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**IMPACT OF POPULATION AGEING ON SUSTAINABILITY OF  
CURRENT FISCAL POLICIES: A GENERATIONAL ACCOUNTING  
APPROACH**

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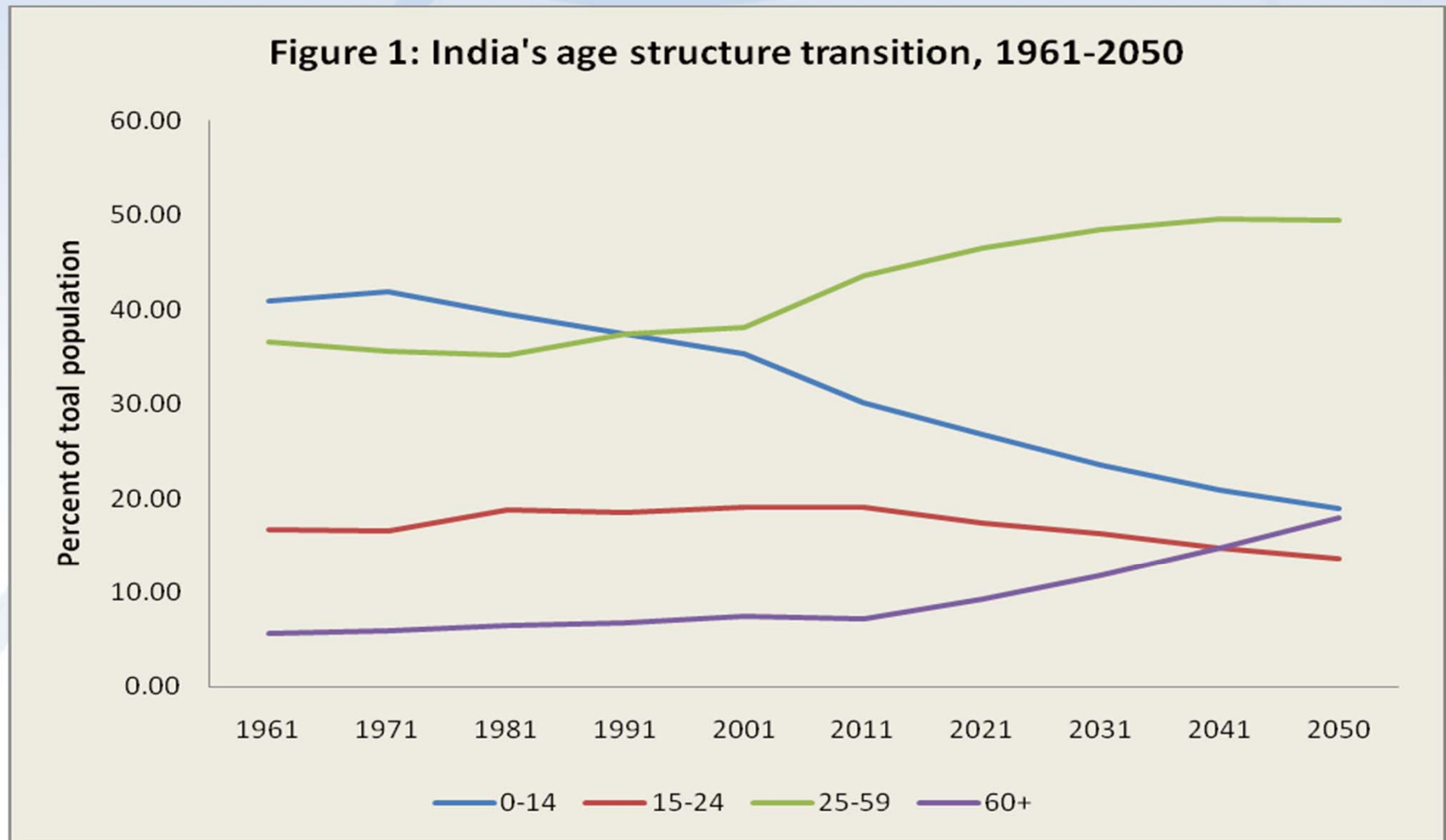


