What can NTA do for Japan and other Asian countries?

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World Population

In 2000, 1.6 billion

20th Century: Century of Population Explosion

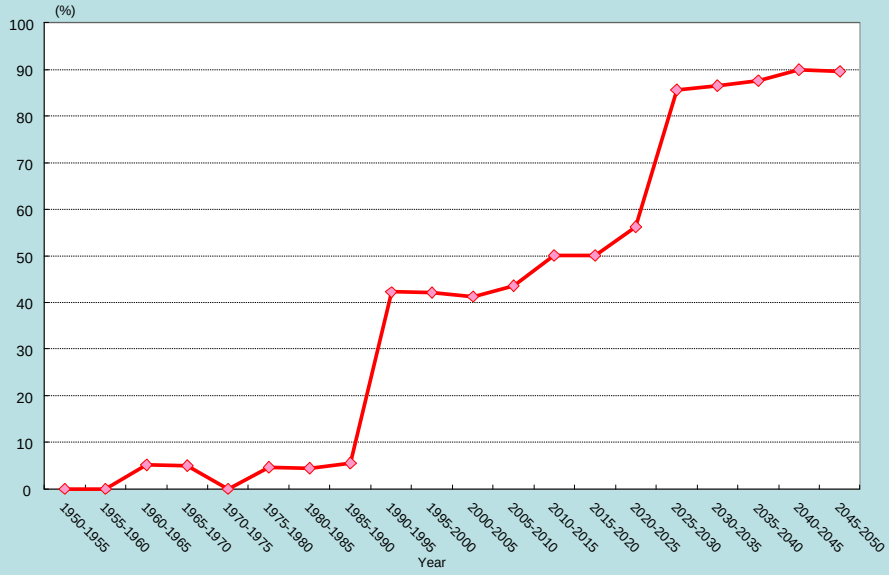
↓

21st Century: Century of Population Aging

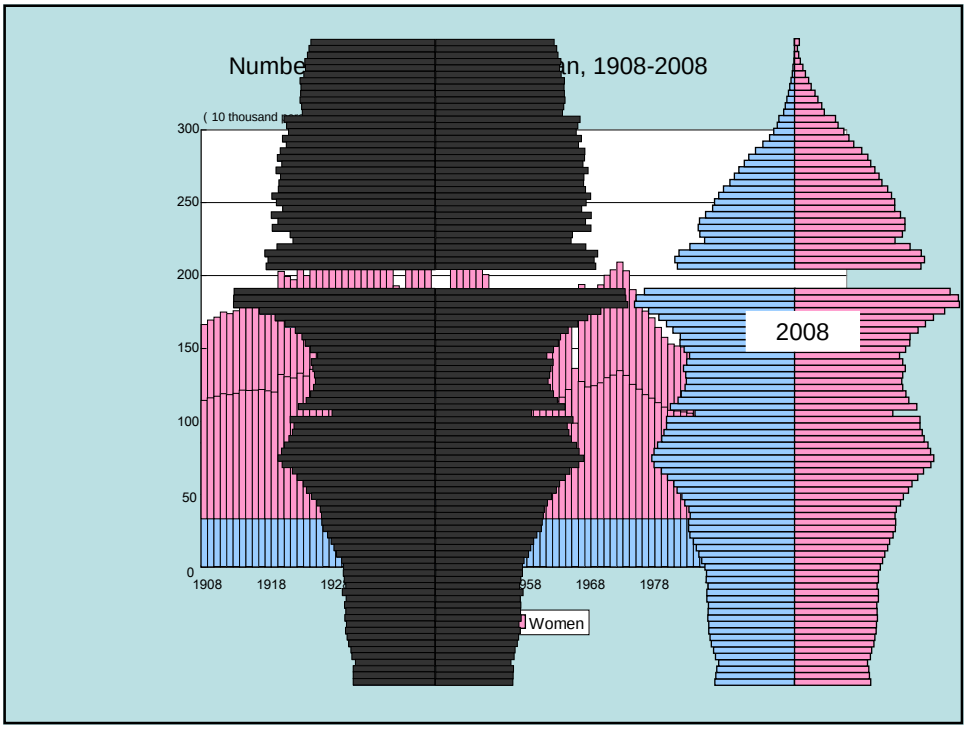
Declining Fertility

The most important demographic source of population aging at an early stage

Proportion of the population with below replacement-level fertility in Asia's total population



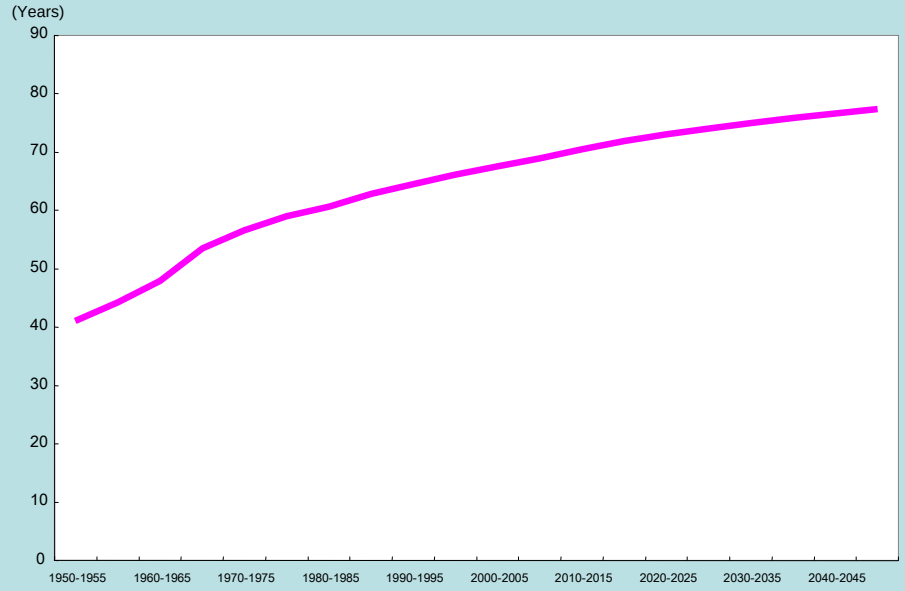
Source: United Nations, Department of Economic and Social Affairs, Population Division, *World Population Prospects: The 2008 Revision*, New York, 2009 (advanced Excel tables).



Declining Mortality

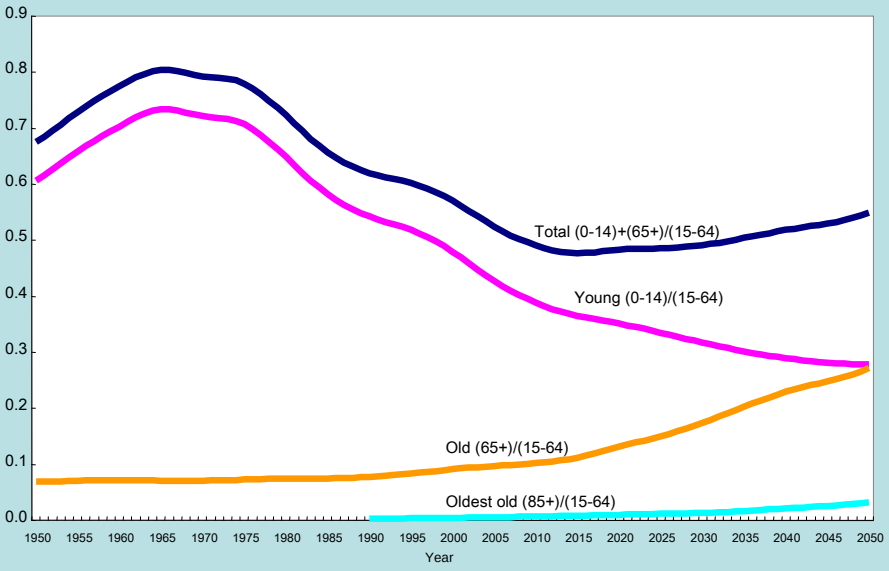
Increasingly important demographic source of population aging at a later stage, particularly when e_0 exceeds 70 years

Changes in life expectancy for entire Asia, 1950-2050

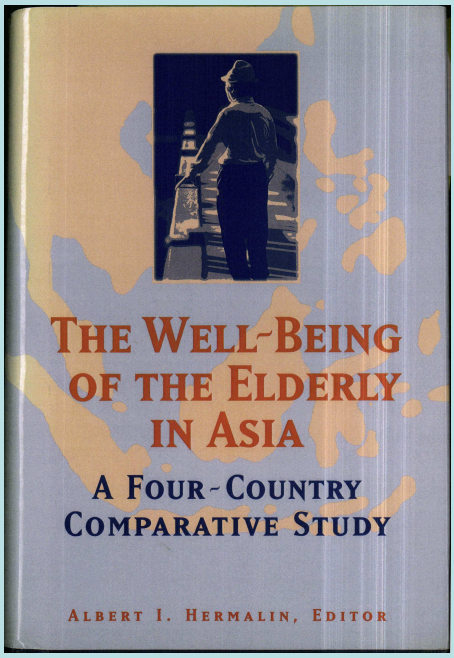


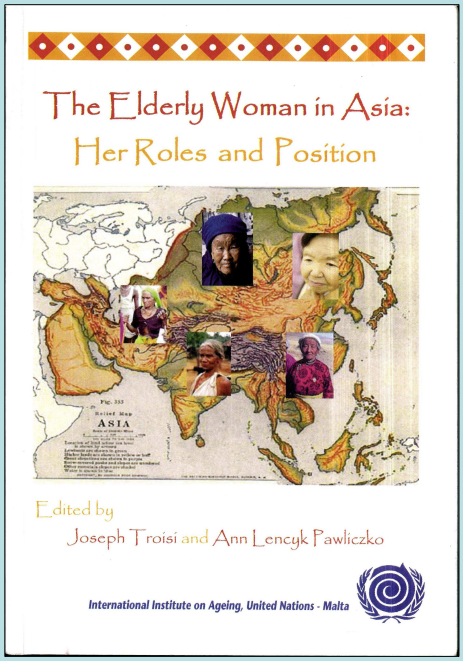
Source: United Nations, 2007, *World Population Prospects: The 2006 Revision*.

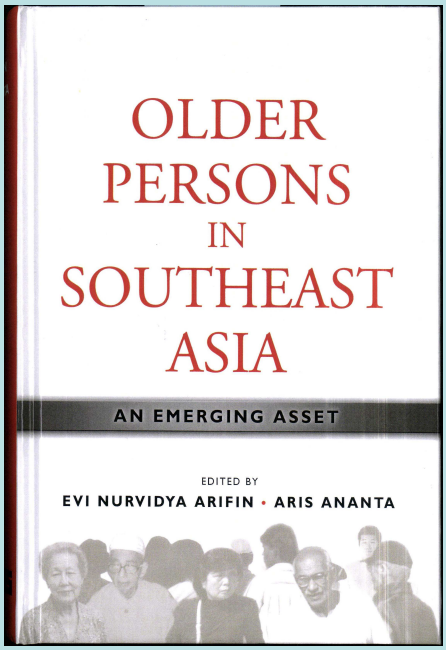
Figure 2. Total dependency ratio for Asia as a whole, 1950-2050

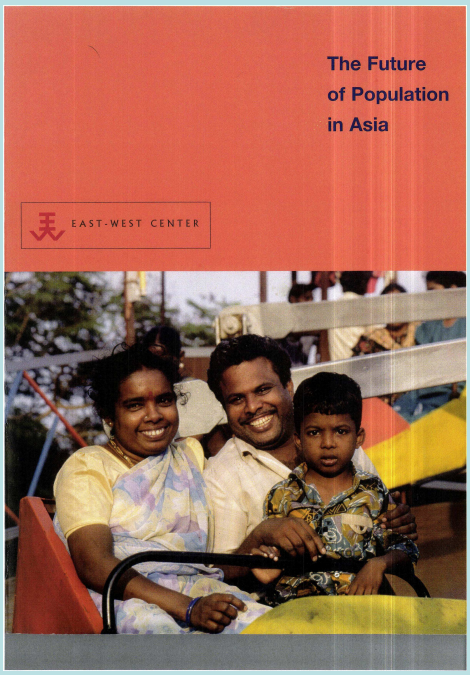


Source: United Nations, 2007, *World Population Prospects: The 2006 Revision*.



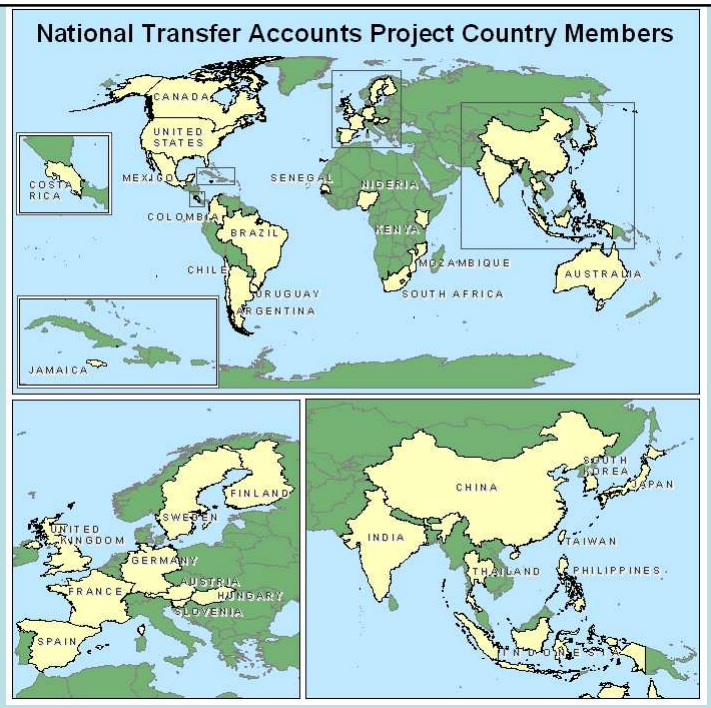






An innovative approach to analyzing some of the aging-related problems:

National Transfer Accounts (NTA)



Basic Features of the National Transfer Account (NTA) Project

- union of macro-level (public) and micro-level (familial) data
- interplay among various age groups (age-specific)
- consistent with the System of National Income

The NTA system will provide important new information relevant to the following issues:

①Analysis of the two demographic dividends
②Intergenerational Equity and Poverty
③Aging Policy
④Childbearing Incentives

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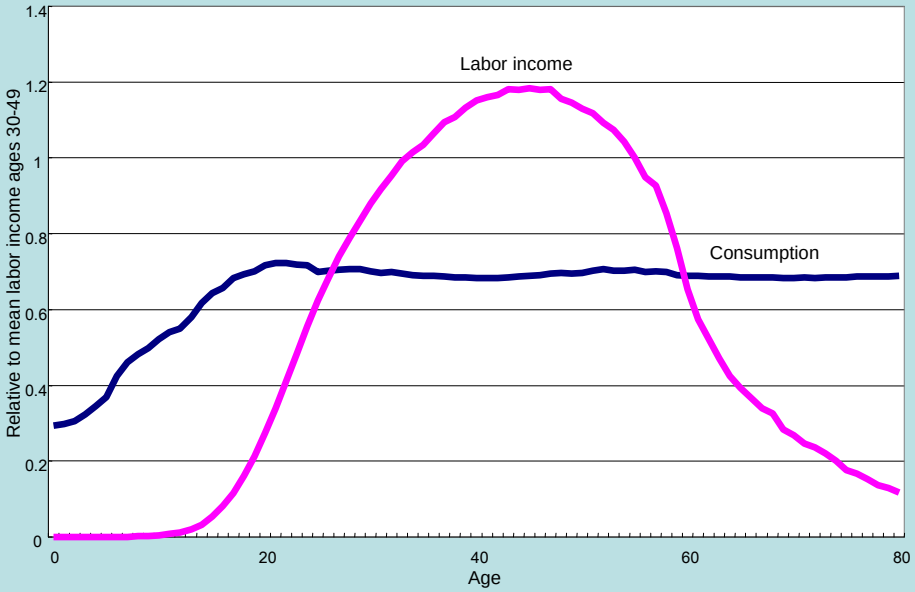
In this presentation, each of these research issues will be touched upon briefly.

First, the generation of the first demographic dividend

Here is Developing Asia's most important graph!

A typical Asian economic lifecycle: NTA estimates on per capita consumption and labor income for four Asian countries combined*



*India (2004), Indonesia (2002), The Philippines (1999), and Thailand (2004)

A typical Asian economic lifecycle: NTA estimates on per capita consumption and labor income

Figure 9. India (2004)

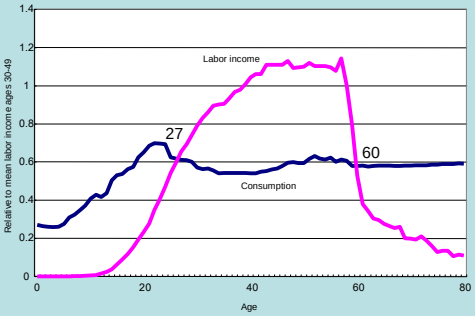


Figure 10. Indonesia (2002)

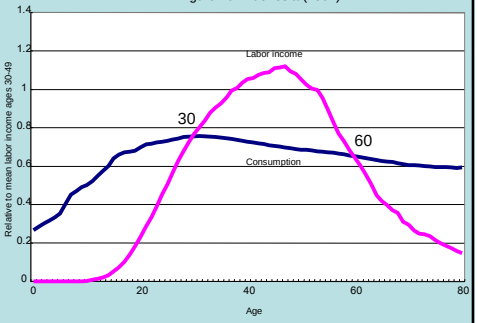


Figure 11. Thailand (2004)

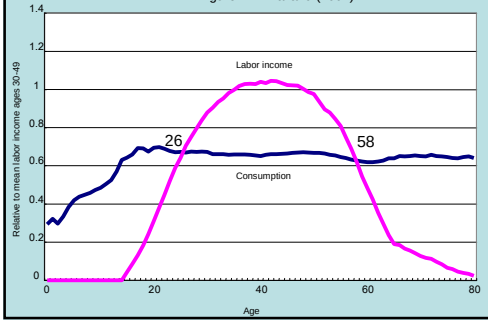
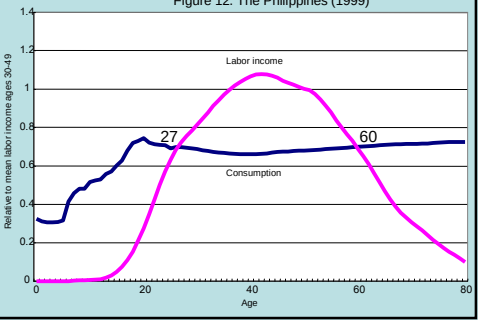
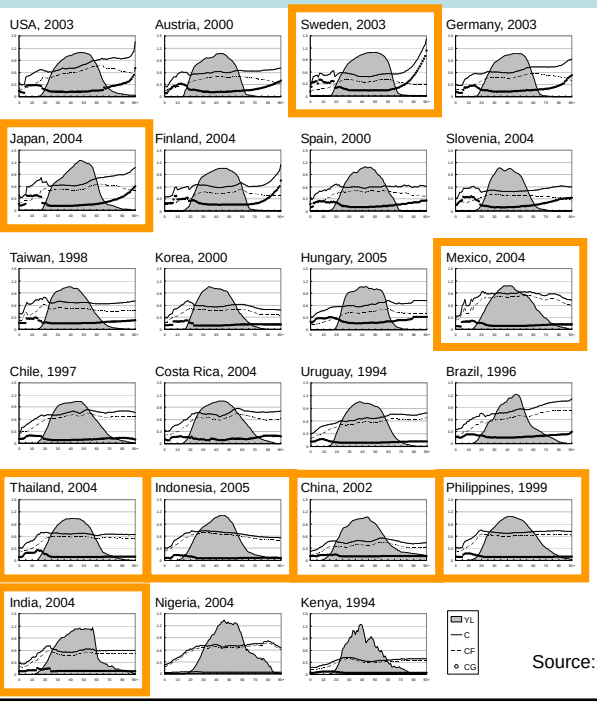


Figure 12. The Philippines (1999)





Source: Tung forthcoming.

To facilitate the discussion that follow, let us calculate the first demographic dividend for selected Asian countries

The First Demographic Dividend
is generated when

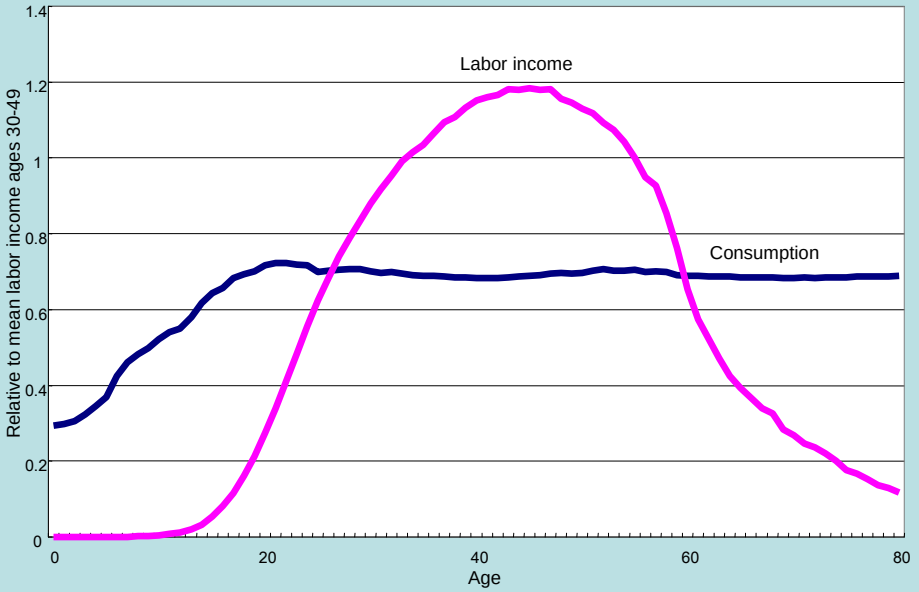
Support ratio ↑

Support Ratios

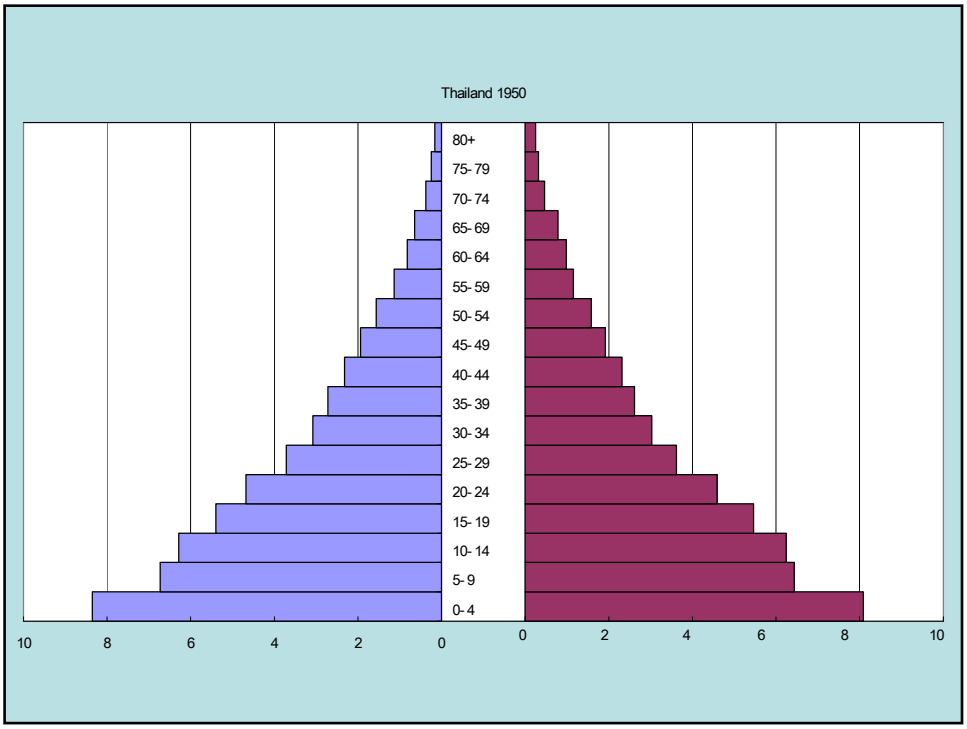
- **Effective** workers are calculated as a weighted sum of pop using labor income age profile.
- **Effective** consumers are calculated in a similar fashion, using consumption age profile.
- Ratio of effective labor to effective consumers is the "**Support Ratio**"
- **The balance of workers and consumers for the whole population is summarized by the support ratio**

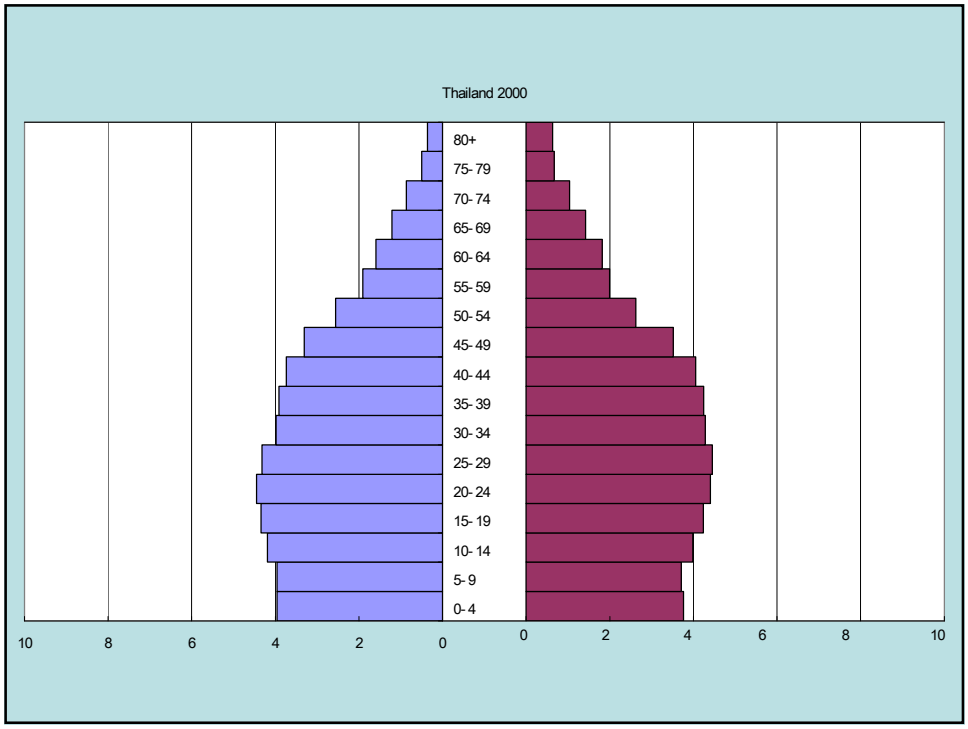
$$\text{Support Ratio} = \frac{\text{Effective Workers}}{\text{Effective Consumers}} = \frac{\sum_0^{\omega} Pop(x)\, y_l(x)}{\sum_0^{\omega} Pop(x)\, c(x)}$$

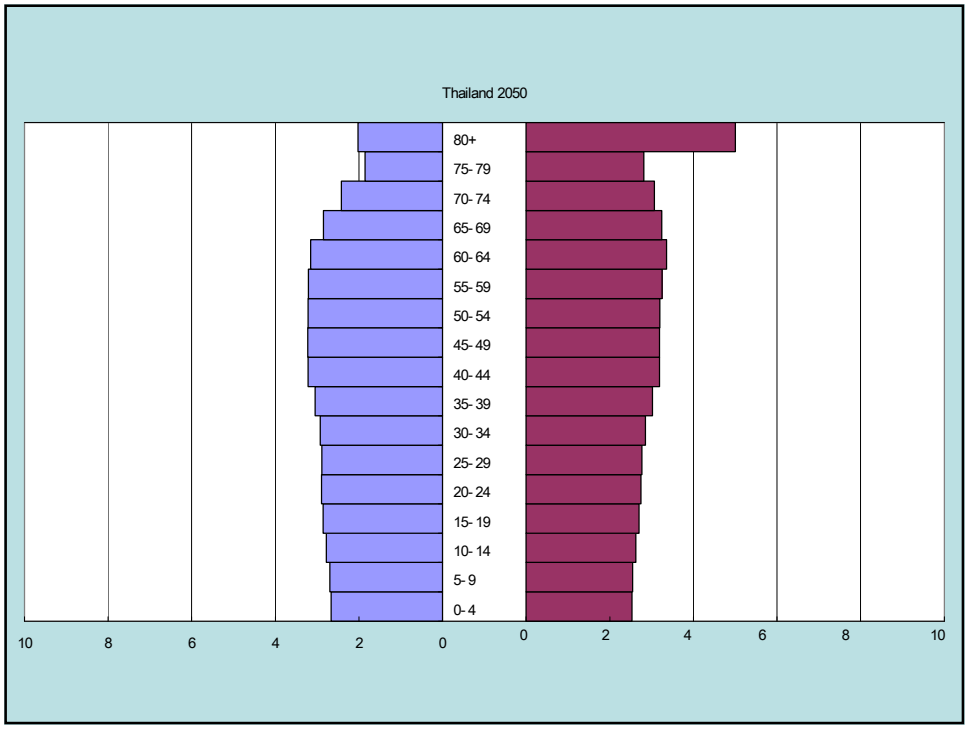
A typical Asian economic lifecycle: NTA estimates on per capita consumption and labor income for four Asian countries combined*

