New perspectives from NTA: Fiscal policy, social programs, and family transfers

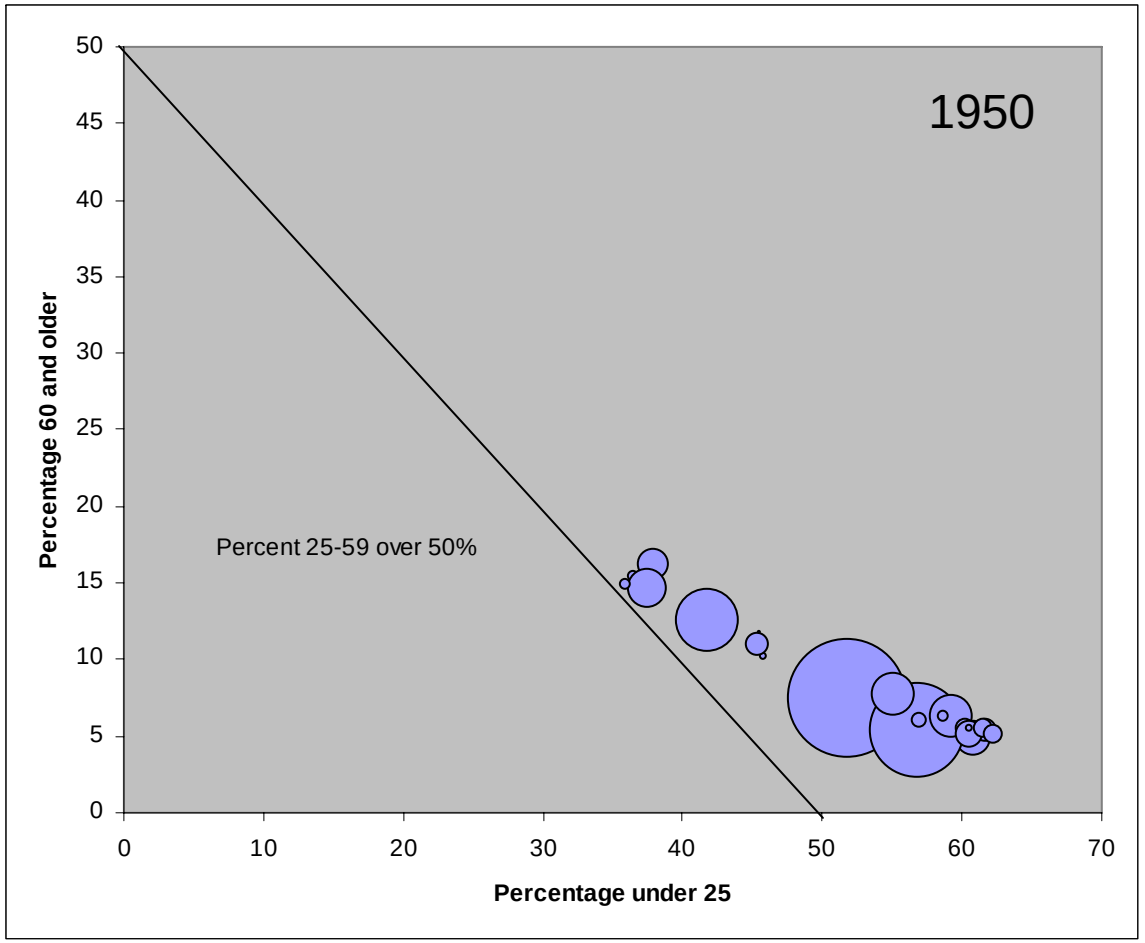
Andrew Mason
University of Hawaii at Manoa
and
East-West Center

Fall 2009: Visiting Professor, Department of Global Health and Population and Center for Population and Development Studies, Harvard University.

Acknowledgments

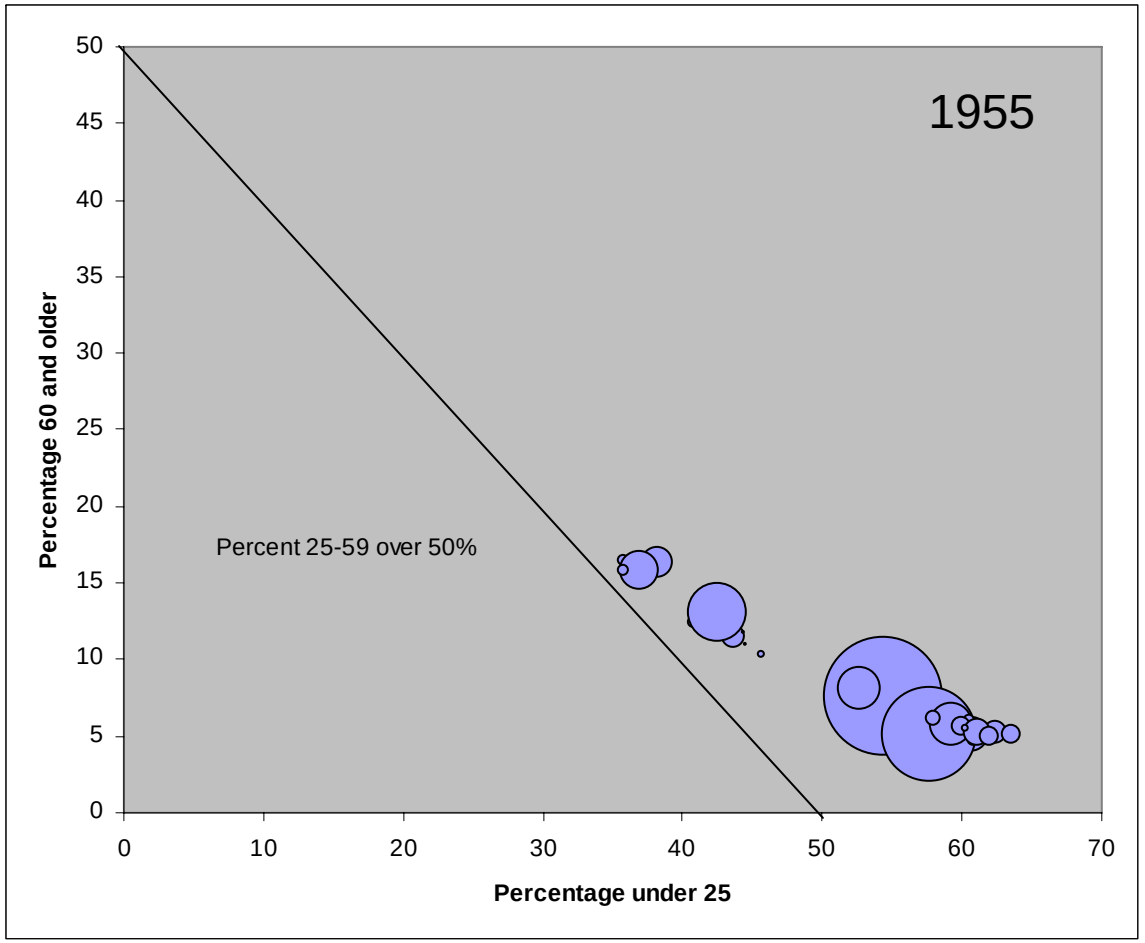
- Research for this paper was funded by parallel grants from the National Institutes of Health to Ronald Lee and Andrew Mason, NIA R37 AG025247 and R01 AG025488; grants from MEXT.ACADEMIC FRONTIER to NUPRI in Japan; and a grant from UNFPA.
- The material presented here draws heavily on collaborative work with Ronald Lee and other researchers involved in the National Transfer Account project: Sang-Hyop Lee, Tim Miller, Naohiro Ogawa, and many others.
- Helpful assistance has been provided by Gretchen Donehower, Marjorie Pajaron, Amonthep Chawla, Turro Wongkaren, and Diana Stojanovic.

The Global Age Transition

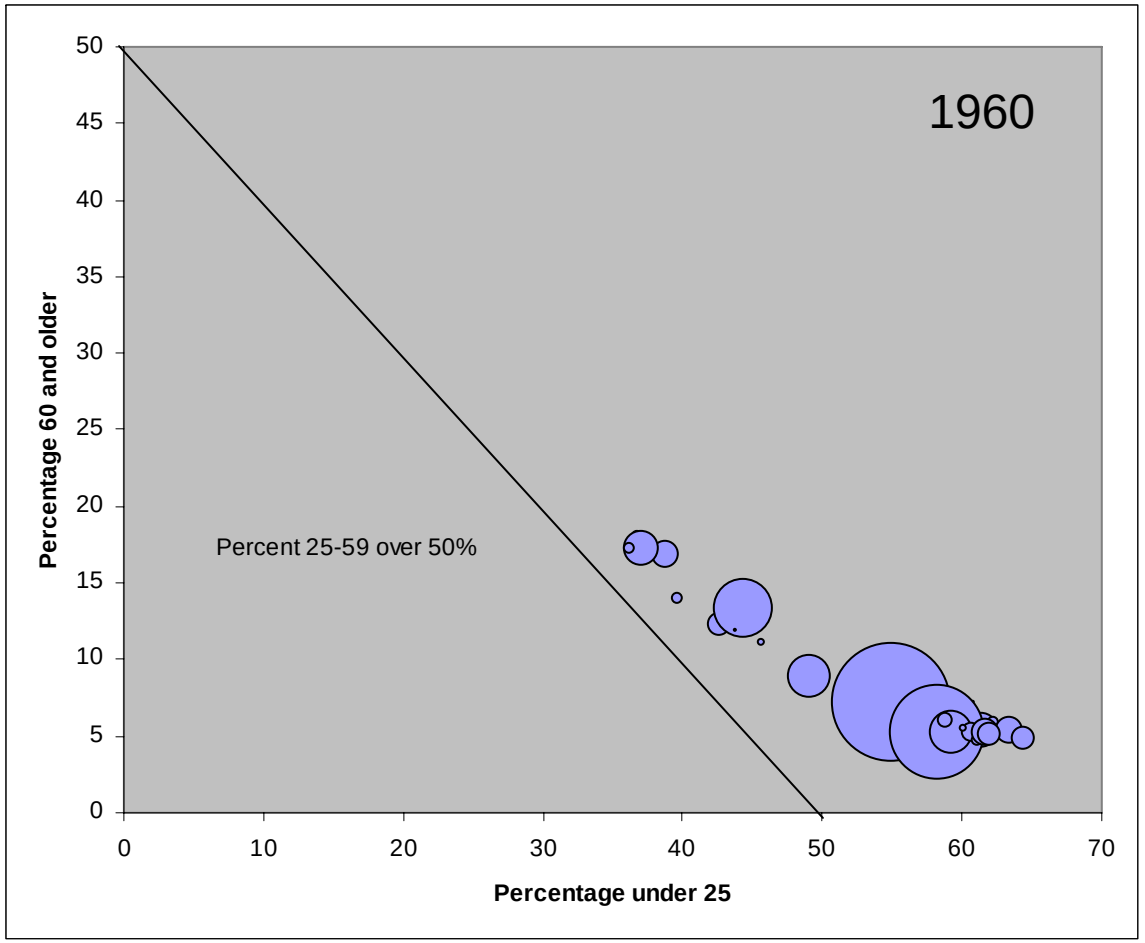


Twenty-eight economies participating in the National Transfer Accounts project. Source: United Nations 2008 (except for Taiwan).

