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# National Transfer Accounts:
# A new methodology for policy research on India's macroeconomic issues

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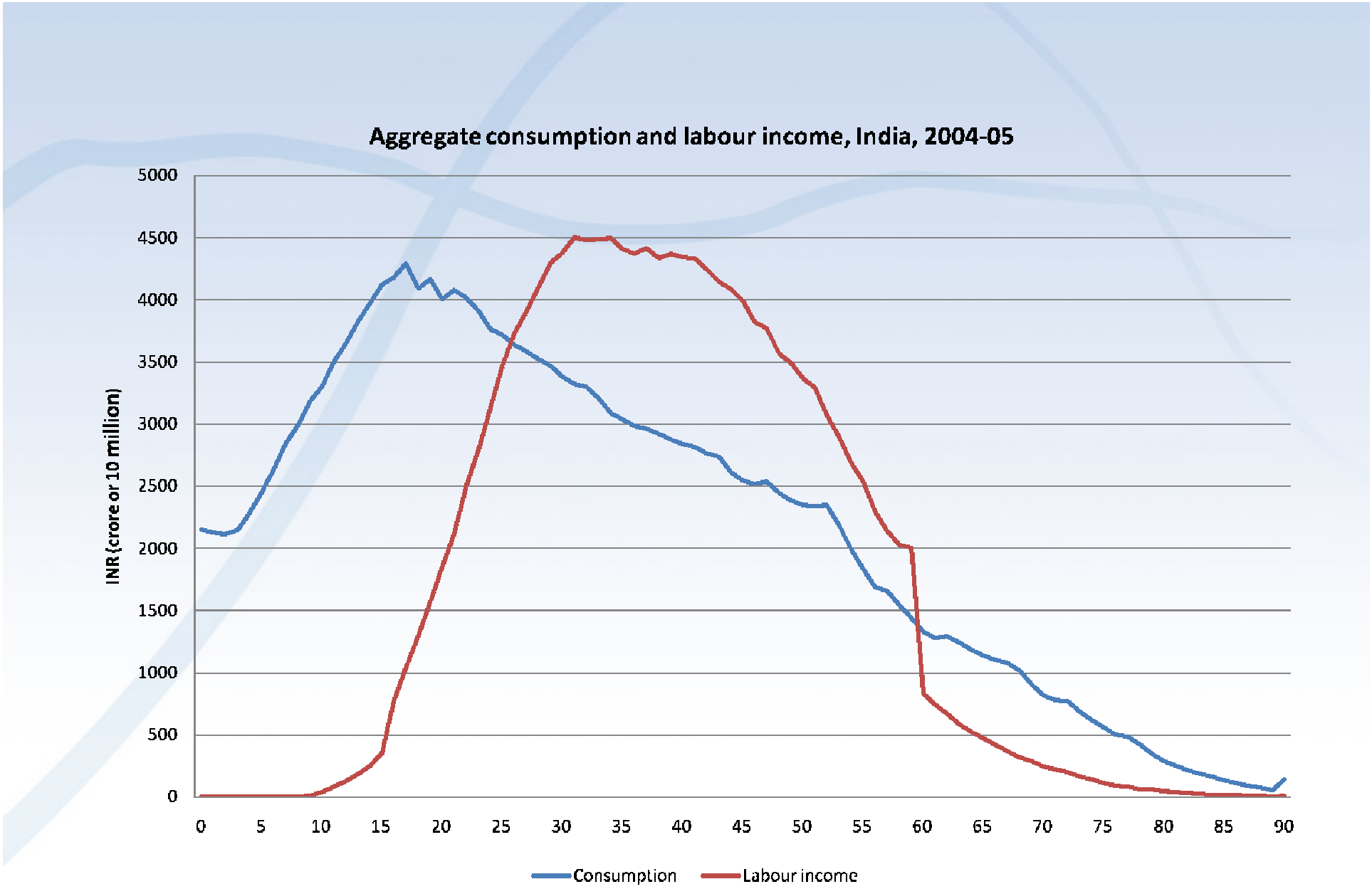
# India and NTA