## Key motivations

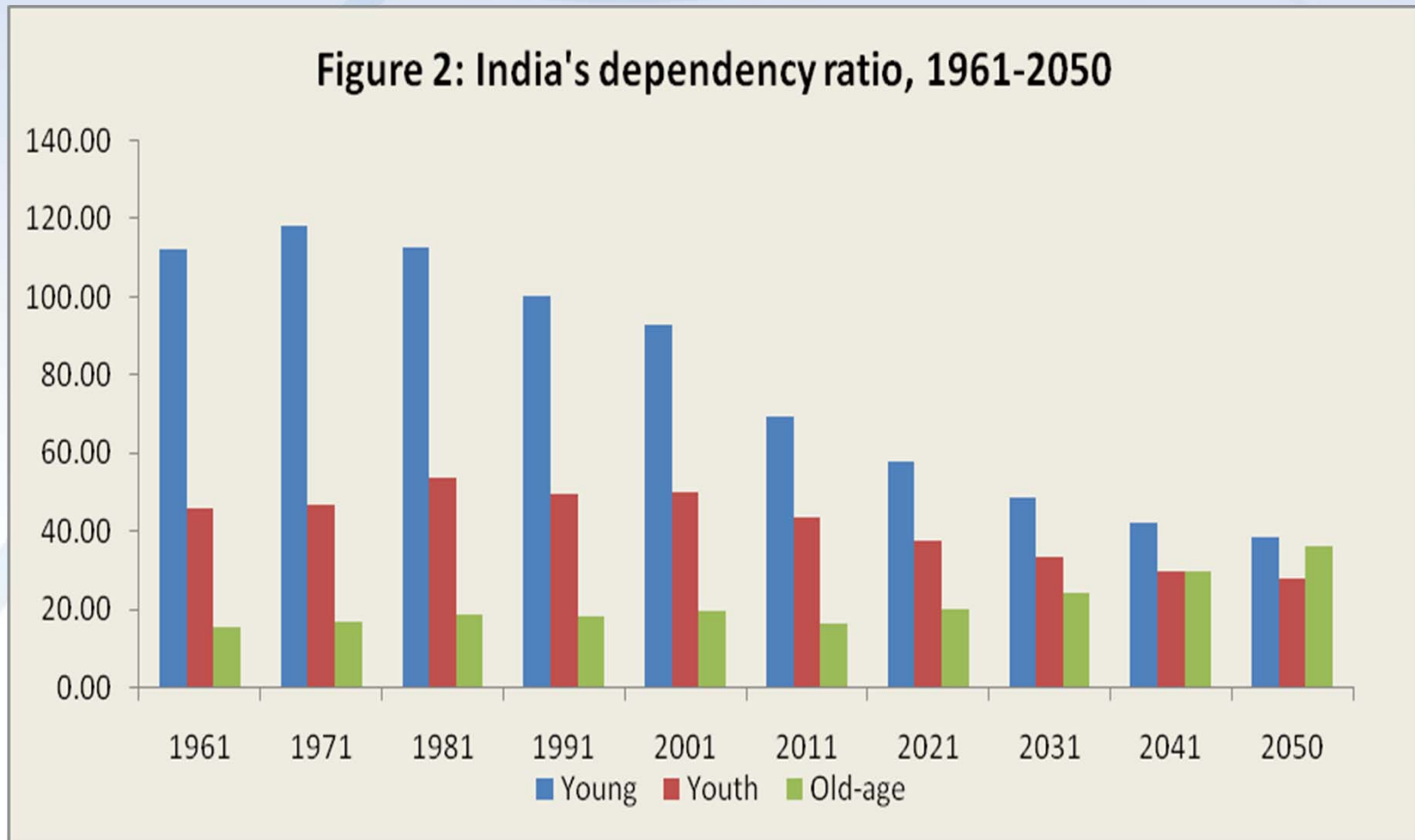
- According to *The UN World Population Prospect: The 2010 Revision*, India's elderly population at age 60 and above show an increase from about 85 million (or about 7 per cent of total population) in 2010 to 303 million (or 18 per cent of total population) in 2050. Correspondingly, old age dependency ratio increases from 11.12 per cent to 28.37 per cent.
- Decline in traditional family support for elderly – Maintenance and Welfare of Parents and Senior Citizens Act 2007 – UNFPA Survey of elderly 2011: 43% have no personal income; 40% utilize public health services
- A policy move towards universal provisioning of publicly funded social security programmes for the increasing elderly population may be expected to exert a big fiscal pressure for India.
- This problem may also question on the sustainability of current fiscal policy of India because of the persisting government deficits and its debt financing.
- Explore the importance and usefulness of Generational Accounting methodology to determine fiscal sustainability and intergenerational distribution of welfare – new for Indian economics and policy making

