Asian Population Studies

LIFECYCLE DEFICIT, INTERGENERATIONAL PUBLIC AND FAMILIAL SUPPORT SYSTEM IN INDIA

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The old and young consume public and private goods and services in excess of their labour income and incur lifecycle deficit (LCD). The share of the benefits received by the elderly 65 years and above and children below 20 years are, respectively, 6.3 and 42.1 per cent of the total familial in-transfer. The elderly themselves contribute to support, particularly for education of grand-children, and their contribution is more than the benefit they receive from intra-household transfers. Contrary to the belief that in India, children provide old-age security, the elderly do not gain from the intra-household familial support. It is found that in India, there is a shortage of public funding to meet a greater share of the LCD of the population of children and the aged, and they would not have been able to consume essential goods and services if not for asset-based consumption and familial support.

KEYWORDS: lifecycle deficit (LCD); asset-based reallocation; public transfers; familial support

Introduction

The young and the old population face lifecycle deficit (LCD), i.e. the excess of lifetime consumption over one's own income. The consumption in an economy includes publicly (government) sponsored targeted programmes for healthcare, education, poverty alleviation, social assistance and other goods, either in-kind or in cash, and private (household) consumption for such things as education, healthcare, housing, food and non-food, e.g. clothing, expenses for social functions and religious ceremonies. Children and the elderly, in particular, during their respective life stages of infancy and schooling, and post-retirement, generally either have insufficient income or no income. Intergenerational exchange of economic resources across generations is viewed as the support system in welfare states to finance the LCD of the old and young population. Public policies mediate intergenerational transfers for education, healthcare, social security and other welfare programmes by collecting direct and indirect taxes, generating revenues and by borrowing (Ladusingh & Narayana 2011a). The institutionalisation of public welfare programmes and monetary values of intergenerational transfers vary considerably within and between subcontinents in the world. The private support system, by and large, comprises intra- and inter-household transfers for healthcare, education and other consumption from members of household with disposable income. Informal and formal financial institutions facilitate asset accumulation and liquidation of savings for meeting the LCD through asset-based reallocations. For a country, the interplay of private and

public support system is crucial for funding the LCD of the dependent old and young population.

India is an important case in point, considering its steadily growing old-age population, low insurance coverage, low coverage of national social assistance programme, low public expenditure on the social sector, and the transformation of Indian society from the traditional extended family to a nuclear one. According to census figures, the proportion of those 65 and above was 4.8 per cent in 2001 and 5.2 in 2011, and is expected to reach 13.1 per cent in 2051 (Population Foundation of India & Population Reference Bureau 2007; Registrar General of India 2006). Only about 10 per cent and 1 per cent of the population, respectively, are covered by formal and community insurance schemes (Planning Commission 2008). Public expenditure on the National Social Assistance Programme was about 0.17 per cent of the revenue expenditure in 2004–2005 (Government of India 2009), and about 9.2 million people were covered under that programme. Public expenditure on health hovers at around 1 per cent of the gross domestic product (GDP), and that on education, below 3 per cent of the GDP (Government of India 2011). Mohanty and Sinha (2010) found that the likelihood of incidence of poverty among elderly living in nuclear families and female-headed households is higher than elderly in other types of living arrangement. On the contrary, Pal and Palacios (2011) have shown, under an econometric framework controlling for family size in most of the Indian states, that poverty rates of households with or without old people above 60 years are at a similar level.

In view of the changing demographic scenario, social set-up and ever-evolving public policies in India, this paper makes an attempt to understand how the interface of these phenomena is reflected in meeting the public and private consumption needs of the old and young population, in particular. This paper has two main objectives. Firstly, it aims to study the magnitude of consumption LCD for the old and young population in India in monetary terms. Secondly, this paper seeks to examine the share of contributions of public and private intergenerational transfers to support the LCD of the old and young dependents, in particular, and other broad age groups, in general, in line with the National Income and Product Accounts (NIPA) for the accounting year 2004–2005. The significance of this paper lies in its contribution to understanding the interplay of public and private intergenerational support for healthcare, education, and other goods and services for the old and young population in India.

The organisation of this paper is as follows. A brief review of the literature is presented in the next section, followed by a section on the definition of concepts and terminologies, data sources, methodology and assumptions. The section on results comprises three parts, namely, LCD, and public support and private support to meet LCD in terms of beneficiaries and donors of intergenerational support. The paper ends with a summary and conclusion.

