

# Is Fertility Too Low? Capital, Transfers, and Consumption

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# Acknowledgements

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- Research assistance of Diana Stajonovic.

# Background

- Already, 46% of world population lives in countries where fertility is below replacement.
- Population aging is coming and many countries must assess whether fertility is too low.
- According to the UN survey of governments in 2009
  - 56 countries view it as **too high**
  - 51 countries view it as **too low**
- Here we ask: What level of fertility is “best” for minimizing dependency and maximizing support in the long run (stable population)?

# Our approach

- Fertility decline has two fundamental effects
  - It reduces the relative number of children, makes the population older, and raises old age dependency on the working ages.
  - It slows population growth which allows either lower saving rates or more capital per worker, raising consumption.
- At high levels of fertility, these two work in the same direction and fertility decline has unambiguously favorable economic effects.
- At low levels of fertility, the age structure effect turns negative and eventually outweighs the population growth effect.

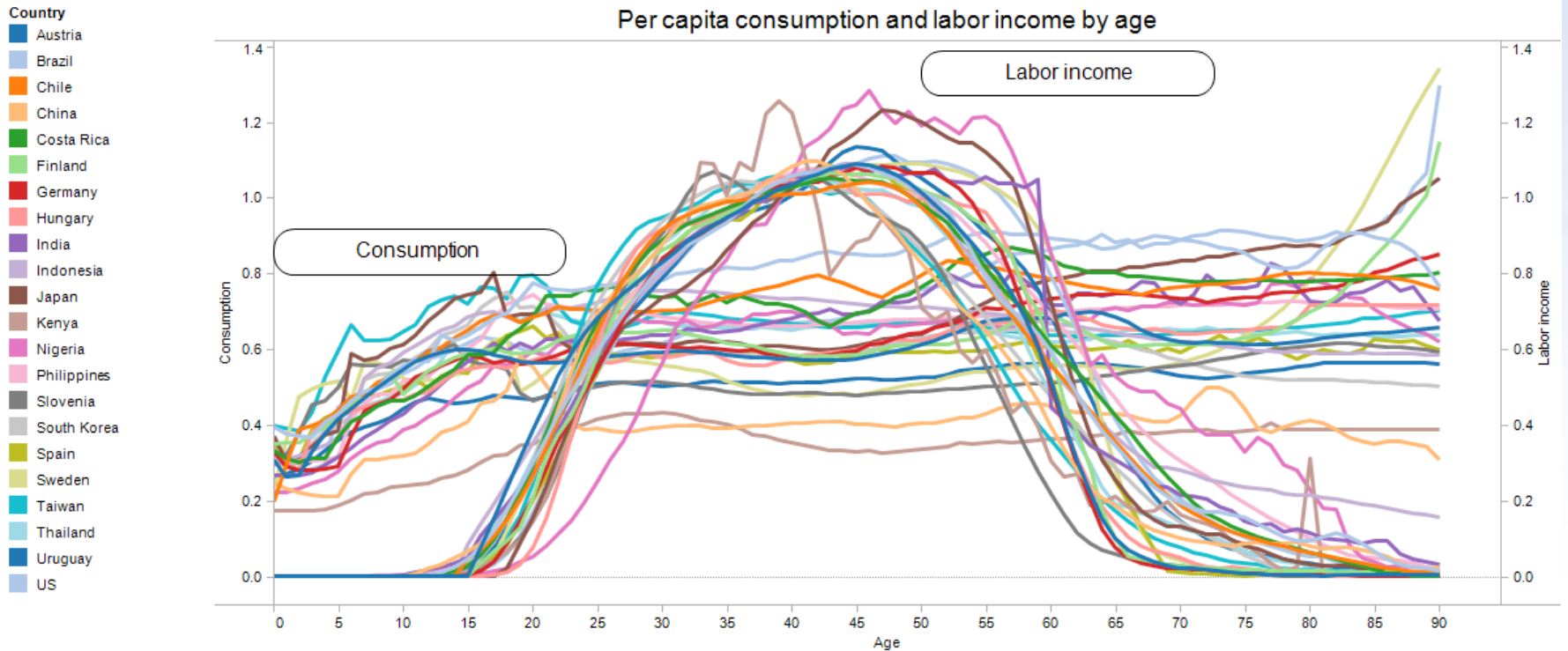
# National Transfer Accounts (NTA)

- We use National Transfer Accounts (NTA) to assess steady state macroeconomic effects of fertility for 30 countries in Africa, Asia, Latin America and the Caribbean, and the West.
- Technical details are discussed in the full paper.
- Information about NTA is available at [www.ntaccounts.org](http://www.ntaccounts.org). Also information for **free download of our new NTA book: *Population aging and the generational economy: A global perspective***

# How NTA measures consumption and labor income

- Profiles are averages for males and females.
- Consumption includes
  - Private expenditures, imputed to individuals within each household
  - Public in-kind transfers (e.g. education, health care)
- Labor income includes
  - Wages, salaries, fringe benefits before tax
  - 2/3 of self employment income
  - Average includes 0's.
- To standardize, divide each economy's age profiles by average labor income ages 30-49.

