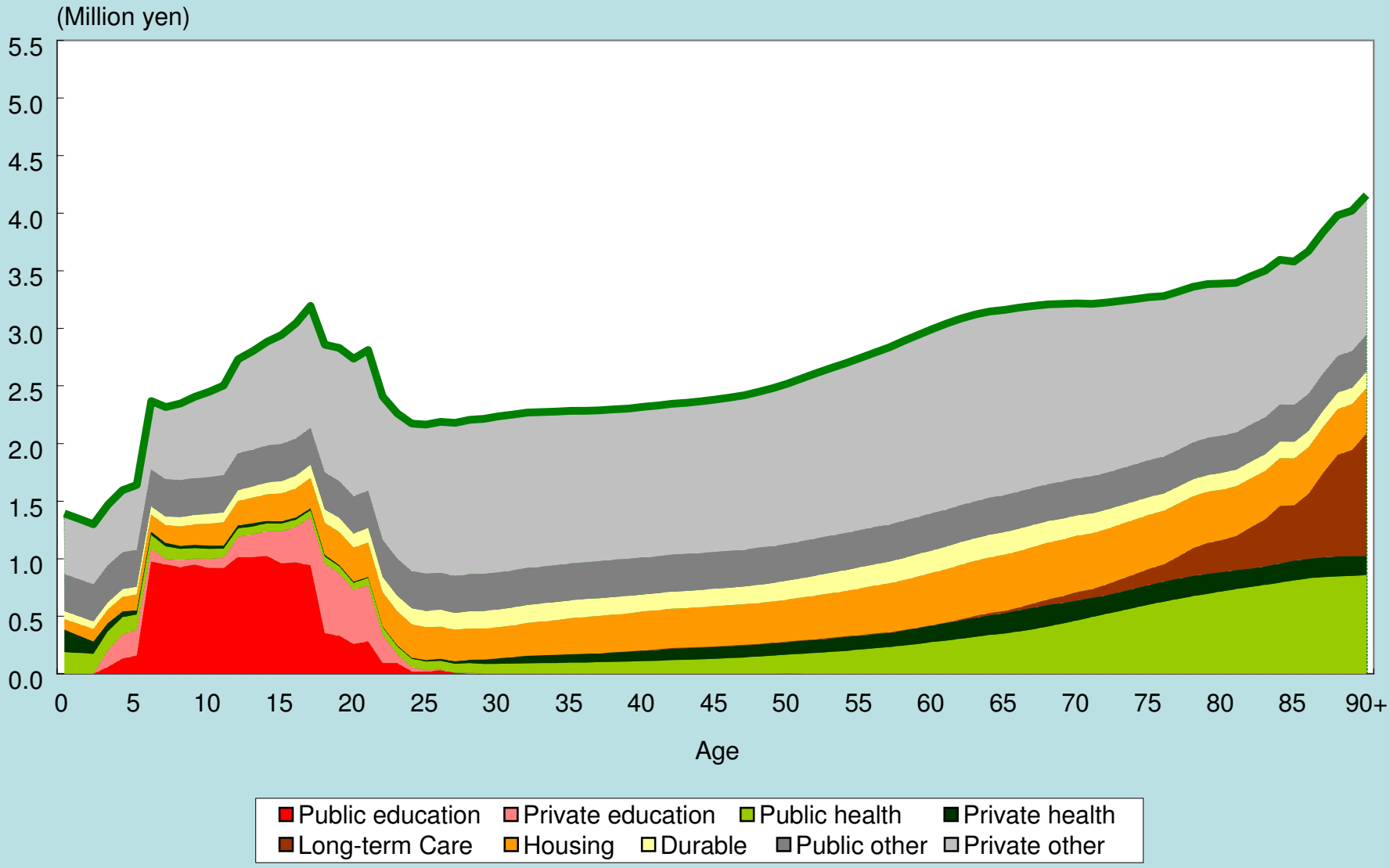


Composition of total consumption

Japan (2009)



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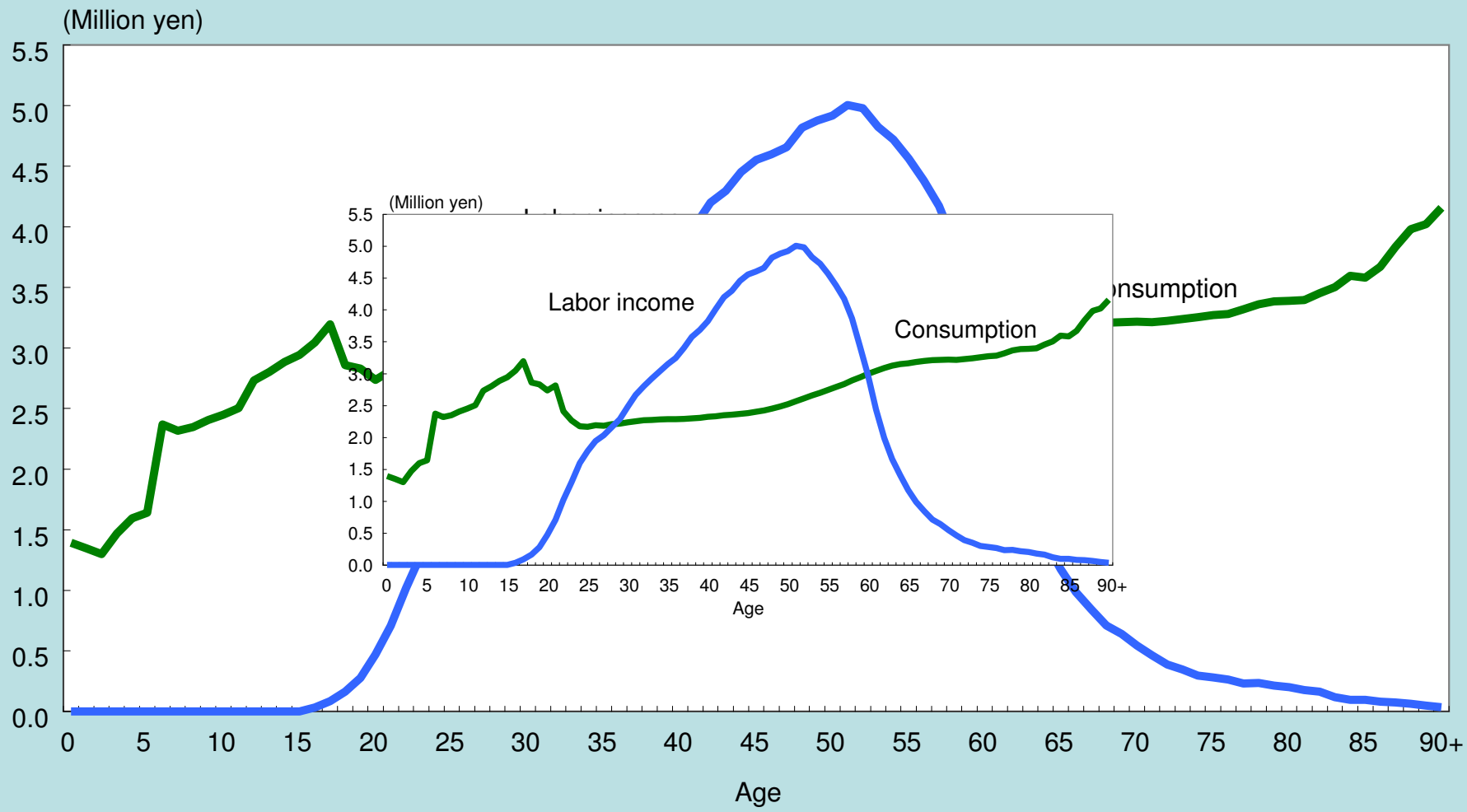
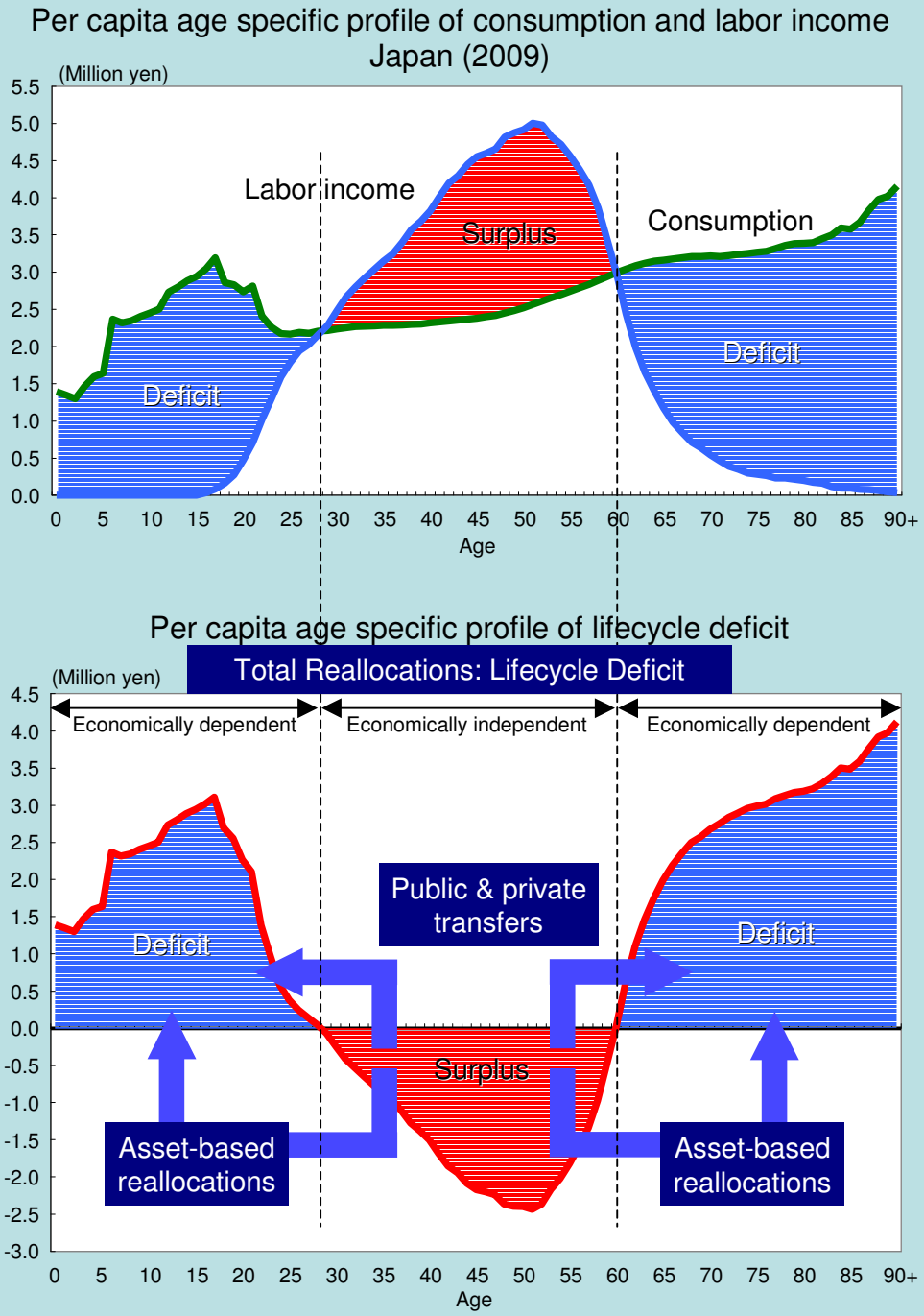
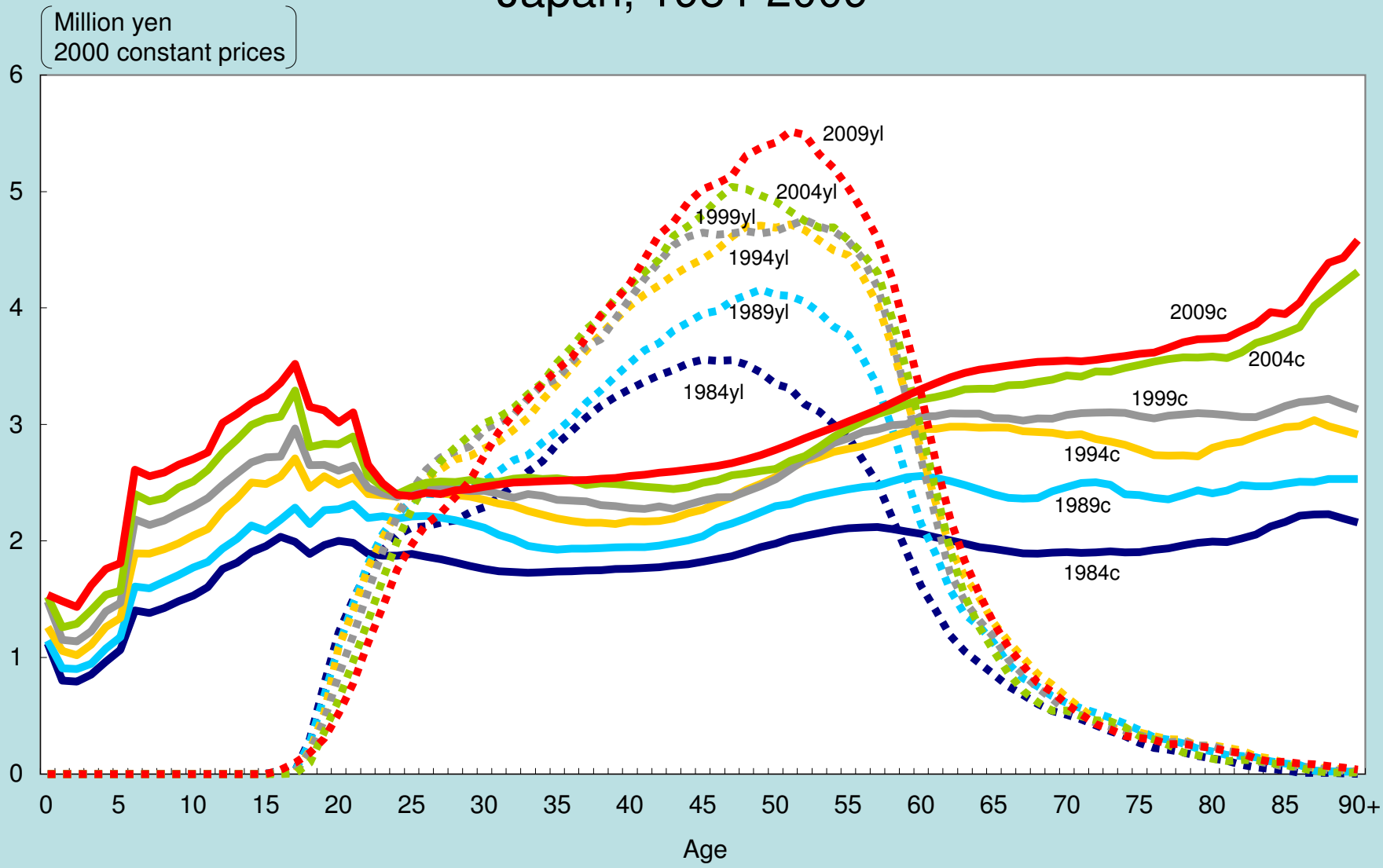



Per capita age specific profile of consumption and labor income
Japan (2009)
(Million yen)
Labor income
Surplus
Consumption
Deficit
Deficit
Age
Per capita age specific profile of lifecycle deficit
Total Reallocations: Lifecycle Deficit
(Million yen)
Economically dependent
Economically independent
Economically dependent
Public & private transfers
Deficit
Deficit
Surplus
Asset-based reallocations
Asset-based reallocations
Age

Per capita age specific profiles of consumption and labor income Japan, 1984-2009



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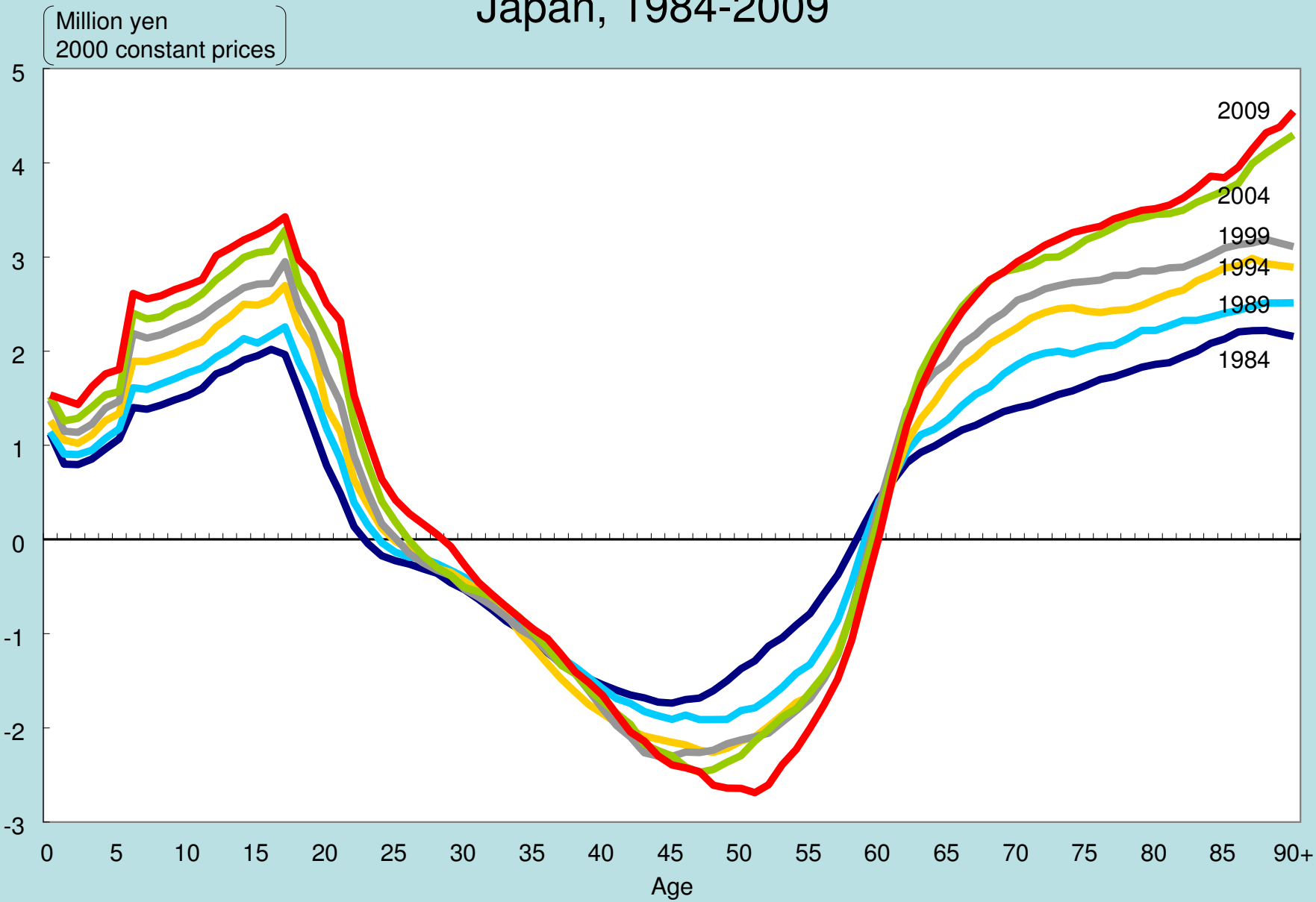
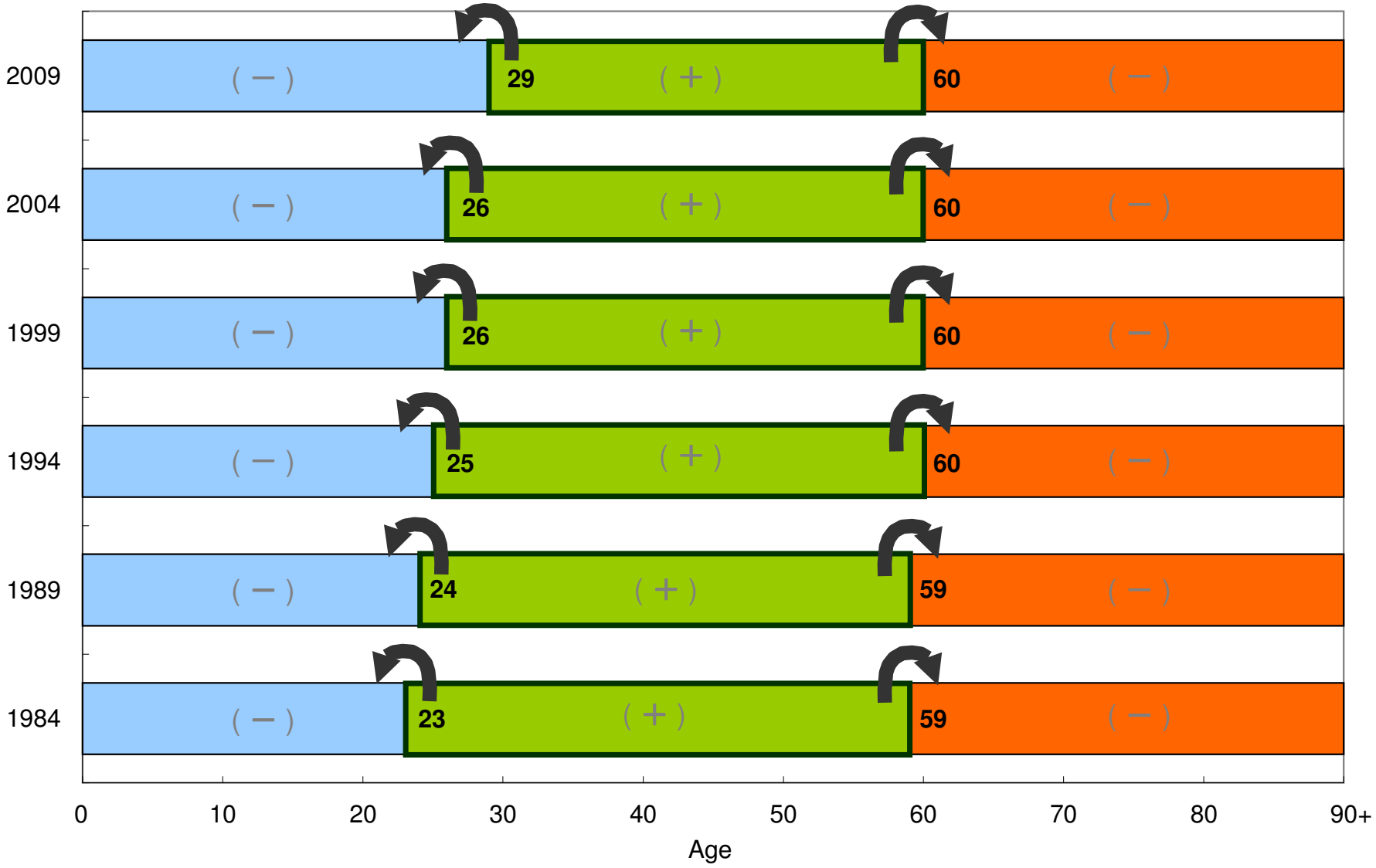
Per capita age specific profiles of consumption and labor income
Japan, 1984-2009

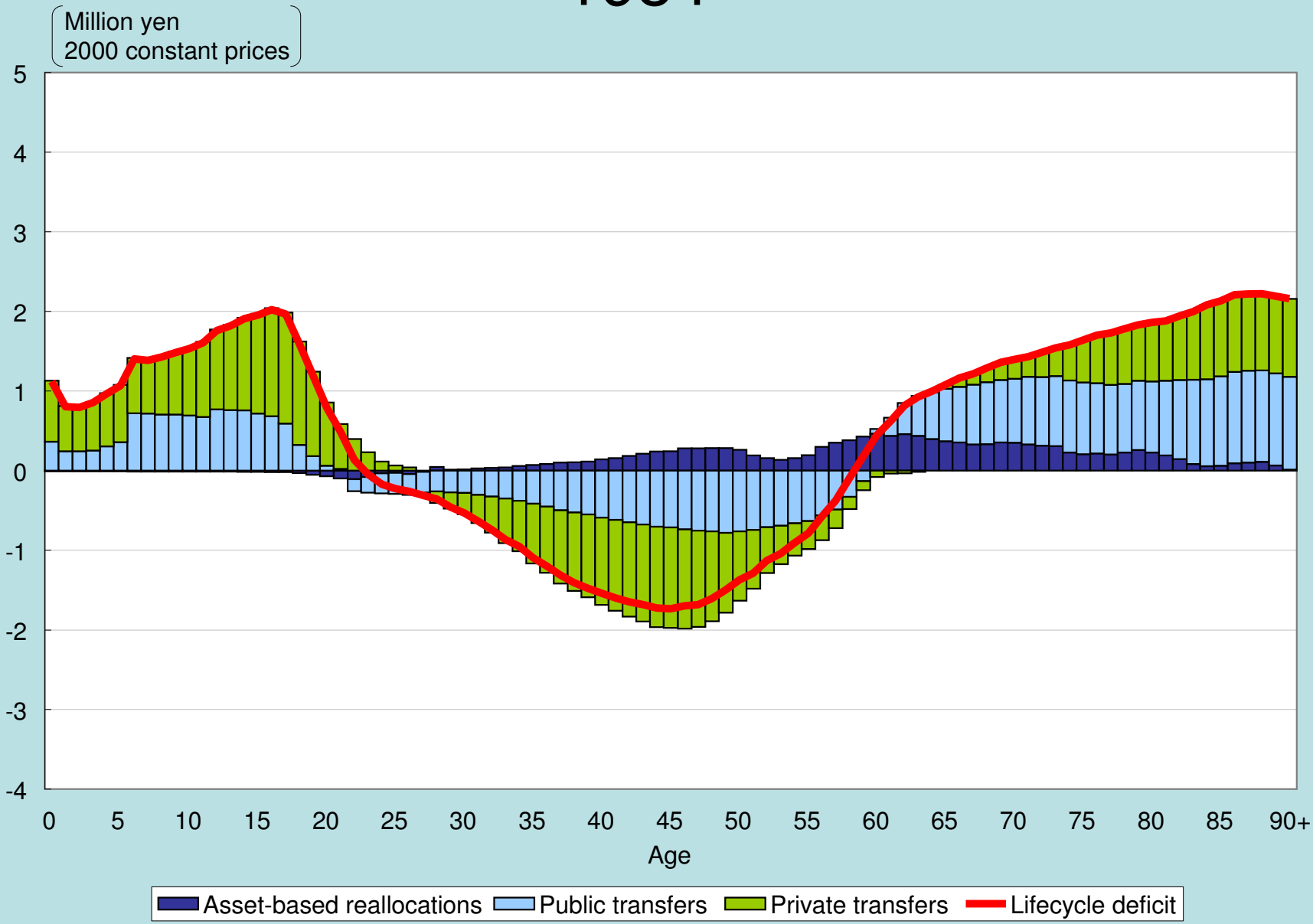


Change in cut-off ages for lifecycle deficit, Japan, 1984-2009



Changing per capita lifecycle deficit in Japan 1984-2004

1984


Million yen
2000 constant prices
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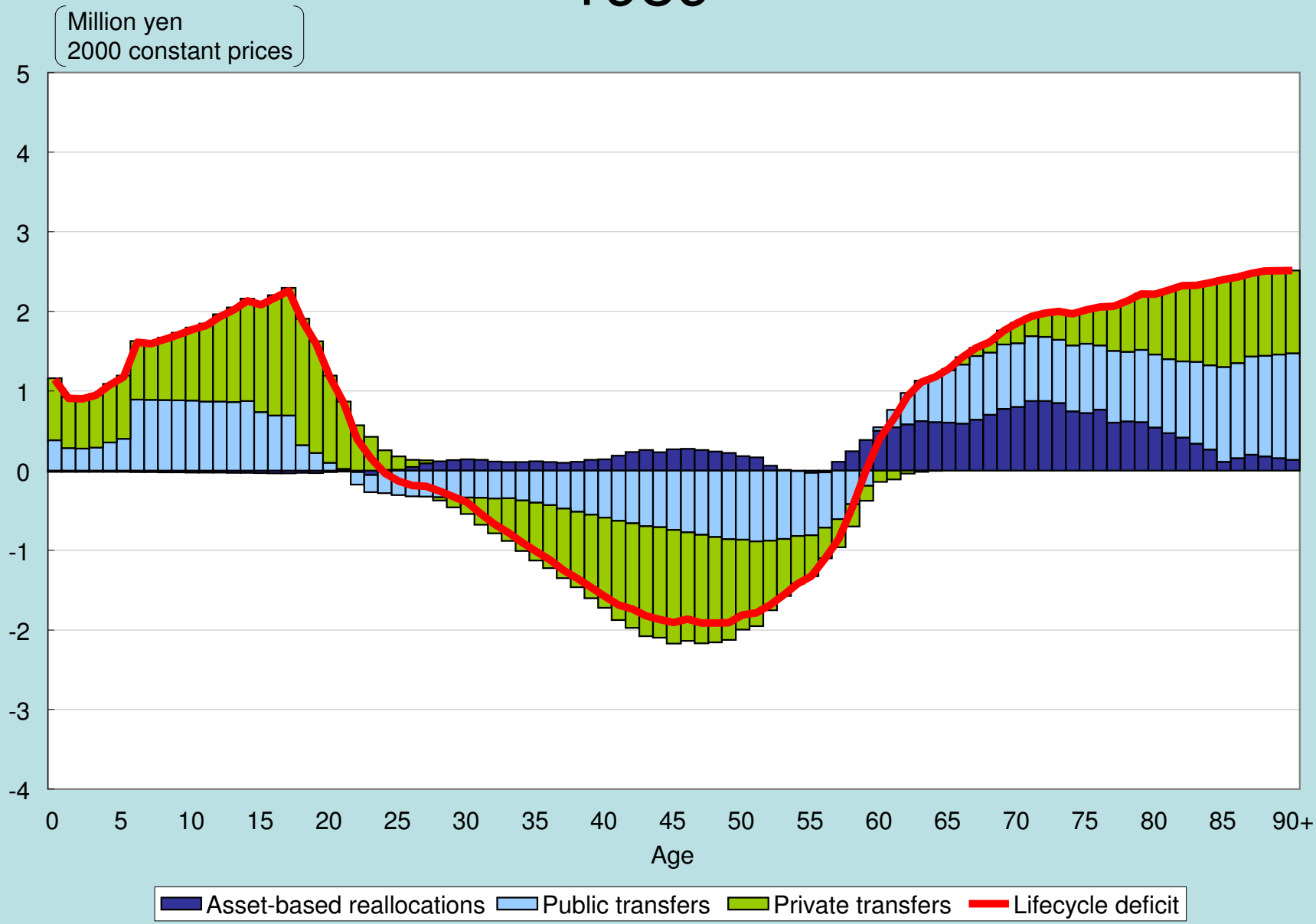
90+
Age
Asset-based reallocations
Public transfers
Private transfers
Lifecycle deficit

