The Generational Contract: Drivers of change and prospects for the future

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NTA12, Mexico City: Session on "Intergenerational Equity"

1. Introduction

What is the "Generational Contract"?

- It is an implicit agreement that patterns of transfers to children and the elderly in the present will continue into the future

- In NTA language, **the age profile of net transfers should remain fixed**

- In a world without change the generational contract would be possible and straightforward

- With steady-state economic growth and stable population growth it would also be possible

- In the actual world of turbulent change, *the generational contract is neither possible nor desirable*

What forces disrupt the Generational Contract?

- Productivity growth speeds up during development and then slows down in maturing economies, altering relative income by age and generation (e.g., China, Taiwan, S. Korea, Vietnam)
- Changing fertility and mortality bring the demographic dividend, population aging, and other age fluctuations (e.g., Russia, US, Canada, Australia)
- Governments introduce new public transfer programs and modify old ones (e.g., Chile, Argentina, Sweden, Russia)
- Health care costs rise faster than productivity growth (e.g., US)
- Cultural values and expectations about old age support change (e.g., Japan, Taiwan)
- Education becomes more important, with high economic returns (e.g., Senegal, Nigeria, Kenya)

2. Transfers in Steady State

Consider the generational contract with stable population growth n and productivity growth g

- Every year, transfers received = transfers given; aggregate total = 0 in closed economy (unlike Senegal, Bangladesh, El Salvador)
- Let net transfers be $\tau(x)$ which will rise over time at rate g
- The stable population age distribution is proportional to $e^{-nx} p(x)$
- Putting all these together, we have:

$$\int_0^\omega e^{-(n+g)x} p(x) \tau(x) \, dx = 0$$

- Cross-sectionally, this says aggregate net transfers are zero
- Interpreted longitudinally over the individual life cycle, it says discounted at n+g, lifetime net transfers = 0, so the "implicit rate of return" = n+g
  - This is growth rate of GDP
- We earn a rate of return equal to the GDP gr rate by participating in the transfer system described by $\tau(x)$

If Net Present Value (NPV) of transfers over the life cycle is zero, where is parental gift to children?

We assumed that although children receive transfers from their parents, including bequests, as adults they must do the same for their own children

> ➢ Under stable conditions this all cancels out

Deviations from steady state break the Generational Contract and lead to NPV above or below zero

- In rich industrial nations, slowing population growth and slowing productivity growth
  - ➤ Reduce the implicit rate of return to participating in the transfer system
  - ➤ For public transfers to the elderly, taxes rise and benefits fall
- In developing countries, main transfers go to children, and the Demographic Dividend makes the Generational Contract easier
  - ➤ Same transfers received per child with lower transfers given by adults
  - ➤ But this makes adjustments even more painful when Demographic Dividend ends and population aging begins

3. Transfer Load: How Population Aging Affects the Generational Contract

The "Transfer Load" measures changes in dependency

- Aggregate net transfers = Sum (net transfers by age x pop by age)
- Transfer Load = Aggregate net transfers/Aggregate consumption
  - In closed pop, this is zero: transfers given = transfers received
- Now hold age profile fixed and vary the population. The Transfer Load changes as relative numbers of children or elderly change
- As population ages, public transfer load will rise. Private might fall
- The Transfer Load shows the proportional adjustment needed to meet the balance constraint in each future year

Public Transfer Load

This measures dependency through public transfers, which can be positive or negative (if elderly pay more in taxes than they get in benefits)

