

Building knowledge base on
Population Ageing in India

Series II, Working Paper-6



Public Expenditure Requirements and Financing Options for a National Level Universal Old Age Pension Scheme in India

M.R. Narayana



Editor's Note

Dear readers,

In most countries of the world, including India, population ageing is likely to become a serious policy and programmatic issue in the coming decades. UNFPA in collaboration with the Institute of Social and Economic Change, Bangalore, the Institute of Economic Growth, Delhi and Tata Institute of Social Science, Mumbai has launched a major research project to build a knowledge base on population ageing in India (BKPAI). The study focuses on social, economic, health and psychological aspects of elderly. This peer reviewed publication is second in the series of working papers based on the data gathered from seven Indian states. We are sure that the findings of this publication will help in generating a healthy debate and policy response amongst a wider cross-section of scholars, professionals, policy makers and civil society.

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LIST OF ABBREVIATIONS

Abbreviation	Expansion of abbreviation
AHHE	Average household expenditure
APL	Above-Poverty-Line
APRO	Asia and the Pacific Regional Office
BPL	Below-Poverty-Line
GDP	Gross Domestic Product
GPFCE	Government final consumption expenditure
GA	Generational Accounting
GI	Generational Imbalance
IGNOAPS	Indira Gandhi National Old Age Pension Scheme
IHDS	India Human Development Survey
INR	Indian Rupee
NCEUS	National Commission for Enterprises in Unorganised Sector
NTA	National Transfer Accounts
NPS	National Pension Scheme
PFDRAI	Pension Fund Development and Regulatory Authority of India
PORB	Pension and other retirement benefits
PFCE	Private final consumption expenditure
SCST	Schedules Caste or Scheduled Tribe
RBI	Reserve Bank of India
ROW	Rest of world
RHS	Right hand side
UNFPA	United Nations Fund for Population Activities
UOAPS	Universal Old Age Pension Scheme

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ABSTRACT

Indira Gandhi National Old Age Pension Scheme (IGNOAPS) is the current social (or civilian) old age pension scheme, public-funded and implemented since 1995 in India. This Scheme lacks universal coverage for reasons including inadequate public resources, availability of pension for schemes for government employees and other workers in other organized sector and exclusion-clauses built-in the scheme. In addition to providing with income or broader social security for elderly individuals, the IGNOAPS is distributive-oriented as it is targeted for elderly individuals belonging to the Below-the-Poverty Line families. In this context, this paper examines the economic arguments and implications of introducing a national level universal old age pension scheme (UOAPS) in India. A key economic argument for a UOAPS is based on poverty-reducing effects of IGNOAPS. Evidence for this argument is given by developing and estimating a probabilistic model of elderly poverty at individual level with benefits of IGNOAPS as one of the explanatory variables. Two expenditure scenarios of UOAPS are generated: first, by extending the IGNOAPS to all elderly individuals; and second, by applying the Pension Parishad's pension proposal to all elderly individuals. Financial requirements for introducing these UOAPS scenarios are calculated for the short term, from 2004-05 through 2013-14, with and without adjustments to (a) total personal income of elderly individuals, (b) annual inflation, (c) official poverty line and (d) income elasticity of public expenditures on pensions. In addition, a measure of net public expenditure is calculated by adjusting the pension expenditure to the tax payments by elderly individuals by applying the methodology of National Transfer Accounts. Long term sustainability of the IGNOAPS and two scenarios of UOAPS are examined by applying the methodology of Generational Accounting as India's population is projected to age over the period up to 2100.

Main result of the analyses shows that the current old age pension scheme has poverty-reducing effect. This provides with a strong distributive justification and demand for the universal coverage of the current IGNOAPS or introduction of a new UOAPS. Public expenditure requirements for introduction of the proposed UOAPS are remarkably higher as compared to the current expenditure on the IGNOAPS. The expenditure is much (a) lower if adjusted for total personal income and tax payments of elderly individuals and (b) higher if adjusted for the official poverty-line, annual inflation and income elasticity of public expenditure. These results show different public expenditure implications and financing options by general taxation for a public-funded UOAPS for the policy makers. Further, the IGNOAPS as well as the UOAPS scenarios are fiscally sustainable in the long run for a given common range of income elasticity of public expenditure on the pension. These results imply that the demands for the UOAPS policy scenarios are strongly justifiable on distributive ground and long term fiscal sustainability.

Given different exclusionary clauses for the IGNOAPS, a redefinition of universality for provisioning of old age pension may be desirable for India. For instance, one plausible redefinition of universality may be to limit old age pensions for elderly individuals who belong to the BPL families, earn less than cutoff personal income, non-payers of personal income tax, and non-recipients of pension in government and other organized sectors, In essence, this redefinition of universality targets the beneficiaries of old age pension. If implemented, this redefinition of universality may ensure old age pension to all the targeted elderly individuals and, other things being equal may ensure fiscal sustainability. Such an approach may be called targeted and sustainable universal old age pension scheme for India.

The approach, results and implications of this paper add to the existing empirical knowledge on India's current policy debates on design of a public-funded UOAPS. The design parameters include (a) identification of target population in terms of socio-economic exclusion clauses, access age and unit of entitlement, (b) determination of pension amount or benefit level and indexation for inflation and (c) conditions for fiscal sustainability of alternative UOAPS.

1. Introduction

Traditionally, economic dependency of India's elderly had been largely supported by family members (e.g. son, daughter and spouse) and partially by own asset incomes and savings. This is evident in different rounds of National Sample Survey on socio-economic profiles of aged in 1987-88, 1993-94, 1995-96 and 2004, and UNFPA (2012). Nevertheless, a decline in family support to elderly is legally recognized by the introduction of Maintenance and Welfare of Parents and Senior Citizens Act, 2007. Every senior citizen (aged 60+)/parent/grandparent, who is unable to maintain himself/herself from his/her own income, can claim maintenance from his children through the Maintenance Tribunals up to INR10000 per month. Further, abandonment of a senior citizen is punishable with imprisonment up to 3 months or fine up to INR5000 or both. In addition, there has been a growing demand for old age pension as a form of public old age support system to provide elderly population with income and consumption security.¹

India's public support or expenditure on old age pensions is of two types: (a) pension and retirement benefits to government employees and (b) old age pension for civilians under the Indira Gandhi National Old Age Pension Scheme (IGNOAPS). At present, elderly individuals aged 60 and above are eligible for the IGNOAPS. The extent of benefit per month per elderly individual is INR200 for those in the age group of 60-79 years and INR500 for those at age 80 years and above. However, public debates on the coverage and amount of civilian old age pension are not new in India. Way back in 2005, the National Commission for Enterprises in the Unorganized Sector (NCEUS) had recommended for the monthly old age pension of INR200 per month to all poor (or Below the Poverty Line or BPL families) unorganized workers aged 60 years and above. The Report of the Working Group on Social Security for Twelfth Five Year Plan 2012-2017 [Planning Commission of India (2012a)] has reiterated, among others, the need for old age income security as one of the elements of social security arrangement for India's unorganized workers, now accounting for 94 percent of India's total labour force (about 488 million). Most recently, the Pension Parishad, a non-governmental initiative to ensure universal, publicly funded, non-means related and non-contributory pension called for a uniform amount of INR2000 per person per month to all eligible citizens in the pensionable ages: 55 years for men; 50 years for women; and 45 years for highly vulnerable groups (such as, tribal groups, transgender, women compelled to become sex workers, and persons with disabilities). About 100 million people are expected beneficiaries of this proposed scheme. The number of beneficiaries is reduced to 80 million, if the income-tax payers are excluded and the benefit is extended to all at 60+. ² Apparently, other things being equal, cost of the proposed pension scheme by the Pension Parishad is ten times bigger than by the NCEUS. Surprisingly, policy makers are not sure of the current and long term fiscal implications of the above pension proposals. If quantified, however, such implications may be of current policy use and public importance.

Interestingly, poverty and old age pension is closely linked because one of the eligibility criteria for the IGNOAPS is elderly individuals should belong to a Below-the-Poverty Line (BPL) family. From this perspective, the old age pension is considerable as an instrument for poverty alleviation among the elderly individuals, provided there exists an empirical evidence that old age pension is not only for poor but also has a poverty-reducing effect. Such empirical evidence may reinforce the distributive aspects of old age pensions and provides a strong case for distribution-oriented public policy on universalization of old age pension scheme in India.

¹ The public opinion in favour of old age pension in general, and universal old age pension in particular, is evident in many newspaper articles. See, for instance, Patnaik (2012), Narayana (2012a and 2012b) and Dreze (2013).

² For details, see Pension Parishad's website: <http://pensionparishad.org/> (accessed on 20 October 2015).

Nevertheless, studies on India's poverty among elderly do not relate old age pensions with poverty or studies on old age pension do not relate the pensions with poverty. This research gap is evident in the studies on poverty among the elderly and old age pensions, such as, Pal and Palacios (2006), Pandey (2009), Srivastava and Mohanty (2012), and Chopra and Pudusery (2014). For instance, using the 52nd Round National Sample Survey (NSS) data on household consumption expenditure in 1995-96, Pal and Palacios (2006) estimated the poverty among the elderly (in terms of head-count ratio by using official state level poverty line) by household level and individual levels for rural areas in 15 states of India. The results showed that households with elderly (+60 years) were less poor than households without elderly. Further, adjusting for equivalence scale and size economies of scale, the head count ratio implied that households with elderly (in age group of 60-74 years) were less poor than with older elderly (+75 years). Pandey (2009) used the 58th Round NSS data on household consumption expenditure in 2002 to measure poverty among elderly and showed that poverty among the disabled elderly was higher than among non-disabled. Srivastava and Mohanty (2012) used the 61st Round NSS on household consumption expenditure data and the official poverty line in 2004-05 to estimate the incidence of poverty between elderly and non-elderly households. The basic estimates showed that 18 million elderly lived below the poverty line. In addition, determinants of poverty among elderly were estimated by using the logistic regression models. Key determinants of elderly poverty, when poverty was unadjusted for household composition and size, included age, educational attainment, social group, number of elderly in household and type of household (i.e. elderly living alone or with other elderly and elderly living with other non-elderly). If adjusted for household size and composition, age was found to be insignificant determinant of elderly poverty in both rural and urban areas and incidence of poverty showed no significant difference between the elderly and non-elderly households or economic deprivation was similar between elderly and non-elderly households. Chopra and Pudusery (2014) study included the field level insights into working of old age pension from a random sample of 432 beneficiaries of social assistance programmes in 2013 from the two districts of Chhattisgarh and Rajasthan. The survey results showed that about 93 per cent of pension was spent on food, 88 per cent on other subsistence needs and 85 per cent on healthcare. This signified the importance of pension for meeting with the consumption needs of elderly individuals.

Outside India, studies on impact of old age social pension on elderly poverty are few and include a study by Kakwani et.al. (2008) for Kenya and Bei Lu et.al. (2014) for China. Kankwani et. al. focused on the cost and impact of a non-contributory social pension. Cost per pension beneficiary is calculated in three alternative scenario: 20 percent, 35 percent and 50 percent of GDP and their impact on reducing poverty in rural and urban areas is calculated among persons who are 55 years or older and 60 years and older. The results showed that targeting elderly at 60 years and older with a benefit level of 20 percent of per capita GDP would cost 0.98 percent of GDP and poverty incidence would be reduced by about 18 percent among the elderly. Thus, the study recommended for this pension system as a feasible option. Bei Lu et.al. calculated the revenue cost of a universal and non-contributory social pension scheme for China's elderly individuals (age 60 years and above) who are rural and non-employee urban residents and uncovered by a formal pension. The proposed pension scheme is adjusted for the official poverty line. Total cost of a social pension each year is the number of pensioners times the benefit, defined by the poverty line and ensuring maintenance of poverty alleviation. Dividing this by GDP, cost of a social pension scheme as a percentage of GDP is equal to the product of ratio of poverty line to per capita GDP and proportion of eligible pensioners in total population. Given the ratio of poverty line to per capita GDP, cost of a social pension scheme as a percentage of GDP can be varied by changes in proportion of eligible pensioners in total population (e.g, by changes in access age). The proposed social pension scheme is considered likely affordable if the cost is less than one percent of GDP. This is satisfied if the if the access age is at 60 in 2011, increasing to 62 by 2030, then 65 by 2050 with a constant benefit level of 6.6 percent of GDP per capita.

This paper argues that a public-funded old age pensions have important effects on elderly poverty and those effects are important to examine a distributive-oriented public or social policy on universal old age pension and to determine its fiscal sustainability under different policy scenarios. This argument raises several policy-related research questions, such as: How to measure poverty for elderly individuals? What is the nature and extent of poverty among elderly in India? How to explain and predict the impact of old age pension on elderly poverty? Is there a case for universal old age pension scheme to be based on poverty-reducing effects of the pension? If not, what are the selective economic needs for a universal old age pension scheme? What are social benefits and public costs of such pension schemes? How can the schemes be publicly financed through fiscal instruments? What are the implications of a universal and non-universal old pension scheme on fiscal sustainability? Plausible answers to these questions are not available in the existing literature on the old age social security in India [e.g. Rajan and Prasad (2008)]. Thus, the main objective of this paper is to find plausible answers to these questions by relating poverty among elderly with old age pension and to argue for a national level universal old age pension scheme for India which is fiscally sustainable in the long run.