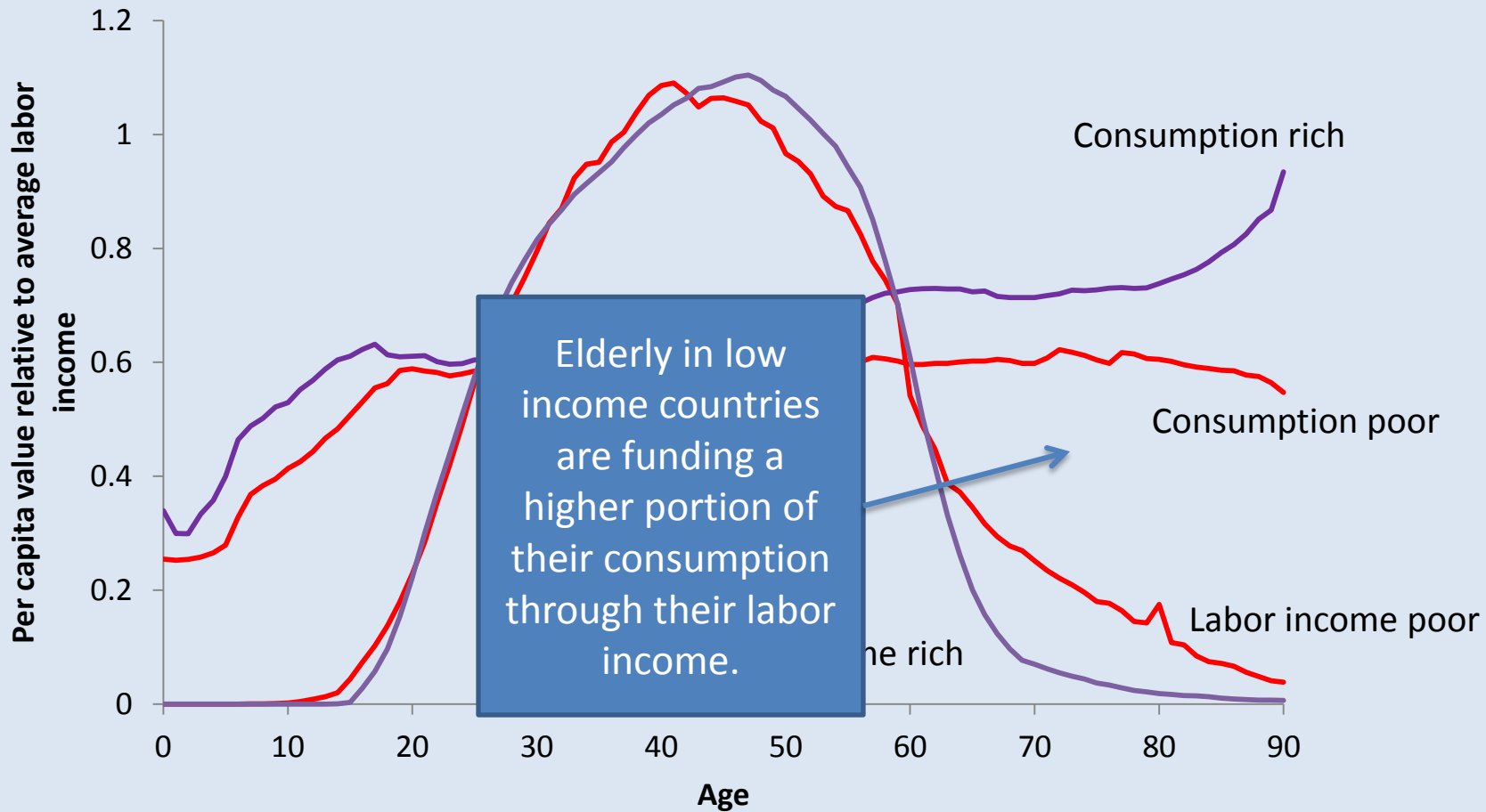
# Age profiles of NTA labor income and consumption for 22 countries around the year 2000



All values expressed relative to the average of per capita labor income for the 30-49 age group. Source: [www.ntaccounts.org](http://www.ntaccounts.org). See Lee and Mason 2011 Population Aging and the Generational Economy: A Global Perspective for more information.