1989


Million yen
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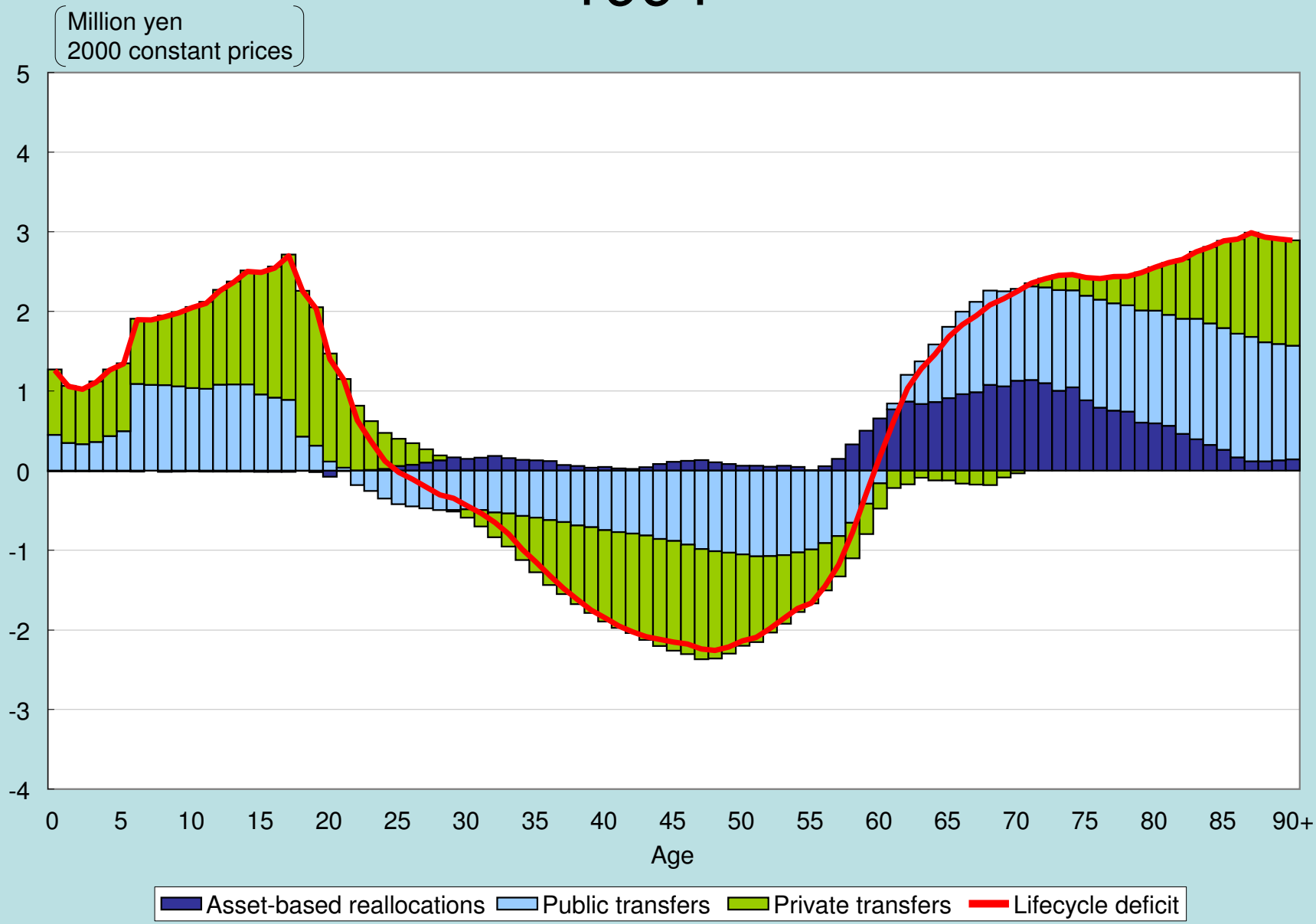
Asset-based reallocations
Public transfers
Private transfers
Lifecycle deficit

1994


Million yen
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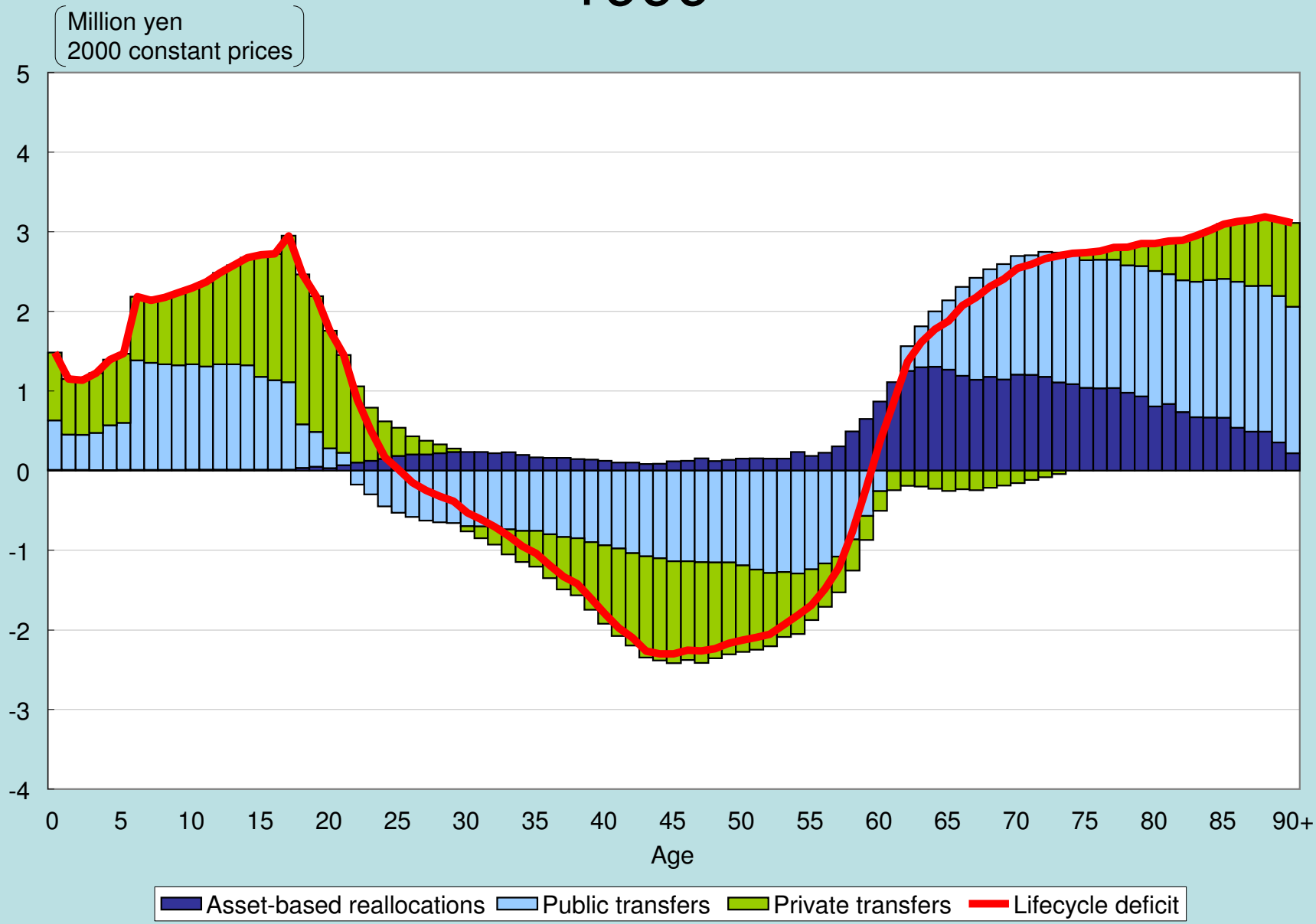
Age
Asset-based reallocations
Public transfers
Private transfers
Lifecycle deficit

1999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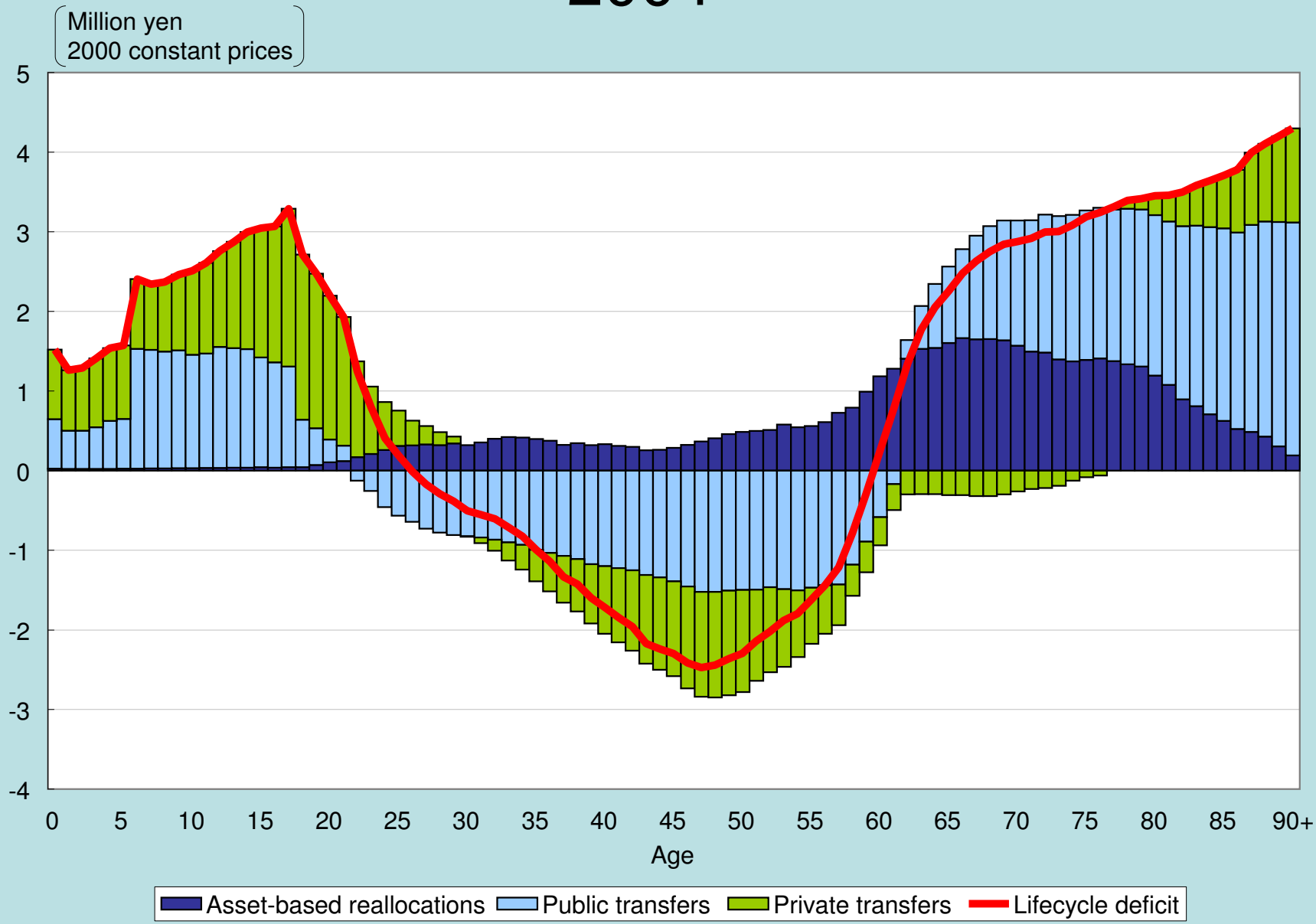
Age
Asset-based reallocations
Public transfers
Private transfers
Lifecycle deficit

2004


Million yen
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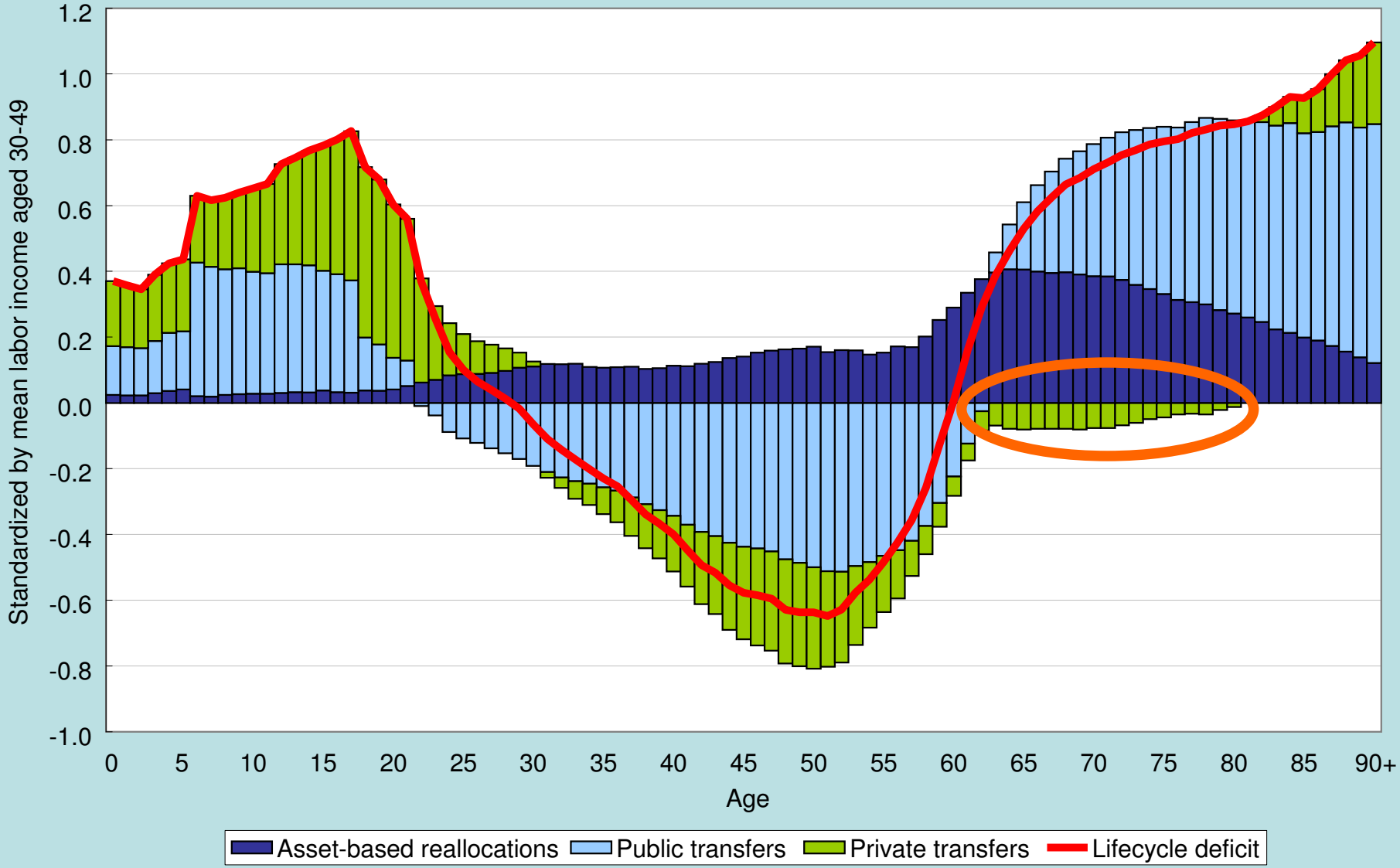
2009


Standardized by mean labor income aged 30-49
1.2
1.0
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-0.4
-0.6
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-1.0
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Age
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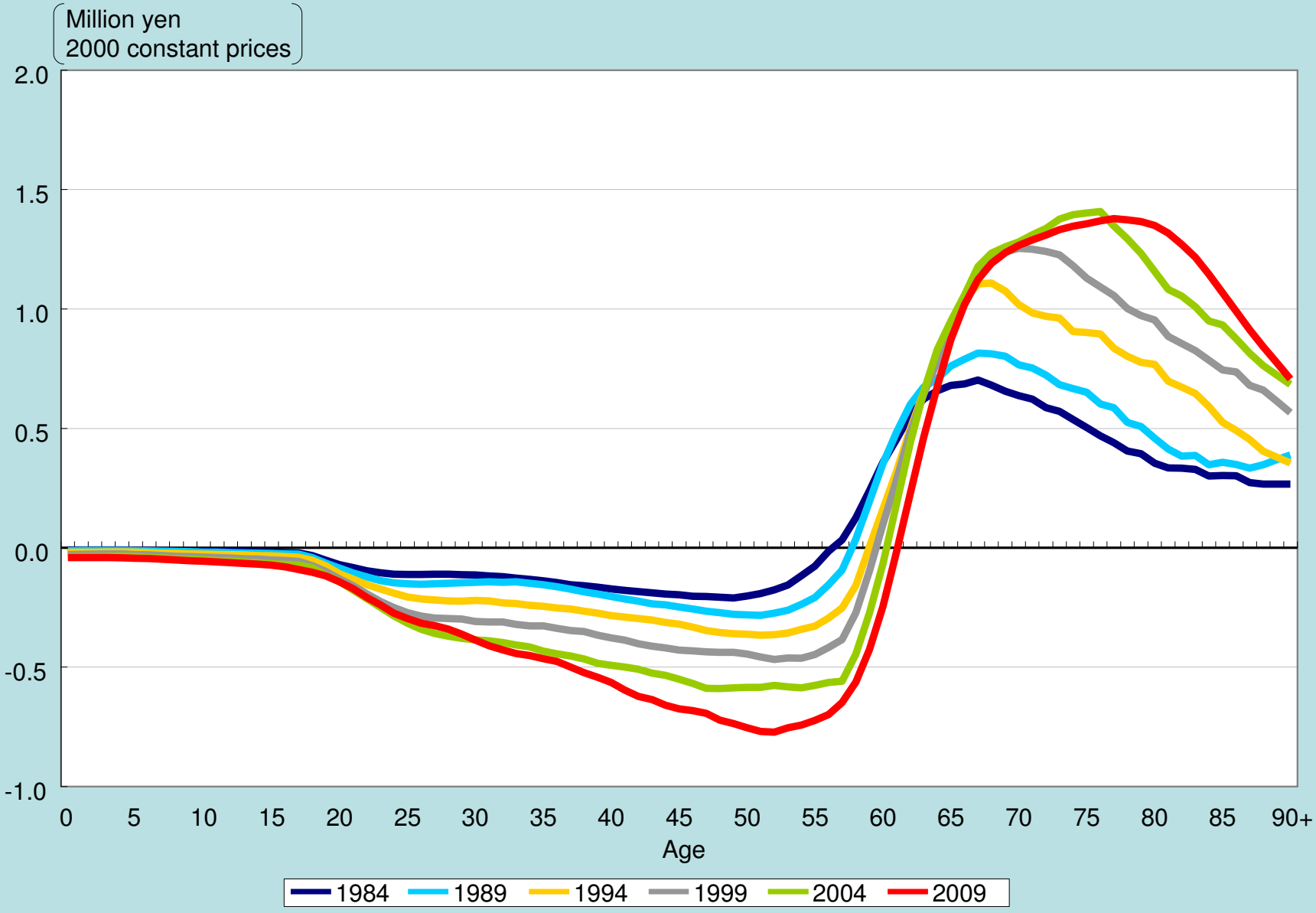
Private transfers
Lifecycle deficit

In Japan, the elderly are playing the role of the society's safety net…

Public pensions are a highly dependable source of income for the elderly.

The employment for their middle-aged sons and daughters has been unstable since the beginning of "Japan's lost decade".

Per capita net public pension transfers, Japan, 1984-2009

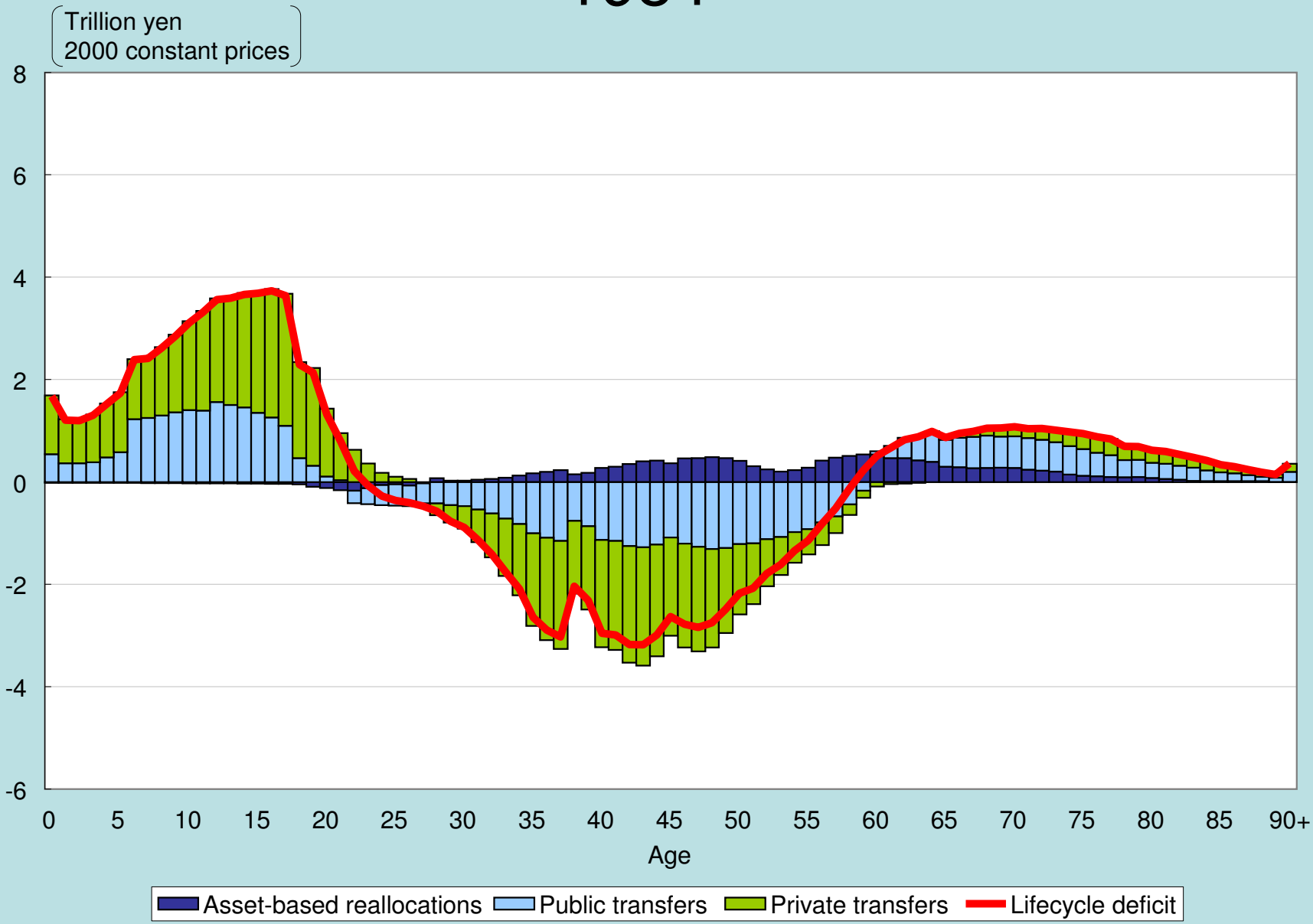


Impact of population aging

from per capita to total population

The case of Japan

1984


Trillion yen
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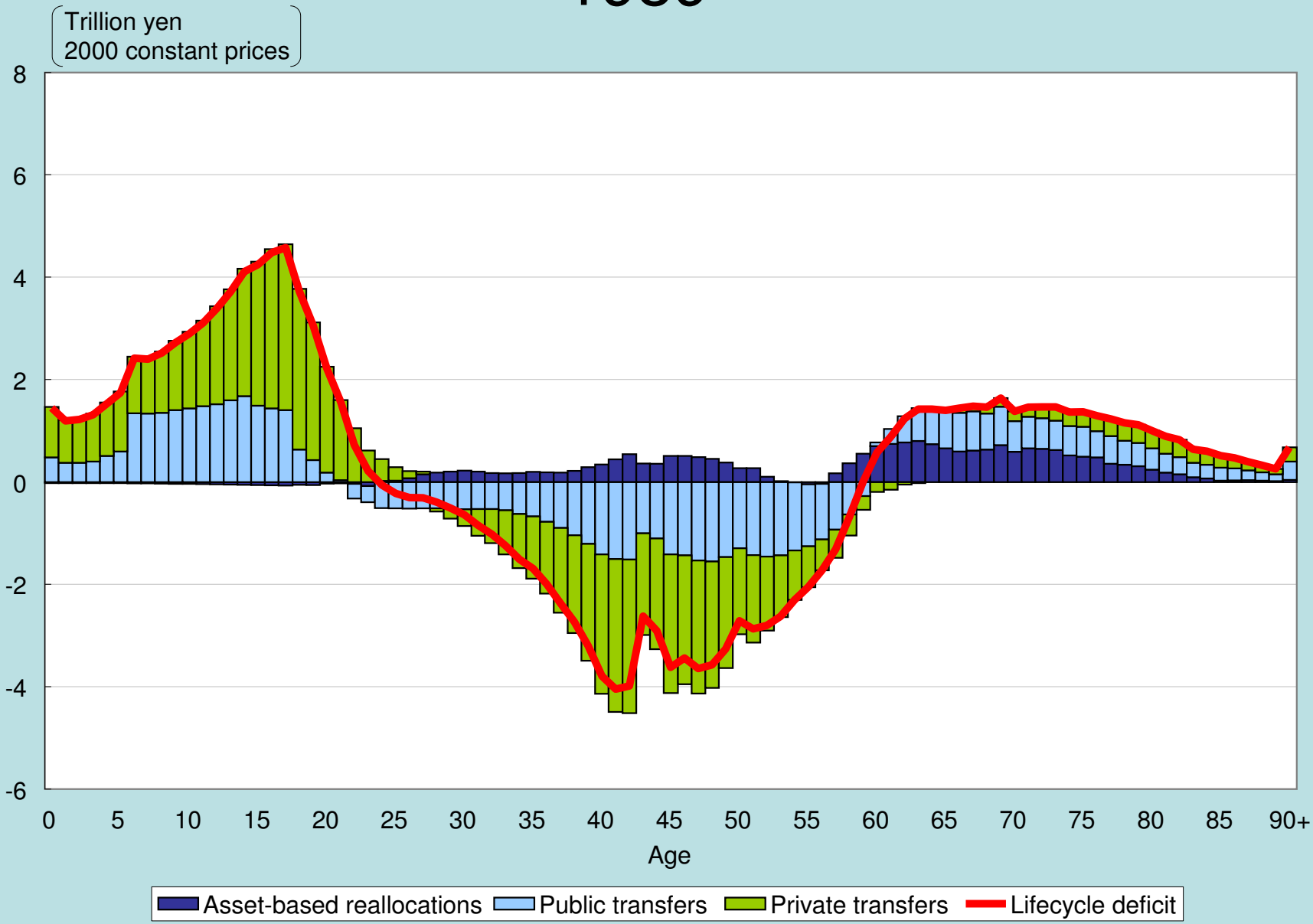
Public transfers
Private transfers
Lifecycle deficit

