Public Sector and Population Aging

10th Global NTA Meeting

Beijing, China

Andrew Mason

Background

- Work is very preliminary
- Developing a model of the public sector
  - Complete NTA model
    - Public transfer inflows, outflows, and taxes
    - Public asset-based reallocations (asset income and saving)
    - Public assets (debt) and public transfer wealth
    - Flows distinguished by purpose
  - Reform options
    - Countries with relatively under-developed public sectors
    - Countries with relatively over-developed public sectors
    - Responses to improvements in health at older ages
- Collaborating: Ron Lee, Maurizio Bussolo, Sang-Hyop Lee, Suphannada Lowhachai and other NESDB staff, Cassio Turra, Bernardo Queiroz, Elisendra Renteria.

Background

- Armed with NTA estimates, assessing the impact of population aging on fiscal imbalances is straightforward.

- The fiscal support ratio tells us how revenues will change relative to spending given population projection and base-year age profiles of public transfer inflows and outflows.

- Impact of population aging on public finances can vary greatly across countries.
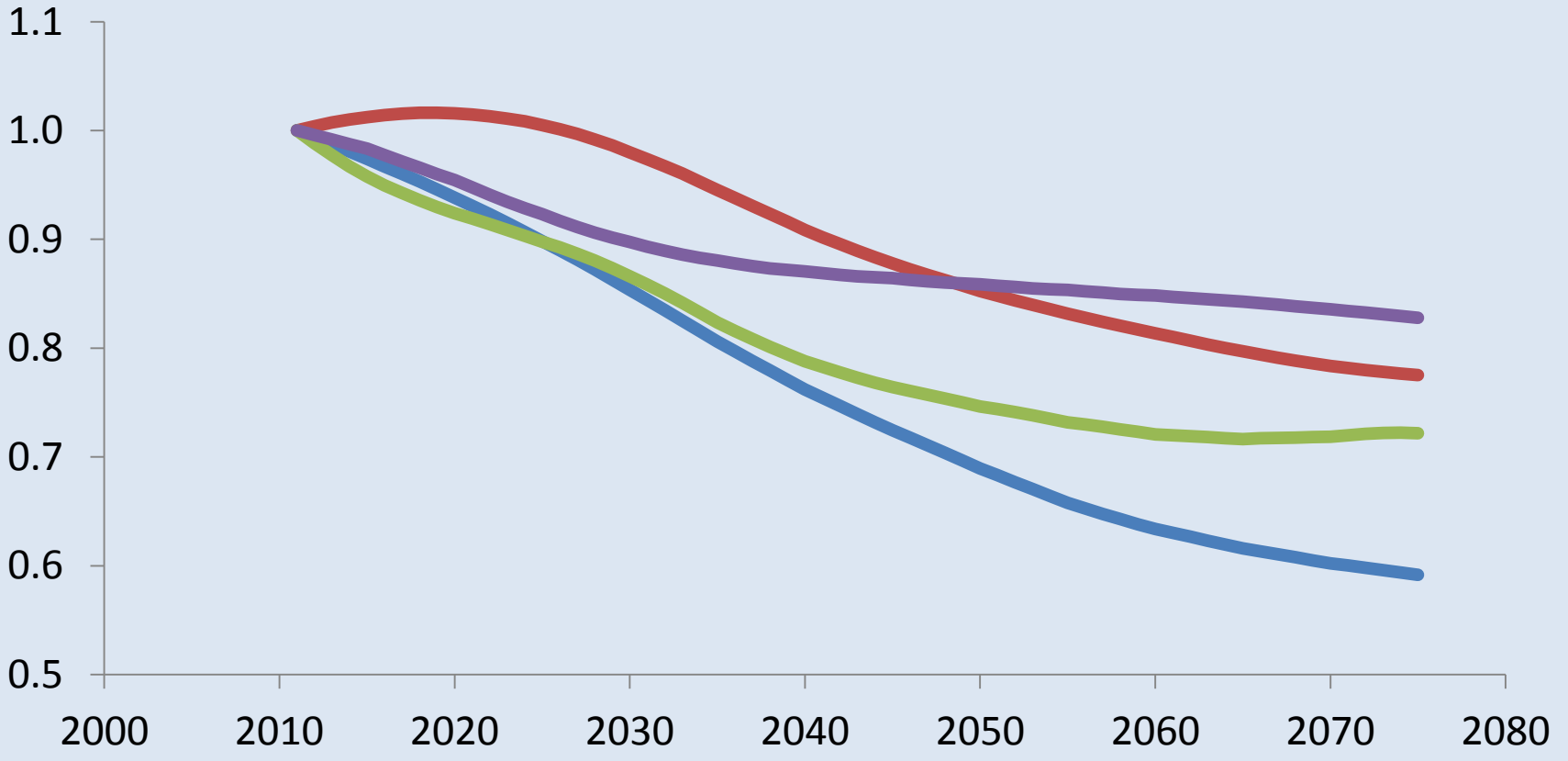
Aging in Four Countries
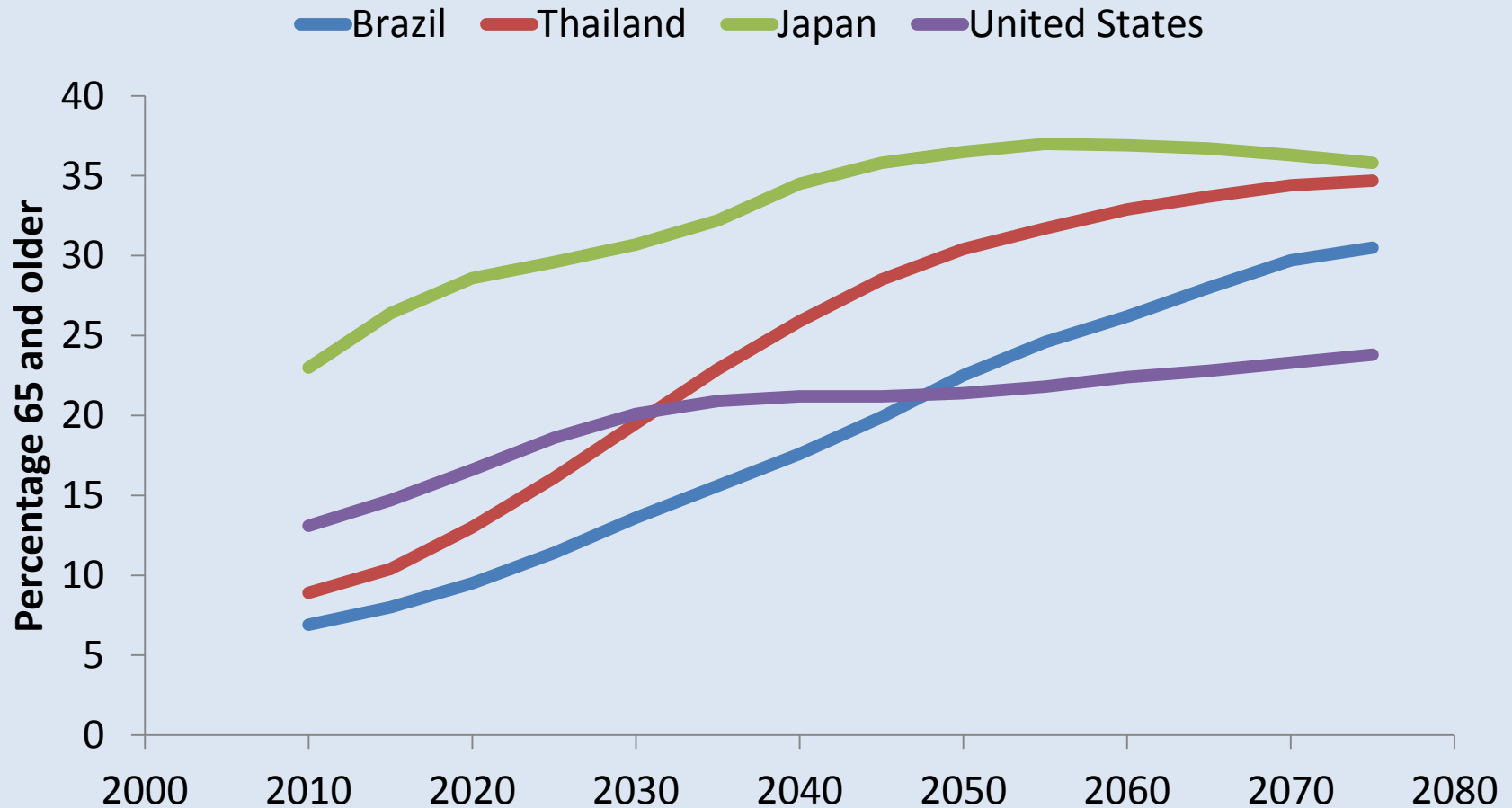
Source: UN Population Division, World Population Prospects, medium fertility scenario.