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# Profiles of labor income and consumption High and low-income countries

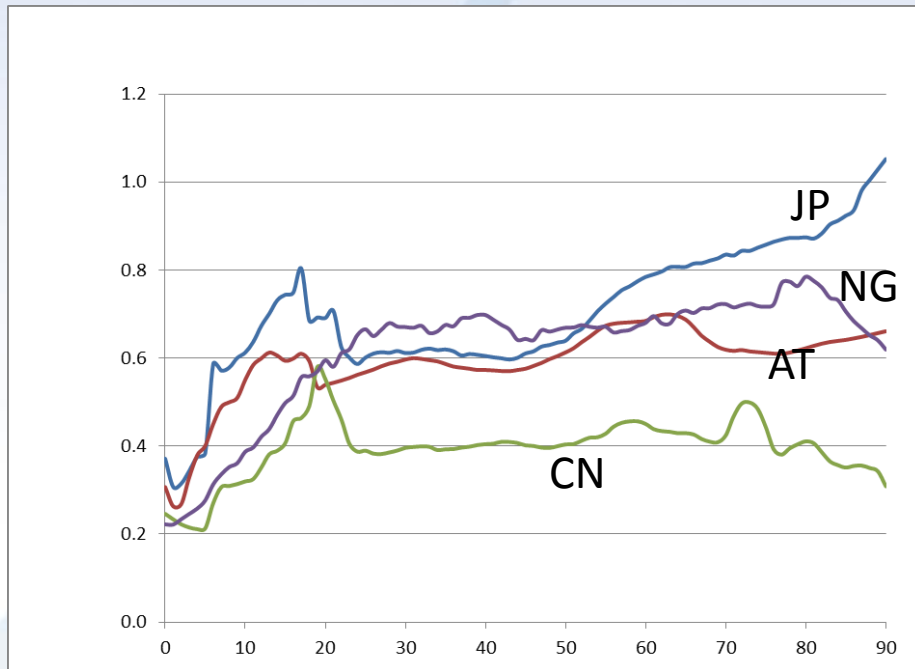


Source: Lee and Mason 2011.