1989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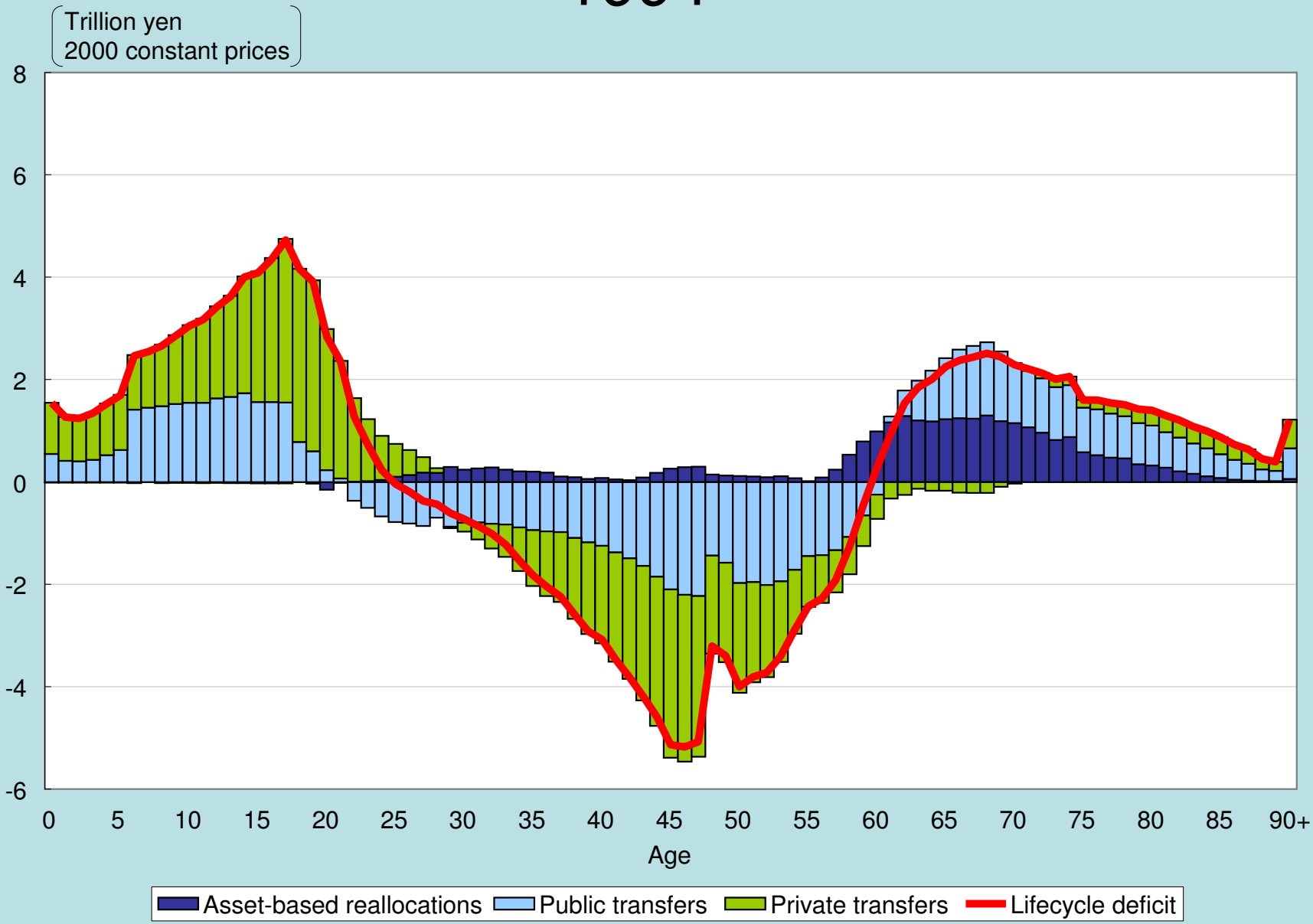
Trillion yen
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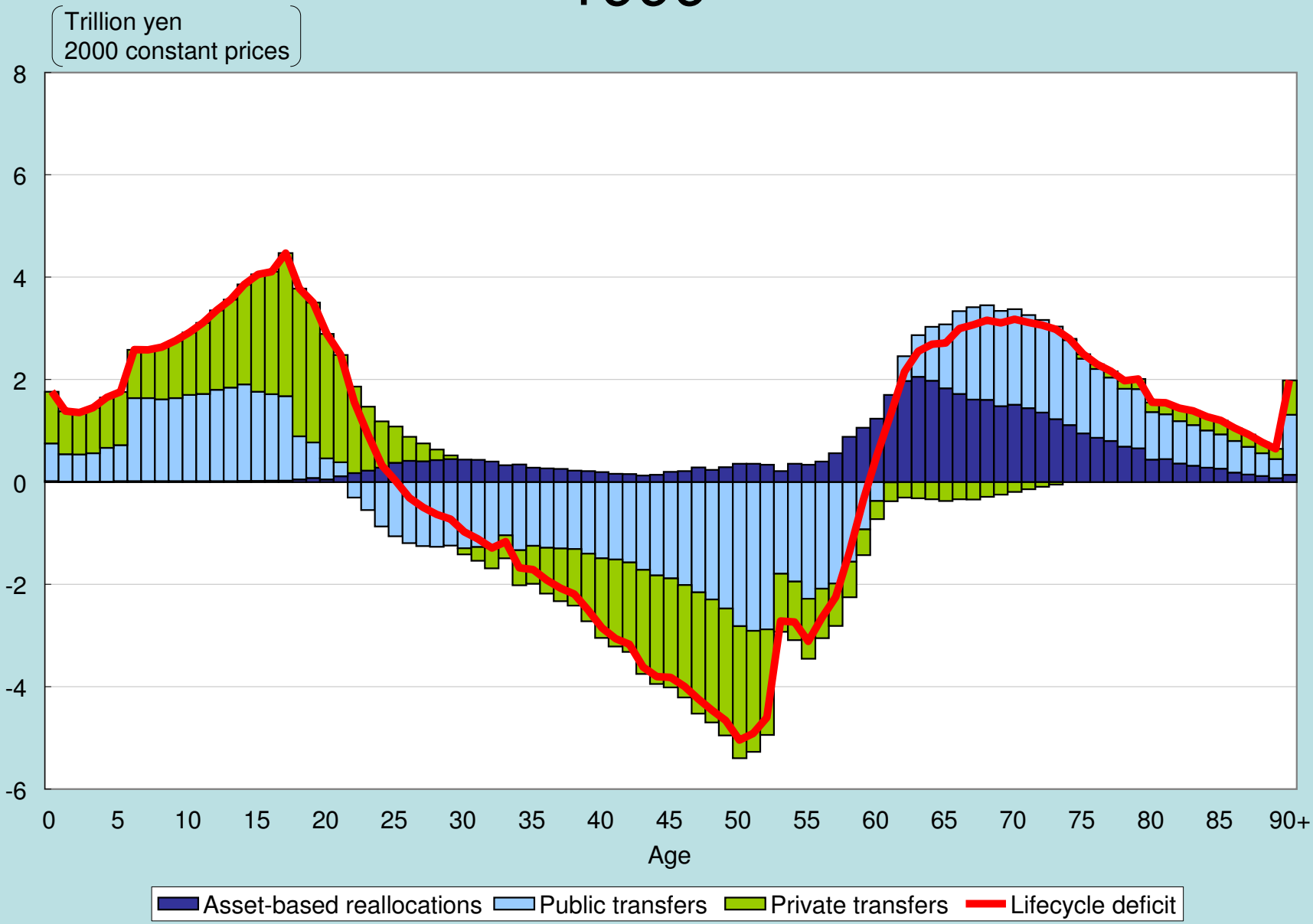
1999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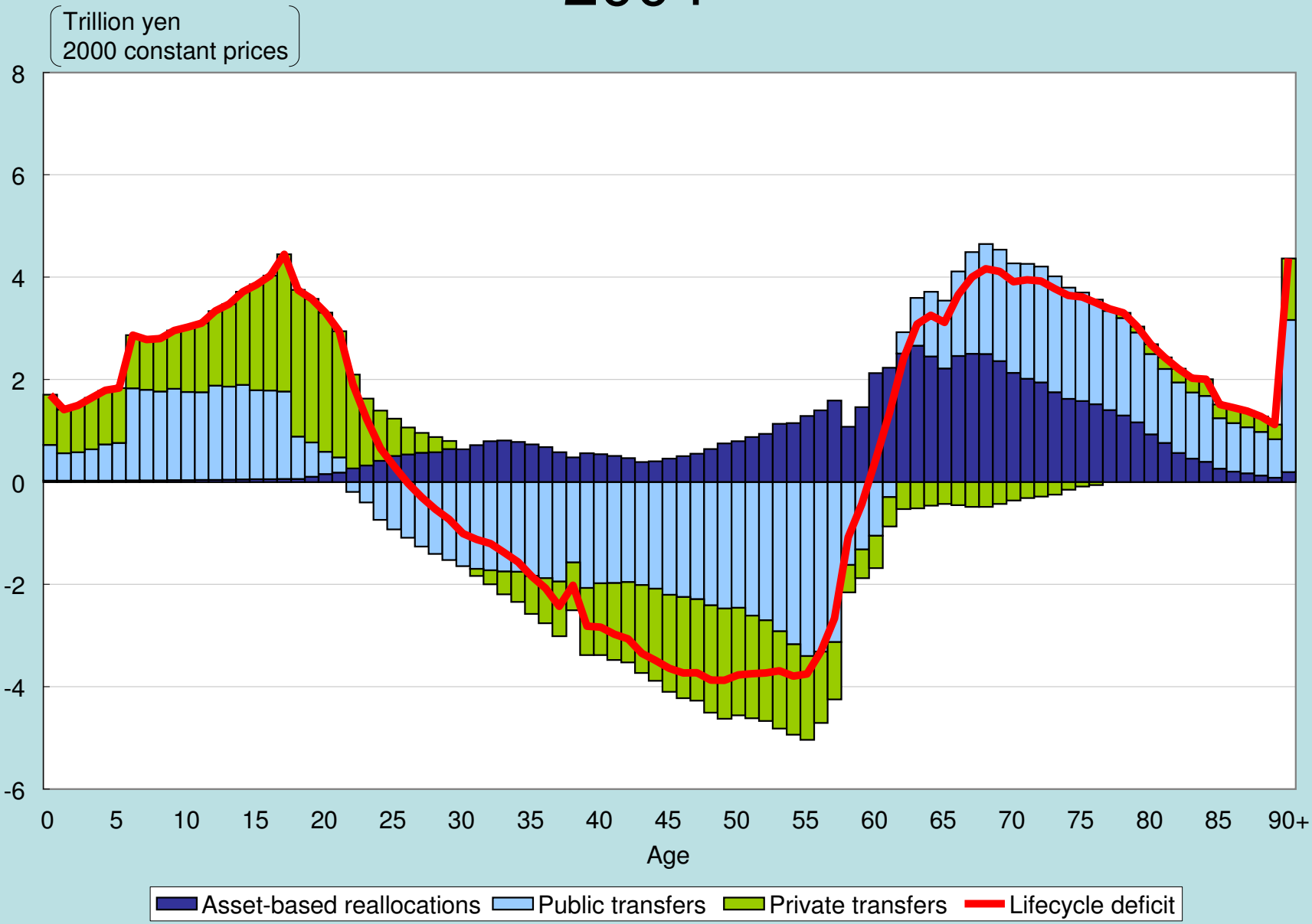
2004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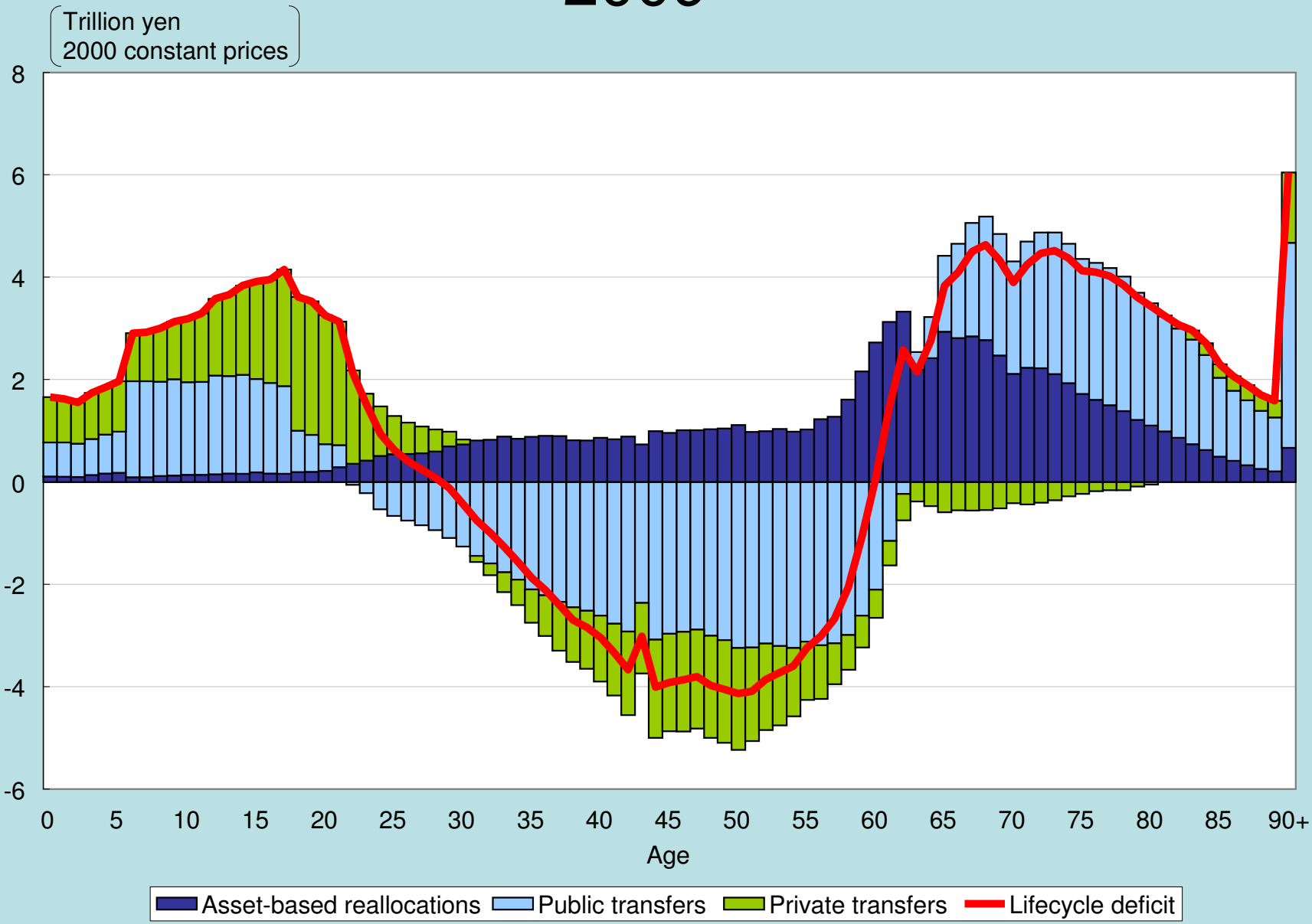
Trillion yen
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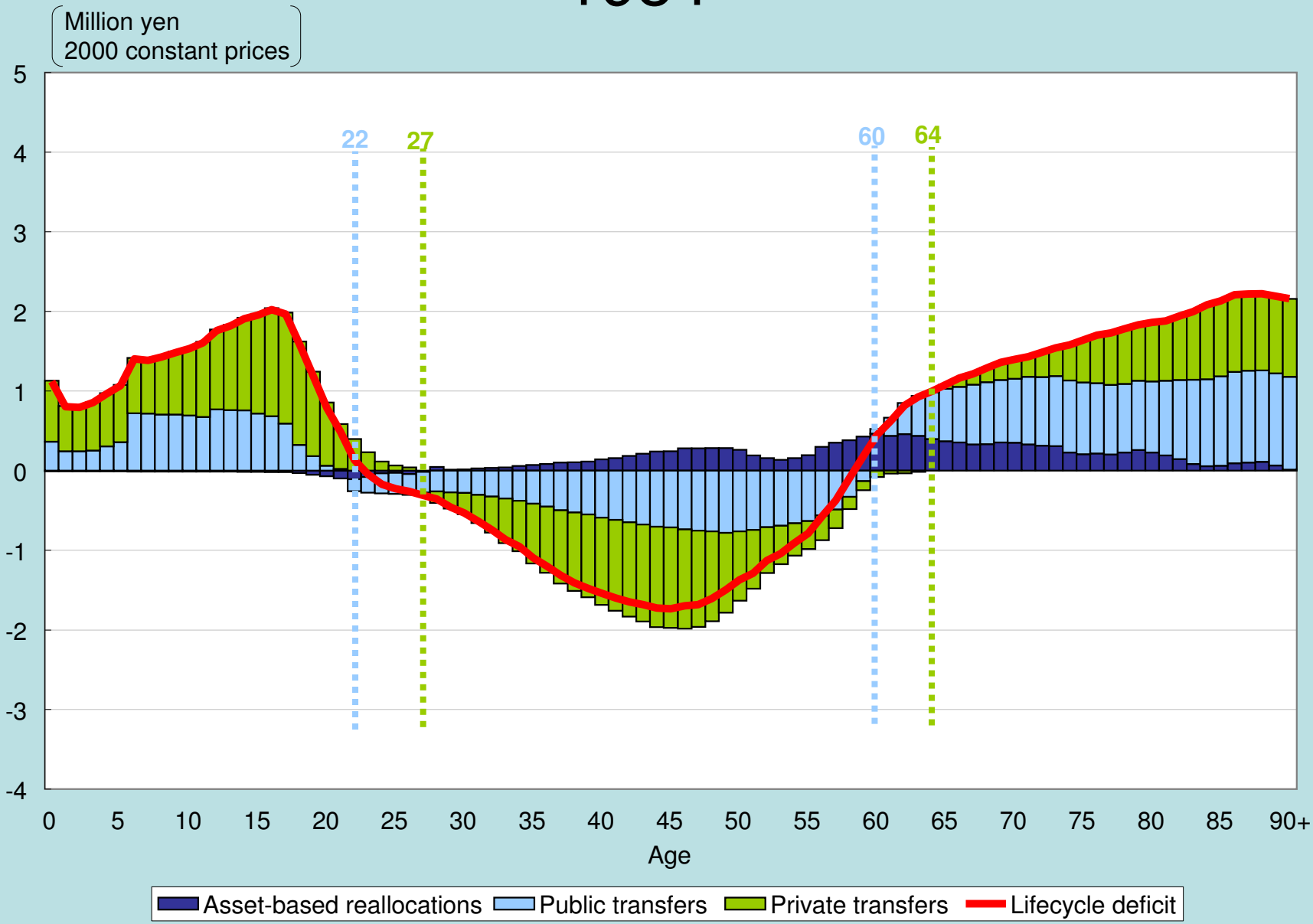
1984


Million yen
2000 constant prices
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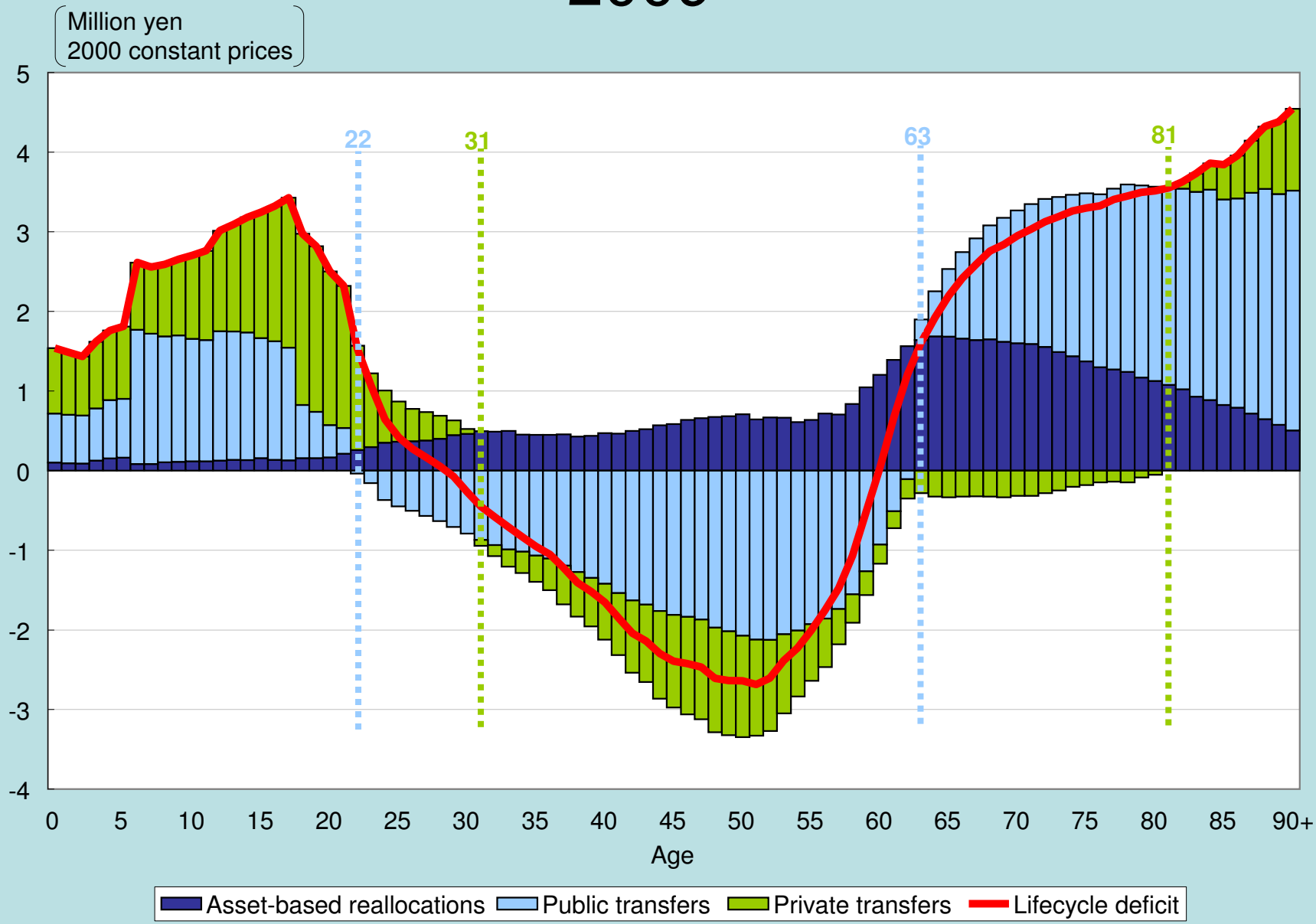
Million yen
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90+
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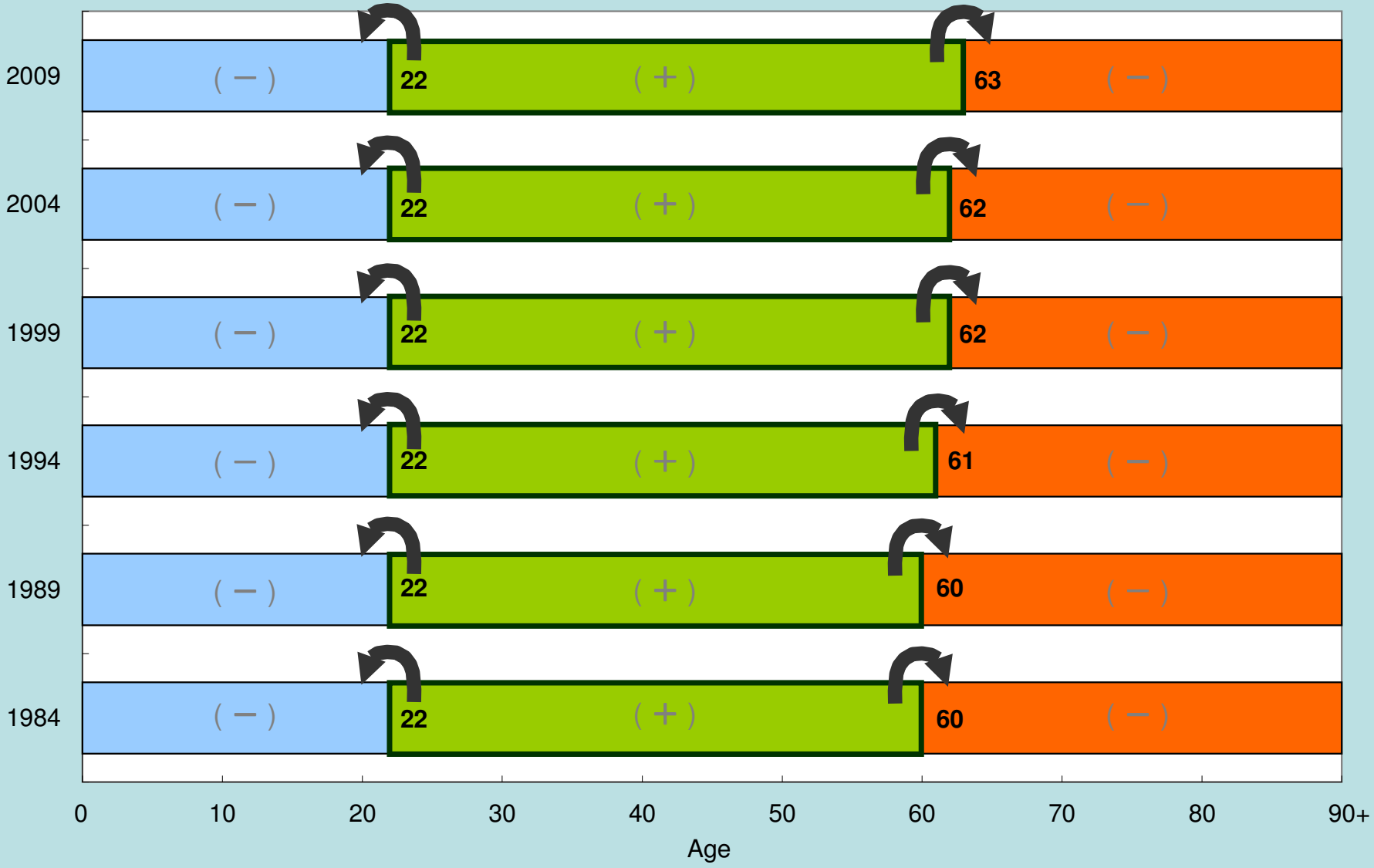
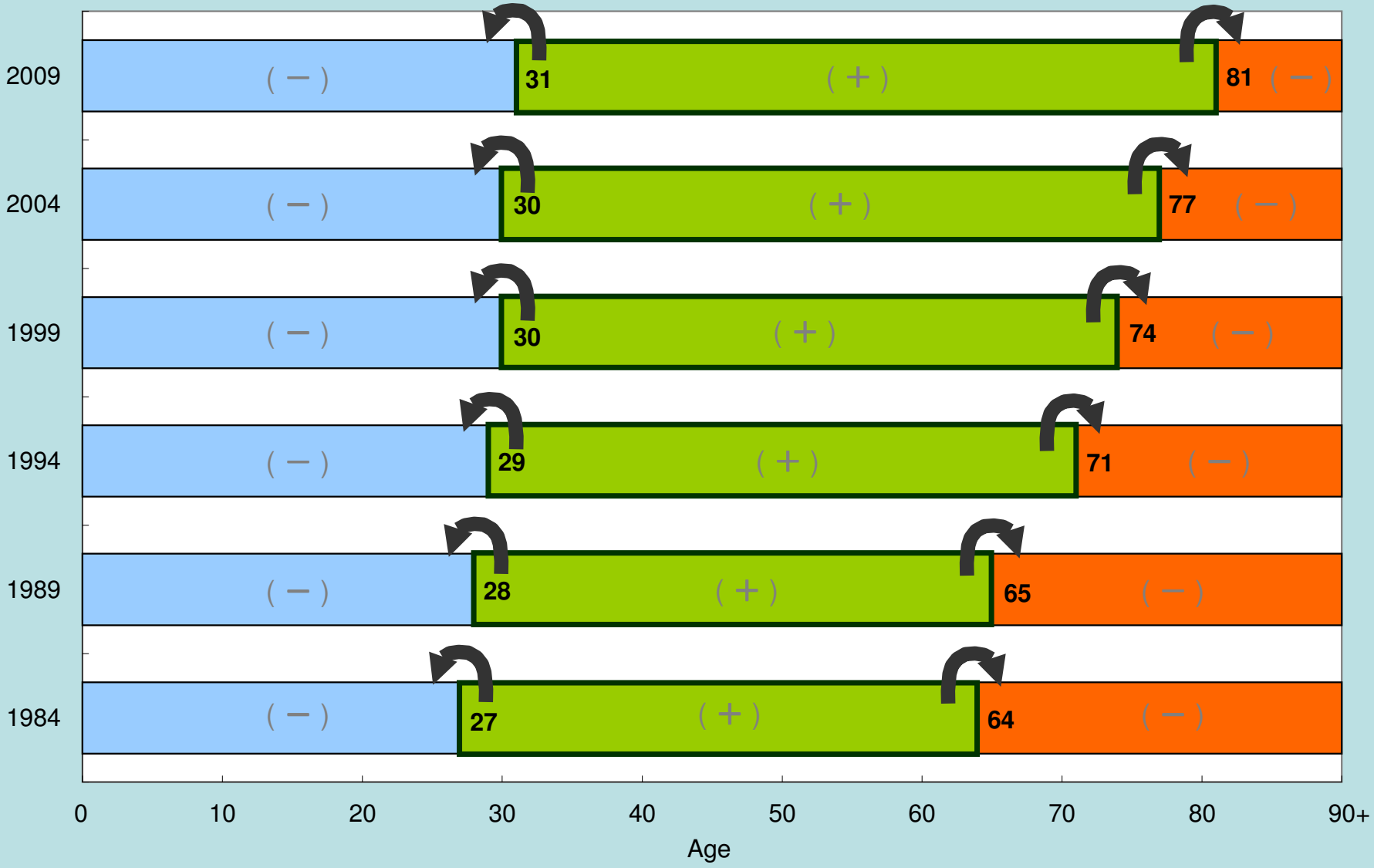
Change in cut-off ages for net public transfers, Japan, 1984-2009



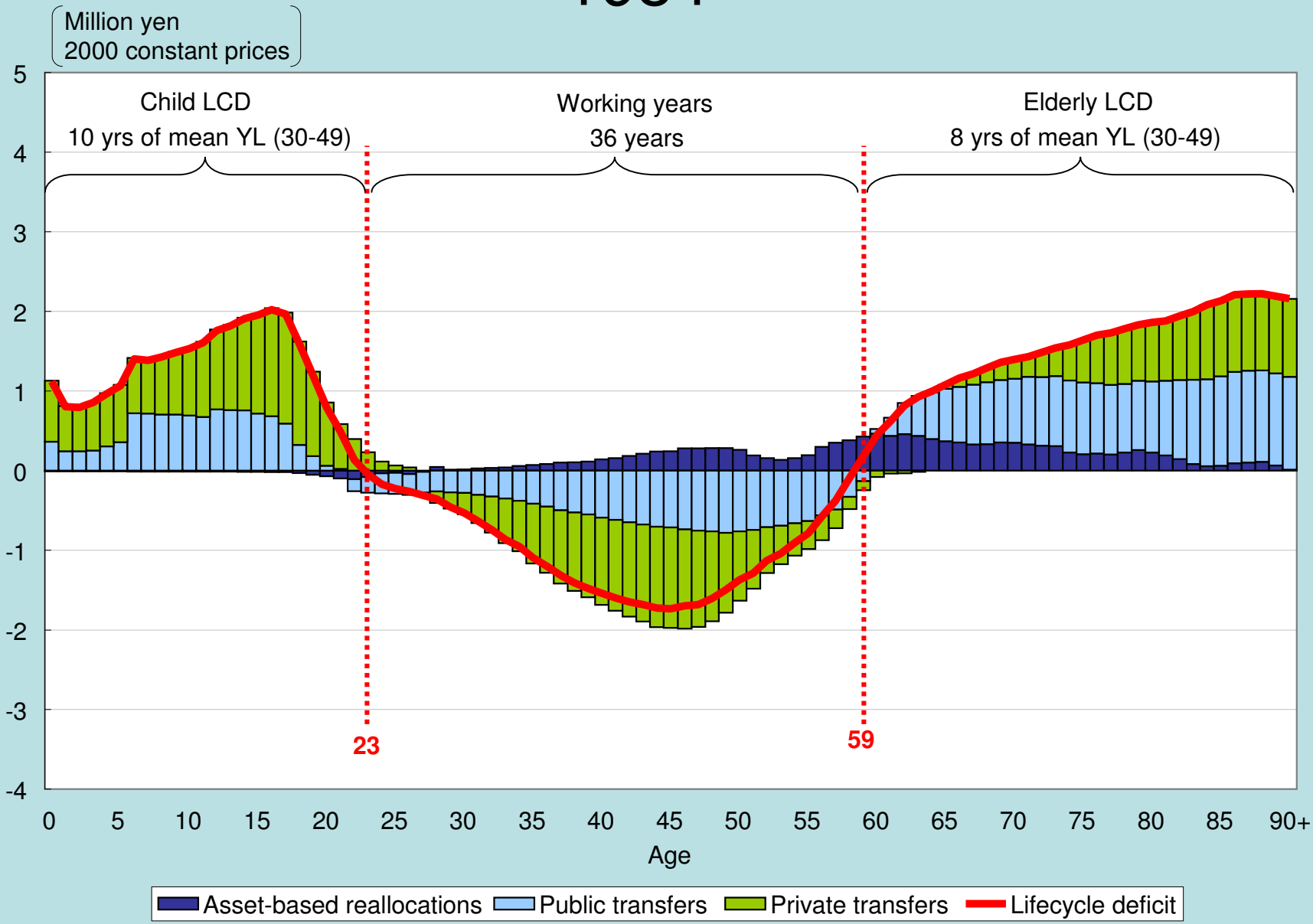
- **The public sector tends to be tardy in responding to Japan's rapidly changing age structure and social needs.**