- India joined the NTA Global Research Project in 2005 – part of global NTA network
- Constructed preliminary NTA for 1999-00 and more comprehensive for 2004-05
- Professors M.R. Narayana (Institute for Social and Economic Change, Bangalore); and Laishram Ladusingh, International Institute for Population Studies, Mumbai) have been the key research persons.
- Associated with two major Asia NTA projects (co-ordinated by NUPRI, Tokyo): *(1) Asia's Dependency Transition: Intergenerational Equity, Poverty Alleviation, Public Policy. (2) Intergenerational Transfers, Population Ageing and Social Protection in Asia*
- Key persons have been trained on the theory, construction, and applications of NTA for national population and development issues
- Opportunities to present research findings and participate in NTA global and regional conferences and meetings
- The trainings and international exposure have built technical capacity to undertake policy research based on NTA for India
- Research outcomes works are evident by ways of research reports, conference papers, newspaper article, dissemination seminars and publications

# New and uniqueness of NTA methodology

- Introduces age into National Income and Product Accounting (NIPA) – establishes consistency with NIPA
- Provides a sound macroeconomic foundation for calculation of age profiles of macroeconomic variables
- **Establishes new accounting relationships and inter-age flows (i.e. inflows and outflows) of variables in monetary terms for an accounting year at national level of aggregation – called the Flow-Account of NTA**
- For instance, calculation of Lifecycle deficit (LCD) across ages or generations – Development of instruments to financing LCD by age reallocations or through public and private transfers and asset reallocations
- Age flows, LCD and age reallocations are vital empirical contents of NTA and bases for all policy research and applications of NTA


Aggregate consumption and labour income, India, 2004-05
INR (crore or 10 million)
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
Consumption
Labour income

# Focus of this presentation

- To explore the relevance and applicability of NTA methodology for policy research on India's current and emerging macroeconomic issues as they are related to population (in particular, age structure transition) and economic development through the current age structure of population and its transition over time.
- Focus of policy research is on deriving select evidence-based implications for policy formulation, execution and evaluation.
- Argue for a strong case to continuing policy research on India NTA