Use population age distribution and public net transfer profile to get total public transfers
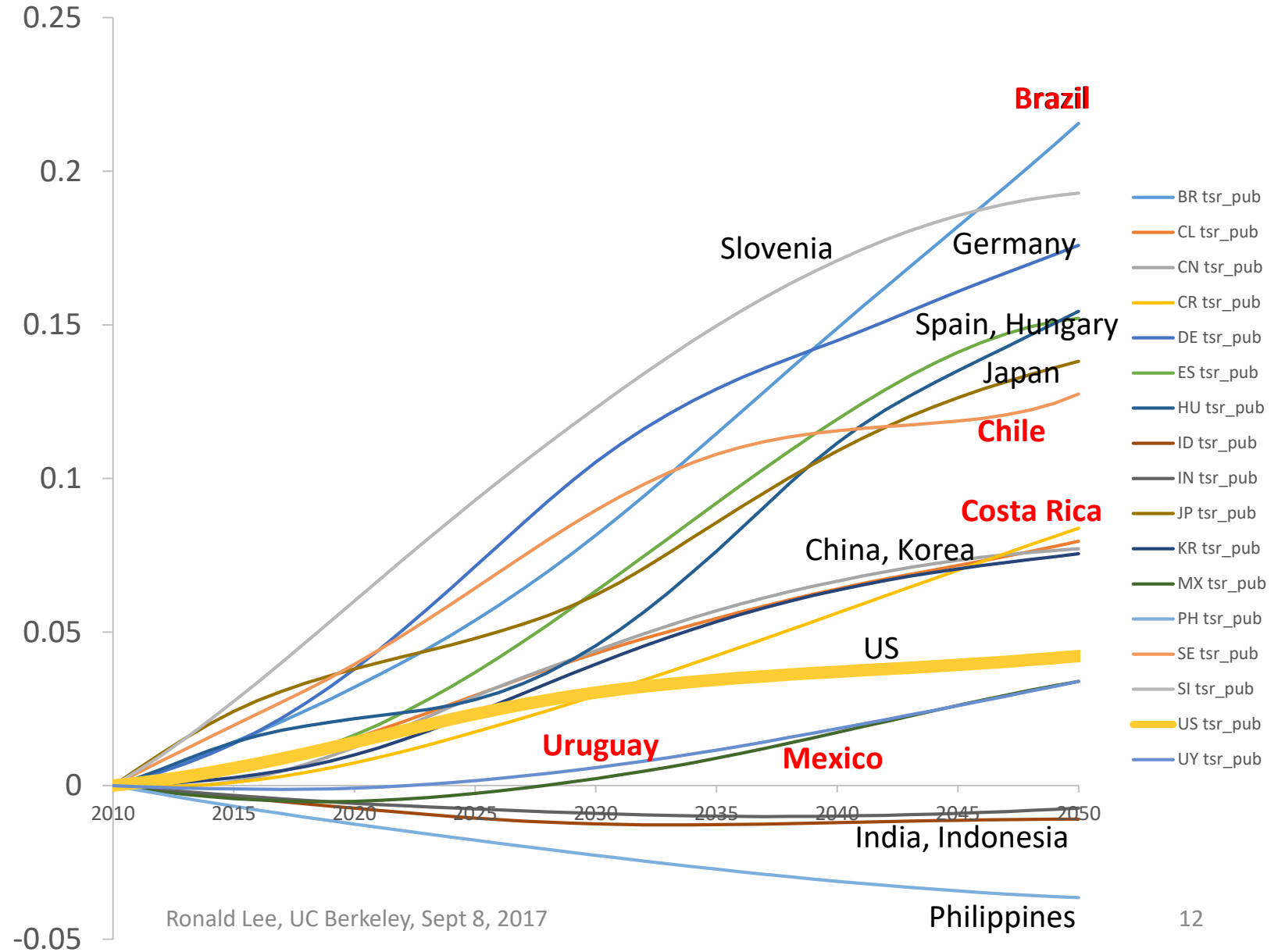
Similarly calculate total consumption

The ratio of public transfers to consumption is the Public Transfer Load

In countries below 0, elderly pay more in taxes than they get in public benefits

The chart shows the increase in transfer load since 2010, not the full level

Change in Public Transfer Load relative to 2010 as populations age, to 2050 (based on current public programs)

Legend:
- BR tsr_pub
- CL tsr_pub
- CN tsr_pub
- CR tsr_pub
- DE tsr_pub
- ES tsr_pub
- HU tsr_pub
- ID tsr_pub
- IN tsr_pub
- JP tsr_pub
- KR tsr_pub
- MX tsr_pub
- PH tsr_pub
- SE tsr_pub
- SI tsr_pub
- US tsr_pub
- UY tsr_pub

Chart labels: Brazil, Slovenia, Germany, Spain, Hungary, Japan, Chile, Costa Rica, China, Korea, US, Uruguay, Mexico, India, Indonesia, Philippines

Ronald Lee, UC Berkeley, Sept 8, 2017

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Private transfer load in selected countries

This measures dependency due to private transfers, which can be positive or negative