The private sector responds more rapidly like…

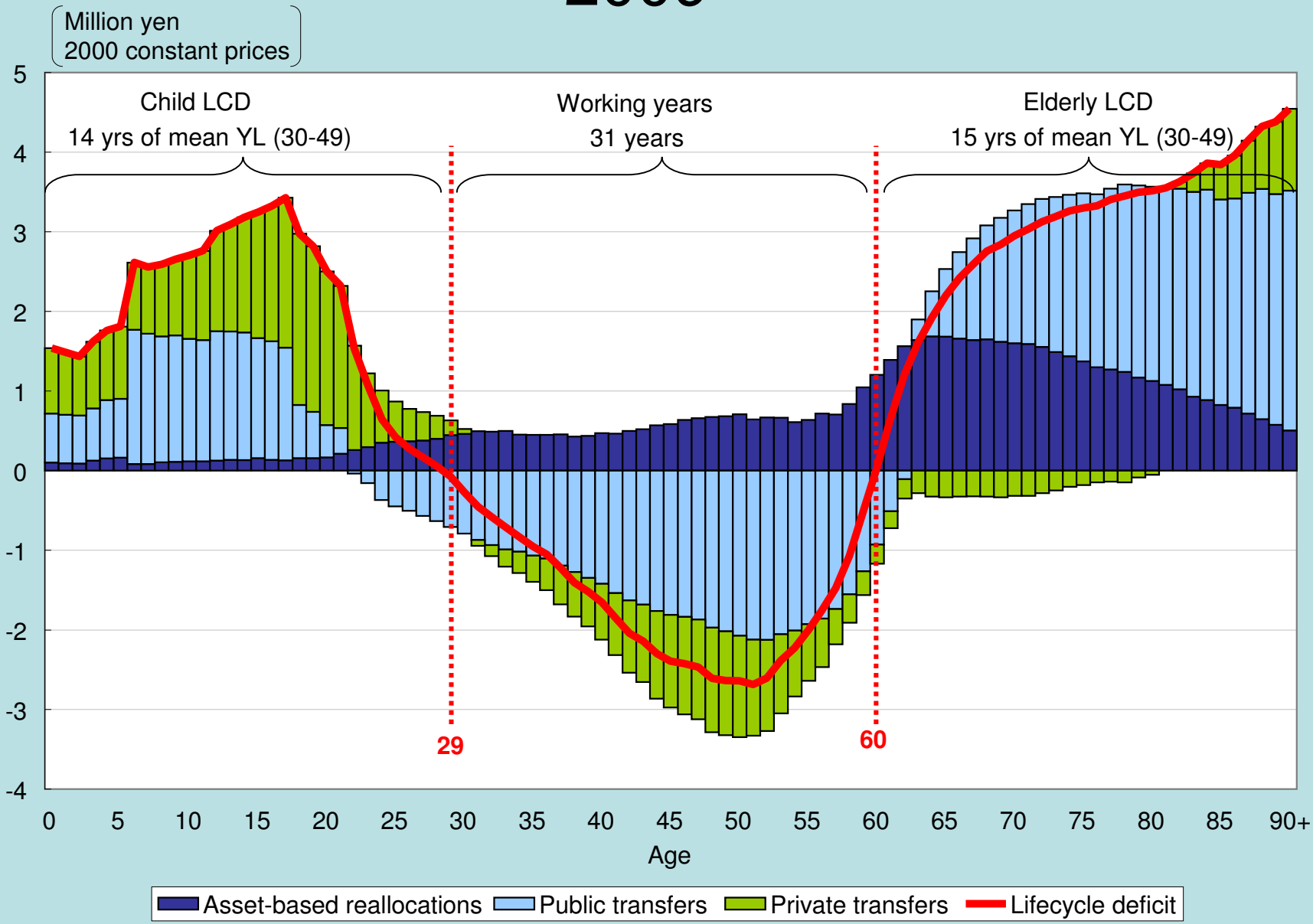
Change in cut-off ages for net private transfers, Japan, 1984-2009



1984


Million yen
2000 constant prices
Child LCD
10 yrs of mean YL (30-49)
Working years
36 years
Elderly LCD
8 yrs of mean YL (30-49)
23
59
5
4
3
2
1
0
-1
-2
-3
-4
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90+
Age
Asset-based reallocations
Public transfers
Private transfers
Lifecycle deficit

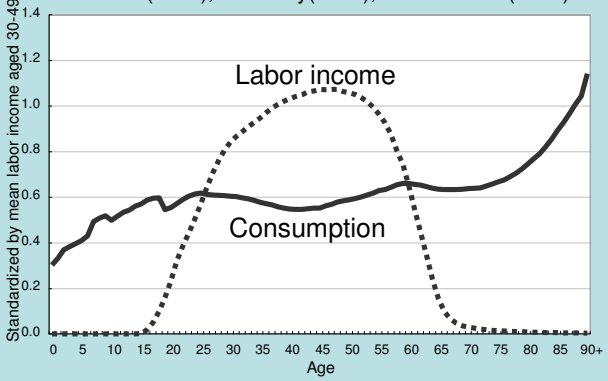
2009


Million yen
2000 constant prices
Child LCD
14 yrs of mean YL (30-49)
Working years
31 years
Elderly LCD
15 yrs of mean YL (30-49)
29
60
5
4
3
2
1
0
-1
-2
-3
-4
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90+
Age
Asset-based reallocations
Public transfers
Private transfers
Lifecycle deficit

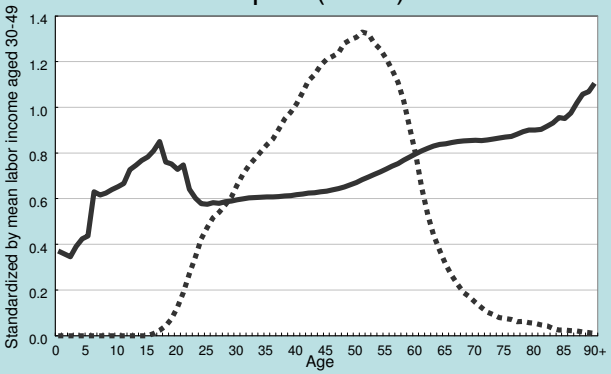
Are they competing for the limited financial resources? Is there any evidence of the "crowding-out" effect between them?

Europe Average

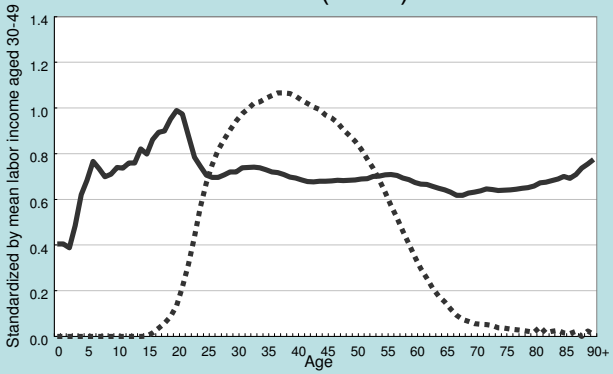
Finland (2004), Germany(2003), and Sweden(2004)



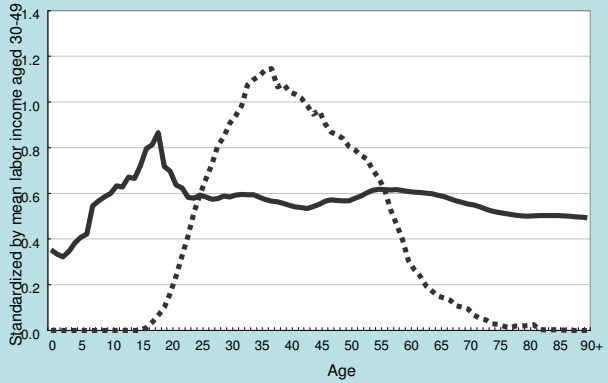
Japan (2009)



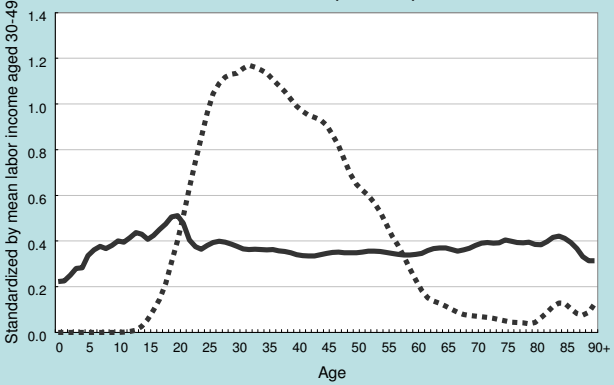
Taiwan (2005)



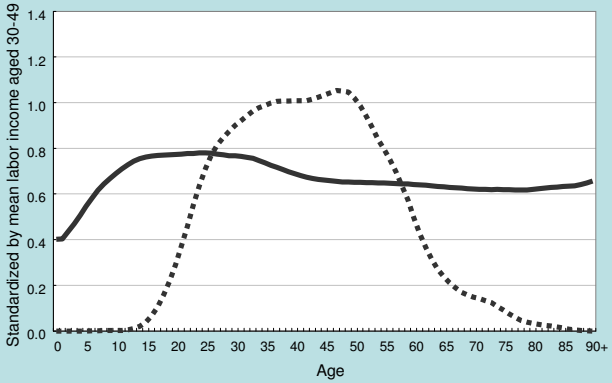
Korea (2005)



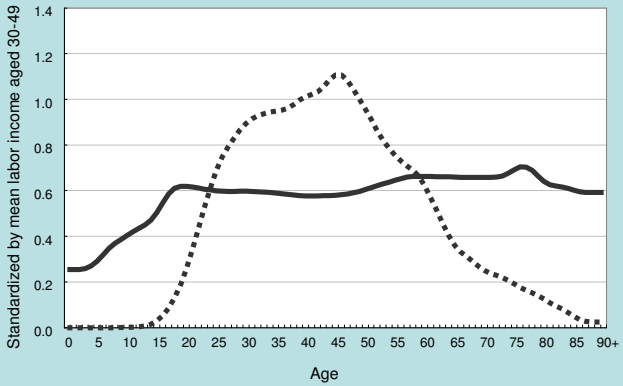
China (2007)



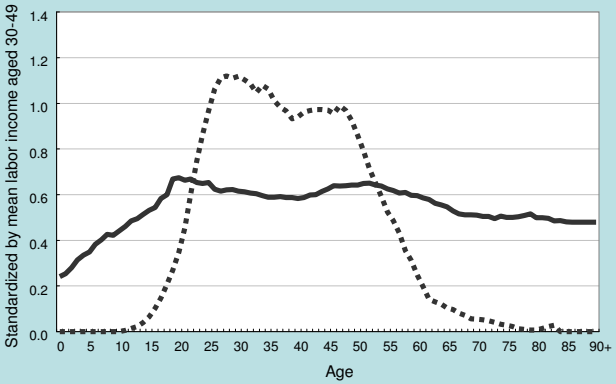
Thailand (2009)



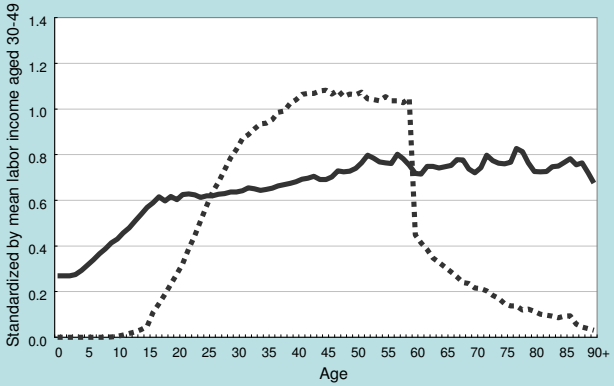
Philippines (2007)

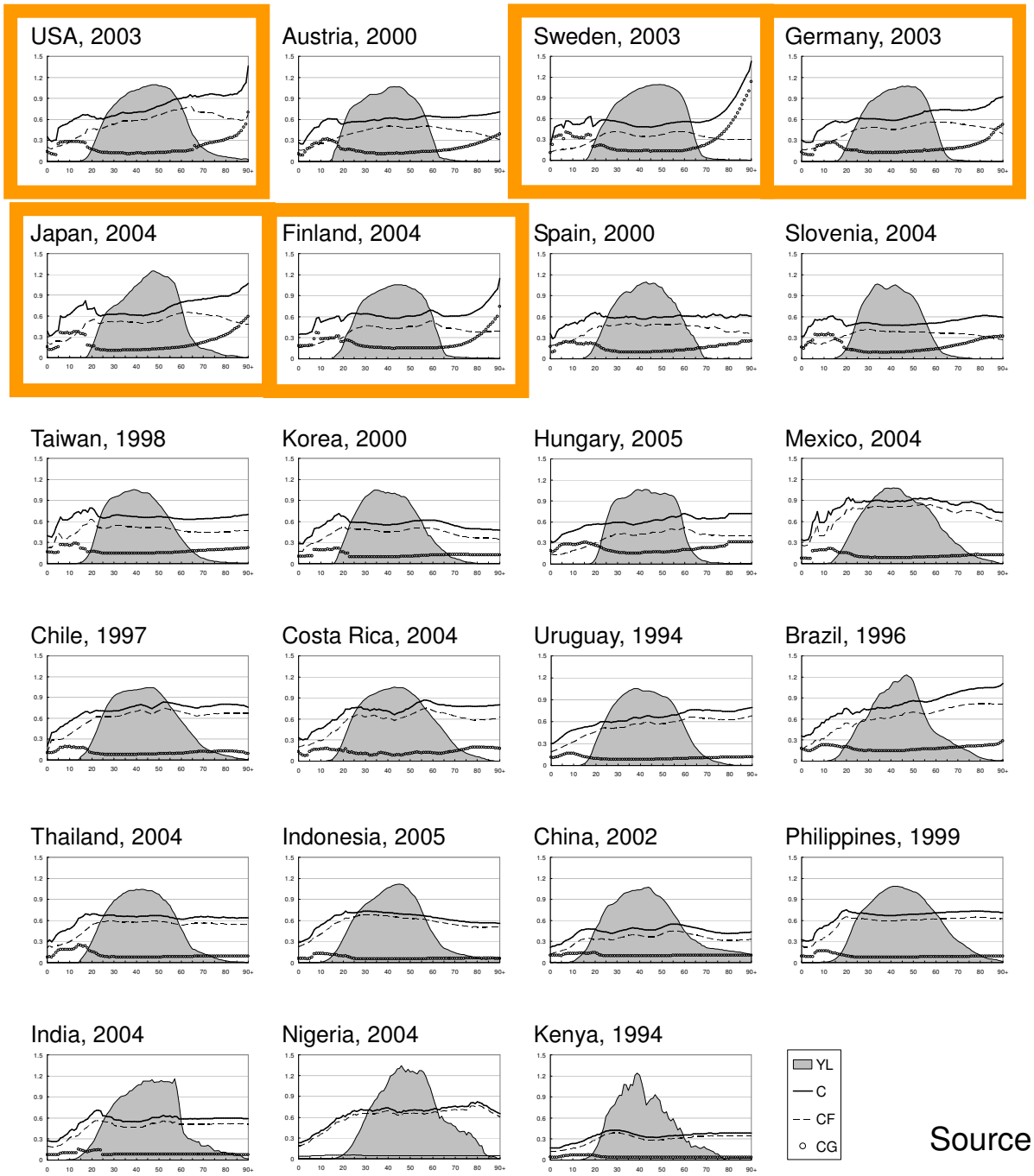


Vietnam (2008)



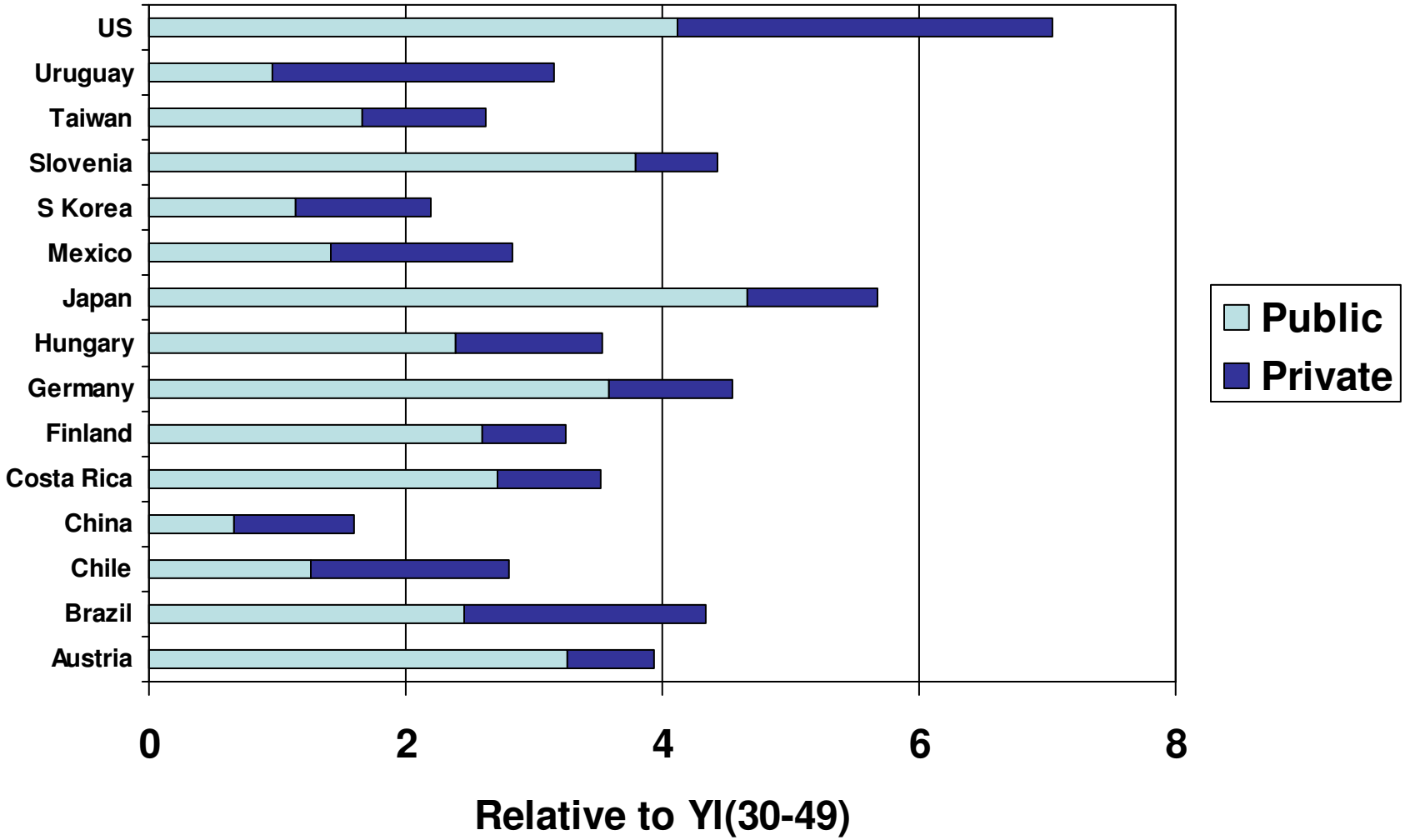
India (2004-5)





Source: Tung forthcoming.

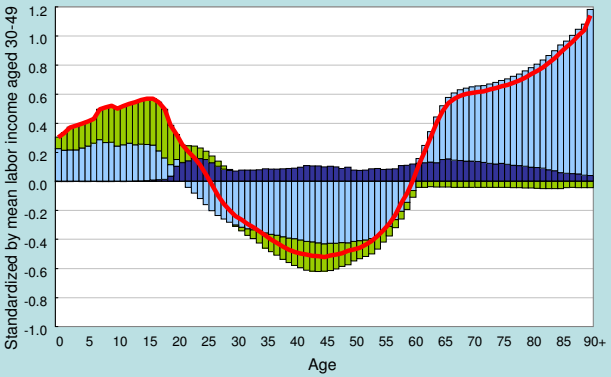
Health Care Spending, Synthetic Cohort, 55+



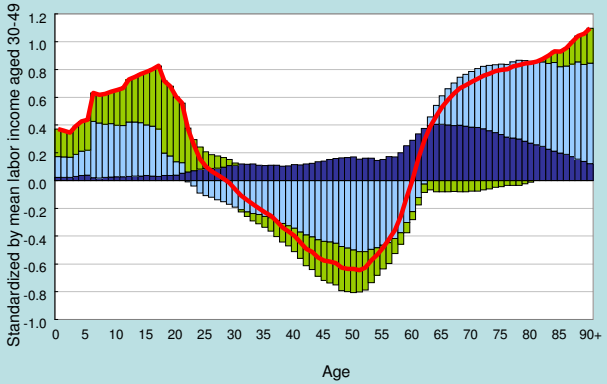
Note: Synthetic cohort values calculated using L(x)/L(55) using the US 2000 life table for both sexes combined. Health spending data: www.ntaccounts.org.

Europe Average

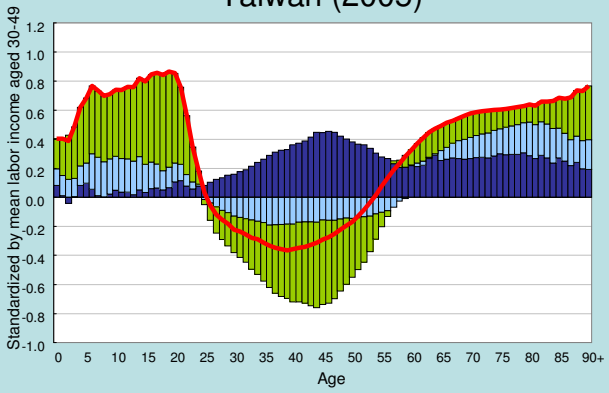
Finland (2004), Germany(2003), and Sweden(2004)



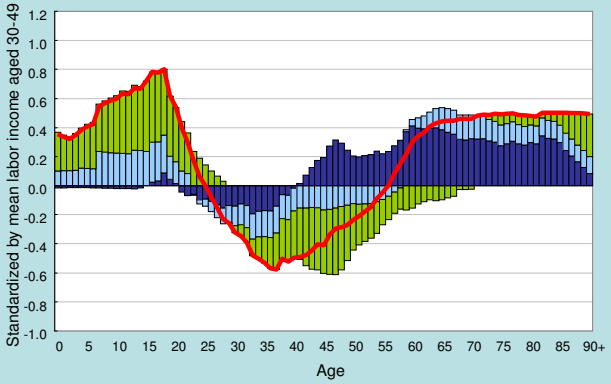
Japan (2009)



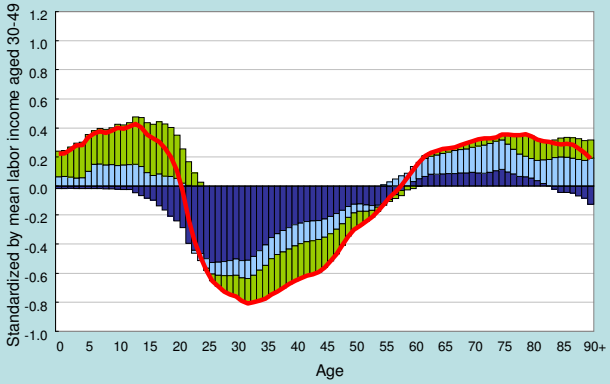
Taiwan (2005)



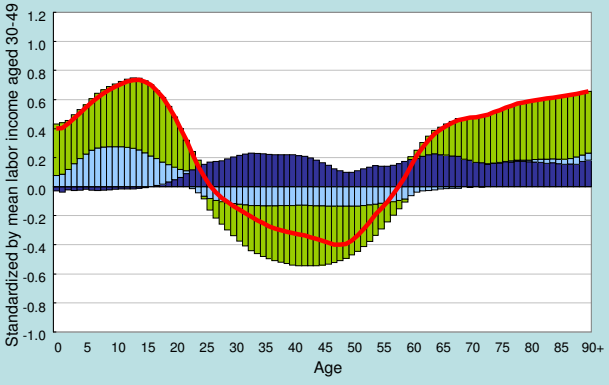
Korea (2005)



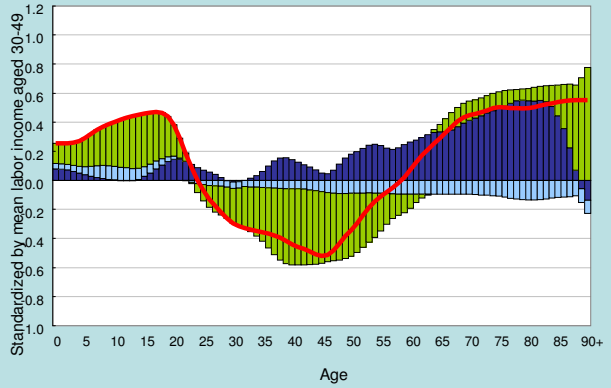
China (2007)

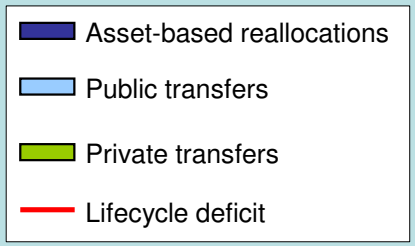


Thailand (2009)

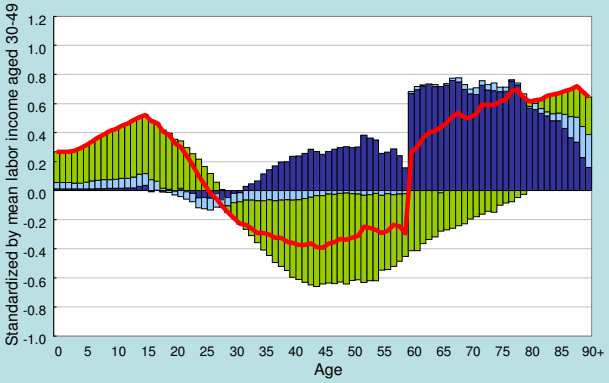


Philippines (2007)

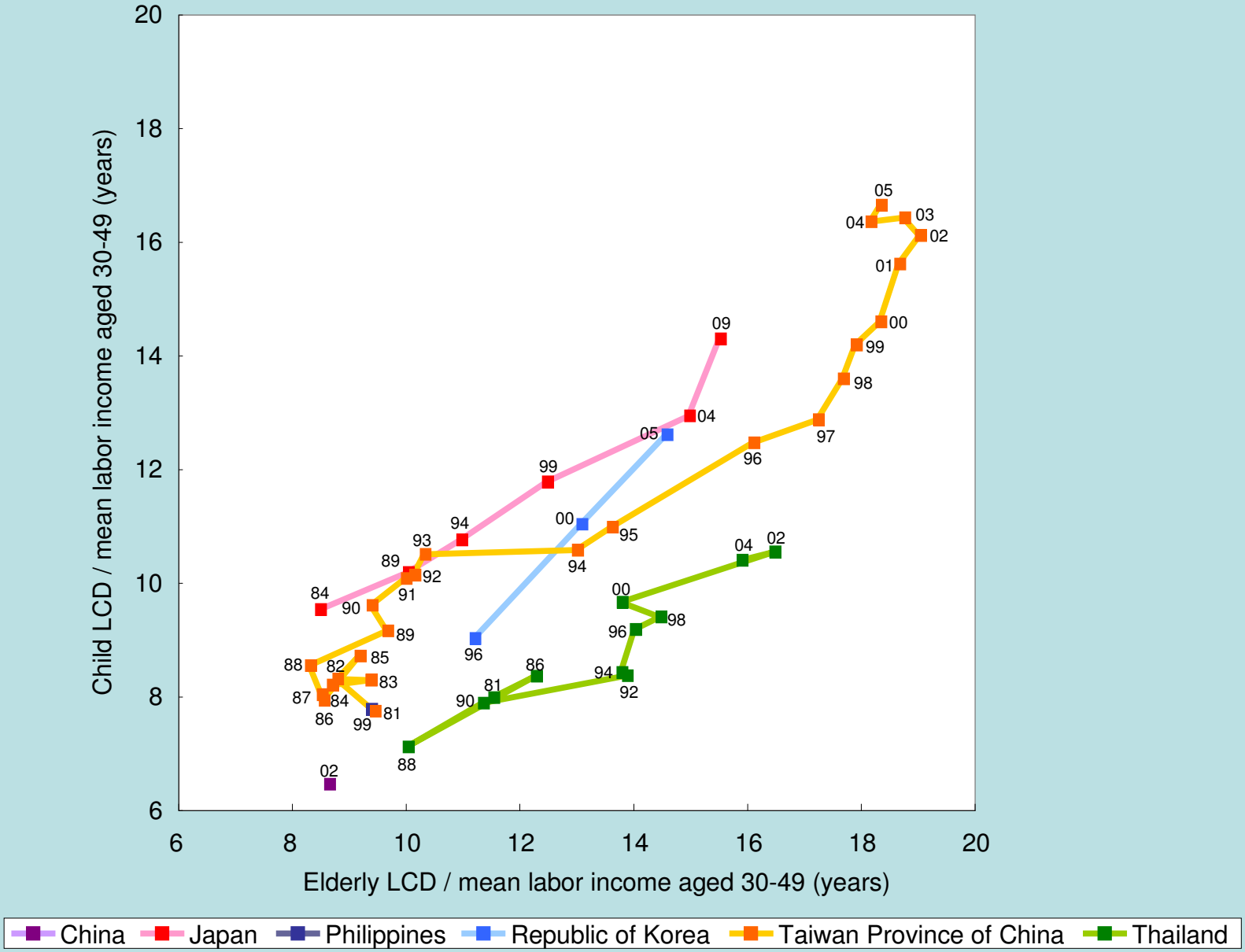




India (2004-5)



Relationship between cost of children and cost of the elderly in the selected Asian countries



Prime-age workers:

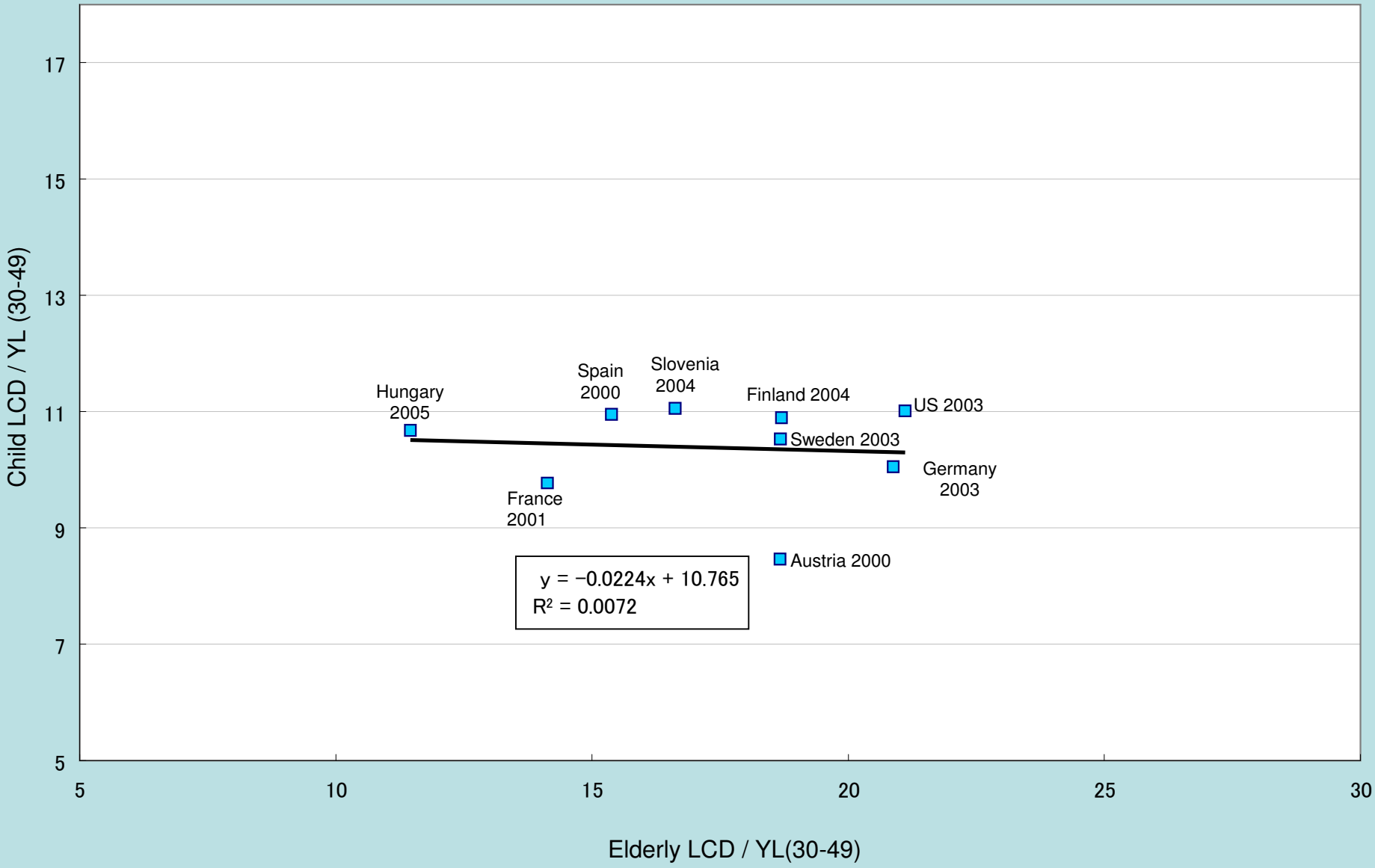
In almost every country, working-age adults are relying heavily on assets to meet their own material needs and their familial and social obligations to other generations.