Literature Review

In traditional societies, investment in children is considered as long-term savings for one's old age (Willis 1980). Although Caldwell (1976) has hypothesised that over the lifecycle, intergenerational flow of resources at the initial stage of development is from the young to the old, a number of empirical findings (Kaplan 1994; Preston 1982) suggest that

net resources flow from the old to the young except in developed societies. Studies of intergenerational transfers in Asia, which focus primarily on parent-child transfers are found in Ofstedal *et al.* (1999), and Zimmer and Kwong (2003). These studies provide not only evidence of intergenerational transfers, but also suggest altruism guided by *quid pro quo* motive as an important factor in determining dynamic resource allocation (Mizushima 2009). In the Philippines, Thailand, Taiwan and Singapore, transfers from adult children are the main source of income for aged persons (Hermalin *et al.* 2002). Ikkink *et al.* (1999) and Stark (1995) were of the opinion that children who support their aged parents are setting a precedent for their own children to follow. Children's support of their aged parents is also considered as a form of repayment of the support given by the parents for the children's education.

In mainland China, between 30 and 50 per cent of aged persons received financial support from mainly adult children (Chen & Silverstein 2000). Agree *et al.* (2005), from a study of intergenerational transfers in Taiwan and the Philippines, found that both these countries are similar in terms of the availability of kin, but in the case of Taiwan, transfer is concentrated among lineal kin, whereas in the Philippines, transfer is more broadly distributed among family relations, particularly siblings. Frankenberg *et al.* (2002) provided evidence of parents giving loans to children that are later repaid, and also substantiated that transfers within families serve as a form of insurance for family members in the case of Indonesia. Using the Malaysian Family Life Survey, Lillard and Willis (1997) reasserted three theories of transfer: repayment to parents for school loans; exchange of money for time; and insurance against risk.

In addition, there are economic theories which have attempted to explain the motivations for familial transfer of resources. Becker's family model (1974, 1991) assumes that each household's head uniformly redistributes resources among family members so that members' surplus resources flow to deficit members, hence keeping the altruism motive. The more altruistic the head is, the more is the investment in children without any expectation of return (Becker & Tomes 1976). Altruism can also motivate children to transfer resources to their old parents in households where parents have instituted the social value of transfer (Lee *et al.* 1994). The implicit assumption of the altruism model of family transfer is that needy family members receive more than what they transfer to other members. Bernheim *et al.* (1985) are among others who have emphasised the quid pro quo motive of familial transfer. Cox's (1987) proposition highlighted the transfer of money to parents from adult children in exchange for care of the latter's own children. Family members who transfer resources to help another member in times of need explain the long-term role of transfers among kin as a source of insurance. However, the evidence does not lend support to the dominance of the altruism model, the exchange model or the insurance model over the other models (Schoeni 1997).

In developed economies, where state-based or market-based alternatives for economic support is prominent, the role of familial transfer is not very significant like in traditional developing countries. Traditionally, German and Italian retirees have relied primarily on publicly sponsored retirement systems for most of their income support (Nyce & Schieber 2005). In Canada and the Unites States, on the other hand, retirees receive income support from a mix of publicly and privately sponsored retirement programmes. In New Zealand, the government provides a flat-rate taxable universal pension. Retirement social security systems are essentially mechanisms that facilitate the distribution of costs (taxes) and benefits (transfers). In publicly (government)-sponsored pay-as-you-go

(pay-go) retirement schemes, taxes are collected from current workers and transferred to current retirees. The popularity of pay-go systems in the face of population ageing has raised concerns about their sustainability.

In the Indian context, there is a lack of empirical evidence of intergenerational monetary transfers, though a number of studies have highlighted theoretical and behavioural considerations of old-age support by children, particularly sons. Intra-household allocation of financial resources, either upwards from children to parents or downwards from parents to children, are important means of intergenerational support for traditional societies, such as the Indian society, and a comprehensive understanding of intergenerational support is of value in drawing policies and programmes to the ever-increasing elderly population. Public policies and programmes play important roles in providing support to the old and young population, and the general population, res-pectively, through targeted programmes and programmes meant for the masses. The National Transfer Accounts (NTA) framework (Mason *et al.* 2009) captures the interplay of public policies and programmes and the intra-household support system in the analysis of the intergenerational support mechanism in an economy. Secondly, the NTA framework reflects the total inflows and outflows of flow accounts in the National Accounts, and the results are consistent with monetary values in the National Accounts. Despite some limitations arising from assumptions to suit the nature of the data on household income and expenditure, the NTA methodology has been tested to a number of countries representing various economies across the world. Ladusingh and Narayana (2011b) used the NTA framework to look into familial support, and this current study is extending the framework by augmenting it to include public in-kind or cash transfers and tax revenues for supporting public policies and programmes. The NTA framework is still evolving to incorporate accounting practice and emerging data and this study is based on the latest development.