# Background descriptions

- Age structure transition and population ageing



# Background descriptions



# Background descriptions

## FISCAL INDICATORS

### Main features

- Continuous government budget deficit over the years
  - Deficit is mainly financed by market borrowings
  - Interest payments constitute a huge expenditure – 6% of GDP, 80% of fiscal deficit and 161% of revenue deficit in 2004/05.
  - Persistence of government deficit and its debt financing raises the problem of debt servicing – not exclusively by new taxation (intergenerational transfers) but also by new issue of debt - thus, debt sustainability is a serious policy issue
- Public expenditure on elderly is limited
- Net wealth of the government is negative

# Government deficit indicators

Year	Deficit indicators (% of GDP)		
	Gross fiscal deficit	Gross Primary deficit	Revenue deficit
2000-01	9.51	3.57	6.60
2001-02	9.94	3.69	6.99
2002-03	9.57	3.09	6.64
2003-04	8.51	2.07	5.79
2004-05	7.24	1.42	3.62
2005-06	6.49	0.96	2.69
2006-07	5.37	-0.01	1.29
2007-08	4.09	-1.12	0.19
2008-09	8.47	3.39	4.31
2009-10	9.42	4.55	5.73
2010-11	8.08	3.42	3.84
2011-12	7.00	2.51	3.25

## Public expenditure on pensions and retirement benefits

Year	Total pension and retirement benefits (INR Billion)	Total pension and retirement benefits as % of		Pension and retirements to government employees as % of total pension and retirement benefits	Expenditure on Indira Gandhi National Old Age Pension Scheme as % of total revenue expenditure
		GDP	Total revenue expenditure		
2000-01	392	1.81	7.58	98.93	0.08
2001-02	408	1.74	7.29	98.86	0.08
2002-03	437	1.73	7.08	98.50	0.11
2003-04	458	1.61	6.76	98.69	0.09
2004-05	565	1.74	7.73	98.17	0.14
2005-06	621	1.68	7.70	98.08	0.15
2006-07	716	1.67	7.67	96.52	0.27
2007-08	805	1.61	7.51	96.41	0.27
2008-09	992	1.78	7.30	95.46	0.33
2009-10	1447	2.24	9.15	96.44	0.33
2010-11	1627	2.12	8.57	98.39	0.14
2011-12	1782	2.01	8.78	96.33	0.32

# Select fiscal ratios

Year	Tax revenues as % of GDP			Aggregate receipts and expenditure as % of GDP		
	Direct taxes	Indirect taxes	Total tax revenues	Revenue receipts	Aggregate receipts	Aggregate expenditure
2000-01	3.73	10.36	14.09	17.47	27.63	27.46
2001-02	3.53	9.87	13.39	17.04	27.72	27.81
2002-03	4.00	10.18	14.18	17.93	27.96	27.85
2003-04	4.43	10.22	14.64	18.27	28.16	28.06
2004-05	4.82	10.15	14.97	18.99	27.40	26.83
2005-06	5.29	10.36	15.65	19.15	27.48	25.99
2006-07	6.24	10.62	16.86	20.43	26.21	25.83
2007-08	7.13	10.47	17.60	21.30	26.67	26.40
2008-09	6.77	9.82	16.59	20.01	28.81	28.65
2009-10	6.58	8.72	15.30	18.75	28.57	28.69
2010-11	6.58	9.59	16.17	20.89	28.95	29.36
2011-12	6.75	9.73	16.48	19.66	27.34	27.26