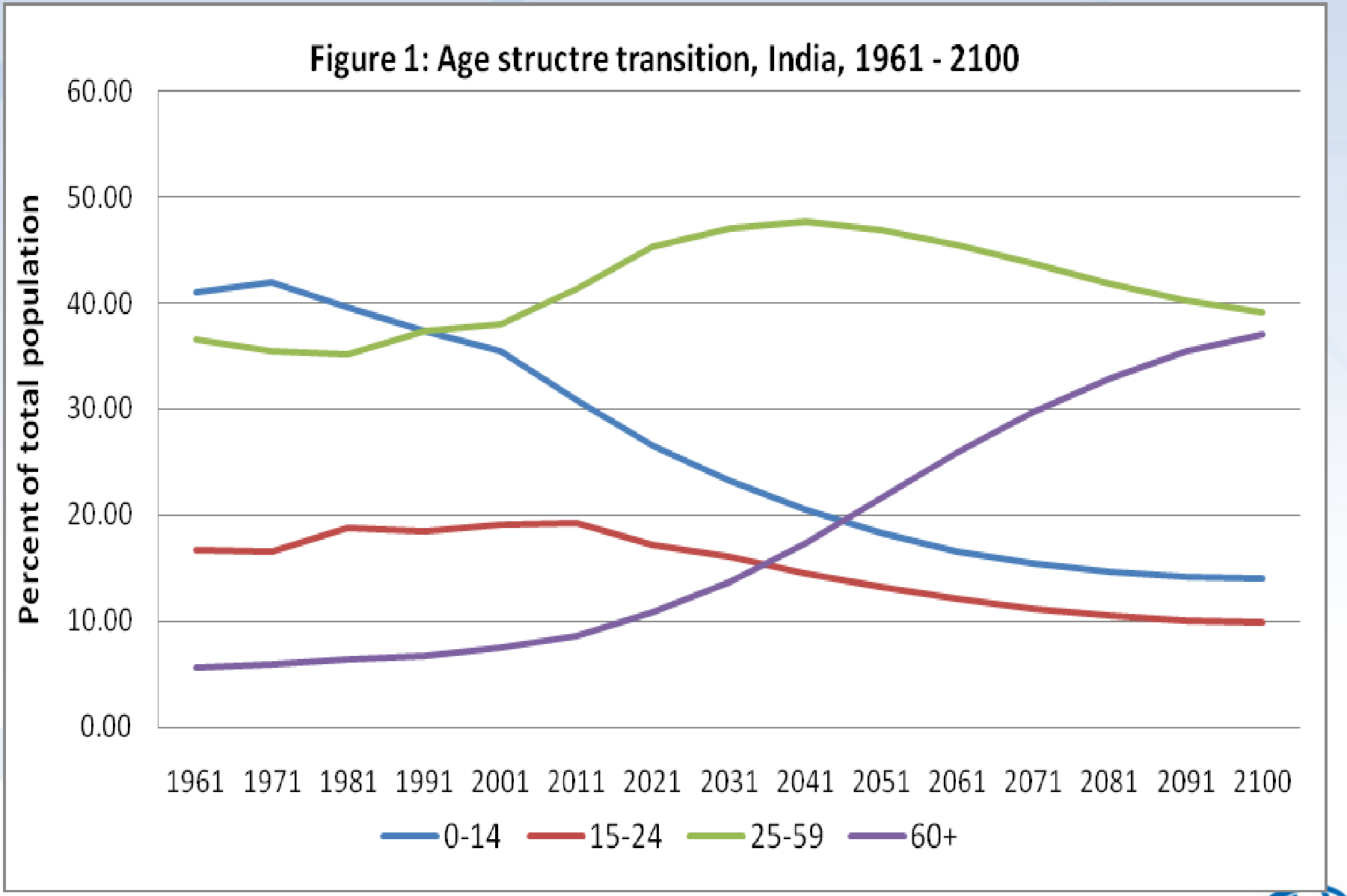


Figure 1: Age structre transition, India, 1961 - 2100
Percent of total population
60.00
50.00
40.00
30.00
20.00
10.00
0.00
1961 1971 1981 1991 2001 2011 2021 2031 2041 2051 2061 2071 2081 2091 2100
0-14
15-24
25-59
60+

# Select policy questions that NTA can answer

## Growth related

- What does the age structure transition imply for India's long term economic growth? What are key economic determinants of such growth ?

## Distribution related

- How do we address the issue of inter-generational equity?
- What are inter-generational allocation of resources mediated through public and private (e.g. family) sectors to attain equity?
- Are inter-generational allocations limited to transfers or extendable to assets reallocations?

## Fiscal policy related

- What are the long term fiscal implications of expected reform for population ageing? E.g. introduction of universal old age pension and universal health coverage with full public funding. Will such a fiscal policy sustainable?

## Gender related

Can we answer the above growth, distribution and fiscal policy related questions by gender? Does gender-based NTA have implication for formulation of gender-budgeting?

# NTA-based analysis of growth-related issues

- India's 12th Five Year Plan (FYP) aims at 8% economic (or real GDP) growth rate over the plan period (2012-2017)
- The macroeconomic framework has identified the following as one of the key determinants: ***benefits of a demographic dividend because the age structure of the population ensures that the labour force will be growing in India.***
- NTA is useful to calculate the nature and magnitude of long term impact of age structure transition on economic growth through demographic dividends. This approach is useful to distinguish the growth effects of age structure transition and productivity and draw implications for improvements in skills and productivity (also emphasized in 12th FYP).

# Analysis of growth-related issues

Summary of NTA approach to demographic dividend

Effective number of producers and consumers are measured respectively by

$$L(t) = \sum \gamma(a)P(a,t) \quad (1)$$

$$N(t) = \sum \phi(a)P(a,t) \quad (2)$$

Using (1) and (2), income per effective consumer [Y(t)/N(t)]:

$$Y(t)/N(t) = \{Y(t)/L(t)\}\{L(t)/N(t)\} \quad (3)$$

In terms of growth rate:

$$g[Y(t)/N(t)] = g[Y(t)/L(t)] + g[L(t)] - g[N(t)] \quad (4)$$

[L(t)/N(t)] in equation (3) is called the **economic support ratio** or ratio of effective producers to effective consumers of goods and services.

Age structure transition leads to large shifts in the support ratio and interacts with labour productivity to determine the economic growth. **The period during which growth of support ratio leads to increase in the economic growth (or growth of national income per effective consumer) is called *First Demographic Dividend* (FDD).** This assumes that productivity growth rate is constant.