It might be added that studies on India's fiscal sustainability have focused on fiscal stability (i.e. targeted reduction in fiscal deficit as a percentage of GDP) and debt sustainability (i.e. targeted reduction in debt/GDP ratio to an initial level) without reference to population ageing and without including the impact of public support systems (e.g. public old age pension schemes) [Olekalns and Cashin (2000)]. Notable exceptions are Narayana (2012c) and Narayana (2014). For instance, using the methodology of the National Transfer Accounts and Budget Forecasting Model, Narayana (2012c) analyzed the impact of population ageing on India's public finance and showed that population ageing would not have unsustainable and adverse impact on overall public finance in India in the long run due to an increasing total budget surplus and fiscal support ratio over the period up to 2050. Narayana (2014) combined the methodology of National Transfer Accounts and Generational Accounting and offered evidence for sustainability of current fiscal policies in the context of an expected reform on a universal old age pension. This paper adds to this empirical knowledge by (a) distinguishing the issues of public expenditure and financing of old age pensions between short and long terms, (b) widening the policy options by adjusting for the different scenarios of public expenditure on old age pensions for inflation and income elasticity, and (c) empirically justifying a case for universal old age pension scheme due to the poverty-reducing effects of old age pensions and (d) examining the long term and distributive (or generational welfare)- oriented fiscal sustainability of universal old age pension proposals and their financing options as India's population ages.

This paper examines the economic arguments and implications of introducing a national level universal old age pension scheme (UOAPS) in India. A key economic argument for a UOAPS is based on poverty-reducing effects of IGNOAPS. Evidence for this argument is given by developing and estimating a probabilistic model of elderly poverty at individual level with benefits of IGNOAPS as one of the explanatory variables. Two scenarios (or expenditure options) of UOAPS are generated: first, by extending the IGNOAPS to all elderly individuals; and second, by applying the Pension Parishad's pension proposal to all elderly individuals. Financial requirements for introducing these UOAPS scenarios are calculated for the short term, from 2004-05 through 2013-14, with and without adjustments to the official poverty-line, annual inflation and income elasticity of public expenditures on pensions. In addition, a measure of net public expenditure is calculated by adjusting the pension expenditure to the tax payments by elderly individuals by applying the methodology of National Transfer Accounts. Long term sustainability of the IGNOAPS and two scenarios of UOAPS are examined by applying the methodology of Generational Accounting as India experiences population ageing over the period up to 2100.

Section 2 gives some basic numbers of public expenditure on old age pension schemes in India. Section 3 describes the nature and extent of elderly poverty in India. A probabilistic model of determinants of elderly poverty including old age pension is developed and estimated in section 4. A case for universal old age pension is argued and public expenditure requirements are calculated in section 5. Short term calculation of public cost and public financing options of universal pension schemes are presented in section 6. Long term issues in public financing of old age pension schemes with reference to fiscal sustainability of different old age pension scenarios are analyzed in section 7. Conclusions and implications are summarized in section 8.

2. INDIA'S PUBLIC EXPENDITURE ON OLD AGE PENSION

India's public expenditure on old age pensions is of two types. First, pension and retirement benefits to government employees and workers in private organized and unorganized sectors.³ Second, old age pension for civilians under the Indira Gandhi National Old Age Pension Scheme (IGNOAPS).⁴

India's pension system for government employees was dominated by Defined Benefit Scheme up to 2013. An important policy change in India's pension system took place on 1st January 2004 with the introduction of National Pension Scheme (NPS) as a defined contributory pension system for the new Central and State government employees (excluding armed forces). The Pension Fund Development and Regulatory Authority of India [PFDRAI (2014a)] gives information on five models of the NPS.⁵ (i) All Citizens' Model for persons in the age group 18-60 years. (ii) Central Government Sector Model for all new employees of the Central Government and Central Autonomous Bodies from 1st January 2004. (iii) State Government Sector model for all new employees of the State Government and State Autonomous Bodies as and when the concerned State government implements the NPS.⁶ (iv) Corporate Model for persons in the age group of 18-60 years and employed in a corporate entity or entities which are registered under one or more of the following: Companies Act, Co-operative Acts, Central and State Public Sector Enterprises, Partnership firms (including Limited Liability Partnership), Trust and Society. (v) Swavalamban Scheme for persons in the age group of 18-60 years and in the unorganized sector (i.e. persons not covered by a social security scheme under different labour acts including Employees' Provident Fund and Miscellaneous Provisions Act, 1952). As on 7th August 2014, total subscribers to the NPS schemes was 0.711 crore with a total corpus of INR 58523 crore.⁷ Of the total subscribers (or corpus), the share of the Central Government is 19.64 (or 48.15) percent, 30.52 (or 43.27) percent is of State Government, 5.26 (or 6.67) percent is of Private Sector and 44.58 (or 1.91) is the combined share of All Citizens' Model and Swavalamban scheme. However, no information on age distribution of the number of subscribers or amount of corpus by the above five models is available in public domain.

The civilian pension scheme, as a form of cash transfer programme, was introduced by the Government of

³ India's pension for government employees and organized sector workers are governed by different departments. First, the Department of Pension & Pensioners' Welfare is for pension and other retirement benefits of Central Government employees who joined before January 1, 2004 and the Ministry of Finance (Department of Financial Services) for those who joined after January 1, 2004. Second, the pensioners of Ministries of Railways and Defence are governed by their respective departments' pension rules. Ministry of Labour deals with the organized employees working in the establishments covered under the Employees Provident Fund Scheme. These diversities in governance indicate the multiplicity of policies for pensions in public and organized private sectors in India.

⁴ Public expenditure on old age pension is one of the public support systems in India. Other systems include public assistance for maintenance of old age homes and various social welfare programmes of the Central and State governments in which elderly are also beneficiaries. A summary of these social security measures is documented in Annexure to Chapter 9 in UNFPA (2012).

⁵ India's Pension Fund Development and Regulatory Authority [PFDRAI] has come into being with the enactment of its Act in 2013 although an interim Authority was established in August 2003. An important objective of the Authority is to promote old age income security by establishing, developing and regulating the pension funds for persons in the age group of 18-60.

⁶ As on 31 December 2014, 26 of the 29 states have adopted the NPS. The non-adopted states are Telangana (newest state and earlier part of Andhra Pradesh), Tripura and West Bengal.

⁷ Crore is a unit of measurement in India. One crore is equal to 10 million. Corpus refers to total amount of money invested by all investors in a pension scheme.

India's Ministry of Rural Development in 1995 as National Old Age Pension Scheme for destitute individuals above age 65 with no means of livelihood and the pension amount was INR75 per individual per month.⁸ The Scheme has been renamed as IGNOAPS since November 2007. Since April 2011, the Scheme has been modified in terms of eligibility criteria and amount of pension for the purposes of claiming the Additional Central Assistance.⁹ The modified eligibility criteria include age of applicant to be 60 years and above and belonging to a Below-the-Poverty Line (BPL) household. The criteria for identification of BPL families are discussed in section 3.1 below. The modified amount of pension is equal to INR200 per individual per month in the age group of 60-79 and INR500 per individual per month for 80 years and above. Since inception, the Scheme is uniformly applied for elderly men and women.

The State governments may give a matching amount or more to the amount of the Central Assistance for each beneficiary-elderly individual. For instance, the Karnataka government's old age pension scheme (called Sandhya Suraksha) provides a supplementary financial assistance of Rs 300 for beneficiaries of the IGNOAPS in the age group 65-80. A more generous supplementary pension schemes is implemented by states, such as, Delhi, Goa and Chandigarh. Further, unlike Andhra Pradesh, Himachal Pradesh Madhya Pradesh and Odisha, Karnataka does not provide old age pension for the eligible elderly in the age group 60-64. Consequently, India's targeted, public-funded and non-contributory old age pension schemes are characterized by non-universality.¹⁰

Over the years, the population coverage of the IGNOAPS has increased. According to the latest figures published by the Government of India (2014), total number of sanctioned beneficiaries of the IGNOAPS is equal to about 1.5 crore persons below the age of 80 and 0.20 crore at age 80 and above. Using the age distribution of population by single years from the Census of India 2011, total beneficiaries is equal to 15.56 percent of total elderly population in the age group 60-80 and 27.17 percent of elderly population in the age group of 80 years and above. Overall, 16.40 percent of India's elderly (at age 60 years and above) are covered by the IGNOAPS.¹¹ The low population coverage of IGNOAPS is attributable to many factors including limitation of public resources, availability of pension schemes for government employees and other organized sector workers, and built-in exclusion-clauses of the scheme including targeting the beneficiaries who belong to the BPL families.

Table 1 summarizes the combined public expenditure on old age pension schemes by Central and State Governments over the period 1995-96 to 2013-14. It shows the trends in size and growth of public expenditure on pension and other retirement benefits and IGNOAPS for India from 1994-95 to 2013-14. All expenditures are measured at current prices and are intended to show the level of public commitment to different old age pensions and the lower commitment for the IGNOAPS. Expenditure by two schemes is focused: (i) pension and other retirement benefits (PORB) and (ii) IGNOAPS. Broadly, PORB are payments to retired (a) Central and

⁸ The concerned State Government (generally, through the Department of Social Welfare) does identification of beneficiaries, sanction of pensions and disbursement of pensions.

⁹ These modifications are notified in the Office Memorandum (No. J-11015/1/2011-NSAP, dated 30 June 2011) by the Ministry of Rural Development, Government of India (New Delhi) on the subject: *Modification of the eligibility criteria for Central Assistance under the Indira Gandhi National Old Age Pension Scheme (IGNOAPS)*.

¹⁰ Details of national and state level pension schemes are well documented in different sources including the following. First, Government of India (2013) gives details of current physical coverage of social security pensions under National Social Assistance Programme (NSAP) and State Schemes in major 22 States/UT s. Second, Annexure to Chapter 9 in UNFPA (2012) gives a brief summary of the Central and State Government Social Security Schemes for Elderly in India. Third, Help Age India (2009) gives details of schemes of old age pension and their eligibility and amount by 17 states and 1 UT. Fourth, Rajan and Mathew (2008) provides with details of social assistance for elderly in India with special reference to NSAP for elderly. This information includes old age pension schemes of the States and UTs by their year of implementation, amount of pension and stipulated age of eligibility. We tried to update the above available information on State/UT level pension schemes for all the other states and UTs. Except for Karnataka, the required information was not directly available from official websites of the respective state/UT governments. Most recently, the Department of Rural Development (NSAP Division), Government of India, has started for collection of the above information through the letter (No.L- I 101 410612015-NSAP, dated 21 July 2015) sent to all the states/UTs for sending information on amount of pension paid by the State/UTs Governments in addition to amount paid under NSAP. If published, this information will be useful to update current public expenditure of social security pensions under NSAP and State Schemes in all the States/UT s.

¹¹ In addition, Government of India (2014) gives data on number of new applicants for the IGNOAPS. These new applicants constituted 0.47 (or 0.49) percent of elderly population in the age group 60-80 years (or 80 years and above).

State government employees including Department of Telecommunications and medical treatment of Central Government Health Scheme pensioners and (b) defense personnel. Over the years, total public expenditure on the PORB has been increasing and was budgeted INR233605 crore in 2013-14. Consequently, annual growth rate of PORB has been positive throughout. In contrast, public expenditure on IGNOAPS has varied over the years. For instance, the annual growth rate of IGNOAPS was 71 percent in 1996-97, 109 percent in 2005-06 and 0.13 percent in 2009-10. The growth rate was negative for years: 1996-97, 1997-98, 1999-00 and 2002-03.¹² Throughout, expenditure on PORB has been less than 8 percent of total public expenditure, less than 10 percent of total revenue expenditure and less than 3 percent of GDP. In contrast, expenditure on IGNOAPS has been less than 1 percent of total public expenditure, total revenue expenditure and GDP. Further, up to 2005-06, the size of public expenditure on PORB was bigger than IGNOAPS by about 2 times and, subsequently, by about 4 times. Consequently, the share of old age pension expenditure for civilians has been very low in India's public expenditure and GDP.

The amount of pension per month per elderly individuals under the IGNOAPS remained at INR75 up to 2006-07 and increased to INR200 for age group 60-79 years and INR500 for age 80 years and above from 2007-08. During this period, the rate of inflation was positive and varied across the years. Thus, other things being equal, the real pension amount must have declined over the years. This is shown in Figure 1 where the real pension amount is calculated net of inflation (or changes in Wholesale Price Index for food items at constant or 2004-05 prices) and compared with nominal pension amount. In essence, the comparison reveals a remarkable decline in real pension amount over the period, 1994-94 to 2013-14. For instance, the real pension amount for elderly individuals at age 80 years above had declined from INR403 in 2007-08 to INR197 in 2013-14.

3. NATURE AND EXTENT OF ELDERLY POVERTY

6

3.1. Measurement of elderly poverty

India's official poverty line is defined by per capita monthly consumption expenditure of households and estimated by the Planning Commission by rural and urban distinctions and by states. For instance, over last 15 years, these official estimates of poverty line are available for 1999-00, 2004-05 and 2009-10. The poverty line and estimate of population below the poverty line is non-age specific. On the other hand, Government of India's Department of Rural Development (in coordination with the State Governments) uses multiple indicators to identify BPL families.¹³ Thus, BPL is a household and not an individual measure of poverty. A family or household with a BPL card is eligible for, among other, subsidized foodgrains through the Public Distribution System. Elderly individuals in BPL families are eligible to receive IGNOAPS and benefits from other social assistance programmes. It is important to note that the official poverty line does not certify for poverty of a person (i.e. being below the poverty line). In contrast, BPL card is a formal or official document to identify a poor person (i.e. belong to a BPL family). Thus, in this paper, an elderly person is considered poor if he/she belongs to a BPL family. Accordingly, poverty among elderly is described and analyzed.

Poverty among the elderly are diversified. These diversities include income (i.e. by holders of BPL/APL/

¹² Negative growth rate may be attributable to non-timely disbursement (e.g. once in 6 months rather than every month) and delay in identification of beneficiaries and sanction of pension benefits. These problems are accounted for bureaucratic procedures and high collection costs by Dreze (2013) based on the field insights on the working of the IGNOAPS in 10 states in India.

¹³ This identification is by using 13 socio-economic indicators to capture the multi-dimensional aspects of identifying the rural poor. The detailed methodology for identification of BPL families by inclusion and exclusion criteria is available in Government of India (2009). Chapter II in Planning Commission (2012b) provides a comparative description of the Planning Commission and Ministry of Rural Development approaches to official poverty estimations.