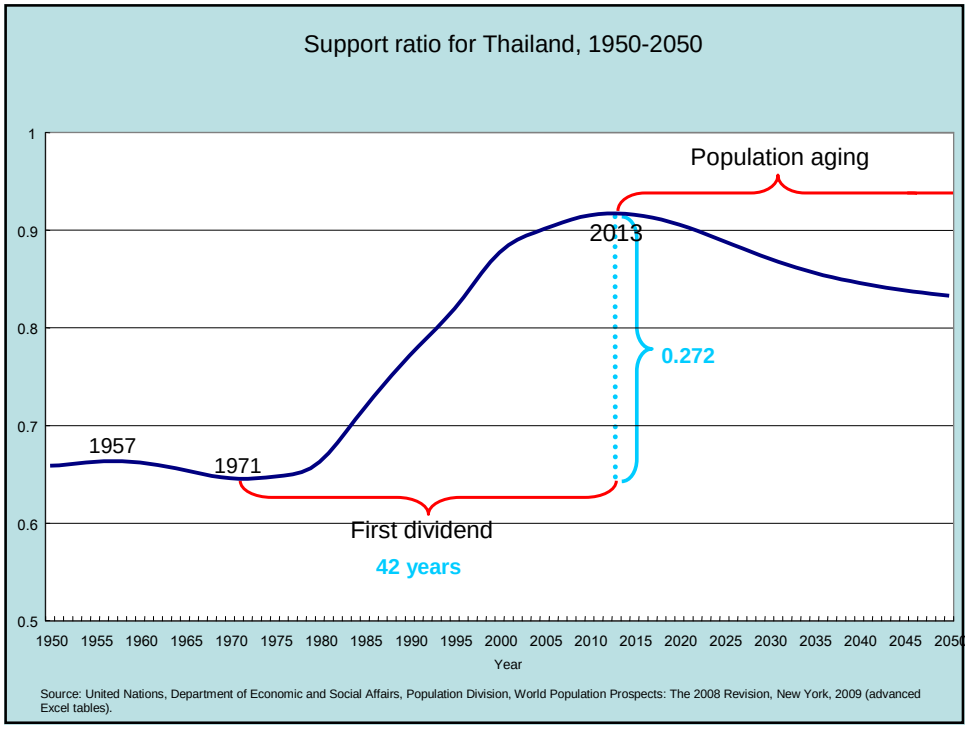


*India (2004), Indonesia (2002), The Philippines (1999), and Thailand (2004)

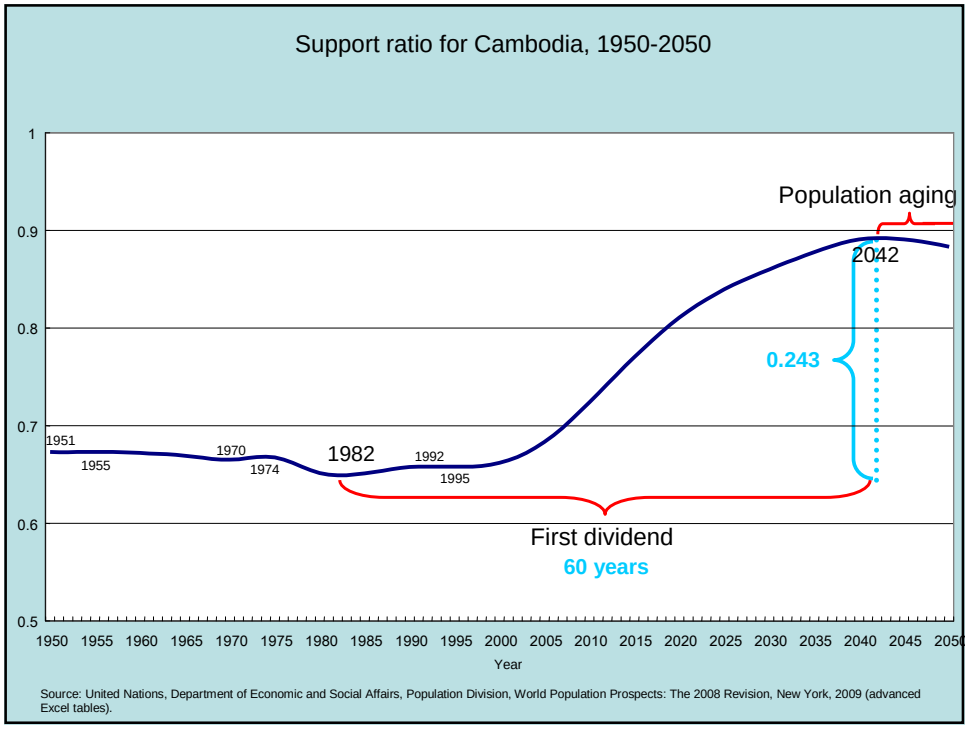


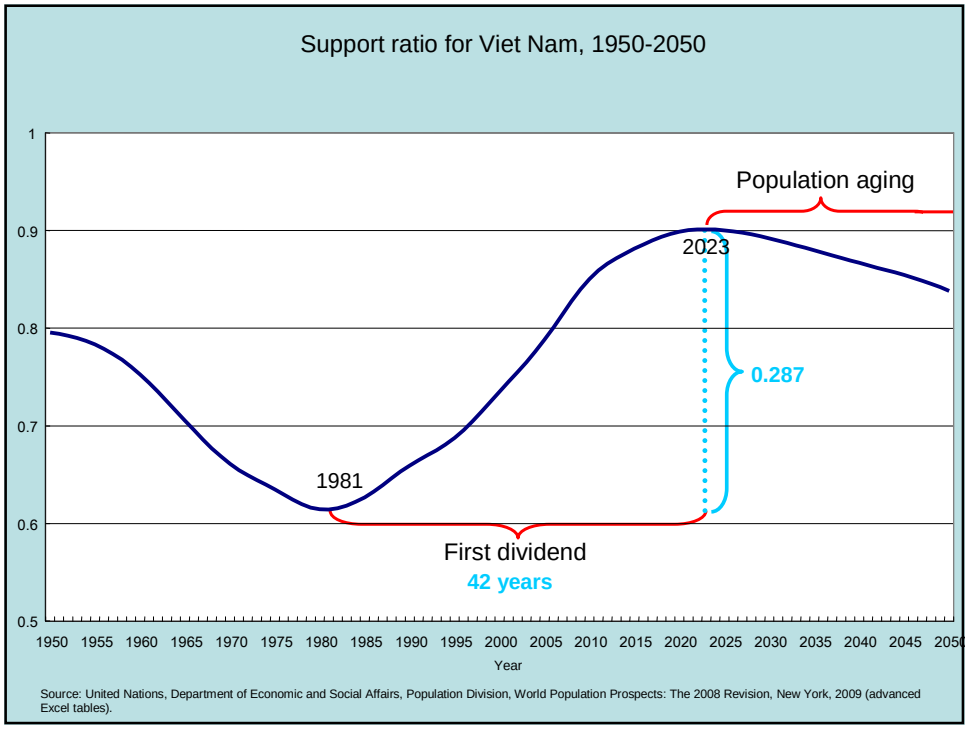

Thailand 2000
80+
75- 79
70- 74
65- 69
60- 64
55- 59
50- 54
45- 49
40- 44
35- 39
30- 34
25- 29
20- 24
15- 19
10- 14
5- 9
0- 4
10
8
6
4
2
0
0
2
4
6
8
10

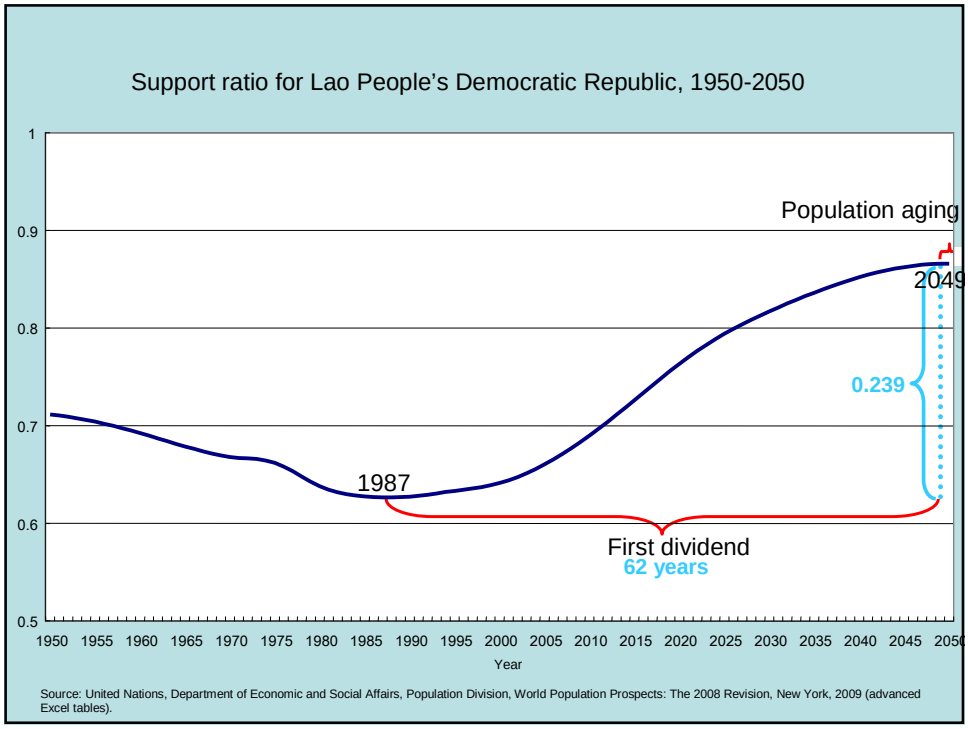

Thailand 2050
80+
75- 79
70- 74
65- 69
60- 64
55- 59
50- 54
45- 49
40- 44
35- 39
30- 34
25- 29
20- 24
15- 19
10- 14
5- 9
0- 4
10
8
6
4
2
0
0
2
4
6
8
10

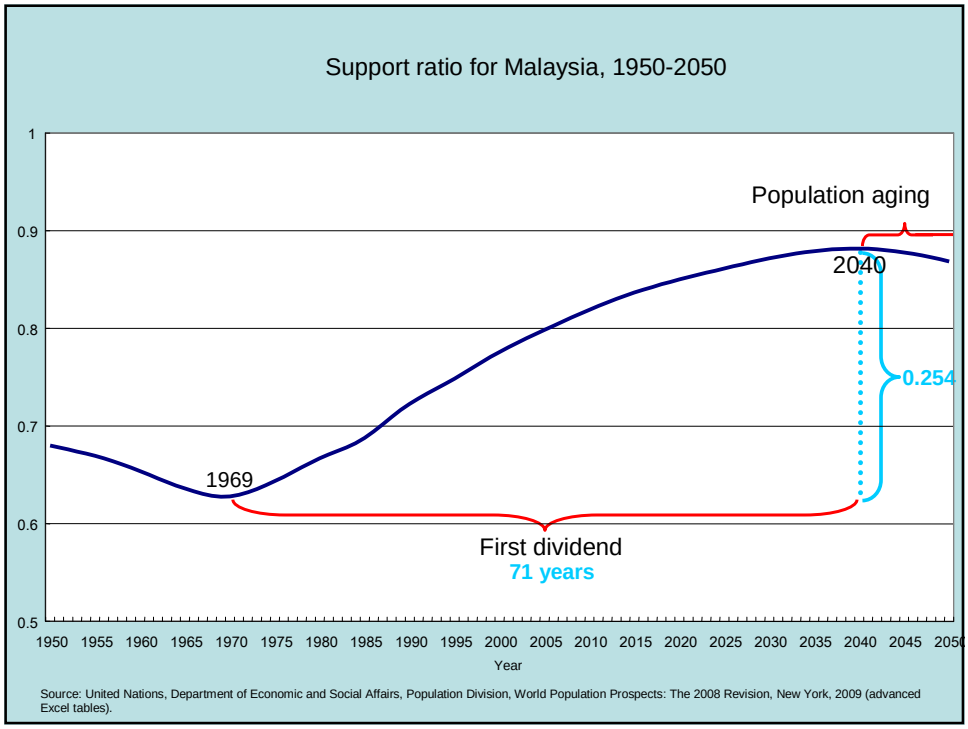


How about the other countries in the Mekong Sub-region?

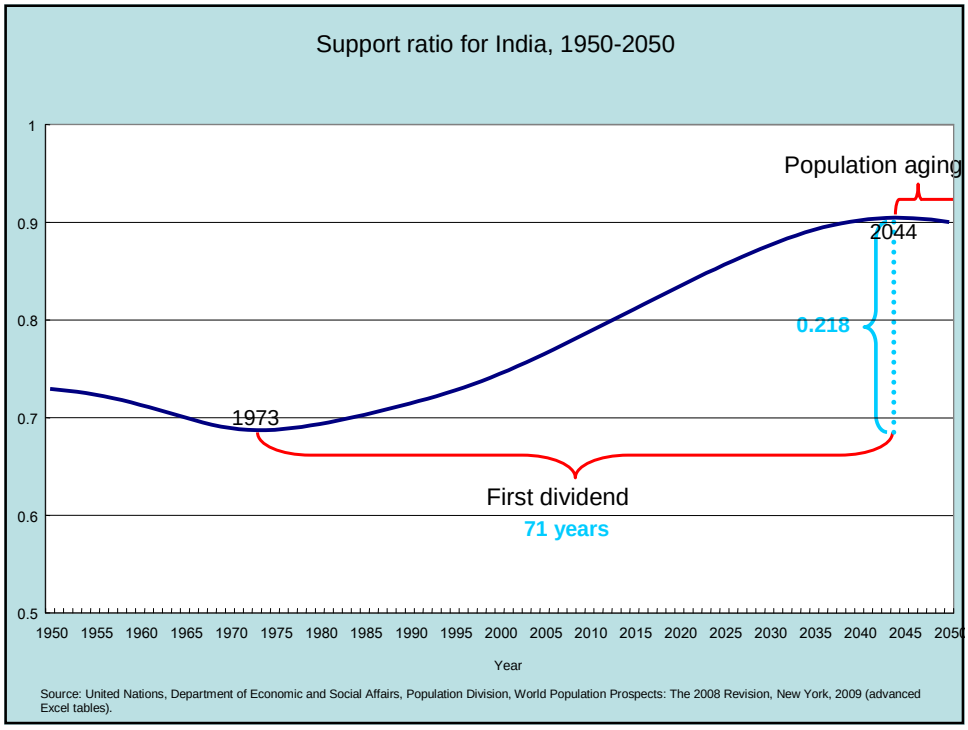

Support ratio for Cambodia, 1950-2050
Population aging
2042
0.243
1951
1955
1970
1974
1982
1992
1995
First dividend
60 years
Year
Source: United Nations, Department of Economic and Social Affairs, Population Division, World Population Prospects: The 2008 Revision, New York, 2009 (advanced Excel tables).

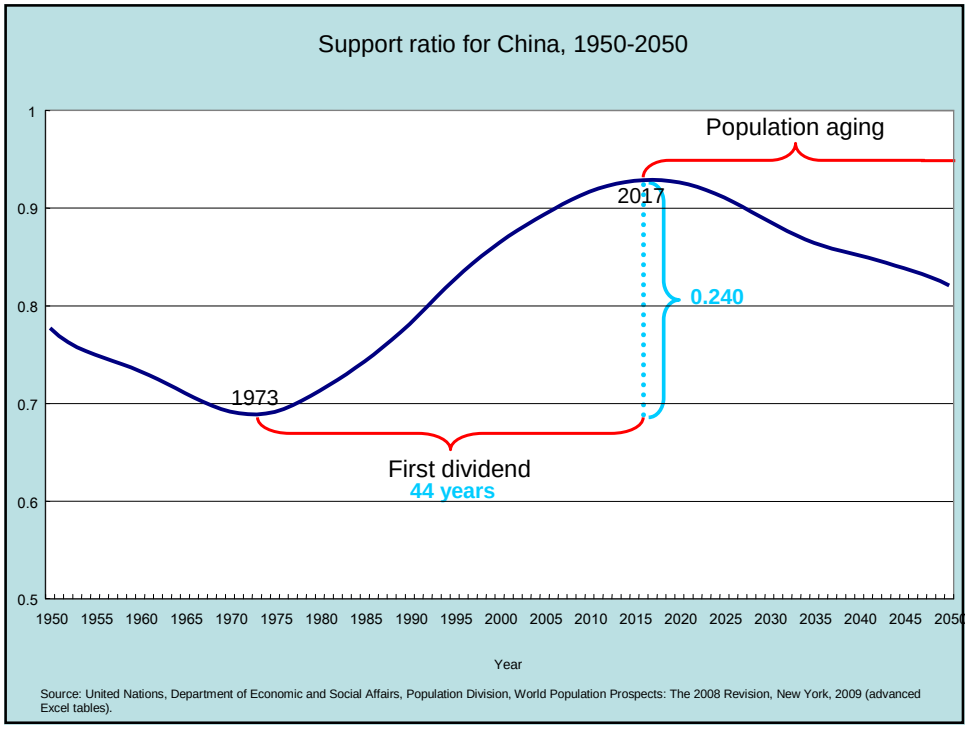

Support ratio for Viet Nam, 1950-2050
Population aging
2023
0.287
1981
First dividend
42 years
Year
Source: United Nations, Department of Economic and Social Affairs, Population Division, World Population Prospects: The 2008 Revision, New York, 2009 (advanced Excel tables).


Support ratio for Lao People's Democratic Republic, 1950-2050
1
0.9
0.8
0.7
0.6
0.5
Population aging
2049
0.239
1987
First dividend
62 years
1950 1955 1960 1965 1970 1975 1980 1985 1990 1995 2000 2005 2010 2015 2020 2025 2030 2035 2040 2045 2050
Year
Source: United Nations, Department of Economic and Social Affairs, Population Division, World Population Prospects: The 2008 Revision, New York, 2009 (advanced Excel tables).

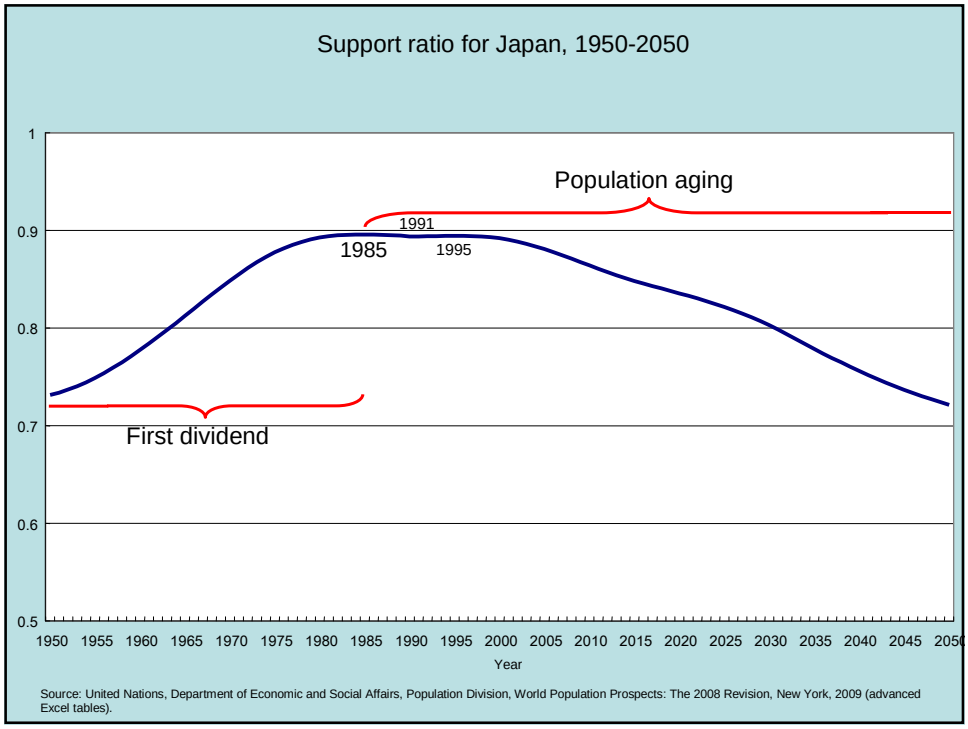

Support ratio for Malaysia, 1950-2050
1
0.9
0.8
0.7
0.6
0.5
Population aging
2040
0.254
1969
First dividend
71 years
1950 1955 1960 1965 1970 1975 1980 1985 1990 1995 2000 2005 2010 2015 2020 2025 2030 2035 2040 2045 2050
Year
Source: United Nations, Department of Economic and Social Affairs, Population Division, World Population Prospects: The 2008 Revision, New York, 2009 (advanced Excel tables).

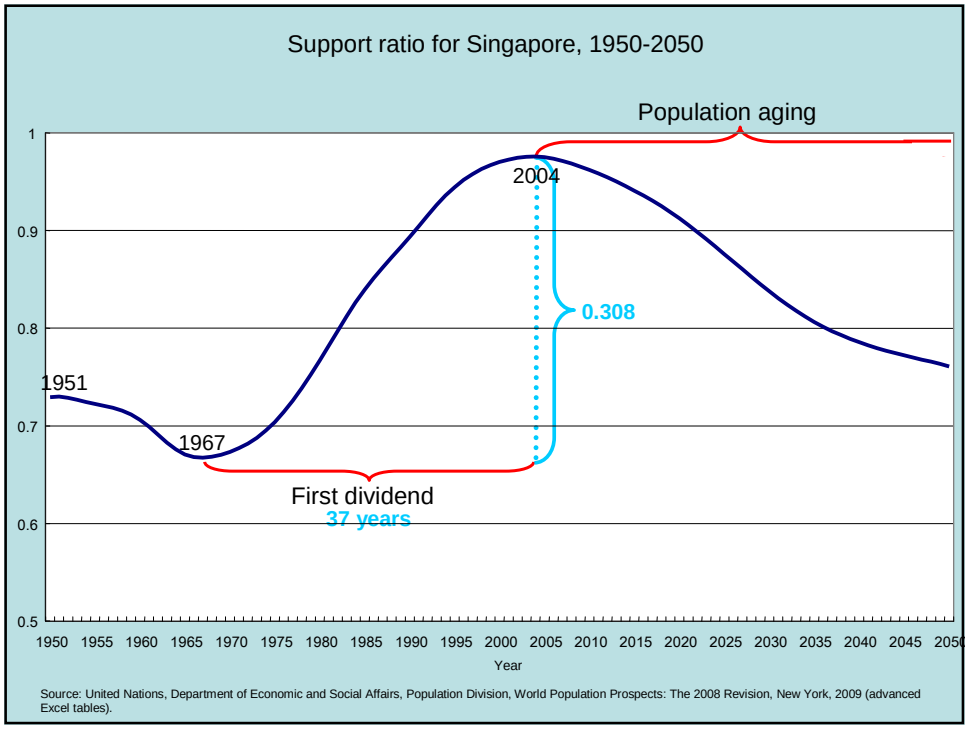
How about Asia's two giants?



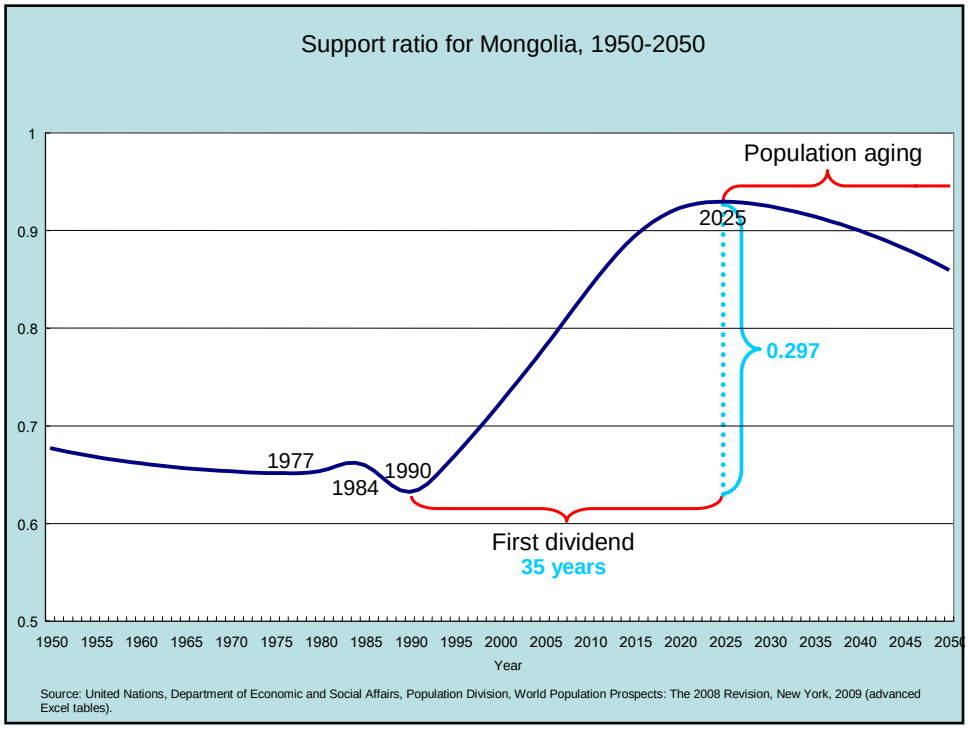


How about Asia's two forerunners in population aging?

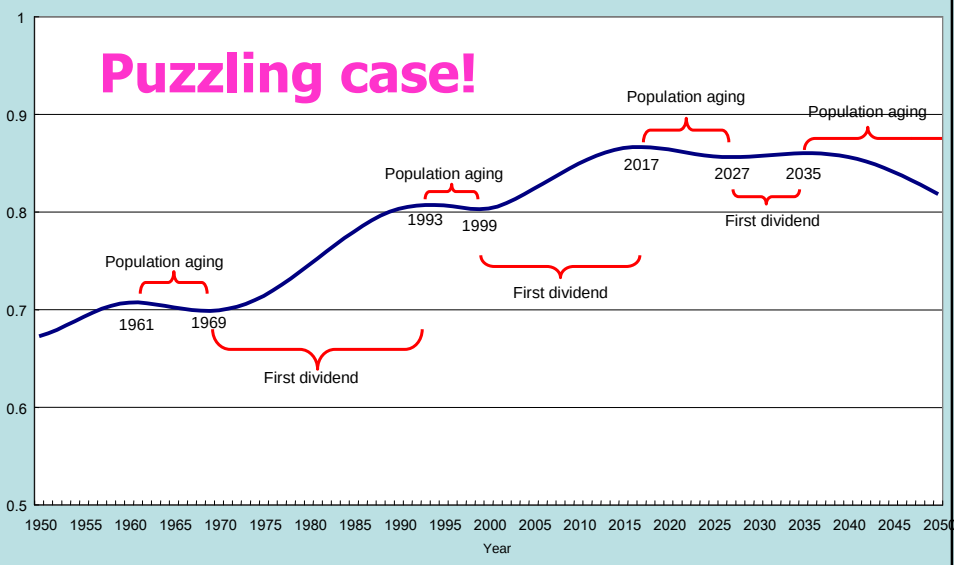

Support ratio for Japan, 1950-2050
Population aging
1991
1985
1995
First dividend
1
0.9
0.8
0.7
0.6
0.5
1950 1955 1960 1965 1970 1975 1980 1985 1990 1995 2000 2005 2010 2015 2020 2025 2030 2035 2040 2045 2050
Year
Source: United Nations, Department of Economic and Social Affairs, Population Division, World Population Prospects: The 2008 Revision, New York, 2009 (advanced Excel tables).


Support ratio for Singapore, 1950-2050
Population aging
2004
0.308
1951
1967
First dividend
37 years
1
0.9
0.8
0.7
0.6
0.5
1950 1955 1960 1965 1970 1975 1980 1985 1990 1995 2000 2005 2010 2015 2020 2025 2030 2035 2040 2045 2050
Year
Source: United Nations, Department of Economic and Social Affairs, Population Division, World Population Prospects: The 2008 Revision, New York, 2009 (advanced Excel tables).

Asia's two exceptional cases. Here they are



Support ratio for Armenia, 1950-2050



Source: United Nations, Department of Economic and Social Affairs, Population Division, World Population Prospects: The 2008 Revision, New York, 2009 (advanced Excel tables).