Available evidence show that India's FDD lasts up to 2047 – to continue this growth, improvement in labour productivity is essential

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# Further analysis of growth-related issues

Indian labour market is divided into formal (comprising salary and wage earners) and informal (comprising self-employed) sectors

- Available estimates show that informal sector contributed about 50 per cent gross value added and 92 per cent of India's total employment in 2004-05
- Over the period 1999-00 to 2004-05, the annual growth of employment in informal sector (3.16 per cent) exceeded the growth rate of total employment (2.89 per cent). This trend is witnessed during 2004-05 to 2009-10 also
- At the same time, level of productivity in informal sector is about 8 times smaller in 1999-00 and 11 times smaller in 2004-05 than the formal sector. The annual growth rate of productivity over the period 1999-00 to 2004-05 is about 9 times smaller in informal sector than the formal sector.

- Share of informal employment in total employment is 93% in 2009-10
- Excluding agriculture, share of informal employment in total non-agricultural employment is 86% - higher as compared to other Asian countries, such as, Indonesia (78%), Philippines (72%) and Thailand (49%).
- Growth rate of employment in formal sector continues to be negative during 2004-05 to 2009-10; Growth rate of informal employment continues to be positive and higher than total employment ; Self employed constitute the highest share among total workers (51% in 2009-10)

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# Implications of labour market realities

These facts imply that growth effects of India's age structure transition (for instance, measured by changes in working population) may be different across sectors due to differences in worker productivity and its growth rate in formal and formal sectors.

This analysis is useful to argue for sector-specific productivity improvement policies to lengthen the FDD and maximize economic growth.

NTA is useful to calculate productivity age profiles by these sectors and the calculate the FDD by formal and informal sectors.