Anthodaya card holders);¹⁴ sources of income [i.e. labour income (due to elderly work participation rate), asset income (as people accumulate assets at older age and retain their asset ownership), pension from organized sector's working and/or– income from savings]; gender [i.e. male and female, female with widowhood]; social categories [i.e. Scheduled Caste or Tribe (SCST) and others],¹⁵ regional [i.e. rural and urban and interstate differences], types of family [i.e. nuclear or extended, and single or co-resident] and by age distribution [i.e. up to 80 years and above]. In what follows, the description of nature and extent of elderly poverty by holders of different ration cards (i.e. BPL, APL and Anthodaya) is limited to few of the above diversities.

3.2. Database

The main database for the descriptions and analyses of elderly poverty is the UNFPA-sponsored sample survey on the Status of Elderly in Select States of India, 2011. This sample survey was conducted in March-April 2011. The sample size comprised 8329 elderly households (i.e. having at least one elderly member aged 60+) or 9852 elderly individuals in seven states (Himachal Pradesh, Kerala, Maharashtra, Odisha, Punjab, Tamil Nadu and West Bengal) in May-September 2011. These sample states were selected as they had a higher percentage of elderly population than the national average. The sample design, survey instruments and sampling errors are given in UNFPA (2013). Throughout, we consider this sample as nationally representative although the coverage is not inclusive of all states in India.

3.3. Extent and disaggregation of elderly poverty

Table 2 shows the size and distribution of elderly households by holders of different ration cards in rural and urban areas. In general, about 93 (or 95) per cent of household in rural (or urban) areas can be considered poor as they hold one of three types of ration card. In short, not all elderly individuals belong to BPL families or not all BPL family elders are beneficiaries of the IGNOAPS. Within the poor households, BPL and Anthodaya card holding households are highest in both rural and urban areas. Further, it is important to note that elderly poverty is not remarkable different between rural and urban areas. This fact may support for pooling of rural and urban data for estimation of determinants of poverty in section 4.

3.4. Old age pension and elderly poverty

Indira Gandhi National Old Age Pension Scheme (IGNOAPS) and Annapurna scheme are public benefits to poorest (i.e. holders of BPL and Anthodaya cards) elderly individuals. Annapurna Scheme was introduced in 2000-01 as a measure of food security. Under this Scheme, all eligible but not recipients of the IGNOAPS are entitled to receive 10 kg of foodgrains per month free of cost. The effectiveness of these schemes depends, among others, on the awareness and utilization of the schemes by these poorest elderly individuals. This is captured in Table 3 by distinguishing the awareness and utilization of the schemes between BPL and APL card holding elderly individuals and disaggregating them by male and female categories and rural and

¹⁴ BPL (or APL) refers to Below-the-Poverty Line (or Above the Poverty Line). As noted earlier, BPL or APL families are identified by the State governments by using a set of criteria. For instance, with effect from 24 August 2012, the Department of Food and Civil Supplies of Government of Karnataka has prescribed a 15-point eligibility criteria for issuing the cards meant for poor families. These criteria refer to families with no (i) income tax payee, (ii) vehicle (except auto drivers and owners) with a capacity of more than 100 cc, (iii) government employees, (d) staff of State-held public sector enterprises, boards and corporations, autonomous institutions, (iv) permanent workers of co-operative bodies, (v) professionals, including lawyers, hospital workers and (vi) employees of MNCs and big industries (vii) legislators, (viii) rental incomes from buildings, (ix) traders (barring those selling vegetables and push-cart/roadside vendors and those operating petty shops), (x) more than seven and half acres of dry land or an equivalent extent of wetland; (xi) employees of aided/unaided schools (barring those of unaided Kannada schools), (xii) registered contractors, APMC traders/commission agents and dealers of seeds and fertilizers, (xiii) more than 3 hectares of dray or equivalent irrigated land, and (xiv) those families whose average monthly electricity bills exceed Rs. 450. Non-BPL families are eligible for APL cards. These details are available at http://ahara.kar.nic.in/Tenders/BPL_Criteria.pdf (accessed on 23 January 2015). On the other hand, Anthodaya card is issued for beneficiaries of Anthodaya Anna Yojana, started in 1999-00. It is a food security programme targeted for the poorest among the BPL families. Food entitlement is equal to 25 kg of foodgrains at subsidized price.

¹⁵ SCST are socially disadvantaged group of society. Persons belonging to these groups are promoted by national and sub-national policies and programmes for their educational and social development and employment opportunities.

urban locations. The disaggregation highlights the diversities in the sample. In general, the gap between awareness and utilization is remarkable by all disaggregation.¹⁶ Both awareness and utilization are higher for BPL card holding men in urban areas. This is in contrast with the awareness for the APL card holding elderly individuals. In addition, utilization is higher for men than women in rural areas due to higher awareness of the schemes among the rural men as compared to the rural women.

Further disaggregation of awareness of IGNOAPS and Annapurna schemes are given in Table 4 for elderly individuals (or elderly household members) by age, marital status, education levels, employment, social categories and living arrangements. Overall, awareness of IGNOAPS (or Annapurna) scheme is above 70 (or below 50) per cent. In particular, awareness declines with age, and is lowest for those who had no schooling and for widows. Thus, there is scope for further promotion of awareness of the schemes among those elderly individuals with these socio-economic background characteristics. Other things being equal, increased awareness may lead to a higher utilization of the IGNOAPS and Annapurna schemes by the elderly household members.

4. DETERMINANTS OF ELDERLY POVERTY

4.1. The empirical model

Whether or not an elderly individual is poor in terms of holding a BPL or Anthodaya card is a qualitative response in the sample survey. This response can be quantified by the familiar dummy-endogenous variable and modeled in the framework of a Binary Logit model as follows.¹⁷

$$\ln [\pi_i / (1-\pi_i)] = \alpha + \beta_j V_{ji} + \varepsilon_i, \{j=1,2,\dots,J; i=1, 2, \dots, N\} \quad (1)$$

where \ln is the base of natural logarithms, π_i is the probability (defined by the standard Logistic distribution function) that an i -th elderly individual is poor, $(1-\pi_i)$ is the probability that an elderly individual is non-poor, V_{ji} is the j -th socio-economic background characteristic which influence the poverty of i -th elderly individual, ε is random disturbance term, and α and β_j are intercept and slope parameters respectively to be estimated. The model in (1) is inherently non-linear and, hence, estimated by the technique of non-linear maximum likelihood estimation.

Using the estimated parameters [denoted by asterisk (*)], the probability of poverty of i -th elderly individual is equal to:

$$\pi_i^* = \ln(Z_i^*) / \{1 + \ln(Z_i^*)\} \quad (2)$$

where Z_i^* is the estimated odds-ratio and is equal to $[\alpha^* + \beta_j^* \cdot V_{ji}]$. Next, the elasticity of probability by the j -th background variable is computable at its sample mean value $[A_j]$ as follows.

$$\eta_j = A_j \cdot (1 - \pi_i^*) \cdot \beta_j^* \quad (3)$$

The elasticity is computed for each background variable in (1). If a background variable is measured by a dummy variable, then the elasticity shows the responsiveness of π_i^* to a discrete change in the variable from 0 to 1.

¹⁶ Awareness does not automatically translate into utilization due to official limitations on population coverage or lack of universality of the IGNOAPS.

¹⁷ A neat presentation on statistical assumptions and construction of Logit model is available, for instance, in Chapter 17 of Green (2011).

4.2. Variables and data descriptions

Variables used for estimations are summarized in Table 5. The data for measurement of these variables is the individual level data from the household sample survey in UNFPA (2012). Poverty is the dependent variable in all the estimation. Independent variables include socio-economic background variables (i.e. social caste, IGNOAPS, total personal income, personal income by business and farm incomes) and individual background characteristics (e.g. age, sex, and living conditions).

Key prediction of the estimation model is negative and significant coefficient on IGNOAPS. This prediction tests the main hypothesis of this paper, viz., old age pension has a poverty-reducing effect on elderly individuals in India. Robustness of this result is estimated by including other explanatory variables along with the IGNOAPS. These specifications are distinguished by estimation of different models.

Summary statistics of all variables used in the estimations are given by descriptive statistics in Table 6. The mean of the dummy variables is the proportion of the sample households having the value of dummy variables equal to 1. For instance, mean of poverty dummy variable shows that 37 per cent of elderly belong to BPL families and social caste dummy variable shows that 24.2 percent belong to SCST. Of the non-dummy variables, the highest variability in terms of standard deviation is evident for the income variable. The wide range of this variable is due to aggregation of different sources of personal income for elderly individuals and inclusion of non-working elderly women in the sample.¹⁸

4.3. Estimation results

Socio-economic and background variables

Table 7 presents the estimation results of seven models. Each model is distinguished by inclusion/exclusion of select socio-economic variables (i.e. social caste, total personal income and sources of personal income) and individual/household background characteristics (i.e. age and sex) along with the IGNOAP. The results are presented by the estimated intercept and slope coefficients and their asymptotic t-ratio.¹⁹ In addition, goodness of fit is presented by the Chi-square test.²⁰ Overall, the statistical results show that all the estimated coefficients are significant except business income variable. The Chi-square test is significant at 1 per cent level in all models.

Statistical theory of Binary Logit Model shows the link between the estimated slope (β^*) coefficients and the odds ratios. That is, other things being equal, exponent of estimated β^* or $\exp(\beta^*)$ is equal to the estimated odds ratio. For instance, the estimated coefficient of social caste dummy variable in Model 1.1 in Table 7 is equal to 0.337 and the odds ratio is equal to 1.400. This means that a SCST elderly is 1.4 time more likely to be below the BPL than a non-SCST elderly. Or, the probability of a SCST elderly to belong to a BPL family is 40 per cent higher than a non-SCST elderly. In general, as the value of an explanatory variable (x) is changed from 0 to 1 or incremented by a unit change, the odds and probability are the same if $\beta^*=0$ or $\exp(\beta^*)=1$; increase if $\beta^*>0$ or $\exp(\beta^*)>1$; and decrease if $\beta^*<0$ or $\exp(\beta^*)<1$. Thus, depending on the value and sign of β^* , the direction of changes in odds ratio and probability can be

¹⁸ In addition, simple correlation coefficients among the explanatory variables showed no higher correlations or indicated no presence of multicollinearity.

¹⁹ The t-ratio is the ratio of estimated value of beta coefficient to its standard error. We use this statistic to directly test whether the estimated coefficient is different from 0 at conventional levels of significance (1%, 5% or 10%).

²⁰ Other goodness of fit in binary logit model is different measures of pseudo R-square [see, for instance, Chapter 8 in Maddala and Lahiri (2009)]. However, there is no unanimity on the use of any particular measure in empirical analysis. Thus, throughout, we prefer to use the -square test as a measure of goodness of fit.

interpreted. This interpretation is followed in the analyses of results below.²¹

The key independent variable is IGNOAPS. This variable is included in all the estimation models to test the impact of IGNOAPS on poverty of elderly individuals. As predicted, the results show that the impact is negative and significant. The magnitude of the coefficient is comparable across the models. Thus, other things being the same, elderly individuals who receive IGNOAP have 0.473 times lesser odds to belong to the BPL families. This result offers a strong and unambiguous evidence for poverty alleviating effect of the old age pension in India.

In addition to the IGNOAPS variable, two other common variables included in all estimations are social caste and personal income. Social caste is included in the estimations to test whether elderly individuals who belong to socially disadvantageous groups (i.e. SCST) have higher poverty than others. The estimation results show that the estimated coefficient of social caste variables is positive and significant in all the estimations. Thus, other things being equal, elderly SCST individuals have about 1.40 times higher odds to belong to BPL families. On the other hand, total personal income is a measure of economic status and resources of elderly individuals. The estimated coefficient is negative and significant but the magnitude is relatively lower as compared to other variables. Thus, given other things, an increase in personal income is predicted to reduce poverty in terms of reduction in odds for elderly individuals in BPL families. However, if total personal income is decomposed by business and farm incomes, the impact of farm income is found to be significant and bigger than business income in reducing the odds in favour of belonging to a BPL family.

Age or age distribution of elderly individuals is included in the estimations to test for age effects on poverty of elderly individuals. In all the estimations, lesser odds are evident for elderly individuals above the age of 71. However, reduction in odds is highest for age group of 86-90.

It is important to note that age elasticity of probability is highest (-1.004 in Model 1.3 and -1.033 in Model 1.7).²²

The estimated coefficient on sex dummy variable is positive and significant. This implies that, other things being the same, male elderly individuals have about 0.22 higher odds for belonging to a BPL family. Thus, male and female distinction does matter for probability of an elderly individual for belonging to a BPL family.

Measurement of elasticity of individual slope coefficient at mean value of the explanatory variable is given in equation (3). The computed value of the elasticity shows the nature and magnitude of a change in probability of an elderly individual to belong to a BPL family for a change in the explanatory variable. Thus, other things being equal, the estimated probability (a) increases by about 5.2 per cent for elderly individuals who belong to SCST; (b) declines by about 0.8 per cent if an elderly individual receives the IGNOAPS; (c) declines as elderly become older. In particular, elasticity is sensitive to age and is highest if an elderly individual belong to age group 71-80 years. Further, changes in personal income have a remarkable impact on estimated probability across models. For instance, a rise in personal income by about INR100 reduces the probability by about 12.4 per cent in model 1.1 and by about 14 per cent in other models.

²¹ The odds ratios (and their standard errors) are not reported in Table 7 and Table 8 because their interpretations are implied by the estimated beta coefficients.

²² In addition, a standard specification of age variable was tried by including age and age-square in estimation model 1.3 and 1.7. In both the estimations, the estimated coefficient on age was negative and significant and that of age-square was positive and insignificant. This implied that poverty declines in early elderly ages and rises in later years. However, a better specification of age effects of poverty is included in estimation model 1.4 to 1.5 by estimating the coefficients of age distribution of elderly individuals.