This working generation is called･･･

“Sandwich generation” or “Panini generation”

Pattern of European countries

Normalized per capita LCD of children vs. that of the elderly in Western countries

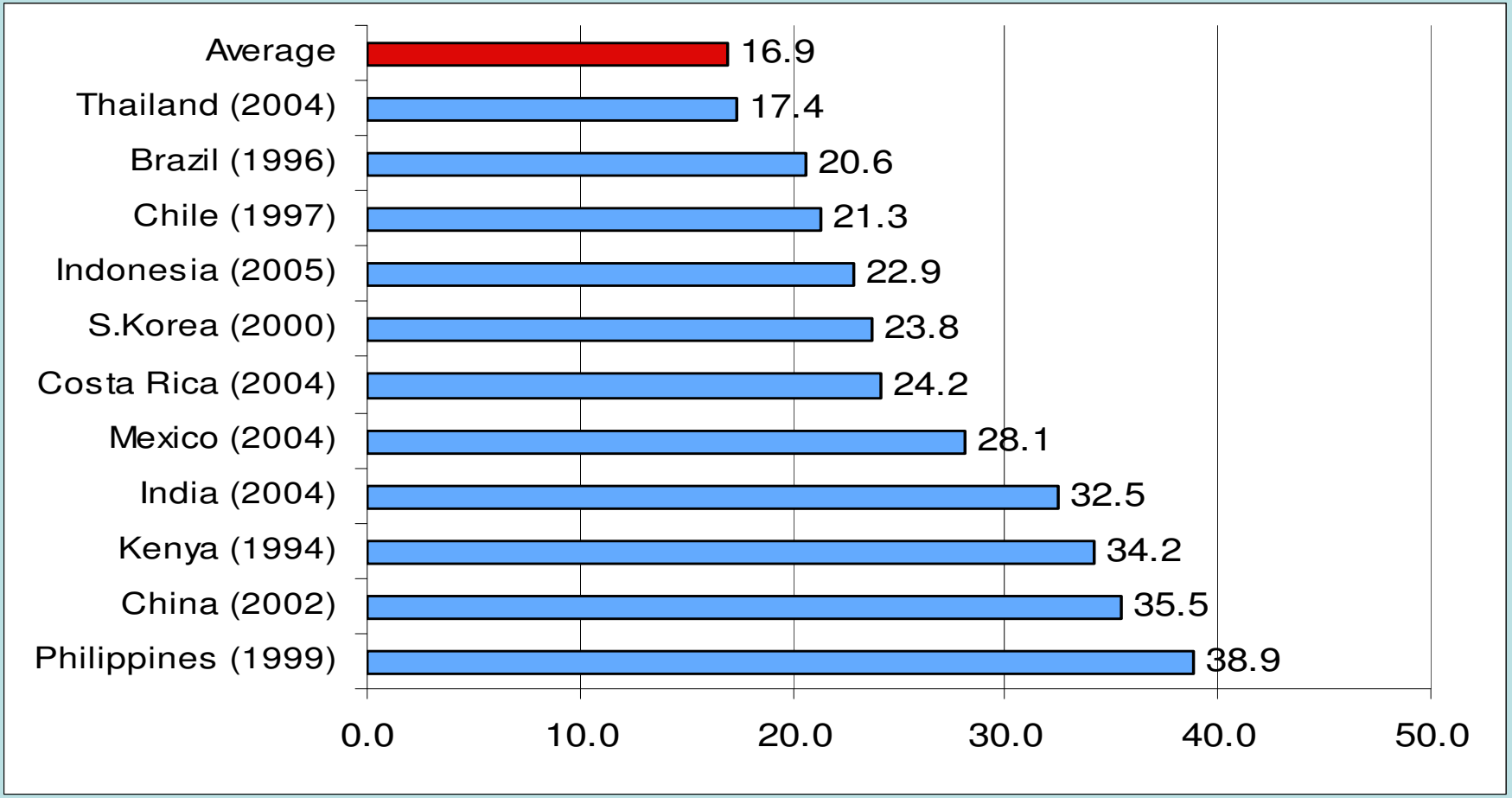


Funding Old Age

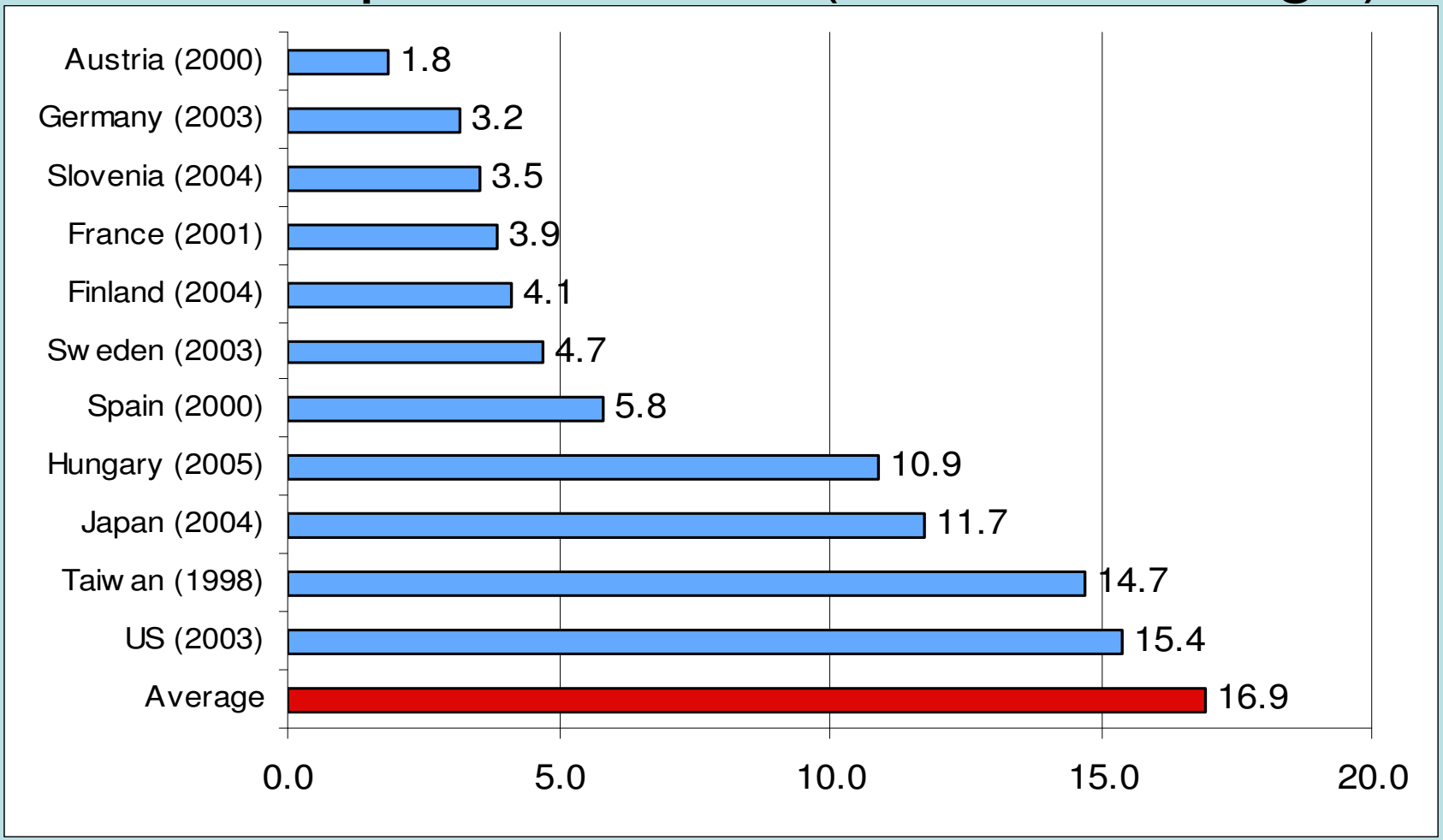
Issues

- Do the elderly produce more of their consumption in some countries?
- How do the elderly fund their lifecycle deficit
  - Public transfers
  - Private transfers
  - Asset-based flows

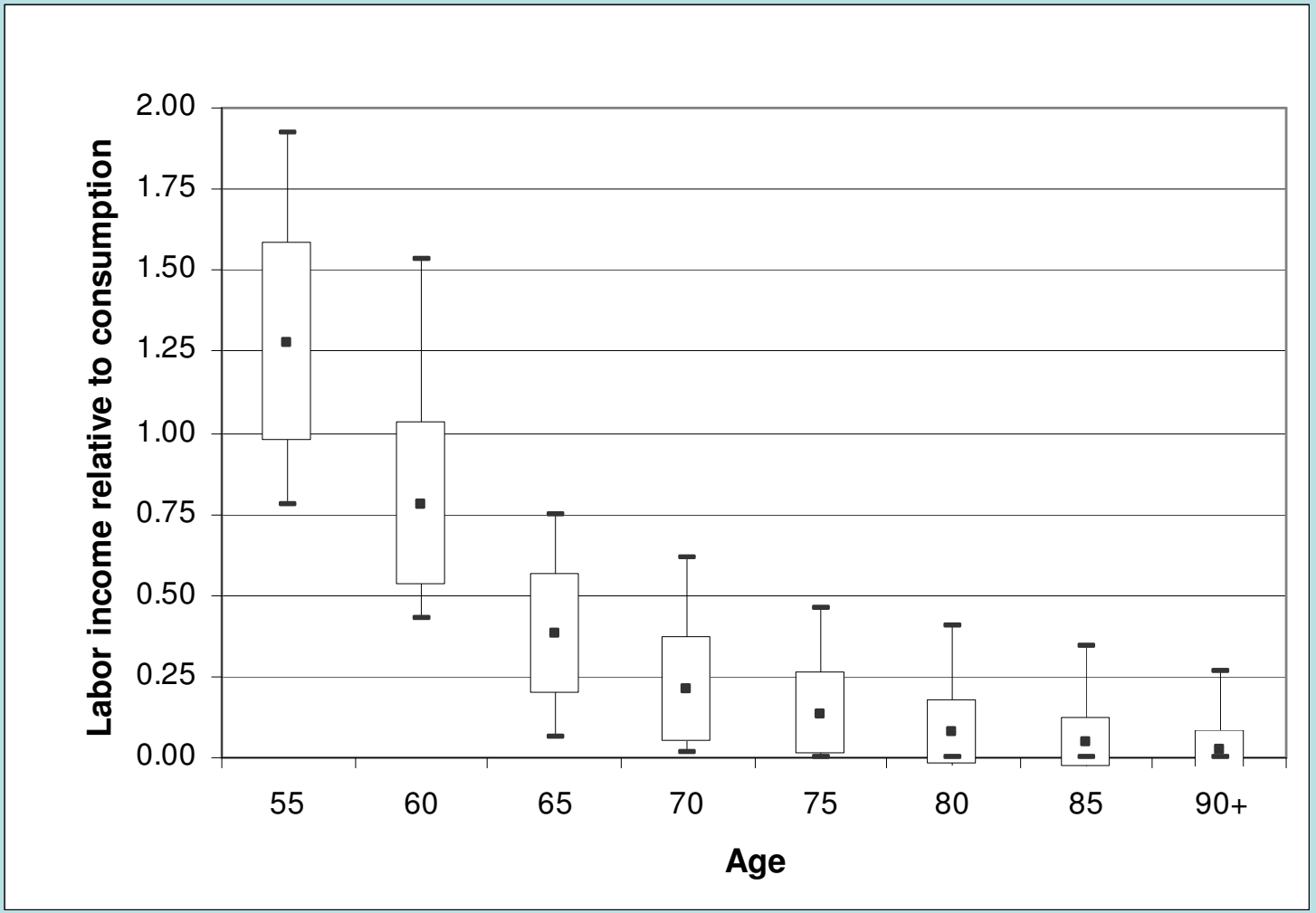
Labor Income as a Percentage of Consumption for 65+ (Above Average)



Labor Income as a Percentage of Consumption for 65+ (Below Average)



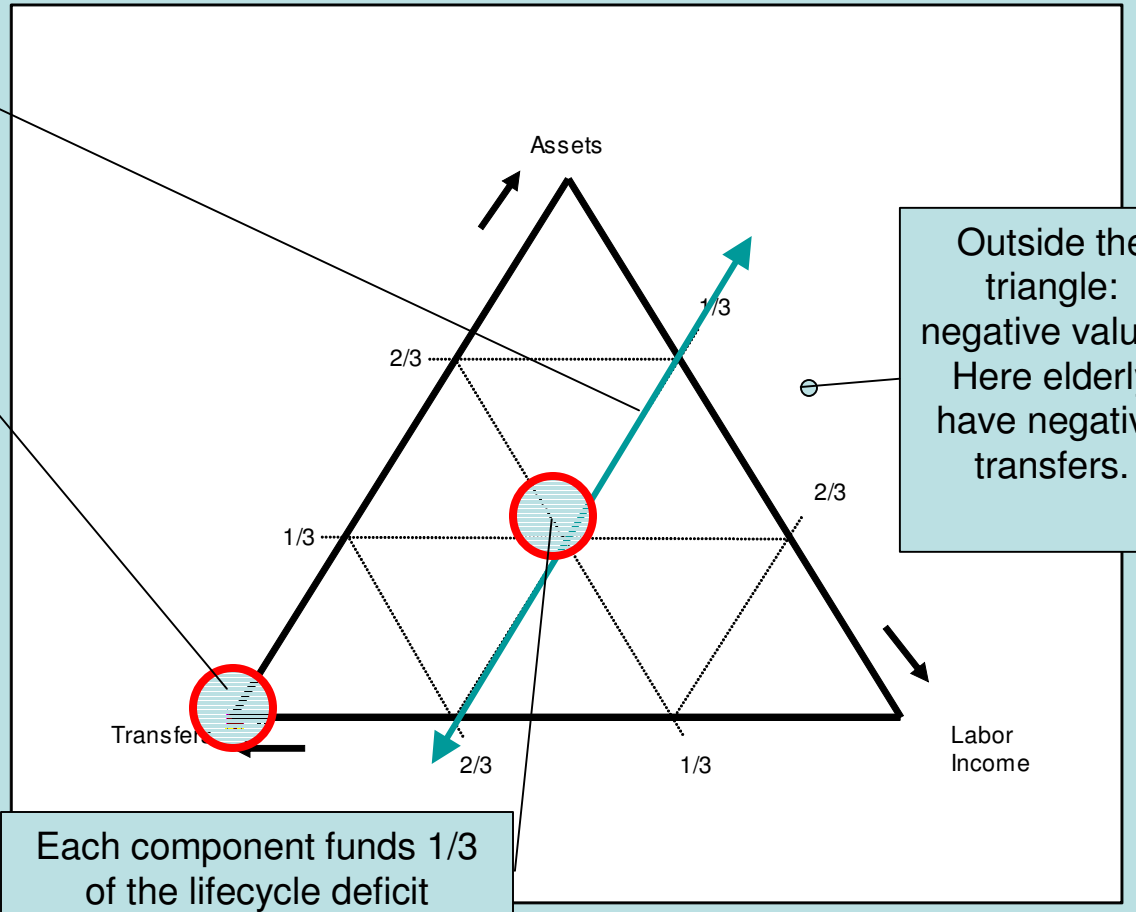
Labor income in old age: 23 NTA countries



Representing the Old-age Support System: Triangle Graph

Along a grid line, share of one component is constant; other two vary. Ex: transfers constant at 1/3.

Value at corner of triangle means that elderly rely exclusively on that source – transfers in this example.

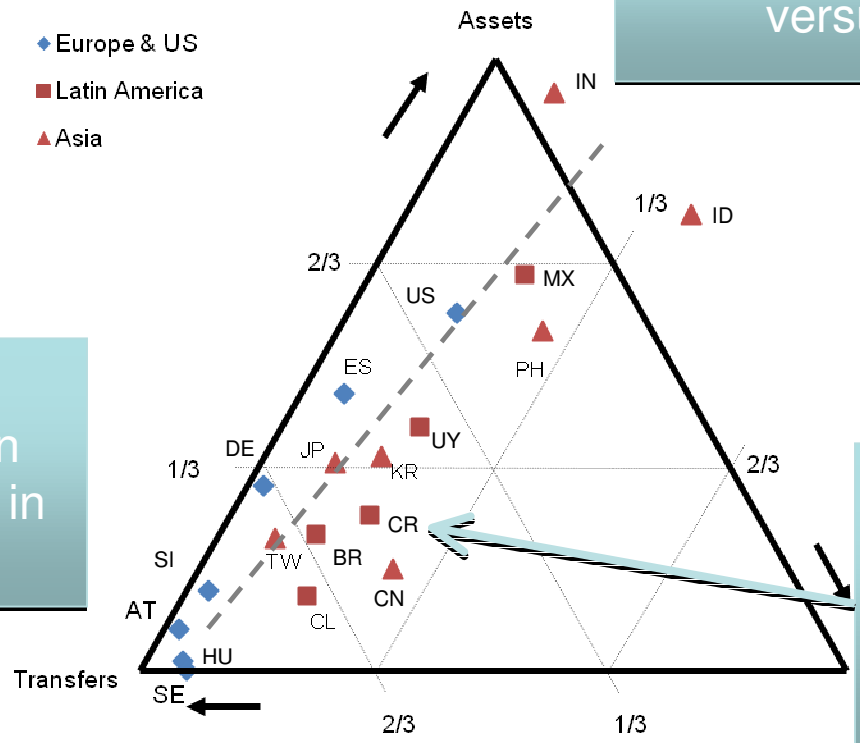


Outside the triangle: negative values. Here elderly have negative transfers.

Each component funds 1/3 of the lifecycle deficit

Old-age Support System NTA Countries

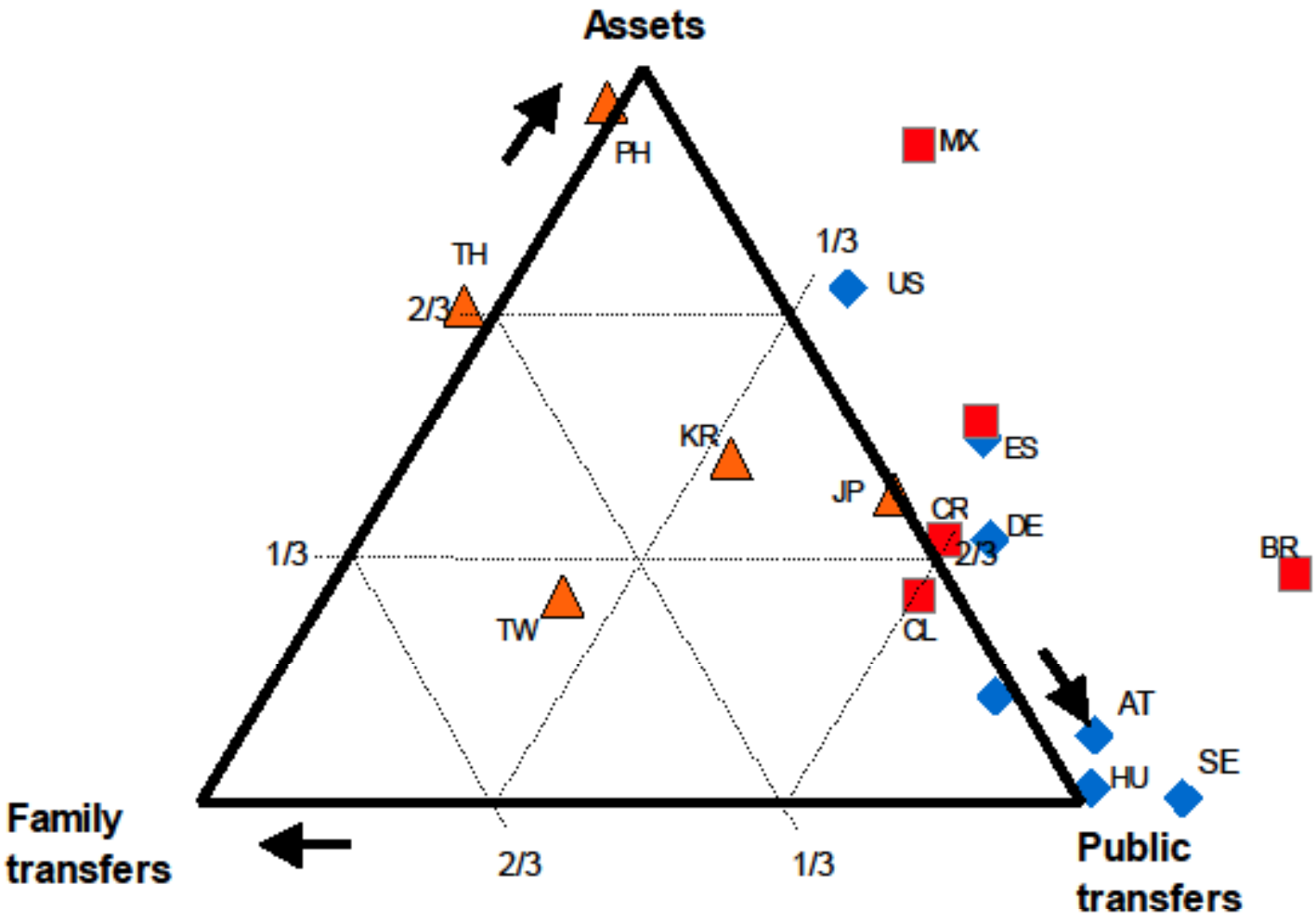
Key tradeoff: transfers versus assets.



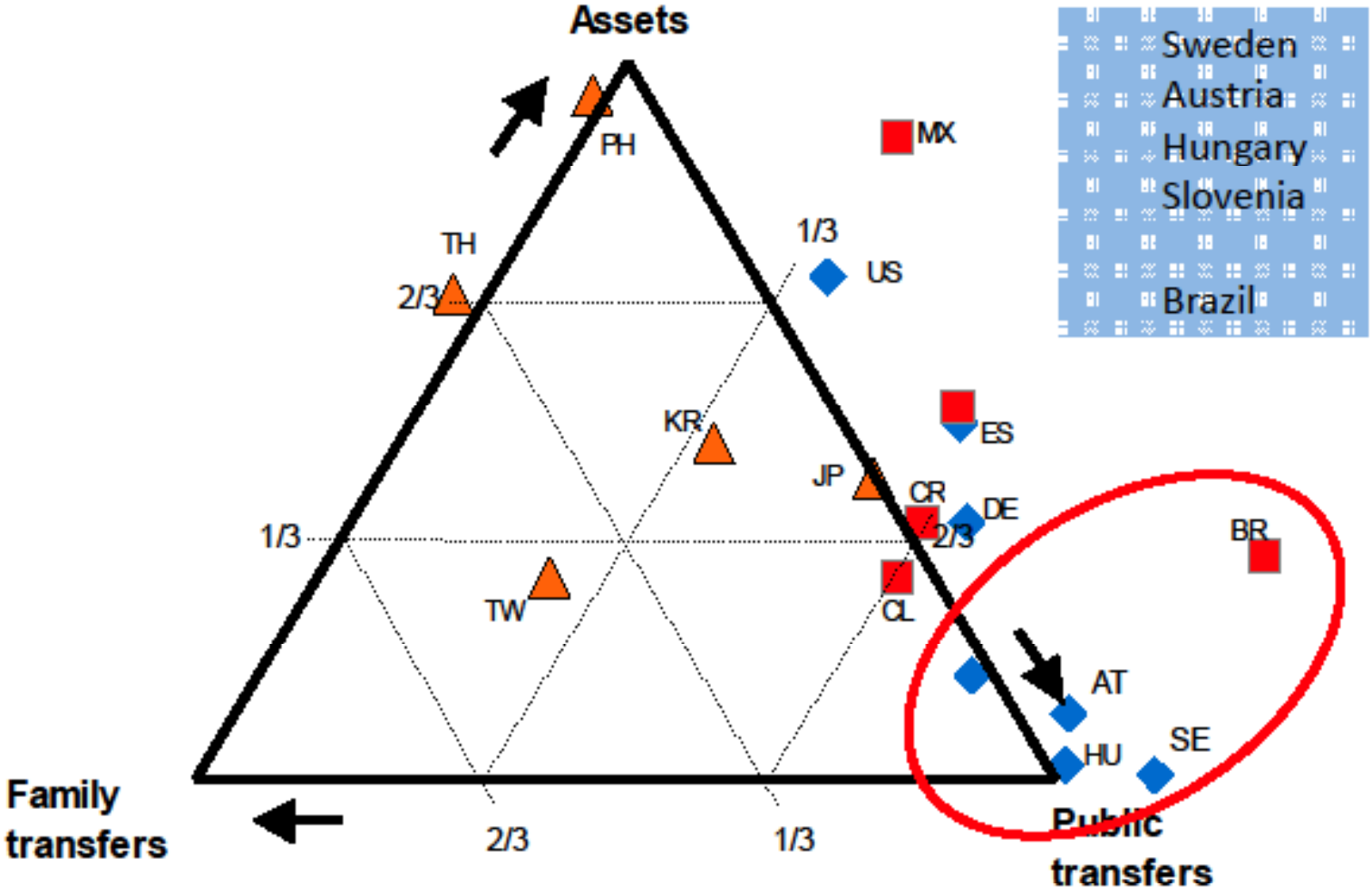
Heaviest reliance on transfers is in Europe.

Latin America and East Asia are similar in their reliance on transfers

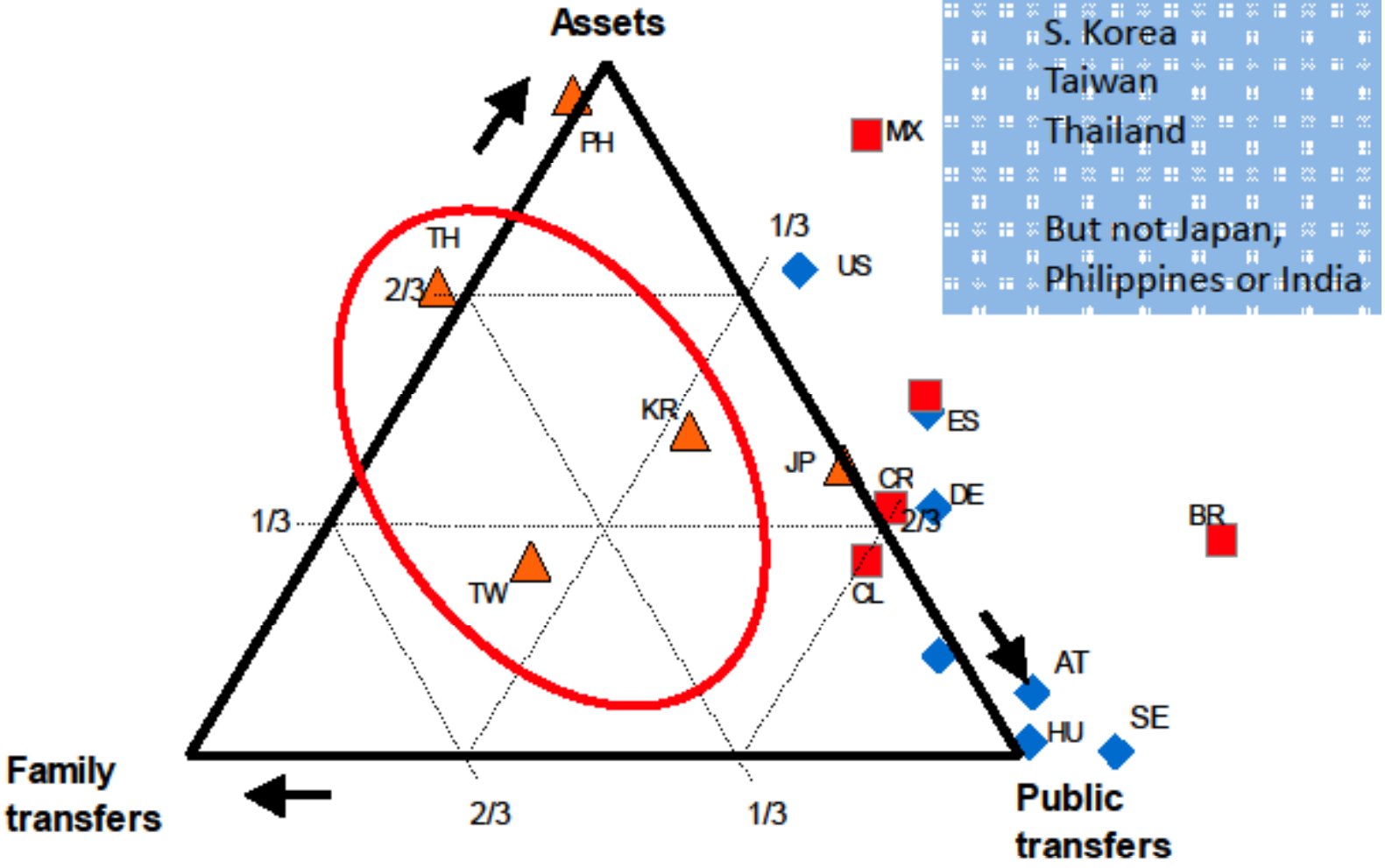
Shares of consumption not covered by labor income: **Family Transfers, Public Transfers** and **Asset income** (part not saved) sum to 1.0



Elders In some countries rely 100% on public sector transfers.