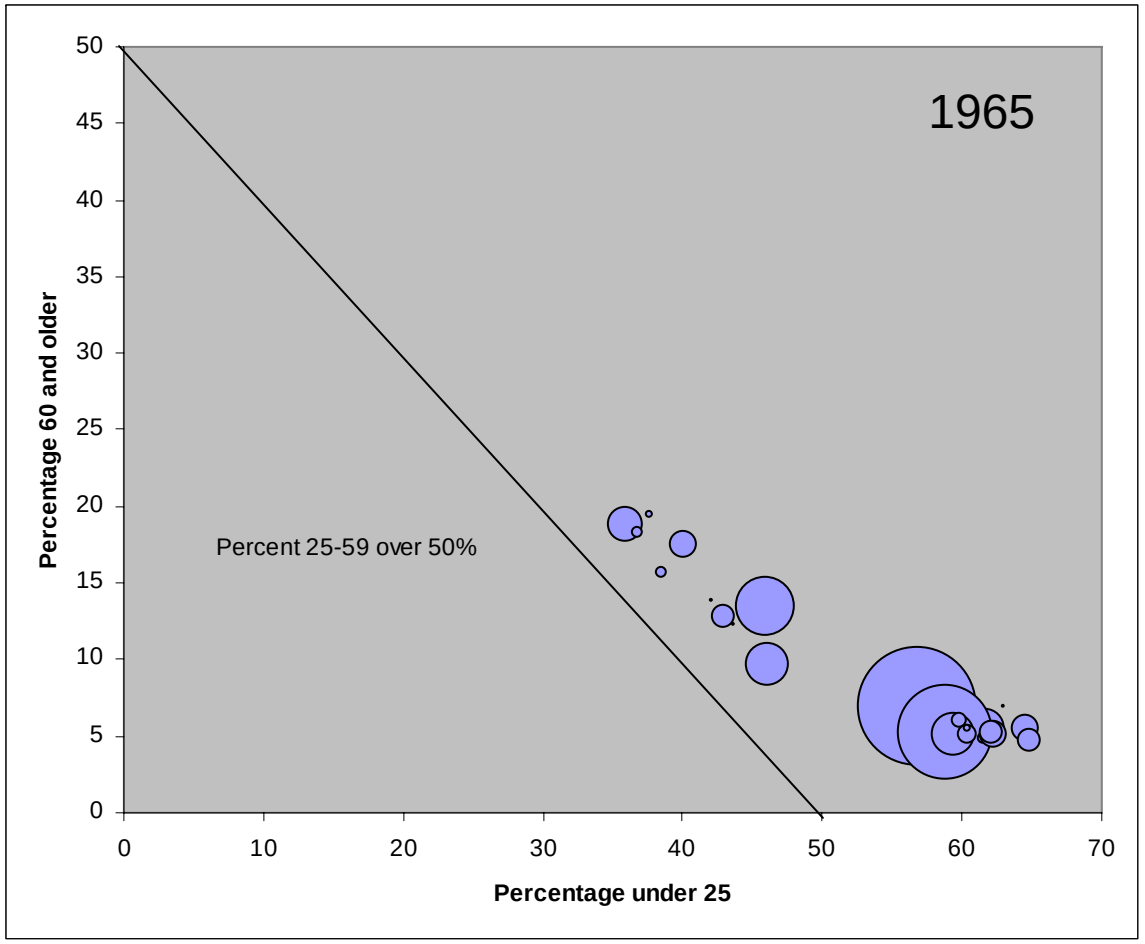
The Global Age Transition



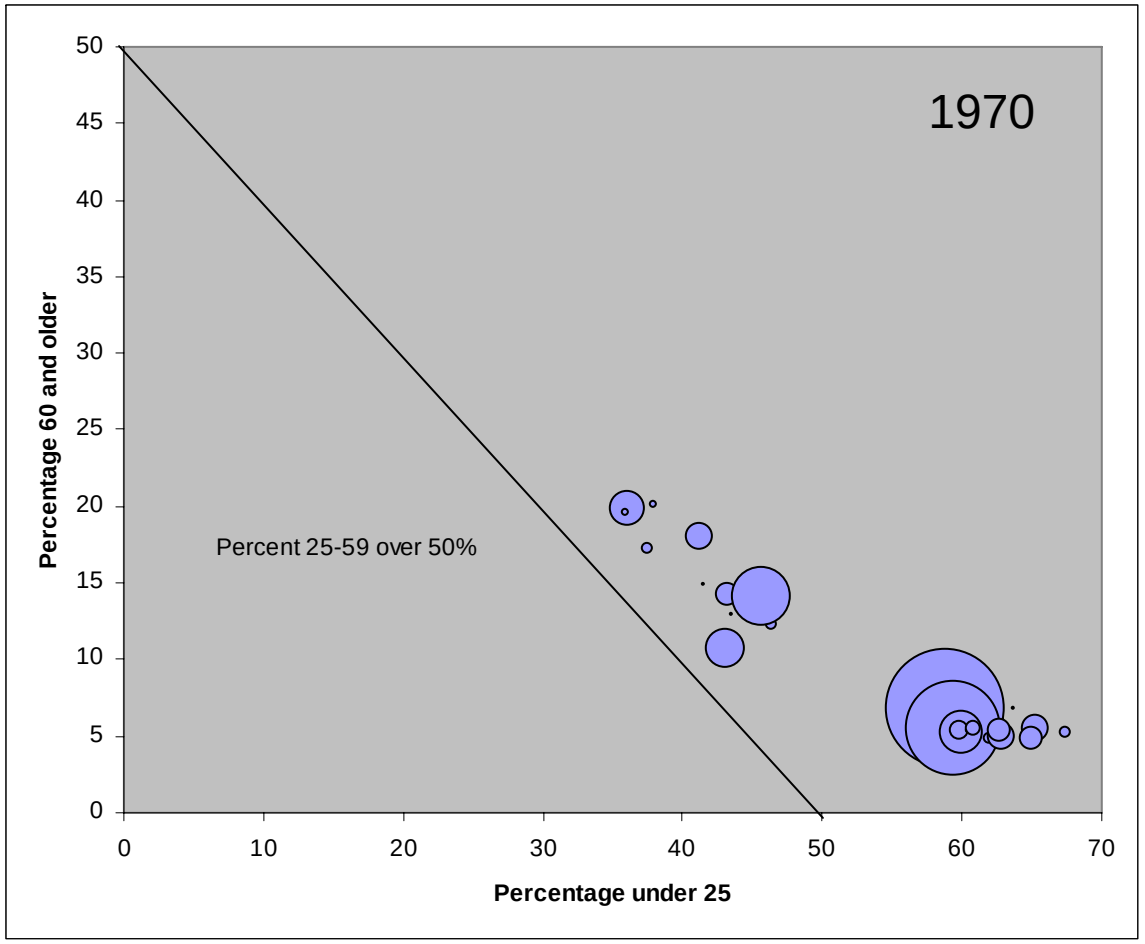
The Global Age Transition



The Global Age Transition

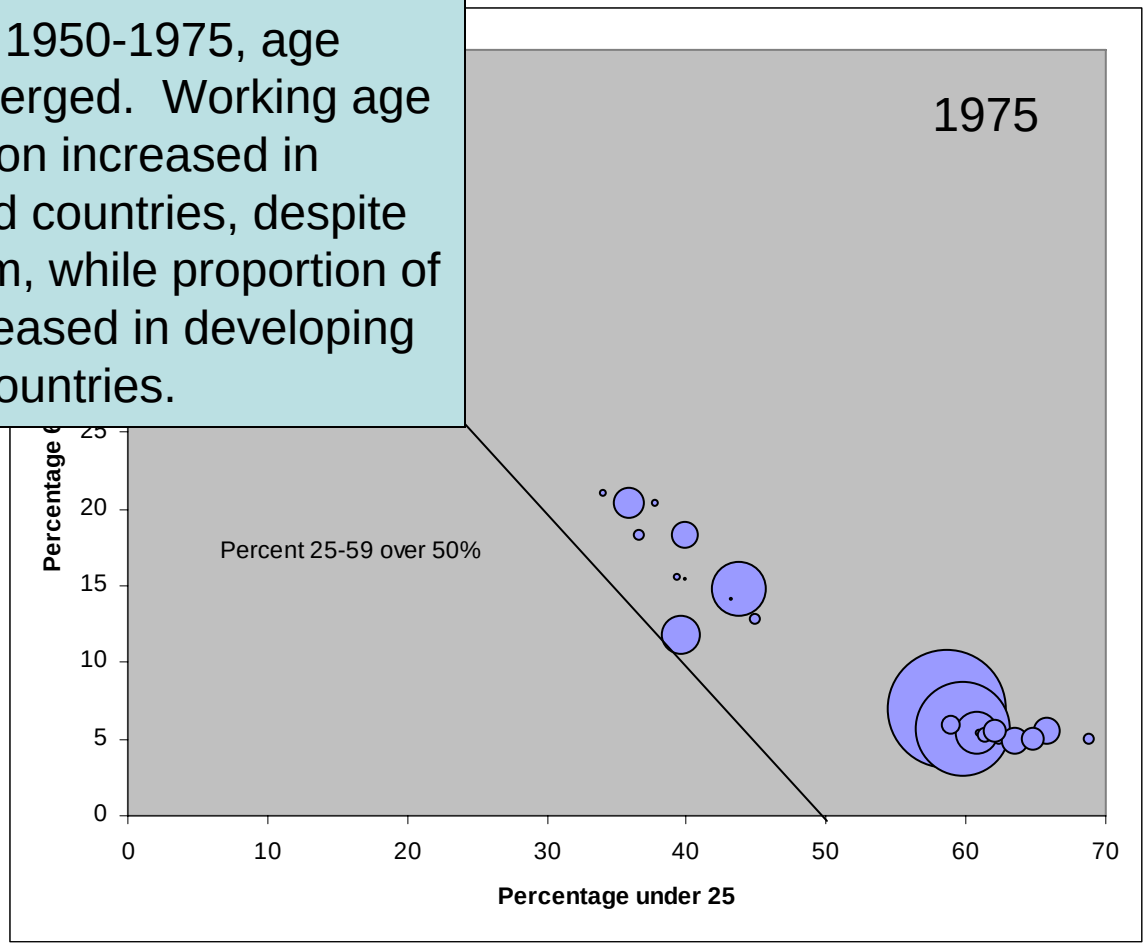


The Global Age Transition

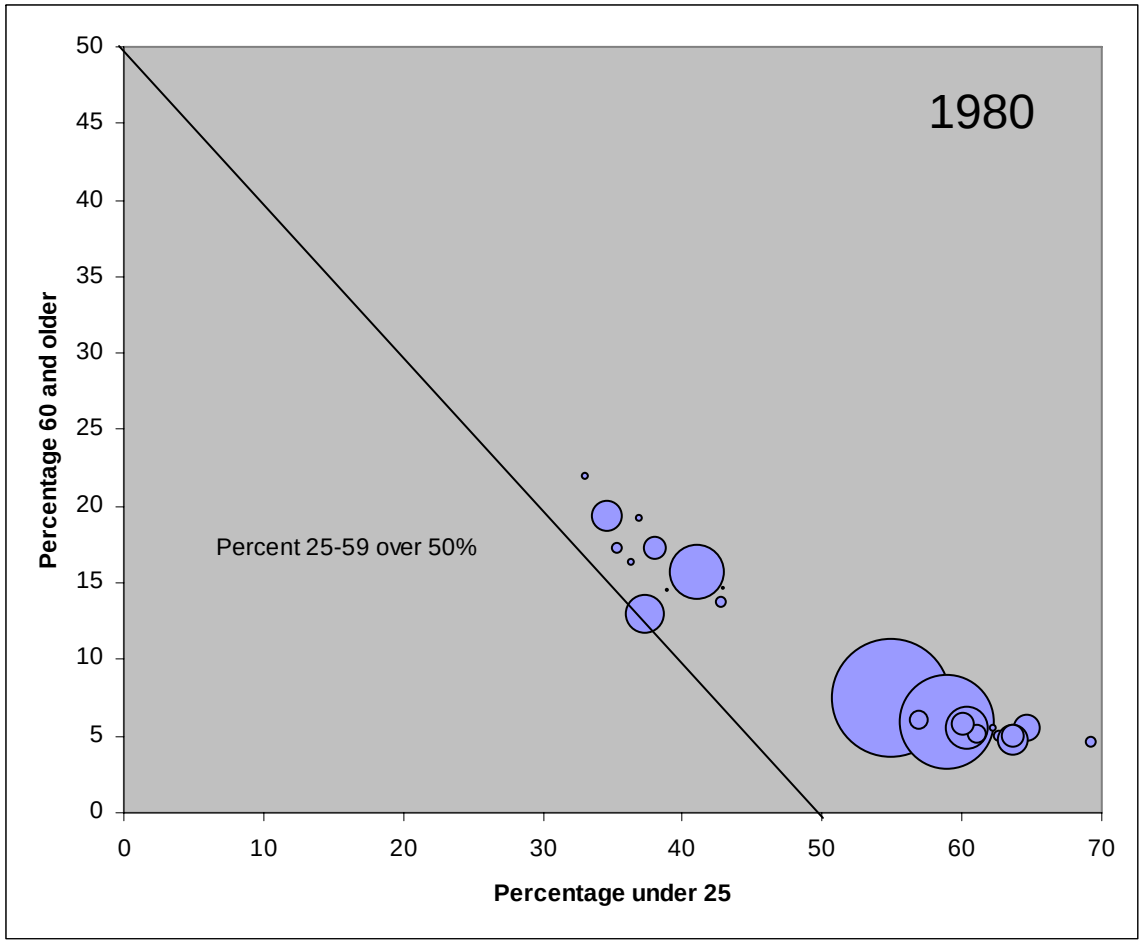


The Global Age Transition

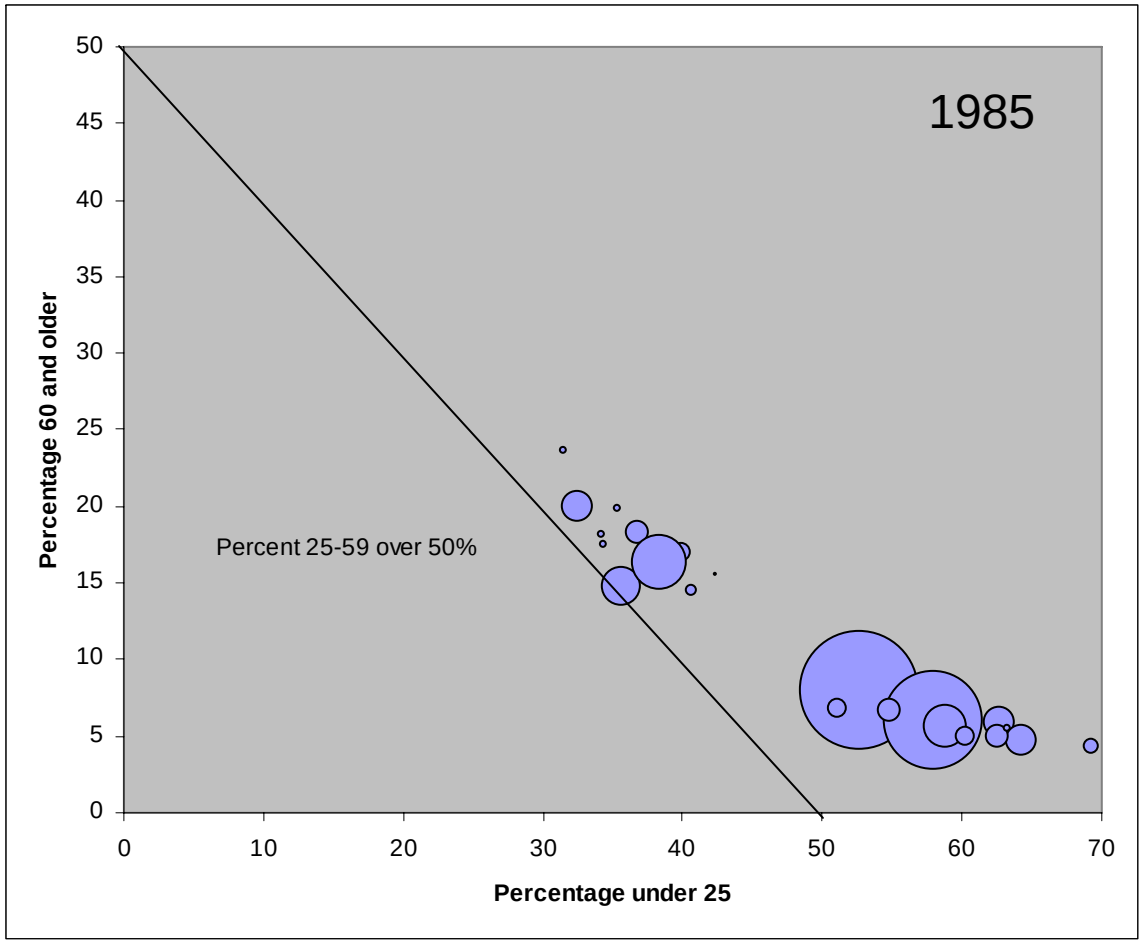
Between 1950-1975, age structures diverged. Working age population increased in industrialized countries, despite the baby boom, while proportion of children increased in developing countries.