Socio-economic and living arrangement variables

Table 8 extends the models in Table 7 by including variables relating to nature of employment (i.e. by public sector jobs, self-employed and informal jobs) and living arrangement (i.e. living with spouse/son/daughter). All estimated coefficients except for sex dummy variable in model 2.1 and model 2.2 and Chi-square statistics are significant at one percent level or more. The nature and magnitude of estimated coefficients are comparable between models in Table 7 and Table 8. This indicates the robustness of these results in models with different explanatory variables. However, the following analyses of results in Table 8 are focused on new explanatory variables.

Types of employment of elderly have a remarkable and different effect on poverty. For instance, the estimated coefficient on public sector job and self employed dummies are negative and significant. In fact, the coefficient on public sector job dummy is biggest in magnitude. In contrast, elderly poverty is positively associated with informal jobs because the estimated coefficient on informal job dummy is positive and significant. Thus, nature of employment does matter for elderly poverty in India.

Four living arrangement variables are included in the estimations (model 2.6 and model 2.7) to test whether a reduction in elderly poverty can be explained and predicted by the best person to live with when one is older. These results can be interpreted that probability of elderly poverty is higher if they live alone as compared to living with their spouse or children (son or daughter).²³

Overall, the estimation results in Table 7 and Table 8 indicate that poverty among elderly individuals may be determined by IGNOAPS with other socio-economic variables, individual background characteristics and living arrangement. Most importantly, in all the estimated models, the coefficient on IGNOAPS is negative and significant. This result offers an empirical support in favor of poverty reducing effects of the IGNOAPS and its continuity and strengthening in future as an instrument of poverty alleviation among elderly individuals in India.

5. CASE FOR A NATIONAL LEVEL UNIVERSAL OLD AGE PENSION SCHEME

Given the above strong evidence for poverty-reducing effects of old age pension, the distributive argument for the IGNOAPS is strengthened. In addition to declining family support for elderly, this provides with a basis for evidence-based policy argument for universalizing the old age pension in India. At present, India does not have a national level universal old pension scheme. In what follows, however, different schemes of universal old age pension for India are proposed and their financial implications in terms of public expenditure (or cost) and financing options are explored. This presumes that all pension expenditure are publicly funded or financed by public expenditures. Throughout, unless stated otherwise, all calculations and projections are based on The 2012 Revision (Medium Variant) of the UN Population Projections [United Nations (2013a)].

Two policy scenarios are presented to highlight the public costs and financing options of a national level

²³ Trial estimations did include household expenditure (HH) related variables (all measured by INR at current prices). First, denoted by AHHE(1) was the average expenditure of HH on food, intoxicants, fuel and transport (INR at current prices). Second, denoted by AHHE(2), was the average expenditure of HH on clothing, education, medicine, taxes, construction, durables, marriage and death (INR at current prices). Third, denoted by AHHFE was the average household expenditure on food items. Estimated coefficient on AHHE(2) was negative and significant. This result implies that expenditure on non-food items has a poverty-reducing effect of elderly individuals. This result was in contrast with the positive and significant coefficient on AHHE(1) and AHHFE. These results are not reported for problems in measurement of expenditure variables due to non-reported information. For instance, all the household expenditure variables had many zero values. That is, number of zero values was 20 for food items and 6006 for consumer durables.

universal old age pension scheme. The first scenario is the UOAPS (Baseline) scenario. Here, costs and financing options are calculated if the existing provisions and benefits of IGNOAPS by the Government of India are extended to all elderly individuals in the country. The second scenario is the UOAPS (Proposed) scenario where the public costs and financing options are calculated if the Pension Parishad's proposal of old age pension of INR2000 per month per individual is extended to all elderly individuals in the entire country. Throughout, these UOAPS proposals are compared with the existing IGNOAPS to single out the essential differences and unique similarities as they are related to the public costs and financing options.

In what follows below, the above cost and financing options are distinguished between the short term analysis by using actual data and long term analysis by using the methodology of Generational Accounting.

6. SHORT TERM TOTAL PUBLIC EXPENDITURE AND ITS FINANCING

6.1. Basic results

Table 9 gives the gross public expenditure requirements on the two schemes of UOAPS as compared to the current IGOAPS from 2004-05 to 2013-14. Three indicators of public expenditure requirements are used: amount of pension (INR at current prices), pension expenditure as a percentage of total revenue expenditure (or combined revenue expenditure of Central and State governments at current prices) and pension expenditure as a percentage of GDP (at current market prices). Expenditure on the IGNOAPS constitutes less than 0.4 percent of total revenue expenditure and ranges between 0.03 to 0.08 percent of GDP. In contrast, the public expenditure requirements for the Baseline and Proposed scenarios of UOAPS are remarkably higher. For instance, the public expenditure on the UOAPS (Baseline) scenario ranges between 3 to 1 percent of total revenue expenditure and 0.58 to 0.25 percent of GDP. On the other hand, the public expenditure requirements for the UOAPS (Proposed) scenario involves huge public expenditure in the range of 26 to 9 percent of total revenue expenditure and 6 to 2 percent of GDP over the period.

It is important to note that the ratio of public expenditure on UOAPS to total revenue expenditure and GDP declines over the period for two important reasons. First, pension payments to elderly individuals remain the same in each UOAPS scenario because they are unadjusted for annual inflation or other cost of living indices. Second, size of pension expenditure changes only due to the population ageing effects because the expenditure are unadjusted for income-elasticity of demand for pension expenditure. Consequently, given the increasing total revenue expenditure and GDP, the expenditure ratios show a decline over the years. In contrast, expenditure ratios on the IGNOAPS show the annual increase because of extended coverage of population and changes in pension amount (e.g. rise in pension amount to INR500 per month for elderly aged 80 years and above in 2011).

6.2. Introduction of exclusionary clauses

Calculation of public expenditure on the UOAPS (Proposed) scenario in Table 9 has no exclusionary clause except the age of beneficiary to be at 60 years and above. Thus, the proposed schemes include the (a) recipients of the government pensions and all other pensioners in the organized sector and (b) elderly

individuals with zero and positive total personal income.²⁴ These inclusions may overestimate the total public expenditure requirements for the UOAPS. From this point of view, public expenditure estimates for the UOAPS may be considered as an upper limit for public spending on the proposed UOAPS. However, the following analyses correct the pension expenditure by making the above adjustments separately and set a lower limit for public pension expenditure..

The sample survey on the Status of Elderly in Select States of India, 2011 [UNFPA (2013)], as described in section 3.2, includes useful information on sources of personal income of elderly individuals. Using this information, two alternative lower limits for public spending on the UOAPS (Proposed) scenario can be calculated.

First, about 11.4 percent of elderly have sourced their personal income from employer's pension from the government or others organized sectors. Excluding this percent of total elderly population, a lower limit on UOAPS is public spending on UOAPS for 88.6 percent of elderly population. Under the public spending on the UOAPS (Proposed) scenario in Table 9, this lower limit reduces the estimated expenditure by about INR21075 crore in 2004-05, INR23412 crore in 2008-09 and INR28139 crore in 2013-14.

Second, a more complicated calculation of lower limit is by distribution of personal income among the elderly individuals. For instance, 43.57 percent have no personal income. Among the elderly who have positive income, 34.71 percent have annual total personal income of less than or equal to INR12000, 14.24 percent have more than INR12000 but less than or equal to INR24000 and rest (52.29 percent) have more than INR24000. A formal measurement of inequality in the distribution of personal income among the elderly individuals is evident by the Lorenz curve is evident in Figure 2. This curve shows the relationship between the cumulative percentages of elderly population (vertical axis) and cumulative percentages of total personal income (horizontal axis). A line of perfect equality in the distribution of personal income implies equal cumulative percentage of income received by equal cumulative percentage of elderly individuals (e.g. 10 per cent of total personal income is received by 10 per cent of elderly individuals and so on). A curve of actual distribution of total personal income is called Lorenz curve. This shows what per cent of elderly individuals received what per cent of total personal income. The Lorenz curve in Figure 1 shows a greater degree of inequality because the curve is away from the line of perfect equality. Bottom 40 percent of elderly population have no income. About 0.43 percent of income is received by 50 percent of the population. Top 10 percent of the population receives 64.21 percent of total personal income.

Given this income inequality, a plausible approach for determination of a lower limit is to adjust the total public pension expenditure for a given distribution of total personal income. This is a form of means-tested old age pension scheme. For instance, a lower limit of public spending on UOAPS (Proposed) is the sum of amount eligible under a UOAPS minus the current total private income for each elderly individual, if his/her total personal is greater than zero but less than or equal to INR24000. A general computational formula for this expenditure under the UOAPS (Proposed) scenario is as follows. Public expenditure on UOAPS (Proposed) scenario = $\sum_{i=1}^N (24000 - Y_i) \geq 0$ if $Y_i \leq 24000$ for all i , where Y_i is total annual personal income of an elderly individual, INR24000 is the maximum annual universal old age pension payment per elderly individual under

²⁴ This inclusion is due to lack of annual data on number and age distribution of government pensioners and pension beneficiaries of organized sector. For instance, available data at Indiatat.com [http://www.indiatat.com/Searchresult.aspx (accessed on 20 January 2015)] is limited to number of State government pensioners in Mizoram (2001-02 to 2010-11) and Karnataka in 1999-2000, and state-wise number of pensioners under the Employees' Pension Scheme 1995 (2001-02 to 2003-04). The Pensioners' Portal of the Government of India [http://www.pensionersportal.gov.in/ (accessed on 21 January 2015)] has no data on number of Central Civil, New Pension Scheme, Defence, Telecom pensioners. In the same way, no data on number of pensioners is available with the pensioners' associations, such as, Bharath Pensioners Samaj [http://www.bharatpensioner.org/Default.aspx (accessed on 22 January 2015)].

the UOAPS (Proposed) scenario and N is total number of elderly individuals. Accordingly, about 69 percent of elderly individuals are eligible for the UOAPS (Proposed) scenario and the lower limit of total spending is about 60 percent of estimated amount in Table 9 for the year 2010-11. Or, this lower limit reduces the total spending on the UOAPS by about INR88460 crore in 2010-11.

The above lower limits imply that the actual expenditure for the UOAPS may be less than the estimated expenditure. However, these lower limits are not calculated for all years for lack of nationally representative sample survey or census data on annual total personal income by age for all elderly individuals in all states of India.

6.3. Poverty-line adjusted total public pension expenditure

India's official poverty line is estimated at the national and state levels by the Planning Commission in terms of monthly per capita consumption expenditure. From 2004-05, these estimates are available for three years: 2004-05, 2009-10 and 2011-12 and by rural and urban residence. At the national level, the poverty line for these years in rural (or urban) areas is respectively as follows. INR 356 (or INR539) in 2004-05, INR672 (or INR860) in 2009-10 and INR816 (or INR1000) in 2011-12. These poverty line estimates are not distinguished by age. Throughout, however, we assume that these general poverty lines are applicable for elderly individuals.

If benefit level of old age pension is equal to these monthly per capita consumption expenditure, then the poverty-line adjusted annual total public pension expenditure can be calculated by the following equation.²⁵

$$E/GDP = (B/g) \times (\sum P_i/P) \quad (4)$$

Where E is total public pension expenditure, GDP is Gross Domestic Product at current market prices, B is the benefit level or amount of old age pension, g is per capita GDP, P_i is the total eligible pension beneficiaries and P is total population. If B is equal to monthly per capita consumption expenditure as defined by the official poverty line, then the equation (4) gives the poverty-line adjusted total public pension requirements as a percentage of GDP.

Table 10 gives the results based on equation (4) from 2004-05 through 2013-14. In total, the results are distinguished by three scenarios and in all the scenarios the benefits are extended for all the elderly population. First, B measured by poverty line at 2004-05 level remains constant up to 2008-09; at 2009-10 level remains constant in 2011-12 and at 2011-12 level remains constant up to 2013-14. Second, B measured by UOAPS (Base line) scenario distinguishes the benefit level by age groups from 2011-12. Third, B measured by UOAPS (Proposed) scenario. As compared to the UOAPS (Base line) scenario, poverty-line adjusted benefit level scenario results in higher (B/g) ratio and (E/GDP) ratio. This provides with a justification for higher public spending on old age pensions than the current levels from the viewpoint of poverty alleviation among the elderly individuals. The benefits in the UOAPS (Proposed) scenario give a higher benefit ratio (B/g) and a higher cost ratio (E/GDP) for all years as compared to the remaining scenarios. Given the required fiscal resources, the (B/g) in the UOAPS (Proposed) scenario represent the extent of generosity old age pension beyond the poverty-line adjusted benefit levels. Further, (E/GDP) ratio would be higher than in 2004-05 in each scenario, if (B/g) in 2004-05 in each scenario is held constant for all years. This ensures, for instance, a constant benefit level of

²⁵ The formulation of equation (4) is drawn from Lu et.al. (2014).

84.87 percent GDP per capita from 2004-05 through 2013-14 under UOAPS (Proposed) scenario. However, such a high adjusted benefit levels and total public pension expenditure on only one item of public expenditure (i.e. UOAPS (Proposed)] is seriously questionable on both affordability and fiscal sustainability for India.

It is important to note that given (B/g) for a benchmark year (e.g. 2004-05), changes in (E/GDP) can be due to changes in proportion of eligible beneficiaries. These changes include (a) shifting the cut-off age from 60 years to 62 years or 65 years and/or (b) introducing more exclusionary clauses for identification of beneficiaries (e.g. changes in criteria for identification of beneficiaries for setting lower limit of total public pension expenditure in section 5.1 above). Sensitivity of (E/GDP) to these changes are important determinants of the long term fiscal sustainability of the pension schemes.