# Net wealth of the government

Year	Net wealth (INR Billion):		Ratio of total liabilities to total assets	Ratio of explicit debt to total assets
	Financial assets minus total liabilities	Financial assets minus total explicit debt		
2001-02	-8590	-1138	1.79	1.10
2002-03	-10196	-2023	1.87	1.17
2003-04	-11539	-3449	1.91	1.27
2004-05	-12729	-4240	1.88	1.29
2005-06	-14284	-5494	1.89	1.34
2006-07	-15433	-5734	1.86	1.32
2007-08	-15342	-4966	1.70	1.23
2008-09	-18627	-7197	1.80	1.31
2009-10	980	13499	0.98	0.72
2010-11	1264	14246	0.98	0.74

## Composition of Government Final Consumption Expenditure, India

Item of consumption expenditure	2001-02	2004-05	2007-08	2010-11
General public service	0.06	0.17	0.05	0.01
Defence	31.88	34.90	24.55	23.55
Public order and safety	23.71	24.64	29.46	29.96
Education	16.95	17.16	20.34	21.15
Health	6.09	6.66	8.20	8.14
Social security and welfare services	3.03	4.19	4.55	5.20
Housing and community amenities	1.53	2.46	1.53	1.89
Recreation, culture and religion	0.94	0.79	0.75	0.82
Fuel and energy	1.08	0.38	1.05	0.74
Agriculture, forestry and fishing	3.88	3.18	2.92	3.40
Mining, manufacturing and construction	0.78	0.52	0.64	0.52
Transportation and communication	1.18	1.68	2.66	1.60
Others	8.89	3.27	3.31	3.03
Total	100.00	100.00	100.00	100.00
Total consumption expenditure (INR in billion)	2145.60	2510.09	3844.30	7199.88

# Objectives

1. Construction of the standard GA for India for the benchmark year 2004-05 by using the computational framework, developed by Professor Young Jun Chun and available on NTA website
2. Determine sustainability by (a) current fiscal policies; (b) sensitivity of assumptions on growth rate of productivity and discount rate; (c) expected policy reforms on Universal Old Age Pension Scheme and Universal Health Coverage Policy; and (d) sources of generational imbalance through zero net debt or no demographic transition cases.
3. Determine sustainability by *Generational Imbalance* between current and future generations and *Sustainability Gap* (government gap as a percentage of present value of GDP)
4. Determine the inter-generational implications of sustainability across young, youth, working-adult and elderly age groups
5. Justify current fiscal policies and expected reforms on sustainability criterion and draw policy implications.

## GA for India, Baseline

Generation's age in 2004-05	Net payments (INR in '000)	Composition (INR in '000)					
		Transfers (per capita)			Payments (per capita)		
		Education	Health	Social Security	Income tax	Corporation tax	Indirect taxes
0 (New born)	244.69	-24.31	-14.30	-16.61	31.35	57.80	210.77
5	248.02	-25.24	-14.22	-19.19	32.74	61.16	212.77
10	244.97	-22.47	-13.77	-22.52	33.27	63.14	207.31
15	242.37	-17.31	-13.25	-27.56	33.77	66.76	199.96
20	237.16	-9.57	-12.61	-34.52	33.73	71.44	188.69
25	236.45	-0.06	-11.77	-34.06	32.75	75.86	173.73
30	220.84	-0.05	-10.94	-36.18	30.37	78.76	158.89
35	203.21	-0.04	-9.91	-37.86	26.96	79.17	144.90
40	183.67	-0.03	-8.81	-37.95	22.94	76.81	130.71
45	161.85	-0.03	-7.61	-37.41	18.28	73.61	115.00
50	139.60	-0.02	-6.47	-36.04	13.44	70.45	98.24
55	115.15	-0.01	-5.37	-36.47	8.55	67.12	81.33
60	87.85	0.00	-4.29	-36.89	4.11	59.93	65.00
65	64.11	0.00	-3.51	-38.22	2.44	50.51	52.89
70	41.86	0.00	-2.77	-37.18	1.50	39.21	41.10
75	26.02	0.00	-2.10	-33.71	0.83	30.56	30.44
80	15.82	0.00	-1.51	-25.23	0.43	21.30	20.83
85	3.54	0.00	-0.96	-17.91	0.19	9.23	12.98
90	1.34	0.00	-0.22	-3.28	0.02	1.79	3.04