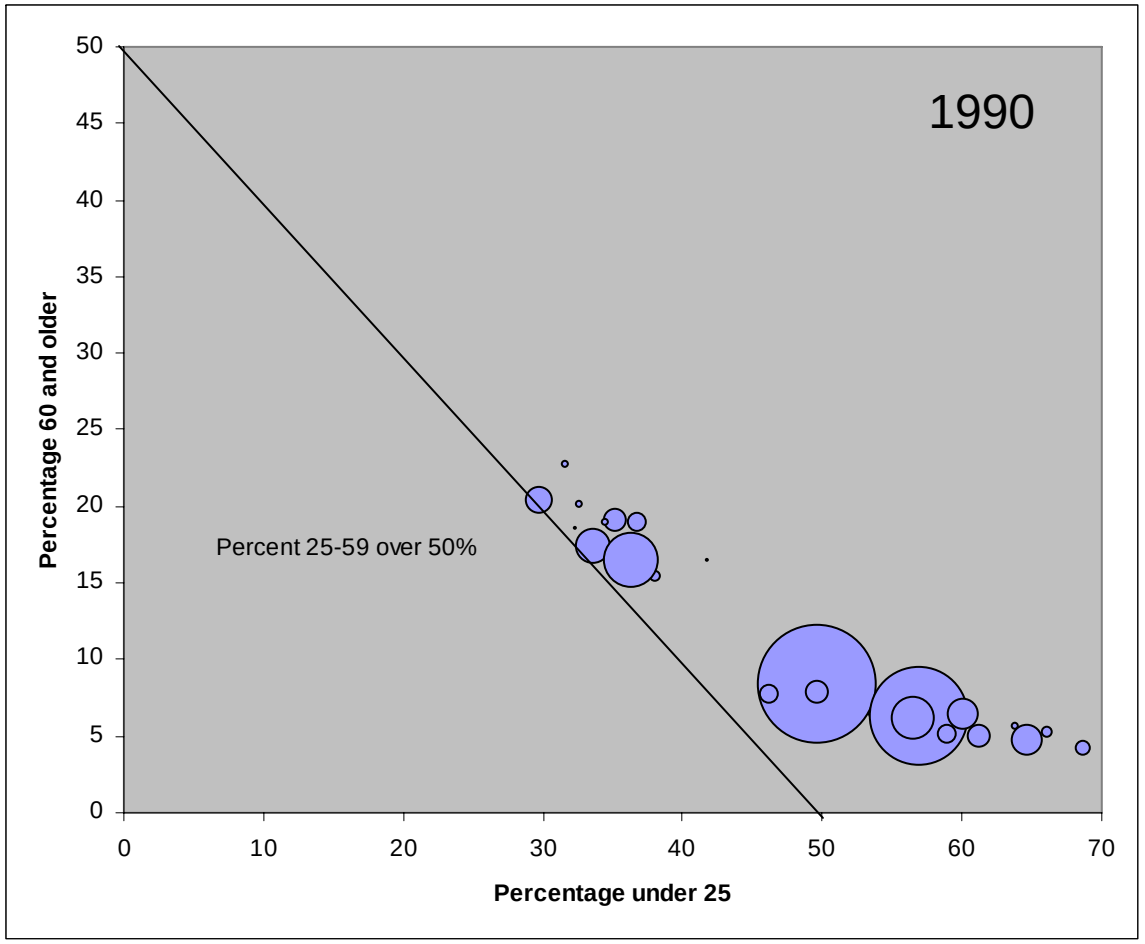
The Global Age Transition



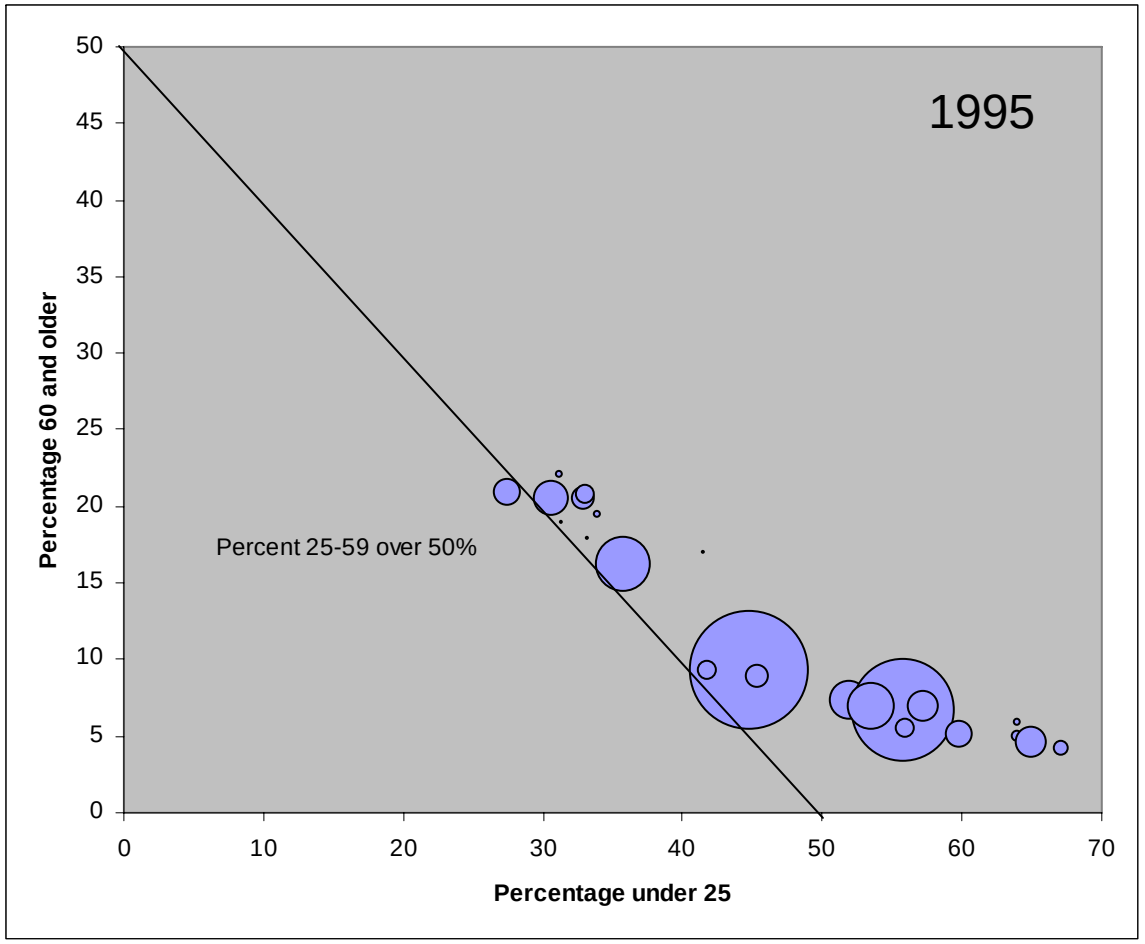
The Global Age Transition



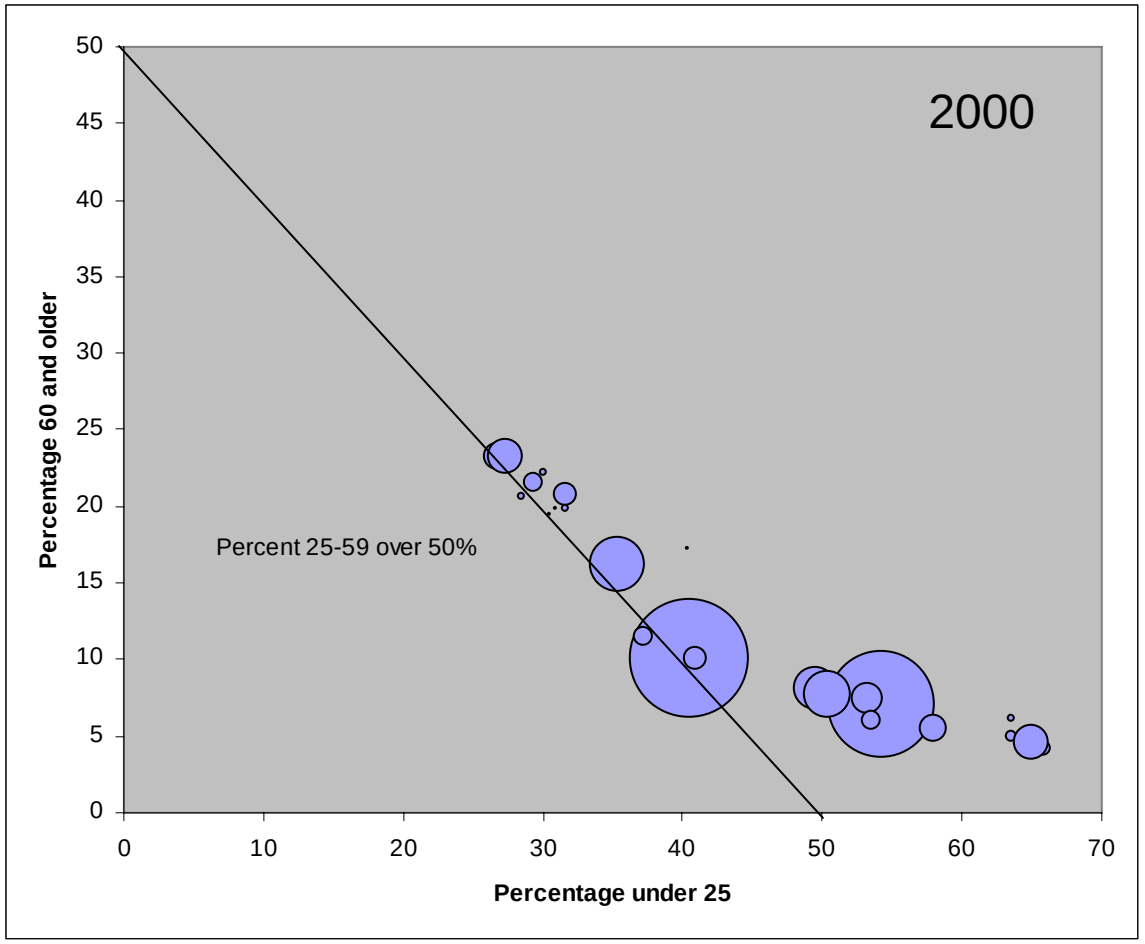
The Global Age Transition



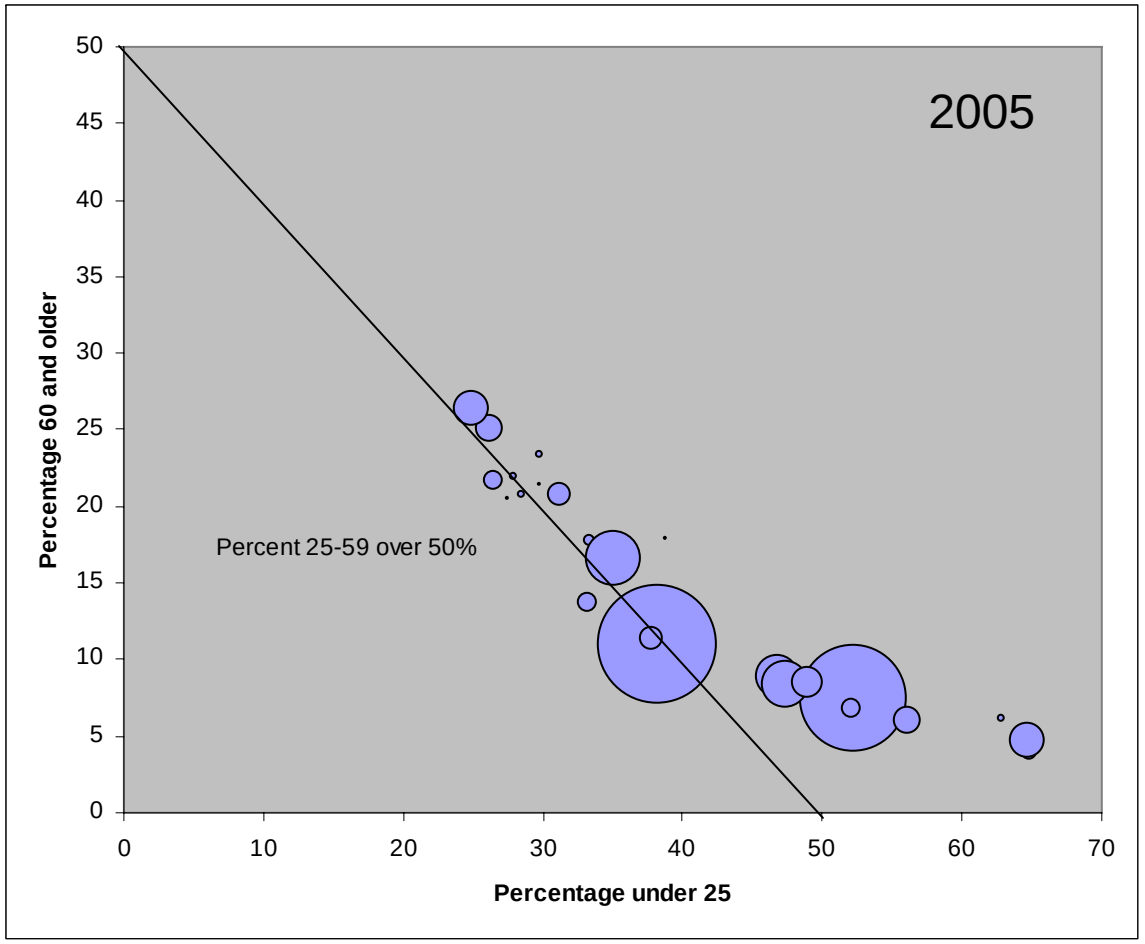
The Global Age Transition



The Global Age Transition

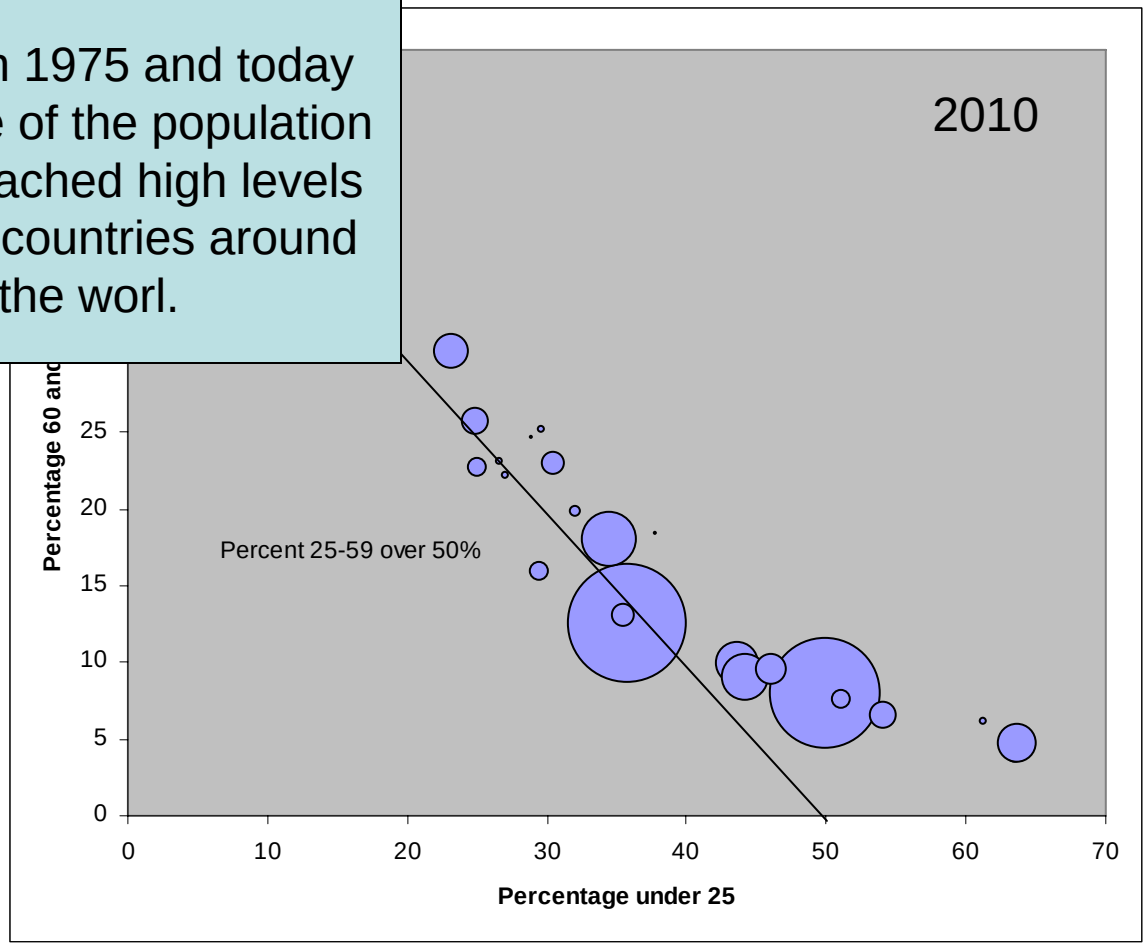


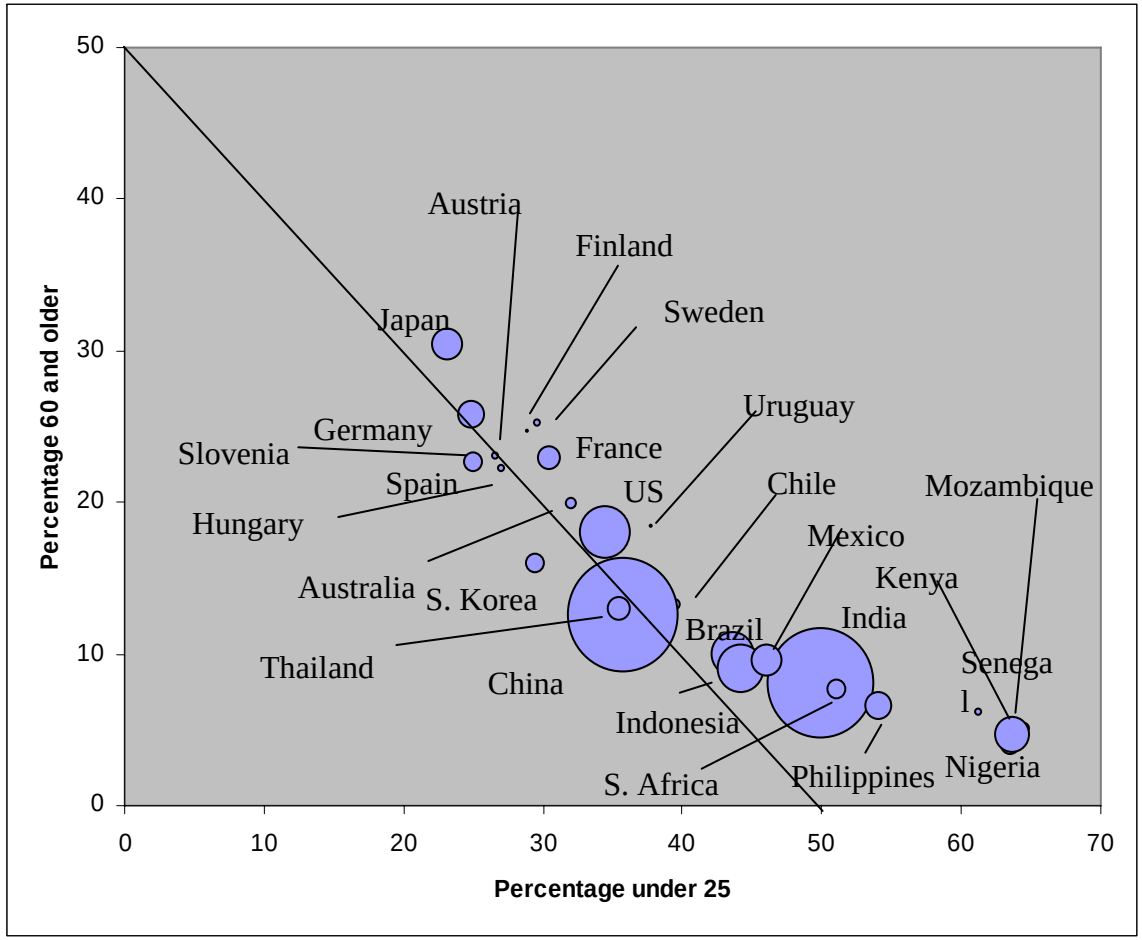
The Global Age Transition



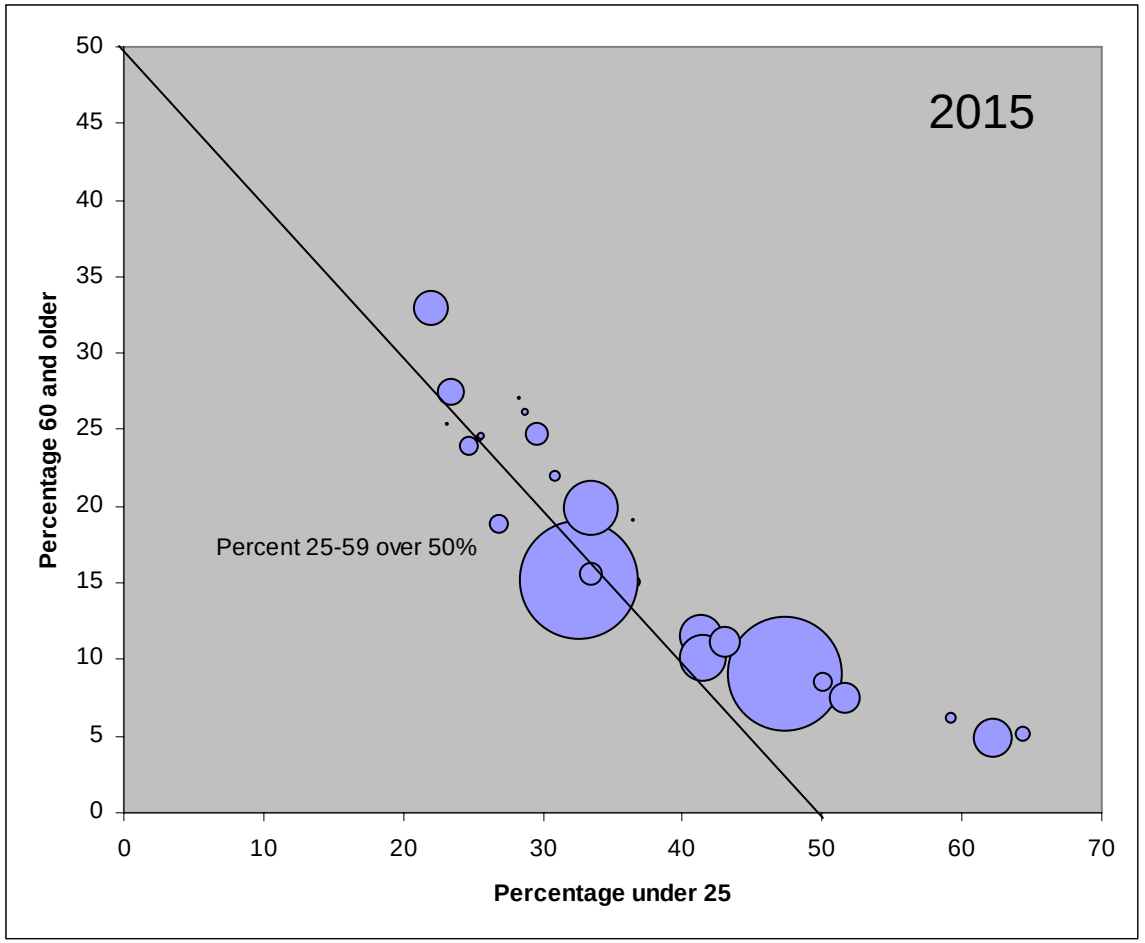
The Global Age Transition

Between 1975 and today the share of the population 25-59 reached high levels in many countries around the worl.