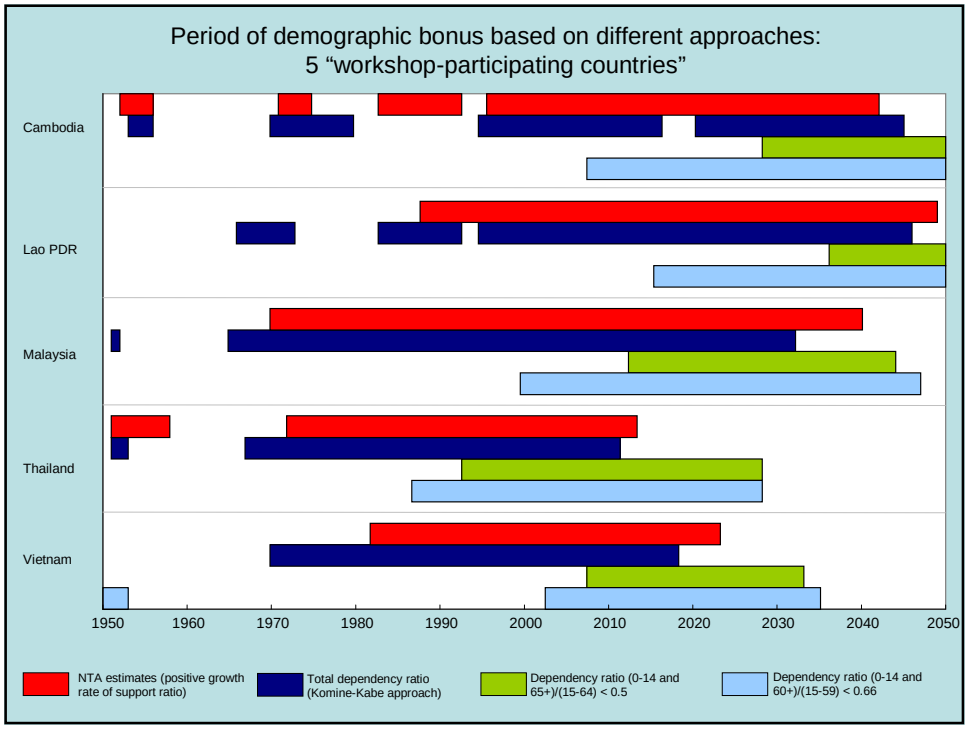
First demographic dividend in Asian countries, 2000-2050, expressed in terms of the annual growth rate

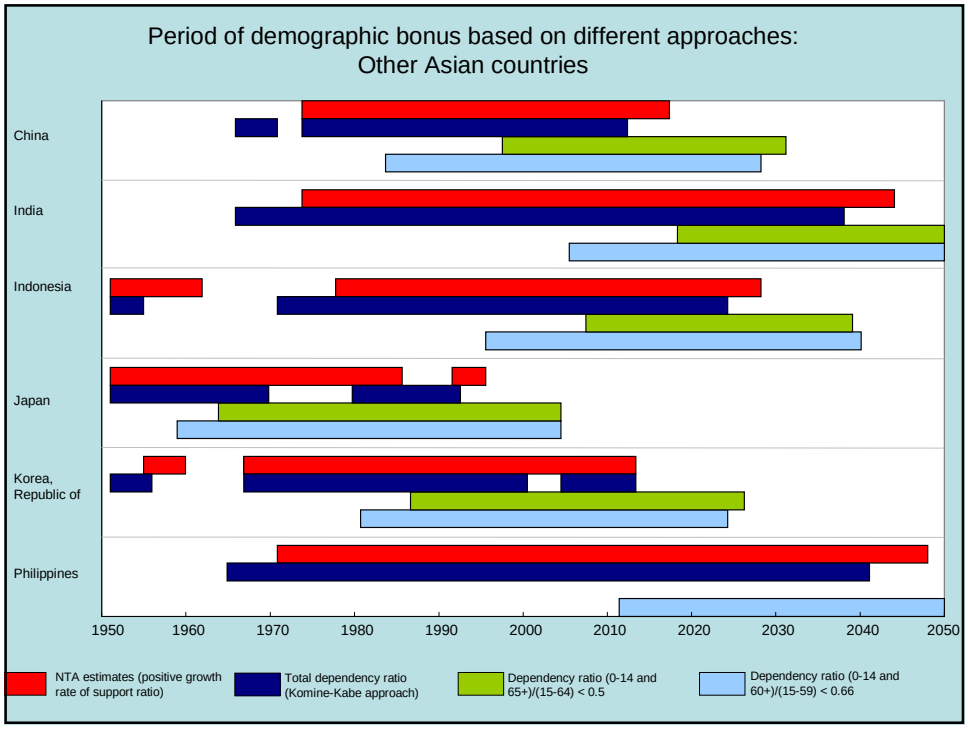
	2000-2010	2010-2020	2020-2030	2030-2040	2040-2050
Armenia	0.74	0.47	0.01	-0.15	-0.79
Bangladesh	0.70	0.61	0.41	0.23	0.05
Cambodia	0.77	1.05	0.61	0.41	-0.02
China	0.58	0.05	-0.54	-0.49	-0.32
India	0.55	0.57	0.48	0.28	-0.03
Indonesia	0.84	0.47	0.10	-0.20	-0.33
Korea, Republic of	0.49	-0.08	-0.60	-0.84	-0.71
Lao People's Democratic Republic	0.95	1.17	0.76	0.45	0.05
Malaysia	0.54	0.36	0.25	0.13	-0.14
Mongolia	**1.60**	0.97	0.08	-0.31	-0.55
Pakistan	0.89	0.97	0.55	0.34	0.01
Philippines	0.58	0.55	0.53	0.40	0.13
Singapore	-0.07	-0.51	-0.84	-0.63	-0.33
Thailand	0.46	-0.19	-0.42	-0.34	-0.21
Viet Nam	**1.22**	0.74	0.10	-0.22	-0.42

Many ways to define and compute the demographic dividend

Demographic Bonus **or** ***Window of Opportunity***
(UNFPA, 1999; Birdsall and Sinding, 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)

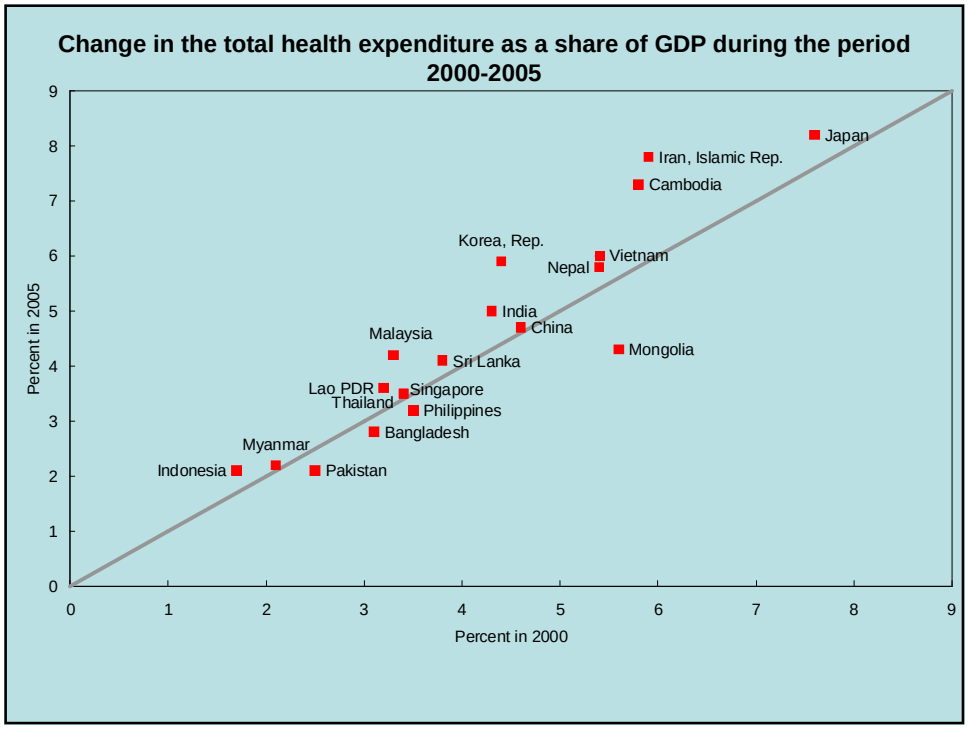
In most of these studies, the conventional total dependency ratio is used…

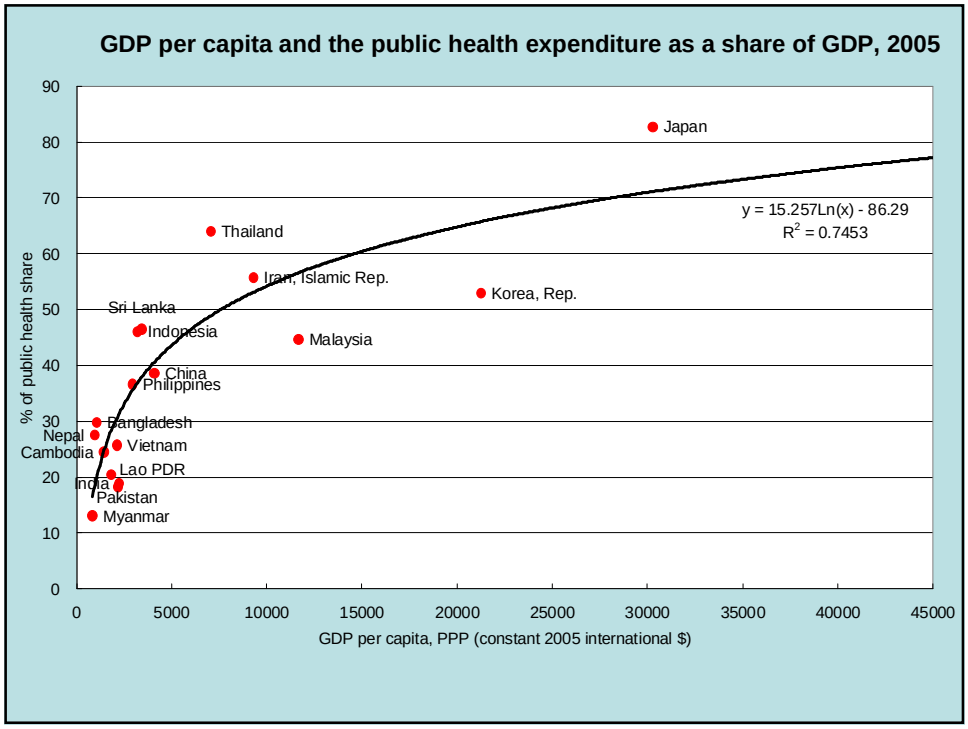


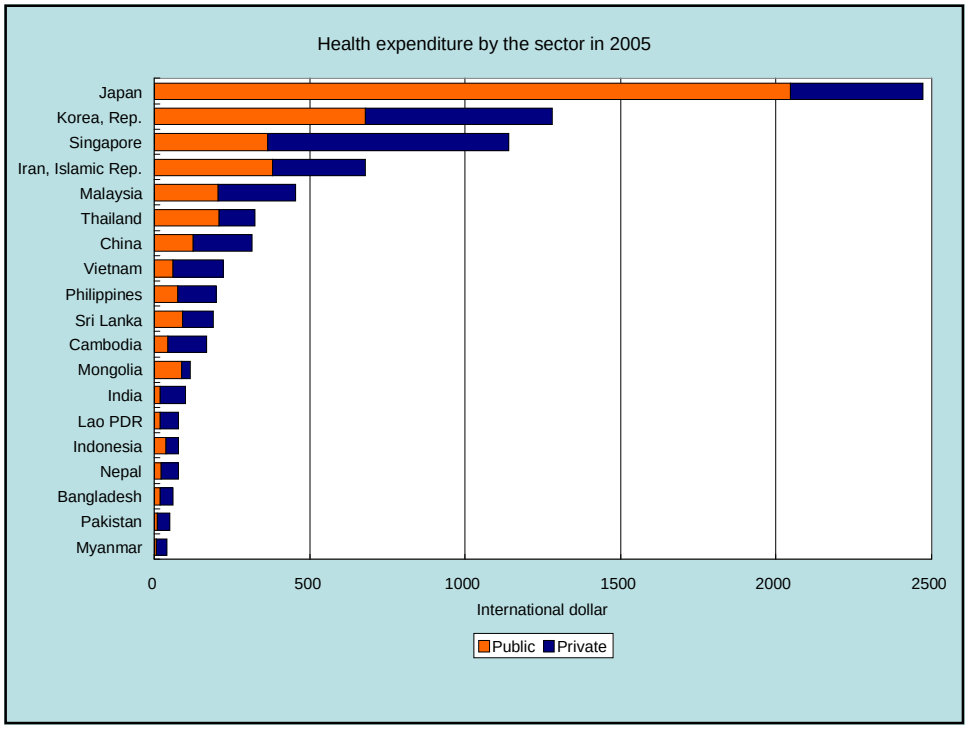


Is Asia seizing the opportunities of the first demographic dividend for strengthening its human resource development programs?

Recent trends of health expenditure in aging Asia

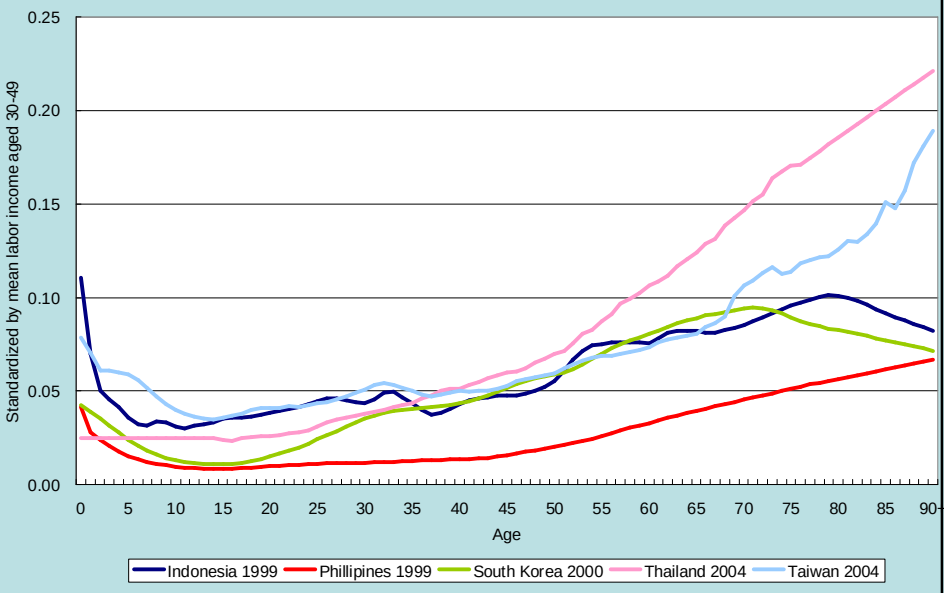



GDP per capita and the public health expenditure as a share of GDP, 2005
% of public health share
GDP per capita, PPP (constant 2005 international $)
y = 15.257Ln(x) - 86.29
R2 = 0.7453
Japan
Thailand
Iran, Islamic Rep.
Korea, Rep.
Sri Lanka
Indonesia
Malaysia
China
Philippines
Bangladesh
Nepal
Vietnam
Cambodia
Lao PDR
India
Pakistan
Myanmar
0
10
20
30
40
50
60
70
80
90
0
5000
10000
15000
20000
25000
30000
35000
40000
45000

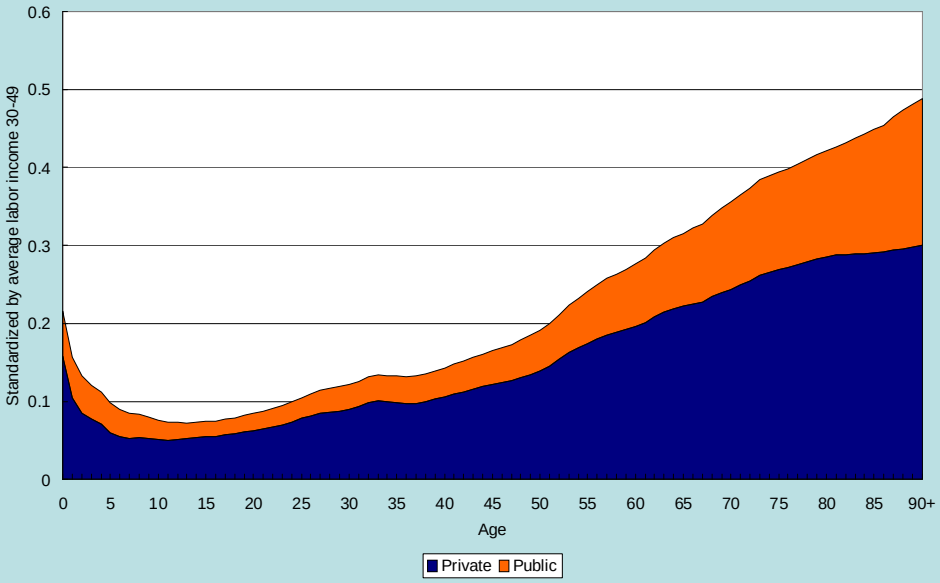

Health expenditure by the sector in 2005
Japan
Korea, Rep.
Singapore
Iran, Islamic Rep.
Malaysia
Thailand
China
Vietnam
Philippines
Sri Lanka
Cambodia
Mongolia
India
Lao PDR
Indonesia
Nepal
Bangladesh
Pakistan
Myanmar
0
500
1000
1500
2000
2500
International dollar
Public
Private

Healthcare costs in selected Asian countries

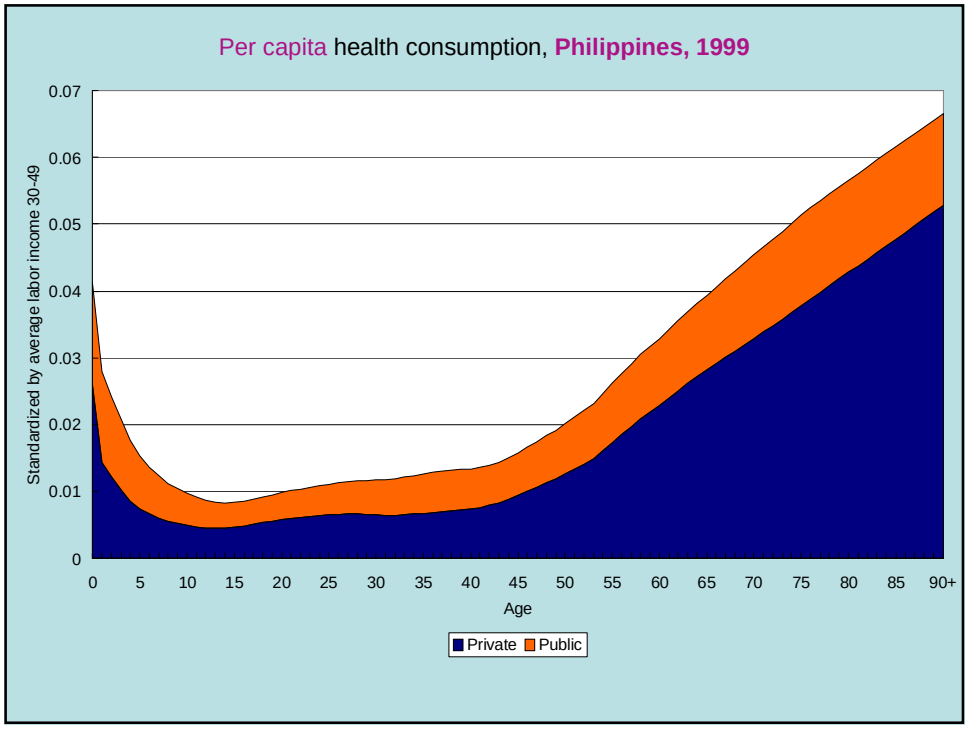
Figure 11. Age-specific profiles of per capita total health expenditure in five selected Asian countries

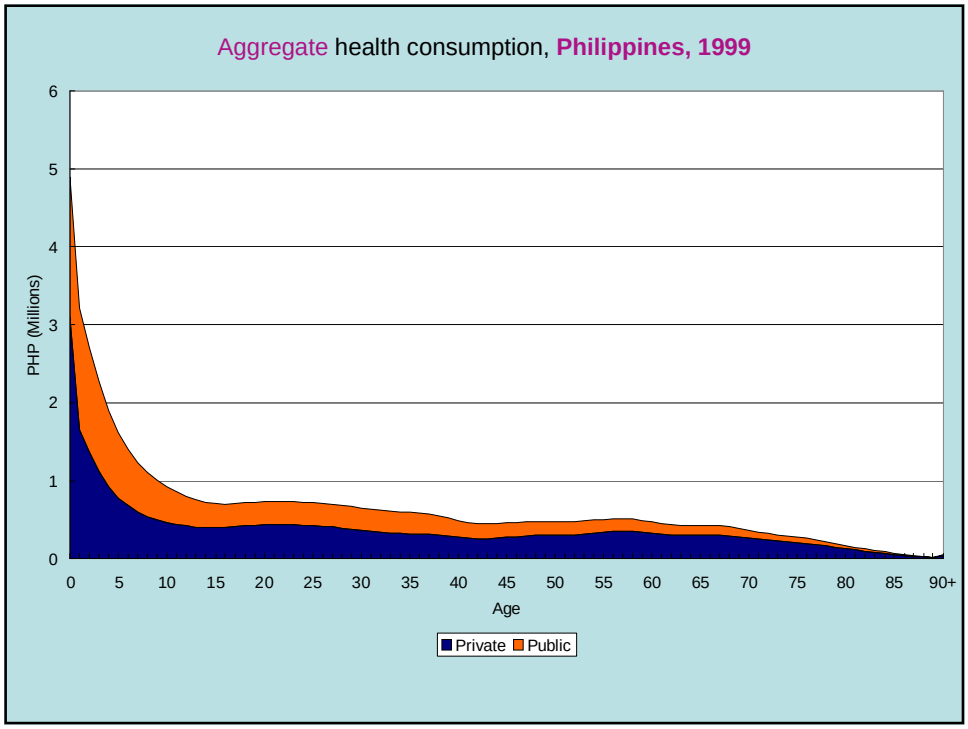


Age-specific profiles of per capita total health expenditure for five Asian countries combined

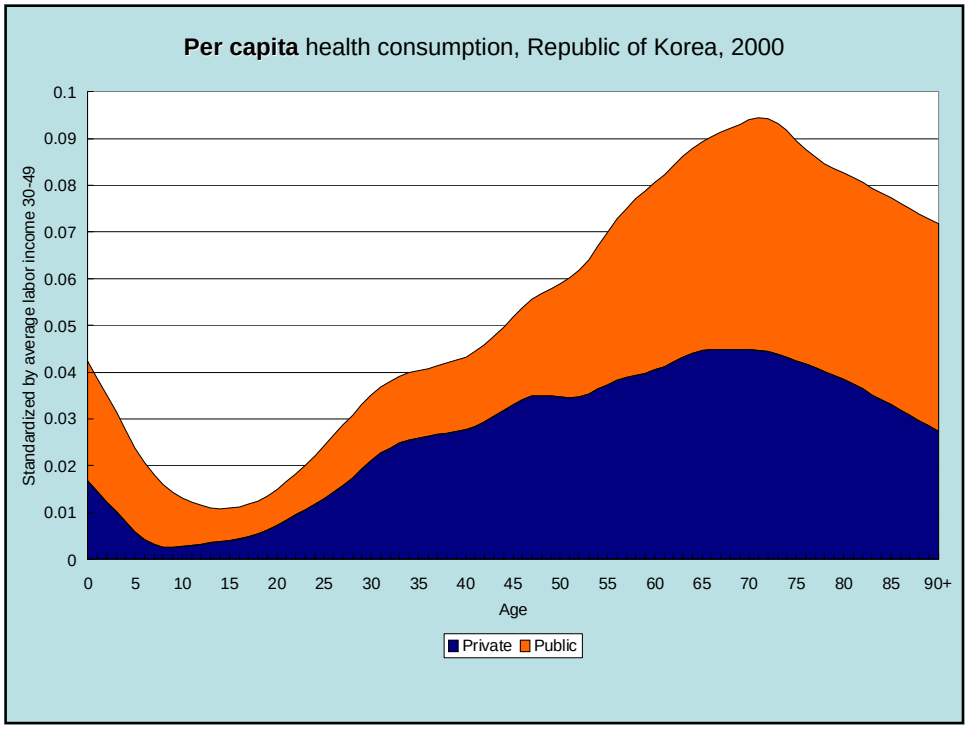


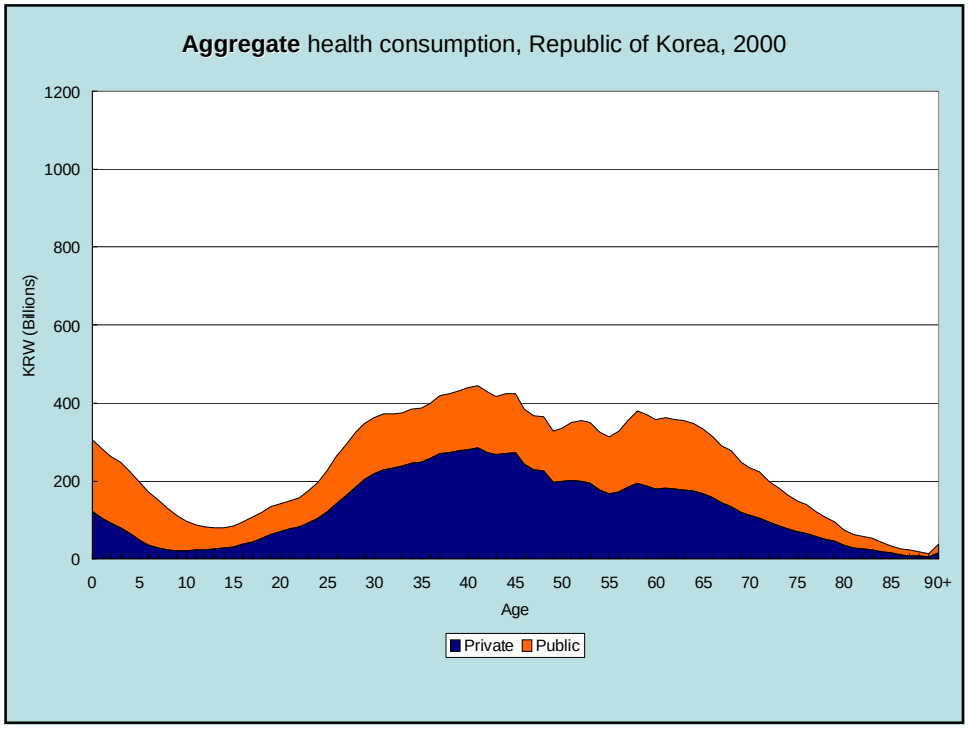
Case of the Philippines


Per capita health consumption, Philippines, 1999
Standardized by average labor income 30-49
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90+
Age
Private Public

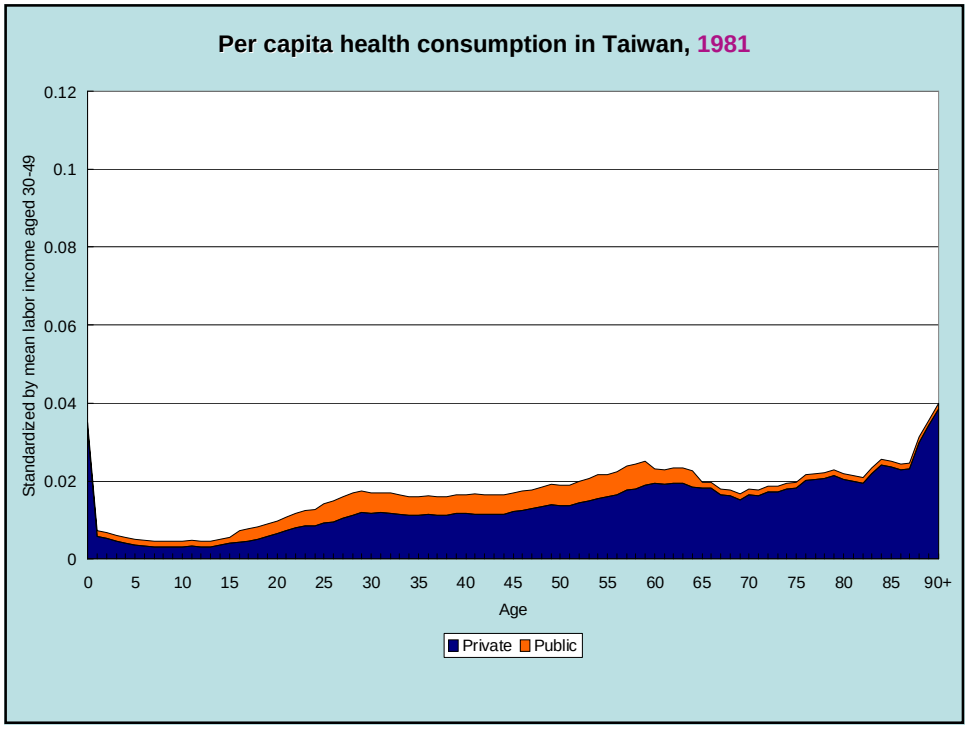

Aggregate health consumption, Philippines, 1999
PHP (Millions)
6
5
4
3
2
1
0
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90+
Age
Private Public