**Figure 2: Age profile of per capita labour income by formal and informal sectors, India, 2004-05**

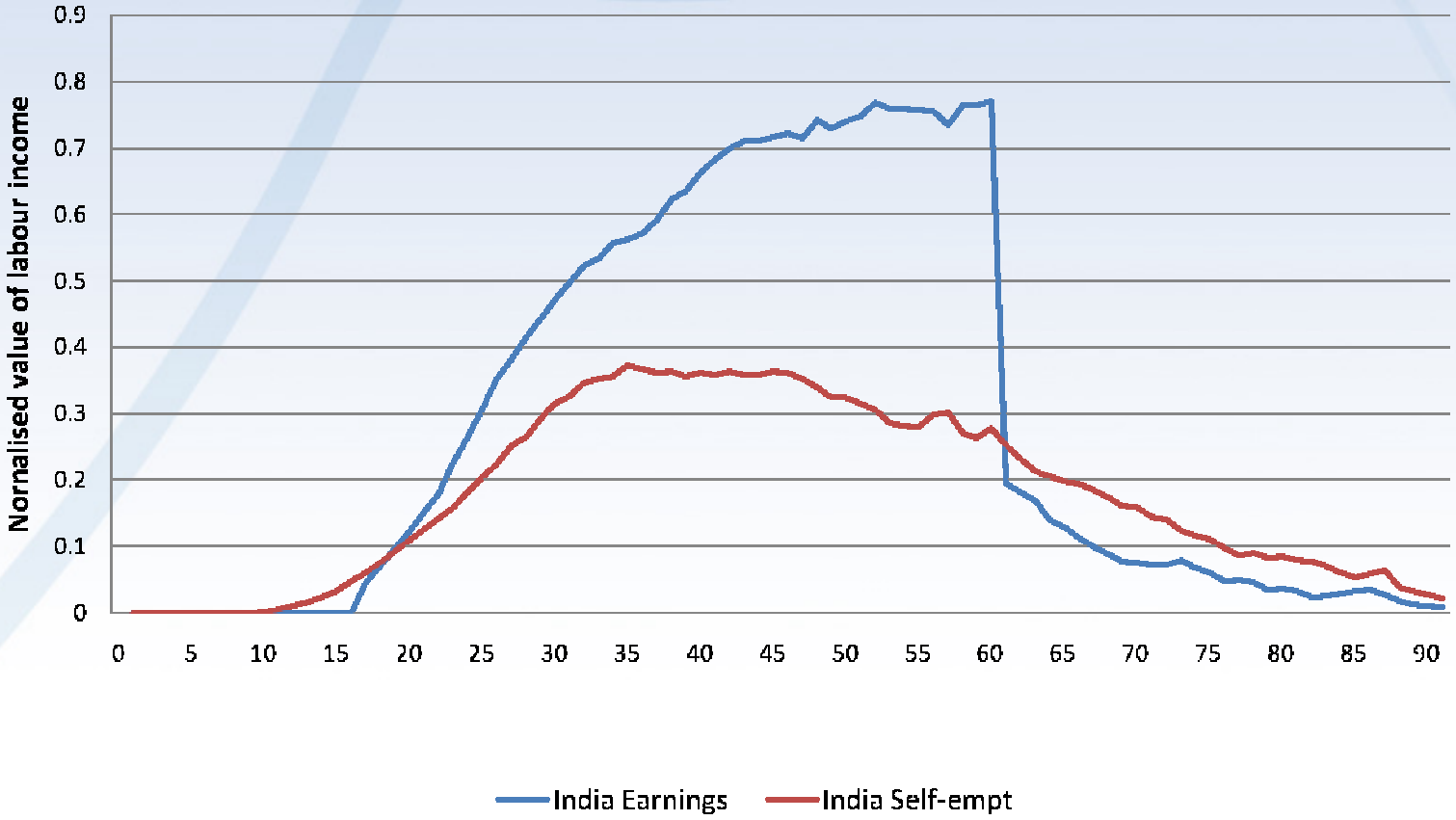