6.4. Calculation of net public cost and its financing

Public financing of UOAPS by general taxation may not always be a burden on working-age population because elderly individuals do pay direct and indirect taxes in India. Using the National Transfer Accounts (NTA) methodology, Narayana (2011) has developed a framework for calculation of age profiles of direct and indirect taxes for India.²⁶ Using this methodology, age profile of taxes is calculated for the benchmark year 2004-05. Assuming that these profiles are constant over the years, annual tax profiles are calculated from 2005-06 to 2013-14 by adjusting for total tax revenues in each year. From these annual age profiles of taxes, share of tax payments by elderly population is obtained. The calculated share of elderly in direct (or indirect) tax revenue is about 24 (or 9) percent of total tax revenue. Accordingly, the share of expenditure on different pension schemes as a percentage of tax payments by elderly is calculated as given in Table 11. Surprisingly, direct and indirect tax payments by elderly remarkably exceed the financial requirements for both the IGNOAPS and UNOAPS (Baseline) scenario. Further, total revenue expenditure net of direct and indirect tax payments by elderly is less than 0.5 percent of public expenditure on the IGNOAPS and less than 3 percent on the UOAPS (Baseline) scenario. In contrast, tax payments by elderly are strikingly falls short of financial requirements for implementation of the UOAPS (Proposed) scenario. In addition, expenditure on UOAPS (Proposed) scenario ranges from 30 to 11 percent of total revenue expenditure net of direct and indirect tax payments by elderly.

Expenditure on each pension scheme as a percentage of total revenue expenditure (net of direct and indirect tax payments) by elderly in Table 11 can be considered as the net public expenditure of the scheme. This is contrast with the total public expenditure or public cost in column 3, 6 and 9 of Table 9 for the IGNOAPS, UOAPS (Baseline) scenario and UOAPS (Proposed) scenario respectively.

6.5. Inflation-adjusted public cost of pension expenditure

If old age pension schemes were to be inflation-adjusted from 2004-05 to 2013-14, the resultant inflation-adjusted total public expenditure on three old age pension schemes would have been as presented in Table 12 by three rates of inflation (i.e. 1%, 5% and 10%). These assumed rates are within the range of actual inflation as measured for the food items in the Wholesale Price Index. However, the figures do not measure the real public expenditure on the old age pension schemes. Rather, they show what would have been increase in the public expenditure if the pension expenditures were to be adjusted for the annual rate of inflation. That is, changes in the public expenditure are measured as a percentage of GDP. Changes in expenditure are less than 0.2 percent for the IGNOAPS and less than 1 percent for the UOAPS (Baseline) scenario. In case of UOAPS

²⁶ Details of the NTA methodology are elaborated in United Nations (2013b). This methodology is necessitated by the fact that no information on age distribution of taxes paid is available in public domain.

(Proposed) scenario, expenditure ratios vary by different rates of inflation. For instance, over the period, the expenditure ratio ranges from 6 to 2 percent at 1 percent inflation rate, 7 to 3 percent at 5 percent inflation rate, and 10 to 4 percent at 10 percent inflation rate.

Using the ratio of total public pension expenditure to GDP in Table 9, Table 10 and Table 11, the inflation-adjusted public expenditure on different scenarios can be directly calculated. For instance, adding the expenditure ratio in column 4 in Table 9 and column 2 in Table 10 gives the inflation-adjusted total public expenditure on the IGNOAPS at 1 percent inflation rate.

6.6. Income elasticity-adjusted total public pension expenditure

If the IGNOAPS and two UOAPS were to be adjusted for income elasticity of public pension expenditure, the resultant total public expenditure would have been as presented in Table 13 for the IGNOAPS, Table 14 for UOAPS (Baseline) scenario and Table 15 for UOAPS (Proposed) scenario. The results are distinguished by three values of income elasticity (i.e. 0.5%, 1% and 1.5%). Public pension expenditure is considered generous if income elasticity is equal to unitary. Or, public pension expenditure is less generous if income elasticity is 0.5 percent and more generous at 1.5 percent. Given the observed the values of GDP and UOAPS, income elasticity of public pension expenditure is calculated for the year 2004-05 and applied for all other years.²⁷

Expenditure on the IGNOAPS under different values of income elasticity in Table 13 is higher as compared to actual expenditure on the IGNOAPS in Table 9 (column 2 and 4). This indicates that the actual expenditure on the IGNOAPS is less than it if were to be based on the income elasticity of demand for public expenditure on IGNOAPS at 0.5 percent or higher. Thus, a higher public expenditure on the IGNOAPS is justifiable if it can be linked even with a lesser generosity of social welfare expenditure in the form of the IGNOAPS. In the same way, a higher spending on the UOAPS in Baseline scenario as well as the Proposed scenario is justifiable if those expenditures can be linked with the income elasticity as shown in Table 14 and Table 15 respectively. It should be emphasized that the public pension expenditure calculations in Table 13 through Table 15 are not adjusted for the inflation. If adjusted, however, all the calculated expenditures would be higher and would justify further higher expenditures on the old age pension schemes.

The results in Table 13 through Table 15 provide with policy options for choosing the existing IGNOAPS or two alternative UOAPS depending on the choice of policy makers (subject to resource or budget constraints, however) on the generosity of the old age pension schemes.

7. LONG TERM ISSUES IN PUBLIC FINANCING OLD AGE PENSION SCHEMES

In the long run, public cost of pension schemes increase due to rapid population ageing in India. Using the age distribution of population by single years from the Census of India from 1961 to 2011 and projected population by single years from the United Nations (2013a), Figure 3 shows the trends in India's population ageing up to 2100. Share of elderly population shows a gradual increase from about 6 percent in 1961 to about 7 percent in 2001 and a rapid increase from about 8 percent in 2011 to about 22 percent in 2051 and to 37 percent in 2100. Further, annual growth rate of projected elderly population is positive between 2011

²⁷ Income elasticity public pension expenditure (%) = $\eta = \left[\frac{\text{GDP}}{\text{UOAPS}} \left(\frac{\delta \text{UOAPS}}{\delta \text{GDP}} \right) \right] * 100$. Given the values of GDP and UOAPS, and the desired η , the value of $\left(\frac{\delta \text{UOAPS}}{\delta \text{GDP}} \right)$ is calculated in 2004-05. Subsequently, given the value of $\left(\frac{\delta \text{UOAPS}}{\delta \text{GDP}} \right)$ in 2004-05, the values of required annual increase in expenditure on UOAPS, required amount of expenditure on UOAPS and required expenditure on UOAPS as a percentage of GDP are calculated by using the observed values of GDP and IGNOAPS and calculated values of UOAPS by years.

and 2051 (3.27 percent) and between 2051-2100 (1.03 percent). Consequently, total projected elderly population in 2100 is equal to 622 million. Whether or not the short term fiscal analyses are sustainable in the long run, as India's population ages, is an important policy question on the sustainability of public funding of pension schemes. This sustainability issue is addressed in the following section.

Three long term fiscal issues in public financing of old age pension schemes are (a) choice of fiscal instrument, (b) intergenerational welfare and (c) sustainability of current fiscal policies. Key fiscal instruments are general taxation, expenditure switching and public debt. These instruments are not mutually exclusive because they can be combined to financing a targeted expenditure on a UOAPS. On the other hand, long term public financing of UOAPS raises intergenerational issue. For instance, whether the future generation would pay more or less taxes than the current generation if a UOAPS is implemented? Or, given limitation of raising taxes and new public debt, whether the future generation would experience cut in benefits by ways of expenditure switching from non-pension to pension programmes? If additional financial requirements are entirely financed by raising new debt, will it be sustainable or be within a targeted debt/GDP ratio? In what follows, we follow the Generational Accounting methodology to evaluate the fiscal sustainability of the pension expenditure scenarios in the long run.

7.1. Generational Accounting approach to sustainability of current fiscal policies

Using GA methodology, fiscal sustainability of current fiscal policies is defined by Generational Imbalance (GI) and measured by the difference in present value of net payment of future generation and newborn (or age-0 cohort in the benchmark year) divided by the present value of net payment of the newborn. Current fiscal policies are sustainable if the value of GI is less than zero. This means that the lifetime net payment of future generation is smaller than that of current generation. Thus, to restore the long term budgetary balance, tax burden should be reduced or transfer benefits should be increased in future in order to satisfy the inter-temporal budget constraint.

Narayana (2014) has developed a framework for application of the GA methodology to evaluate the impact of population ageing on India's current fiscal policies for the benchmark year, 2004-05. We use the NTA and non-NTA variables and macroeconomic parameters and databases for India in Narayana (2014) to evaluate the sustainability of current fiscal policies in the context of the pension schemes. Key macroeconomic parameters are productivity growth rate (3.01%), discount rate (8.13%) and inflation rate (5%). In this approach, old age pension schemes are a part of the broader social welfare expenditure in the form of cash transfers under the social assistance programmes. Thus, eligible elderly individuals are added the difference between the proposed universal old age pension amount and their existing old-age related social security receipts in the form of cash transfers. The aggregate control for this age profile is the sum of total current cash transfers and the net amount added due to the proposed UOAPS scenarios. Fiscal adjustments to cope with increasing expenditure on the old age pension programmes are focused on taxes and expenditure because the inter-temporal budget constraint of the government includes the debt stock at the benchmark year as given throughout.

7.2 Main results of Generational Accounting on sustainability of old age pension schemes

Table 16 presents the GA results on the fiscal sustainability of current fiscal policy under the IGNOAPS, UOAPS (Baseline) scenario and UOAPS (Proposed) scenario. Generational Imbalance (GI) is the only criterion used to evaluate the sustainability of these pension schemes. All macroeconomic parameters are assumed to be same for all the pension schemes. However, the results are distinguished by income elasticity of public social

welfare expenditure (e_1) and public health expenditure (e_2). As noted before, unitary income elasticity ($e_1=1$) is a case for a generous public pension policy. This is called generous pension scheme. Less generous pension scheme is a case for $e_1<1$. Public expenditure on health is included to highlight expenditure switching policy. That is, whether or not sustainability is attainable if $e_1=1$ but $e_2<1$. In total, four policy scenarios of sustainability are obtained: (a) Generous pension scheme; (b) Less generous pension scheme; (c) Generous pension scheme with expenditure switching policy; and (d) Less generous policy with expenditure switching.

At the outset, two general results can be noted. First, the nature but not the magnitude of GI is comparable across the pension schemes. Second, sustainability of current fiscal policies is worsened under the UOAPS because the value of generational imbalance is positive and bigger under the Baseline and Proposed scenarios than under the IGNOAPS.

Interestingly, the sustainability is not attainable if a generous public pension expenditure policy is adopted as well as health expenditure. This is evident by the positive value of GI for all values of $e_1=1$ under the generous pension scheme and less generous pension scheme ($e_1<1$; and $e_2=1$). Sustainability is restorable for all the pension schemes if a generous pension scheme is simultaneously implementable with an expenditure switching policy such that $e_1=1$ and $e_2\leq 0.6$. Or, less generous IGNOAPS as well as UOAPS (Baseline) scenarios is implementable if $e_1=e_1\leq 0.6$. These results provide a policy maker with options for implementation of a pension scheme on economic consideration of the fiscal sustainability.

UOAPS is much discussed for its heavy burden on public resources. The above empirical results show that such a discussion is not justifiable on strict economic grounds because the condition for attainment of fiscal sustainability is a common range of income elasticity of public expenditures. This evidence is strongly supportive to justify the sustainability of the current fiscal policies in the context of the IGNOAPS or the UOAPS scenarios.

Sustainability of current fiscal policies implies that it may be necessary to reduce taxes and/or increase transfers to future generations in order to satisfy the inter-temporal budget constraint. Table 17 shows the required adjustments by current generation (as of 2005), future generation and select years (2010, 2020, 2030 and 2050) by three scenarios of sustainable fiscal policies. Required tax adjustment shows the percentage reduction in tax burden. Tax and transfer adjustments show a decrease (or increase) in tax burden accompanied by the same percentage increase (or decrease) in transfer payments. The results in Table 17 imply that the (i) required adjustments need the highest reduction in tax burden for the current generation in all the pension schemes; (ii) the magnitude of required adjustments is different between the current and future generations due to difference in cost and benefits of the IGNOAPS as well as UOAPS scenarios; (iii) the required adjustments are higher if the generosity of the schemes are higher, and (iv) the required adjustments in the magnitude of tax burden and transfer payments increases up to 2050 and beyond if the required adjustments are delayed from 2020.

8. CONCLUSIONS, IMPLICATIONS AND EXTENSIONS

This paper has developed the empirical frameworks to (a) estimate the distributive impact of current scheme of old age pension in India and to argue for a national level universal old age pension scheme; (b) calculate public expenditure requirements of UOAPS scenarios with and without adjustment for (i) total personal income and tax payments of elderly individuals, (ii) inflation and (iii) income elasticity of public expenditure on social welfare; (c) explore public financing options for implementation of UOAPS scenarios; and (d) evaluate

the long term fiscal sustainability of the IGNOAPS and UOAPS scenarios under the assumed values of income elasticity of public expenditure on social welfare and health for India. These frameworks are implemented for India to provide with unambiguous answers to the research questions in this paper and plausible policy implications for consideration for national policy makers. These analyses lead to the following conclusions and implications on the formulation and specification of design parameters for a national level universal old age pension policy for India.

About 16 percent of India's elderly are the beneficiaries of the current old age pension scheme (or IGNOAPS) in India. This implies the limited population coverage of the scheme. However, there is a strong and growing demand and need for extending the old age pensions by universal provisioning of the pension benefits because the old age pension has poverty-reducing effects. The supportive evidence for the poverty-reducing effects of the IGNOAPS in this Report can be used as an empirical basis for formulation of a distributive-oriented universal old age pension scheme for India.

This paper has developed two financing options or policy scenarios on UOAPS for consideration for policy makers in India. The first option extends the current IGNOAPS to all elderly individuals [UOAPS (Baseline) scenario]. Second option extends the old age pension as per the amount proposed by the Pension Parishad [UOAPS (Proposed) scenario]. The public expenditure requirements for implementation of these scenarios demand huge public expenditures, especially if the public expenditures are adjustable for the official poverty-line, annual inflation and income elasticity.