Elders In some Asian countries rely in part on family transfers.

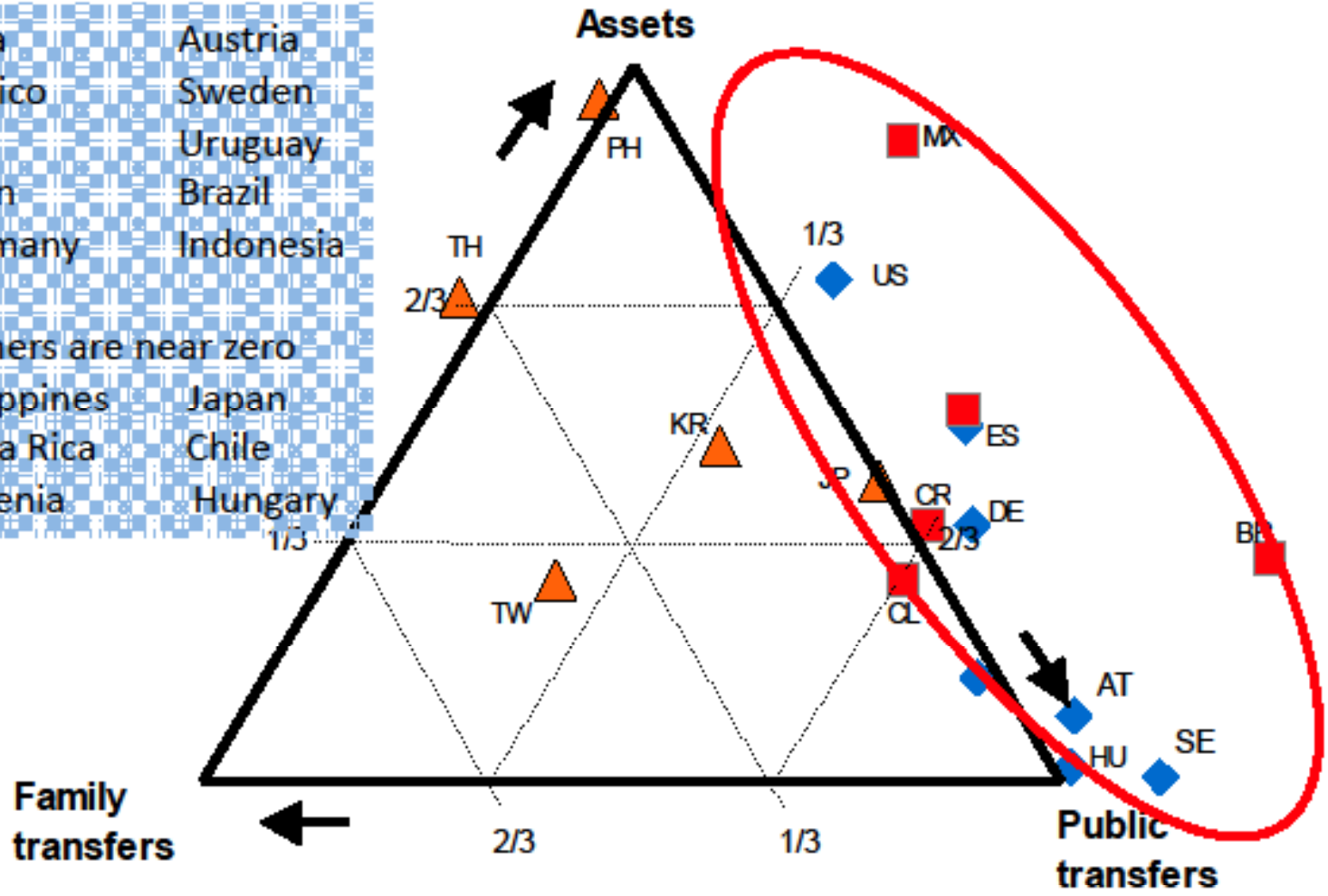


But in more countries, elders actually make net transfers to their children

India	Austria
Mexico	Sweden
US	Uruguay
Spain	Brazil
Germany	Indonesia

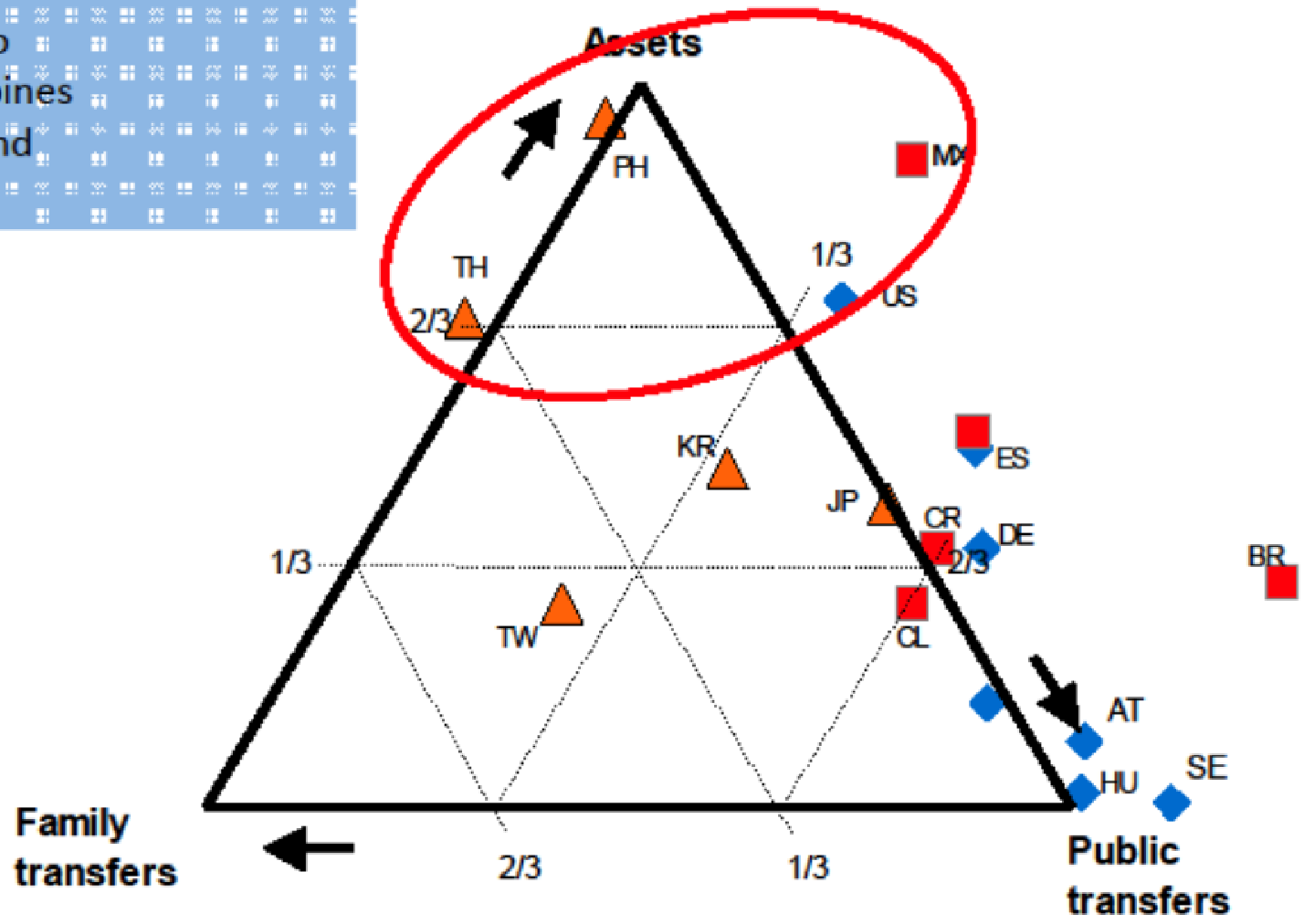
While others are near zero

Philippines	Japan
Costa Rica	Chile
Slovenia	Hungary



In some countries, elders rely mainly on asset income.

India
Mexico
Philippines
Thailand
US



Cost of Children

A Simple Calculation for Japan 1984

Working years (in 1984)····· 30 years of LY

Lifecycle deficit per child····· 1 years of mean LY

Lifecycle deficit in retirement·· 5 years of mean LY

TFR 1.89

How many children?

Any further extension of longevity?

Work longer, live longer!

Is the cost of children related to the number of children in Japan as well as other Asian countries?

Quantity-Quality Tradeoff: interpretation of elasticities

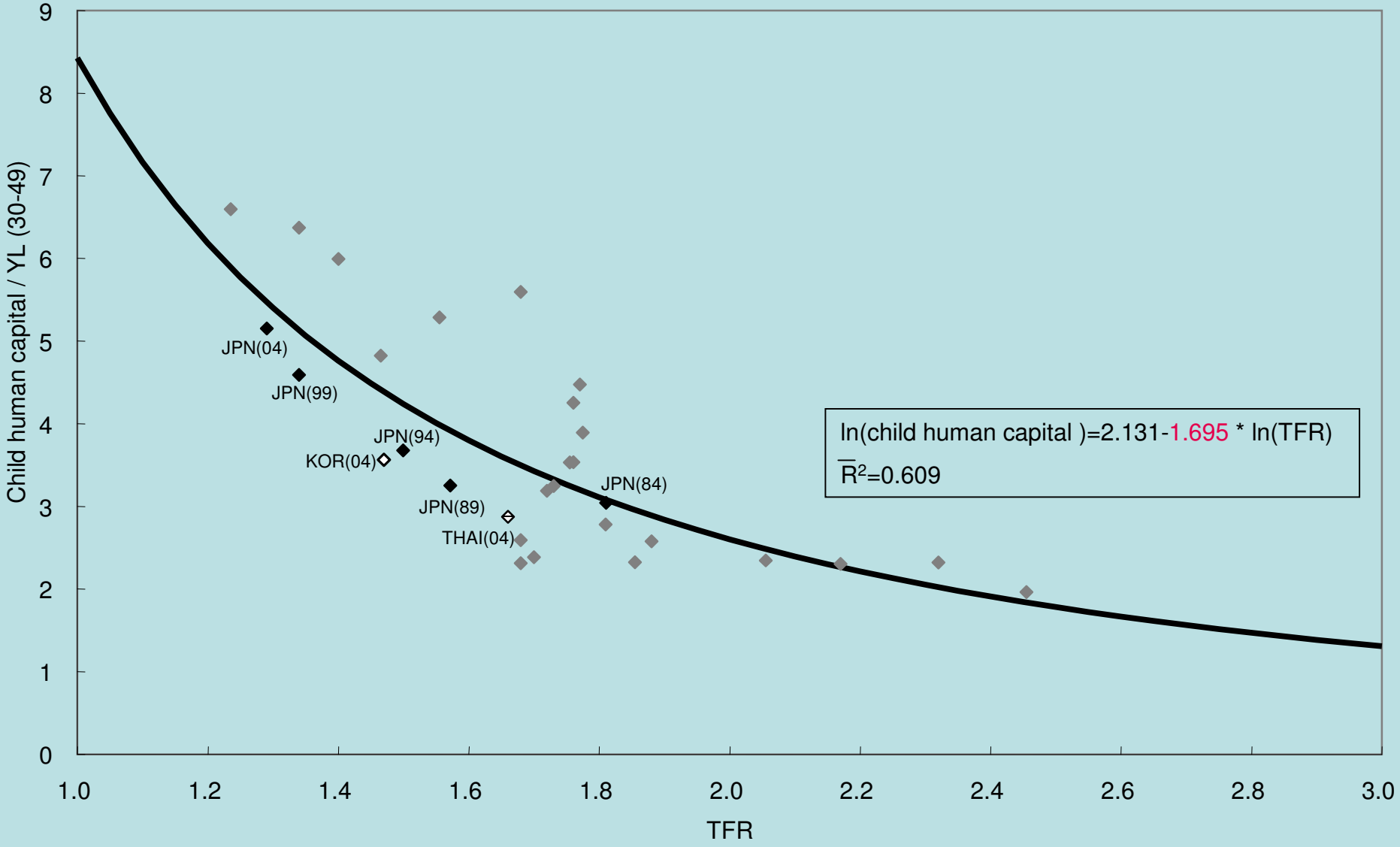
- ln C = b0 +b1 ln N

where C=cost per child and

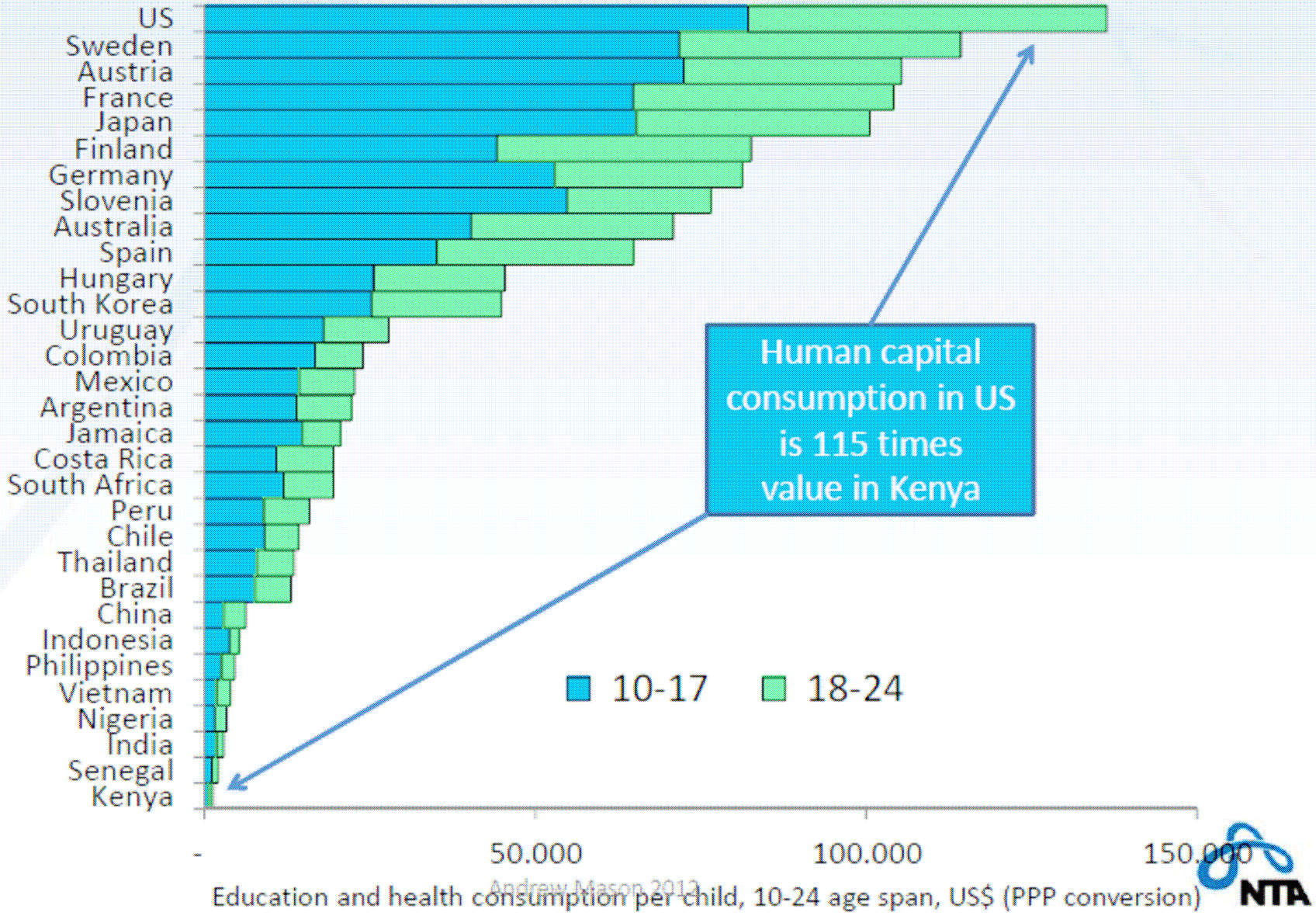
- N=number of children

- ln CN (cost per adult) =
- b0 + (b1+1) ln N
- KEY: b1 > -1 or <-1

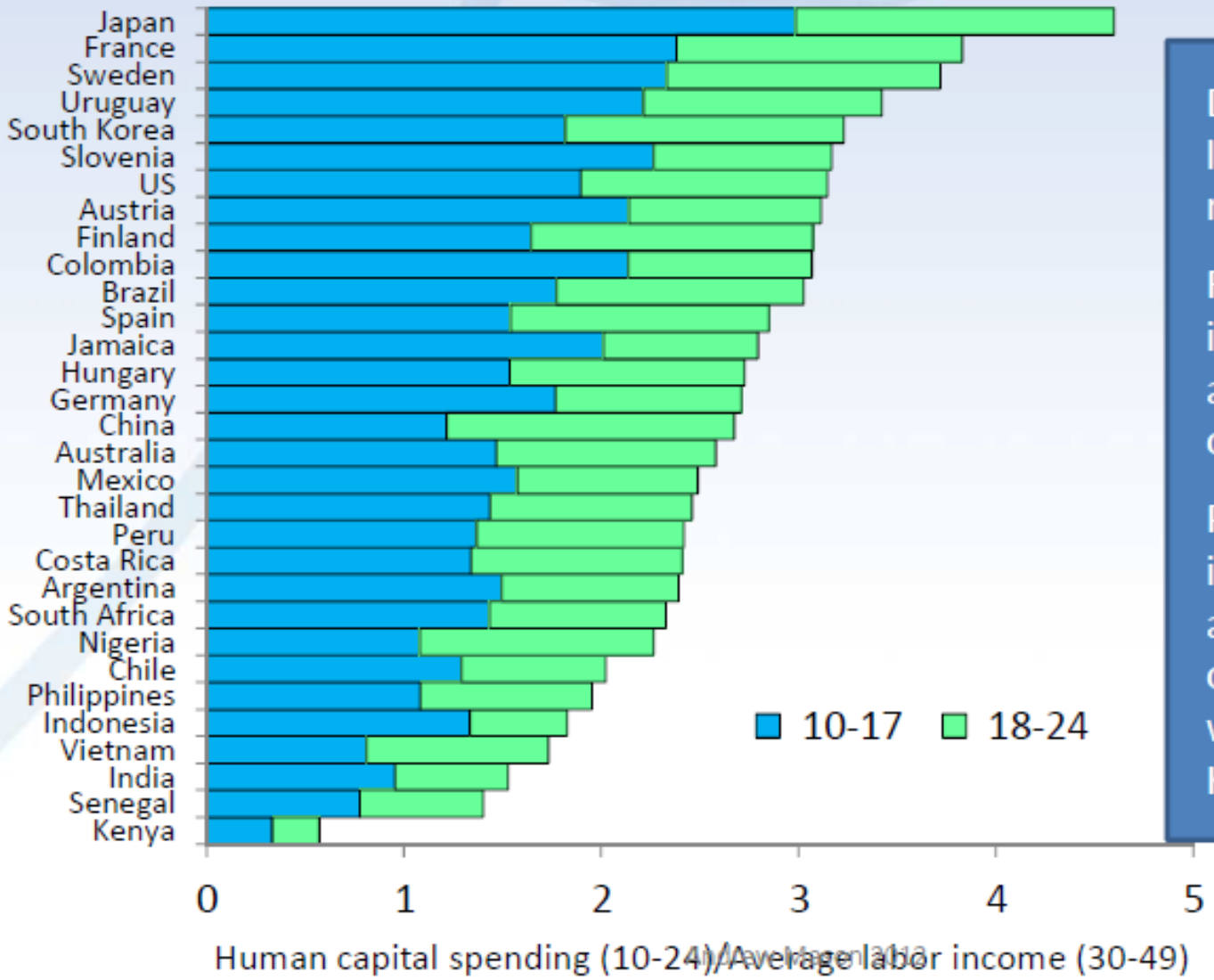
TFR vs. normalized per capita human capital spending for children in selected Asian countries



Disparity in Human Capital Spending



First Driver of Disparity: Differences in Income



Differential is much lower if expressed relative to income.

Rich countries investing 3 to 4 times annual labor income of persons 30-49.

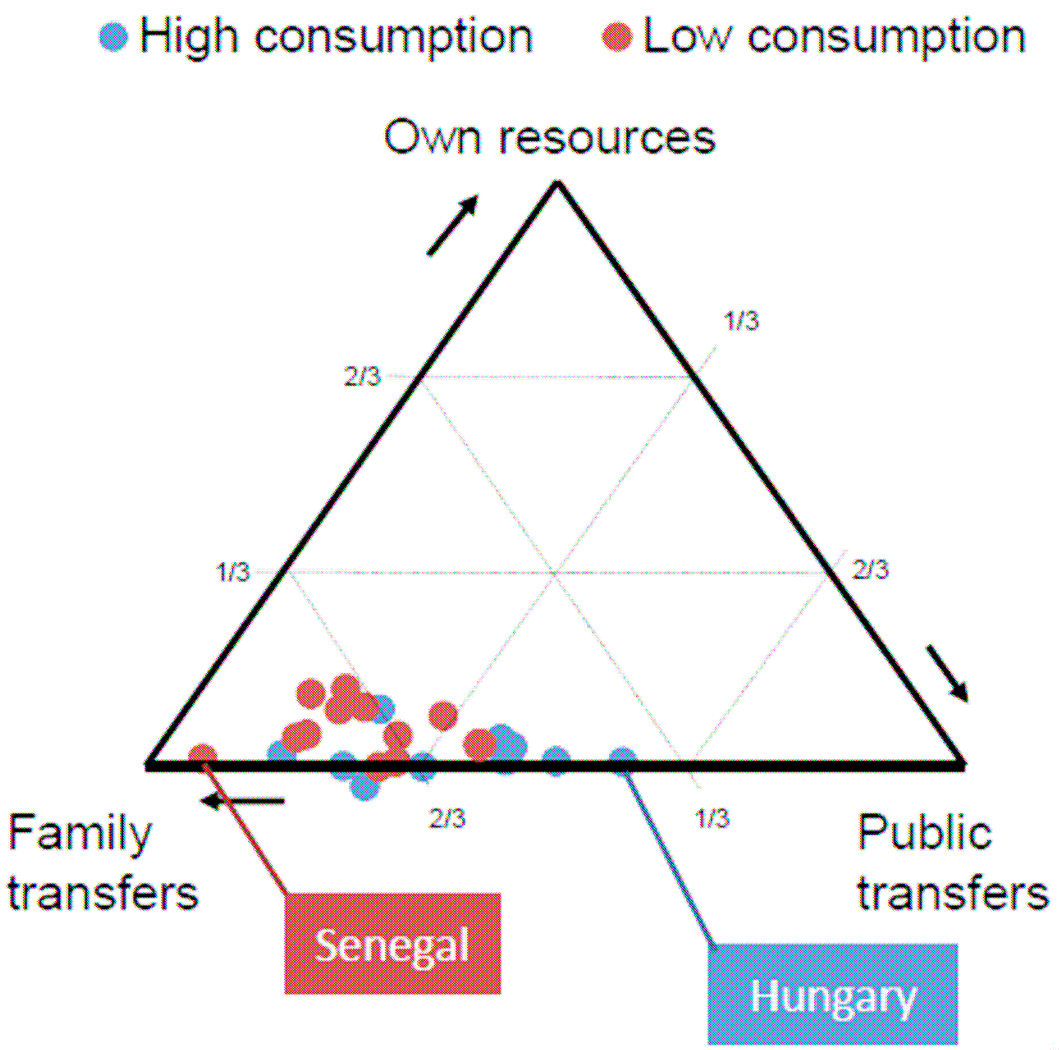
Poor countries are investing 1 to 2 times annual labor income of persons 30-49 with lower value for Kenya.

Second Driver: Dependence on Families, 10–17 Year Olds in 24 Countries

Own resources include labor income, asset income, and credit

High consumption: average for 10-24 > $5000

Low consumption: average for 10-24 < $5000.

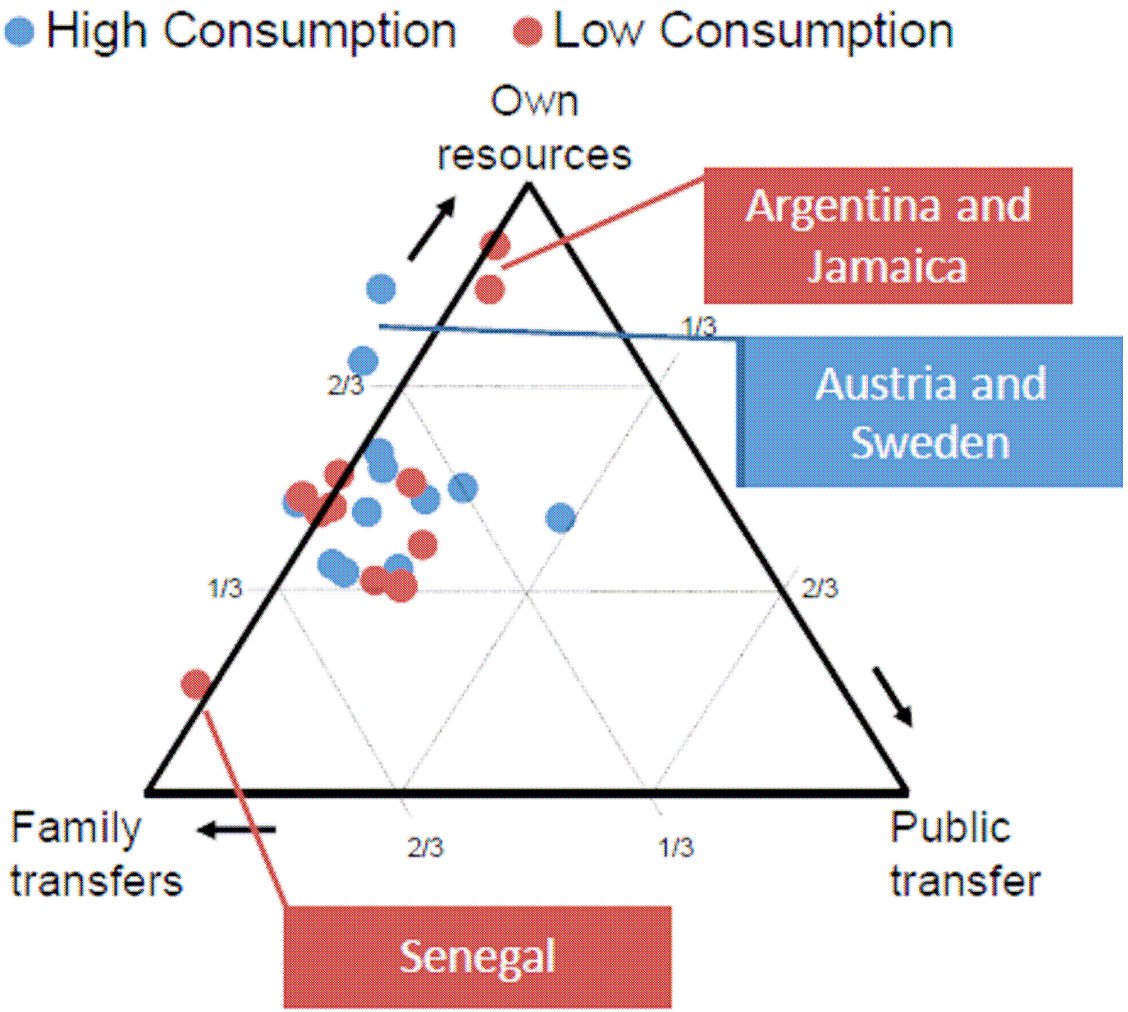


Second Driver: Dependence on Families, 18-24 Year Olds in 24 Countries

Consumption for 18-24 year olds is funded from own resources and family transfers

Net public transfers are very small in all countries

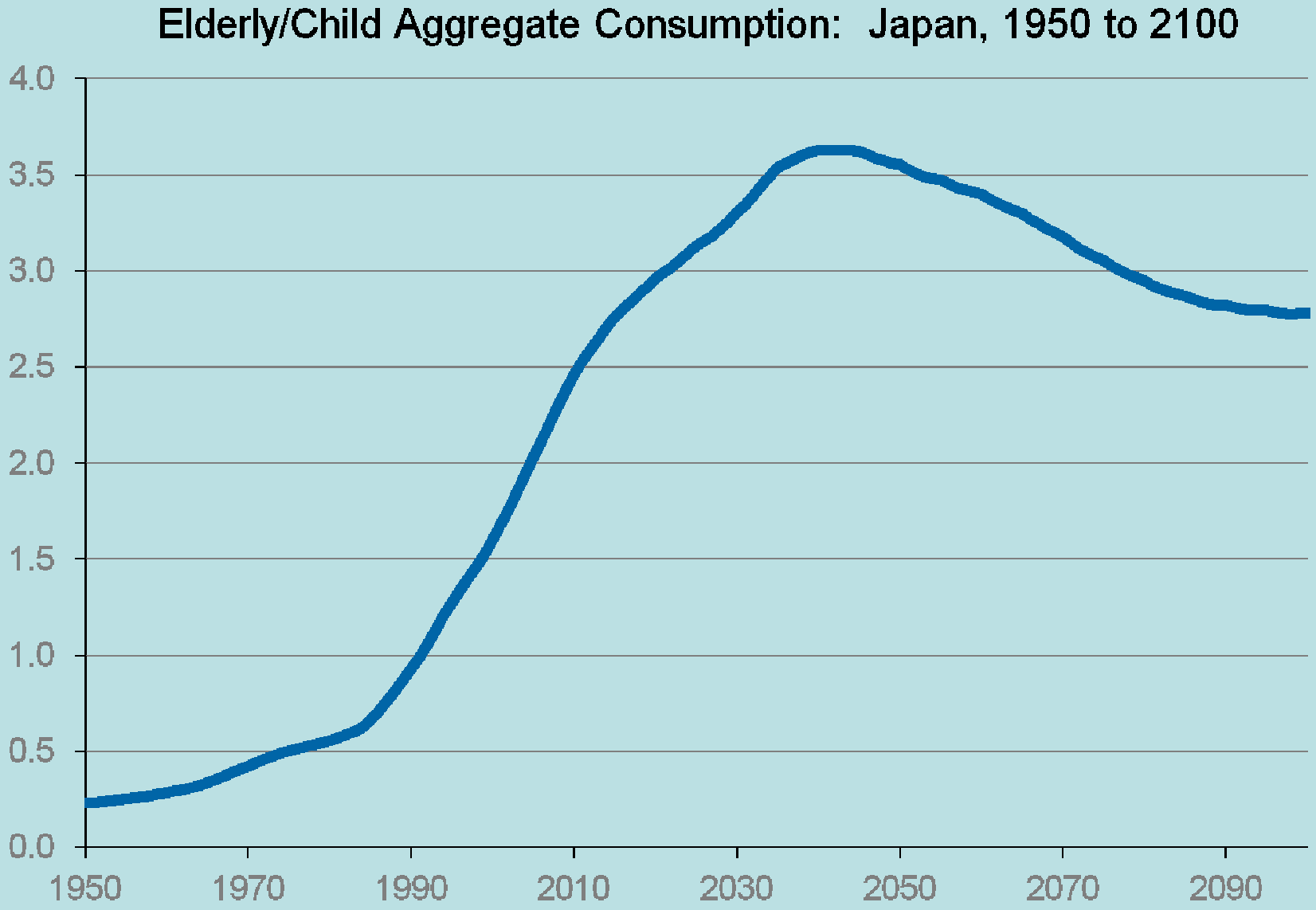
For countries to the left of the triangle taxes paid exceed benefits received.