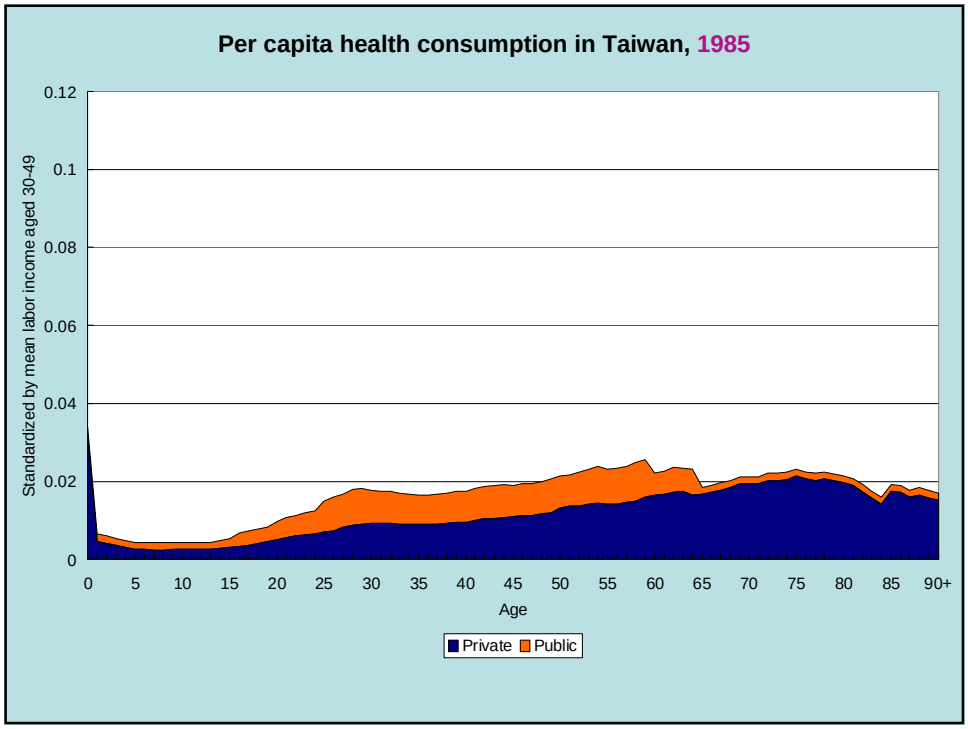
Case of the Republic of Korea

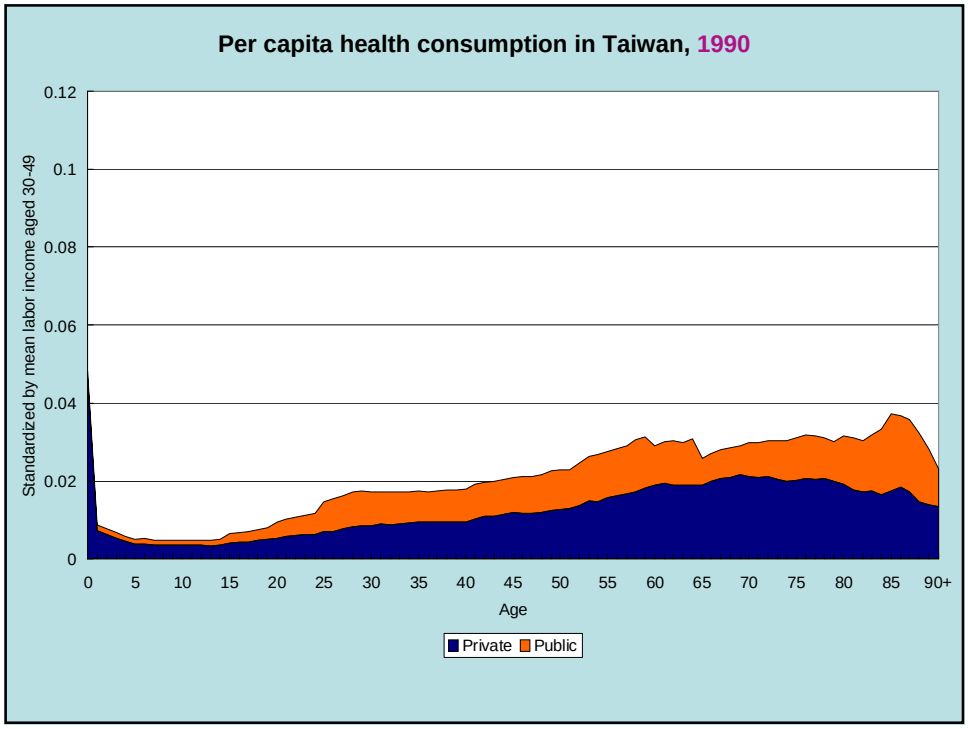




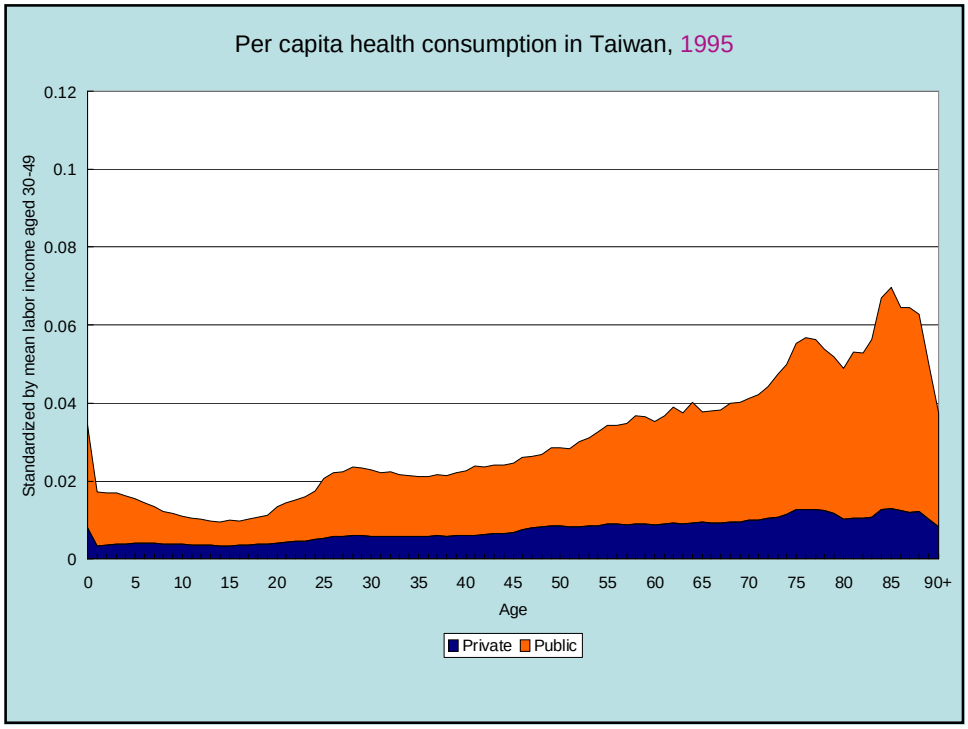
Case of Taiwan Province of China


Per capita health consumption in Taiwan, 1981
Standardized by mean labor income aged 30-49
0.12
0.1
0.08
0.06
0.04
0.02
0
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90+
Age
Private Public

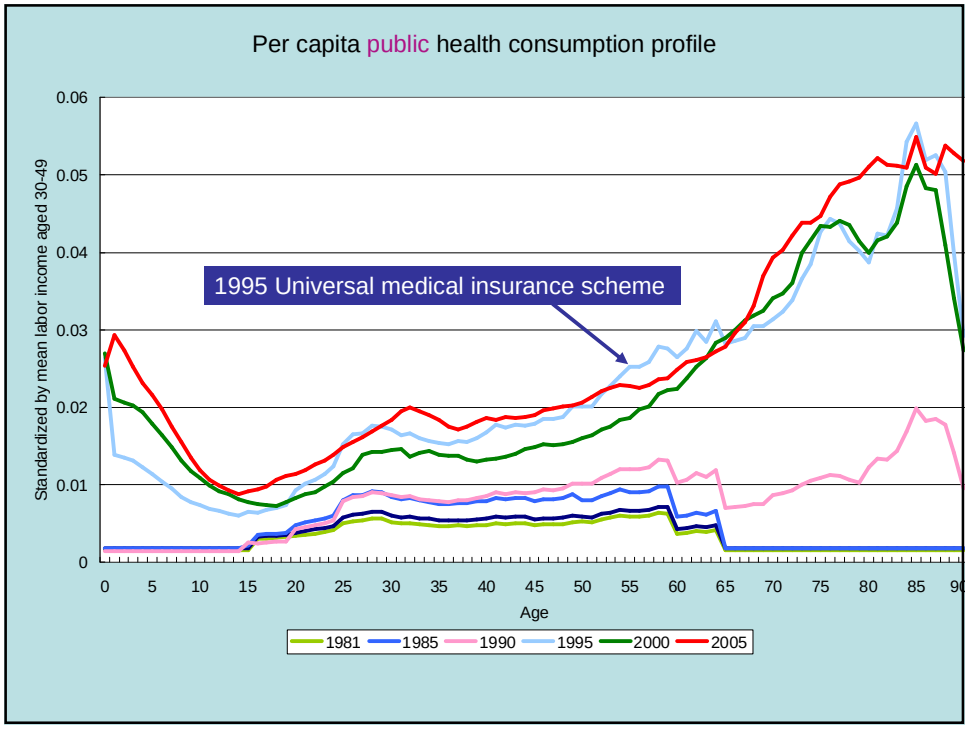

Per capita health consumption in Taiwan, 1985
Standardized by mean labor income aged 30-49
0.12
0.1
0.08
0.06
0.04
0.02
0
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90+
Age
Private Public

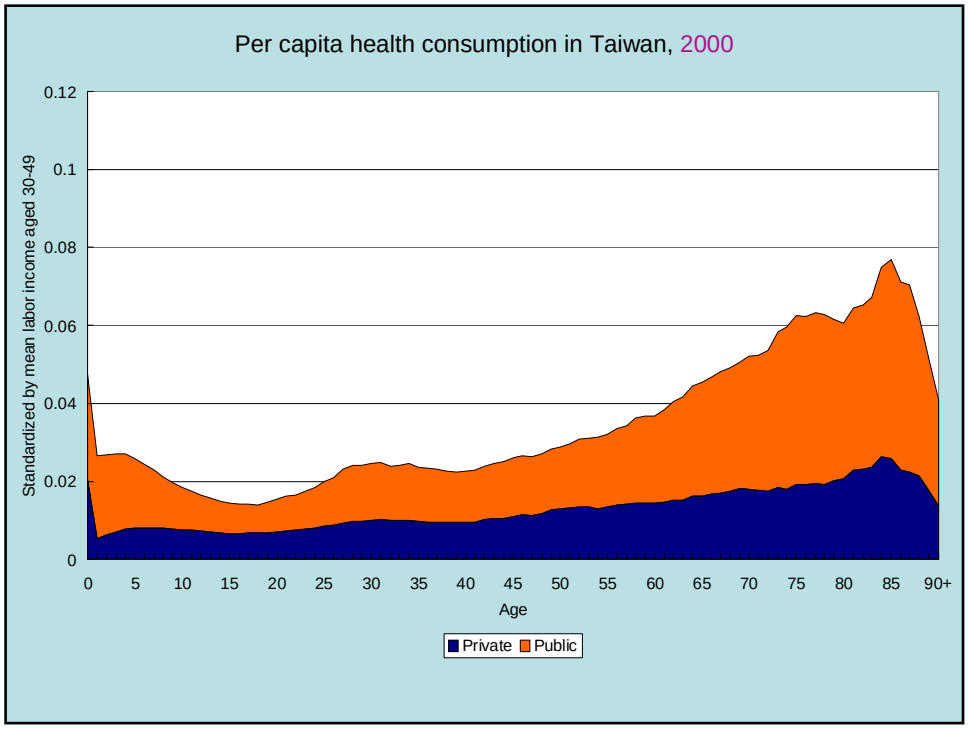

Per capita health consumption in Taiwan, 1990
Standardized by mean labor income aged 30-49
0.12
0.1
0.08
0.06
0.04
0.02
0
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90+
Age
Private Public

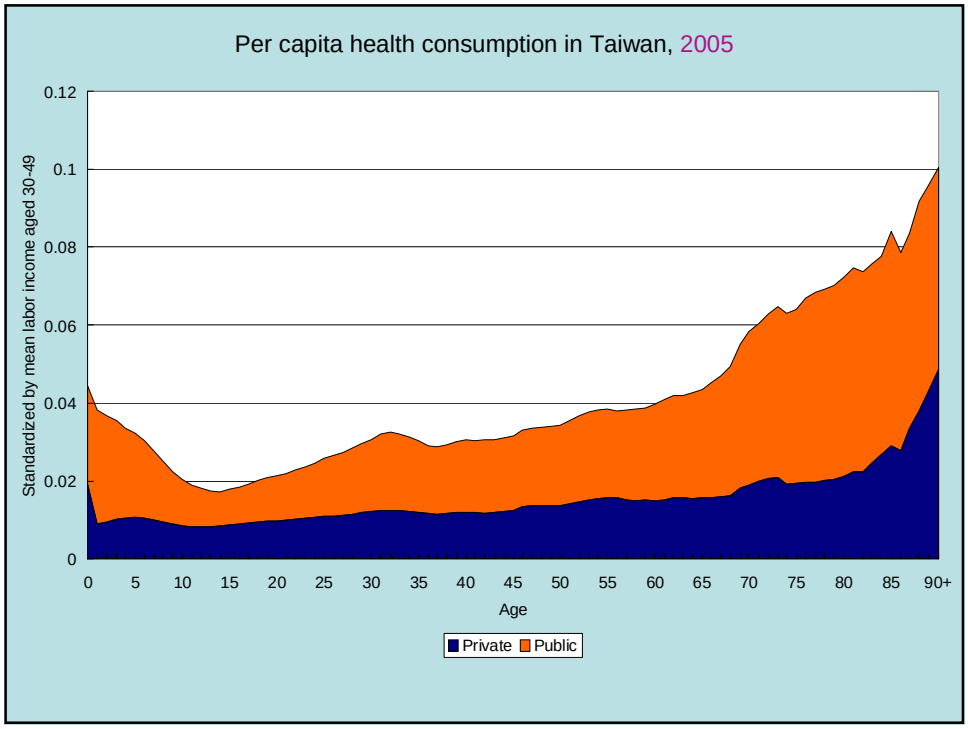
Major shift!



What happened in the early 1990s in Taiwan?

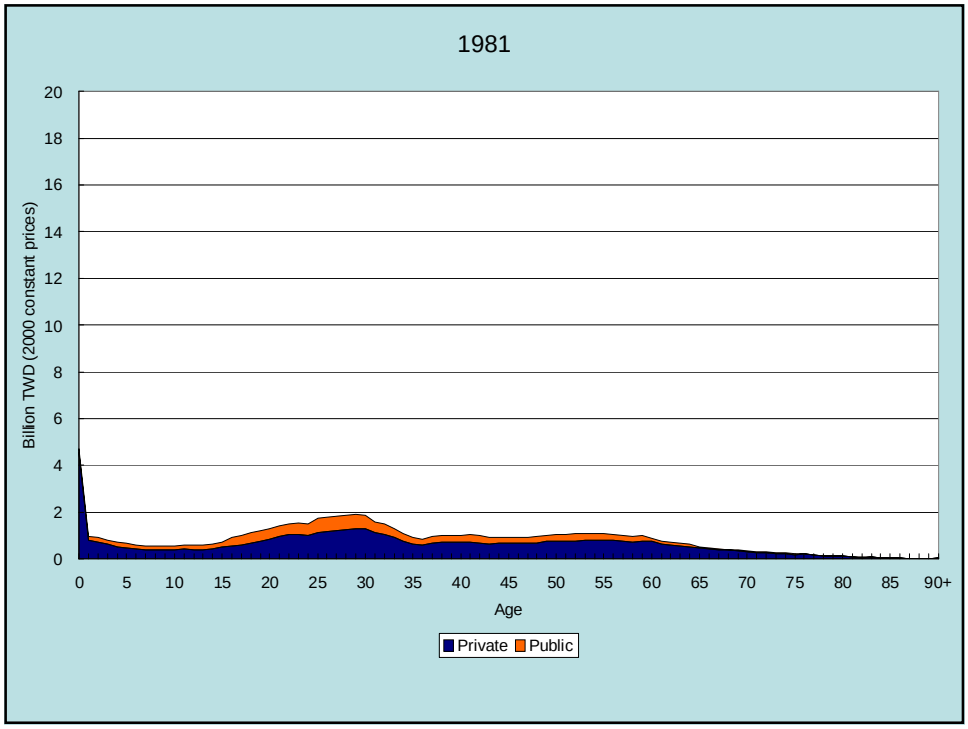

Per capita public health consumption profile
Standardized by mean labor income aged 30-49
0.06
0.05
0.04
0.03
0.02
0.01
0
1995 Universal medical insurance scheme
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90
Age
1981 1985 1990 1995 2000 2005

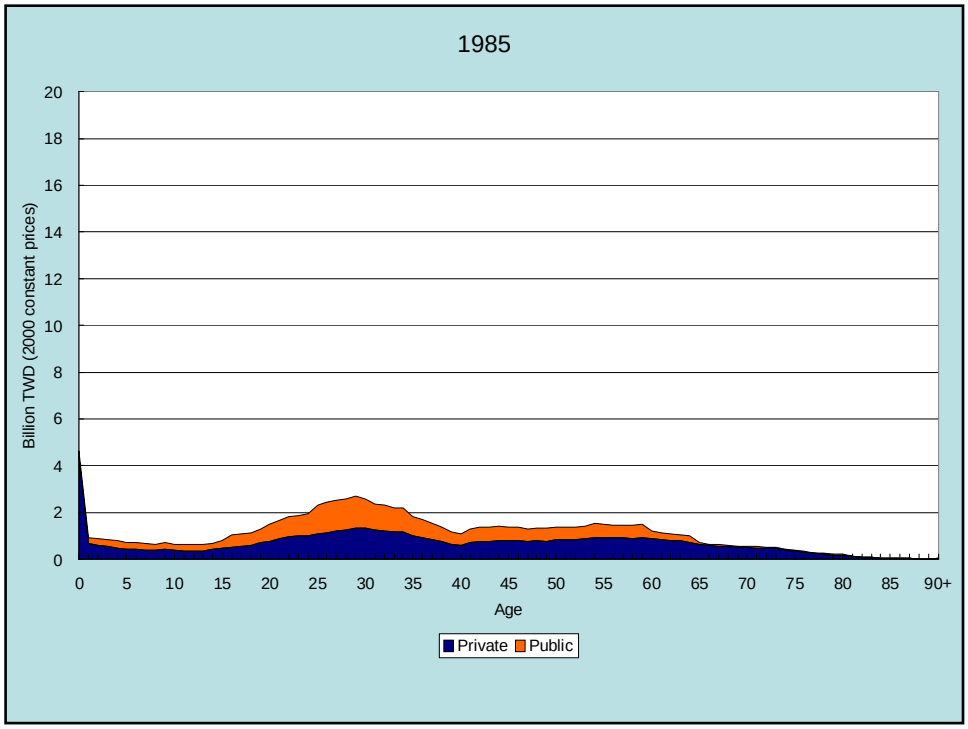

Per capita health consumption in Taiwan, 2000
Standardized by mean labor income aged 30-49
0.12
0.1
0.08
0.06
0.04
0.02
0
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90+
Age
Private Public

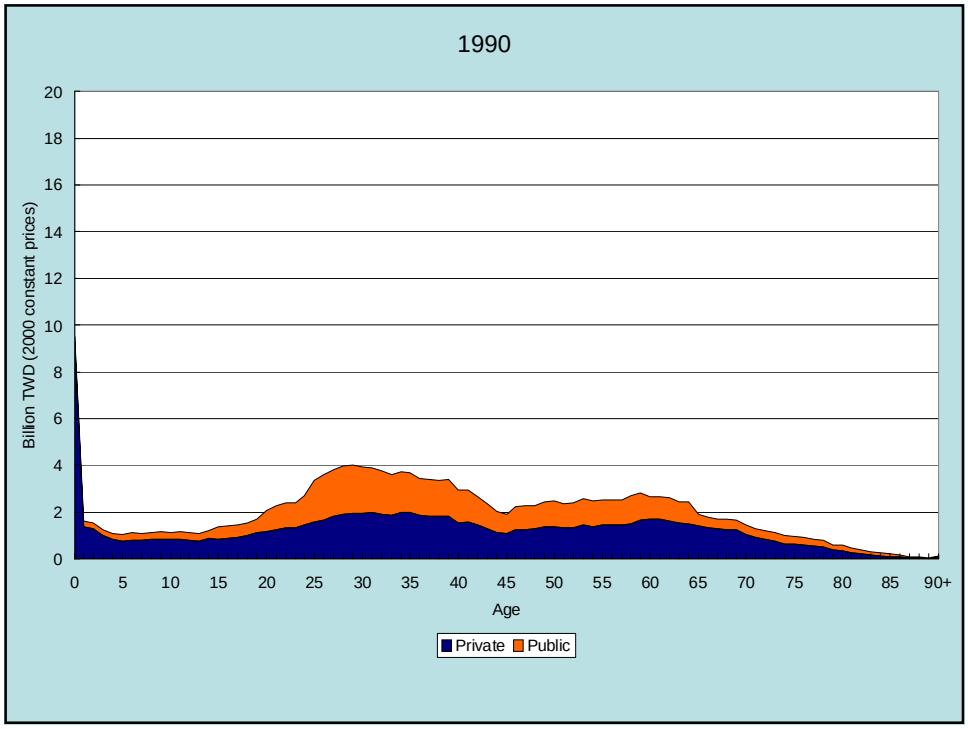


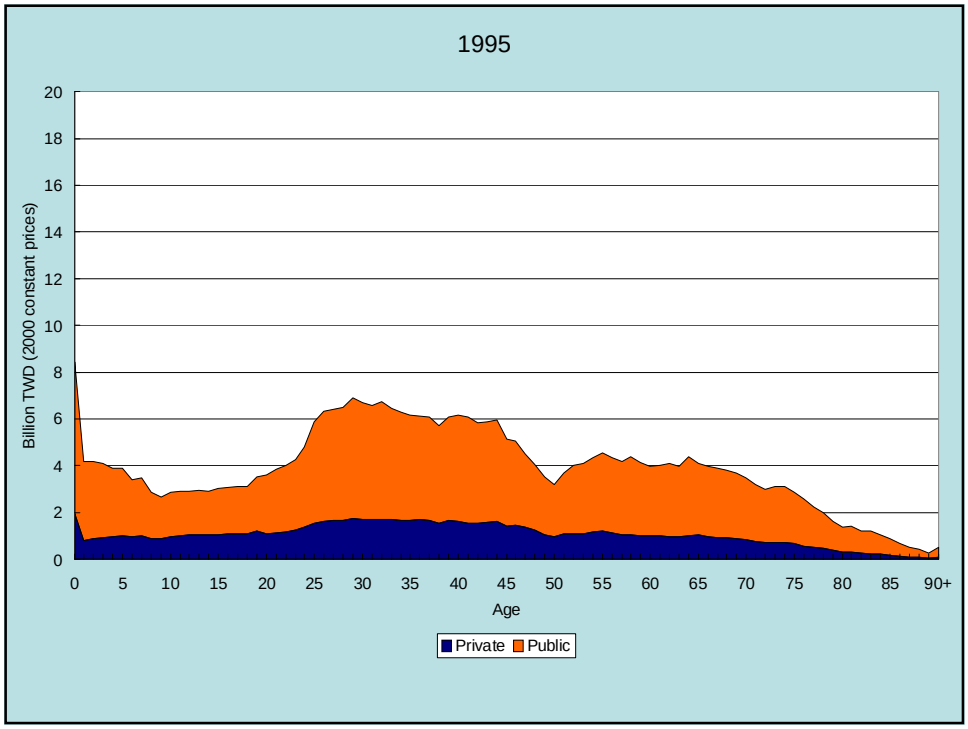
Taiwan Province of China:

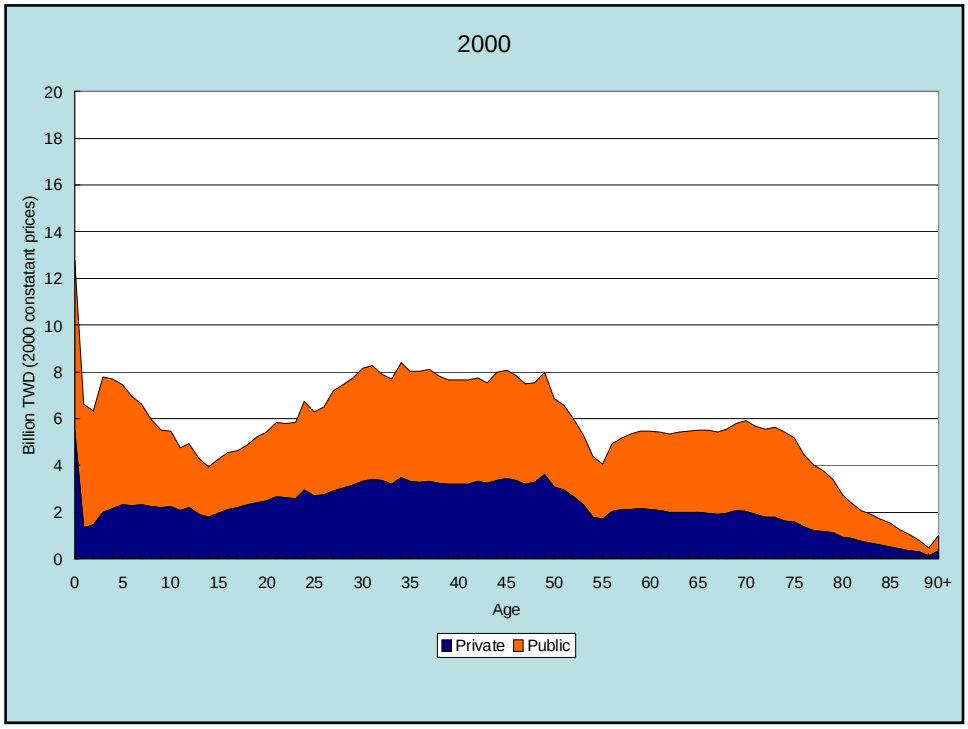
Aggregate case (total population)

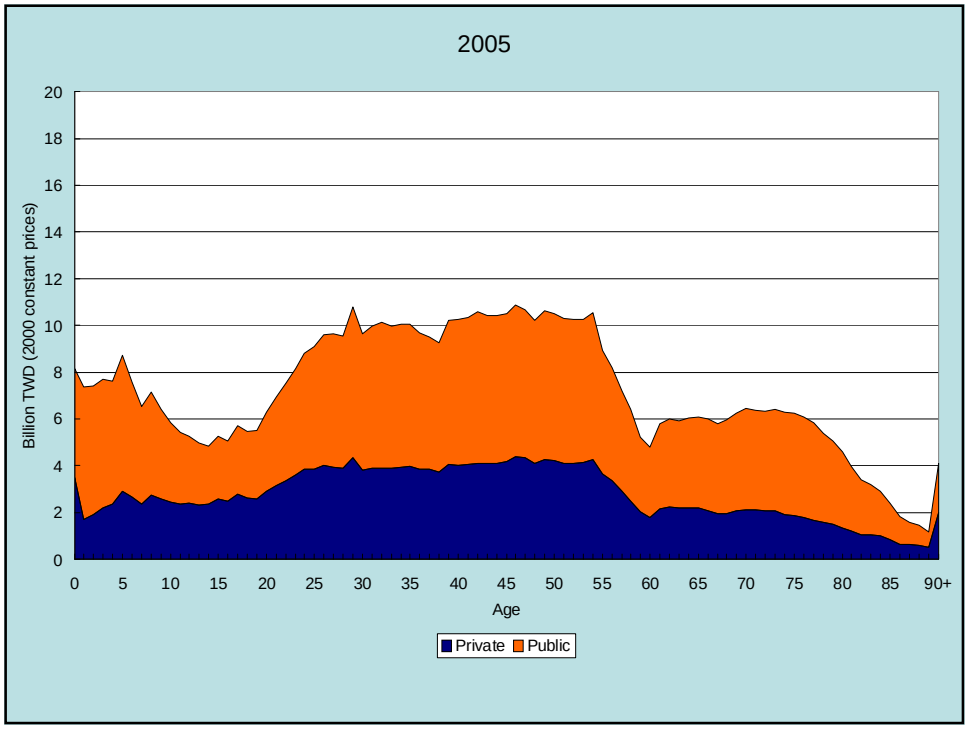

1981
Billion TWD (2000 constant prices)
20
18
16
14
12
10
8
6
4
2
0
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90+
Age
Private Public