## GA for India, Baseline

Net payment of future generation (INR in 000)	197.02
Generational imbalance (%)	-19.48
Sustainability gap (%)	-7.35
Net payments as % of lifetime income	
1.1. Current generation	
• Newborn	22.22
1.2. Future generation	12.20

# Main results: GA - Baseline

- The net payment is highest or peaks at age 25.
- The net payment is positive for all ages in the current generation.
- The higher net payment is strongly driven by (a) low amount of transfers in general and health transfers in particular and (b) high level of corporation income and indirect or consumption taxes.
- Age pattern of net payment is not characterized by a lifecycle pattern because India's elderly are also net tax payers rather than net beneficiaries of public transfers. This is for three reasons. (i) Elderly are not beneficiaries of public education transfers. (ii) No universal elderly-specific public spending, such as, universal old age pension. (iii) Elderly pays all taxes in general and asset-income based (i.e. corporation tax) in particular.
- The above results of India's GA are different from those available for the 16 developed countries in Kotlikoff and Lebfritz (1999).
- Current fiscal policies are sustainable:  $GI < 0$

# Sensitivity analysis

Indicators and Generations	g=3.01			g=4.0			g=4.5		
	r=10	r=12	r=14	r=10	r=12	r=14	r=10	r=12	r=14
<b>1. Net tax payment (INR'000) – per capita</b>									
1.1. Current generation									
• Newborn	113	56	31	170	80	42	211	96	50
1.2. Future generation	52	19	18	103	26	14	150	35	13
<b>2. Generational imbalance (%)</b>	-54.40	-66.36	-40.50	-39.71	-67.22	-67.38	-28.75	-63.52	-71.51

# Main results – Sensitivity analysis

- For a given productivity growth rate, a higher discount rate reduces the net payment of both current and future generations.
- For a given discount rate, a higher productivity growth rate increases the net payment of the current generation as well as the future generation.
- Thus, the results show the sensitivity of GA to productivity growth rate and discount rate do not depend on the generation in question.
- A major implication of the above sensitivity analysis is that India's current fiscal policy is sustainable in all the sensitivity cases.
- Nevertheless, a lesser discount rate with higher productivity growth rate (i.e.  $g=4.5$  and  $r=10$ ) is preferable to higher discount rate with lower productivity growth rate because it needs lesser adjustments in taxes and transfers in future.



## Expected reforms

- **Universal Old Age Pension Scheme** – INR2000 per month – publicly funded, non-means related and non-contributory – demanded by Pension Parishad
- Estimated additional cost – INR1643.23 billion in 2004-05 (5.07% of GDP)
- Use age profile of cash transfers – add the difference between proposed UOAPS amount and existing amount of cash transfers to all elderly
- **Universal Health Coverage Policy** – publicly funded – ensure a National Health Package of essential primary, secondary and tertiary health care services – recommended by High Level Expert Group in 2011
- Estimated additional cost - INR941.56 billion (2.9% of GDP)
- Use the combined age profile of public and private health consumption
- Both expected are assumed to be financed by debt