India's elderly individuals pay both direct and indirect taxes. National Transfer Accounts methodology is useful to calculate the age profile of taxes and distinguish the tax contribution of elderly. This Report has calculated the tax payments by elderly and show the nature and extent of such payment to financing the pension schemes. Surprisingly, the tax payments by elderly are self-financing of the pension schemes except the UOAPS (Proposed) scenario. This unrecognized and unintended fiscal contribution of elderly is useful to (a) calculate the net public cost of pension schemes by policy makers and (b) eliminate the mindset that all the elderly individuals are a burden to public exchequer.

Levels of personal income distribution of India's elderly show considerably variations by age. These variations need to be incorporated into the calculations of total public cost of pension schemes. This paper has developed a simple methodology to calculate the public pension expenditure adjusted for personal income distribution of elderly individuals. The results show appreciable reduction in total public cost of universal old age pension schemes for the year 2010-11. However, the implementation of this adjusted-public pension expenditure is challenged by data requirements of annual total personal income and its components for elderly individuals in the entire country.

The nature and magnitude of the old age pension expenditures are bound to increase in future as India experiences population ageing for the rest of this century. Thus, long run fiscal sustainability of the UOAPS assumes special policy significance in India. Generational Accounting (GA) is a useful methodology to evaluate the sustainability of current fiscal policy in the context of UOAPS scenarios. This paper has calculated the GA by assuming, among others, the inflation rate of 5% and a range of income elasticity of public expenditures. Fiscal adjustments for sustainability are focused on taxes and expenditure rather than raising the public debt. Interestingly, the GA results show that the IGNOAPS and two scenarios of UOAPS are fiscally sustainable for a common range of income elasticity of public expenditure on social welfare and health. Thus, the UOAPS are justifiable on economic consideration of fiscal sustainability.

Given the different exclusionary clauses for the IGNOAPS, a redefinition of universality for provisioning of old age pension may be desirable for India. For instance, one plausible redefinition of universality may be to limit old age pensions for elderly individuals who belong to the BPL families, earn less than cutoff personal income, non-payers of personal income tax, and non-recipients of pension in government and other organized sectors. In essence, this redefinition of universality targets the beneficiaries of old age pension. If implemented, this redefinition of universality may ensure old age pension to all the targeted elderly individuals and, other things being equal, may ensure fiscal sustainability. Such an approach to the universal old age pension may be called targeted and sustainable universal old age pension scheme for India.

Select extensions

- (i) India's demography is characterized by remarkable inter-state differences in size of elderly population and rates of population ageing. States in India have considerable autonomy in fiscal policy. Different State governments contribute to old age pensions in addition to the pension amount received from the Central Government. A comprehensive study is needed to document and analyze the State/UT level pension policies and programmes for the elderly. For instance, social pensions may have massively different costs and impact in older states like Kerala as compared to younger states like Bihar. Thus, it will be useful to extend the policy framework of National Transfer Accounts and Generational Accounting to the state level to capture the impact of these differences on public cost and financing options of introducing either supplementary or new state level old age pension schemes. In addition, with large regional and state differences in demography and economy in India, national public transfer policies might introduce geographic inequities because of differences in long term decline in life expectancy and fertility may mean that national public pensions would favor some regions. That is, some regions may experience fiscal dividends more than others, and those regions will be subsidizing the costs of the population age distribution elsewhere. It would be of policy importance to study in future such geographic differences across the states or regions in national transfer policy as it is related to universal old age pension, although such differences may offset each other at national level of aggregation.
- (ii) In estimating the cost of universal old age pension, the economic cost of administration, inclusion and exclusion errors (which are not insignificant in India where institutional capacity to deliver public services is weak) is not included or recognized. This assumption of perfect administration or zero compliance costs must be relaxed in future estimations.
- (iii) There have been many social security initiatives introduced over the past 12 months in India. These include Jan Dhan Yojana, Atal Pension Yojana, Jan Suraksha Yojana and others. Should universal pension be a substitute or complement to these schemes?.

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Table 1: Public expenditure on pension and other retirement benefits and IGNOAPS, India, 1994-95 to 2013-14

Year	Public expenditure on pension and other retirement benefits (PORB)		Public expenditure on PORB as a percentage of			Public expenditure on IGNOAPS		Public expenditure on IGNOAPS as a percentage of			Public expenditure on IGNOAPS as a percentage of expenditure on PORB
	Amount: INR crore	Annual growth rate (%)	Total public expenditure	Total revenue expenditure	GDP (at current market prices)	Amount: INR crore	Annual growth rate (%)	Total public expenditure	Total revenue expenditure	GDP (at current market prices)	
1995-96	12170	NA	4.15	4.95	0.99	297	NA	0.10	0.12	0.02	2.44
1996-97	14936	22.73	4.59	5.28	1.05	507	70.79	0.16	0.18	0.04	3.40
1997-98	18545	24.16	4.97	5.77	1.18	464	-8.55	0.12	0.14	0.03	2.50
1998-99	26262	41.61	5.89	6.82	1.46	457	-1.53	0.10	0.12	0.03	1.74
1999-00	37018	40.96	7.16	8.25	1.84	476	4.24	0.09	0.11	0.02	1.29
2000-01	38819	4.87	7.03	8.00	1.79	421	-11.67	0.08	0.09	0.02	1.08
2001-02	40321	3.87	6.57	7.52	1.72	465	10.54	0.08	0.09	0.02	1.15
2002-03	43038	6.74	6.50	7.36	1.70	657	41.31	0.10	0.11	0.03	1.53
2003-04	45227	5.09	5.93	6.92	1.59	602	-8.34	0.08	0.09	0.02	1.33
2004-05	55437	22.58	6.72	7.92	1.71	1032	71.36	0.13	0.15	0.03	1.86
2005-06	60871	9.80	6.52	7.71	1.65	1190	15.28	0.13	0.15	0.03	1.95
2006-07	69069	13.47	6.36	7.50	1.61	2490	109.26	0.23	0.27	0.06	3.60
2007-08	77634	12.40	6.24	7.68	1.56	2890	16.07	0.23	0.29	0.06	3.72
2008-09	94668	21.94	6.23	7.34	1.68	4500	55.72	0.30	0.35	0.08	4.75
2009-10	139551	47.41	7.69	9.05	2.15	5155	14.57	0.28	0.33	0.08	3.69
2010-11	165958	18.92	7.88	9.30	2.13	5162	0.13	0.25	0.29	0.07	3.11
2011-12	189265	14.04	7.95	9.38	2.10	6596	27.79	0.28	0.33	0.07	3.49
2012-13 (RE)	207978	9.89	7.54	8.93	2.06	7885	19.53	0.29	0.34	0.08	3.79
2013-14 (BE)	233605	12.32	7.29	8.82	2.06	9112	15.57	0.28	0.34	0.08	3.90

Notes: (a) One crore is equal to 10 million. (b) RE (or BE) refers to revised (or budget) estimate. (c) All public expenditure refers to combined expenditure by Central and State governments at current prices.

Source: Author's calculations using basic data in IndiaStat.com (2014) and Reserve Bank of India (2014).

Table 2: Distribution of household elderly poverty by types of ration cards, India, 2011

Households possessing cards	Per cent of households		
	Rural	Urban	Total
BPL	48.0	51.8	49.1
APL	40.6	40.2	40.5
Anthodaya	4.8	3.7	4.5
Not holding any cards	6.6	4.3	6.0
Total	100.0	100.0	100.0
Total households	4251	4078	8329

Note: All figures are adjusted for survey weights.

Source: Author's calculations and compilations from UNFPA (2012).

Table 3: Awareness and utilization of targeted schemes for poor elderly individuals, India, 2011

Schemes	Rural (Per cent of elderly individuals)			Urban (Per cent of elderly individuals)			Total (Per cent of elderly individuals)		
	Men	Women	Total	Men	Women	Total	Men	Women	Total
1. BPL families									
• IGNOAPS	80.6 (25.3)	70.3 (15.6)	75.1 (20.1)	81.0 (10.1)	71.1 (12.3)	75.5 (11.3)	80.7 (21.5)	70.5 (14.7)	75.2 (17.8)
• Annapurna	41.7 (4.1)	35.8 (3.9)	38.5 (4.0)	19.4 (2.2)	14.4 (2.1)	16.6 (2.1)	36.2 (3.6)	30.1 (3.4)	32.9 (3.5)
Total families	1112	1296	2408	724	914	1638	1836	2210	4046
2. Non-BPL families									
• IGNOAPS	88.5	78.8	83.6	80.8	69.4	74.7	86.5	76.2	81.2
• Annapurna	53.3	40.0	46.6	44.4	31.1	37.3	51.0	37.5	44.1
Total families	1341	1389	2730	1795	1581	3076	2836	2970	5806
3. All families									
• IGNOAPS	85.0 (17.5)	74.9 (13.6)	79.7 (15.5)	80.9 (6.4)	70.1 (8.9)	75.1 (7.8)	84.0 (14.6)	73.6 (12.3)	78.5 (13.4)
• Annapurna	48.3 (2.0)	38.1 (2.0)	43.0 (2.0)	34.0 (1.0)	23.6 (0.9)	28.4 (1.0)	44.6 (1.8)	34.2 (1.7)	39.1 (1.8)
Total	2453	2685	5138	2219	2495	4714	4672	5180	9852

Note: (a) Figures in parentheses refer to utilization of the scheme. (a) BPL families include Anthodaya card holders.

Source: Author's calculations and compilations from UNFPA (2012).

Table 4: Awareness of schemes by socio-economic characteristics of poor elderly individuals, India, 2011

Schemes	IGNOAPS (Per cent of elderly individuals)			Annapurna (Per cent of elderly individuals)			Total HH
	Men	Women	Total	Men	Women	Total	
1. Age (years)							
• 60-64	76.9	81.7	79.4	29.1	48.8	39.1	3,533
• 65-60	75.4	83.4	79.9	38.1	45.7	42.3	2,706
• 70-79	72.6	79.7	76.8	34.0	42.3	38.8	2,601
• 80+	74.4	78.3	76.8	30.8	32.2	31.6	1,012
2. Marital status							
• Married	78.4	84.7	82.1	35.9	49.3	43.7	5,847
• Widowed	70.5	74.9	72.8	28.7	35.4	32.2	3,768
• Others	76.9	80.0	78.3	33.7	30.1	31.7	237
3. Education							
• No schooling	69.3	77.4	73.3	34.1	38.0	36.0	4,533
• 1-4 years	81.3	80.1	80.7	42.7	40.5	41.5	1,258
• 5-7 years	80.2	82.7	81.6	34.4	45.7	40.9	1,324
• 8+ years	88.0	87.0	87.4	19.1	55.0	43.8	2,682
4. Employment							
• Never worked	77.3	75.5	76.2	33.9	35.8	35.1	3,587
• Previously worked	71.4	84.8	78.7	25.9	48.9	38.5	4,001
• Currently working	78.2	85.4	81.6	41.7	51.0	46.2	2,264
5. Caste							
• SC/ST	78.9	79.2	79.0	42.1	37.6	40.3	2,383
• OBC	72.0	81.3	76.0	22.7	43.5	31.7	3,353
• Others	75.9	81.8	80.5	40.3	46.7	45.2	4,116
6. Living arrangement							
• Alone	65.0	78.1	69.7	19.7	38.4	26.5	612
• Spouse only	77.7	86.1	81.7	28.6	52.4	39.9	14,688
Children and others	75.8	80.5	78.6	35.7	43.0	39.9	7,770

Source: Author's calculations and compilations from UNFPA (2012).

Table 5: Descriptions and measurement of variables

Variables		Measurement of variables
1.	Poverty	=1 if holder of a BPL, =0 otherwise
2.	Social caste	=1 if belongs to Scheduled Caste/Tribe (SCST), =0 otherwise
3.	IGNOAPS	=1 if recipient of pension under the Indira Gandhi National Old Age Pension Scheme, =0 otherwise
4.	Income	Total personal income (excluding old age pension) from all source of elderly individual (INR at current prices)
5.	Sex	=1 if the elderly individual is male, =0 otherwise
6.	Age	Completed age of the elderly individual (years)
7.	Business income	=1, if the source of income is business activities, =0 otherwise
8.	Farm income	=1, if the source of income is farm activities, =0 otherwise
9.	Age 71-80	=1 if the elderly individual is in the age group of 71-80 years
10.	Age 81-85	=1 if the elderly individual is in the age group of 81-85 years
11.	Age 86-90	=1 if the elderly individual is in the age group of 85-90 years
12.	B-alone	=1, if best to live alone when one is older, =0 otherwise
13.	B-spouse	=1, if best to live with spouse when one is older, =0 otherwise
14.	B-son	=1, if best to live with a daughter when one is older, =0 otherwise
15.	B-daughter	=1, if best to live with a son when one is older, =0 otherwise
16.	Public sector job	=1, if current/most recent/main job is in a public sector
17.	Self-employed	=1, if current/most recent/main job is self-employment
18.	Informal job	=1, if current/most recent/main job is in informal sector

Source: Author

Table 6: Descriptive statistics for variables used in the estimations

Variable	Mean	Standard deviation	Minimum	Maximum
1. Poverty	0.370	0.483	0	1
2. Social caste	0.242	0.428	0	1
3. IGNOAPS	0.016	0.125	0	1
4. Income	169219	1039594	0	9888888
5. Sex	0.474	0.499	0	1
6. Age	68	7.286	60	120
7. Business income	0.049	0.216	0	1
8. Farm income	0.097	0.296	0	1
9. Age 71-80	0.198	0.399	0	1
10. Age 81-85	0.037	0.189	0	1
11. Age 86-90	0.018	0.132	0	1
12. B-alone	0.040	0.195	0	1
13. B-spouse	0.288	0.453	0	1
14. B-son	0.510	0.500	0	1
15. B-daughter	0.034	0.181	0	1
16. Public sector job	0.116	0.320	0	1
17. Self-employed	0.157	0.364	0	1
18. Informal job	0.285	0.451	0	1

Source: Author

Table 7: Determinants of elderly poverty in India: Estimates of Binary Logit Model