1985
Billion TWD (2000 constant prices)
20
18
16
14
12
10
8
6
4
2
0
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90+
Age
Private Public

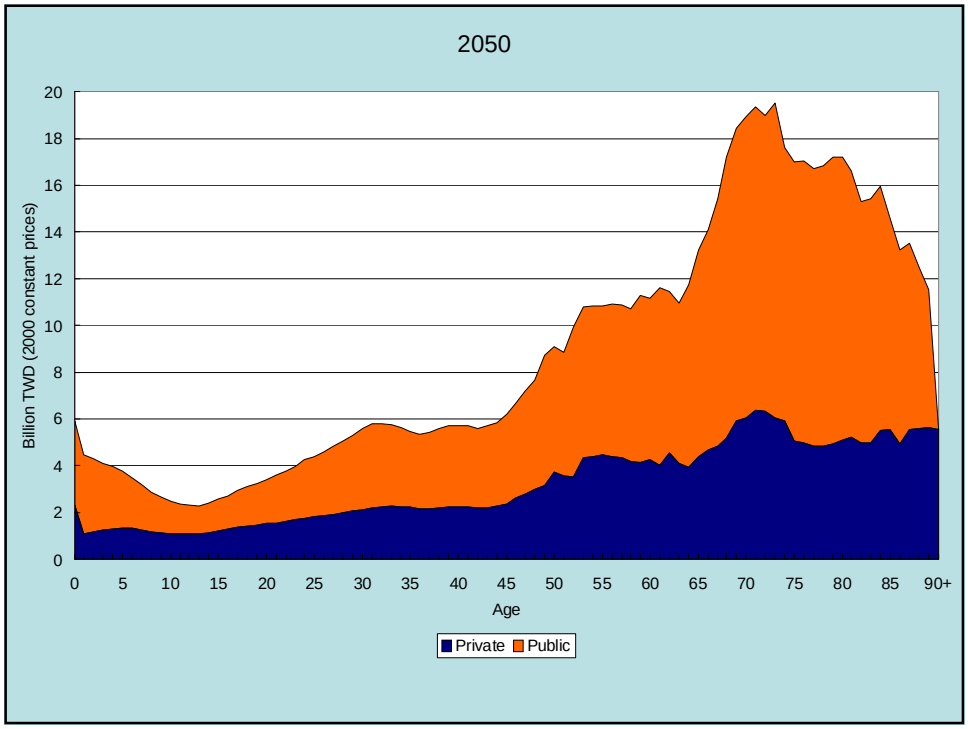

1990
Billion TWD (2000 constant prices)
0
2
4
6
8
10
12
14
16
18
20
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90+
Age
Private
Public


1995
Billion TWD (2000 constant prices)
0
2
4
6
8
10
12
14
16
18
20
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90+
Age
Private
Public

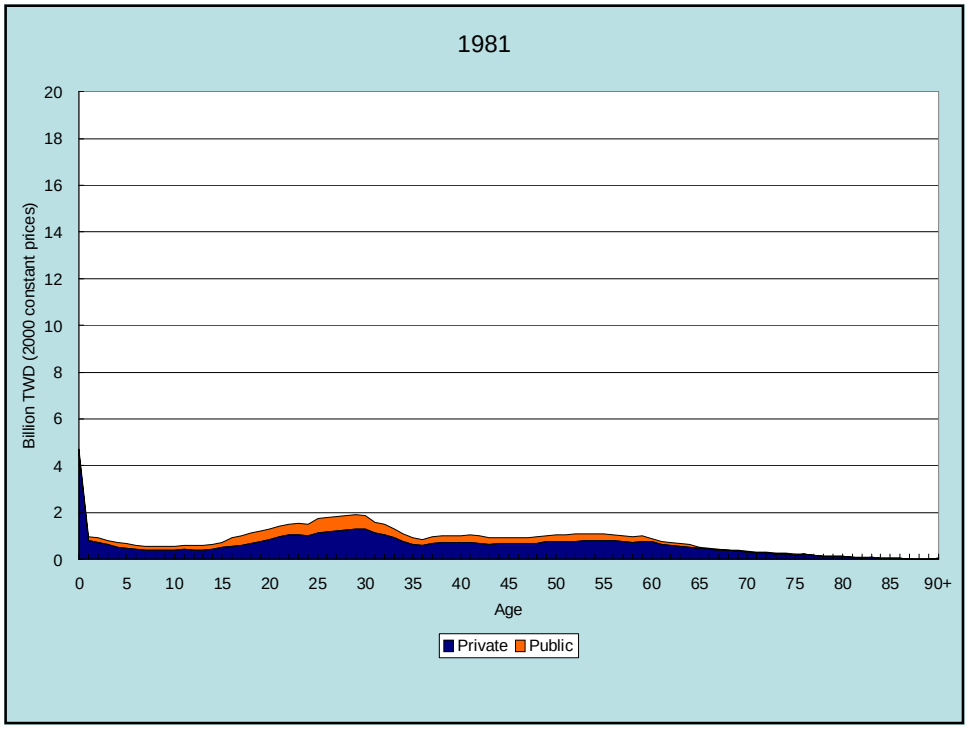

2000
Billion TWD (2000 constatant prices)
0
2
4
6
8
10
12
14
16
18
20
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90+
Age
Private
Public


2005
Billion TWD (2000 constant prices)
0
2
4
6
8
10
12
14
16
18
20
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90+
Age
Private
Public

Projected result for 2050, only due to demographic change

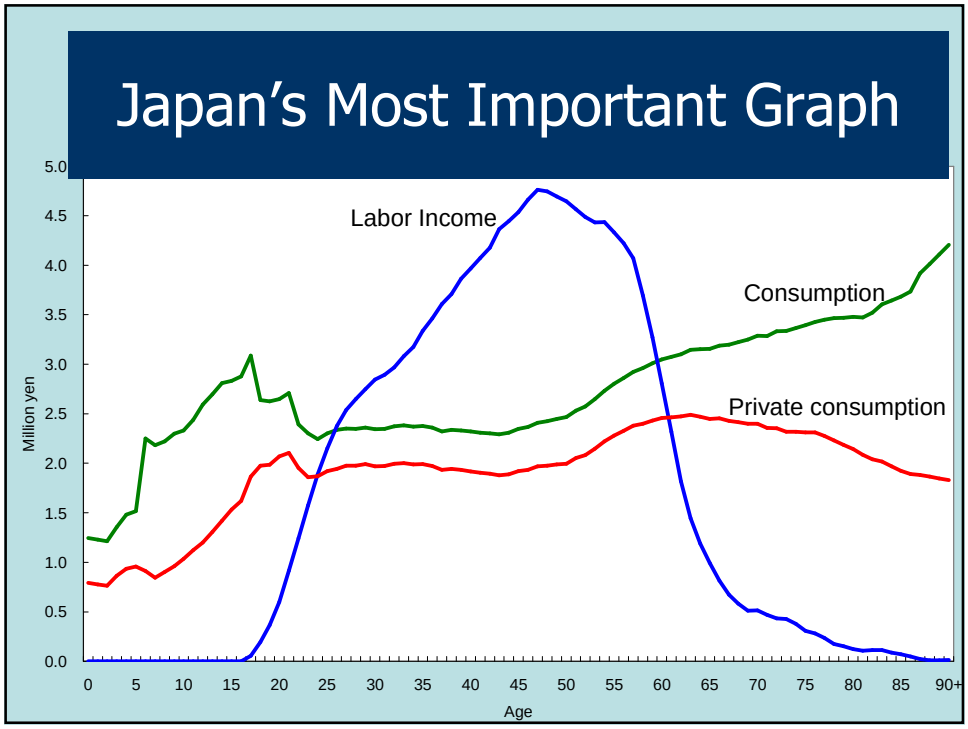


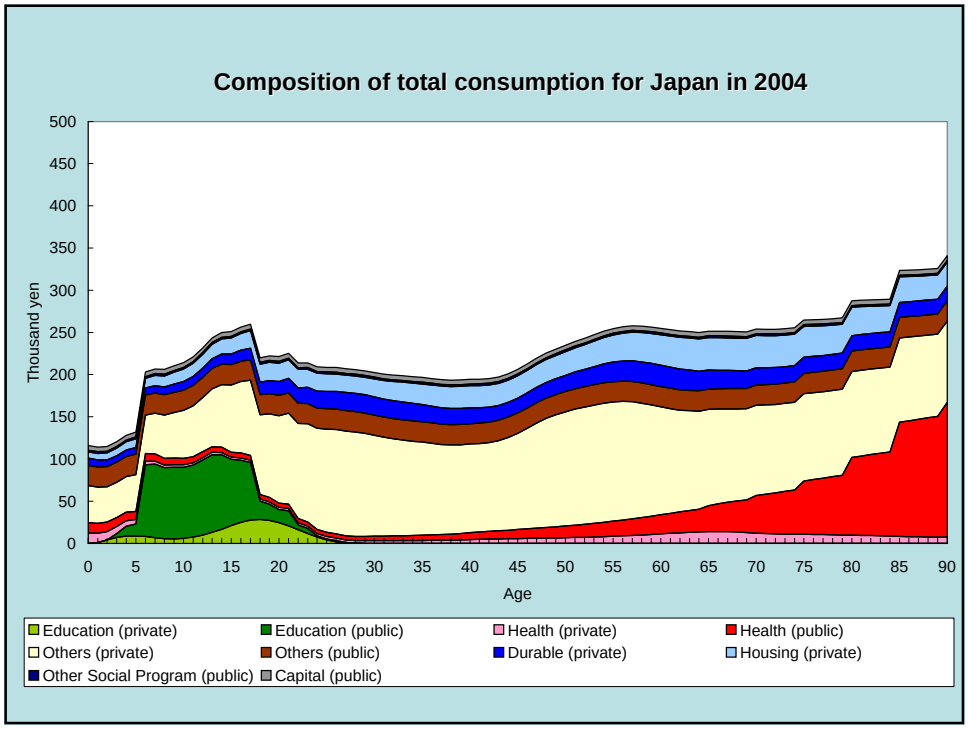
Remember! In 1981, it was like …



Will Taiwan and other Asian countries be able to cope with their escalating health costs?

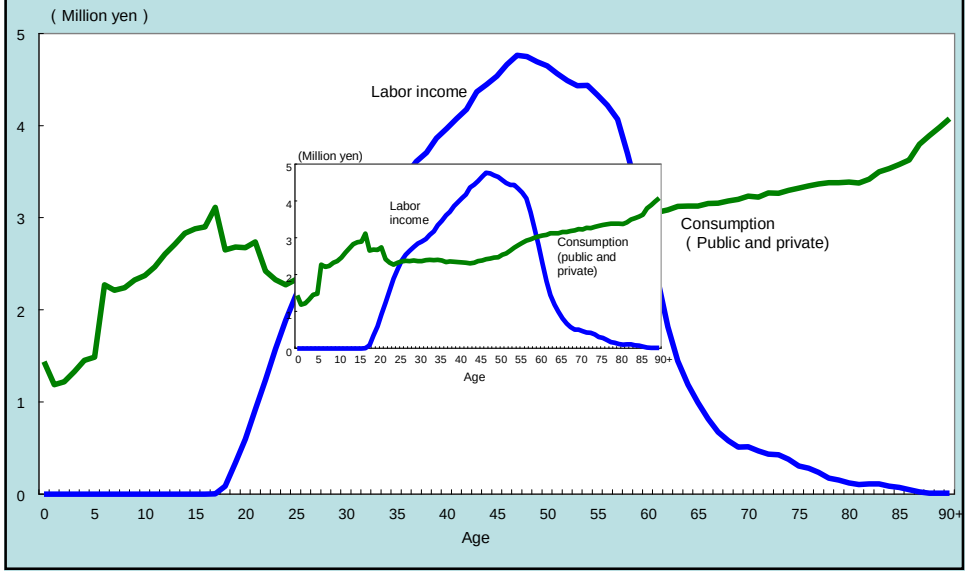
Lessons that Japan can offer to other Asian countries, as the world forerunner in population aging

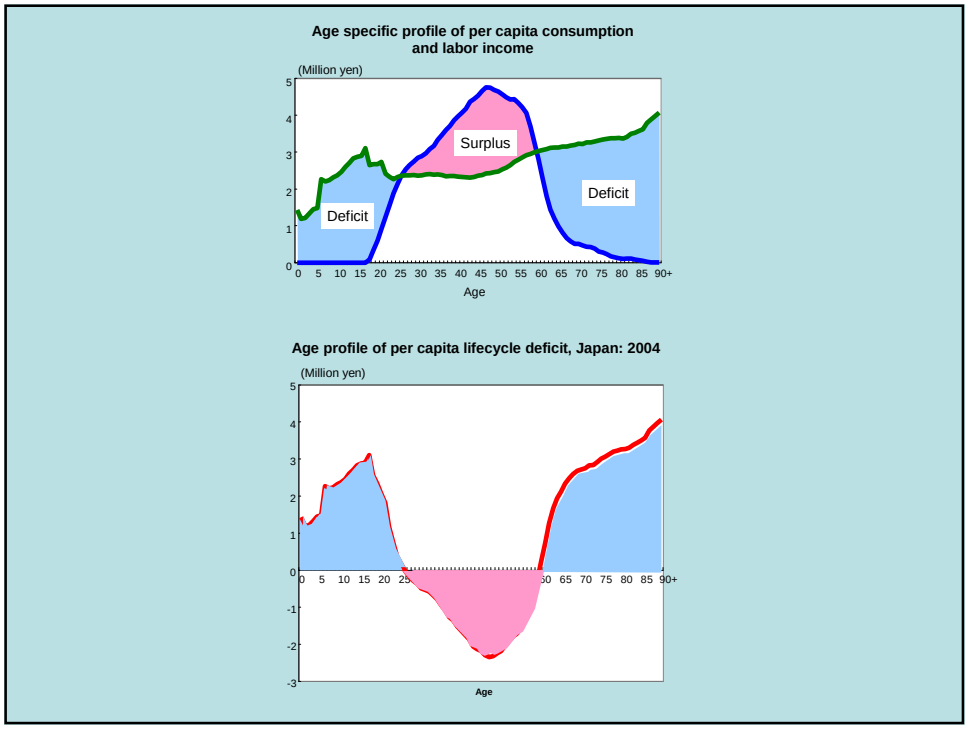

Japan's Most Important Graph
Labor Income
Consumption
Private consumption
Million yen
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90+
Age

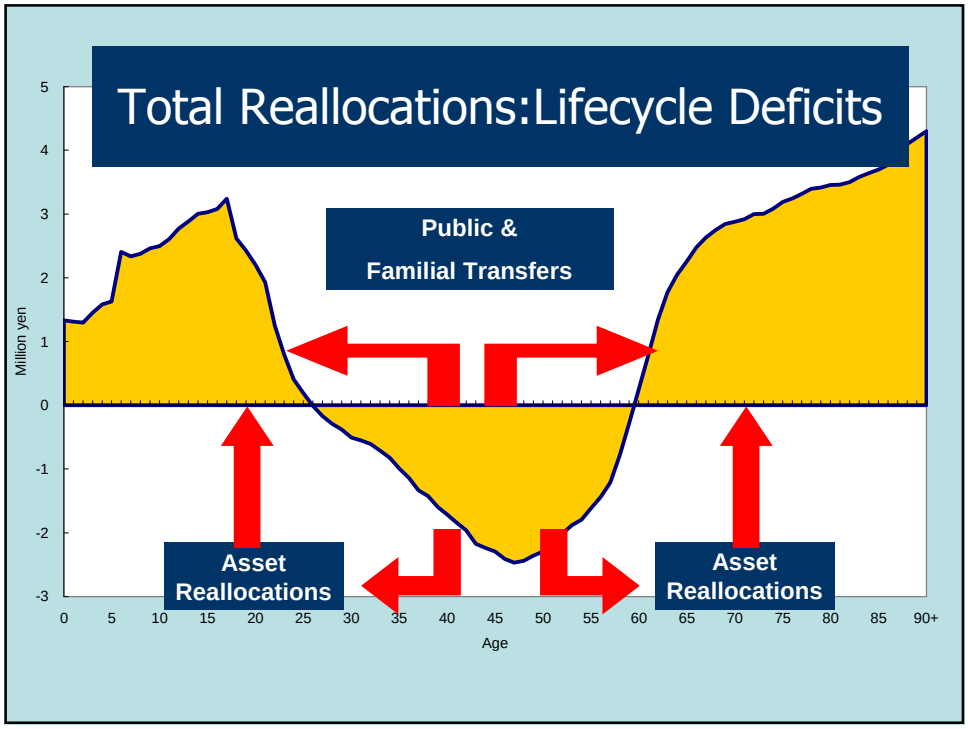

Composition of total consumption for Japan in 2004
Thousand yen
500
450
400
350
300
250
200
150
100
50
0
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90
Age
Education (private)
Education (public)
Health (private)
Health (public)
Others (private)
Others (public)
Durable (private)
Housing (private)
Other Social Program (public)
Capital (public)

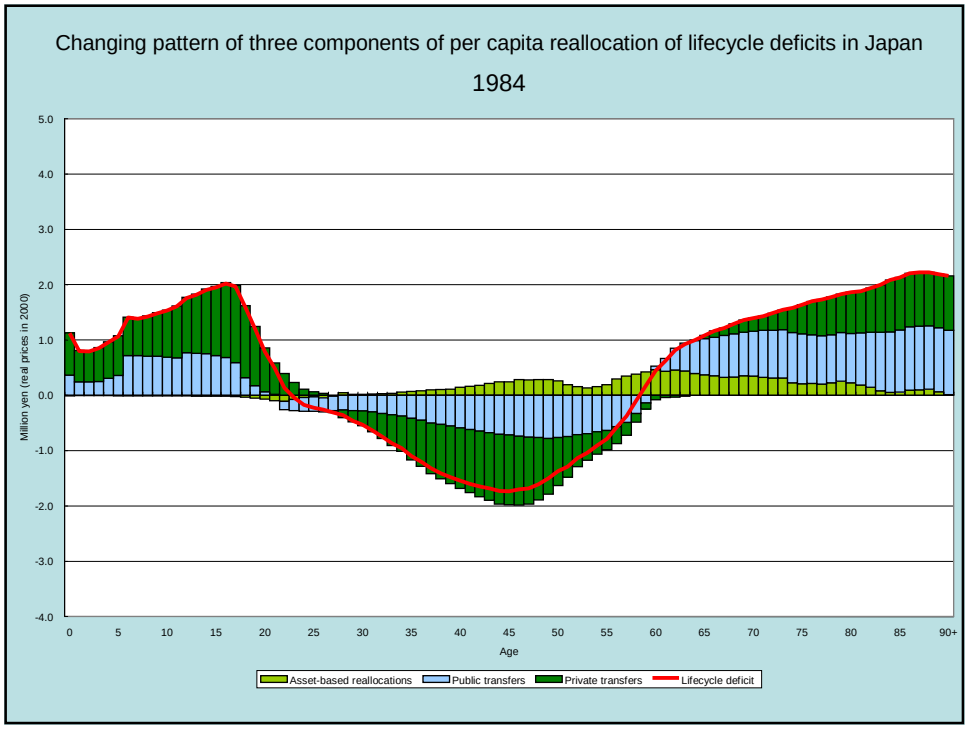
Japan's Most Important Graph

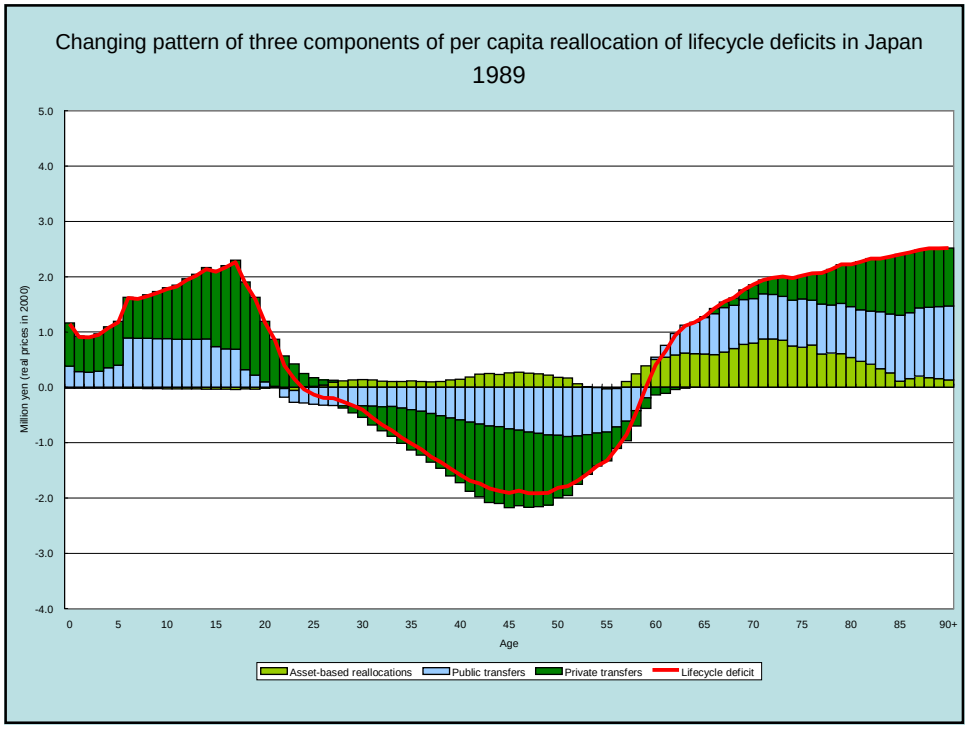
(Per-capita lifecycle)

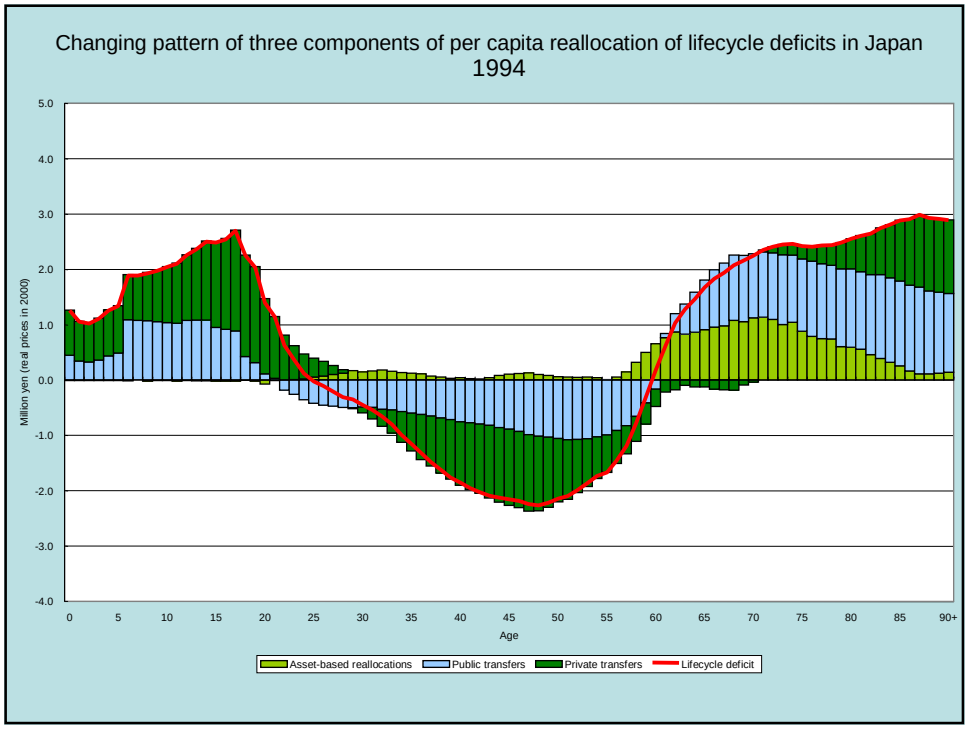




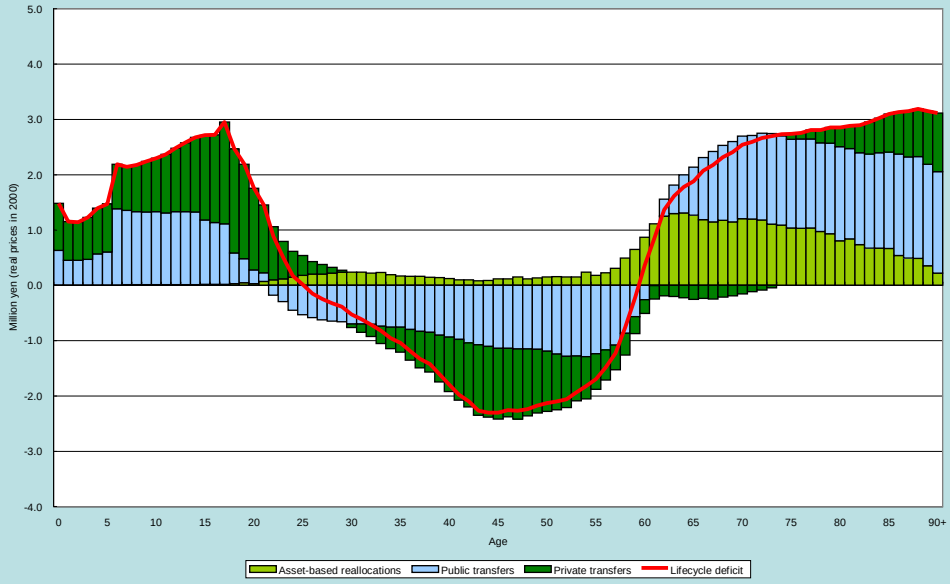

Total Reallocations:Lifecycle Deficits
Public &
Familial Transfers
Asset
Reallocations
Asset
Reallocations
Million yen
Age


Changing pattern of three components of per capita reallocation of lifecycle deficits in Japan
1984
Million yen (real prices in 2000)
Age
Asset-based reallocations
Public transfers
Private transfers
Lifecycle deficit

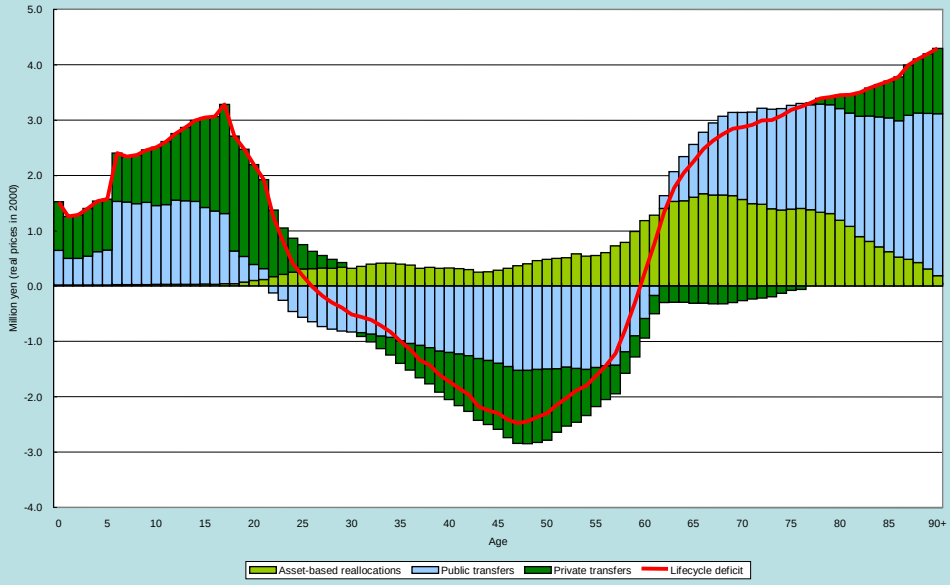

Changing pattern of three components of per capita reallocation of lifecycle deficits in Japan
1989
Million yen (real prices in 2000)
5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90+
Age
Asset-based reallocations
Public transfers
Private transfers
Lifecycle deficit


Changing pattern of three components of per capita reallocation of lifecycle deficits in Japan
1994
Million yen (real prices in 2000)
5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
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

Changing pattern of three components of per capita reallocation of lifecycle deficits in Japan
1999