Forecasts based on Japan NTA data from 2004

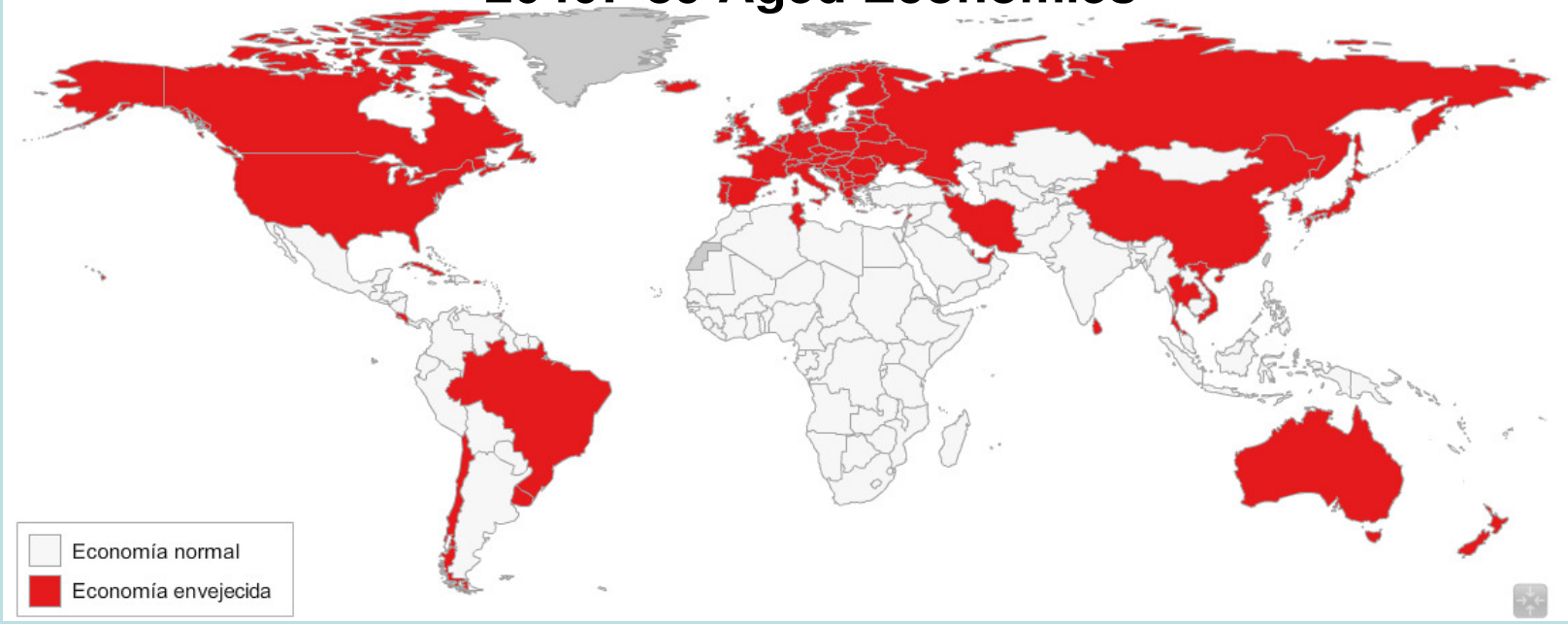
- Aggregate consumption by elderly versus children.
- Economic Support Ratios
- Family and Fiscal Support Ratios

Japan became the world's first Aged Economy in 1992, when consumption by elderly exceeded that by children.

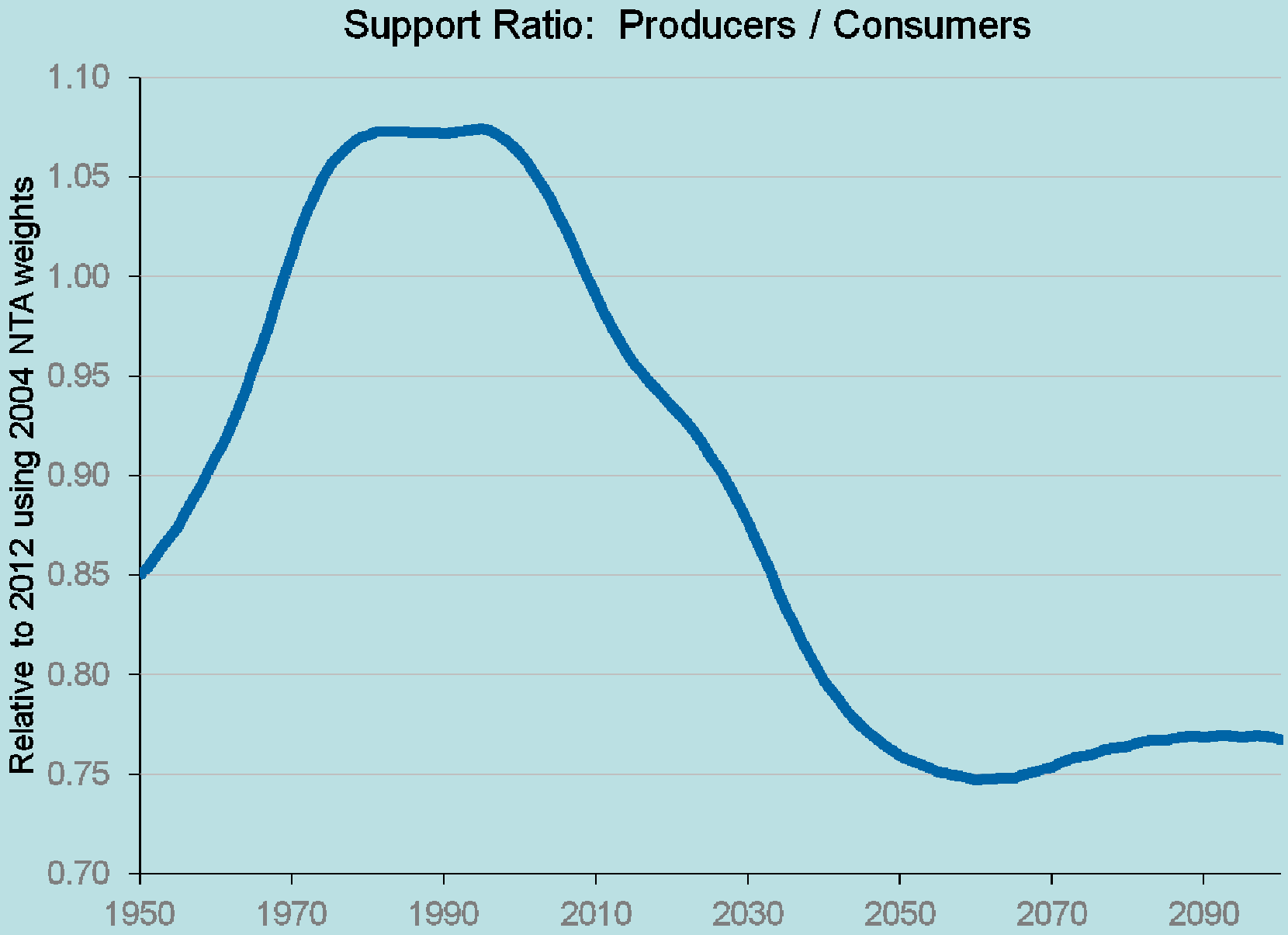


2010: 23 Aged Economies in the World

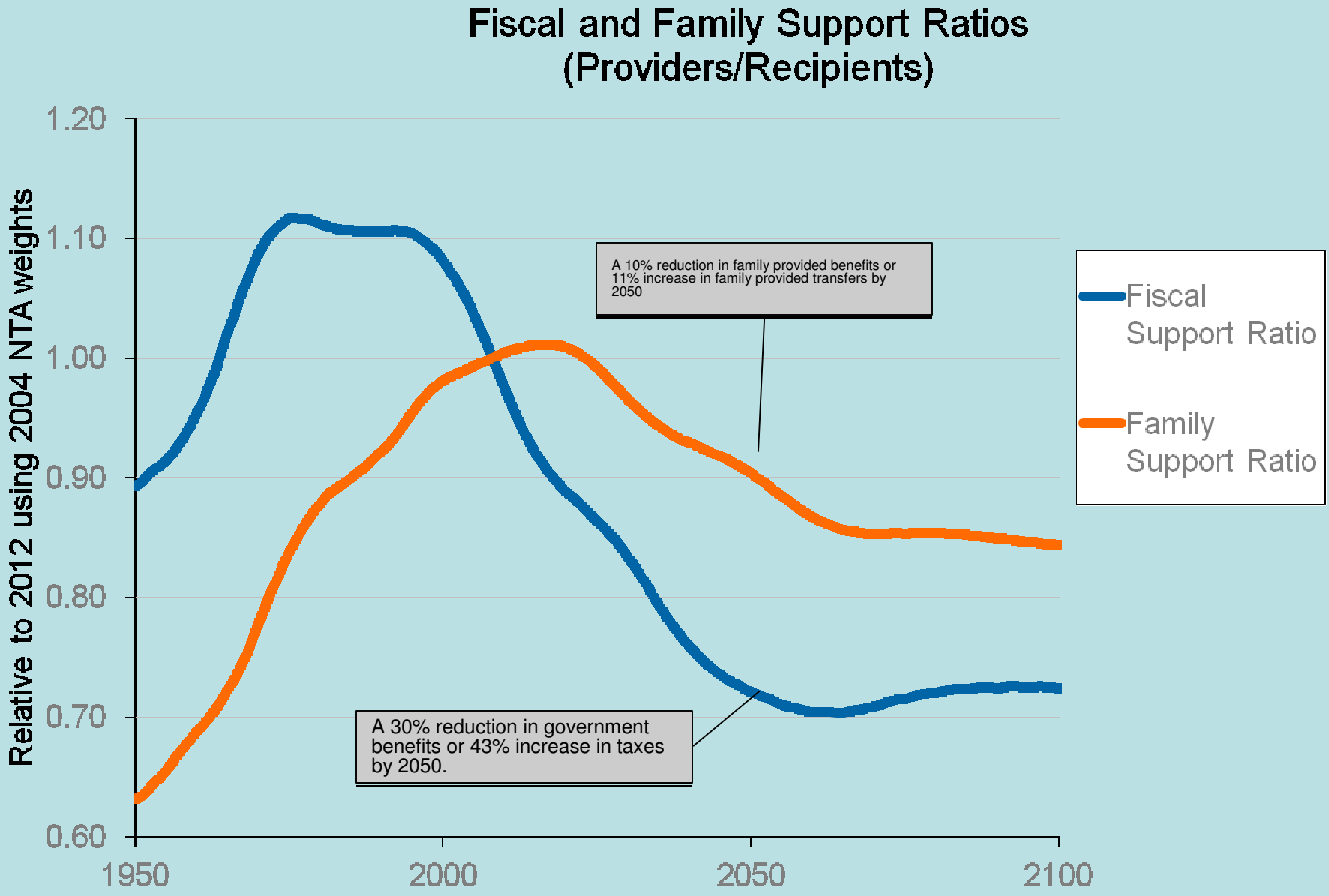
2040: 89 Aged Economies



A reversal in trend:
Labor force will grow more slowly than consumers.



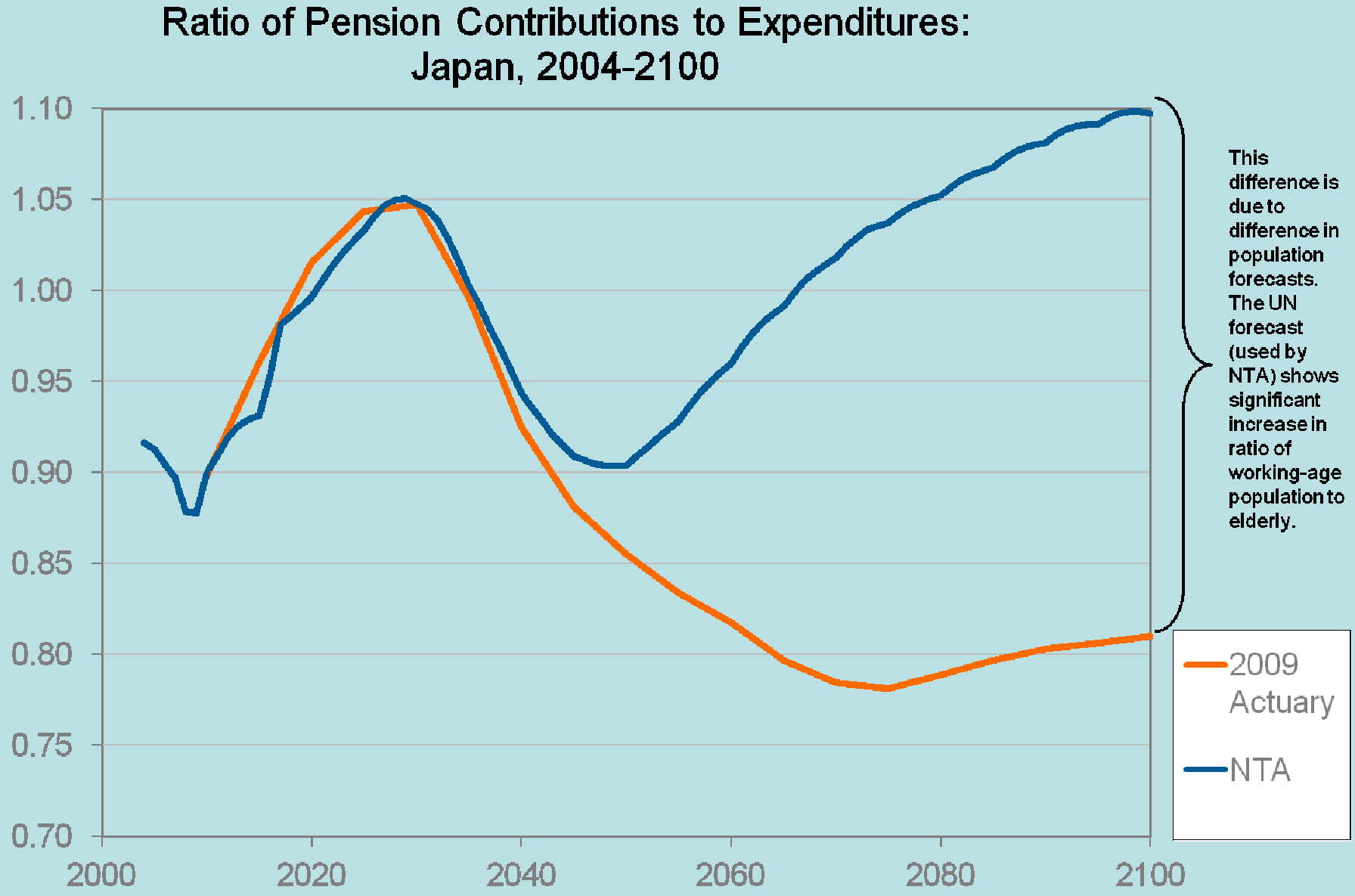
Japan to face double crisis: Decline in both fiscal and family support ratios.



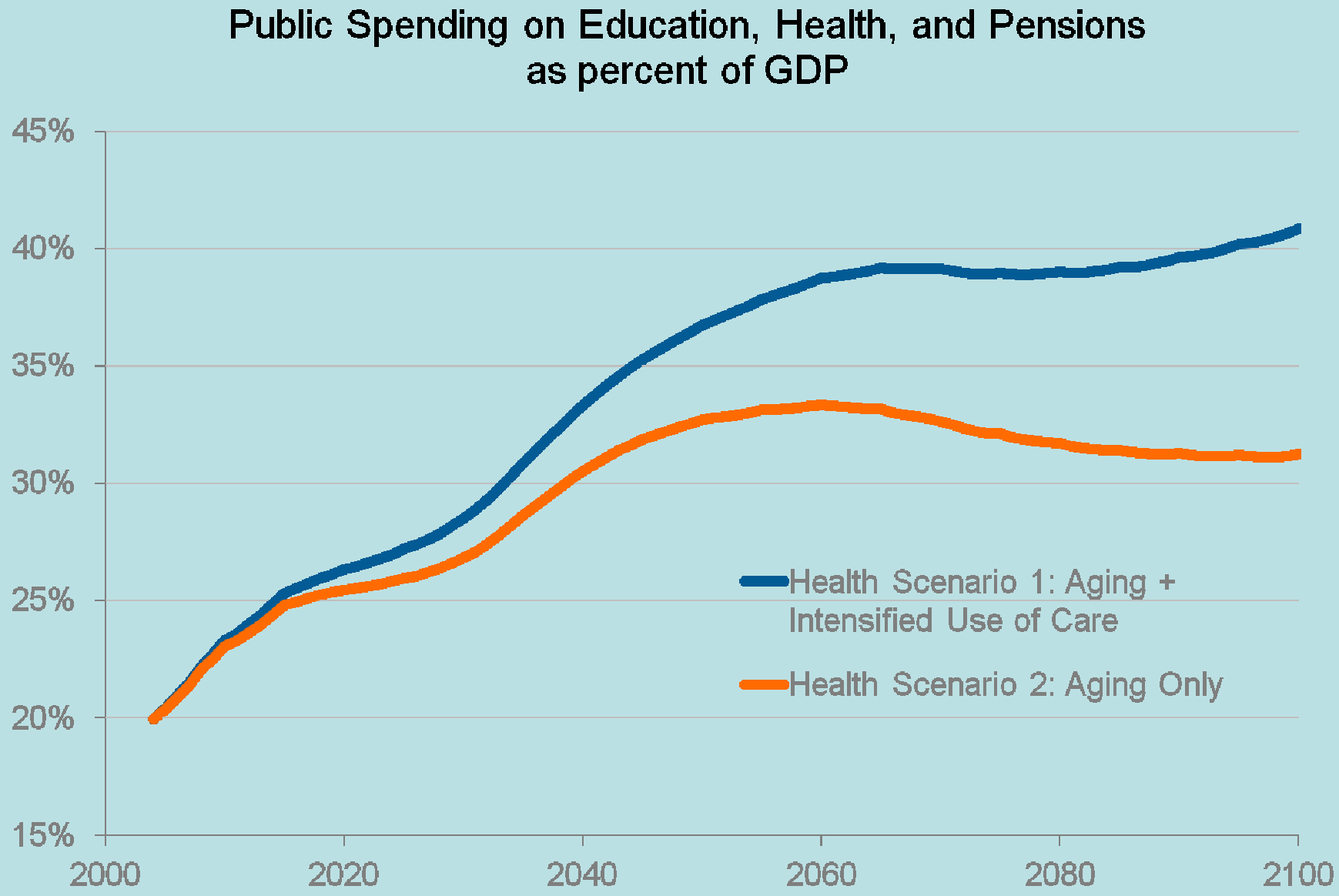
Fiscal forecasts based on Japan NTA data from 2004

- Pensions and impact of reforms.
- Fiscal impact of health care to exceed that of pensions.

Our simple NTA pension projection model closely matches official projections over the short run.



Public transfers > 1/3 of economy by 2050



Another forecasts based on Japan NTA data from 2004

- Bequest Estimate and Wealth Impact in Japan
- Provide reliable estimates of bequest flows in Japan (using a OLG model with realistic demography)
- Give insight on the observed inheritance U-shaped pattern described by Piketty (2011)
- http://www.demogr.mpg.de/papers/working/wp-2013-012.pdf

Bequest: Part I/II

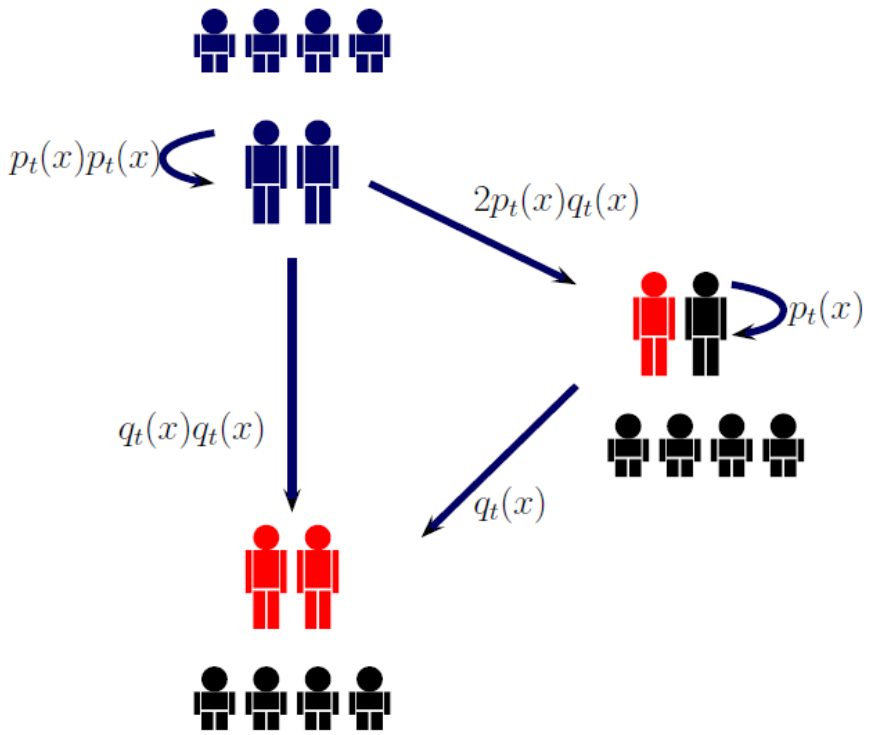


Figure: Expected bequest given, by partnership status and age

Bequest given at age *x* depends on

- Age
- Partnership status {married, widow/er}
- Number of eligible offspring
- Assets holding
- Inheritance law

Bequest: Part II/II

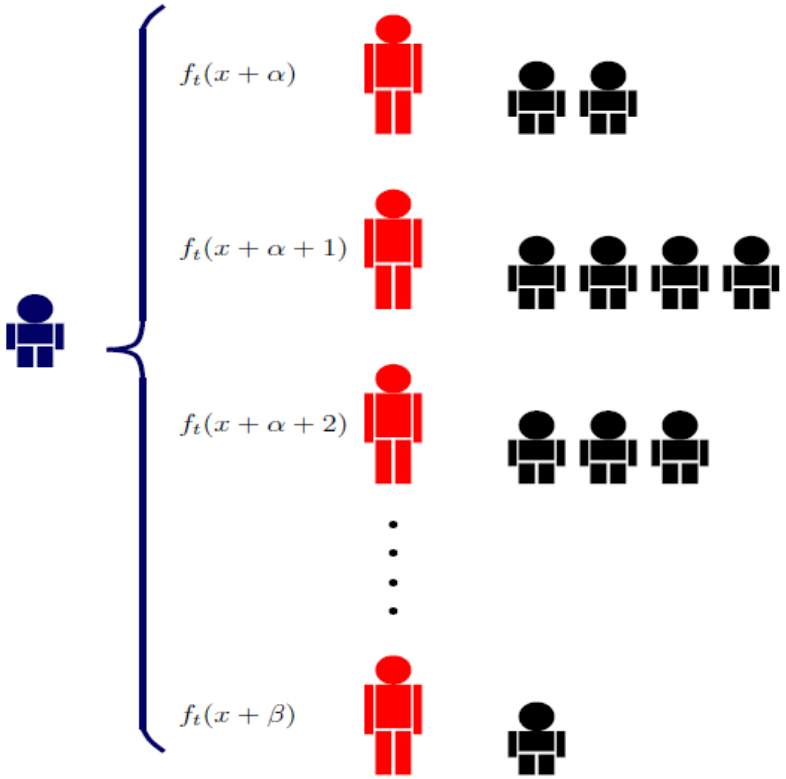


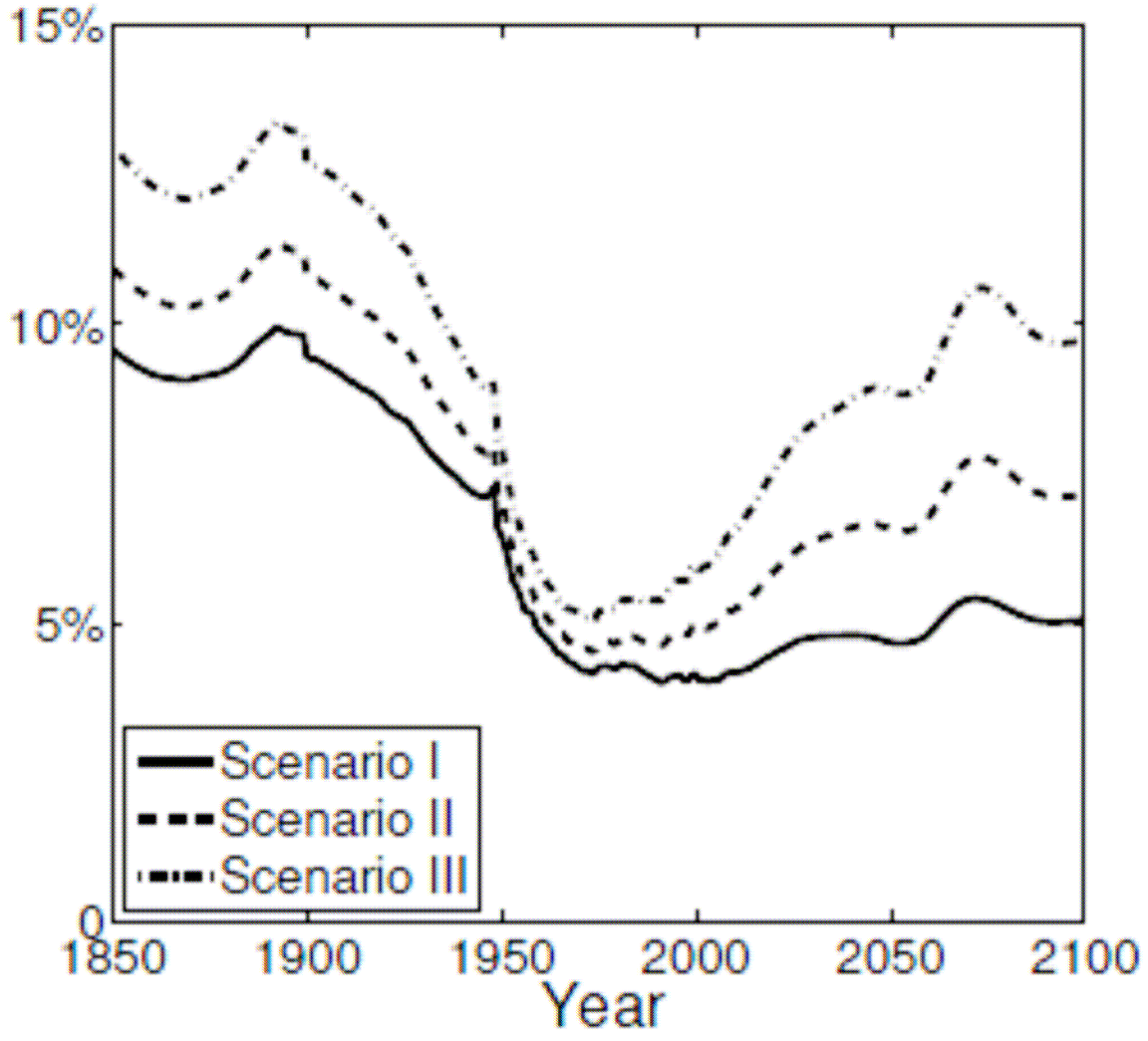
Figure: Expected bequest received, by age

Bequest received at age *x* depends on

- Age of the expected parent
- Status of the parent {married, widow/er}
- Assets held by parent(s)
- Own marriage status
- Assets held by spouse
- Inheritance law

a) bequest received at death of first parent
b) bequest received at death of second parent
c) bequest received at the simultaneous death of both parents
d) bequest received at death of the spouse.