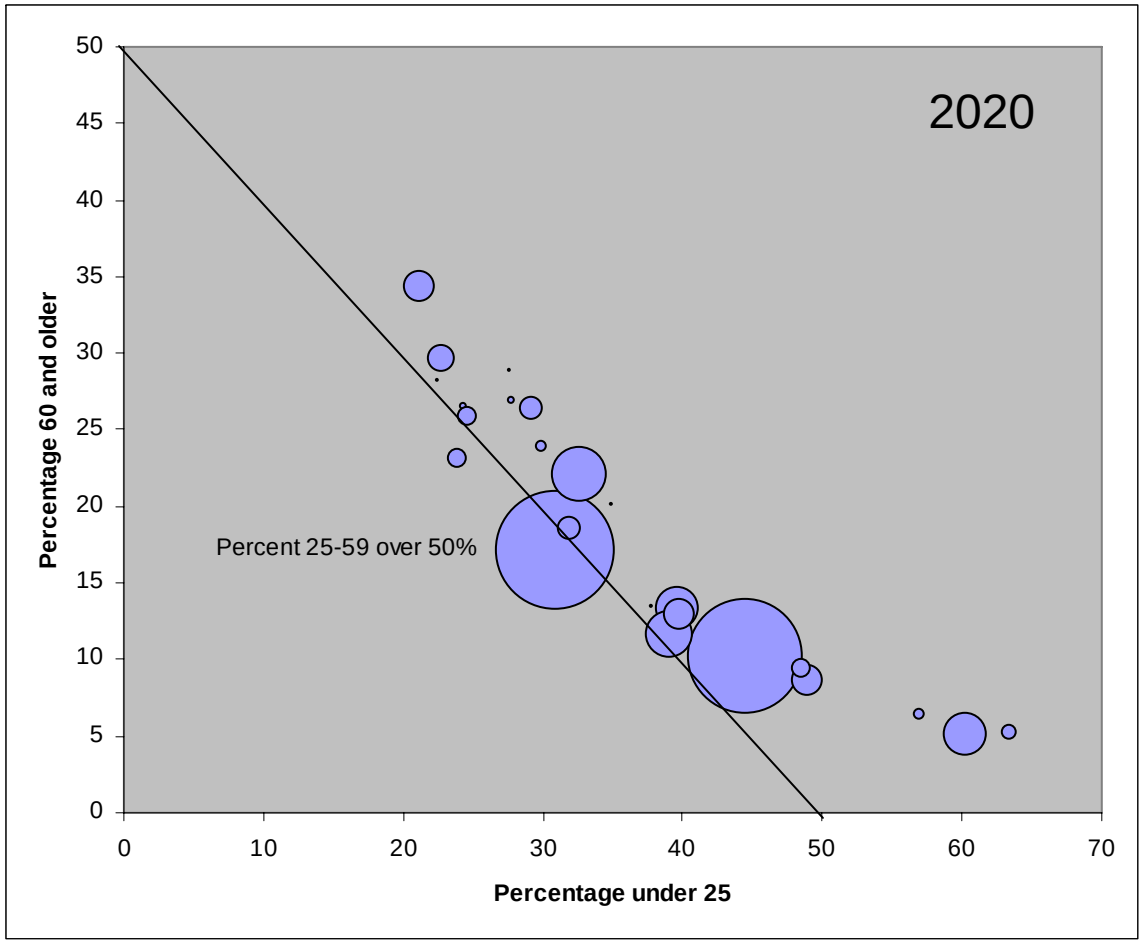



Percentage 60 and older
Percentage under 25
0
10
20
30
40
50
60
70
Austria
Finland
Sweden
Japan
Uruguay
Germany
Slovenia
France
Spain
US
Chile
Mozambique
Hungary
Mexico
Kenya
Australia
S. Korea
India
Brazil
Thailand
China
Senega
l
Indonesia
S. Africa
Philippines
Nigeria