**Figure 3 Age profile of per capita labour income in formal sector: India and select Asian countries**

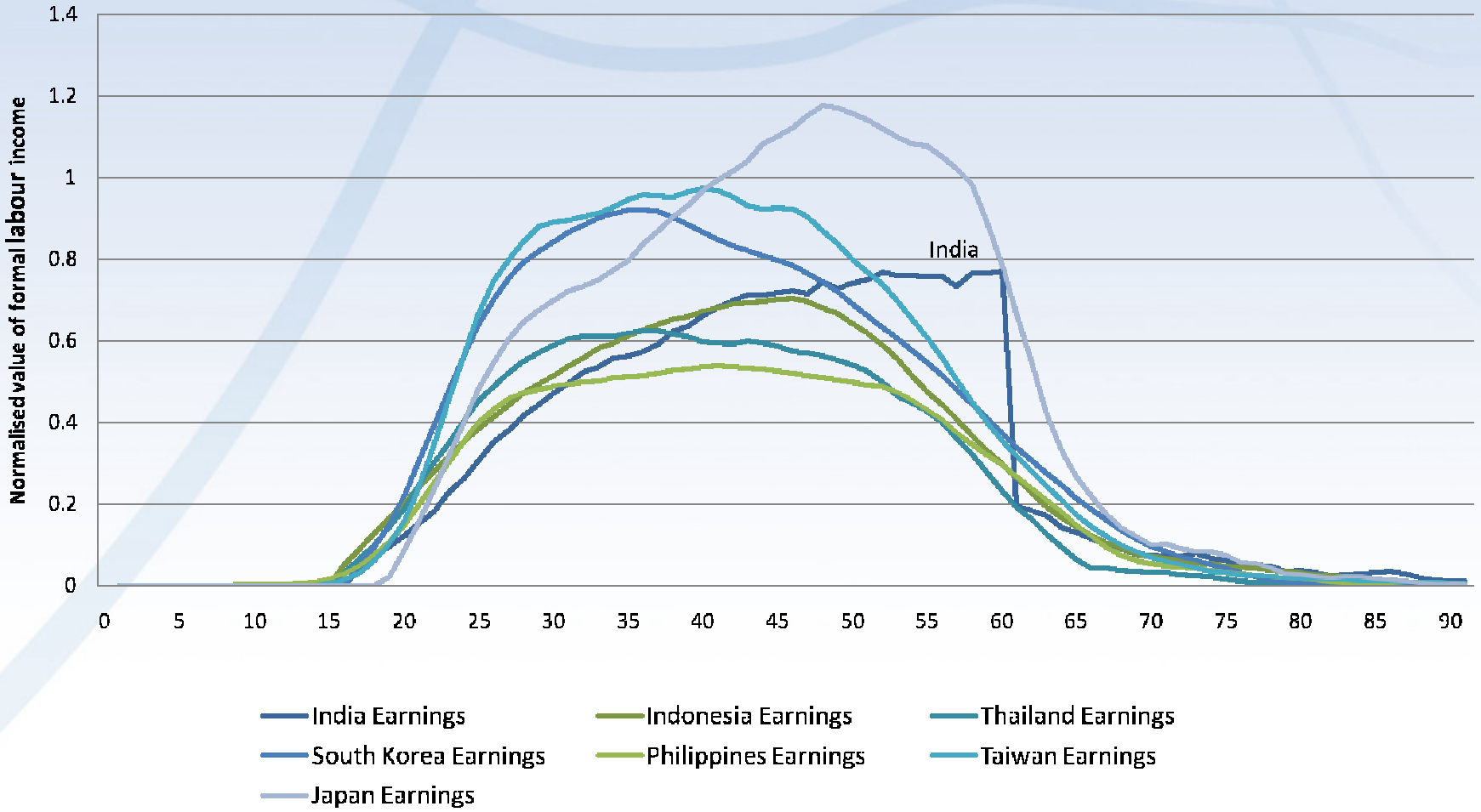
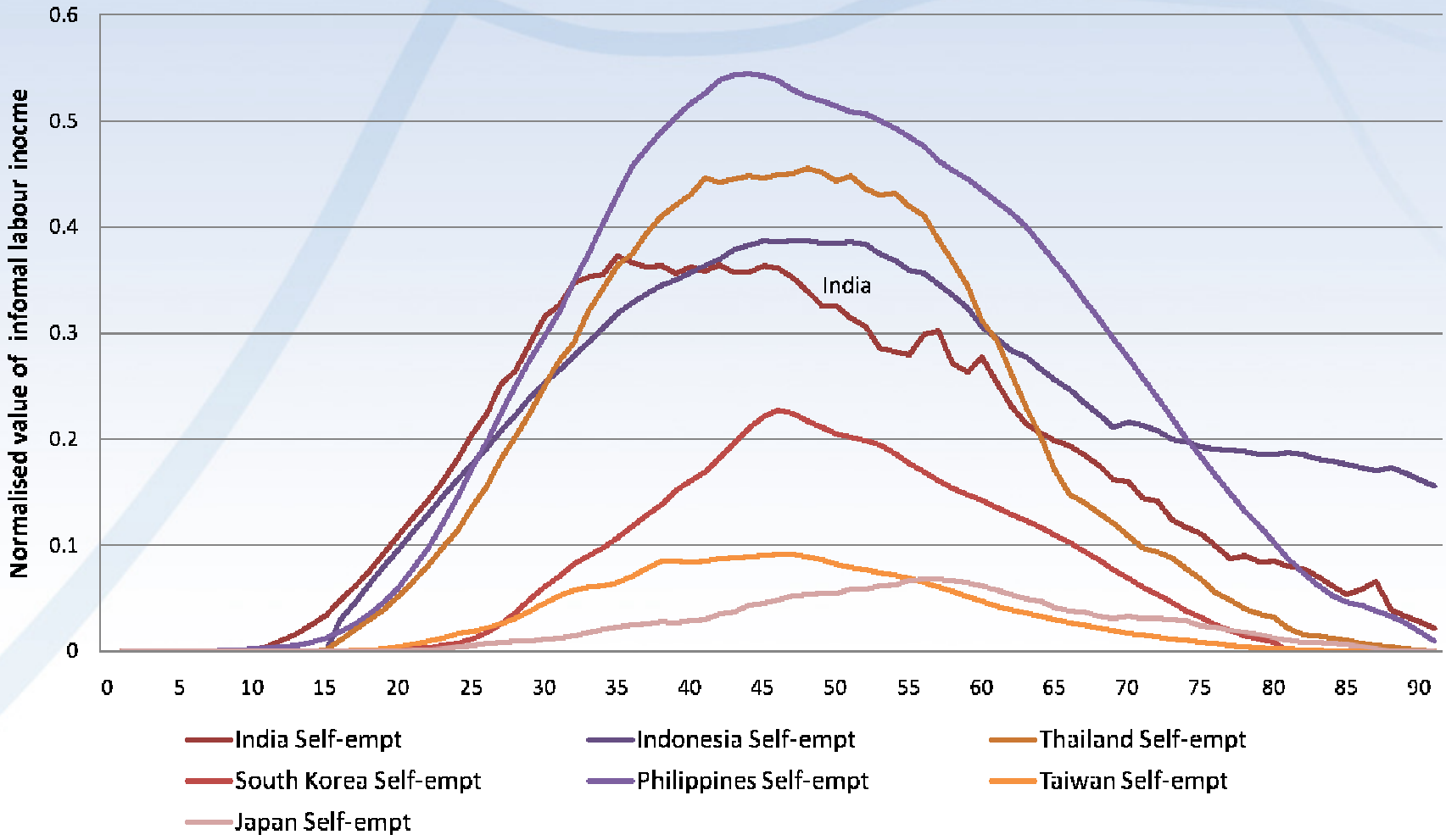