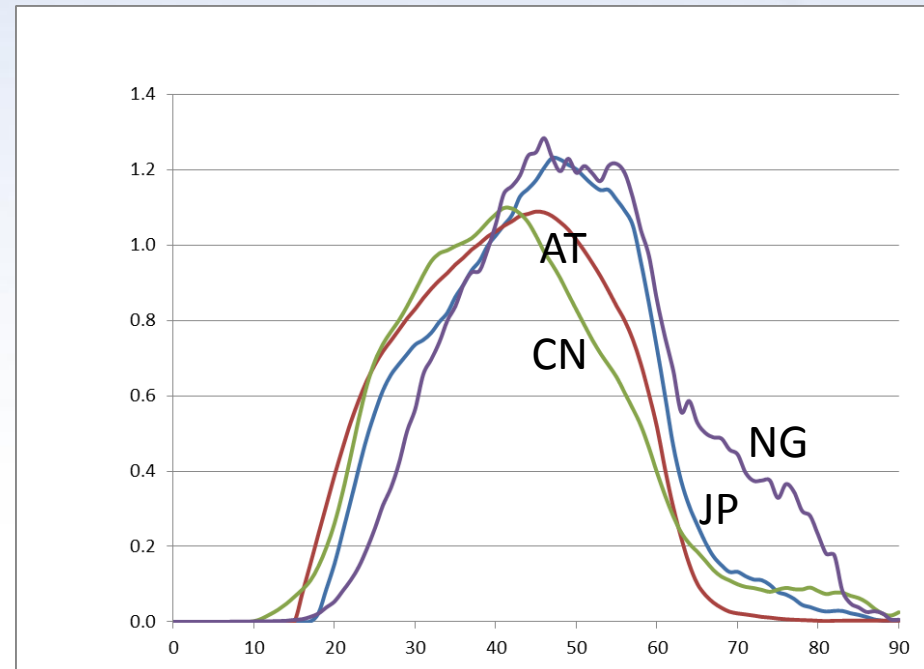


# Comparison of consumption and labor income by age in China, Japan, Austria and Nigeria

## Consumption

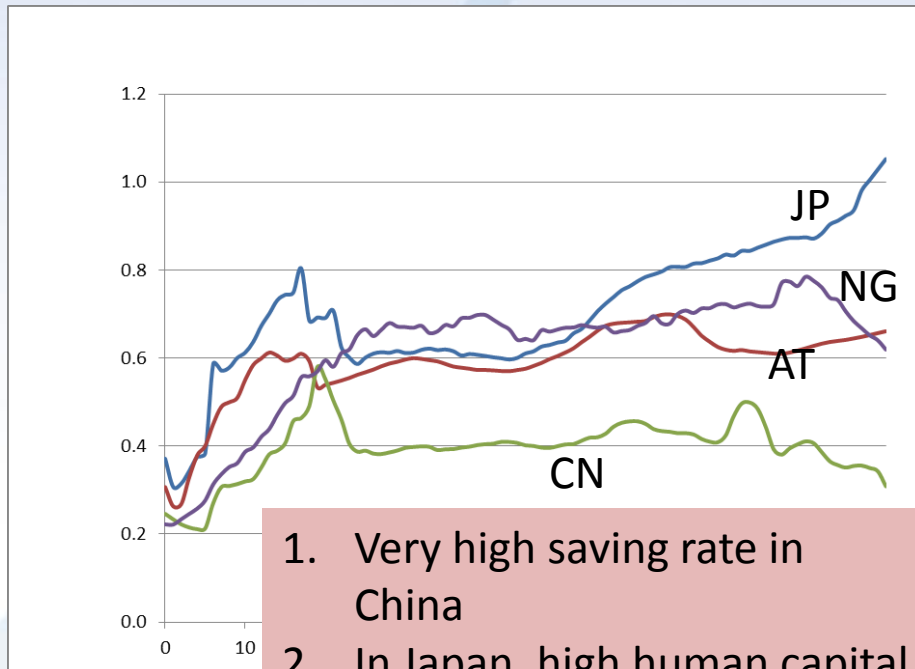


## Labor Income



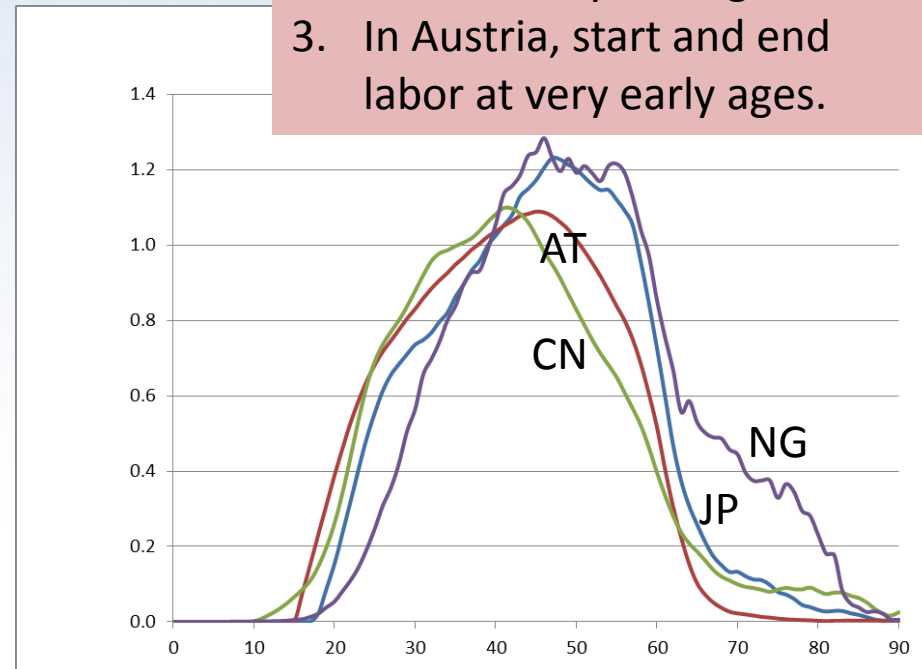
# Comparison of consumption and labor income by age in China, Japan, Austria and Nigeria

## Consumption



1. Very high saving rate in China
2. In Japan, high human capital spending and high spending on elderly

## Labor Income



1. Extremely early retirement in China;
2. In Nigeria, start and end labor at very late ages.
3. In Austria, start and end labor at very early ages.