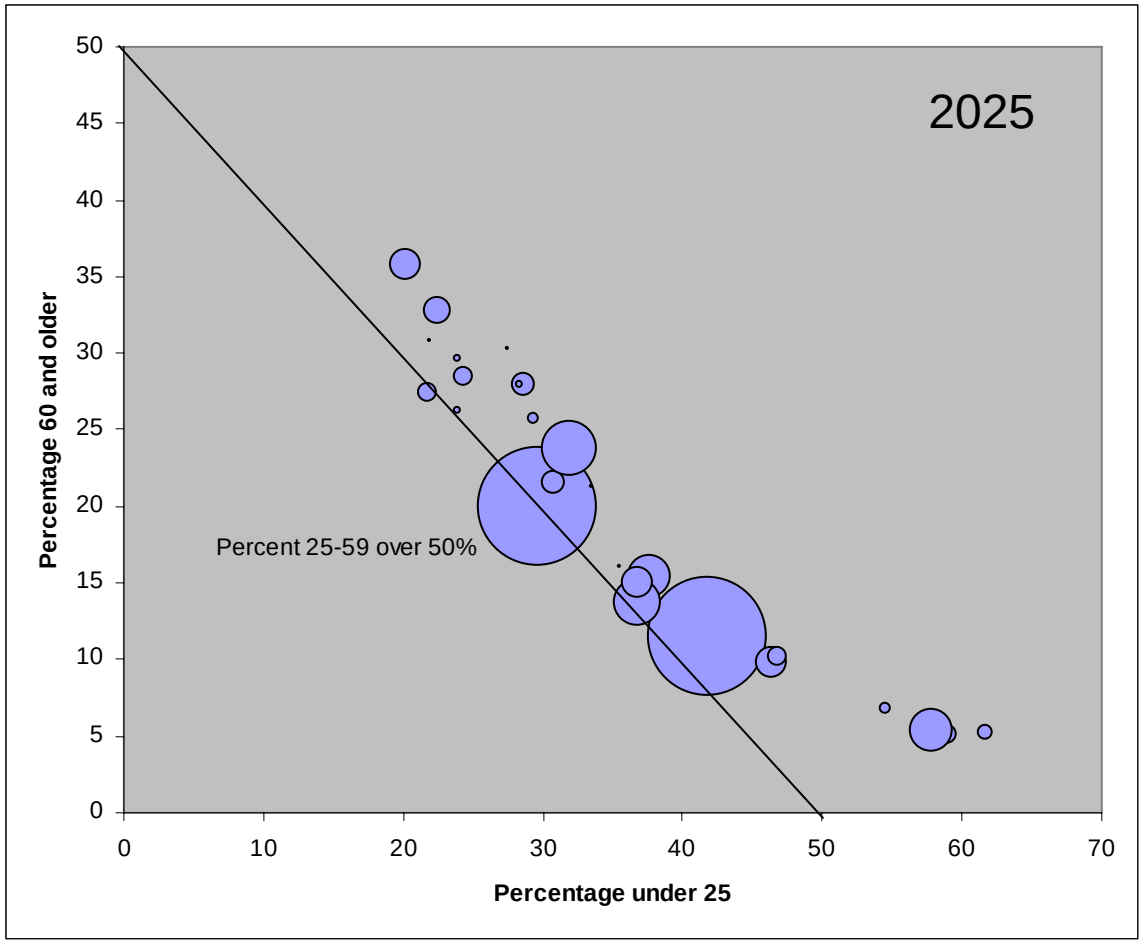
The Global Age Transition



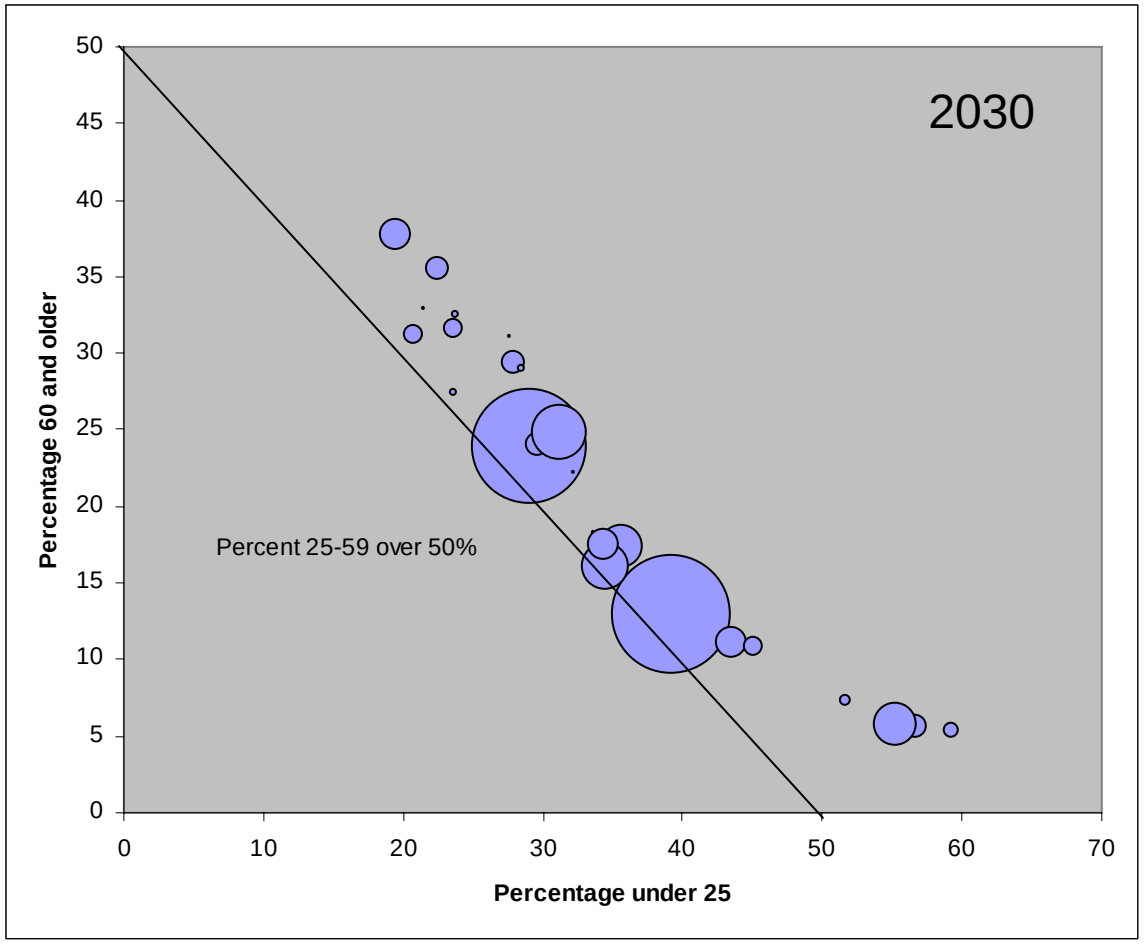
The Global Age Transition



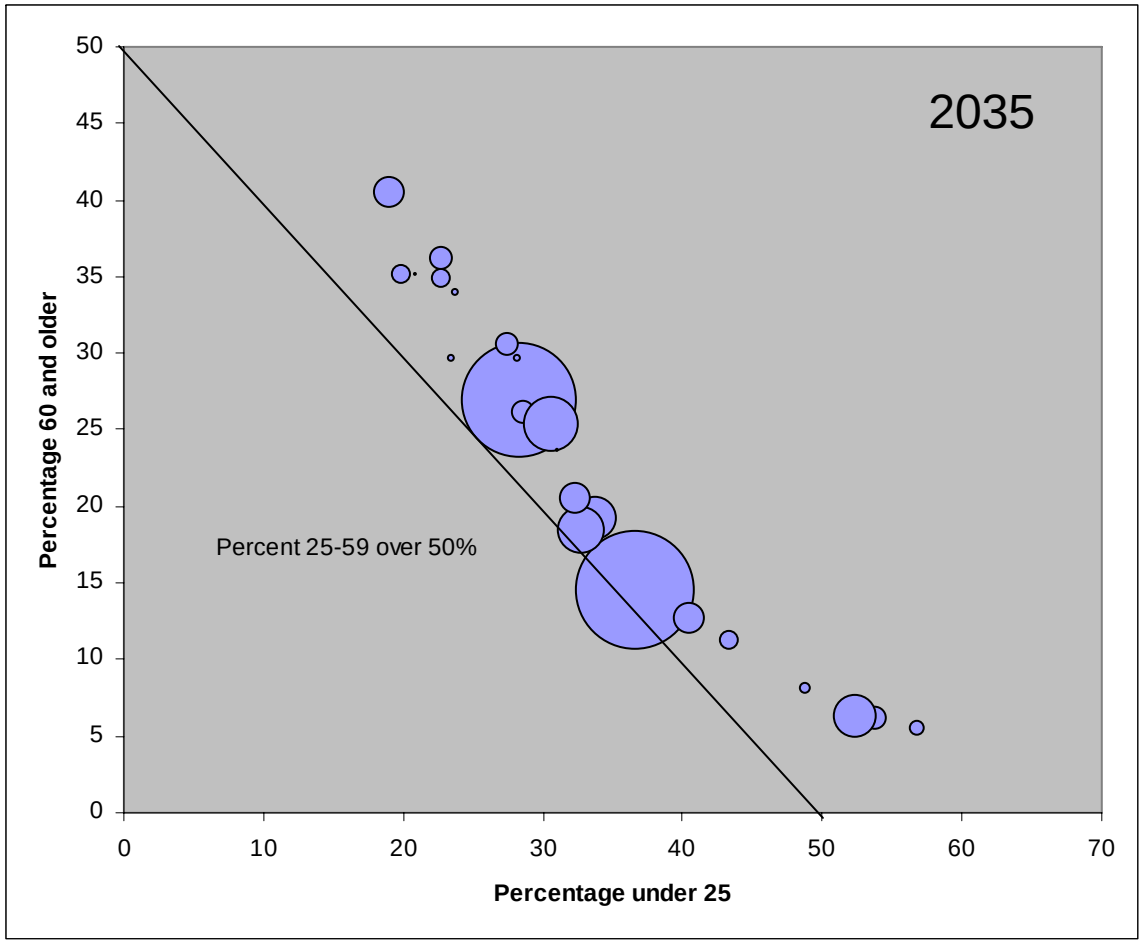
The Global Age Transition



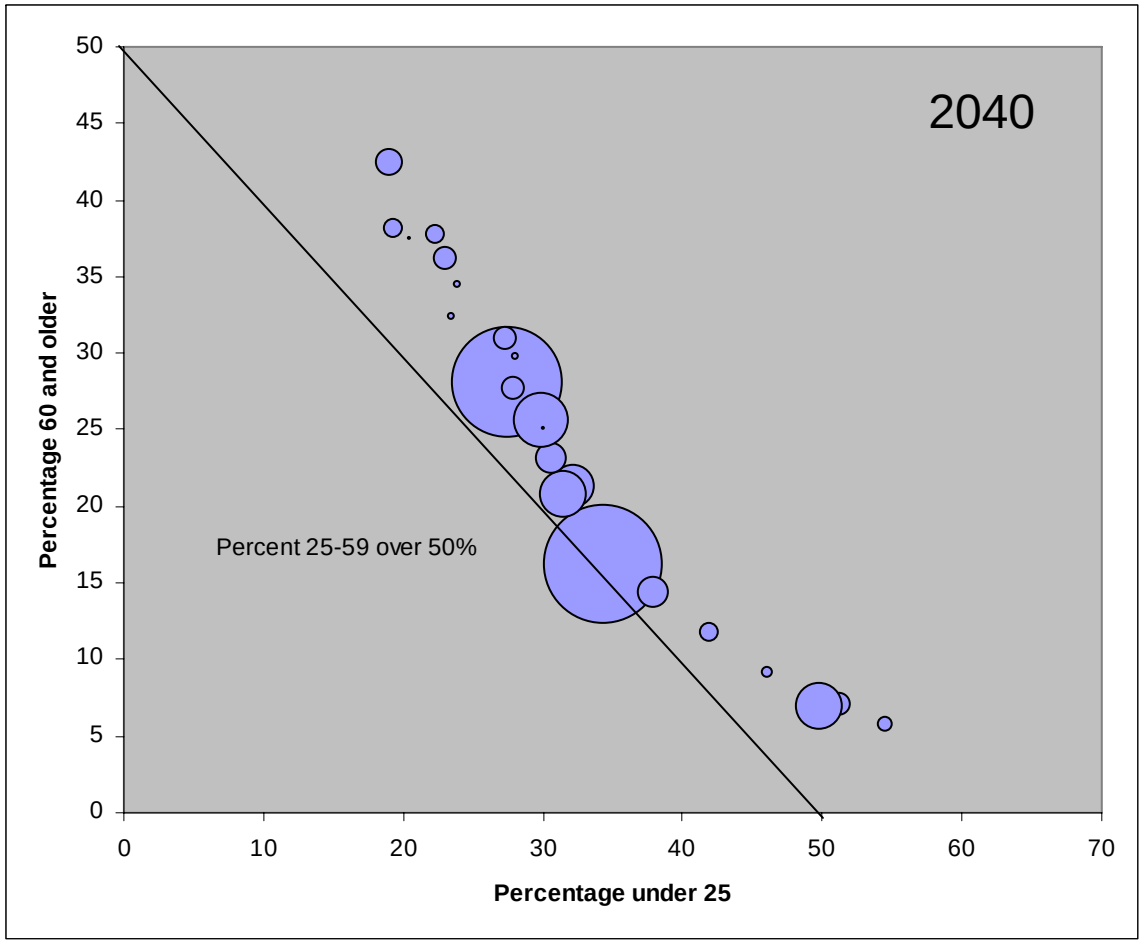
The Global Age Transition



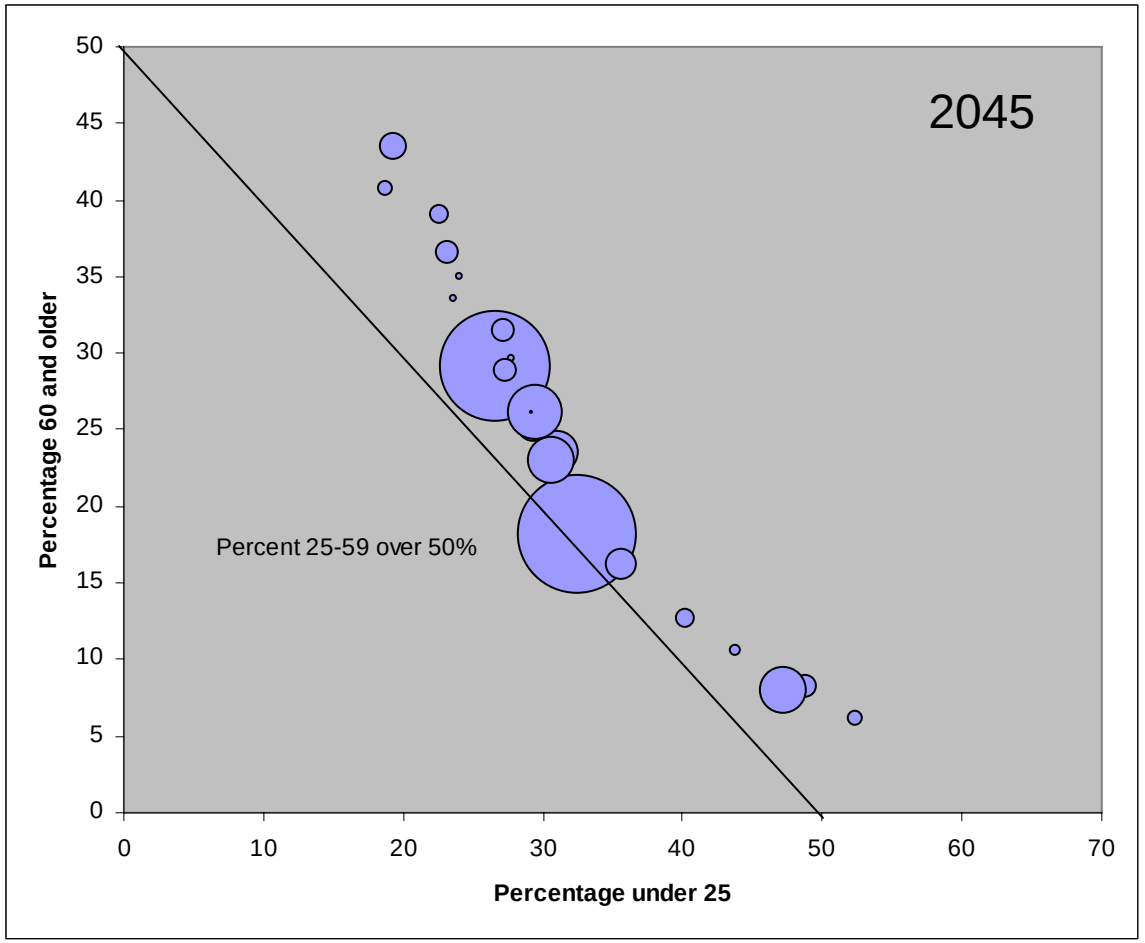
The Global Age Transition



The Global Age Transition

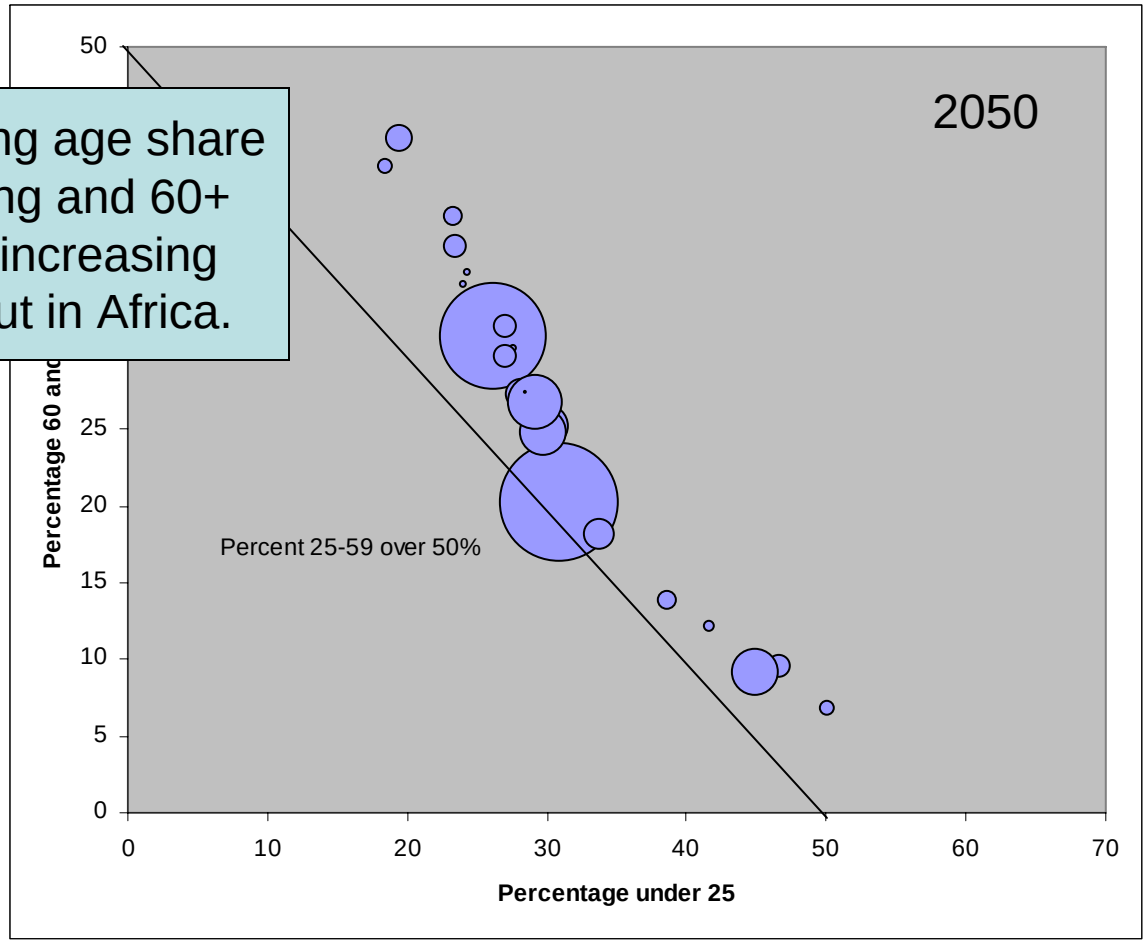


The Global Age Transition



The Global Age Transition

By 2050, working age share will be declining and 60+ share will be increasing everywhere but in Africa.



The Global Age Transition Summarized

Decline in birth and death rates have led to changes in population age structure in three phases:

I. An increase in the share of children.

II. An increase in the working-age share.

III. An increase in the old-age share.

The timing and magnitudes vary across countries but the underlying patterns are very similar.

Key Idea

Global age transition interacts with the generational economy to influence:

- Economic growth and standards of living
- Generational equity and conflict
- Sustainability of public and private support systems
- Investment in human and physical capital

What do we mean by the generational economy?

- The generational economy refers to the institutions and economic mechanisms that govern how resources are acquired and used by members of different generations or age groups.
- National Transfer Accounts quantify the economic flows that characterize the generational economy.

Outline of Presentation

I. Provide an overview of National Transfer Accounts (NTA) and the Generational Economy.

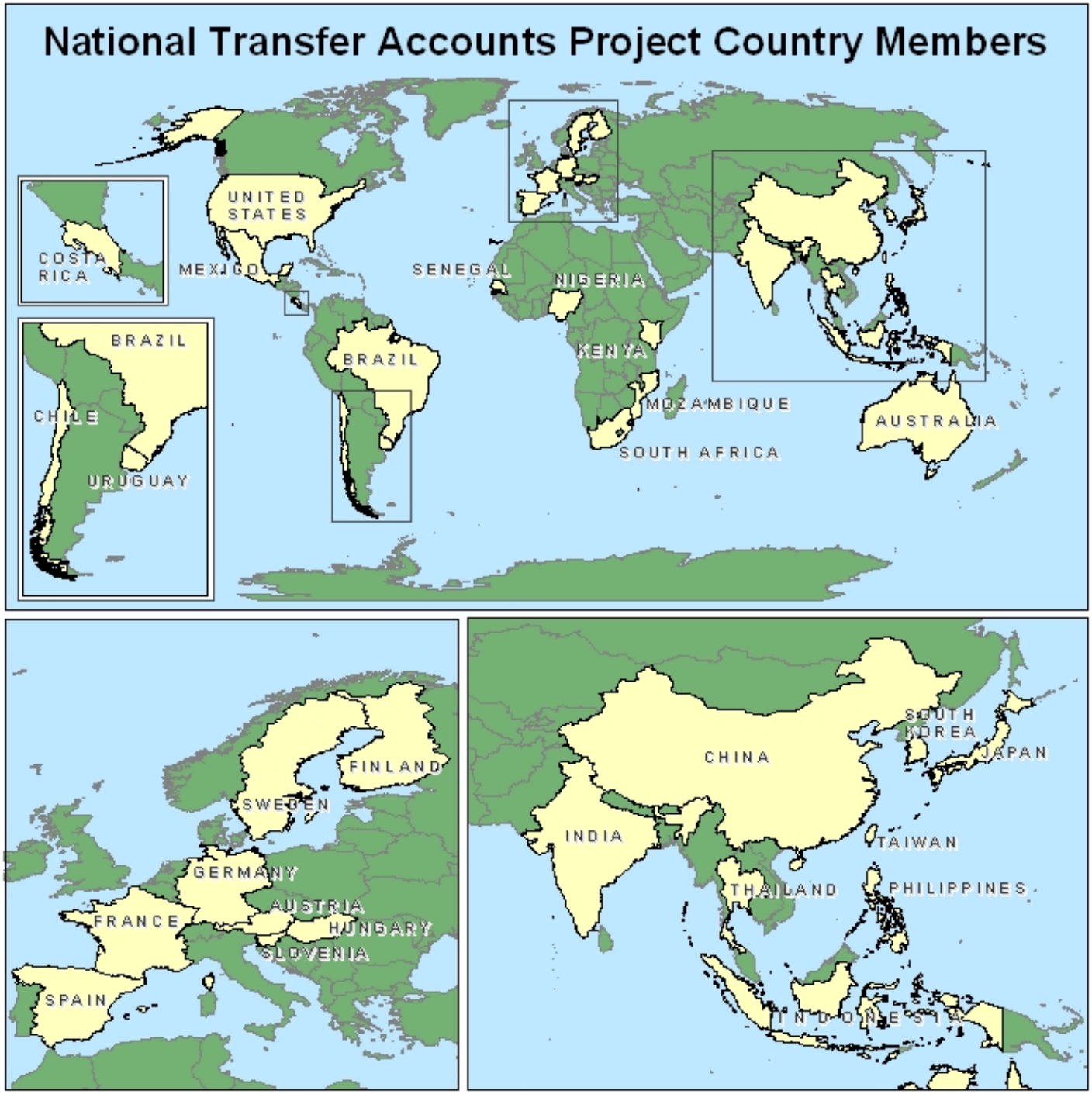
II. Present several key findings (limited by the available time).

I. NTA Overview
Theoretical Foundations for NTA

- Samuelson (1958)
- Diamond (1965)
- Tobin (1967)
- Arthur-McNicoll (1978)
- **Willis (1988)**
- Cutler et al (1990)
- **Lee (1994)** and Bommier and Lee (2003)
- Simon Kuznets and Richard Stone who pioneered the development of National Income and Product Accounts

The NTA Project

- Project directors
  - Ronald Lee
  - Andrew Mason
- Funding
  - National Institute on Aging
  - International Development Research Center
  - United Nations Population Fund
  - MacArthur Foundation
  - MEXT Academic Frontier grant to NUPRI (Japan)
- Website: www.ntaccounts.org
- Research teams in 28 countries and six continents are constructing NTAs.


National Transfer Accounts Project Country Members
UNITED STATES
COSTA RICA
MEXICO
SENEGAL
NIGERIA
KENYA
MOZAMBIQUE
SOUTH AFRICA
AUSTRALIA
BRAZIL
BRAZIL
CHILE
URUGUAY
FINLAND
SWEDEN
GERMANY
AUSTRIA
HUNGARY
SLOVENIA
FRANCE
SPAIN
CHINA
SOUTH KOREA
JAPAN
INDIA
TAIWAN
THAILAND
PHILIPPINES
INDONESIA

The Flow Account Identity

- Inflows
  - Labor Income
  - Asset Income
  - Transfer Inflows
- Outflows
  - Consumption
  - Saving
  - Transfer Outflows

$$\underbrace{Y^l(x) + Y^a(x) + \tau^+(x)}_{\text{Inflows}} = \underbrace{C(x) + S(x) + \tau^-(x)}_{\text{Outflows}}$$

$$\underbrace{C(x) - Y^l(x)}_{\text{Lifecycle Deficit}} = \underbrace{\tau^+(x) - \tau^-(x)}_{\text{Net Transfers}} + \underbrace{Y^a(x) - S(x)}_{\text{Asset-based Reallocations}}$$

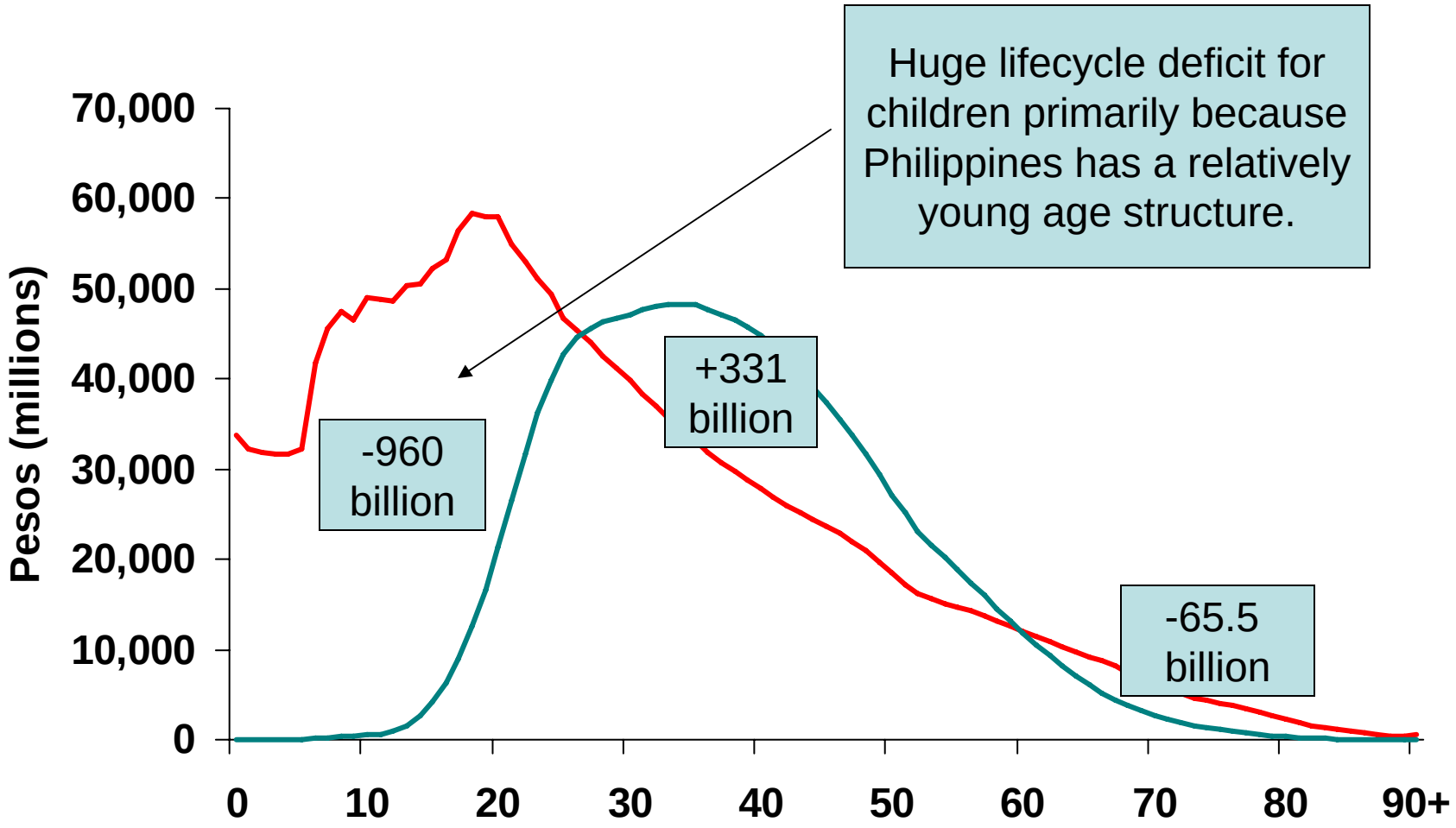
Age Reallocations

where *x* is age.