Fiscal Support Ratio, 2010-2075

Important Questions

- How should countries respond to a declining fiscal support ratio? Raise taxes, reduce spending, accumulate debt?

- How can we assess the effects of population aging in countries which expect to reform their public sectors?

- How can we measure, analyze, and evaluate the impact of population aging and public policy on intergenerational transfers?

Public Intergenerational Transfers

- In previous research, Lee (1994) introduced methods for quantifying intergenerational transfers.

- He showed that under certain circumstances, the difference between the mean ages of transfer inflows and transfer outflows X the per capita flow is equal to per capita transfer wealth.

- Transfer arrows have been used many times including the chapter on transfer systems in Population Aging and the Generational Economy and the UN NTA manual.

- In the recent Science paper we show that in steady state the fiscal support ratio reaches a maximum when the mean ages of public transfer inflows and outflow are equal.

- Can we adapt these tools to summarize the current IG characteristics of public transfer systems?

NTA

Possible index

- Based on estimates of current values.
- No projecting, discounting, or other assumptions.
- Measures the extent to which public transfers influence the mean age of consumption.
- Can be calculated for any component of the reallocation system.

$$IGIndex(t) = w_{tg}(ATGI(t) - ATGO(t))$$

$$w_{tg} = TGI(t)/C(t)$$

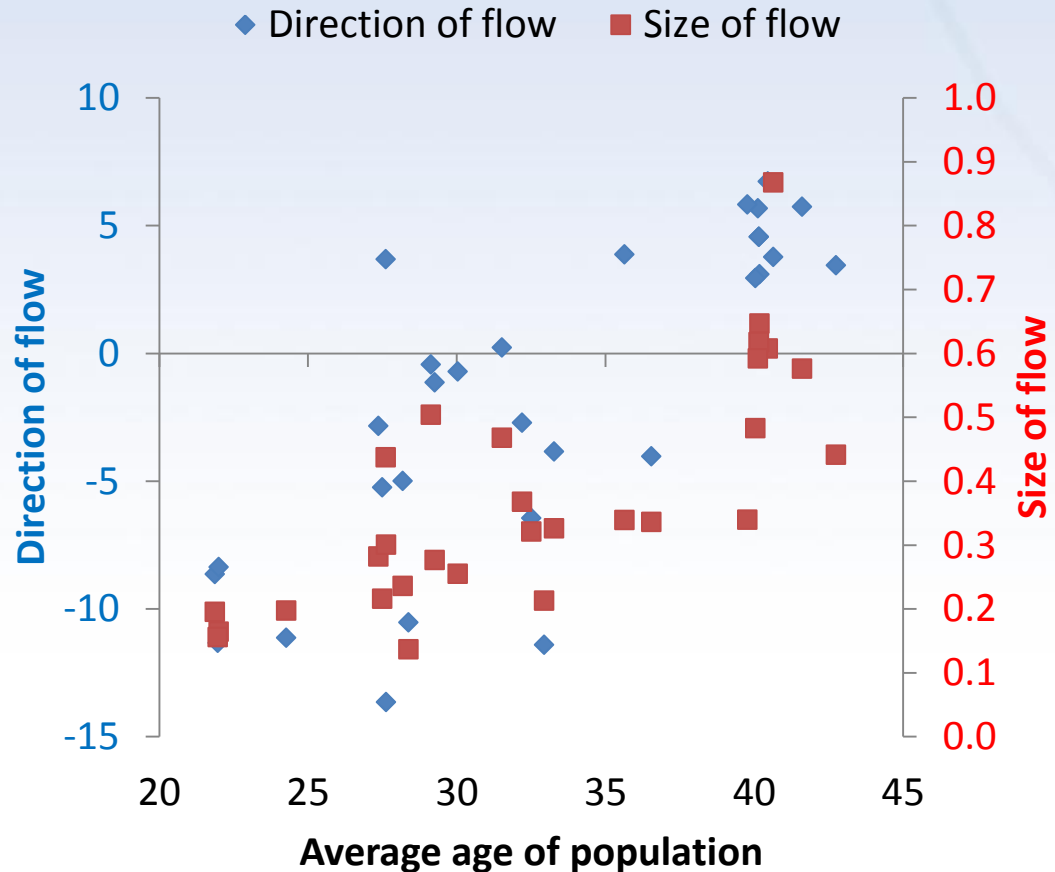$$ATGI(t) = \sum_{x=0}^{\omega} xTGI(x,t) \Big/ TGI(t)$$

$$ATGO(t) = \sum_{x=0}^{\omega} xTGO(x,t) \Big/ TGO(t)$$
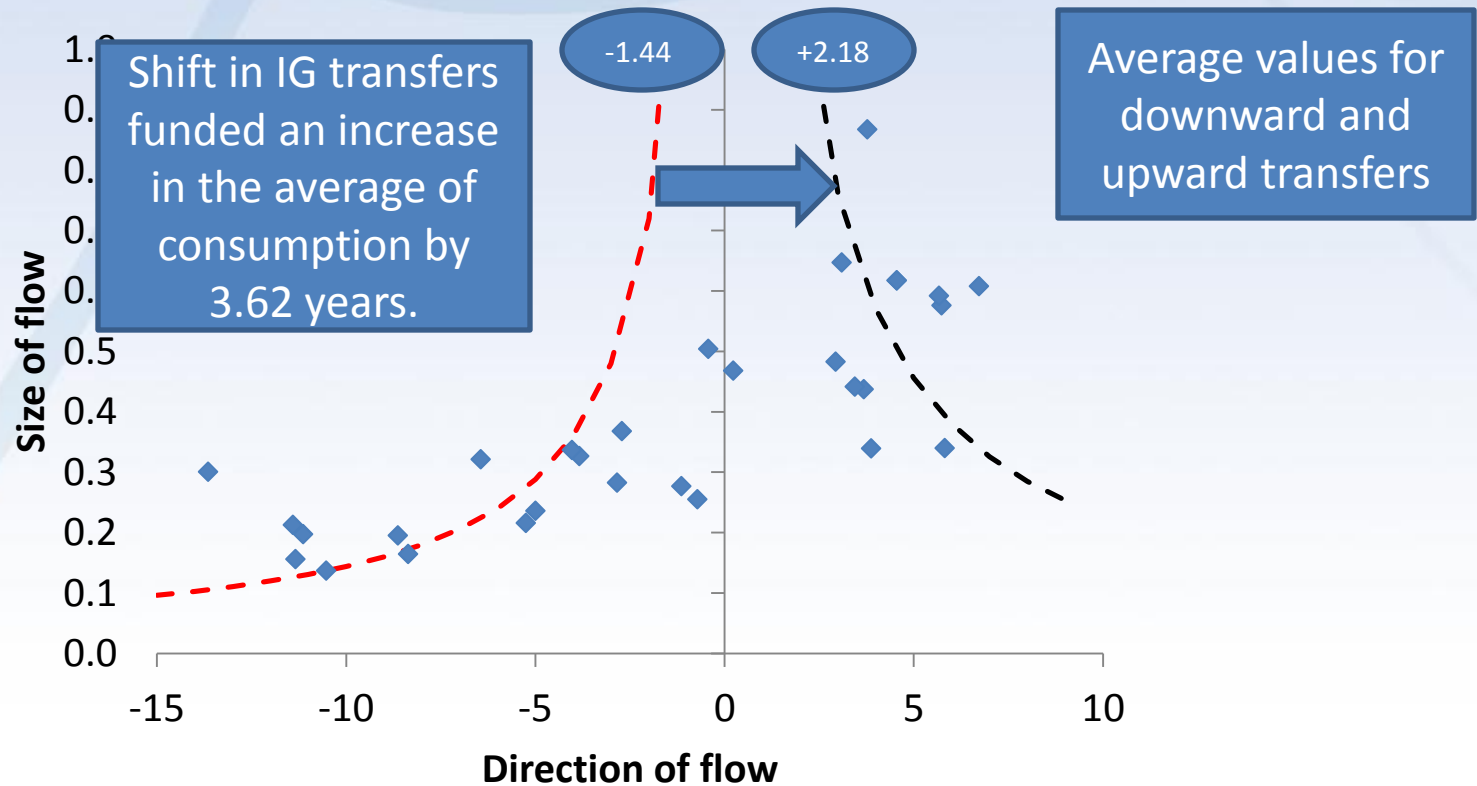
Public Sector for NTA Countries
Size and direction of flows