**Figure 4: Age profile of per capita labour income in informal sector: India and select Asian countires**



## Growth effects of changes in labour productivity in FDD model: Select simulation results

Case 1: Benchmark: Growth rate of relative productivity is 3.38% and absolute productivity in informal sector is 0.89%.
Case 2: Growth rate of relative productivity is equalized: Growth rate of relative productivity is 1% and the absolute productivity is 5.50%.
Case 3: Output is doubled in formal sector: Growth rate of relative productivity is 10.04% and the absolute productivity is 0.89%.
Case 4: Output is doubled in both formal and informal sectors: Growth of relative productivity is 1.15 and the absolute productivity is 15.89%
Case 5: Output is doubled in informal sector: Growth rate of relative productivity is 0.74% and growth rate of the absolute productivity is 15.89%

| Year | Annual rate of economic growth (%) | | | | |
|---|---|---|---|---|---|
| | Case 1 | Case 2 | Case 3 | Case 4 | Case 5 |
| 2005-2010 | 6.82 | 9.05 | 16.48 | 19.59 | 19.18 |
| 2010-2015 | 6.05 | 8.28 | 15.71 | 18.82 | 18.41 |
| 2015-2020 | 5.87 | 8.10 | 15.53 | 18.64 | 18.23 |
| 2020-2025 | 5.63 | 7.85 | 15.28 | 18.39 | 17.98 |
| 2025-2030 | 5.37 | 7.60 | 15.03 | 18.14 | 17.73 |
| 2030-2035 | 5.12 | 7.35 | 14.78 | 17.89 | 17.48 |
| 2035-2040 | 4.83 | 7.05 | 14.48 | 17.59 | 17.18 |
| 2040-2045 | 4.56 | 6.79 | 14.22 | 17.33 | 16.92 |
| 2045-2050 | 4.32 | 6.54 | 13.97 | 17.08 | 16.67 |

# Analysis of distribution related issues

NTA focuses on inter-generational equity: Young, working and elderly

Equity is related to lifecycle balance between consumption and labour income

Lifecycle deficit is a case for inequity and demand for age reallocations. For instance, the NTA Flow Account Identity shows:

$$(C_{f,i} + C_{g,i}) - Y_{L,i} = LCD_i = (Y_{A,i} - S_i) + (T_{f,i}^{+} + T_{f,i}^{-}) - (T_{g,i}^{+} + T_{g,i}^{-}), (5)$$

This framework is useful to determinate the relative efficacy of instruments of inter-generational equity by public and private asset-based reallocations, net public transfers and net private transfers (intra and inter-household).

Construction of NTA over period is useful to understand the changing efficacy of the instruments for attainment of equity.

# Public sector in NTA

- Distinguishes public sector inflows and outflows
  - Inflows: In-kind and cash transfers
  - Outflows: Direct and indirect taxes
- Net transfers (inflows minus outflows) are calculated by age
- Useful to distinguish the net transfers by young, working and elderly population
- Uniqueness of NTA lies in accounting for tax contributions of all generations including elderly population. This has two implications: First, elderly are not merely recipients of transfers but contributors to financing them by taxes. Second, overall fiscal burden of financing public transfers to elderly is less than its total cost, especially when elderly pay asset-based taxes (because, in general, assets are accumulated and owned at later ages)