Some Details

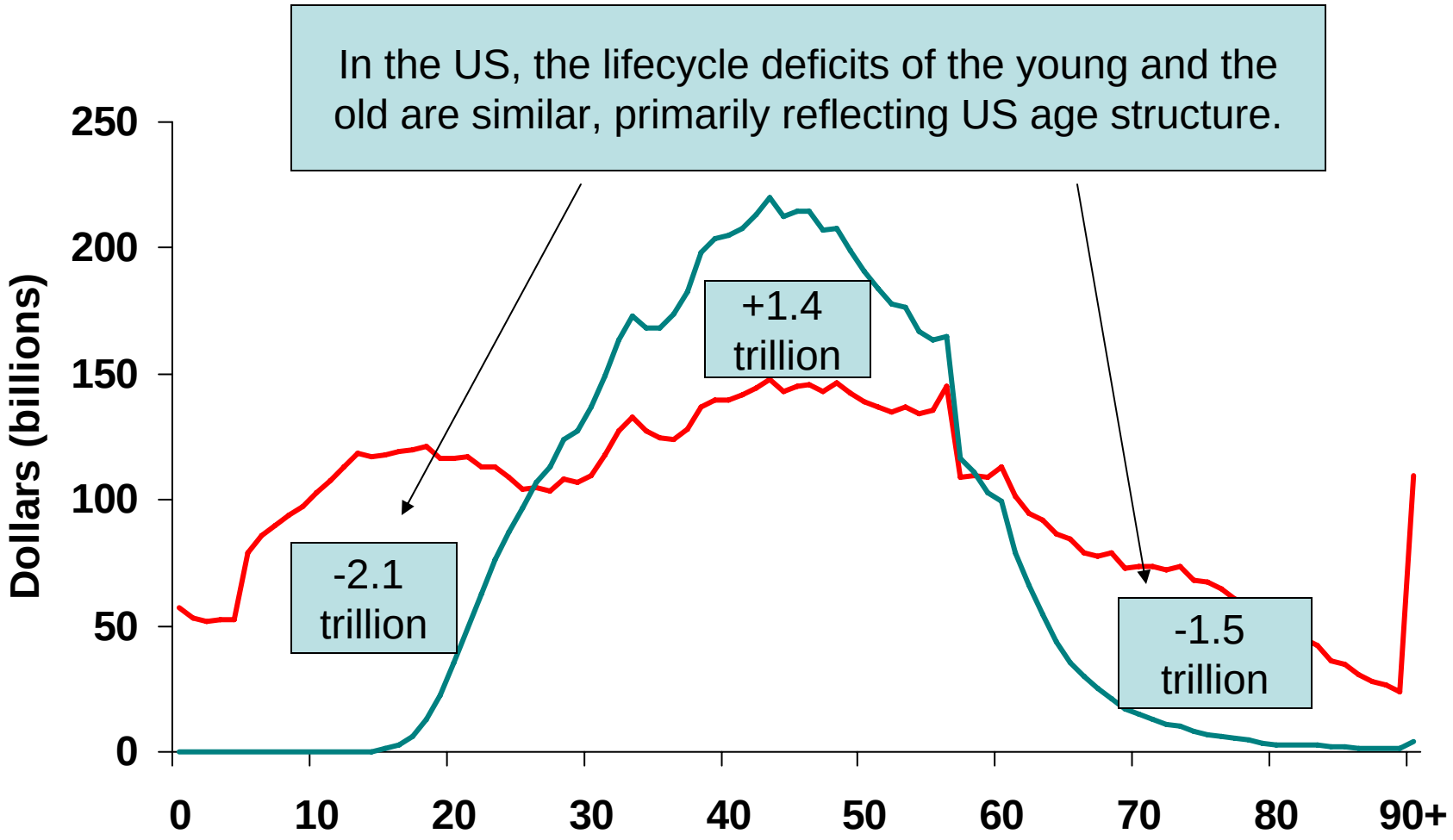
- Total values for most flows are based on National Income and Product Accounts.
- Age distribution of flows estimated from household surveys and government administrative records.
- Accounts are estimated in considerable detail with particular emphasis on education, health, pensions, and long-term care.

Aggregate Economic Lifecycle, Philippines, 1999



Source: Racelis and Salas. 2007.

Aggregate Economic Lifecycle, US, 2003



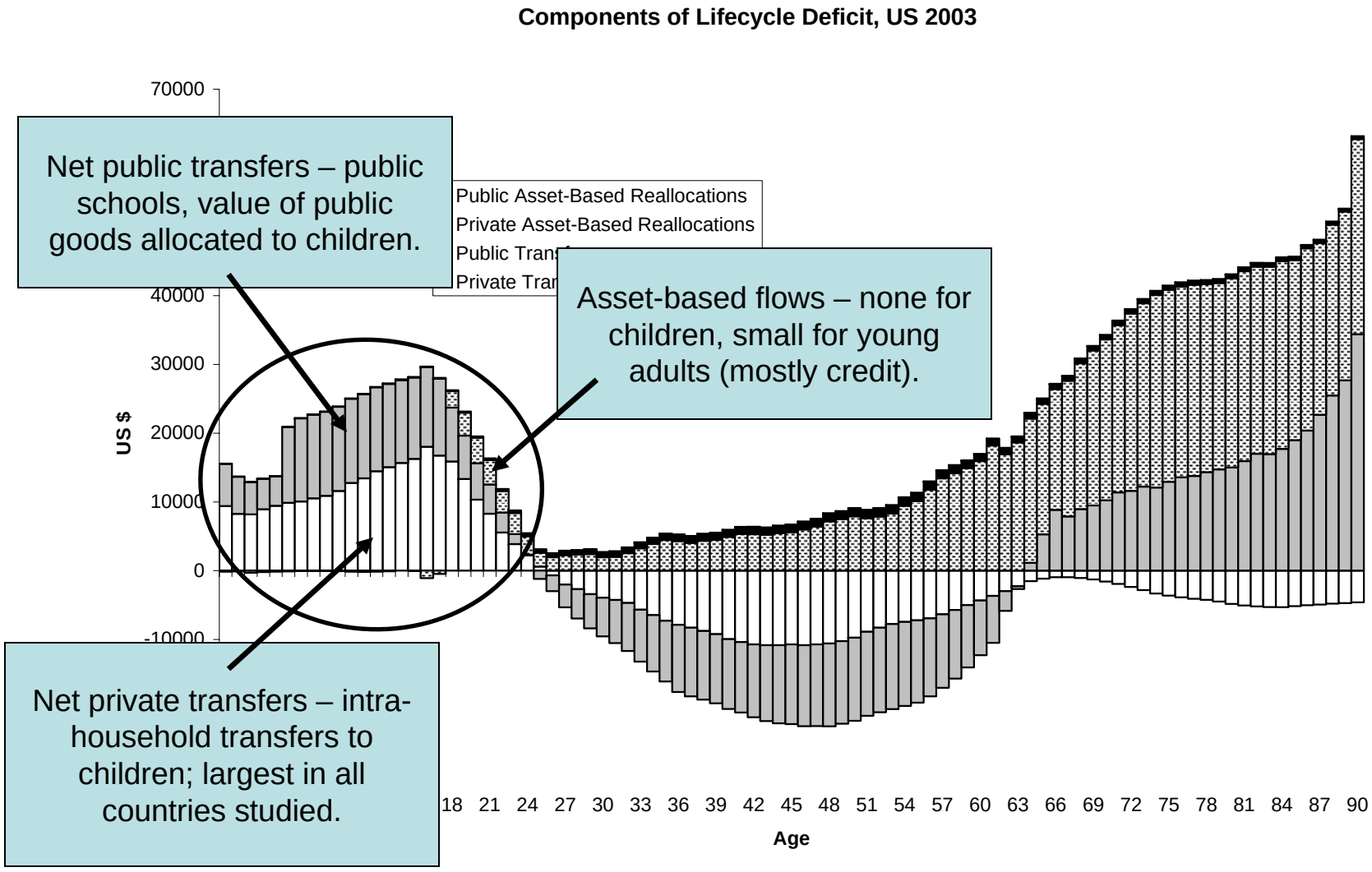
Source: Lee, et al. 2007; Lee, Mason, and Lee. 2008.

Age Reallocation System

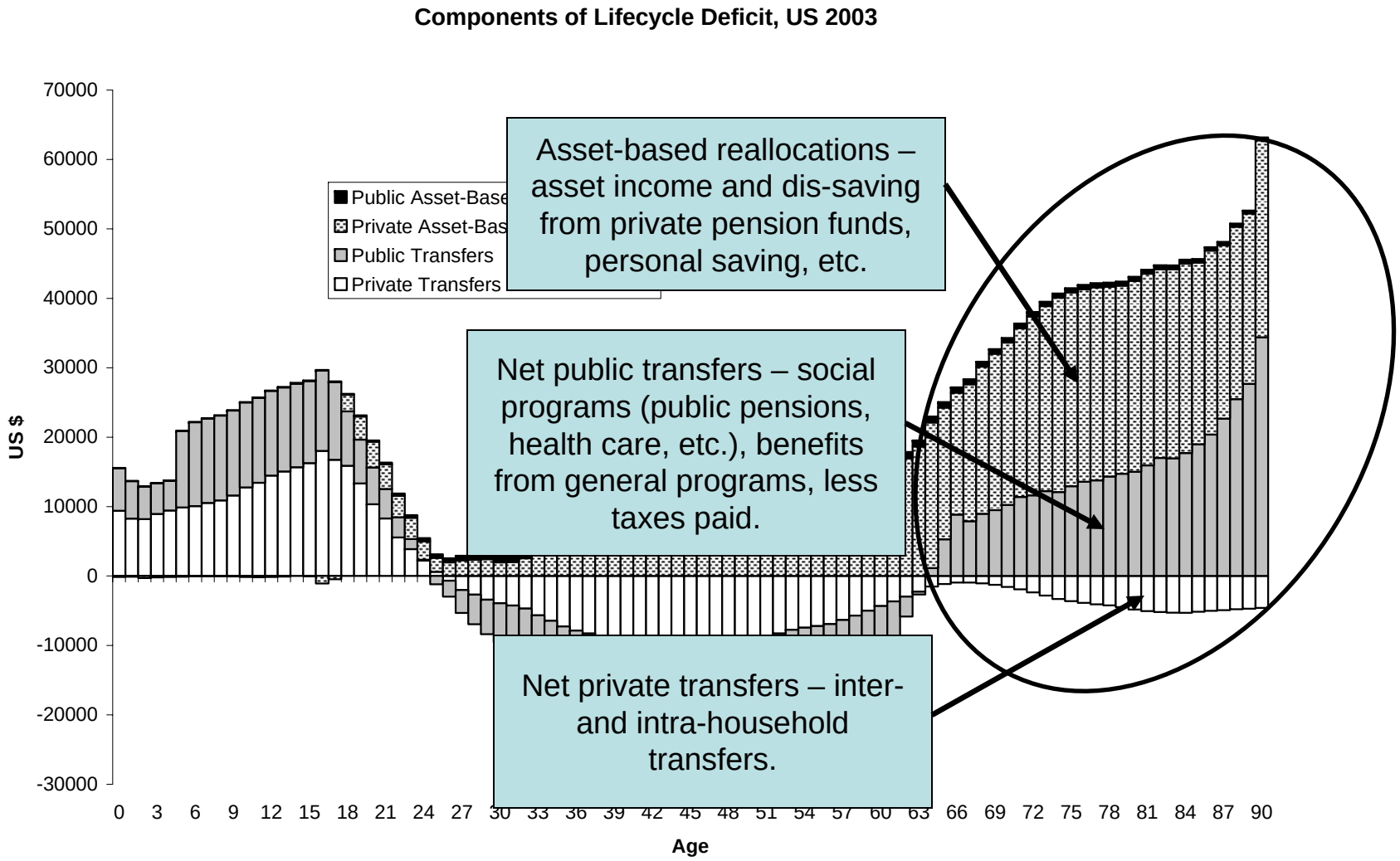
- Economic system that shifts resources from one age group to another.
- NET effect is to fill the gap between consumption and labor income (flow constraint).
- Transfers
  - Public transfers (cash and in-kind)
  - Private transfers (familial including intra-household)
- Asset-based reallocations
  - Asset income
  - Saving

A Classification of NTA Reallocations.			
	Asset-based Age Reallocations		
	Capital and Other Non-Financial Assets	**Credit**	**Transfers**
Public	Public infrastructure Public land and sub-soil minerals	Public debt Student loans Money	Public education Public health care Unfunded pension plans
Private	Housing Consumer durables Factories, Farms Private land and sub-soil minerals Inventories	Consumer credit	Familial support of children and parents Bequests Charitable contributions
Source: Mason, Lee et al. (2009); adapted from Lee (1994).			

Funding the Child Deficit



Funding the Old-age Deficit

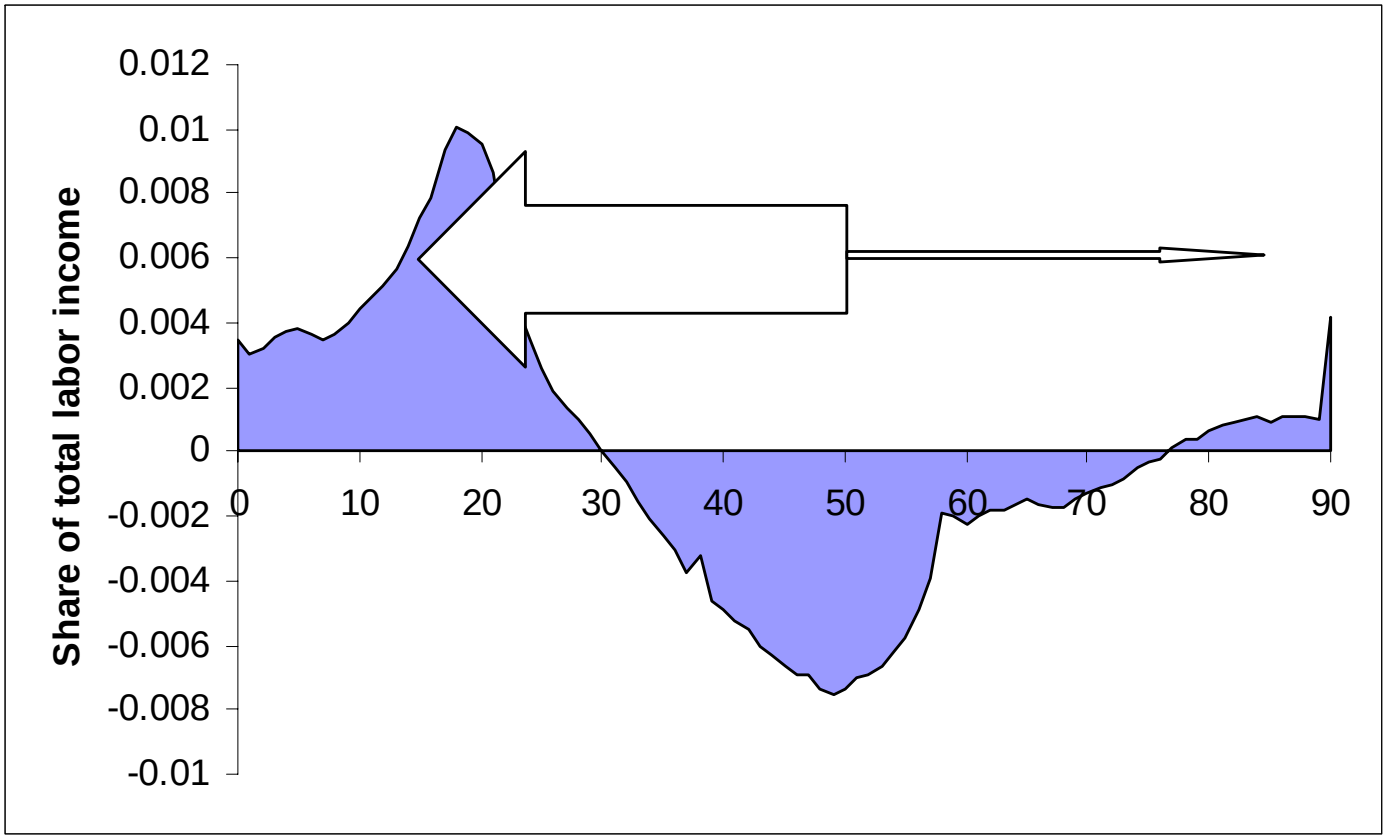


II. Interesting Findings

1. Private Transfers

- Private transfers to children dominate private transfers to the elderly in ALL countries, but especially in countries with young age structures.
- Importance:
  - Understanding the fertility transition;
  - Economic role of the family in aging societies.

Aggregate Net Private Transfers by Age, Oldest Country in the World (Japan 2004)



Mean age of outflows: 50.0; mean age of child inflows: 15.2; mean age of old-age inflows: 86.4. Private child transfers as a share of total labor income: 0.146; private old-age transfers as a share of total labor income: 0.012.

Summarizing Transfers: Transfer Wealth and Arrow Diagrams

- Transfer wealth (T) is the present value of net transfers expected by the current population.
- The counterpart of transfer wealth is implicit debt of future generations.
- Under special conditions (golden rule growth), T equals the area of the arrow or: $$T = Flow \times \left(A^{\tau^+} - A^{\tau^-} \right)$$

<u>For Japan</u>

Downward transfers:

T = (15.2 – 50) X 0.146 = -5.09 times annual aggregate labor income

Upward transfers:

T = (86.4 – 50) X 0.012 = 0.54 times annual aggregate labor income.

Combined transfer wealth equals -4.55 times annual aggregate labor income.

Expected private transfers to future generations substantially exceed the expected private transfers from future generations.

Table xx. Private transfer summary, with own and standard population age distributions.

Country (from richest to poorest)	Average age of inflows	Average age of outflows	Transfers/ Normalized labor income	Wealth	Adjusted Wealth
United States	34.2	46.9	0.25	-3.17	-3.47
Austria	36.4	46.2	0.17	-1.67	-2.34
Japan	42.1	50.6	0.29	-2.46	-4.03
Slovenia	32.6	43.4	0.19	-2.05	-3.17
Taiwan	31.3	40.3	0.35	-3.15	-3.31
South Korea	33.8	44.2	0.45	-4.68	-5.13
Mexico	28.1	42.6	0.47	-6.81	-5.86
Chile*	30.3	45.2	0.33	-4.92	-4.46
Costa Rica	28.6	42.4	0.35	-4.83	-4.11
Thailand	33.3	43.7	0.33	-3.43	-3.26
Brazil*	28.9	44.0	0.39	-5.89	-4.72
Indonesia*	24.8	43.8	0.29	-5.51	-5.07
China*	32.9	43.9	0.2	-2.20	-2.25
Philippines	27.6	42.9	0.42	-6.43	-4.23

Private transfers are normalized on the labor income of those in the 30-49 age group.