- In countries with older populations
  - Public IG transfers are larger relative to total consumption
  - Direction of transfers is upward rather than downward
- Differences explained by many factors, not only age structure.

Direction of flow: mean age of public transfer inflows less the mean age of public transfer outflows. Size of flow: total public transfer inflows/total consumption

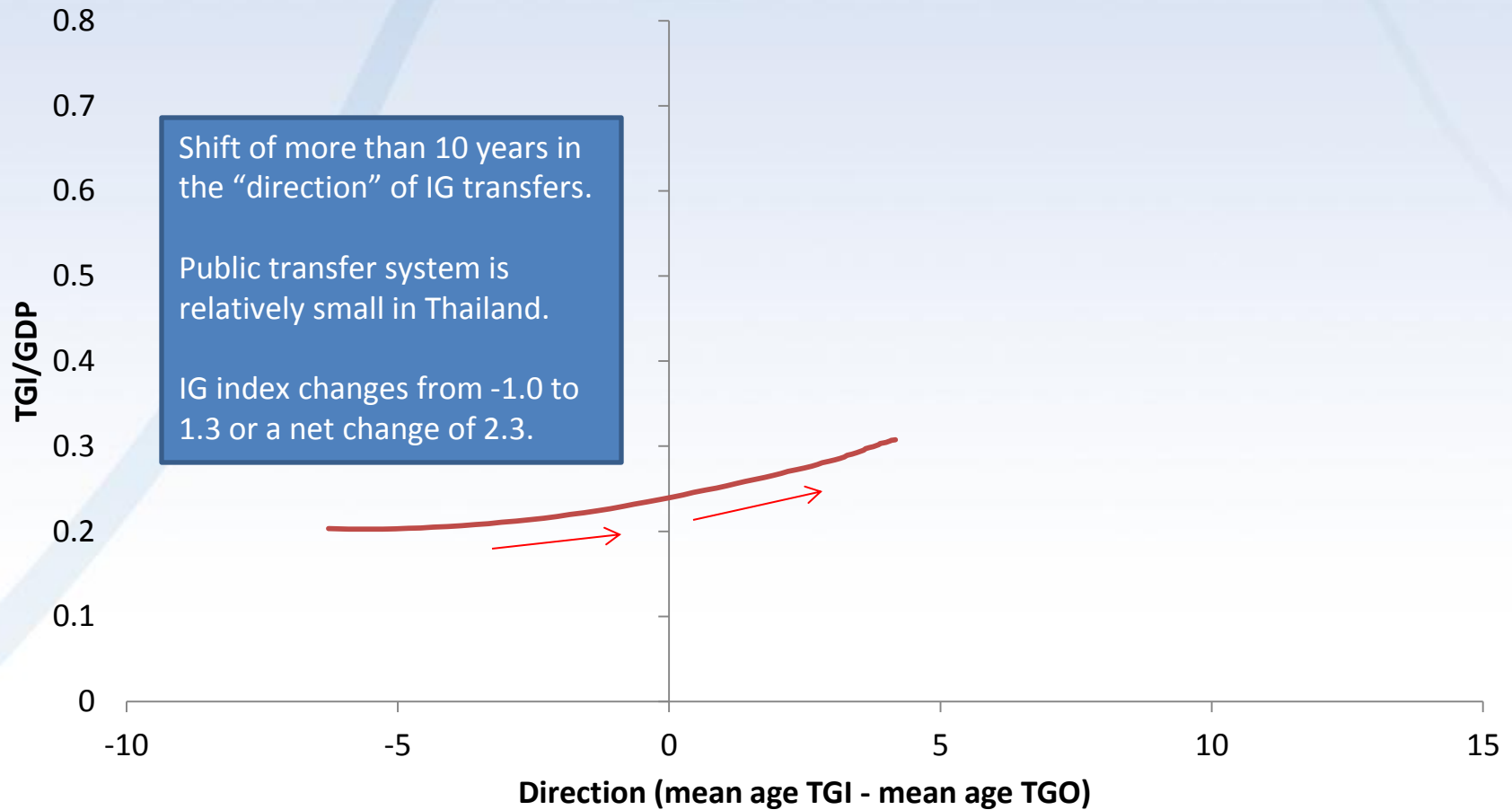# Combined impact on IG allocation of resources is captured by IG index

Shift in IG transfers funded an increase in the average of consumption by 3.62 years.