# Usefulness of public sector outflow profiles

| Year | Labour income of elderly individuals as a percentage of GDP (at market prices) | Expenditure on UOAPS as a percentage of | | | | | |
|---|---|---|---|---|---|---|---|
| | | GDP (at market prices) | Labour income of elderly individuals | Indirect tax payments by elderly individuals | Direct tax payment by elderly individuals | Combined revenue expenditure of the Central and State governments | Combined revenue expenditure of the Central and State governments net of direct and indirect tax payments by elderly individuals |
| 2004-05 | 2.00 | 5.75 (4.01) | 287.03 (200.13) | 575.42 (401.20) | 561.21 (391.29) | 26.63 (18.57) | 29.39 (20.49) |
| 2005-06 | 1.80 | 5.18 (3.50) | 287.33 (194.13) | 507.25 (342.70) | 460.20 (310.92) | 24.24 (16.38) | 26.94 (18.20) |
| 2006-07 | 1.59 | 4.58 (2.91) | 288.65 (183.56) | 434.38 (276.23) | 341.71 (217.30) | 21.34 (13.57) | 24.02 (15.27) |
| 2007-08 | 1.40 | 4.05 (2.43) | 289.67 (174.06) | 391.07 (234.99) | 261.00 (156.83) | 19.95 (11.99) | 22.87 (13.74) |
| 2008-09 | 1.27 | 3.68 (1.92) | 289.97 (151.25) | 387.57 (202.16) | 248.65 (129.70) | 16.06 (8.38) | 17.97 (9.37) |
| 2009-10 | 1.14 | 3.30 (1.06) | 289.23 (93.34) | 386.73 (124.81) | 228.81 (73.84) | 13.86 (4.47) | 15.34 (4.95) |
| 2010-11 | 0.99 | 2.84 (0.68) | 287.64 (69.37) | 206.61 (49.83) | 527.74 (127.28) | 11.90 (2.87) | 12.94 (3.12) |

## Analysis of fiscal policy related issues (includes application of NTA-based public sector inflow and outflow profiles)

- Sustainability of current fiscal policies in the context of population ageing
- Two key policy issues:
  - Universal Old Age Pension Scheme (UOAPS) – strongly proposed by *Pension Parishad*
  - Universal Health Coverage (UHC) – Recommended by Planning Commission's HLEG on UHC for India in 2011
- Integration of NTA with (a) Tim Miller's Budget Forecasting Model (BFM)and (b) Generational Accounting (GA)
- Both models are useful to evaluate the sustainability in regard to UOAPS and UHC.
- At present, there is no policy research to examine the sustainability of current fiscal policies if UOAPS and/or UHC is introduced.
- NTA has important useful to start new policy research

# Other policy uses and issues of NTA

## Gender related issues

- NTA age profiles by male/female categories are policy useful
- For instance, the profiles are useful for gender budgeting

## Sub-national NTA

Indian federation includes 28 states with different size and remarkable population and development issues

Construction of sub-national NTA at state level is useful for analysis of inter-state growth and equity

## Data issues

- India Human Development Survey 2009-10 – not yet available in public domain
- Building Knowledge Base on Population Ageing in India (UNFPA, 2011): Available in public domain: Covers 8329 households and 9852 individuals in 7 states – available in public domain – Using this database, research is on-going: ***Universal Old Age Pension in India: Estimates of economic demand, public cost and financing options***
- Sub-national data for construction of NTA aggregate controls are limited in India – more data research is needed here

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# Concluding remarks

- NTA as a new methodology is:
  - Relevant and applicable for India's economic structure (Federal, open and mixed economy) and age structure transition
  - Useful to address newer policy issues in India's economic growth and inter-generational equity; and gender issues
  - Useful to analyze current policy issues in India's public sector – fiscal sustainability of current fiscal policies in the context of introducing expected reforms, such as, universal old age pension scheme and universal health coverage
  - Insightful to understand the support systems and its evolution by public and private sectors
- NTA is an international and inter-continental project – offers a great opportunity to learn from and share with other countries' experiences

Thus, NTA has much to promise for policy research on macroeconomic issues for India.

# NTA dissemination for policy makers in India

- National seminars in 2008 and 2012 – Key policy makers included Mr Ramesh Kolli (CSO) and Professor Radhakrishna (National Statistical Commission) in Government of India
- Presentation for national seminars, conference and workshops
- Publication in academic journals: Asian Population Studies, Journal of Population Ageing, Journal of the Economics of Ageing
- Publication in national and international edited volumes
- Articles in leading newspaper – English language
- Sharing research output directly to policy makers

# Gratitude

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# THANK YOU