Adjusted wealth uses a standard population age distribution to calculate private transfers.

Source: Lee and Mason 2009.

Table xx. Private transfer summary, with own and standard population age distributions.

Country (from richest to poorest)	Average age of inflows	Average age of outflows	Transfers/ Normalized labor income	Wealth	Adjusted Wealth
United States	34.2	46.9	0.25	-3.17	-3.47
Austria	36.4	46.2	0.17	-1.67	-2.34
Japan	42.1	50.6	0.29	-2.46	-4.03
Slovenia	32.6	43.4	0.19	-2.05	-3.17
Taiwan	31.3	40.3	0.35	-3.15	-3.31
South Korea	33.8	44.2	0.45	-4.68	-5.13
Mexico	28.1	42.6	0.47	-6.81	-5.86
Chile*	30.3	45.2	0.33	-4.92	-4.46
Costa Rica	28.6	42.4	0.35	-4.83	-4.11
Thailand	33.3	43.7	0.33	-3.43	-3.26
Brazil*	28.9	44.0	0.39	-5.89	-4.72
Indonesia*	24.8	43.8	0.29	-5.51	-5.07
China*	32.9	43.9	0.2	-2.20	-2.25
Philippines	27.6	42.9	0.42	-6.43	-4.23

Private transfers are normalized on the labor income of those in the 30-49 age group.

Adjusted wealth uses a standard population age distribution to calculate private transfers.

Source: Lee and Mason 2009.

Uses average age structure

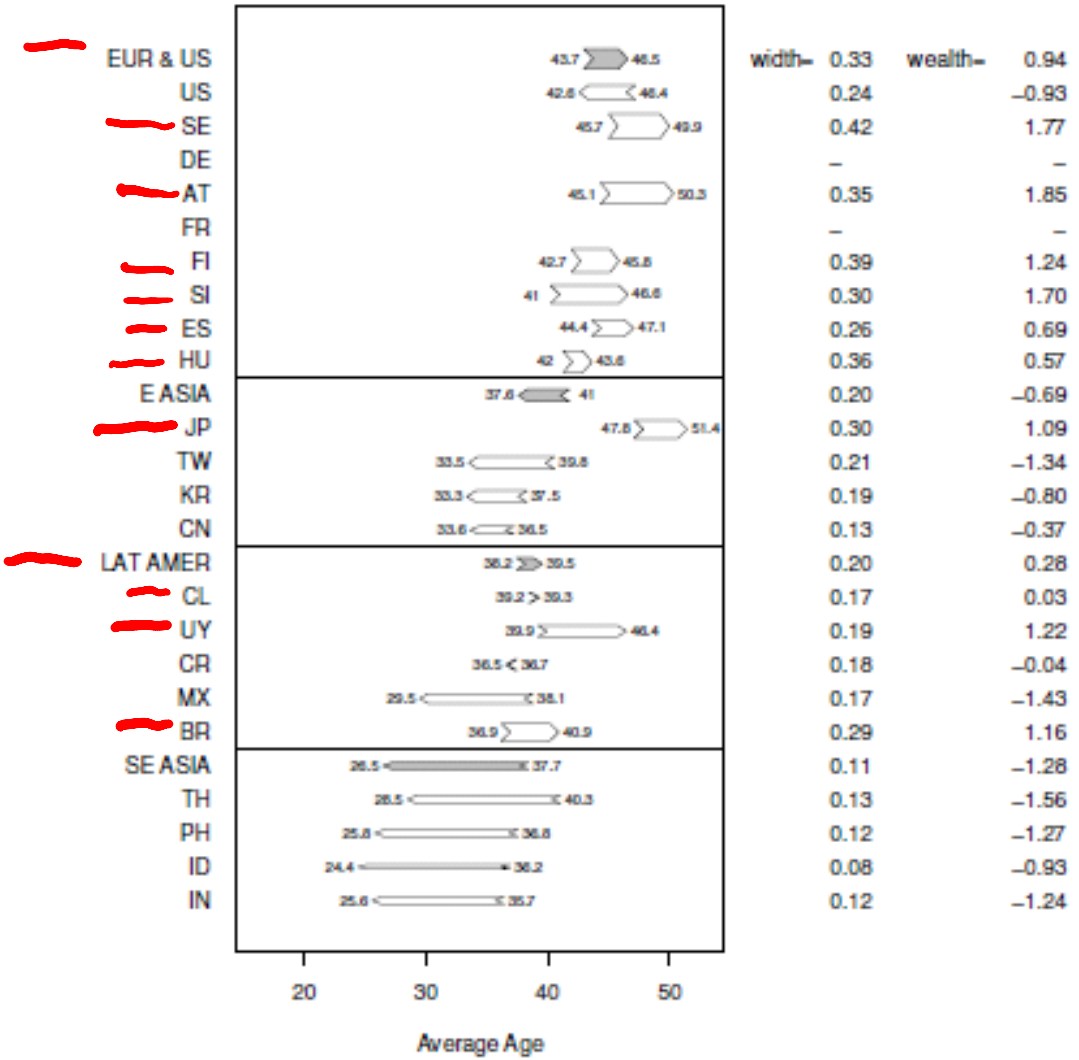
Variance ↓

Δs across countries mostly age structure.

2. Public Transfers

- Public transfers are downward in low-income countries (education)
- Public transfers are upward in high-income countries (health care and pensions)
- Implications
  - As populations age public transfer wealth will grow and, hence, implicit debt on future generations will increase.
  - Public transfer systems can not be sustained in their current form and may lead to generational conflict.

Public transfers given and received for countries and regions (with **actual** population age distribution)

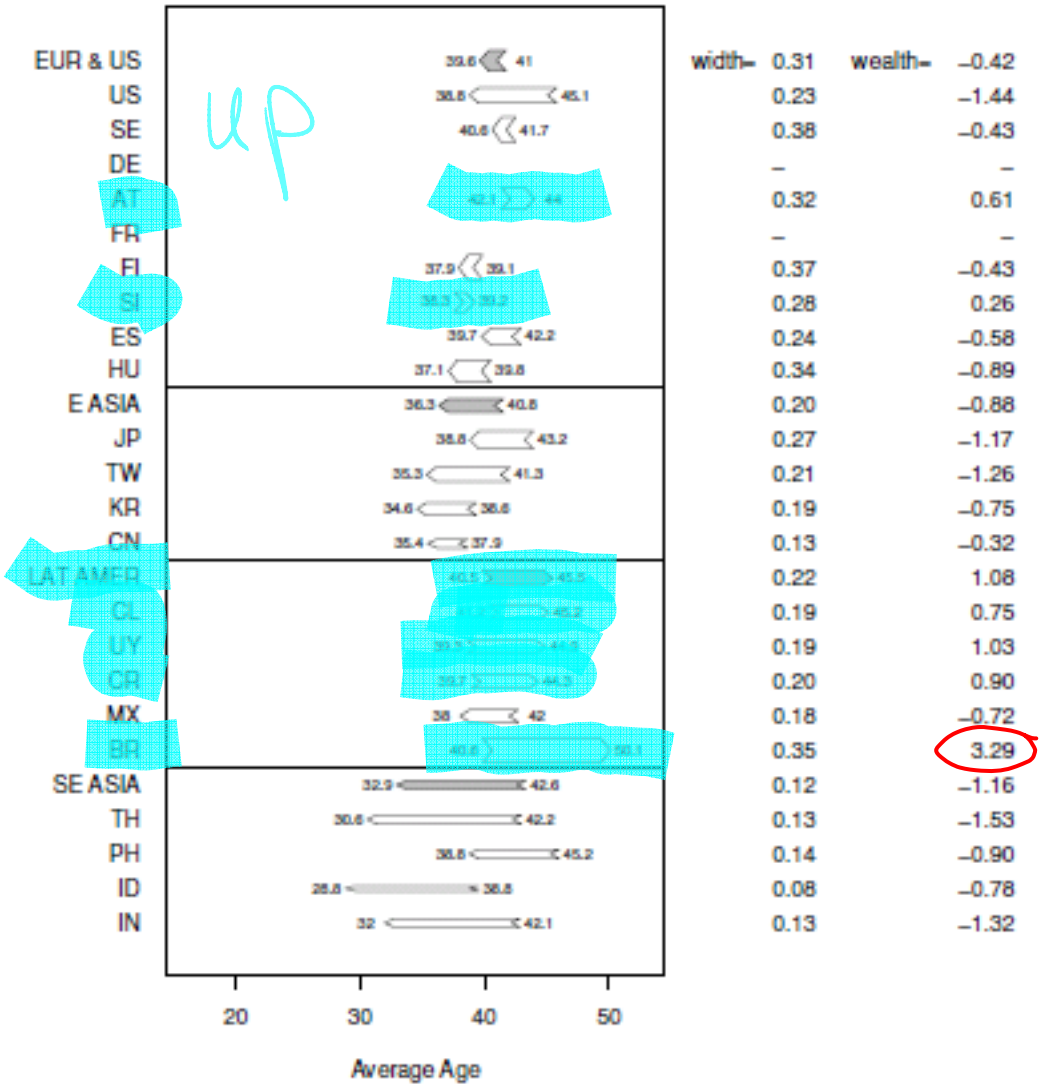


	width	wealth
EUR & US	0.33	0.94
US	0.24	–0.93
SE	0.42	1.77
DE	–	–
AT	0.35	1.85
FR	–	–
FI	0.39	1.24
SI	0.30	1.70
ES	0.26	0.69
HU	0.36	0.57
E ASIA	0.20	–0.69
JP	0.30	1.09
TW	0.21	–1.34
KR	0.19	–0.80
CN	0.13	–0.37
LAT AMER	0.20	0.28
CL	0.17	0.03
UY	0.19	1.22
CR	0.18	–0.04
MX	0.17	–1.43
BR	0.29	1.16
SE ASIA	0.11	–1.28
TH	0.13	–1.56
PH	0.12	–1.27
ID	0.08	–0.93
IN	0.12	–1.24

Source: Lee and Mason 2009.

Public transfers given and received for countries and regions (with **standard** population age distribution)

- Europe & US: public transfers are upward because of pop aging.
- E Asia: Given age structure public systems favor young more and elderly less than in Europe.
- Latin America: Public systems build in large upward transfers – Brazil in particular.
- SE Asia: Public systems strongly favor the young.



Source: Lee and Mason 2009.

Long-run fiscal projections

- Impacts of demographic changes are profound, but not observed in the short-run.
- Mindful of population aging, several governments have recently begun to issue long-run projections of their budgets: European Union, United States, Australia, New Zealand, United Kingdom.
- Miller, Mason, & Holz (2009): long-run projections of public expenditures on education, health care, and pensions for 10 Latin American countries.

Key Findings of Miller et al.

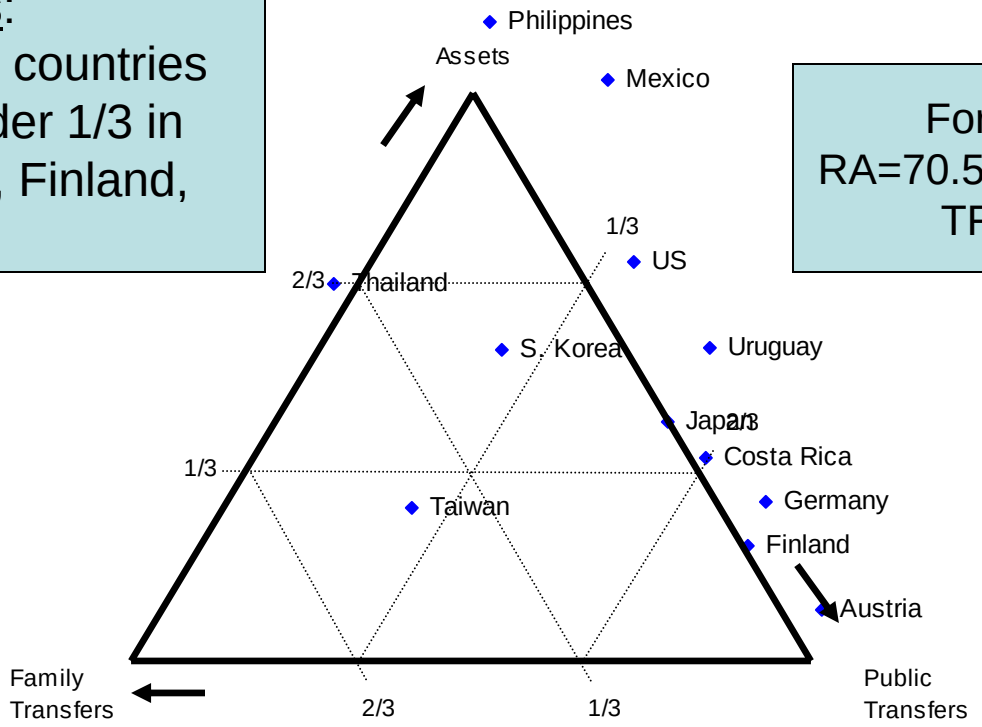
- On average, the **fiscal impact of population aging** will be as large in Latin America as in Europe.
- Fiscal impact of population aging will vary among the 10 countries – with **pension reforms** playing a large role.
- Increases in **health care obligations** are likely to rival those of pensions.
- Population aging may reduce the total cost of **educational investment** in the region or allow substantially greater investment per child.

3. Support Systems for the Elderly

- Support systems vary widely in ways not closely connected to the level of development
  - Public transfers important in Latin America and Europe
  - Private, familial transfers are important in Asia (Japan excepted).
  - Reliance on assets varies widely.
- Importance: Excessive reliance on transfers in some countries undermine an important incentive for capital accumulation with potentially adverse implications for economic growth.

Funding the Lifecycle Deficit, 65 and older, NTA countries, recent year

<u>Asset-based flows</u>:
Exceed 2/3 in four countries including US; Under 1/3 in Taiwan, Germany, Finland, and Austria.



For US 65+, RA=70.5%; TG=38.3%; TF=-8.8%.

<u>Net private transfers</u>:
Positive only for 3 Asian economies; zero in Japan; negative elsewhere.

<u>Net public transfers</u>:
Range from zero in Thailand and Philippines to over 2/3 in Germany, Finland, and Austria.

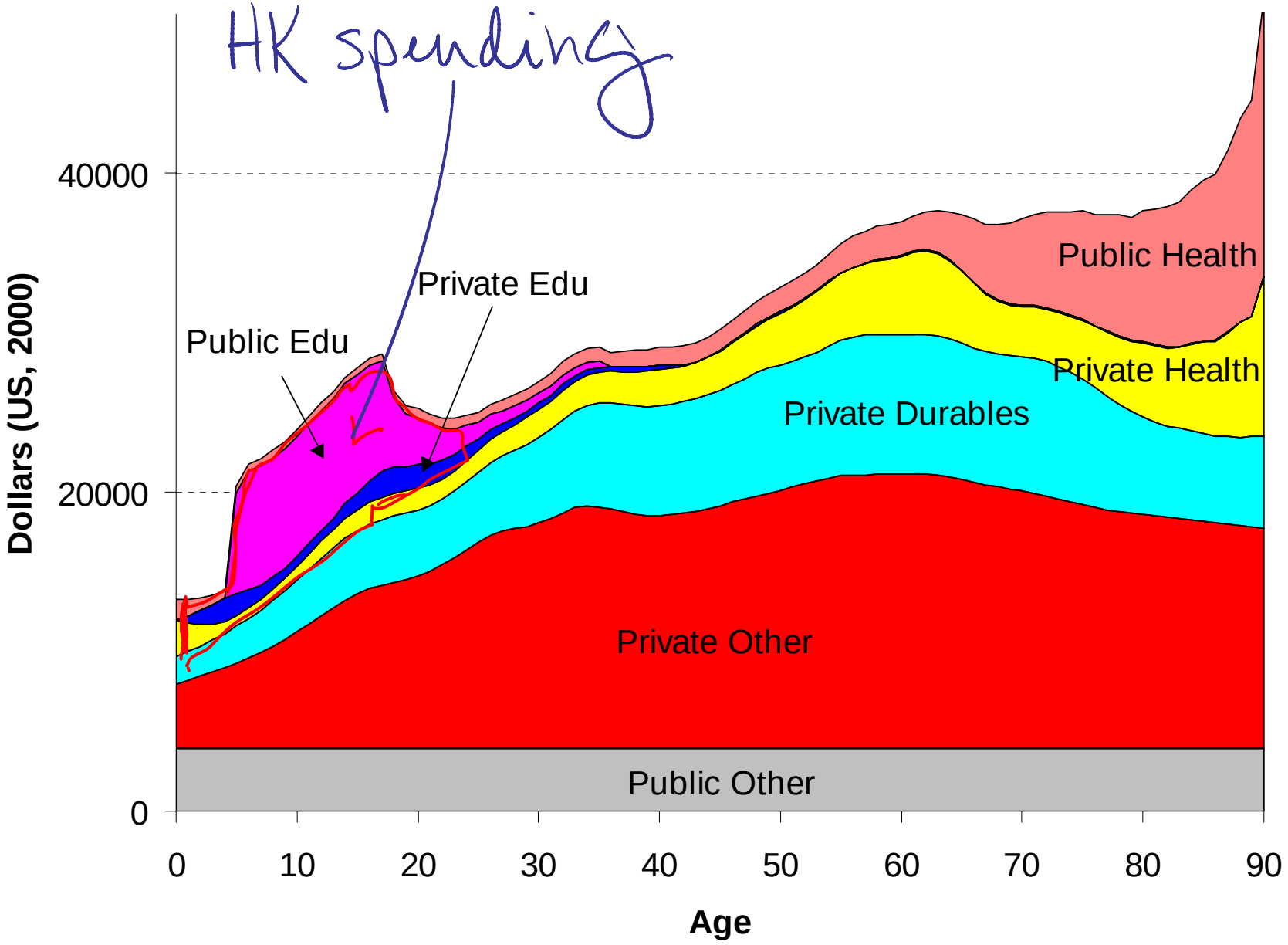
4. Tradeoff between HK and N

- In the cross-section there is a strong tradeoff between human capital spending per child and the TFR.
- In a few countries where time series estimates are available (US, Japan, Taiwan), tradeoff is confirmed.
- Tradeoff is primarily due to public HK spending.
- Importance: Low fertility, the principle cause of population aging, was accompanied by strong HK investment. Reinforces positive effects of aging on K and, hence, worker productivity and economic growth.