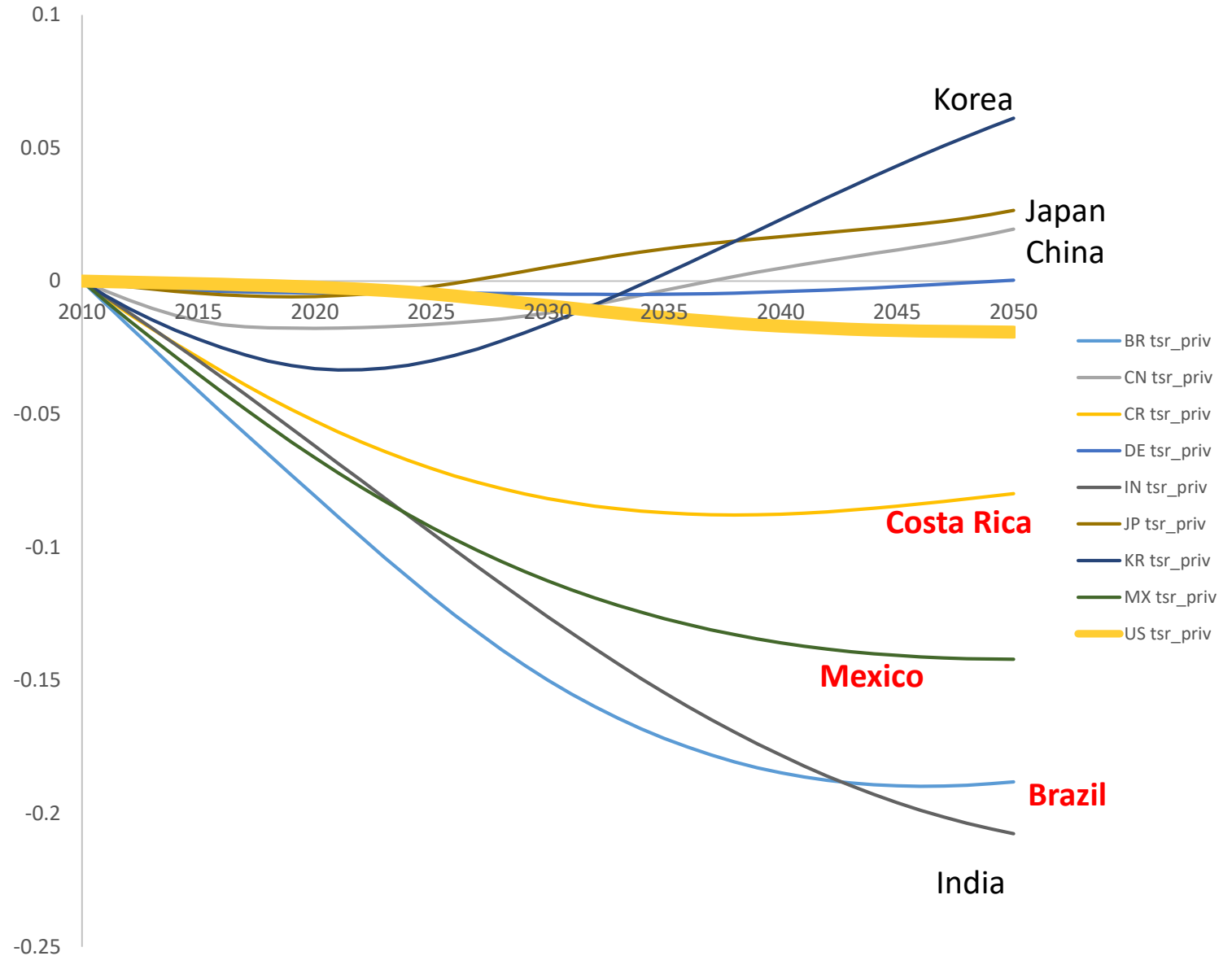Uses population age distribution and private transfer profile to get total private transfers

Similarly calculates total consumption

The ratio of private transfers to consumption is the Private Transfer Load

In countries above zero line, families make net transfers to the elderly, even perhaps at high ages like >78 (in Japan)

In countries below the line (negative), the elderly make net transfers to younger people, so population aging generates a surplus

Private transfer Load as populations age in selected countries (based on current behavior)

Legend:
- BR tsr_priv
- CN tsr_priv
- CR tsr_priv
- DE tsr_priv
- IN tsr_priv
- JP tsr_priv
- KR tsr_priv
- MX tsr_priv
- US tsr_priv