-1.44

+2.18

Average values for downward and upward transfers

Size of flow

Direction of flow

IG shift in public transfers "funded" 40% of the shift in the mean ages of consumption (comparing downward to upward).
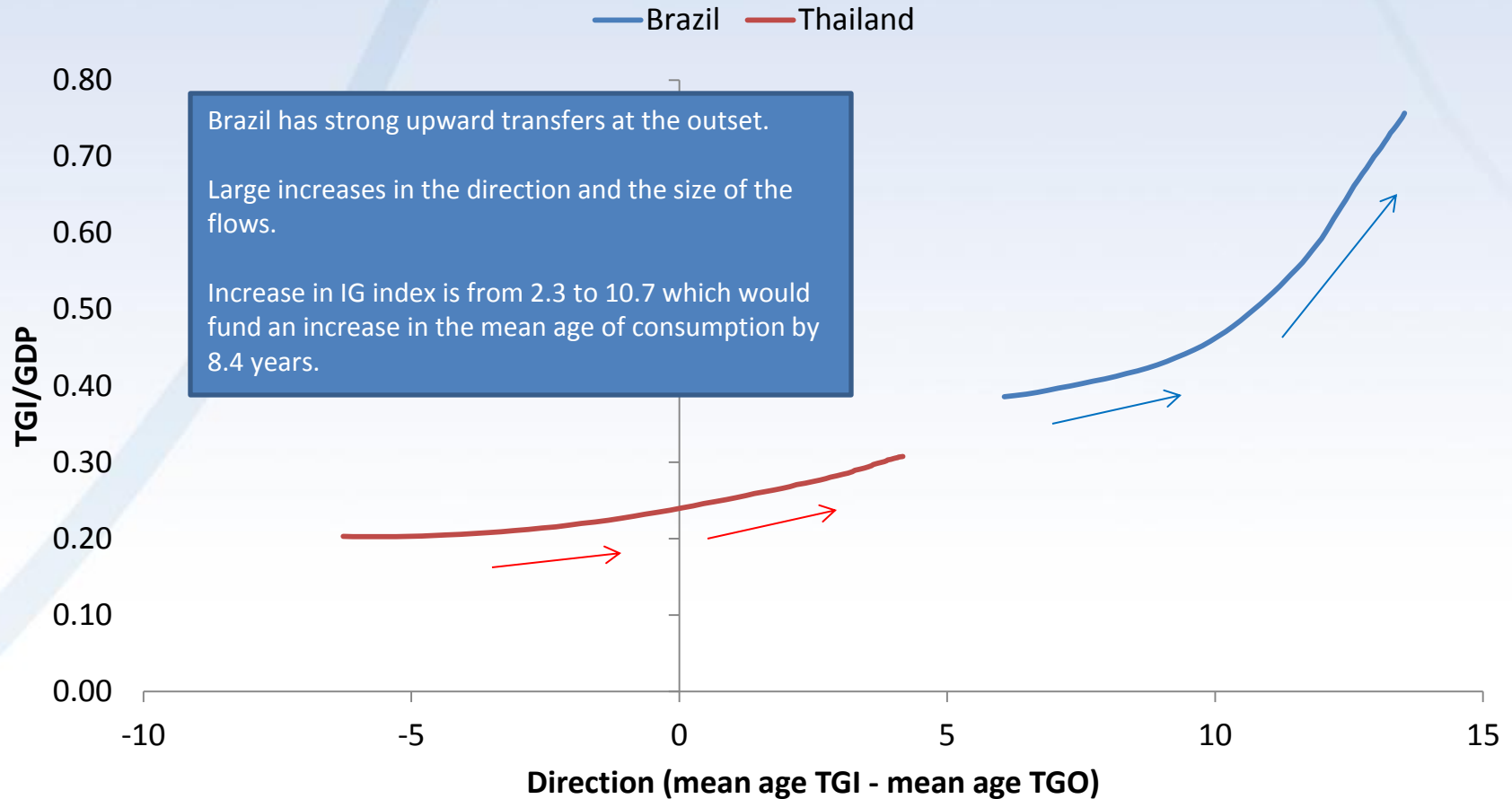
Baseline Projections

- Exogenous population growth – UN World Population Prospects, Medium Fertility Scenario

- Age-specific labor income profile shifts upward at exogenous rate of productivity growth.

- Ratio of GDP to total labor income fixed at base year value

- Normalized age profiles of transfer inflows and outflows fixed at values in base year.

- Projections to 2075 presented here.