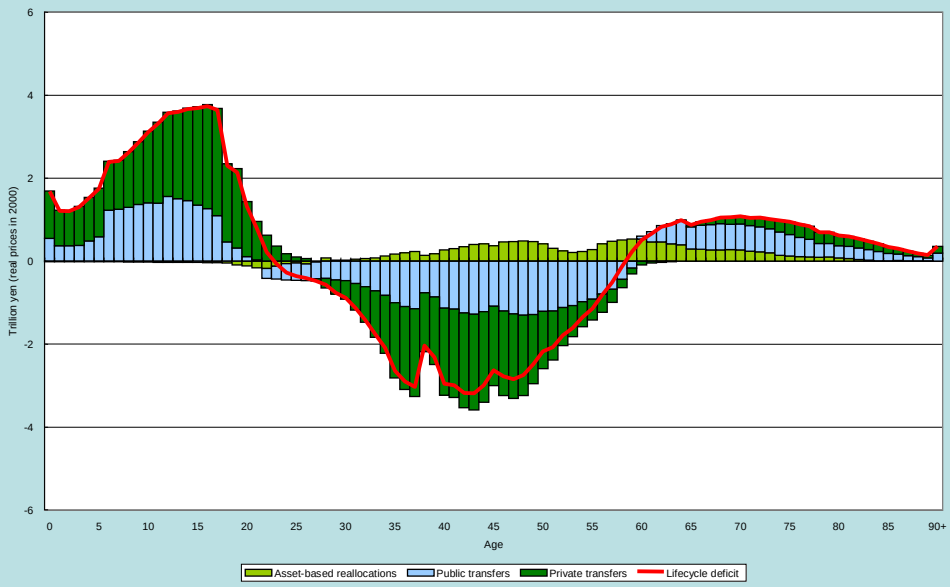
Changing pattern of three components of per capita reallocation of lifecycle deficits in Japan
2004

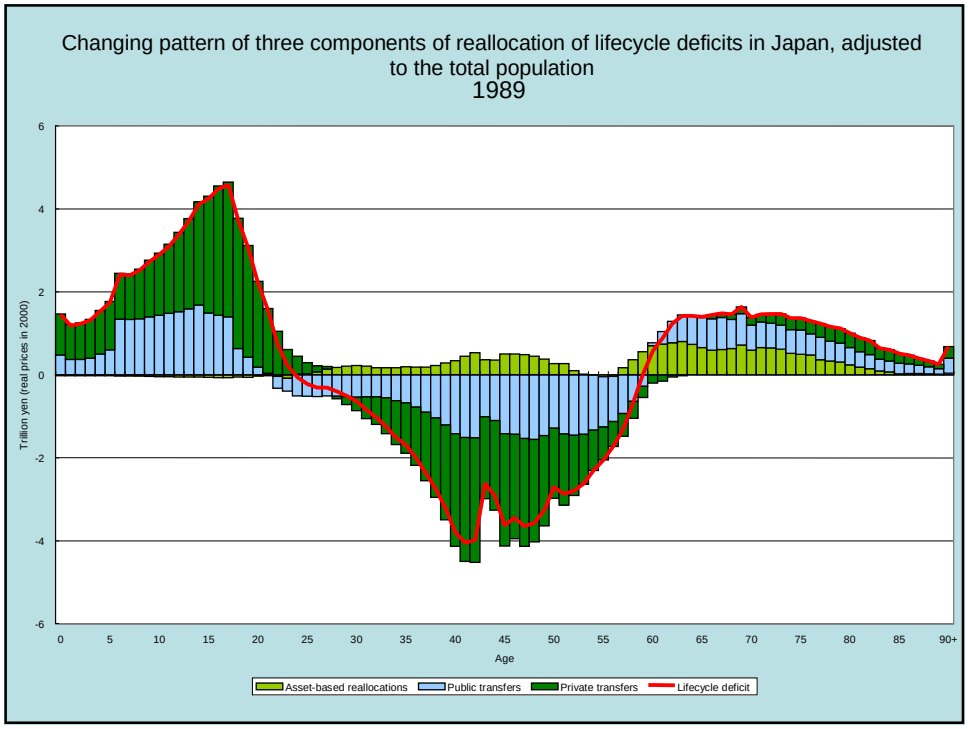


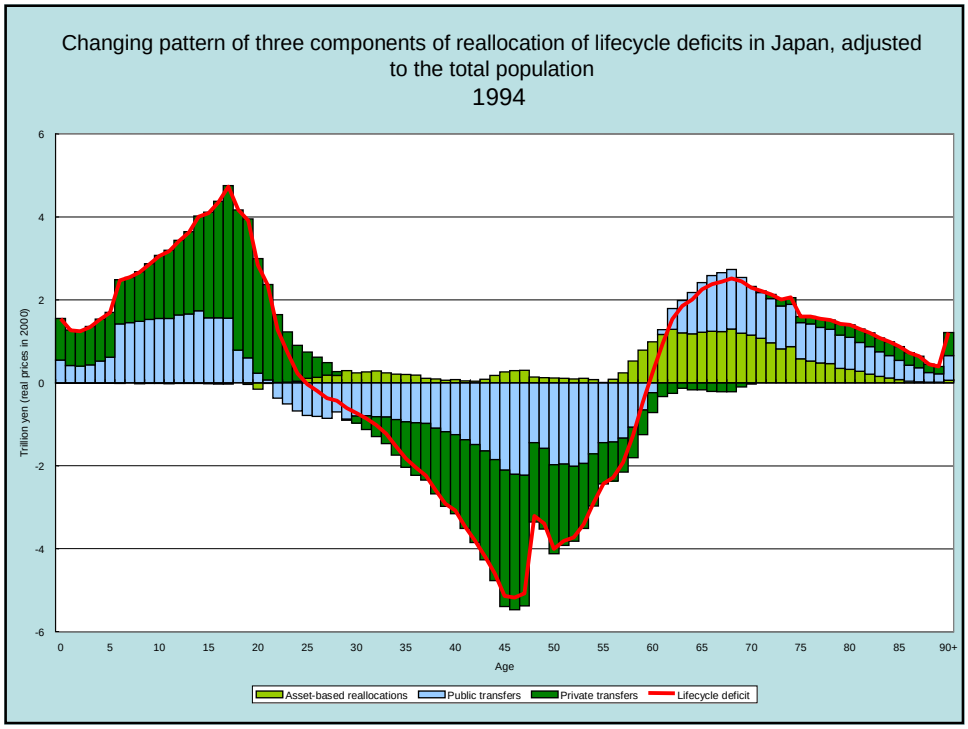
Impact of Population Aging:

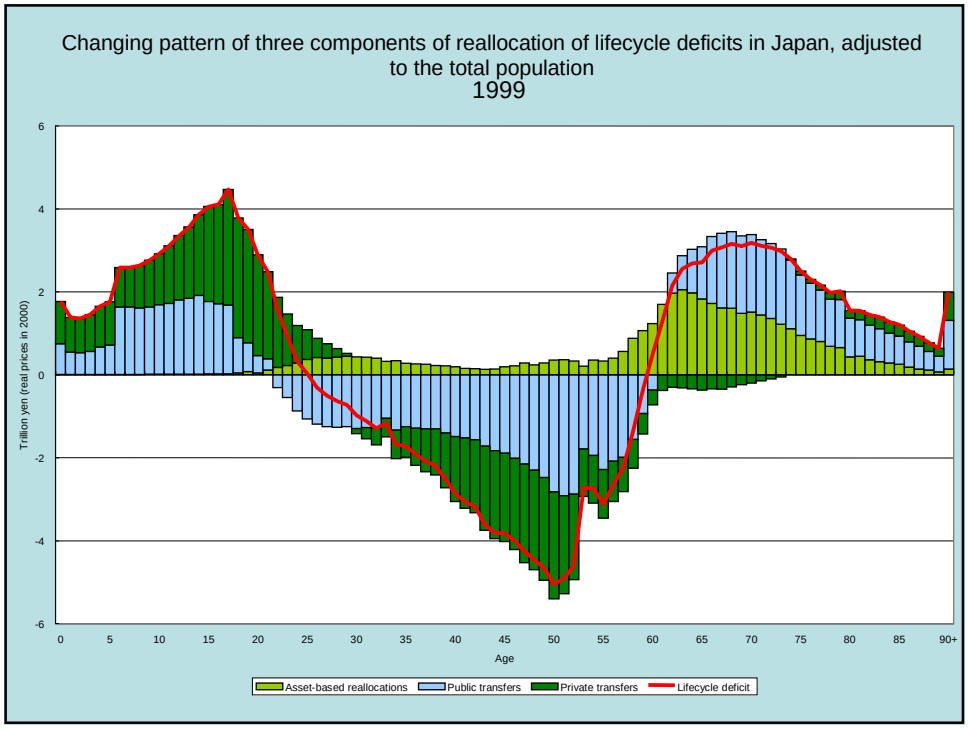
from per capita to total population

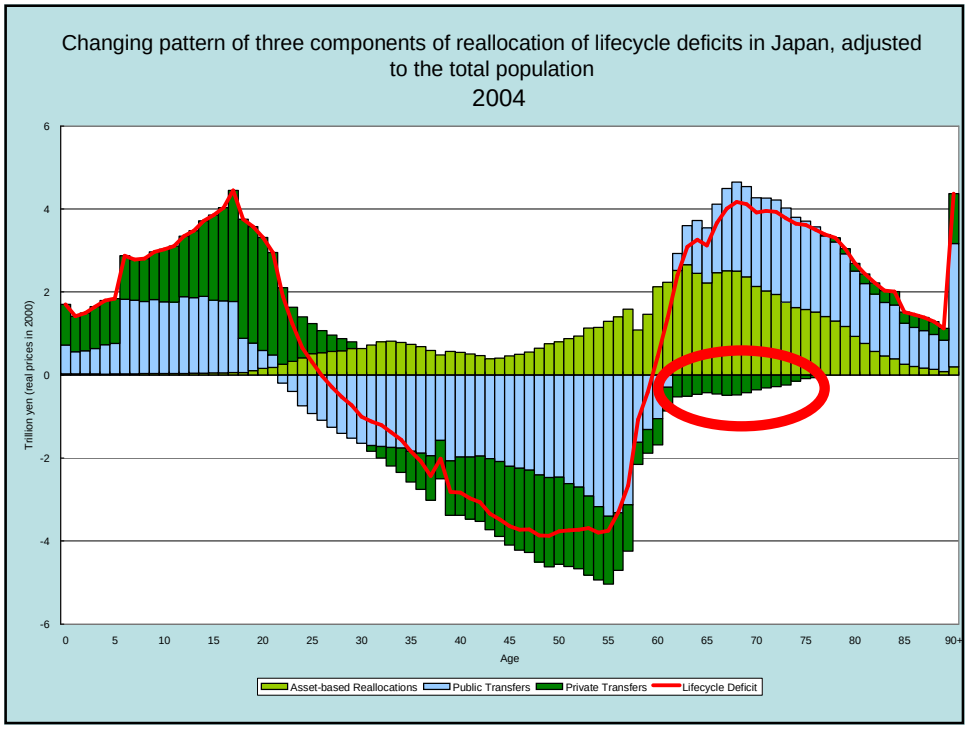
Changing pattern of three components of reallocation of lifecycle deficits in Japan, adjusted to the total population
1984

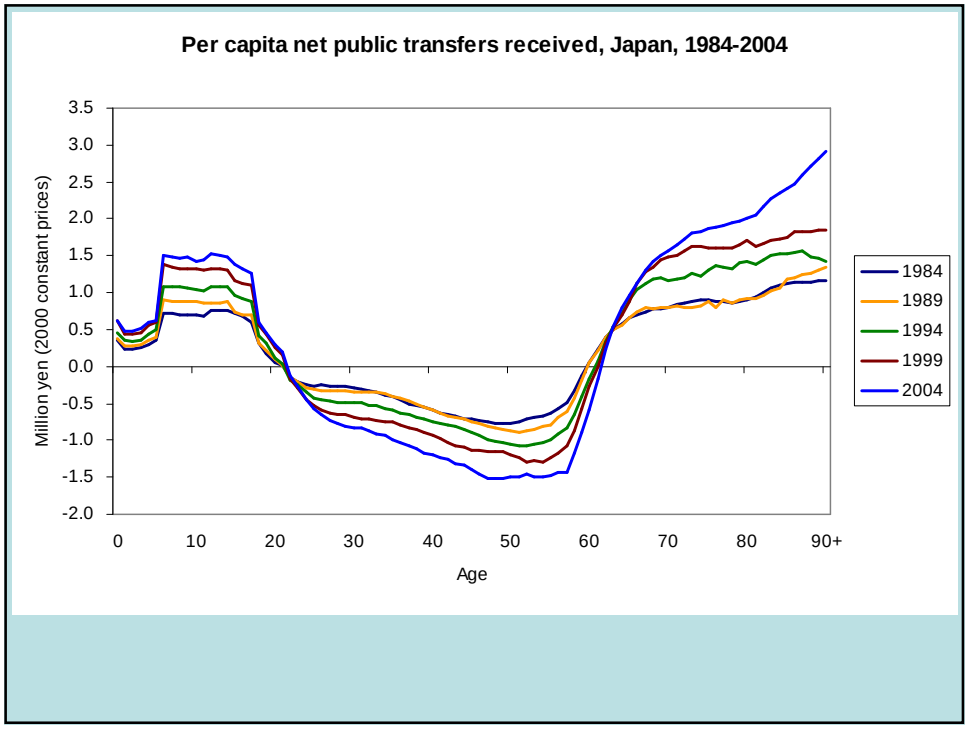


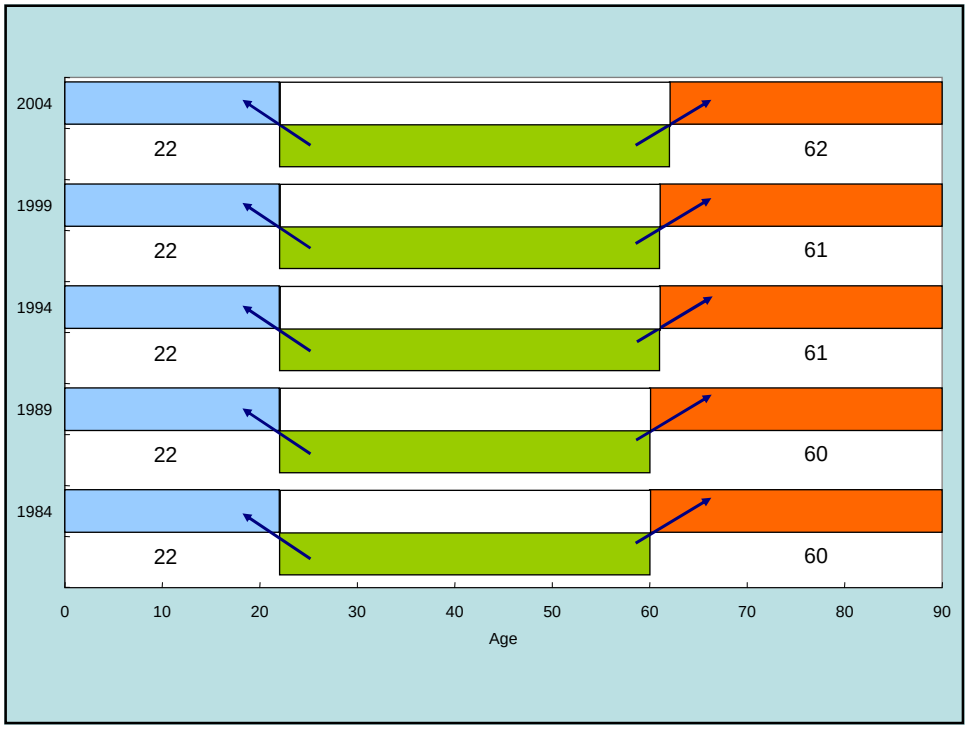

Changing pattern of three components of reallocation of lifecycle deficits in Japan, adjusted to the total population
1989
Trillion yen (real prices in 2000)
6
4
2
0
-2
-4
-6
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90+
Age
Asset-based reallocations
Public transfers
Private transfers
Lifecycle deficit


Changing pattern of three components of reallocation of lifecycle deficits in Japan, adjusted to the total population
1994
Trillion yen (real prices in 2000)
6
4
2
0
-2
-4
-6
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


Changing pattern of three components of reallocation of lifecycle deficits in Japan, adjusted to the total population
1999
Trillion yen (real prices in 2000)
6
4
2
0
-2
-4
-6
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


Changing pattern of three components of reallocation of lifecycle deficits in Japan, adjusted to the total population
2004
Trillion yen (real prices in 2000)
6
4
2
0
-2
-4
-6
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

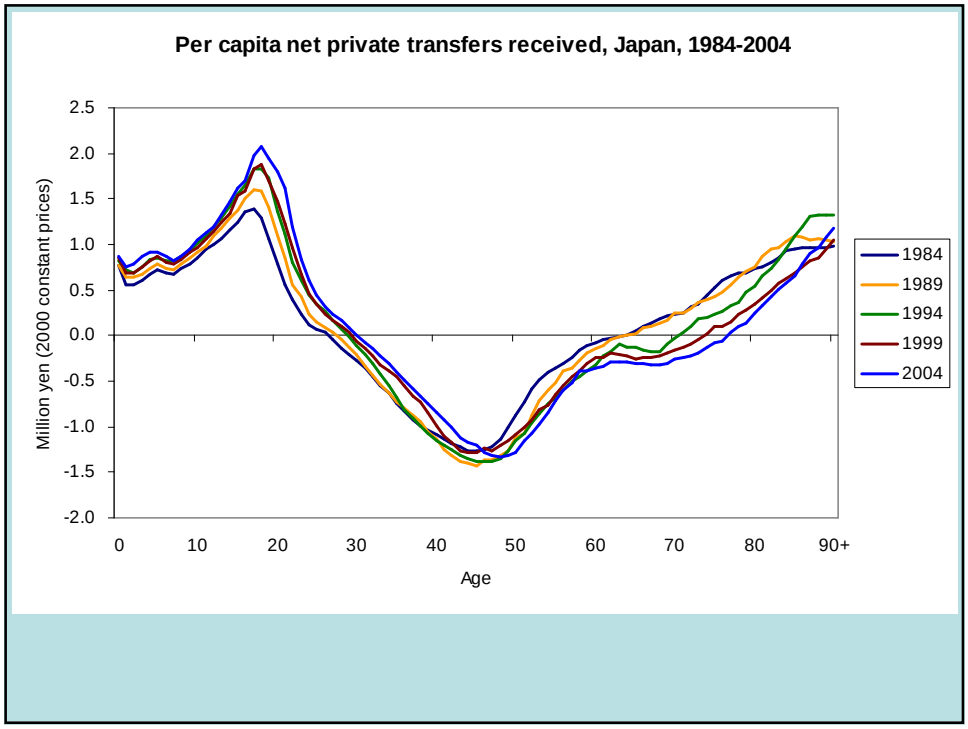

Per capita net public transfers received, Japan, 1984-2004
Million yen (2000 constant prices)
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
-0.5
-1.0
-1.5
-2.0
0
10
20
30
40
50
60
70
80
90+
Age
1984
1989
1994
1999
2004

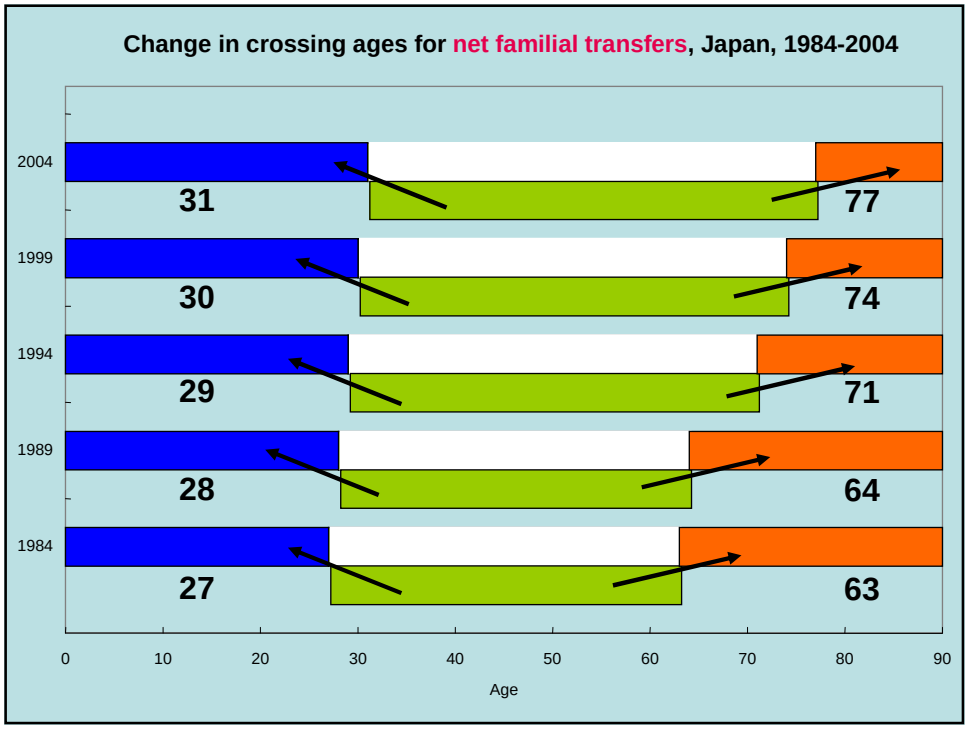

2004
22
62
1999
22
61
1994
22
61
1989
22
60
1984
22
60
0
10
20
30
40
50
60
70
80
90
Age

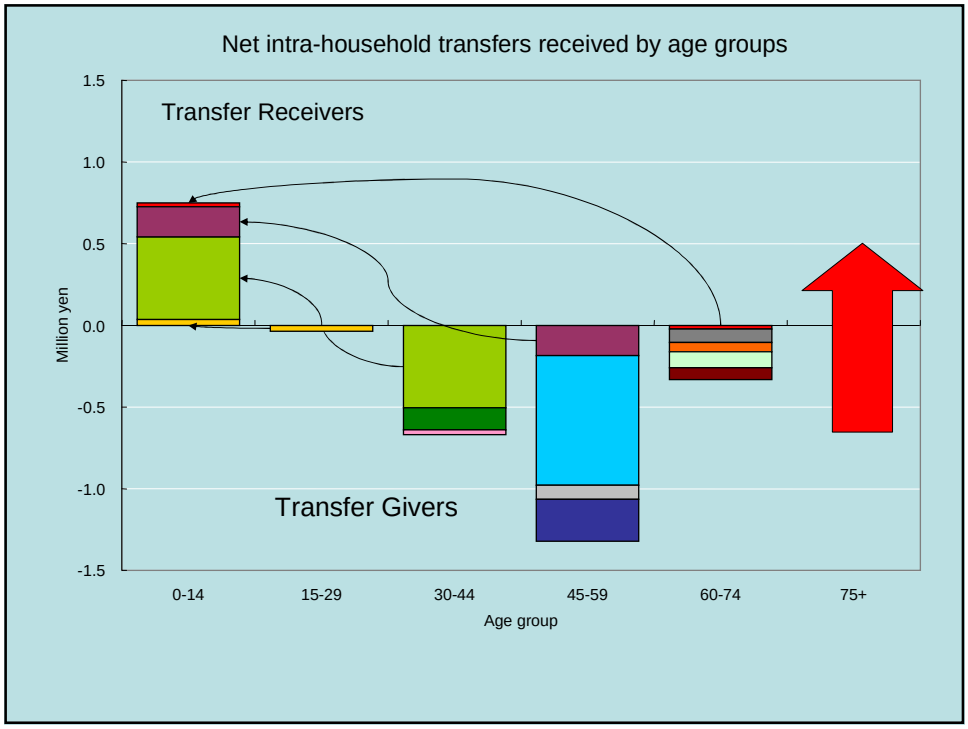
- The public sector tends to be tardy in responding to Japan's rapidly changing age structure and social needs.

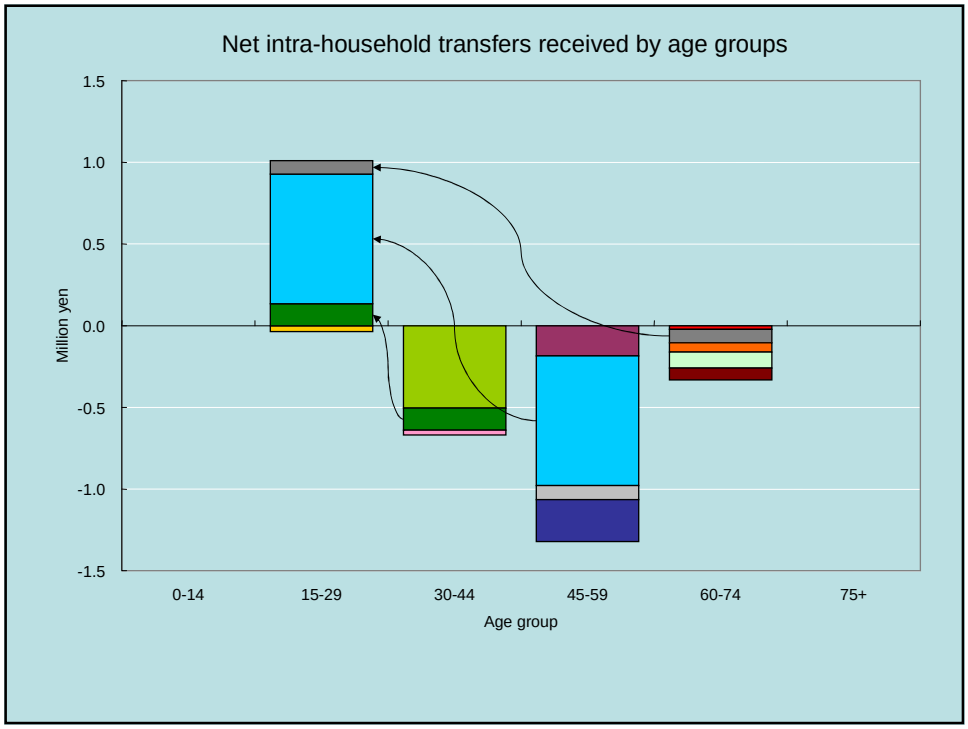
- The public sector tends to be tardy in responding to Japan's rapidly changing age structure and social needs.