Labels: Korea, Japan, China, Costa Rica, Mexico, Brazil, India
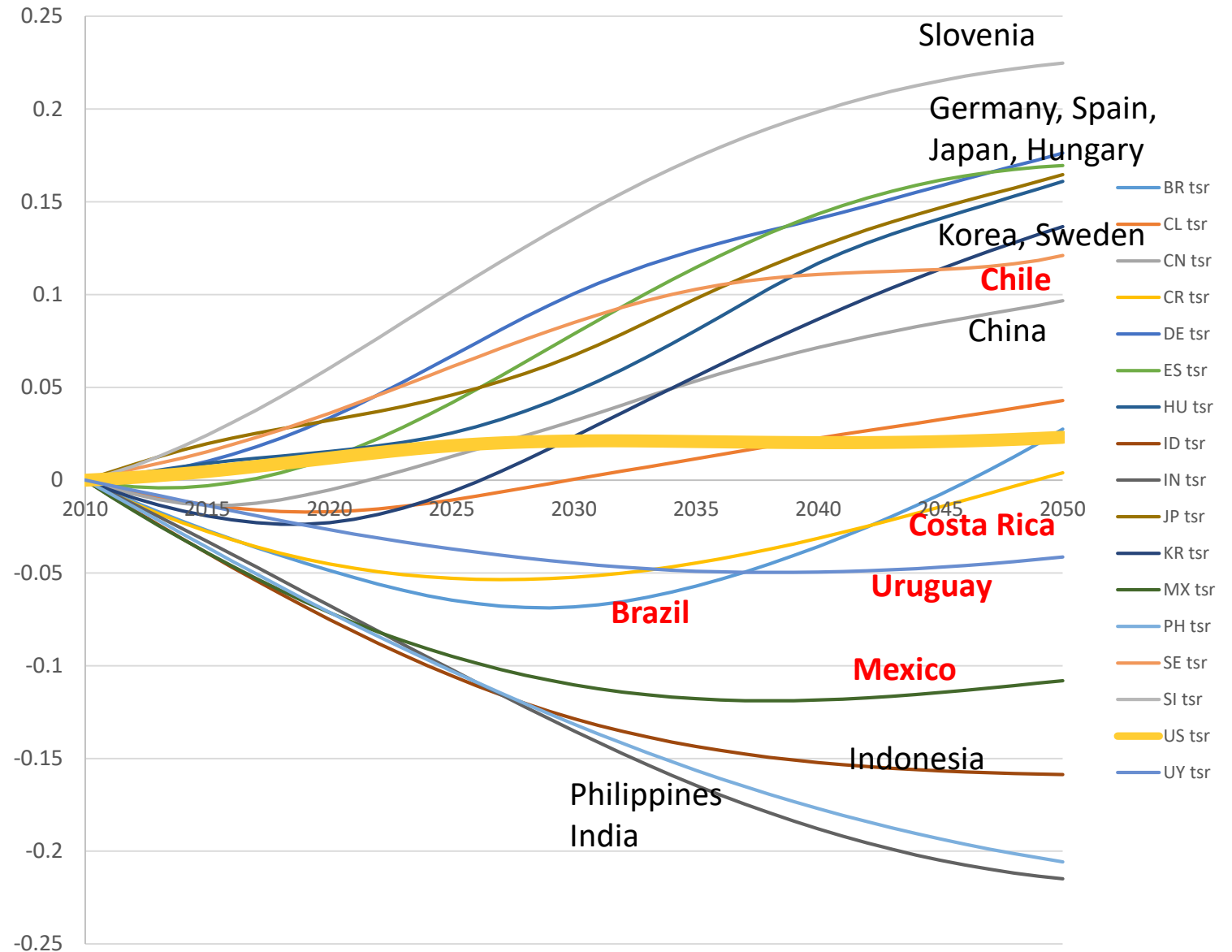
Total transfer load in selected countries

Net dependency for public and private transfers combined: Can be positive or negative

Most LAC countries will have a *decreasing* transfer load because elderly make private transfers to younger people, and that gets easier with more elderly and fewer young people

In Chile the transfer load rises because the elderly receive both net public and net private transfers

Amazingly, Brazil generally has a lower transfer load than now, except close to 2050 and increasingly thereafter