Generation's age in 2004-05	Per capita net payment (INR in 000)			Per capita transfers (INR in 000)	
	UOAPS	UHCS	NOAPS and UHC	UHCS	UOAPS
0 (New born)	244.64	180.78	180.73	-78.21	-16.66
5	247.73	184.43	184.14	-77.81	-19.48
10	244.19	182.55	181.77	-76.19	-23.30
15	240.56	179.84	178.03	-75.77	-29.37
20	233.52	176.15	172.51	-73.62	-38.16
25	230.59	179.58	173.72	-68.65	-39.92
30	211.23	168.18	158.56	-63.61	-45.80
35	187.70	155.01	139.49	-58.11	-53.37
40	158.98	139.77	115.09	-52.70	-62.63
45	122.66	120.24	81.05	-49.22	-76.60
50	76.78	101.42	38.60	-44.65	-98.87
55	12.48	81.10	-21.57	-39.42	-139.14
60	-80.01	59.04	-108.82	-33.11	-204.75
65	-80.13	39.73	-104.51	-27.89	-182.47
70	-77.31	22.02	-97.15	-22.61	-156.36
75	-70.95	10.37	-86.61	-17.75	-130.68
80	-68.56	3.91	-80.47	-13.43	-109.62
85	-59.79	-4.50	-67.82	-8.99	-81.23
90	-18.50	-0.63	-20.48	-2.20	-23.13

# GA – expected reforms

Generation's age in 2004-05	Per capita net payment (INR in 000)		
	UOAPS	UHCS	NOAPS and UHC
Net payment of future generation (INR in 000)	198.71	200.64	202.33
Generational imbalance (%)	-18.78	10.98	11.95
Sustainability gap (%)	-7.28	-3.43	-3.36

## Main results – Expected reforms

- Generational implications of the expected reforms are not neutral across ages and between current and future generations.
- Current fiscal policy is sustainable under the expected reform on UOAPS (because, the value of generational imbalance is negative if UOAPS is introduced separately but not jointly with UHCP).
- Current fiscal policy is not sustainable under the expected reform on UHCP (because, the value of generational imbalance is positive if UHCP is introduced separately or jointly with UOAPS).

# Sources of GI

Generational indicators	Baseline	Zero debt scenario				No demographic transition scenario			
		Baseline	UOAPS	UHCP	UOAPS & UHCP	Baseline	UOAPS	UHCP	UOAPS & UHCP
Generational imbalance (%)	-19.48	-19.8	-19.09	10.55	11.52	-21.16	-24.72	-0.32	1.93
Sustainability gap (%)	-7.35	-7.38	-7.32	-3.46	-3.39	-5.93	-5.85	-2.67	-2.59
Per capita net payment of future generation (INR)	197.02	196.24	197.93	199.86	202.55	104.12	105.18	105.6	106.66

## Main results – Sources of GI

- Sources of GI are traced to net debt and demographic transition –Sustainability is determined by current policies and expected reforms
- Current fiscal policies and expected reform on UOAPS are sustainable under both the sources of GI. This is consistent with the results on expected reforms when net debt and demographic transition are present.
- Expected reform on UHCP is sustainable under both the sources of GI. This is a new result as compared to results on expected reforms when net debt and demographic transition are present.
- Simultaneous introduction of UOAPS and UHCP is not justifiable on sustainability grounds by all sources of GI.

## Major conclusions and implications

- India's current fiscal policies are sustainable in the context of population ageing. This result is robust because sustainability is preserved by changes in productivity growth rates (3% to 4.5%) and discount rates (10% to 14%) or by sources of generational imbalance.
- Current fiscal policies are not sustainable under all expected reforms. If introduced separately, NOAPS is sustainable and UHCP is unsustainable.
- Expected reforms may not result in sustainability if both UOAPS and UHCP are introduced simultaneously.
- Thus, in general, policy makers may be selective in introducing the expected reforms to ensure sustainability of current fiscal policies.
- Given that India's demographic transition and population ageing are distinguishable by States, sustainability of State level fiscal policies in the context of population ageing may be explored in future by using GA.

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