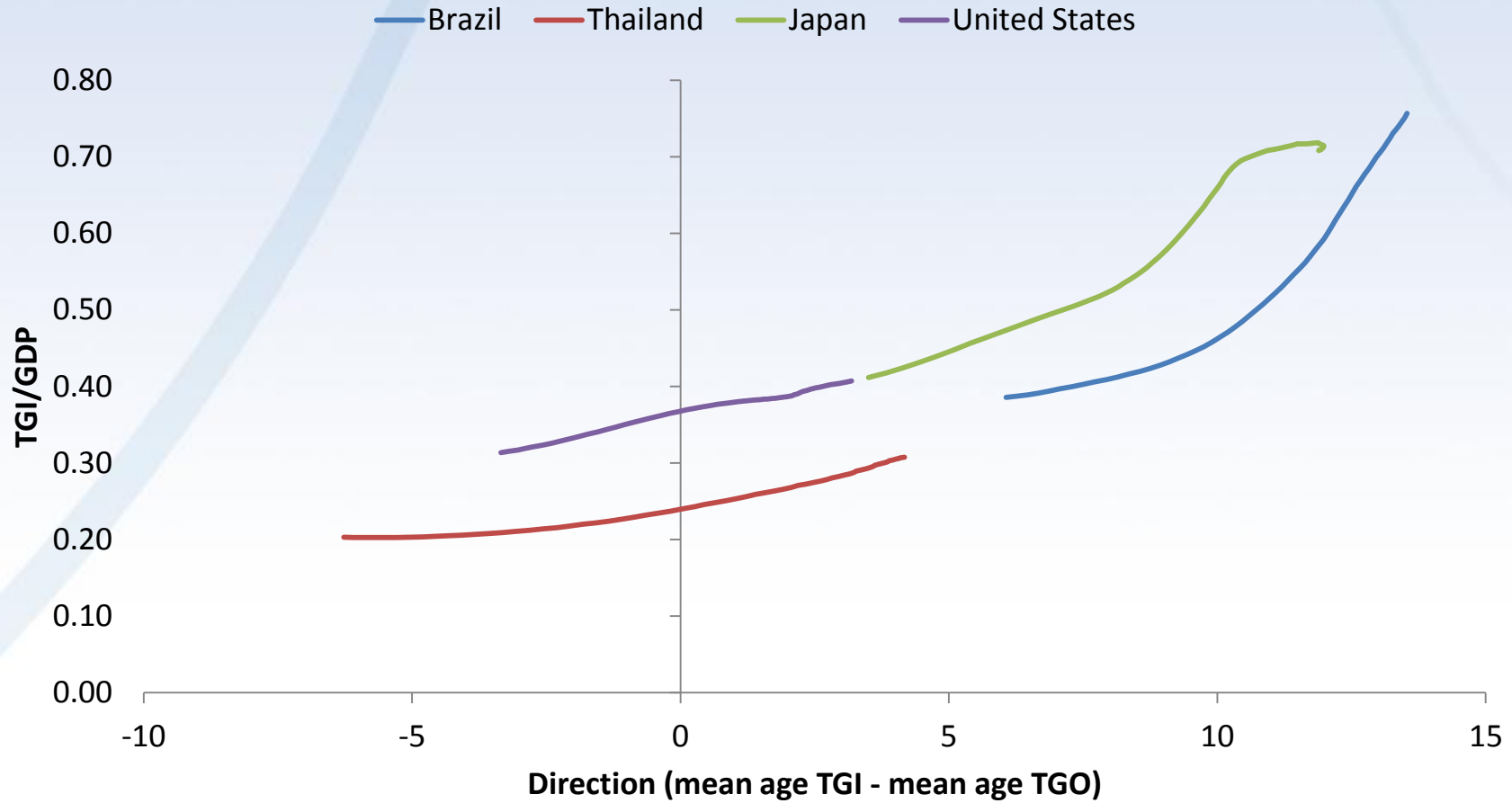# Thailand, 2011-2075

Shift of more than 10 years in the "direction" of IG transfers.

Public transfer system is relatively small in Thailand.

IG index changes from -1.0 to 1.3 or a net change of 2.3.

TGI/GDP

Direction (mean age TGI - mean age TGO)

Thailand and Brazil

Brazil has strong upward transfers at the outset.

Large increases in the direction and the size of the flows.

Increase in IG index is from 2.3 to 10.7 which would fund an increase in the mean age of consumption by 8.4 years.

Brazil, Thailand, US, and Japan

Final Observations

- Very preliminary exploration
- In further work we hope to explore how public policy should be informed by the impact of population aging on both the fiscal balance and the intergenerational flows of public transfer systems.