# Support Ratio

$$SR_t = \frac{\sum_x y_l(x, t_0) P(x, t)}{\sum_x c(x, t_0) P(x, t)}$$

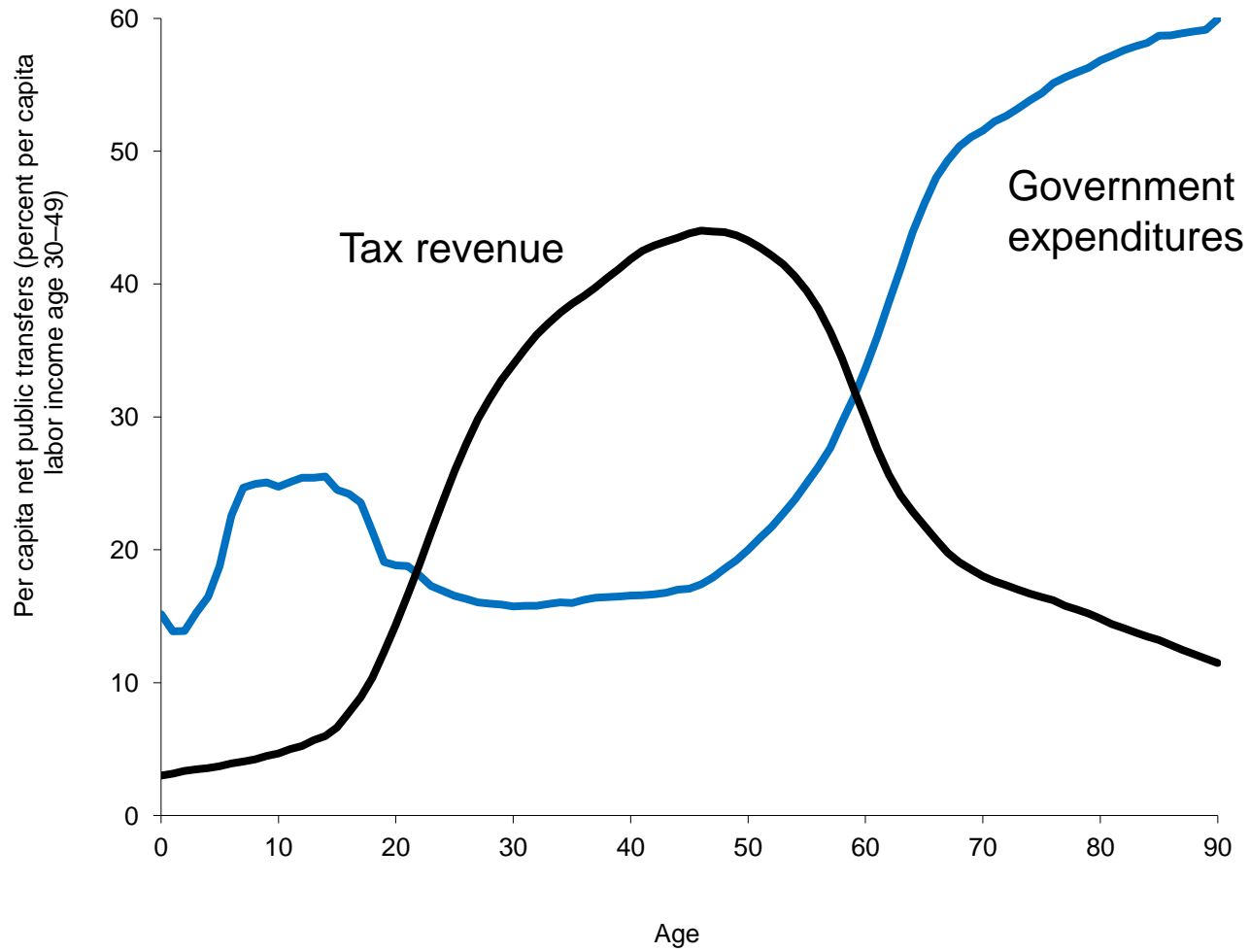
$y_l$  – Age index of labor income

$c$  – Age index of consumption

$P$  – Population.