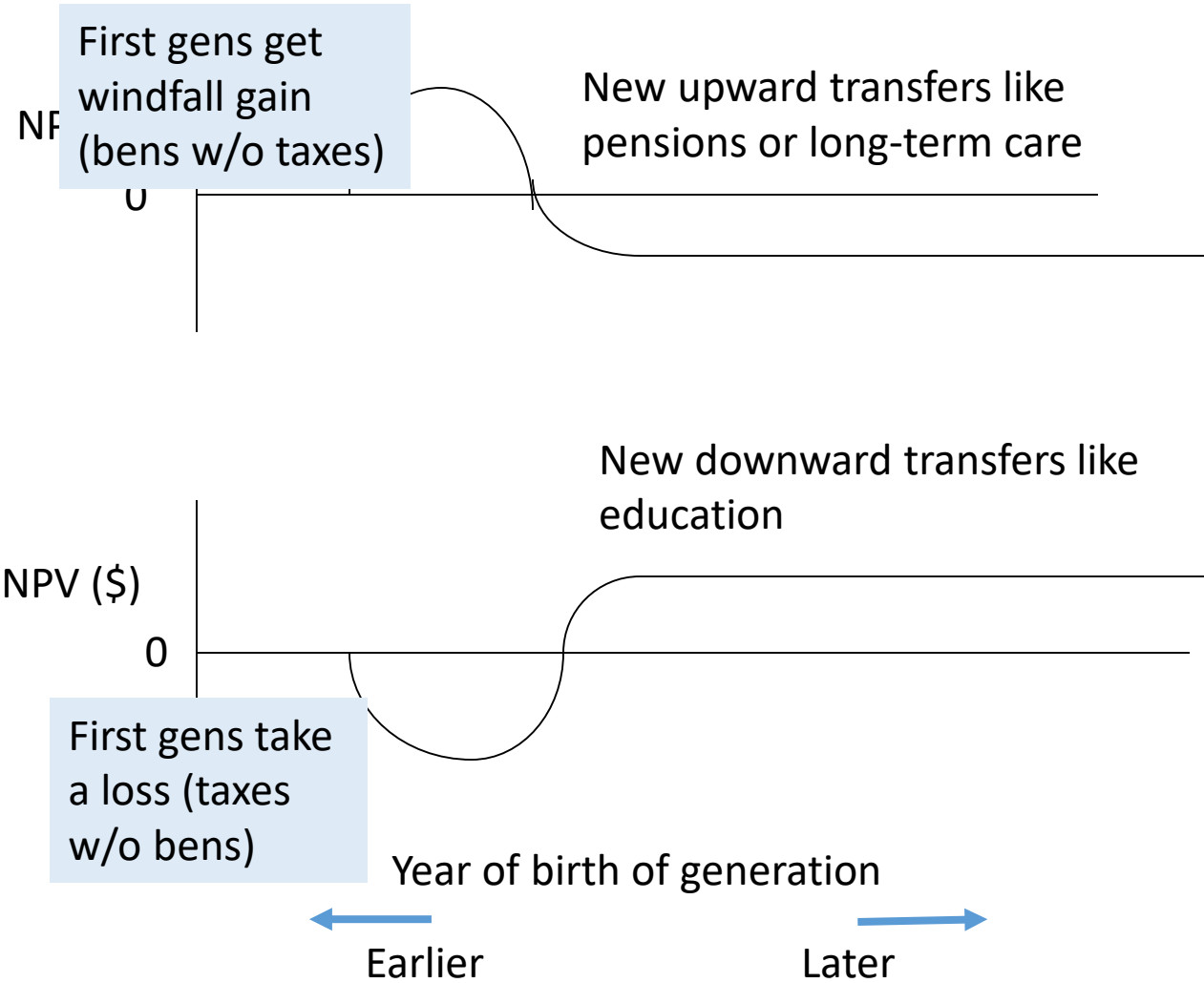## Total transfer load as populations age in selected countries (const age profiles)

Legend: BR tsr, CL tsr, CN tsr, CR tsr, DE tsr, ES tsr, HU tsr, ID tsr, IN tsr, JP tsr, KR tsr, MX tsr, PH tsr, SE tsr, SI tsr, US tsr, UY tsr

Labels on chart: Slovenia; Germany, Spain, Japan, Hungary; Korea, Sweden; Chile; China; Costa Rica; Brazil; Uruguay; Mexico; Indonesia; Philippines; India

4. How Changing Public Transfer Systems and Demography Affect Generations

Remember: Stable transfer systems have implicit rate of return equal to growth rate of GDP

- The market discount rate is often greater than this
- Implications:
  - ➢Net transfers to the elderly (give when working, received later) have negative NPV – elderly would get a better deal saving in the market
  - ➢Net transfers to children (receive when a child, repay when worker) have a positive NPV, like borrowing at a low interest rate

Net Present Value of life time benefits minus taxes (NPV) by generation
[for stable population and discount rate > growth rate of economy]

First gens get
windfall gain
(bens w/o taxes)

NPV

0

New upward transfers like
pensions or long-term care

New downward transfers like
education

NPV ($)

0

First gens take
a loss (taxes
w/o bens)