Measuring Human Capital Investment

- Synthetic cohort estimated based on per capita consumption of health and education.
- Both private and public consumption included.
- Education is sum of per capita values over the 0 – 26 age range.
- Health is sum of per capita values over the 0 – 17 age range.
- All values are normalized on average per capita labor income controlling for differences in income and labor costs across countries.

Components of US Consumption, 2003

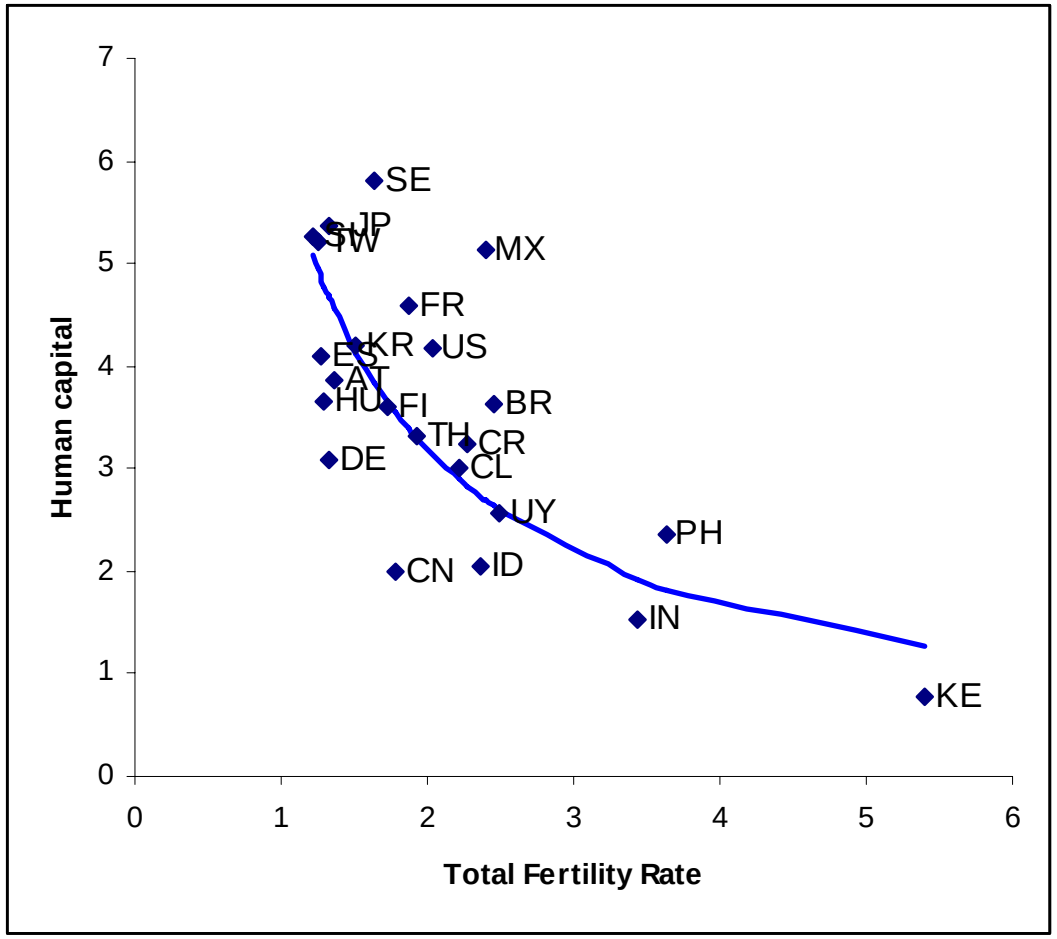


Quantity-Quality Tradeoff: Cross-sectional Relationship

Estimated elasticity

$d \ln HK / d \ln TFR$

is -0.913

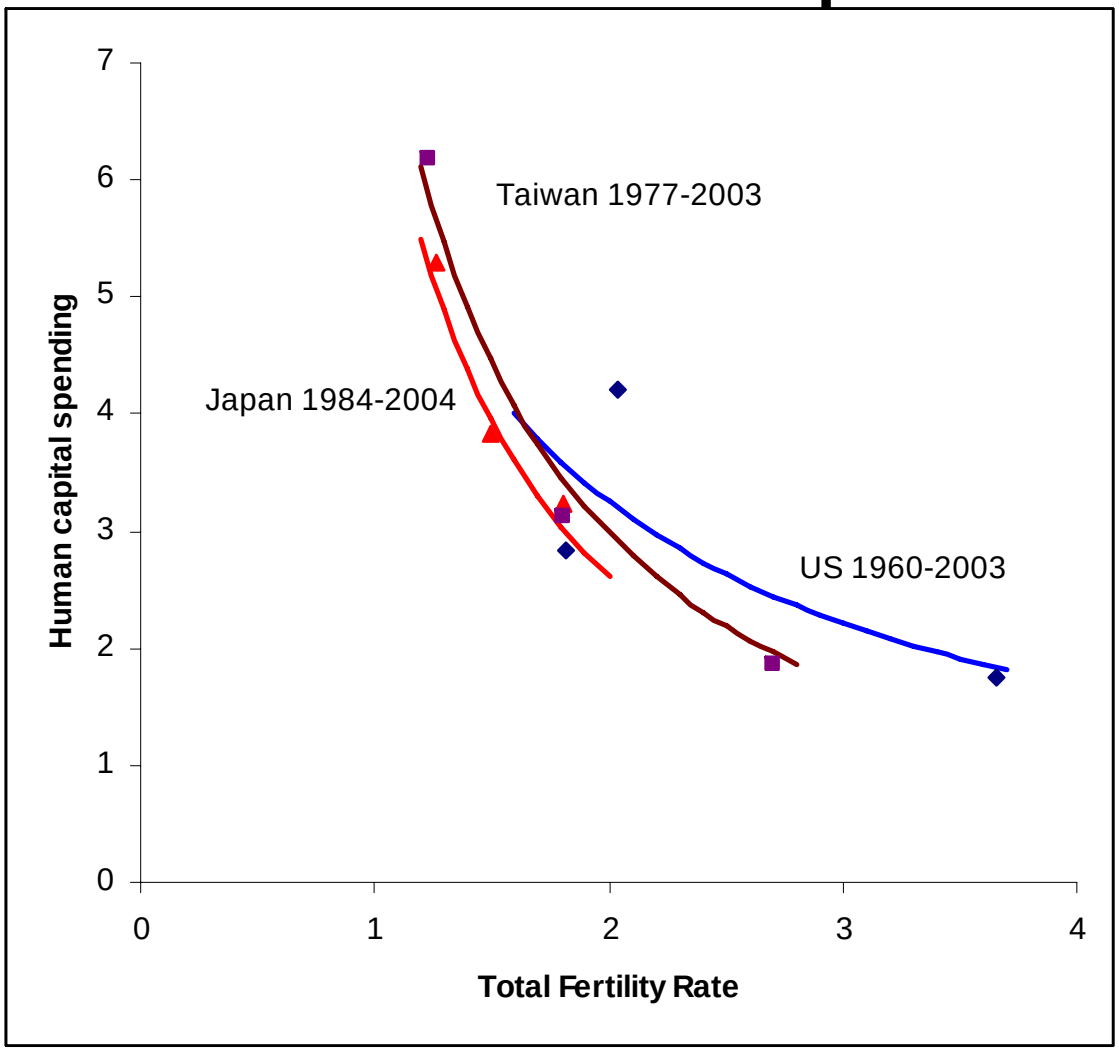


Source: Lee and Mason, forthcoming, European Journal of Population (updated).

Human Capital and TFR: Time Series Relationship

Estimated elasticities	
Japan	-1.46
Taiwan	-1.40
United States	-0.72

Number of Observations	
Japan	5
Taiwan	27
United States	23



Source: Ogawa et al., 2009.

5. Generational Role of Assets

- Contribution to old age support varies as shown above.
- Even where it is important, elderly are relying on asset income and not on dis-saving.
- Large inflows to working-age adults
  - Needed to support own consumption plus transfers
    - Mostly to children in young populations
    - To both children and elderly in older populations
  - Exceptions: China and S Korea (to some extent)
- Importance
  - Assets are dealing with two lifecycle problems
    - Lifecycle deficit of the elderly.
    - Multiple obligations of working-age adults
  - Provides an incentive for conventional lifecycle saving, but also for bequests and other capital transfers (dowry, help with buying a house, etc.)

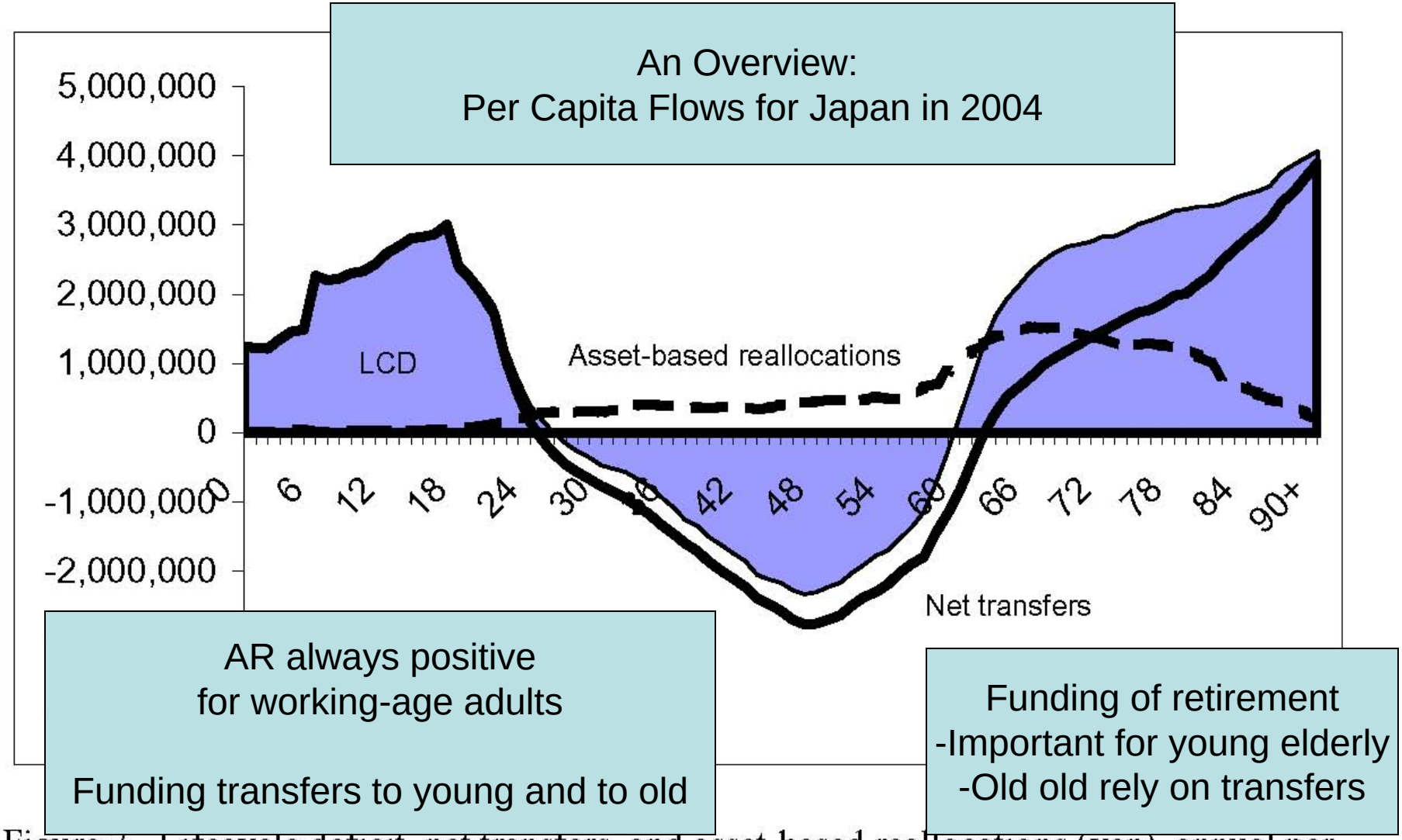
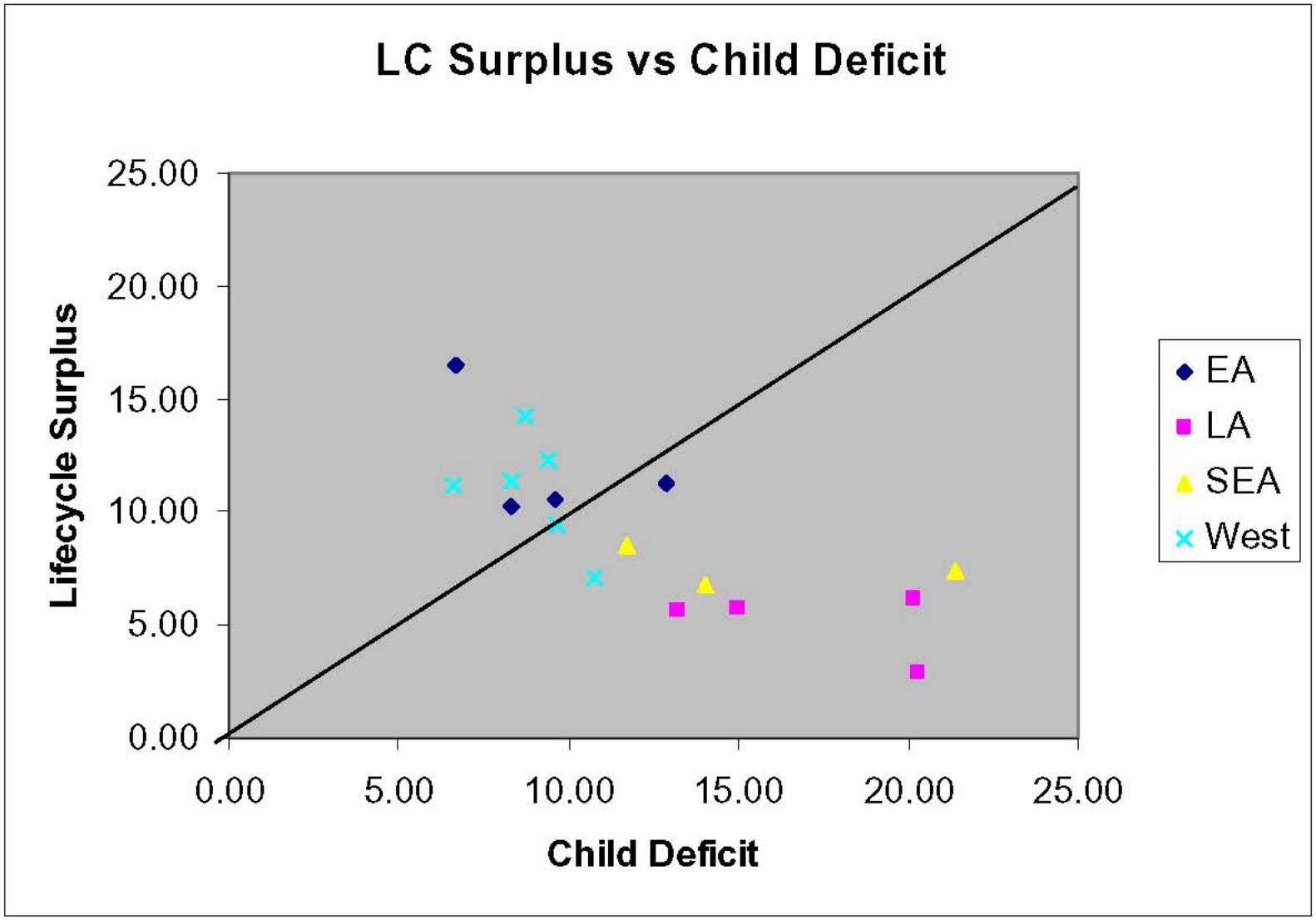


Figure 7. Lifecycle deficit, net transfers, and asset-based reallocations (yen), annual per capita flow, Japan, 2004.



If child deficit exceeds lifecycle surplus, labor income is insufficient to cover consumption during surplus years plus transfers to children. Asset-based inflows funding own-consumption and consumption of children.

Conclusions

- In high fertility, low-income countries resource demands of children are very substantial and lead to large public and private downward transfers.
- Resources are spread over many children and human capital investment per child is low.
- As fertility declines, human capital spending per child increases but the causal mechanisms are complex.

Conclusions

- Population aging combined with the growth of public transfer systems are reversing the flow of intergenerational transfers – from downward to upward.
- Public policy towards old-age transfers is very important. Upward transfers are very large in Europe and Latin America virtually eliminating the pension motive for accumulating wealth.
- Latin American policy is particularly biased towards the elderly although recent policy reform in some countries is addressing this problem.

Conclusions

- The economic impact of population aging will depend on the success of public policy.
- The decline in the relative size of the workforce is not a problem IF
  - High rates of investment in human capital compensate for low rates of childbearing.
  - Accumulation of assets is an important component of the old-age support system.
- Realizing these outcomes will require many changes in both industrialized and third world countries.
  - Improvements in educational systems
  - Strengthening of financial structures
  - Mechanisms for encouraging higher rates of saving.

Thank you