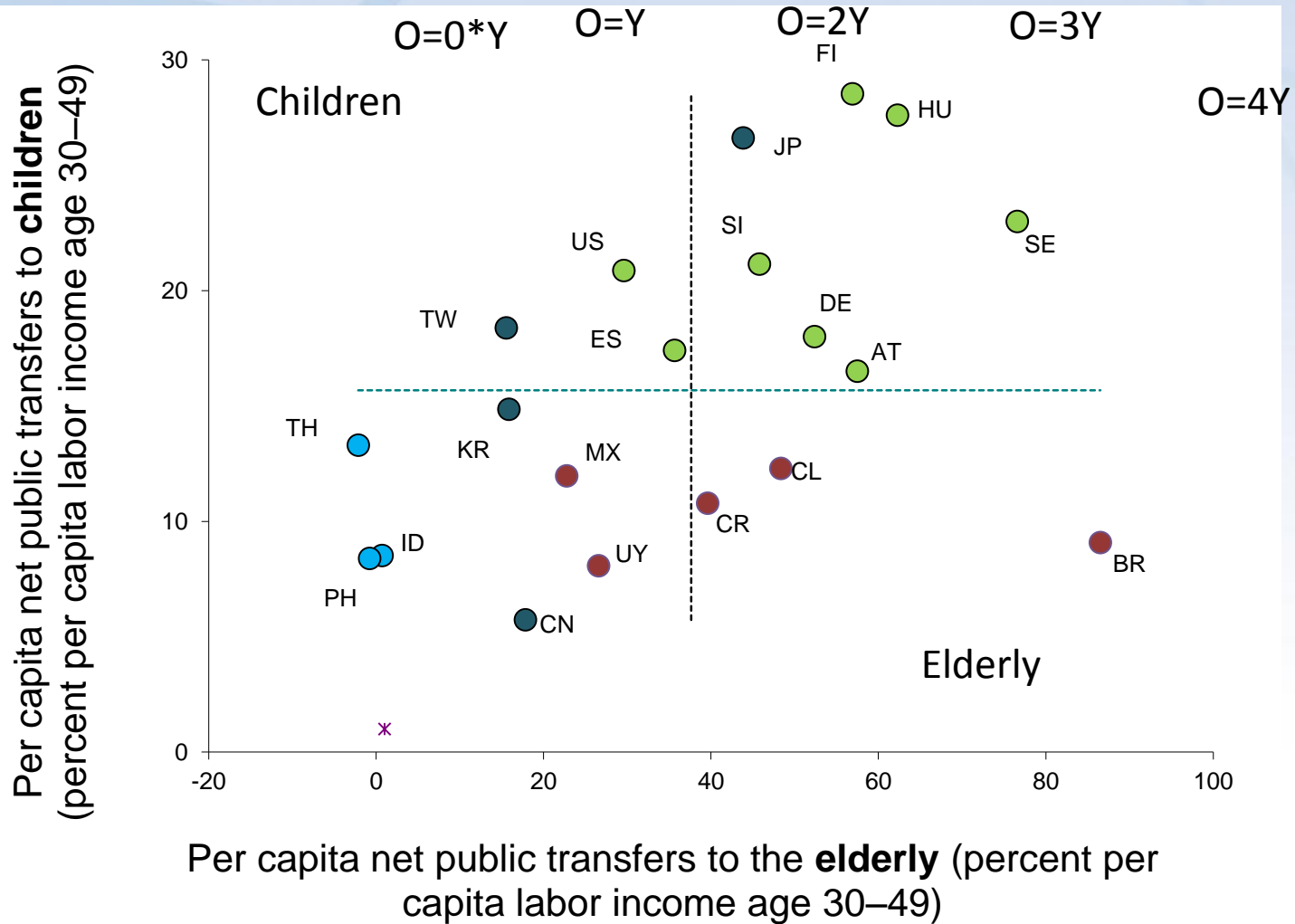
“fiscal support ratio” is defined in the same way for taxes and government benefits by age.