Independent variables	Model 1.1	Model 1.2.	Model 1.3	Model 1.4	Model 1.5	Model 1.6	Model 1.7
Intercept	-0.452 (-16.65)*	-0.527 (-16.47)*	1.281 (6.16)*	-0.457 (-13.60)*	-0.516 (-15.99)*	-0.514 (-15.98)*	1.0417 (5.06)*
Social caste	0.337 (6.95)*	0.330 (6.80)*	0.318 (6.53)*	0.317 (6.51)*	0.327 (6.72)*	0.329 (6.77)*	0.3770 (7.79)*
IGNOAPS	-0.749(-4.03)*	-0.761(-4.09)*	-0.764 (-4.09)*	-0.765 (-4.11)*	-0.758 (-4.08)*	-0.755 (-4.06)*	-0.6814 (-3.65)*
Income	-0.00005 (-11.76)*	-0.00006 (-12.28)*	-0.00007 (-12.70)*	-0.00006 (-12.38)*	-0.00006 (-12.32)*	-0.00006 (-12.34)*	
Sex		0.203 (4.52)*	0.217 (4.81)*	0.212 (4.71)*	0.205 (4.57)*	0.199 (4.44)*	
Age			-0.267 (-8.77)*				-0.0240 (-8.00)*
Age 71-80				-0.360 (-6.54)*			
Age 81-85					-0.301 (-2.58)**		
Age 86-90						-0.645 (-3.62)*	
Business income							-0.3885 (-3.79)*
Farm income							-0.0642 (-0.90)
Chi-square	276.99#	297.42#	377.03#	341.254#	304.27#	311.79#	153.06#
Estimated probability	0.3598	0.3583	0.3566	0.3575	0.3581	0.3580	0.3683
Estimated elasticity							
Social caste	0.052	0.051	0.050	0.049	0.051	0.051	0.058
IGNOAPS	-0.008	-0.008	-0.007	-0.008	-0.008	-0.008	-0.007
Income	-0.124	-0.141	-0.149	-0.143	-0.142	-0.142	
Sex		0.062	0.066	0.064	0.063	0.061	
Age			-1.164				-1.033
Age 71-80				-0.045			
Age 81-85					-0.007		
Age 86-90						-0.007	
Business income							-0.012
Farm income							-0.004

Notes: (1) Figures in the parentheses are t-ratios. (2) * (or **) indicates (or indicate) that the t-statistic is significant at 1 (or 5) percent level or more. (3) # indicates that the Chi-square statistic is significant at 1 percent level or more.

Source: Author's estimations based on equation (1) through (3).

Table 8: Determinants of elderly poverty in India: Estimates of Binary Logit Model

Independent variables	Model 2.1	Model 2.2.	Model 2.3	Model 2.4	Model 2.5	Model 2.6	Model 2.7
Intercept	-0.611 (-19.48)*	0.970(4.72)*	1.273 (6.13)*	1.323 (6.38)*	1.118 (5.32)*	0.540 (2.49)*	0.869 (3.95)*
Social caste	0.391(8.12)*	0.382(7.92)*	0.325 (6.66)*	0.319 (6.54)*	0.241 (4.85)*	0.374 (7.71)*	0.310 (6.34)*
IGNOAPS	-0.671 (3.62)*	-0.673(-3.61)*	-0.763 (4.09)*	-0.746 (-3.99)*	-0.829-(4.40)*	-0.630 (-3.35)*	-0.724 (-3.84)*
Income			-0.00004 (7.24)	-0.00006 (-11.91)*	-0.00005 (-10.46)*		-0.00007- (12.54)*
Sex	-0.014 (0.34)	-0.012 (-0.29)				0.008 (0.18)	0.228 (4.99)*
Age		-0.023(-7.77)*	-0.025 (-8.31)*	-0.026 (-8.48)*	-0.026-(8.45)*	-0.023 (-7.57)*	-0.026 (-8.51)*
Public sector job			-0.630 (-6.85)*				
Self-employed				-0.161 (-2.66)*			
Informal job					0.646 (13.80)*		
B-alone						0.930 (7.72)*	0.917(7.53)*
B-spouse						0.395 (5.28)*	0.415(5.48)*
B-daughter						0.437 (6.25)*	0.392(2.97)*
B-son						0.427 (3.25)*	0.378(5.30)*
Chi-square	75.21#	137.49#	402.59#	360.99#	544.16#	207.33	440.89#
Estimated probability	0.3700	0.3690	0.3595	0.3580	0.3573	0.3675	0.3556
Estimated elasticity							
Social caste	0.059	0.059	0.050	0.050	0.037	0.057	0.048
IGNOAPS	-0.007	-0.007	-0.008	-0.008	-0.008	-0.006	-0.007
Income			-0.084	-0.127	-0.112		-0.148
Sex	-0.004	-0.004				0.002	0.070
Age		-1.001	-1.097	-1.121	-1.131	-0.984	-1.139
Public sector job			-0.047				
Self-employed				-0.016			
Informal job					0.118		
B-alone						0.023	0.023
B-spouse						0.072	0.077
B-daughter						0.009	0.009
B-son						0.141	0.124

Notes: (1) Figures in the parentheses are t-ratios. (2) * (or **) indicates (or indicate) that the t-statistic is significant at 1 (or 5) percent level or more. (3) # indicates that the Chi-square statistic is significant at 1 percent level or more.

Source: Author

Table 9: Public expenditure requirements for implementation of the IGNOAPS and UOAPS scenarios, India, 2004-05 to 2013-14

Year	IGNOAPS			UOAPS (Baseline) scenario			UOAPS (Proposed) scenario		
	Total amount (INR crore)	As percentage of total revenue expenditure	As percentage of GDP	Total amount (INR crore)	As percentage of total revenue expenditure	As percentage of GDP	Total amount (INR crore)	As percentage of total revenue expenditure	As percentage of GDP
2004-05	1032	0.15	0.03	18651	2.66	0.58	186508	26.63	5.75
2005-06	1190	0.15	0.03	19132	2.42	0.52	191316	24.24	5.18
2006-07	2490	0.27	0.06	19655	2.13	0.46	196547	21.34	4.58
2007-08	2890	0.29	0.06	20176	2.00	0.40	201758	19.95	4.05
2008-09	4500	0.35	0.08	20730	1.61	0.37	207297	16.06	3.68
2009-10	5155	0.33	0.08	21366	1.39	0.33	213656	13.86	3.30
2010-11	5162	0.29	0.07	22115	1.24	0.28	221150	12.39	2.84
2011-12	6596	0.33	0.07	25891	1.28	0.29	229571	11.38	2.55
2012-13	7885	0.34	0.08	26988	1.16	0.27	238940	10.26	2.36
2013-14	9112	0.34	0.08	28130	1.06	0.25	249018	9.41	2.19

Notes: (a) One crore is equal to 10 million. (b) All figures are at current prices. (c) Total revenue expenditure refers to the combined revenue expenditure of the Central and State governments.

Source: Author's calculations

Table 10: Poverty-line and per capita income adjusted total public pension expenditure on universal old age pension scheme, India, 2004-05 to 2013-14

Year	Poverty-line adjusted benefit levels and total public pension expenditure on IGNOAPS				UOAPS (Base line) scenario adjusted benefit levels and total public pension expenditure					UOAPS (Proposed) scenario adjusted benefit levels and total public pension expenditure	
	(B/g) based on rural poverty line (%)	(B/g) based on urban poverty line (%)	(E/G) based on rural poverty line (%)	(E/GDP) based on urban poverty line (%)	(B/g) for age group: 60-79 (%)	(B/g) for age group: 80 and above (%)	(E/GDP) for age group: 60-79 (%)	(E/GDP) for age group: 80 and above (%)	(E/G) based on UOAPS (Baseline) scenario (%)	(B/g) (%)	(E/G) based on UOAPS (Proposed) scenario (%)
2004-05	15.12	22.86	1.14	1.73	8.49	8.49	0.54	0.10	0.64	84.87	6.41
2005-06	13.47	20.37	1.03	1.56	7.56	7.56	0.49	0.09	0.58	75.64	5.80
2006-07	11.76	17.78	0.92	1.38	6.60	6.60	0.43	0.08	0.51	66.02	5.14
2007-08	10.28	15.53	0.81	1.23	5.77	5.77	0.38	0.07	0.46	57.68	4.55
2008-09	9.23	13.96	0.74	1.12	5.18	5.18	0.35	0.07	0.42	51.82	4.16
2009-10	8.14	12.30	0.67	1.01	4.57	4.57	0.31	0.06	0.37	45.67	3.73
2010-11	12.95	16.57	1.09	1.39	3.85	3.85	0.27	0.05	0.32	38.55	3.24
2011-12	11.35	14.51	0.98	1.25	3.38	8.44	0.24	0.12	0.37	33.77	2.92
2012-13	12.44	15.24	1.10	1.35	3.05	7.62	0.22	0.11	0.34	30.49	2.71
2013-14	11.23	13.76	1.02	1.26	2.75	6.88	0.21	0.11	0.31	27.51	2.51

Notes: (a) All ratios are expressed in percent. (b) The (B/g) and (E/GDP) are the same as defined in equation (4).

Source: Author's calculations based on equation (4).

Table 11: Net public expenditure requirements for implementation of IGNOAPS and UOAPS scenarios, India, 2004-05 to 2013-14

Year	IGNOAPS			UOAPS (Baseline) scenario			UOAPS (Proposed) scenario		
	Expenditure on IGNOAPS as a percentage of direct tax payment by elderly individuals	Expenditure on IGNOAPS as a percentage of indirect tax payment by elderly individuals	Expenditure on IGNOAPS as a percentage of total revenue net of direct and indirect tax payments by elderly individuals	Expenditure on UOAPS as a percentage of direct tax payment by elderly individuals	Expenditure on UOAPS as a percentage of indirect tax payment by elderly individuals	Expenditure on UOAPS as a percentage of total revenue net of direct and indirect tax payments by elderly individuals	Expenditure on UOAPS as a percentage of direct tax payment by elderly individuals	Expenditure on UOAPS as a percentage of indirect tax payment by elderly individuals	Expenditure on UOAPS as a percentage of total revenue net of direct and indirect tax payments by elderly individuals
2004-05	3.11	3.18	0.16	56.12	57.54	2.94	561.21	575.42	29.39
2005-06	3.00	3.15	0.17	48.28	50.73	2.69	482.84	507.25	26.87
2006-07	4.55	5.50	0.30	35.94	43.44	2.39	359.39	434.38	23.94
2007-08	3.83	5.60	0.33	26.77	39.11	2.28	267.72	391.07	22.82
2008-09	5.80	8.41	0.39	26.74	38.76	1.79	267.40	387.57	17.88
2009-10	5.79	9.33	0.37	23.98	38.67	1.53	239.77	386.73	15.29
2010-11	4.84	7.06	0.32	20.75	30.25	1.38	207.54	302.53	13.78
2011-12	5.57	7.66	0.36	21.85	30.08	1.43	193.71	266.72	12.66
2012-13	5.80	7.69	0.38	19.87	26.31	1.29	175.91	232.93	11.44
2013-14	5.68	7.56	0.39	17.52	23.34	1.19	155.09	206.64	10.52

Source: Author's calculations

Table 12: Sensitivity of public expenditure on IGNOAPS and UOAPS scenarios to inflation rate, India, 2004-05 to 2013-14

Year	Public pension expenditure as percent of GDP: Sensitivity to inflation rates								
	IGNOAPS			UOAPS (Baseline) scenario			UOAPS (Proposed) scenario		
	1%	5%	10%	1%	5%	10%	1%	5%	10%
2004-05	0.03	0.04	0.05	0.58	0.67	0.98	5.81	6.67	9.79
2005-06	0.03	0.04	0.05	0.52	0.60	0.88	5.23	6.00	8.82
2006-07	0.06	0.07	0.10	0.46	0.53	0.78	4.62	5.30	7.79
2007-08	0.06	0.07	0.10	0.41	0.47	0.69	4.09	4.69	6.88
2008-09	0.08	0.09	0.14	0.37	0.43	0.63	3.72	4.27	6.27
2009-10	0.08	0.09	0.14	0.33	0.38	0.56	3.33	3.82	5.61
2010-11	0.07	0.08	0.11	0.29	0.33	0.48	2.87	3.29	4.83
2011-12	0.07	0.08	0.12	0.29	0.33	0.49	2.57	2.95	4.34
2012-13	0.08	0.09	0.13	0.27	0.31	0.45	2.39	2.74	4.02
2013-14	0.08	0.09	0.14	0.25	0.29	0.42	2.21	2.54	3.73

Note: All figures are calculated at current prices.

Source: Author's calculations

Table 13: Sensitivity of public expenditure on IGNOAPS to income elasticity of public social welfare expenditure, India, 2004-05 to 2013-14

Year	Public expenditure on IGNOAPS by income elasticity								
	Income elasticity=0.5			Income elasticity=1.0			Income elasticity=1.5		
	Required annual increase in expenditure (%)	Required amount of expenditure (INR crore)	Required expenditure as a % of GDP	Required annual increase in expenditure (%)	Required amount of expenditure (INR crore)	Required expenditure as a % of GDP	Required annual increase in expenditure (%)	Required amount of expenditure (INR crore)	Required expenditure as a % of GDP
2004-05	0.50	1551	0.05	1.01	2070	0.06	1.51	2588	0.08
2005-06	0.50	1781	0.05	0.99	2371	0.06	1.49	2962	0.08
2006-07	0.28	3177	0.07	0.55	3864	0.09	0.83	4551	0.11
2007-08	0.28	3688	0.07	0.55	4486	0.09	0.83	5284	0.11
2008-09	0.20	5401	0.10	0.40	6302	0.11	0.60	7202	0.13
2009-10	0.20	6192	0.10	0.40	7228	0.11	0.60	8265	0.13
2010-11	0.24	6407	0.08	0.48	7653	0.10	0.72	8898	0.11
2011-12	0.22	8038	0.09	0.44	9480	0.11	0.66	10921	0.12
2012-13	0.21	9503	0.09	0.41	11121	0.11	0.62	12739	0.13
2013-14	0.20	10929	0.10	0.40	12746	0.11	0.60	14563	0.13

Notes: (a) One crore is equal to 10 million. (b) GDP is measure at current market prices.