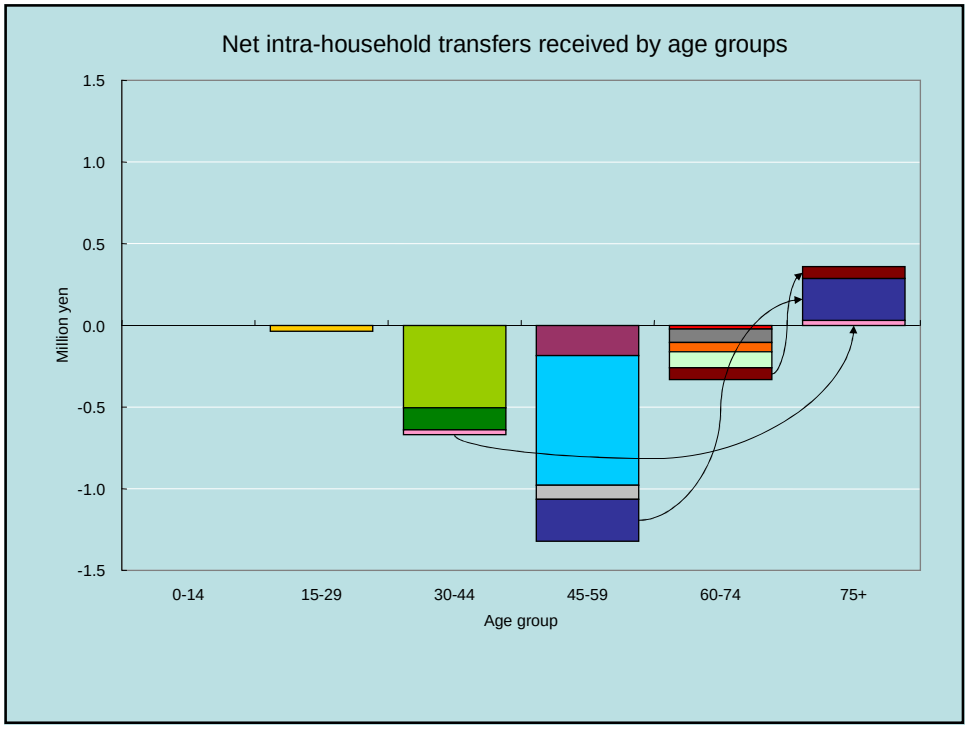
The private sector responds more rapidly like…

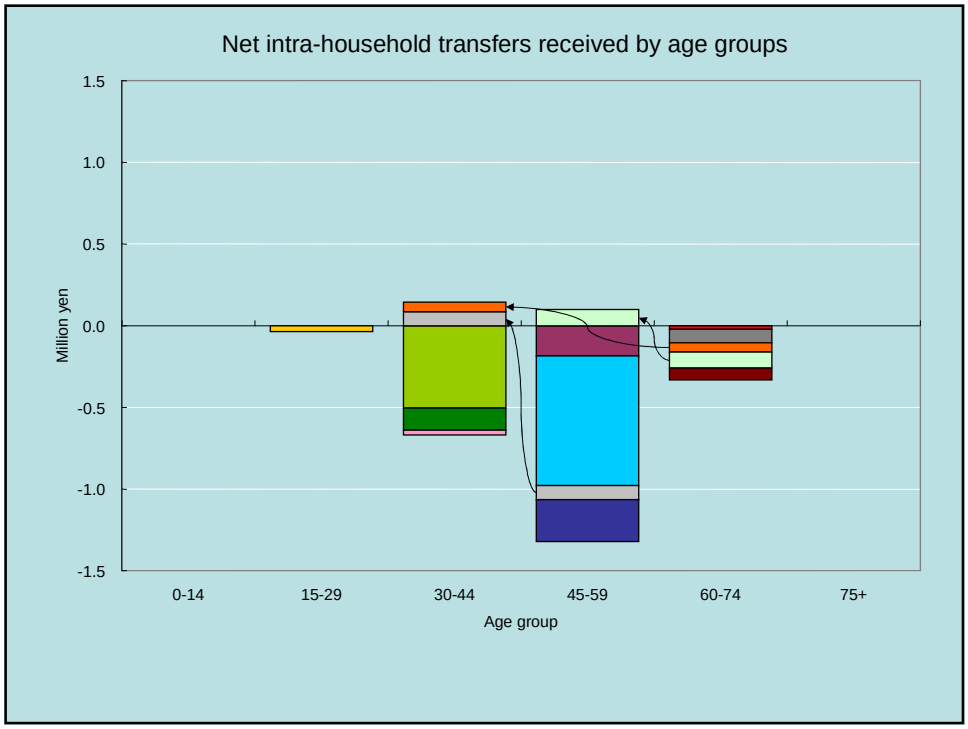

Per capita net private transfers received, Japan, 1984-2004
Million yen (2000 constant prices)
2.5
2.0
1.5
1.0
0.5
0.0
-0.5
-1.0
-1.5
-2.0
0
10
20
30
40
50
60
70
80
90+
Age
1984
1989
1994
1999
2004

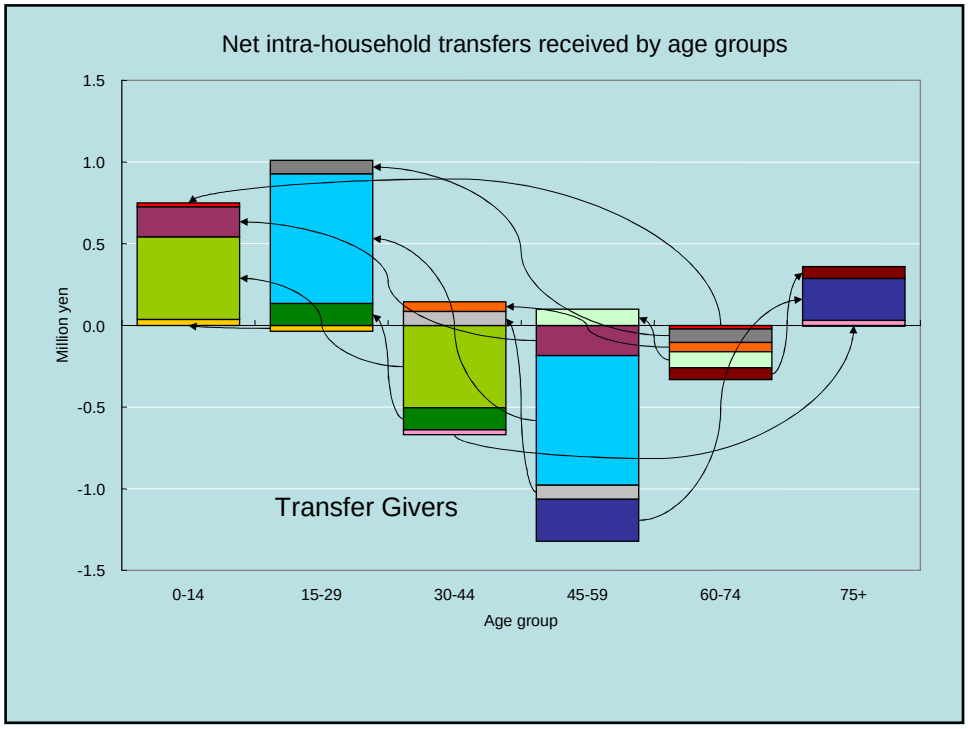

Change in crossing ages for net familial transfers, Japan, 1984-2004
2004
31
77
1999
30
74
1994
29
71
1989
28
64
1984
27
63
0
10
20
30
40
50
60
70
80
90
Age


Net intra-household transfers received by age groups
Transfer Receivers
Transfer Givers
Million yen
1.5
1.0
0.5
0.0
-0.5
-1.0
-1.5
0-14
15-29
30-44
45-59
60-74
75+
Age group


Net intra-household transfers received by age groups
Million yen
1.5
1.0
0.5
0.0
-0.5
-1.0
-1.5
0-14
15-29
30-44
45-59
60-74
75+
Age group


Net intra-household transfers received by age groups
1.5
1.0
0.5
0.0
-0.5
-1.0
-1.5
Million yen
0-14
15-29
30-44
45-59
60-74
75+
Age group


Net intra-household transfers received by age groups
1.5
1.0
0.5
0.0
-0.5
-1.0
-1.5
Million yen
0-14
15-29
30-44
45-59
60-74
75+
Age group

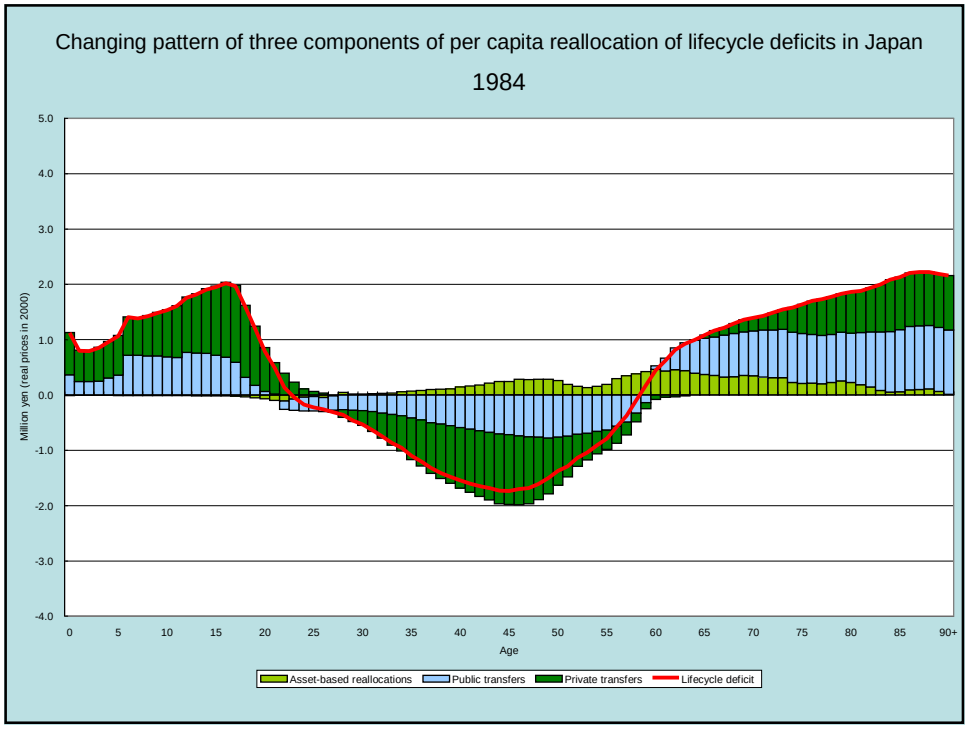


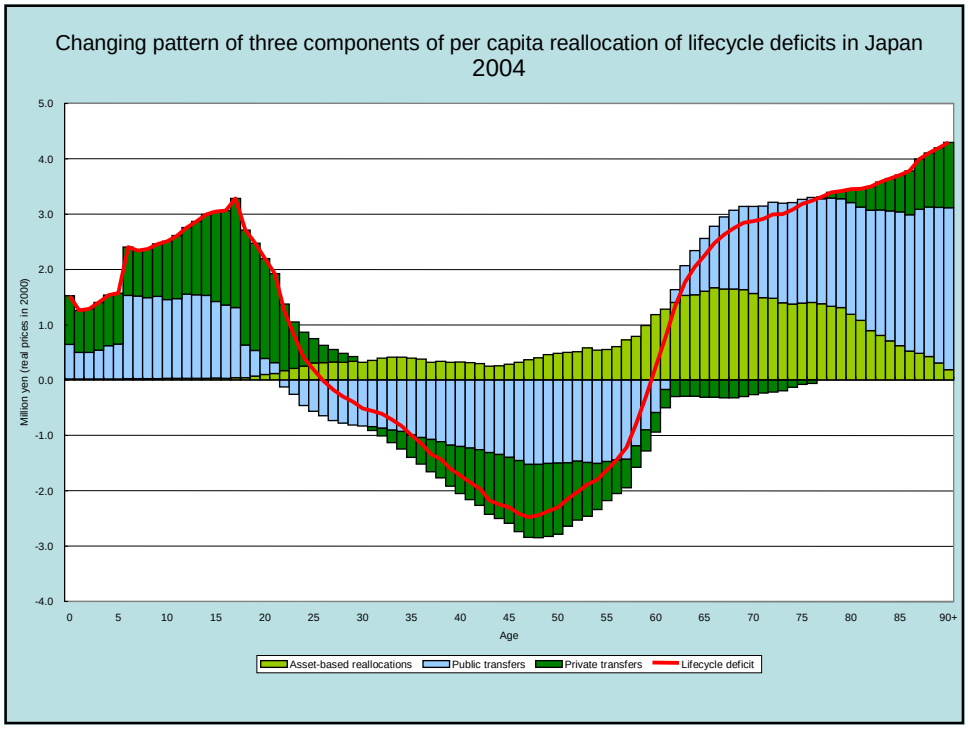
In Japan, the elderly are playing the role of the society's safety net…

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

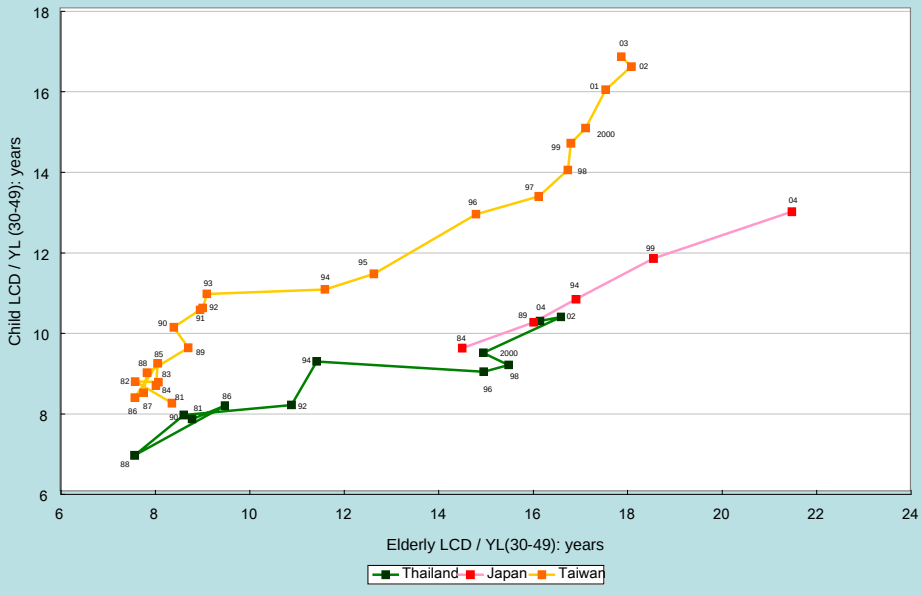
The employment for their middle-aged sons and daughters has been unstable since the beginning of "Japan's lost decade".

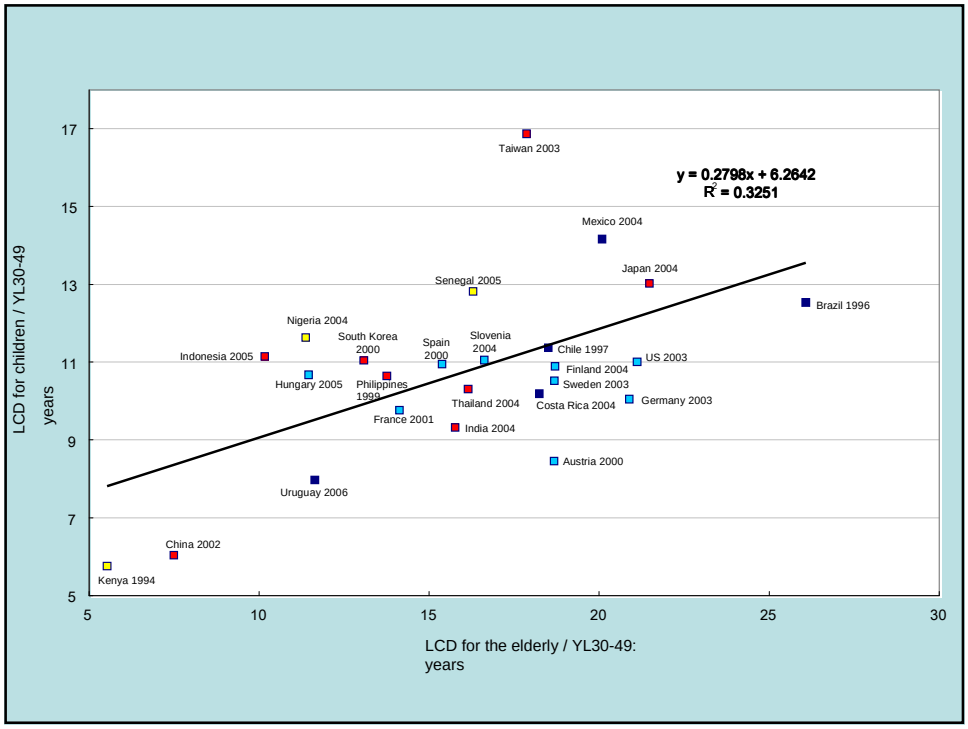
In Japan, the cost of the elderly has been rising, and so is the case of the cost of children, as shown in the following two graphs:

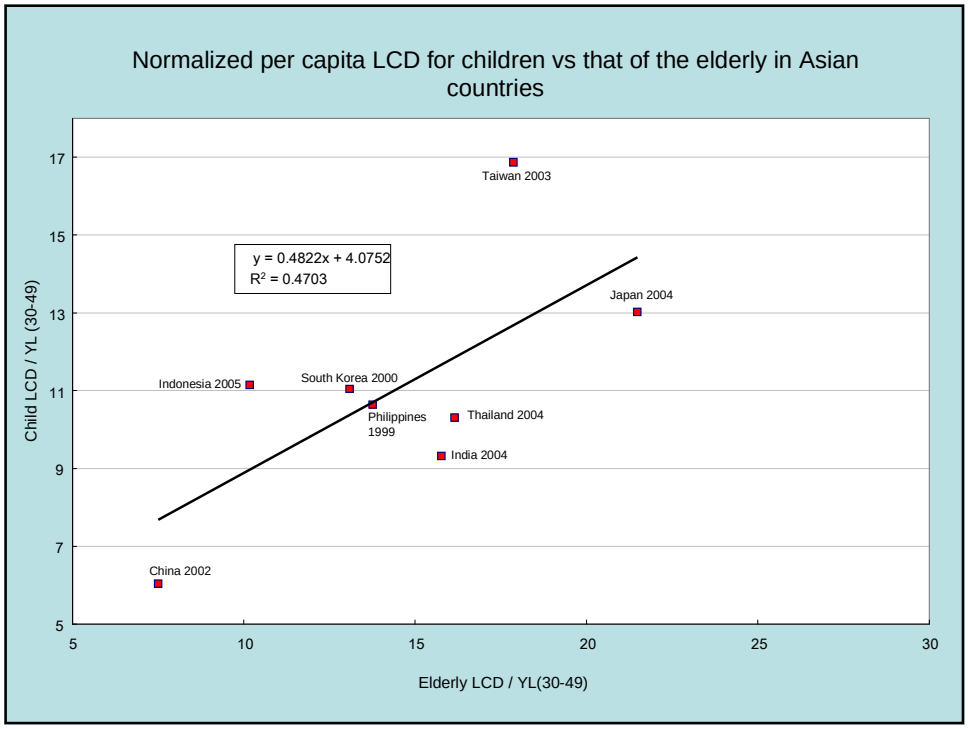

Changing pattern of three components of per capita reallocation of lifecycle deficits in Japan
1984
Million yen (real prices in 2000)
5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90+
Age
Asset-based reallocations
Public transfers
Private transfers
Lifecycle deficit

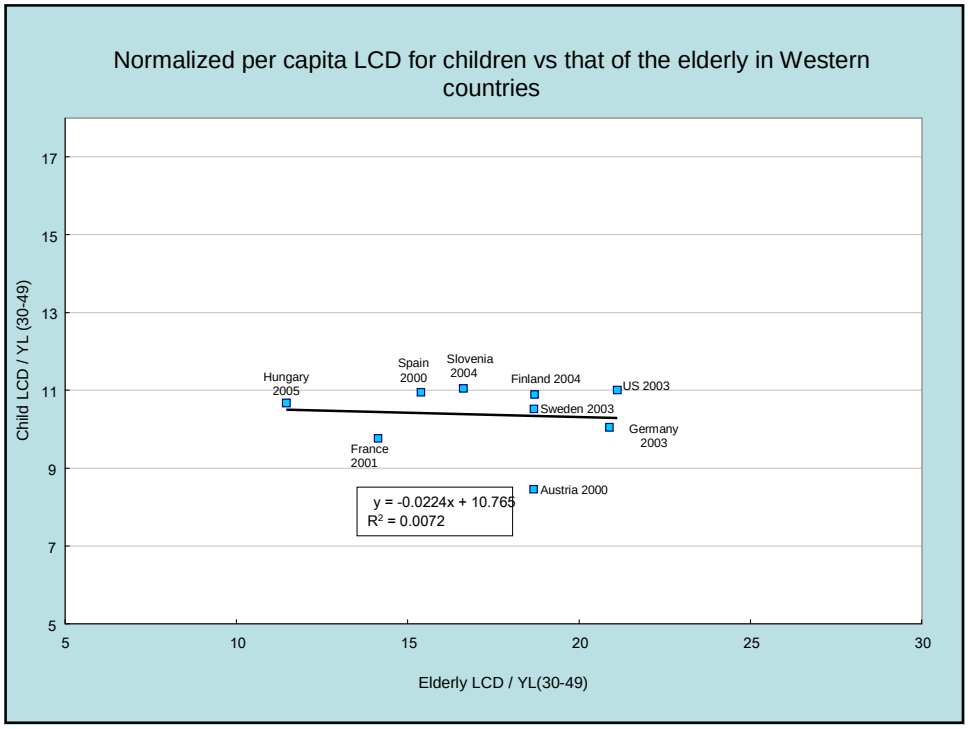

Changing pattern of three components of per capita reallocation of lifecycle deficits in Japan
2004
Million yen (real prices in 2000)
5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90+
Age
Asset-based reallocations
Public transfers
Private transfers
Lifecycle deficit

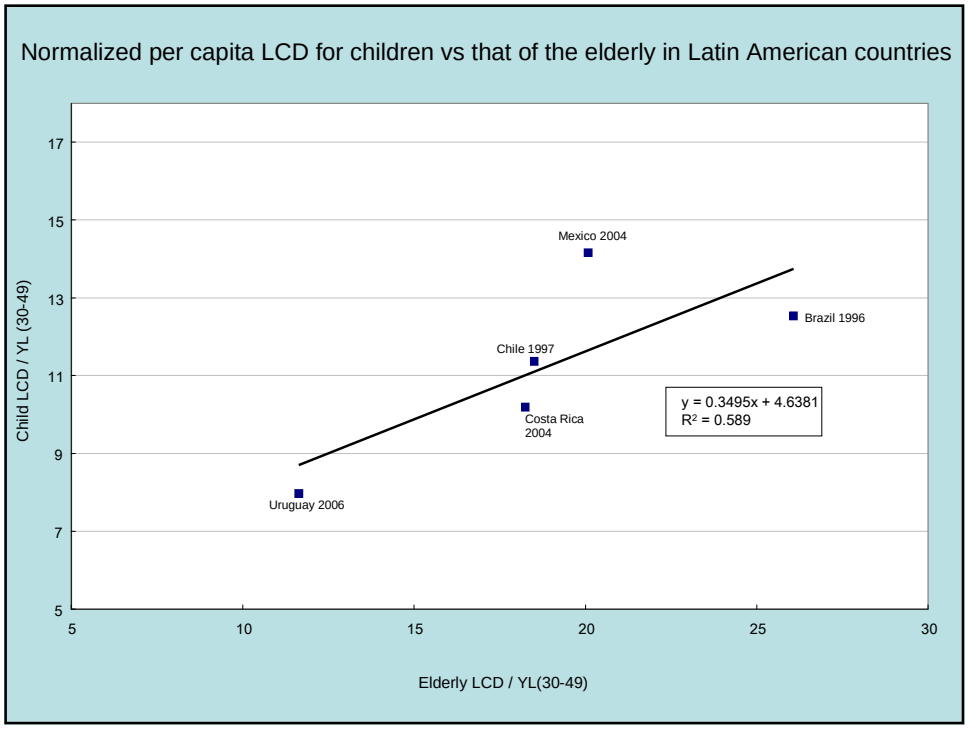
Are they competing for the limited financial resources? Is there any evidence of the "crowding-out" effect between them?




y = 0.2798x + 6.2642
R² = 0.3251
LCD for children / YL30-49 years
LCD for the elderly / YL30-49: years
Taiwan 2003
Mexico 2004
Japan 2004
Senegal 2005
Brazil 1996
Nigeria 2004
South Korea 2000
Spain 2000
Slovenia 2004
Chile 1997
US 2003
Indonesia 2005
Finland 2004
Hungary 2005
Philippines 1999
Sweden 2003
Thailand 2004
Costa Rica 2004
Germany 2003
France 2001
India 2004
Austria 2000
Uruguay 2006
China 2002
Kenya 1994


Normalized per capita LCD for children vs that of the elderly in Asian countries
y = 0.4822x + 4.0752
R² = 0.4703
Child LCD / YL (30-49)
Elderly LCD / YL(30-49)
Taiwan 2003
Japan 2004
Indonesia 2005
South Korea 2000
Philippines 1999
Thailand 2004
India 2004
China 2002


Normalized per capita LCD for children vs that of the elderly in Western countries
Child LCD / YL (30-49)
Elderly LCD / YL(30-49)
17
15
13
11
9
7
5
5
10
15
20
25
30
Hungary 2005
Spain 2000
Slovenia 2004
Finland 2004
US 2003
Sweden 2003
Germany 2003
France 2001
Austria 2000
y = -0.0224x + 10.765
R² = 0.0072


Normalized per capita LCD for children vs that of the elderly in Latin American countries
Child LCD / YL (30-49)
Elderly LCD / YL(30-49)
17
15
13
11
9
7
5
5
10
15
20
25
30
Mexico 2004
Brazil 1996
Chile 1997
Costa Rica 2004
Uruguay 2006
y = 0.3495x + 4.6381
R² = 0.589

The Sandwich Generation

- 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.
- They are saving, but substantially less than the income earned from assets.

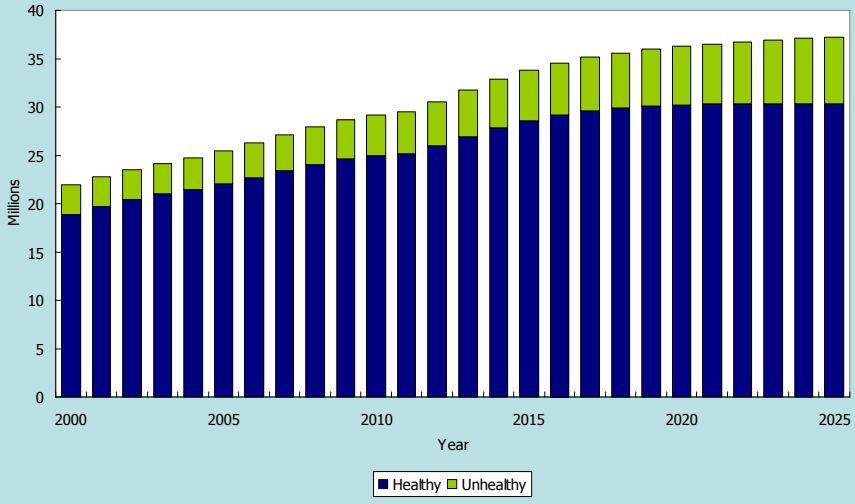
Let us discuss other lessons that Japan can share with other Asian countries

Use of Japan's latent assets

Healthy, weathy, and better educated elderly persons!

Projected elderly population by heath status, Japan 2000-2025

(based on health status transition rates)



Simulation Exercise

All healthy elderly persons work

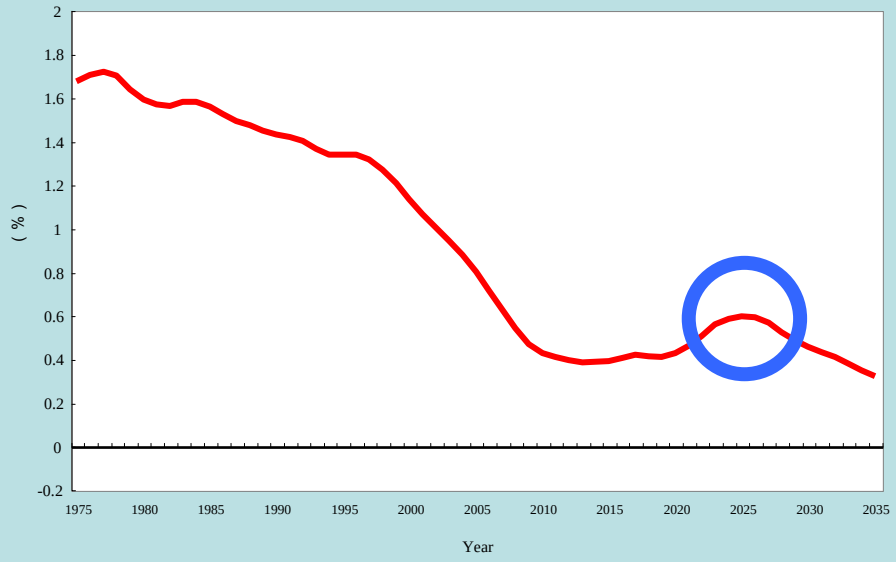
Over the period 2005-2025, per capita income is expected to be 27% higher than the base line

Use of the second demographic dividend

The Second Dividend (age compositional and behavioral effects)

- Life expectancy is increasing
- Lower fertility (fewer children)
- Stimulates the accumulation of wealth
- More wealth leads to a permanent increase in income

Trend in second dividend: Japan, 1960-2035



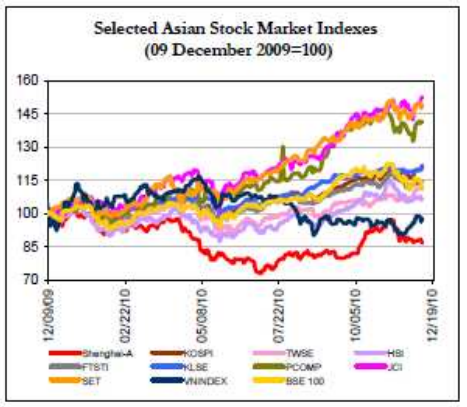
First demographic dividend in Asian countries, 2000-2050, expressed in terms of the annual growth rate

	2000-2010	2010-2020	2020-2030	2030-2040	2040-2050
Armenia	0.74	0.47	0.01	-0.15	-0.79
Bangladesh	0.70	0.61	0.41	0.23	0.05
Cambodia	0.77	1.05	0.61	0.41	-0.02
China	0.58	0.05	-0.54	-0.49	-0.32
India	0.55	0.57	0.48	0.28	-0.03
Indonesia	0.84	0.47	0.10	-0.20	-0.33
Korea, Republic of	0.49	-0.08	-0.60	-0.84	-0.71
Lao People's Democratic Republic	0.95	1.17	0.76	0.45	0.05
Malaysia	0.54	0.36	0.25	0.13	-0.14
Mongolia	**1.60**	0.97	0.08	-0.31	-0.55
Pakistan	0.89	0.97	0.55	0.34	0.01
Philippines	0.58	0.55	0.53	0.40	0.13
Singapore	-0.07	-0.51	-0.84	-0.63	-0.33
Thailand	0.46	-0.19	-0.42	-0.34	-0.21
Viet Nam	1.22	0.74	0.10	-0.22	-0.42

Selected Asian stock market indexes

STOCK INDEXES

	Latest closing	% change from Previous Day	% change from 4-Jan-10
Dow Jones Ind Avg	11,370.06	-0.02	7.43
NASDAQ	2,616.67	0.29	13.35
S&P 500	1,233.00	0.38	8.83
FTSE 100	5,807.96	0.23	5.59
NIKKEI 225	10,285.88	0.52	-3.46
China, PR Shang-A	2,943.69	-1.32	-13.48
Hong Kong HSI	23,171.80	0.34	6.18
India BSE 100	10,060.67	-2.49	8.20
Indonesia JCI	3,786.10	0.43	47.01
Korea KOSPI	1,988.96	1.70	17.26
Malaysia KLCI	1,521.29	0.74	19.25
Pakistan KSE	8,043.45	-0.47	20.03
Philippines PCOMP	4,209.42	-0.28	40.08
Singapore STI	3,210.20	0.23	10.90
Taipei,CH TWSE	8,753.84	0.58	6.65
Thailand SET	1,035.85	1.05	41.46
Viet Nam VNINDEX	460.45	1.68	-10.95



Source: Asia regional Integration Center, ADB (http://aric.adb.org/pdf/dmw/stock.pdf) (saved on Dec 13, 2010).