Figure 1



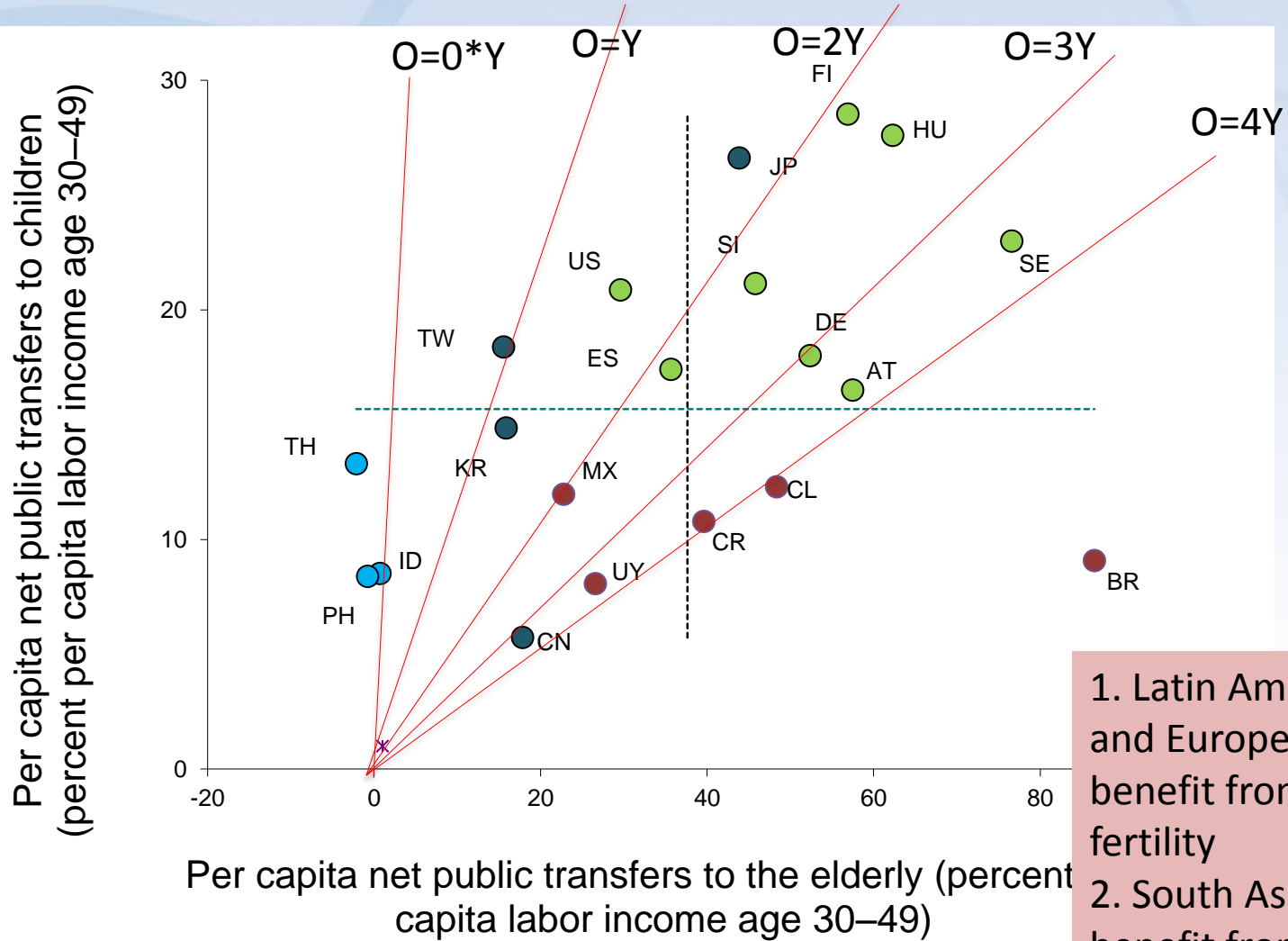
Source: Miller, 2011

# Per capita net public transfers to children and the elderly: 20 economies around 2000.



Source: Miller, 2011

# Per capita net public transfers to children and the elderly: 20 economies around 2000.



Source: Miller, 2011

1. Latin America and Europe will benefit from high fertility
2. South Asia will benefit from low fertility.
3. East Asia mixed.

**Summary of total fertility rate that maximizes alternative objectives.**

**For individual Asian countries, results assume current Japan mortality.**

<b>Region/Country</b>	<b>Current TFR</b>	<b>Fiscal support ratio</b>
<b>Africa</b>	4.3	na
<b>East Asia</b>	1.3	2.3
<b>S and SE Asia</b>	2.3	1.2
<b>Latin America</b>	2.2	3.9
<b>West</b>	1.7	3.1
<b>Individual East Asia</b>		
<b>China</b>	1.6	2.6
<b>Japan</b>	1.3	2.7
<b>S. Korea</b>	1.3	2.1

1. In LAC and the West a high fertility rate favors public finances.
2. In Asia public transfers to the elderly are more modest and, hence, public finances are less vulnerable.

# The public sector

- Some programs (pensions, health care, long term care) are very strongly impacted by population aging
- But public is just a fraction of the whole economy
- Also, shifting support costs from family to public sector may not change the full cost.
- Need to consider the whole economy.
- The broader measure of consumption and labor income does this.
- Now look at TFR that maximizes general support.



## Summary of total fertility rate that maximizes alternative objectives.

For individual Asian countries, results assume current Japan mortality.

Region/Country	Current TFR	Fiscal support ratio	Support ratio
Africa	4.3	na	1.5
East Asia	1.3	2.3	2.2
S and SE Asia	2.3	1.2	1.8
Latin America	2.2	3.9	2.1
West	1.7	3.1	2.4
<b>Individual East Asian countries</b>			
China	1.6	2.6	2.1
Japan	1.3	2.7	2.3
S. Korea	1.3	2.1	2.1

- For general support ratio, the maximizing TFR moves toward replacement in every case.
- In Africa, with low child costs and low net consumption by elderly, the maximizing TFR is very low.

# Consumption per Worker

Effect of slower population growth considered using two polar cases.

- I. “Golden Rule” saving: the saving rate that maximizes consumption.
- II. Fixed capital-output ratio: based on average for OECD countries.

Technical details provided in the paper.

Results presented below.