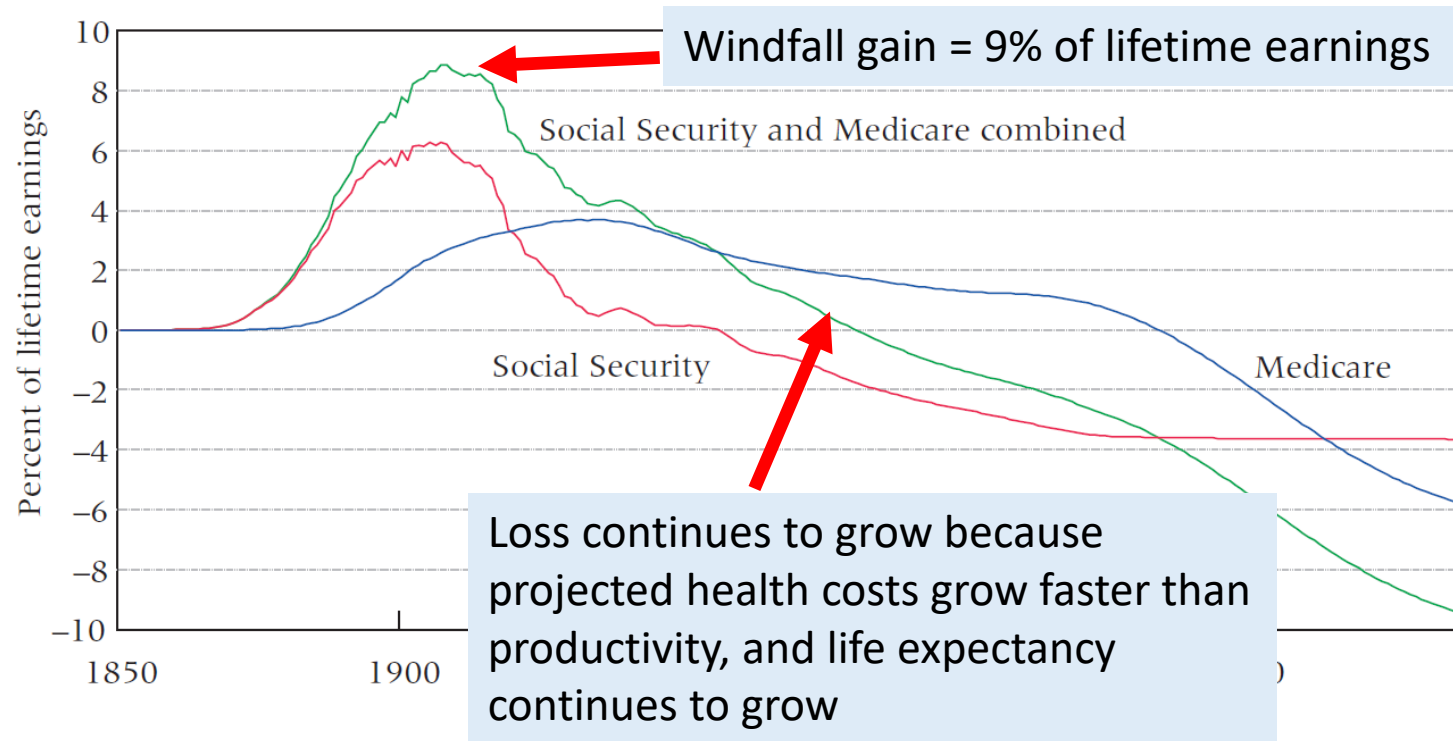Year of birth of generation

Earlier   Later

US case: Consider largest programs—pensions (Soc Sec), Medicare (health care for elderly), and public education

- Calculations assume budget is balanced, half by cutting benefits, half by raising taxes, year to year
  - Discount rate = 3%
  - Productivity growth rate = 1.5%
  - Uses historical and projected survival

- Discussion usually focuses on pensions, but rise in education is extremely important
  - With survival risks and discounting, a unit received in childhood is worth 8 or 10 units received in old age!