Average per capita bequest relative to average labor income (ages 30-49), Japan 1850-2100



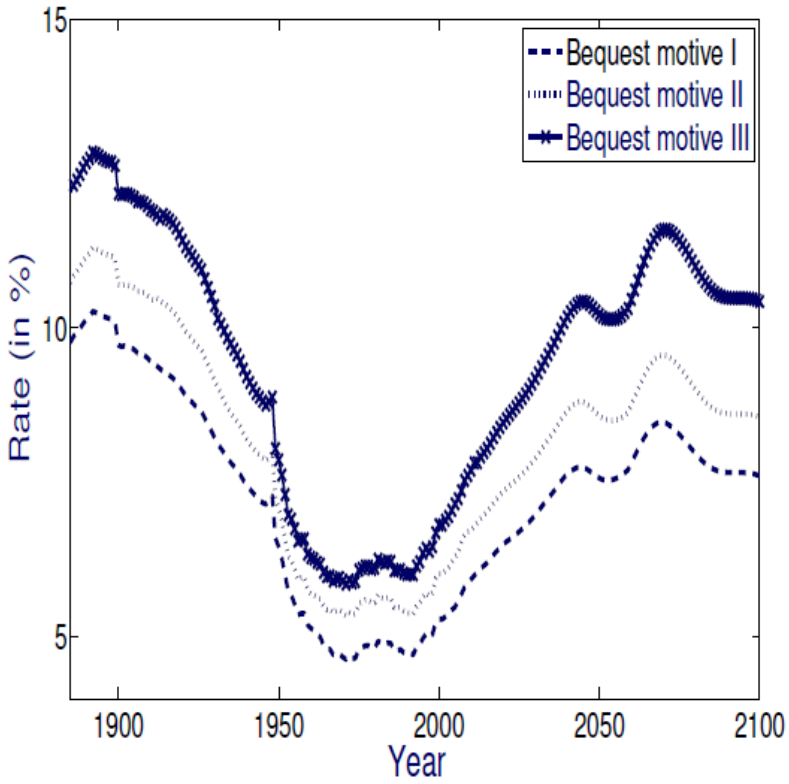


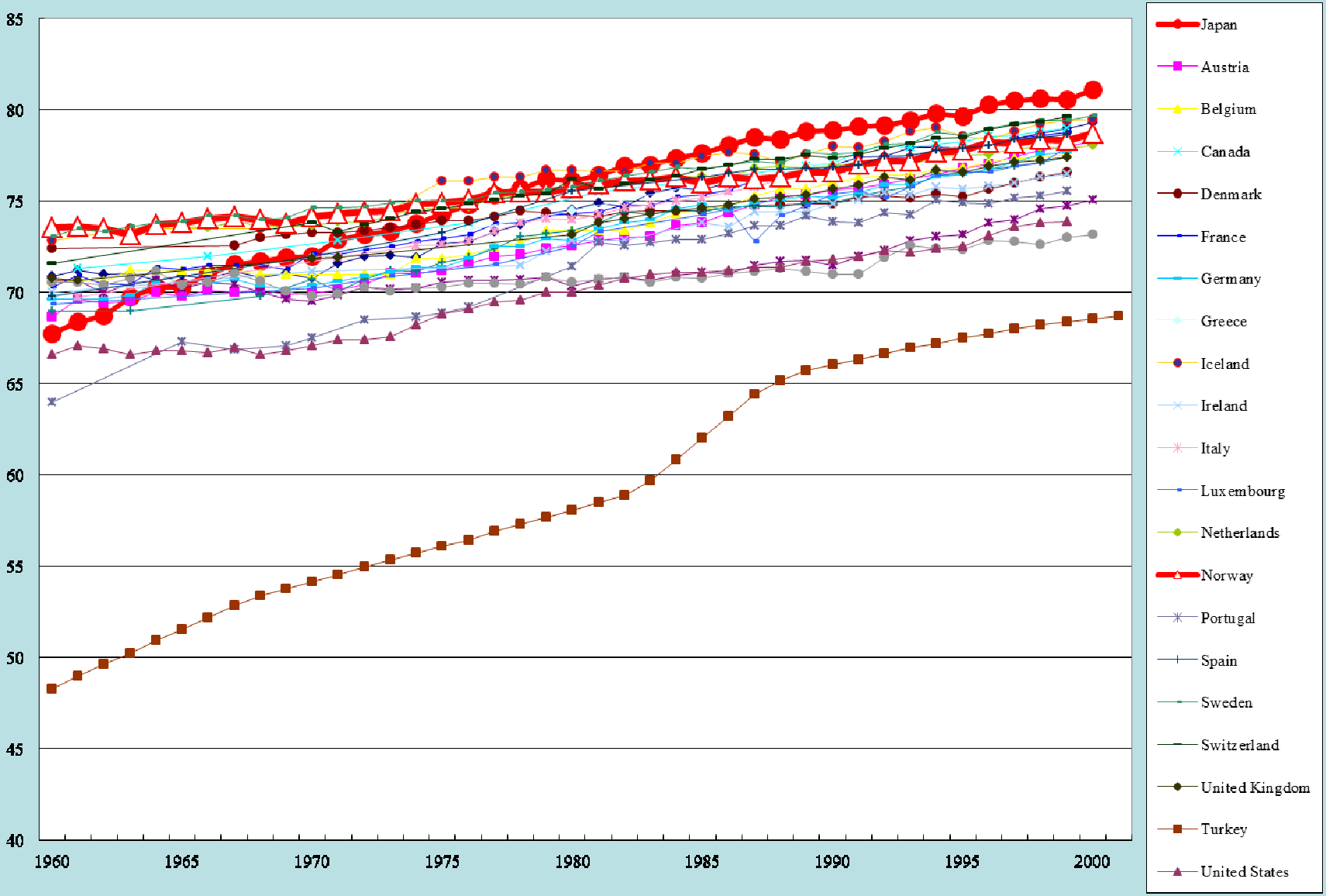
Figure: Bequest to output ratio (period 1885-2100), Japan

U-shaped pattern

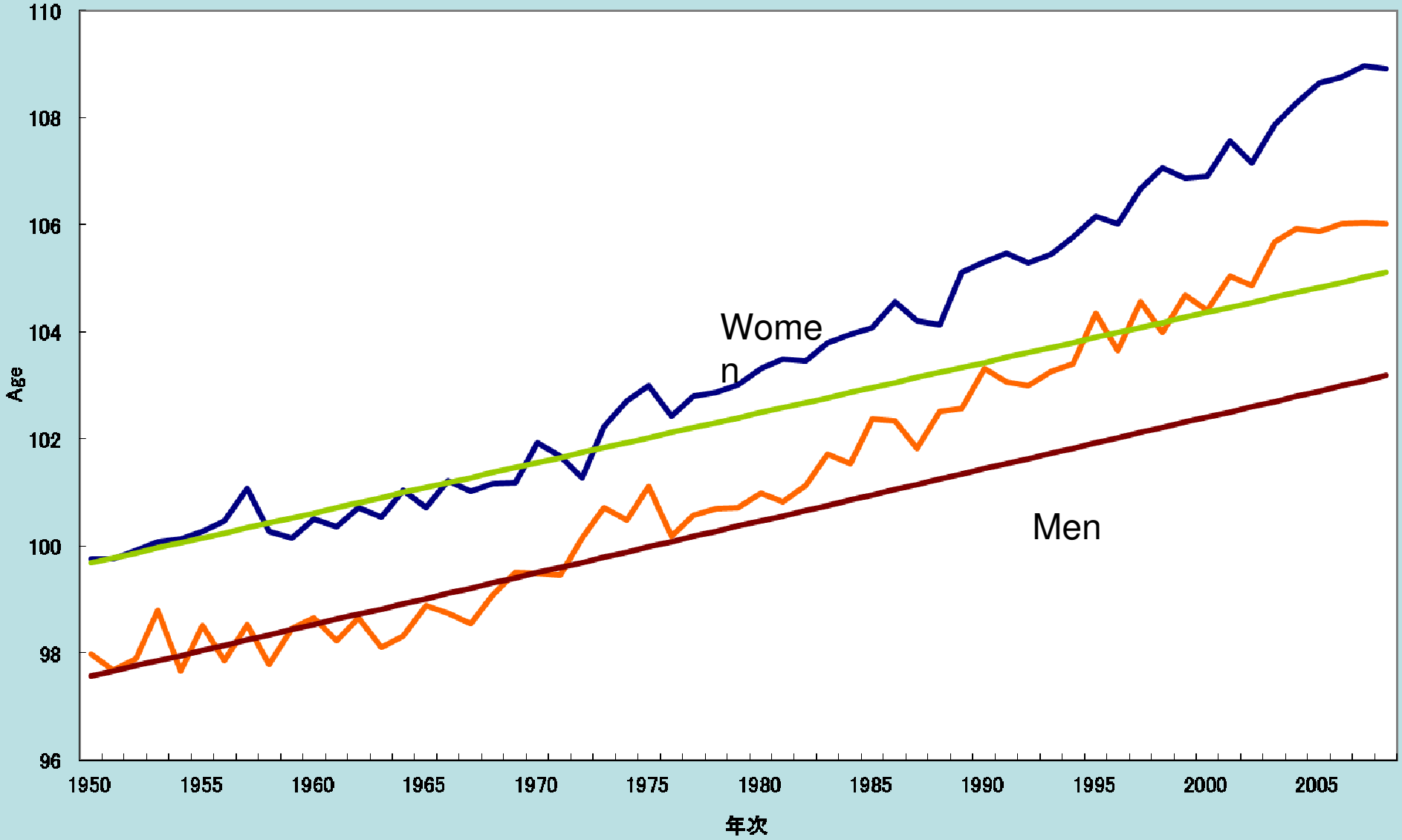
- Piketty (2011, QJE): $r > g$ logic
- Alternative and complementary reasons from demography:
  - Rapid population growth $\downarrow K/N$
  - "Tempo effect" postponement of inheritance
  - $\downarrow$ precautionary saving ($\downarrow$ variability of the age at death)
  - $\uparrow$ saving for retirement motive ($\uparrow e_R$)

Thank you

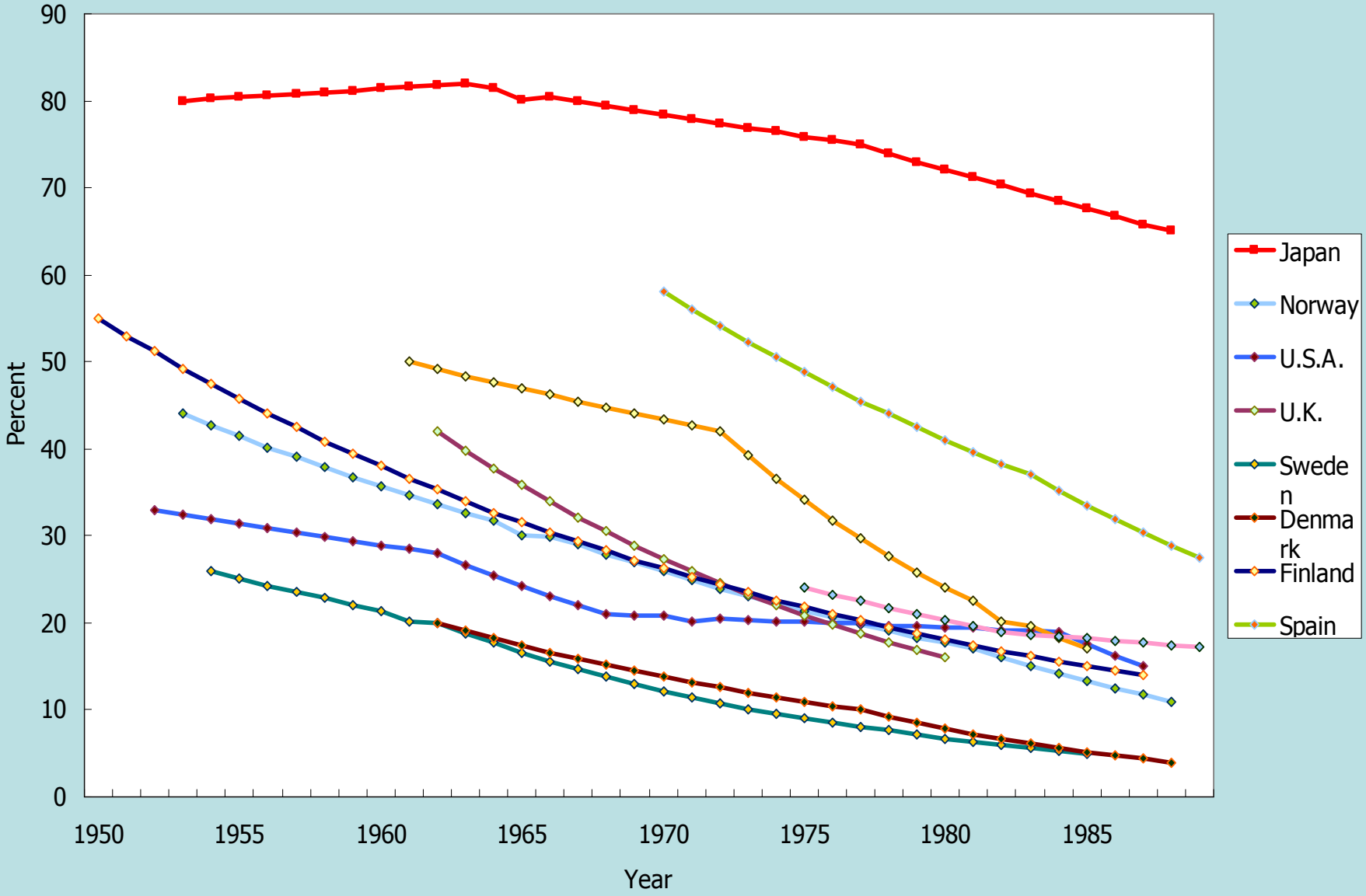
Trend in both sex life expectancy at birth in OECD countries, 1960-2001



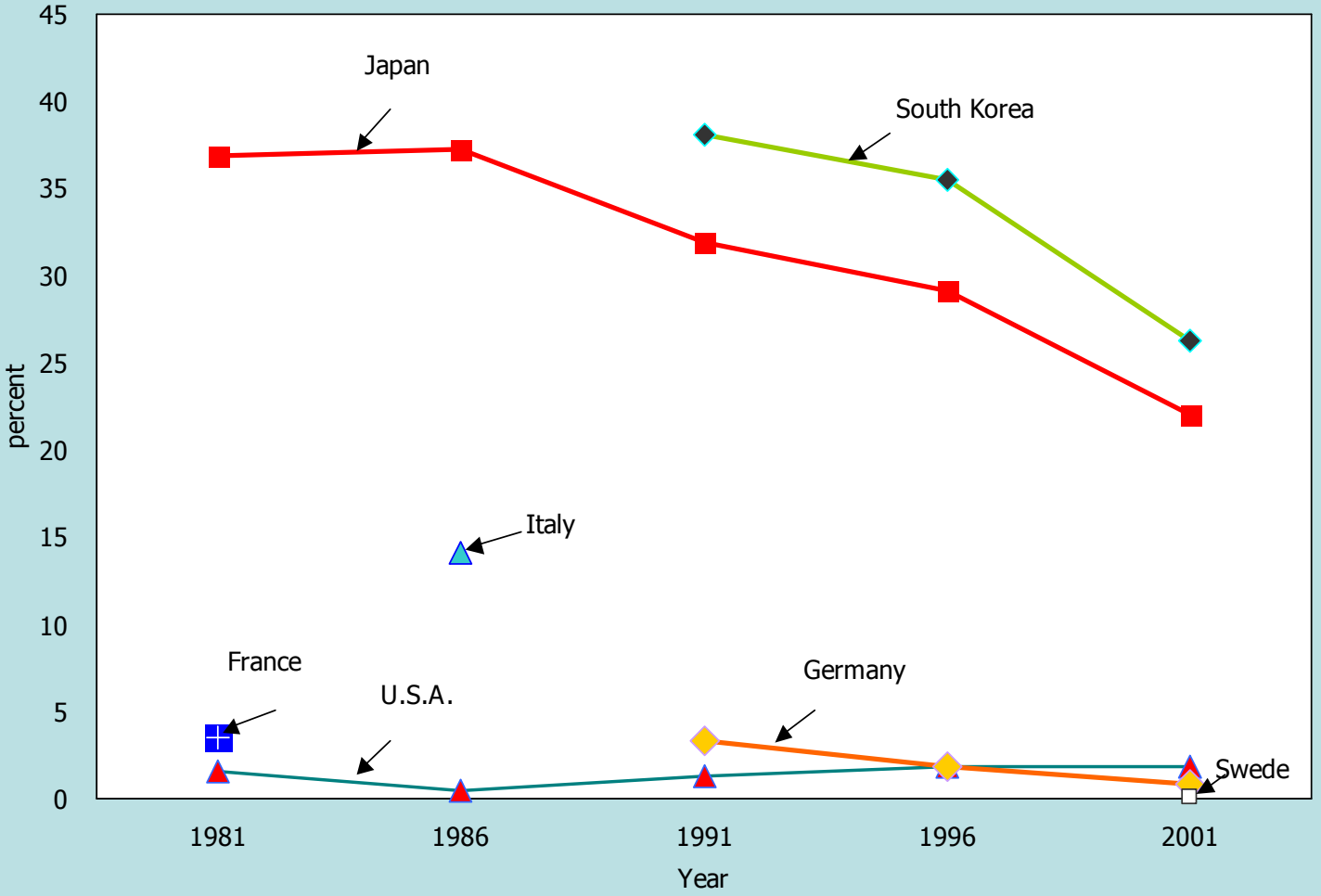
Change in average age of death among 100 oldest persons by sex, Japan, 1950-2008



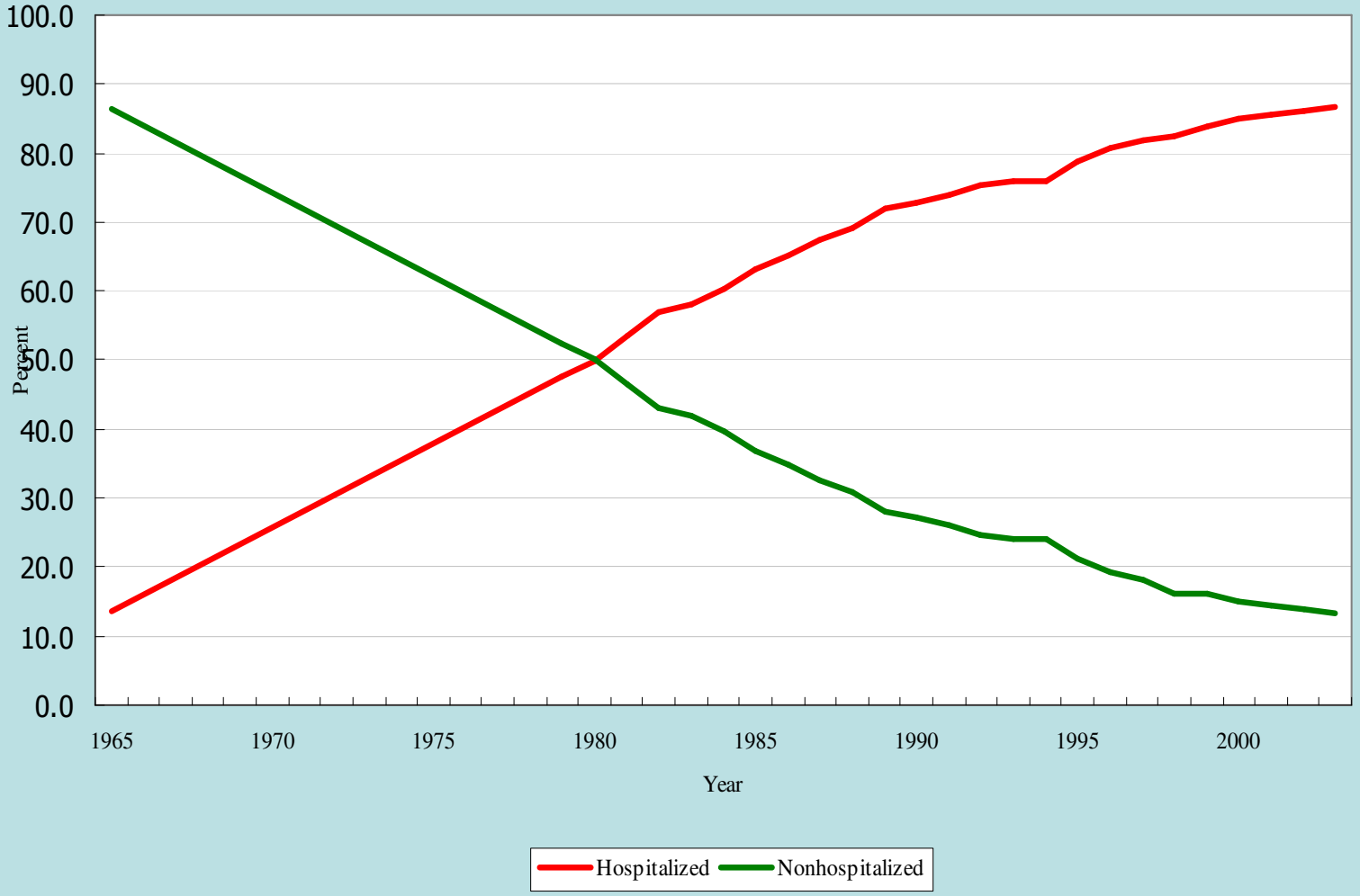
Percent of elderly aged 65 and older who coreside with children, Japan and other industrialized countries 1950-89



Change in the proportion of those 60+ living in three-generational households, selected countries, 1981-2001

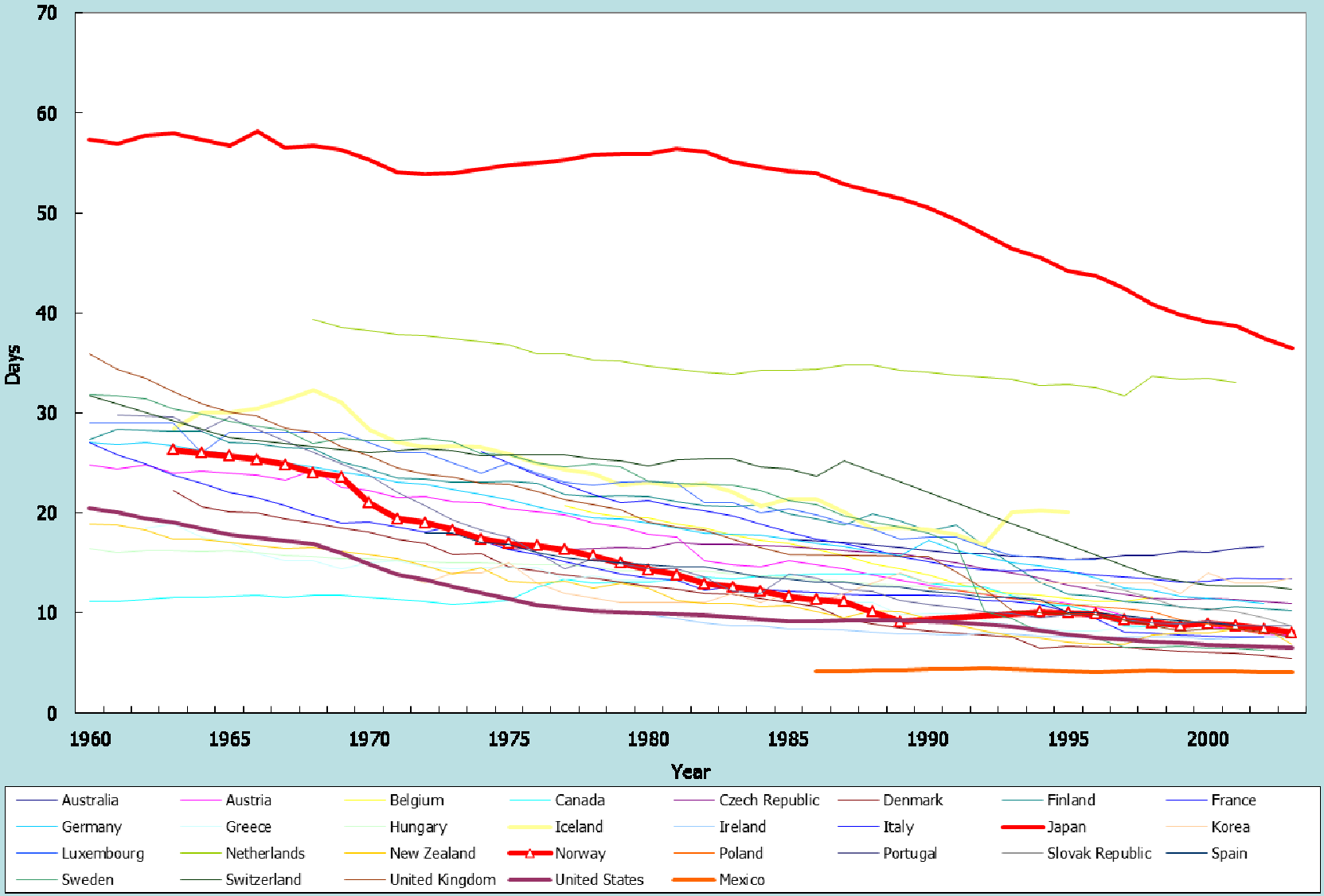


Change in the place of deaths among the elderly in Japan, 1965-2003



Source: Ministry of Health, Labour and Welfare, *Vital Statistics,* various years.

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



Source: OECD, *OECD Health Data 2005*,

Change in composition of the Japanese social security system

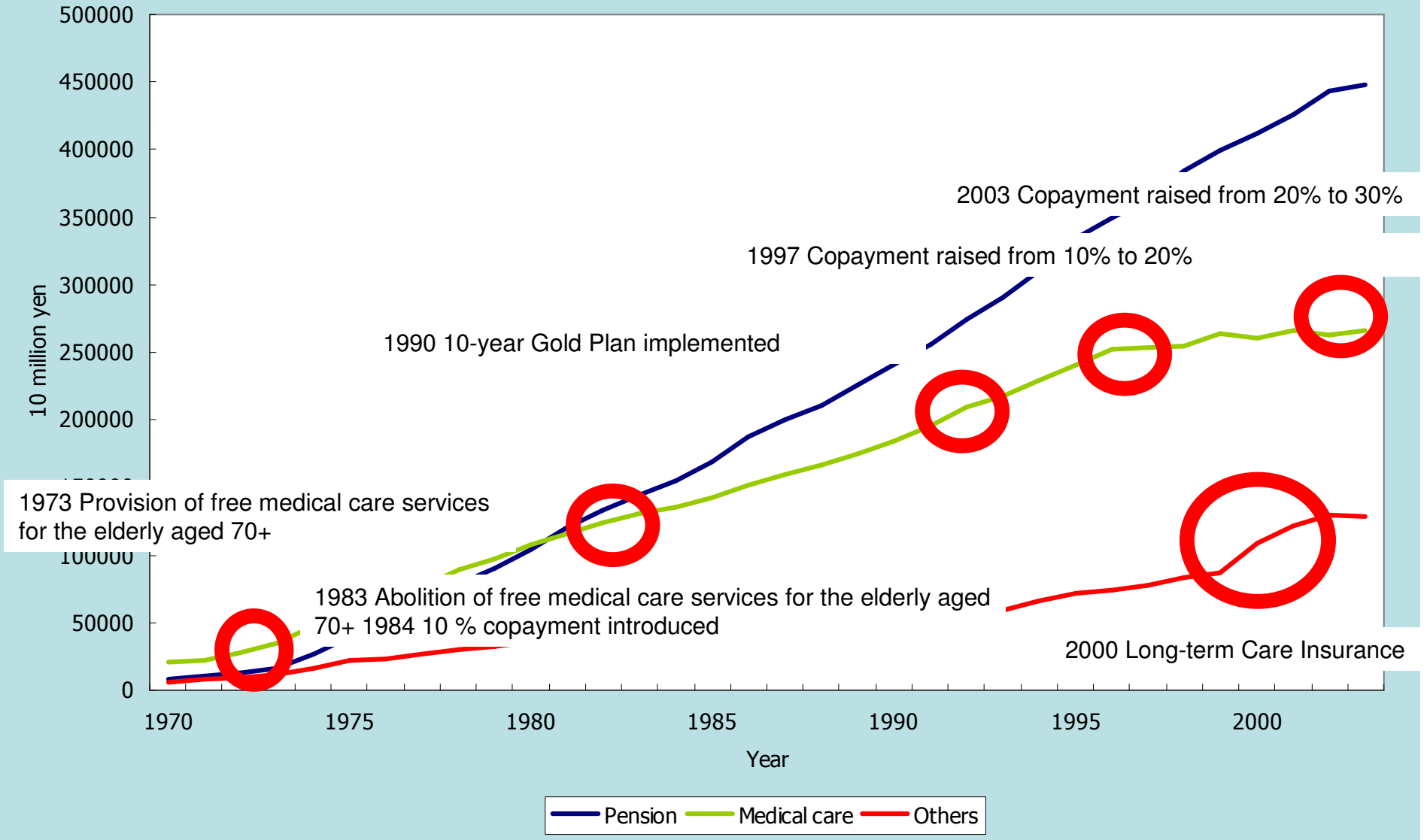
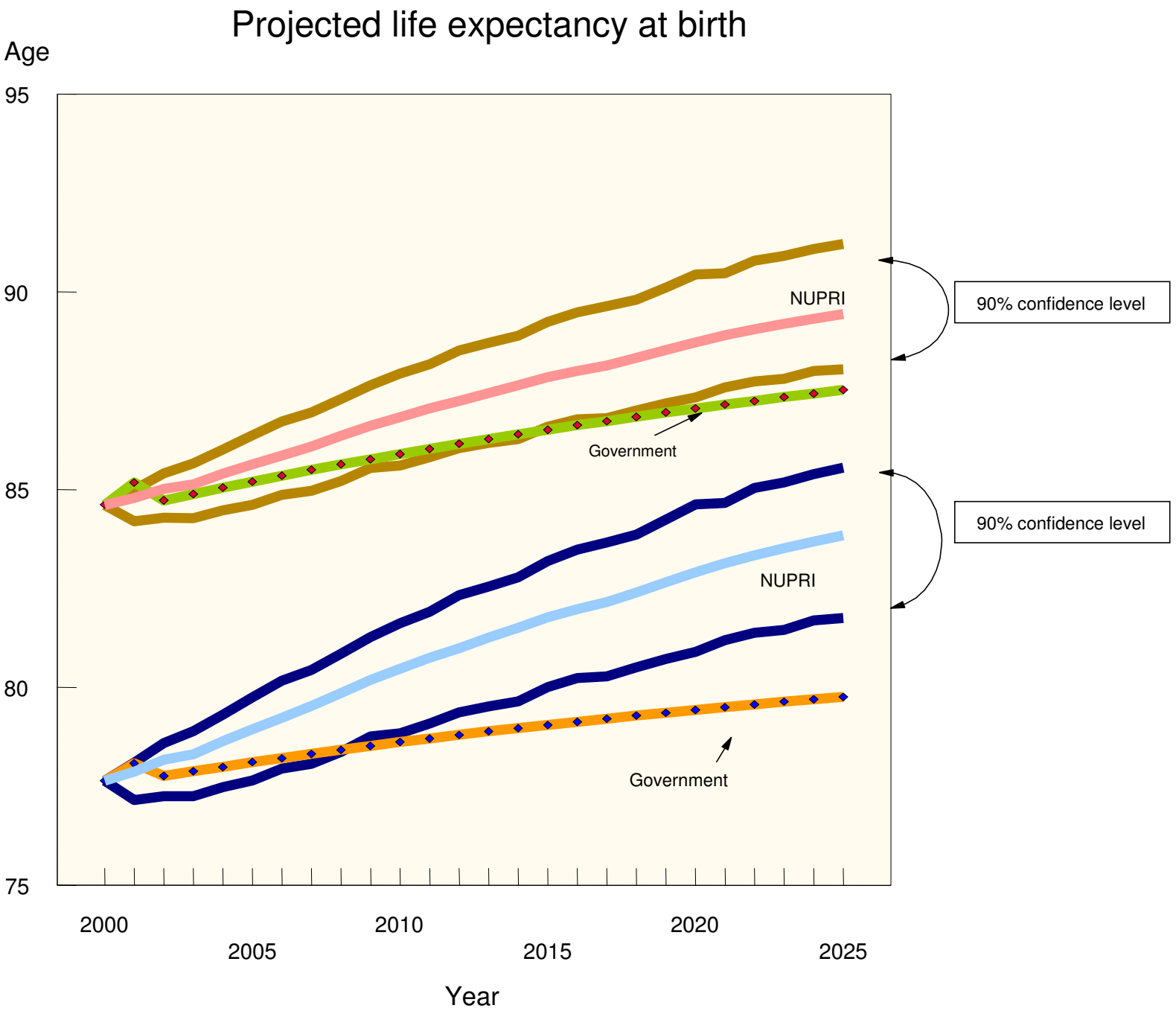


Table 1. Evolution of the medical care system in Japan, 1961-2003

Year	Development of policies and programs
1961	Establishment of the universal coverage of medical care services
1973	Provision of free medical care services for the elderly aged 70 and over
1983	Abolition of free medical care services for the elderly aged 70 and over, and the implementation of the Law on Health Service System for the Elderly aged 70 and over
1984	10% copayment introduced
1987	Law on the Health Services Facilities for the Elderly was implemented
1990	10-year Gold Plan implemented
1997	Copayment raised from 10% to 20%
2000	Long-term Care Insurance went into effect
2003	Copayment increased from 20% to 30%, and the introduction of the Diagnosis Procedure Combination (DRC) to 82 speciallyd-designated hospitals


Projected life expectancy at birth
Age
95
90
85
80
75
NUPRI
Government
90% confidence level
NUPRI
Government
90% confidence level
2000
2005
2010
2015
2020
2025
Year

Age structural change: 1950-2025