Second demographic dividend in Asian countries, 2000-2050, expressed in terms of the annual growth rate

	2000-2010	2010-2020	2020-2030	2030-2040	2040-2050
Armenia	2.26	2.48	0.95	0.85	0.52
Bangladesh	5.35	5.12	2.98	2.06	1.57
Cambodia	-4.32	10.19	4.60	1.98	2.43
China	2.25	1.86	1.14	0.38	0.34
India	2.87	2.28	1.74	1.32	1.13
Indonesia	2.60	2.46	1.91	1.29	0.78
Korea, Republic of	2.23	1.84	1.03	0.34	0.09
Lao People's Democratic Republic	-	7.98	3.48	2.47	2.02
Malaysia	2.85	2.40	1.53	1.13	1.01
Mongolia	4.09	4.22	2.46	1.64	1.00
Pakistan	6.18	5.45	2.94	2.47	2.13
Philippines	4.99	3.46	2.33	1.75	1.35
Singapore	2.19	1.57	0.40	-0.19	0.10
Thailand	2.00	2.02	1.31	0.74	0.39
Viet Nam	2.60	3.09	1.87	1.26	0.85

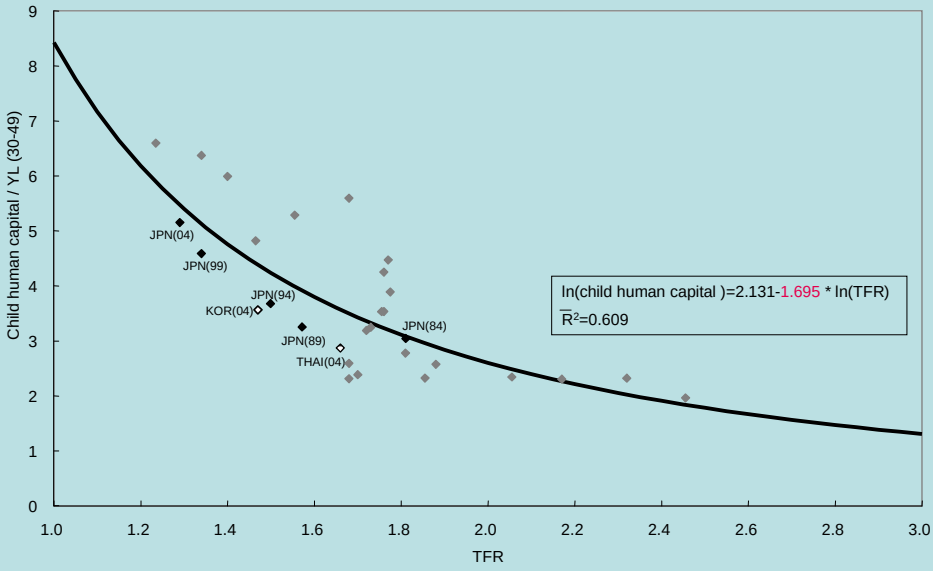
Efficient use of young human capital

Are Asian children public goods or private goods?

Proportion of private spending in per capita educational costs for children aged 0-24 in selected countries

Country	Year	(%)
Sweden	2003	3.1
France	2001	5.0
Austria	2000	5.8
Slovenia	2004	8.7
Hungary	2005	11.1
United States	2003	17.0
Costa Rica	2004	22.3
Japan	2004	26.0
Chile	1997	39.4
Indonesia	2004	39.6
Uruguay	1994	46.4
The Philippines	1999	48.2
Republic of Korea	2000	54.2
Taiwan	2003	66.8

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



- 20 NTA countries:
  -0.91
- USA (1980-2003):
  -0.72
- East Asia (+Thailand):
  -1.70

The "elasticity" result for East Asia suggests:

the decline in numbers is offset by an increase in human capital and, hence, productivity

Japan's untapped resource:

Will Gary Becker's "quality" children be able to boost Japan's future productivity?

The Japan Times Tuesday Jul 27, 2010

65% of universities are setting academic bar lower for freshmen

KYODO

The number of universities offering high school-level supplementary lessons and other special measures to cope with academic deficiencies among freshmen is on the rise, reaching 65 percent of surveyed schools in fiscal 2008, data compiled by the education ministry showed Monday.

The survey indicates that universities have been accelerating efforts to deal with a decline in the level of academic ability among students following the government's adoption in the late 1970s of a more relaxed education policy, which led to reductions in teaching hours, critics said.

Easier university entrance examinations stemming from the declining birthrate may also have had a part in causing a decline in student performance, a ministry official said.

According to the survey conducted from last December to January on 723 public and private universities, 473 schools were found to have taken special measures to deal with students' insufficient academic ability during the year to March 2009, including grouping classes by academic skill level and holding supplementary lessons.

The number of universities taking such steps represents an increase of 10 from fiscal 2007 and a rise of 37 from fiscal 2006. Of the 473 schools, 70 were national universities, 35 were prefectural or municipal universities and 368 were private.

Under the government's more relaxed education policy, the content of school lessons for younger students has been reduced and universities began implementing a wider variety of entrance tests that don't necessarily gauge scholastic ability.

As a result, universities came to face an increasing number of students lacking basic academic skills that are indispensable to pursue their majors, including economics students who don't understand math and medical students who haven't learned biology in high school, the critics said.

In response to criticism that the relaxed education policy has precipitated a decline in academic skills, the government has recently ditched the policy and is set to increase teaching hours for the first time in some 30 years.

Mean score in student performance on the mathematics scale

Rank	Country	2000	Country	2003	Country	2006	Country	2009
1	Japan	557	Hong Kong-China	550	Taiwan	549	Singapore	562
2	Korea	547	Finland	544	Finland	548	Hong Kong-China	555
3	New Zealand	537	Korea	542	Hong Kong-China	547	Korea	546
4	Finland	536	Netherlands	538	Korea	547	Taiwan	543
5	Australia	533	Liechtenstein	536	Netherlands	531	Finland	541
6	Canada	533	Japan	534	Switzerland	530	Liechtenstein	536
7	Switzerland	529	Canada	532	Canada	527	Switzerland	534
8	United Kingdom	529	Belgium	529	Macao-China	525	Japan	529
9	Belgium	520	Macao-China	527	Liechtenstein	525	Canada	527
10	France	517	Switzerland	527	Japan	523	Netherlands	526
11	Austria	515	Australia	524	New Zealand	522	Macao-China	525
12	Denmark	514	New Zealand	523	Bergium	520	New Zealand	519
13	Iceland	514	Czech Republic	516	Australia	520	Beljium	515
14	Liechtenstein	514	Iceland	515	Estonia	515	Australia	514
15	Sweden	510	Denmark	514	Denmark	513	Germany	513
16	Ireland	503	France	511	Czech Republic	510	Estonia	512
17	Norway	499	Sweden	509	Iceland	506	Iceland	507
18	Czech Republic	498	Austria	506	Austria	505	Denmark	503
19	United States	493	Germany	503	Slovenia	504	Slovenia	501
20	Germany	490	Ireland	503	Germany	504	Norway	498

* excluding Shanghai, China

Sources: Ministry of Education, Culture, Sports, Science and Technology (2007) Summary of PISA 2006 results, accessed on December 24, 2009 (http://www.mext.go.jp/a_menu/shotou/gakuryoku-chousa/sonota/071205/001.pdf) and OECD (2010) Volume I of Pisa 2009 Results: What Students Know And Can Do, Paris, OECD.

The Japan Times Tuesday Jul 27, 2010

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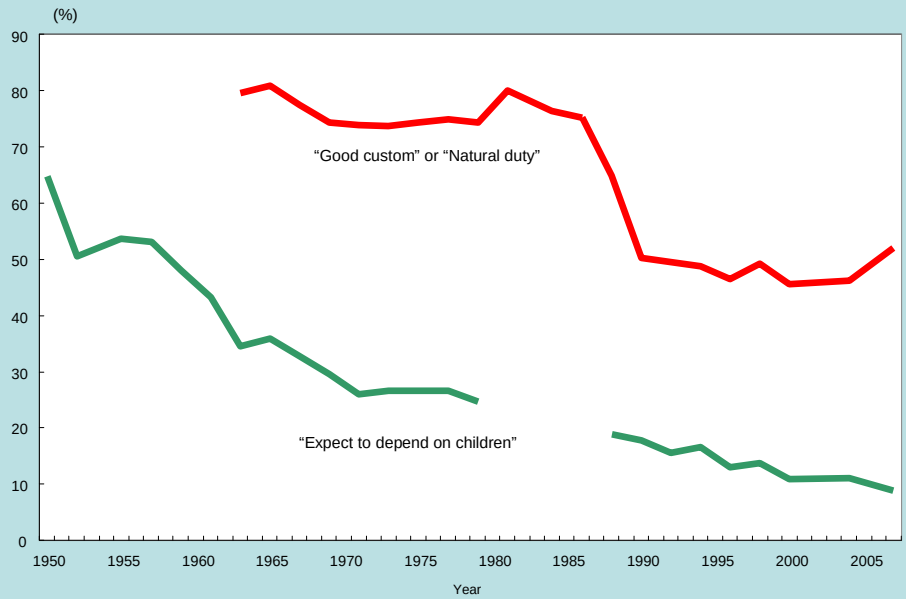
In response to criticism that the relaxed education policy has precipitated a decline in academic skills, the government has recently ditched the policy and is set to increase teaching hours for the first time in some 30 years.

Sources of uncertainties that might weaken Japan's human resources

Trends in values and expectations about care for the elderly: Japan, 1950-2007



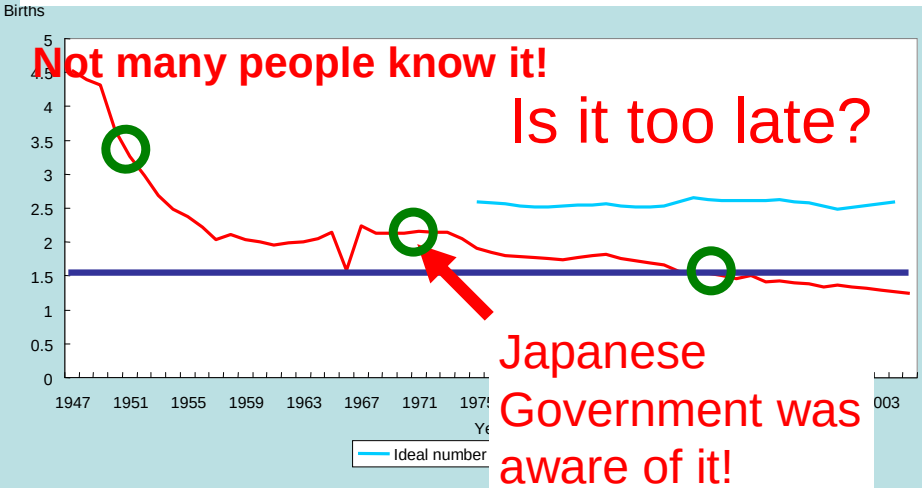
Sources: Mainichi Newspapers of Japan, *Summary of Twenty-fifth National Survey on Family Planning, 2005.*
Mainichi Newspapers of Japan, *Summary of the 2004 round of the National Survey on Population, Families and Generations*, 2004.
Nihon University Population Research Institute, *National Survey on Work and Family*, 2007.

Those aged 50+ living in Tokyo Metropolitan Area

- Husbands **41%**
- Wives **19%**

Then, can we rely on our future children?

Total fertility rate (TFR) and ideal family size, Japan, 1947-2009



Not many people know it!

Is it too late?

Japanese Government was aware of it!

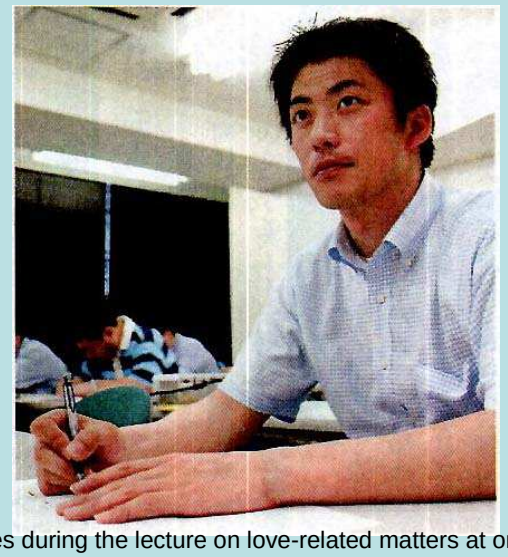
If today's marriage market remains unchanged,

30% men will remain unmarried…

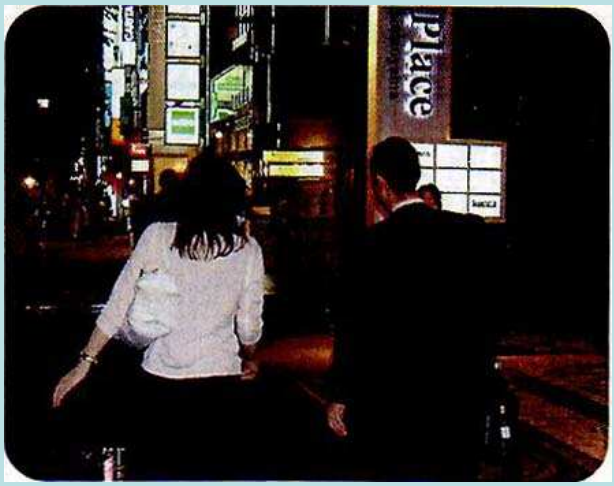
12 million "parasite single" persons (below 35)

Since the early 1990s, the proportion of single women who are not dating has been stable around 45%

Rapidly increasing male "grass-eaters" and female "meat-eaters" …



Young men taking notes during the lecture on love-related matters at one of the open colleges in Tokyo



PRESIDENT 20060814号　花婿学校　模擬デート

Parents desperately looking for their kids' prospective mates

結婚相談所オフィス・アン主催の親が集まって子どもの見合い相手を探す交流会。（写真：札幌市開催の親の代理の見合いパーティー。オフィス・アン代表者が挨拶をしているところで、親たちはその後子どものプロフィールを交換し合った。）

これまでに全国13都市で57回開催し、延べ約6500人が参加した。参加費は札幌市（5000円）を除き、1万円。

毎日新聞　夕刊　2008年7月16日（水）特集ワイド「親の結婚活動（婚活）　一生の大事任せなさい！？」

Prefectural government sponsored match-making party held at a world heritage site

2006年11月8日、「なら出会いセンター」は世界遺産の薬師寺での写経をしながらの合コンを実施した。

参加者は僧侶による結婚をテーマにした法話を聞いた後、良縁成就祈願の写経を体験。写経の後、1対1のトークタイムが設けられた。

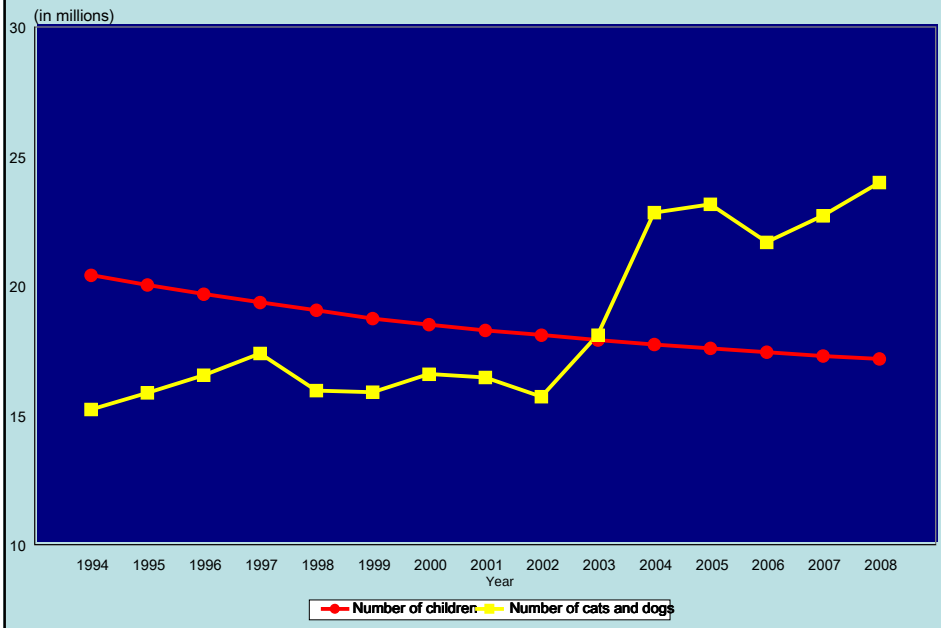
定員男女各20名のところ150を超える応募があった。本合コンでは10組以上のカップルが誕生した。

奈良県の2005年の出生率は東京(0.98)に次いで全国ワースト2位(1.12)。同県は2005年4月、「なら出会いセンター」を開設。同年7月から地元のホテルやレストランなどと協力して出会いイベントを始めた。最初の1年間で誕生したカップルはわずか6組と振るわず、2年目の取り組みとして、平城京跡のボランティア清掃と出会いイベントを組み合わせたところ、問い合わせが殺到し、応募者は定員の5倍強に当たる210人に達した。

Nikkei Net Kansai「自治体、出会いお膳立て―関西女性高い未婚率」 (http://www.nikkei.co.jp/kansai/news/news003661.html) (2008/06/14アクセス)
R25「ライフいま、奈良で話題の"写経合コン"をマネしたら・・・」(http://r25.jp/magazine/ranking_review/10008000/1112006111615.html)(2008/06/14アクセス)
少子化対策、奈良県が奇策　世界遺産・薬師寺で「合コン」(2006/10/13)産経新聞　大阪　夕刊。(日経テレコン)
奈良日日新聞(2006/11/19) (http://www.naranichi.co.jp/20061119cy23.html) (2008/06/14アクセス)

Newly-emerging consumption goods in place of babies…

Number of pets and children, 1994-2008, Japan



Source : Statistics Bureau of Ministry of Internal Affairs and Communications, and Pet Food Manufacturers Association of Japan (various years) "Survey on the Percentage of Households Keeping Dogs and Cats" http://www.jppfma.org/shiryo/shiryo-set.html.

Water for humans

2ℓ　100yen

Water for pets

2ℓ

900yen

Food Supplements
for dogs

ペット用サプリメント「ラクトペットDR10」

ラクトペット物語　（ http://www.lactopet.or.tv/a003.html, http://www.lactopet.or.tv/a002.html ）(2007/11/14)

Therapy for Dogs

ドッグセラピー

（左）girlsschool (http://g-w.st/pc/search.php?k=_GS_CourseDetail&crsm_id=817)(2008/02/28アクセス)

（右）株式会社RAJA(http://www.raja.co.jp/technique/dog_healing/index.html) (2008/02/28アクセス）

Dog Healing Salon

リフレクソロジーやロミロミ、指圧やマッサージなどのヒーリングエッセンスを融合させたRAJAオリジナルのワンちゃんのための癒し技術。人間同様に疲れがたまりやすい首の付け根から足、背中、お腹など全身を丹念に刺激します。

15 minutes・・・ 1,575 yen
30 minutes・・・ 3,150 yen

株式会社RAJA(http://www.raja.co.jp/salon/type/ic/dogmenu.html)(2008/02/28アクセス）

Changing life expectancy of pets

Cats

		Survey year		
		1990-91	1994-95	2002-03
Total		**5.1**	6.7	**9.9**
Sex	Male	4.5	5.8	8.7
	Female	5.8	8.0	11.1
Breed	Purebred	8.7	9.8	11.4
	Hybrid	4.8	6.4	9.6

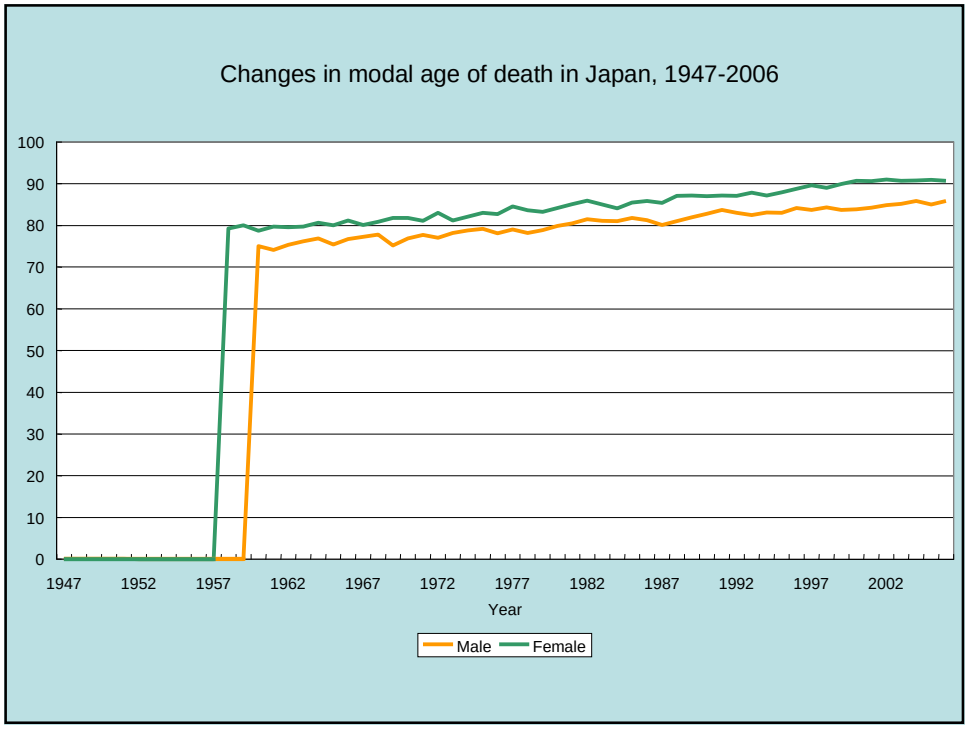
Dogs

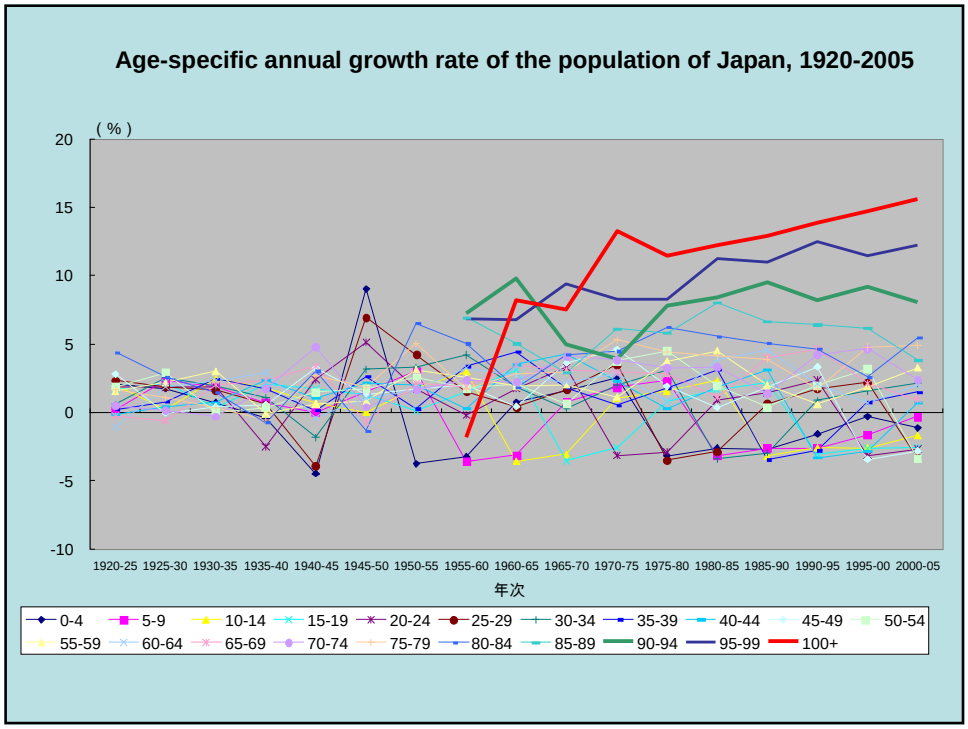
		Survey year		
		1990-91	1994-95	2002-03
Total		8.6	10.1	11.9
Sex	Male	8.3	9.9	12.0
	Female	9.0	10.3	11.9
Breed	Purebred	8.7	9.8	11.3
	Hybrid	8.4	10.6	13.3

Source: Hideki Hayashidani (2005) "Changes in average lifespan and causes of death of cats and dogs (Inu to neko no heikinjumyo to shiin no henka)", *Aigan Dobutsu* (Pet animals) (in Japanese), Japan Pet Care Association, No. 181 (January), pp. 10-11.

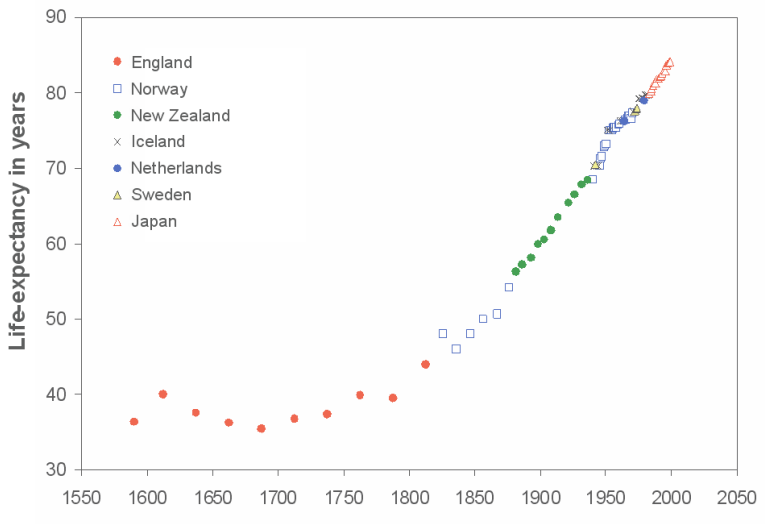
In Japan, the number of pets is growing at a phenomenal rate, and they are living longer…

So are the elderly!

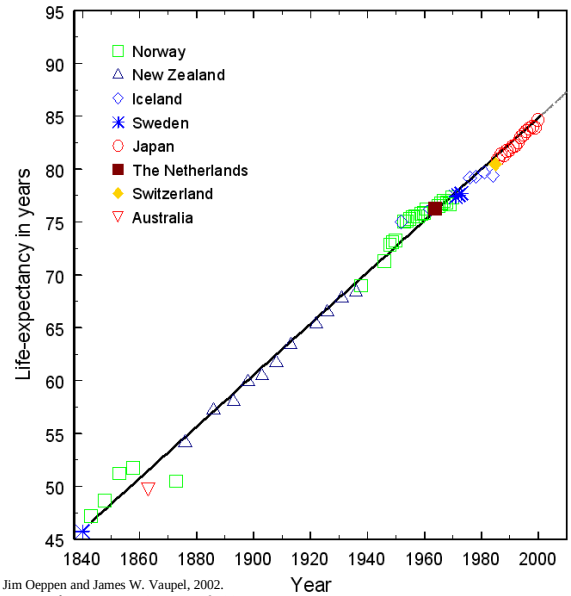

Changes in modal age of death in Japan, 1947-2006
100
90
80
70
60
50
40
30
20
10
0
1947
1952
1957
1962
1967
1972
1977
1982
1987
1992
1997
2002
Year
Male
Female


Age-specific annual growth rate of the population of Japan, 1920-2005
(%)
20
15
10
5
0
-5
-10
1920-25
1925-30
1930-35
1935-40
1940-45
1945-50
1950-55
1955-60
1960-65
1965-70
1970-75
1975-80
1980-85
1985-90
1990-95
1995-00
2000-05
年次
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75-79
80-84
85-89
90-94
95-99
100+

Broken limits to life expectancy since 1550



Broken limits to life expectancy since 1840



Source: Jim Oeppen and James W. Vaupel, 2002.
'Broken Limits to Life Expectancy,' Science: Vol.296

Since 1840, the average life expectancy in the longest-lived countries has improved steadily – rising by three months every year.
And that growth continues to this day.

(From *50 Facts that Should Change the World* by Jessica Williams.)

Each day,
Japanese life expectancy grows
by 6 hours!

Will the Sun rise again in Japan 10 years from now?

Concluding Remarks

-**Demography** is not destiny

-**Demography** defines various possibilities

What do we choose?

Political leadership counts,

particularly in Japan!

Thank you