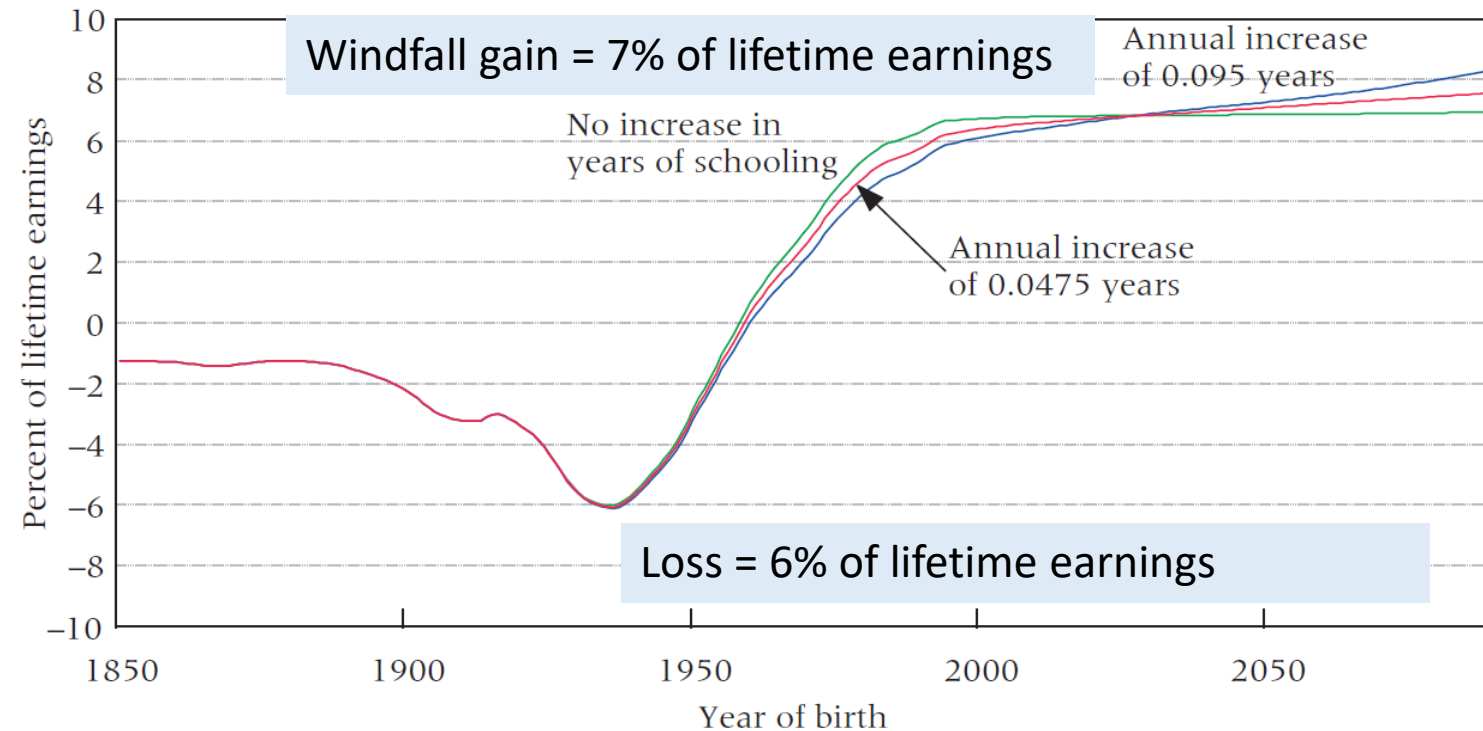# NPV of Social Security and Medicare, upward transfers

FIGURE 3   Net present value at birth of expected lifetime Social Security and Medicare benefits as a percent of lifetime earnings

Windfall gain = 9% of lifetime earnings

Social Security and Medicare combined

Social Security

Medicare

Loss continues to grow because projected health costs grow faster than productivity, and life expectancy continues to grow