Source: Author's calculations.

Table 14: Sensitivity of public expenditure on UOAPS (Baseline) scenario to income elasticity of public social welfare expenditure, India, 2004-05 to 2013-14

Year	Public expenditure on UOAPS (Baseline) scenario by income elasticity								
	Income elasticity=0.5			Income elasticity=1.0			Income elasticity=1.5		
	Required annual increase in expenditure (%)	Required amount of expenditure (INR crore)	Required expenditure as a % of GDP	Required annual increase in expenditure (%)	Required amount of expenditure (INR crore)	Required expenditure as a % of GDP	Required annual increase in expenditure (%)	Required amount of expenditure (INR crore)	Required expenditure as a % of GDP
2004-05	0.50	28053	0.87	1.01	37456	1.16	1.50	46534	1.44
2005-06	0.56	29840	0.81	1.16	41286	1.12	1.66	50887	1.38
2006-07	0.63	32109	0.75	1.31	45423	1.06	1.88	56589	1.32
2007-08	0.72	34638	0.69	1.48	50098	1.00	2.13	63065	1.26
2008-09	0.79	37057	0.66	1.63	54510	0.97	2.34	69148	1.23
2009-10	0.88	40151	0.62	1.82	60233	0.93	2.61	77075	1.19
2010-11	1.02	44689	0.57	2.11	68820	0.88	3.03	89058	1.14
2011-12	1.01	52019	0.58	2.09	79950	0.89	2.99	103375	1.15
2012-13	1.09	56316	0.56	2.25	87668	0.87	3.22	113962	1.13
2013-14	1.17	61060	0.54	2.42	96261	0.85	3.47	125784	1.11

Note: (a) One crore is equal to 10 million. (b) GDP is measure at current market prices.

Source: Author's calculations.

Table 15: Sensitivity of public expenditure on UOAPS (proposed) scenario to income elasticity of public social welfare expenditure, India, 2004-05 to 2013-14

Year	Public expenditure on UOAPS (Proposed) scenario by income elasticity								
	Income elasticity=0.5			Income elasticity=1.0			Income elasticity=1.5		
	Required annual increase in expenditure (%)	Required amount of expenditure (INR crore)	Required expenditure as a % of GDP	Required annual increase in expenditure (%)	Required amount of expenditure (INR crore)	Required expenditure as a % of GDP	Required annual increase in expenditure (%)	Required amount of expenditure (INR crore)	Required expenditure as a % of GDP
2004-05	0.50	187448	5.78	1.01	374556	11.55	1.50	465338	14.35
2005-06	0.56	192386	5.21	1.12	405480	10.98	1.66	508869	13.78
2006-07	0.63	197793	4.61	1.27	445640	10.38	1.88	565892	13.18
2007-08	0.72	203204	4.07	1.43	491009	9.85	2.13	630647	12.65
2008-09	0.79	208929	3.71	1.58	533840	9.48	2.34	691482	12.28
2009-10	0.88	215535	3.33	1.76	589370	9.10	2.61	770750	11.90
2010-11	1.02	223407	2.87	2.04	672629	8.64	3.03	890584	11.44
2011-12	1.14	232183	2.58	2.28	752135	8.35	3.38	1004407	11.15
2012-13	1.23	241873	2.39	2.45	825510	8.16	3.64	1108682	10.96
2013-14	1.32	252311	2.22	2.64	907613	7.99	3.92	1225555	10.79

Note: (a) One crore is equal to 10 million. (b) GDP is measure at current market prices.

Source: Author's calculations.

Table 16: Sustainability of India's current fiscal policies by IGNOAPS and UOAPS scenarios

Generosity of the pension scheme [e1 (e2) = Income elasticity of social welfare including pensions (health) expenditure]	Value of Generational Imbalance		
	IGNOAPS	UOAPS (Baseline)	UOAPS (Proposed)
1. Generous pension scheme			
• e1=1; e2=1	11	19	261
2. Less generous pension scheme			
• e1=0.9; e2=1	9	17	242
• e1=0.6; e2=1	6	13	214
• e1=0.3; e2=1	5	12	203
• e1=0.1; e2=1	4	11	199
3. Generous pension scheme with expenditure switching policy			
• e1=1; e2=0.9	-11	-6	60
• e1=1; e2=0.6	-32	-31	-19
• e1=1; e2=0.3	-38	-38	-33
• e1=1; e2=0.1	-14	-4	-37
4. Less generous pension scheme with expenditure switching policy			
• e1=0.9; e2=0.9	-12	-8	56
• e1=0.6; e2=0.6	-34	-33	-22
• e1=0.3; e2=0.3	-41	-40	-36
• e1=0.1; e2=0.1	-43	-42	-40

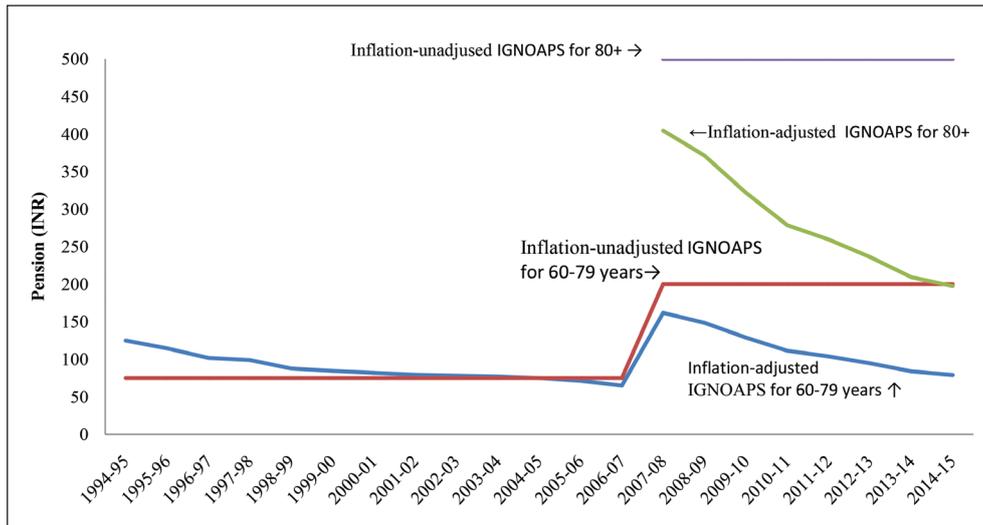
Source: Author's calculations.

Table 17: Required fiscal adjustments in India's current fiscal policies for implementation of the sustainable pension schemes

Required fiscal adjustments under sustainable fiscal policies	IGNOAPS		UOAPS (Baseline)		UOAPS (Proposed)	
	Tax adjustment (%)	Tax and transfer adjustment (%)	Tax adjustment (%)	Tax and transfer adjustment (%)	Tax adjustment (%)	Tax and transfer adjustment (%)
Generous pension scheme with expenditure switching policy						
e1=1; e2=0.6						
Current generation	-1175.0	-921.5	-1169.5	-904.6	-1117.1	-753.6
Future generation	-47.9	-45.1	-47.7	-44.8	-45.6	-42.3
• 2010	-46.5	-43.6	-46.3	-43.3	-44.3	-40.7
• 2020	-47.0	-44.1	-46.8	-43.9	-44.7	-41.3
• 2030	-47.5	-44.7	-47.3	-44.4	-45.2	-41.8
• 2050	-48.5	-45.7	-48.3	-45.4	-46.1	-42.9
e1=1; e2=0.1						
Current generation	-1234.7	-1045.4	-1233.4	-1034.4	-1220.7	-935.9
Future generation	-50.4	-48.2	-50.3	-48.2	-49.8	-47.7
• 2010	-48.9	-46.7	-48.9	-46.7	-48.4	-46.1
• 2020	-49.4	-47.3	-49.4	-47.2	-48.9	-46.7
• 2030	-49.9	-47.8	-49.9	-47.8	-49.4	-47.3
• 2050	-50.9	-48.8	-50.9	-48.8	-50.4	-48.3
Less generous pension scheme with expenditure switching policy						
e1=0.6; e2=0.6						
Current generation	-1277.1	-1013.3	-1271.6	-994.9	-1219.3	-830.7
Future generation	-52.1	-51.0	-51.9	-50.7	-49.7	-47.9
• 2010	-50.6	-49.2	-50.4	-48.9	-48.3	-46.1
• 2020	-51.1	-49.9	-50.9	-49.6	-48.8	-46.8
• 2030	-51.6	-50.5	-51.4	-50.2	-49.3	-47.5
• 2050	-52.7	-51.7	-52.5	-51.4	-50.3	-48.7

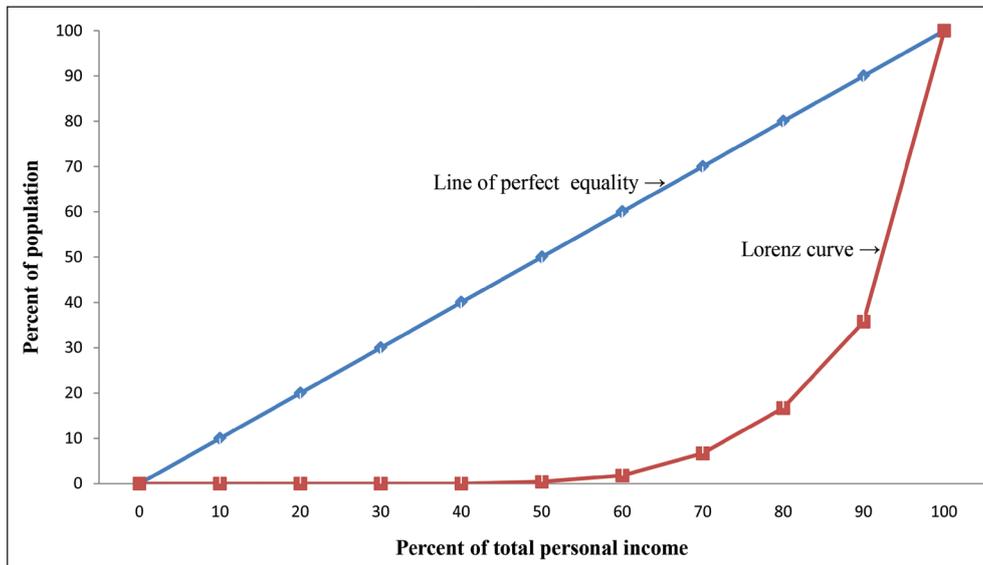
Source: Author's calculations.

Figure 1: Real value of pension amount under the IGNOAPS



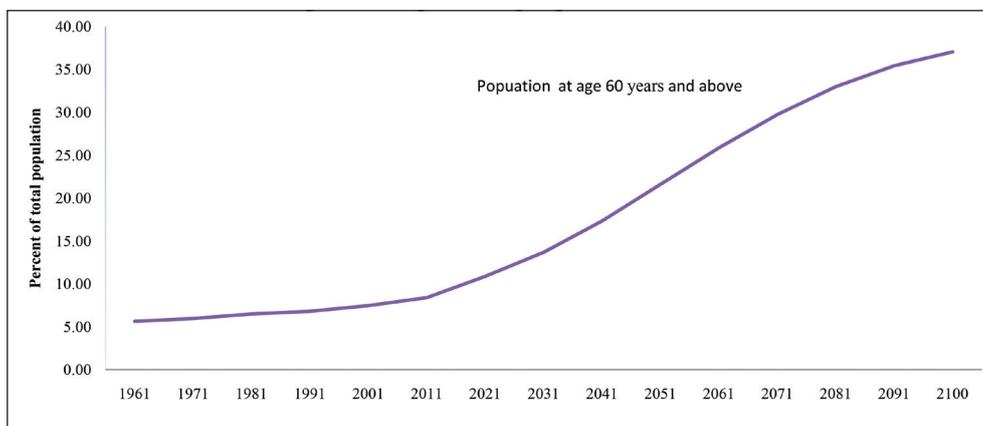
Source: Author's calculations based on the Wholesale Price Index for food items (at 2004-05 prices).

Figure 2: Lorenz curve for personal income distribution of elderly individuals, India, 2010-11



Source: Author's calculations by using the sample survey data in UNFPA (2013).

Figure 3: Population ageing, India, 1961 - 2100



Source: Author's calculations using various reports on Census of India from 1961 2011 and United Nations (2013a).

About the Project

The United Nations Population Fund - UNFPA supported project BUILDING KNOWLEDGE BASE ON POPULATION AGEING IN INDIA aims at contributing and further expanding the existing knowledge base on the emerging population dynamics in India which are resulting in significant shifts in the age structure towards higher proportions of older persons aged 60 years and above. In first stage, the project supported the preparation of a series of thematic studies using existing secondary data sources. In the second stage the project initiated a primary survey in seven states in India. Dissemination of the findings to various stakeholders is a key objective of the project to help enhance the overall understanding of the situation of elderly in the country for further research and policy analysis on the growing numbers of India's senior citizens. The project is a partnership between the Institute for Social and Economic Change (ISEC), Bangalore, the Institute of Economic Growth (IEG), New Delhi and Tata Institute of Social Sciences, Mumbai

More information on the project can be obtained from www.indiaunfpa.org or <http://www.isec.ac.in/prc.html>

The second phase of the project involves an updated situation analysis through the collection of primary data from seven states in India which have relatively higher proportions of elderly. These are Himachal Pradesh, Kerala, Maharashtra, Orissa, Punjab, Tamil Nadu and West Bengal. The survey data includes socio-economic characteristics, family dynamics, living arrangements, health and awareness of social security programmes of the elderly. This paper is based on the data gathered from the seven states.

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