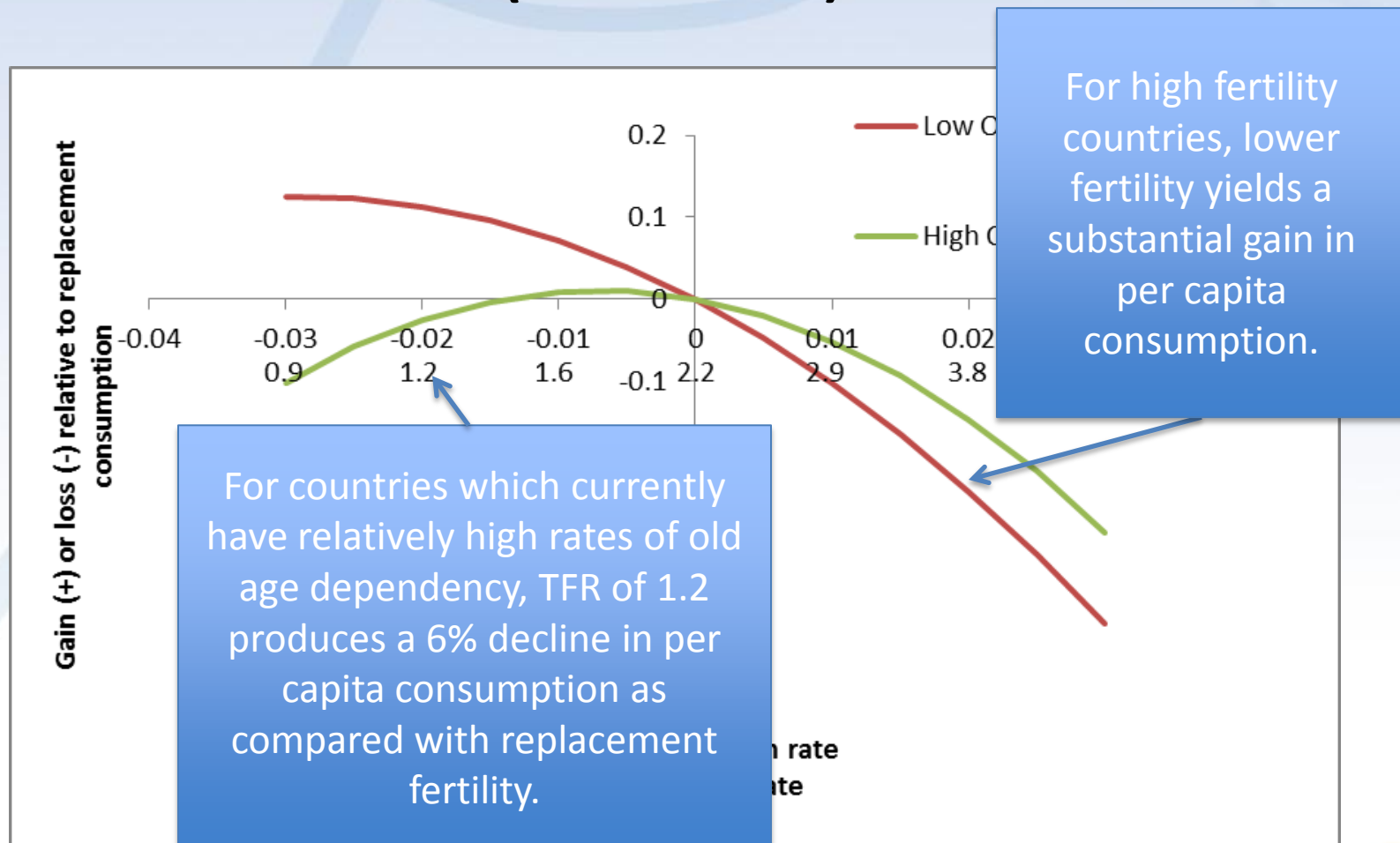
**Summary of total fertility rate that maximizes alternative objectives.**

**For individual Asian countries, results assume current Japan mortality.**

Region/Country	Current TFR	Fiscal support ratio	Support ratio	Consumption	
				K/Y=3	Golden rule
<b>Africa</b>	4.3	na	1.5	1.1	0.8
<b>East Asia</b>	1.3	2.3	2.2	1.7	1.4
<b>S and SE Asia</b>	2.3	1.2	1.8	1.3	1.0
<b>Latin America</b>	2.2	3.9	2.1	1.6	1.3
<b>West</b>	1.7	3.1	2.4	1.9	1.5
<b>Individual East Asian countries</b>					
<b>China</b>	1.6	2.6	2.1	2.0	1.7
<b>Japan</b>	1.3	2.7	2.3	1.9	1.6
<b>S. Korea</b>	1.3	2.1	2.1	1.7	1.4

1. TFR that maximizes consumption is substantially below the TFR that maximizes support ratio because of the population growth effect.
2. TFR below replacement maximizes consumption.

# Effect of TFR on Consumption ( $K/Y = 3$ )



Note: OAD is old age dependency as measured by per capita consumption relative to per capita labor income for elderly.

# Conclusions: Limitations

- We assumed that current age profiles of consumption and labor income remain fixed. But many sensible policies would alter them, e.g. later retirement.
- Our analysis does not include “consumption value” of children for parents. Hence,
  - Does not provide rationale for intervention to reduce fertility
  - Does indicate that pronatalist incentives may not be warranted.
- Implications of environmental constraints were not considered, but these would reinforce our conclusions.

# Conclusions

- Very low fertility is **fiscally** costly in Europe, Japan, US, and Latin America with large public old-age support systems.
  - Population aging will require painful adjustments to these programs.
- However, low fertility does not lead to lower standards of living **overall**.
- Very low fertility has a moderately adverse economic effect.
- However, economic fundamentals with low fertility do not look bad.