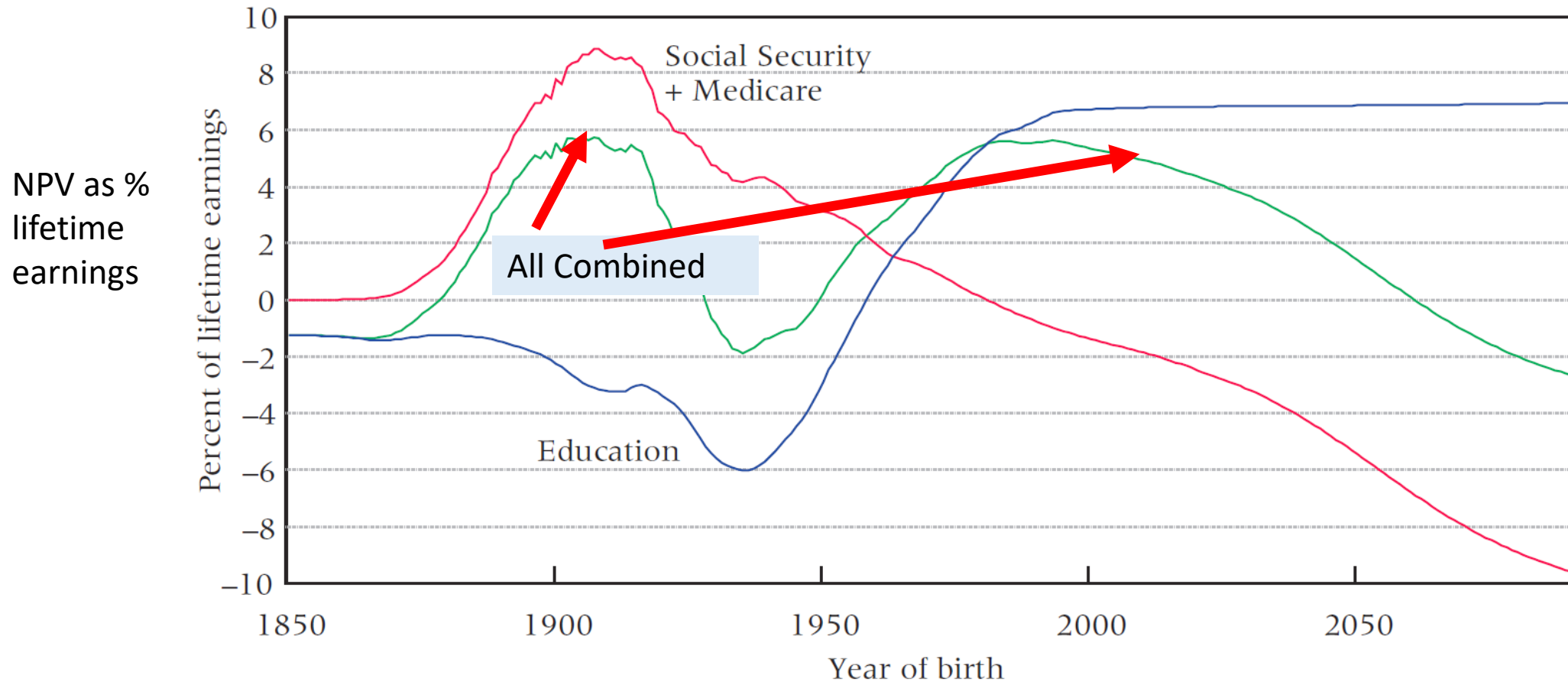NOTE: Calculated using the baseline assumption (see text).

NPV of public education, downward transfers

FIGURE 6   Net present value at birth of expected lifetime education
benefits as a percent of lifetime earnings under three alternative scenarios
assuming different changes in years of schooling beginning in 2000

Windfall gain = 7% of lifetime earnings

Annual increase of 0.095 years

No increase in years of schooling

Annual increase of 0.0475 years

Loss = 6% of lifetime earnings

NPV as percent of lifetime earnings, generations born 1850 to 2090

FIGURE 7   Present value at birth of expected lifetime education, Social Security, and Medicare net benefits as a percent of lifetime earnings

NPV as % lifetime earnings

Social Security + Medicare

All Combined

Education

NOTE: Calculated using the baseline assumptions (see text).

Source: Bommier et al (2010)

Results are surprising

- Today's younger generations do well; Public education is a great gift.\
- Todays elderly born in the 1930s and '40s are slight losers.\
- Every generation born since 1975
  - Loses through programs for the elderly
  - Gains from rising public education and in total
  - Big losers will be those born after 2050, who will do increasingly badly
- Keep in mind this is just the public sector

5. What Do We Give the Next Generations, Combining Public and Private?

Comparative study of lifetime transfers in US and Taiwan (Lee, McCarthy, Sefton, Sambt, 2017, PDR; thanks to An-Chi Tung and Taiwan team)

Present Value of lifetime transfers + bequests, gross and net, in US and Taiwan, as percent of Present Value of lifetime earnings, for birth in 2010

PV transfers	US	Taiwan
Gross received	123%	158%
Gross received minus taxes paid	66%	92%
Net transfers received: Total gross minus public and private made to others	9%	15%

Under Generational Contract, transfer patterns must be continued, so we subtract public taxes and private transfers to others

Total net transfers drop for births in 2040, one generation later

- From 8.6% for 2010 births to 6.4% for 2040 births in US
- From 15.2% for 2010 births to –5.5% for 2040 births in Taiwan

- This reflects population aging, rising health costs, etc.

6. Conclusions

We need to reformulate the generational contract

- Increasingly important to invest in human capital of children
- Requires change in generational contract
- Parents
  - ➤ Spend more on each child
  - ➤ Have fewer children to be able to invest more in each
  - ➤ But fewer children means population aging and higher costs of supporting elderly
- There is no reason why the elderly should ask their children to pay for their ever-longer retirements as healthy life spans rise
- The contours of the new social contract are clear

Literature cited

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