Definition, Data Sources, Methodology and Assumptions

a. Definition and Data Sources

The LCD at each age is the excess of consumption over the labour income of persons of this age. We make a distinction between publicly funded and privately funded consumption, focusing on health, education and other goods and services collectively as one category of consumption. The labour income is the sum of the compensation of employees (including net compensation of employees from the rest of the world) and a fixed part of mixed income (income from one's own business enterprise). Public and private transfers are the two support systems to finance the LCD. Public transfer inflows are benefits received by individuals from the government in kind or in cash for goods and services for targeted and untargeted programmes mandated by the constitution. The government collects taxes and revenues from individuals to generate resources for funding public programmes and these constitute public transfer outflows for contributors. Intra- and inter-household transfers make up private transfers. Members with disposable income are contributors, while members with no or inadequate income are the beneficiaries of intra-household private transfers. In other words, the intergenerational public and private support system represents the reallocation of monetary resources across generations.

In all societies, children and the elderly consume more than they produce, thereby incurring LCD. Working-age adults have lifecycle surplus because their labour income is

usually more than their consumption needs. The NTA is an accounting framework for measuring intergenerational reallocations of monetary resources across age groups to make up for the LCD of children and the elderly in a manner consistent with the NIPA. The flow identity, which governs the NTA framework, is described in detail in the Appendix. The LCD is met by two broad economic forms of intergenerational monetary reallocations across age groups, namely, asset-based reallocations and net transfers. Asset-based reallocations are equal to asset income less savings. Assets can be held in the form of capital, property and credit. Individuals can accumulate assets when they are young and dispose them at old age to meet the consumption needs of goods and services.

The consumption by sectors, LCD, and public and private support considered in this study is consistent with the NIPA for the accounting year 2004–2005. Macro aggregate controls for the consumption for health, education and consumption of goods and services other than health and education for public and private households for the financial year 2004–2005 are compiled from the National Accounts Statistics (Government of India 2008). The macro aggregate control for labour income is the sum of the compensation of employees (including net compensation of employees from the rest of the world) and two-thirds of the mixed income. The variable and measurement descriptions of India's aggregate controls for income and consumption are summarised in Table 1.

TABLE 1
Definition and measurement of aggregate controls.

Aggregate control variable	Measurement of aggregate control variable
Aggregate income	
Labour income	Compensation of employees + (2/3) of mixed income + net compensation of employees from the rest of world (ROW)
Asset income	Operating surplus of non-household sector + (1/3) of mixed income of household sector + net property and entrepreneurial income from ROW − subsidies
Aggregate consumption	
Public	Government final consumption expenditure (GFCE)
Private	Private final consumption expenditure (PFCE)
Education consumption	
Public	Expenditure on education under GFCE
Private	Expenditure on education under PFCE
Health consumption	
Public	Expenditure on health under GFCE
Private	Expenditure on medical care and health services under PFCE
Consumption other than for education and health	
Public	Expenditure on non-education and non-health under GFCE
Private	Expenditure on non-education and non-medical care and health services under PFCE

Source: Narayana and Ladusingh (2009).
Notes: (1) Private other consumption includes general public services; defence; social security and welfare services; housing and other community amenities; cultural, recreational and religious services; economic services, e.g. agriculture, mining, transport and communication. (2) Public other consumption includes food and beverages; clothing and footwear; fuel and power; furniture, furnishing, appliances and services; transport and communication; and recreation and cultural services. (3) All private consumption is defined net of consumption (indirect) taxes.

TABLE 2
Macro aggregate control for labour income and consumption by sectors in India, 2004–2005.[1]

Consumption by sector	Public	Private	Total
Education	60,505	38,221	98,726
Health	74,441	80,895	155,336
Others	184,152	1,537,401	1,721,553
Macro control for labour income			1,546,099

Source: Extracted from the National Accounts Statistics, 2008; Ladusingh and Narayana (2011a).
[1]The figures are in crore Indian rupees (INR), one crore = 10 million.

Table 2 presents the extracted values of aggregate macro controls for labour income, and for public and private consumption for health, education and other consumption.

To derive age patterns of public and private consumption for education, health and other consumption and labour income, unit level data which provide this information, distinguishing between public (government) and private (household) consumption are required at the individual level. This is particularly needed for charting the age profile of labour and other income, either at the individual or household level, ideally from a family income and expenditure survey (FIES). The India Human Development Survey (IHDS) (Desai *et al.* 2008), conducted during 2004–2005, is the source of much of the micro data.[1] This is a nationally representative survey covering 200 thousand individuals from over 41 thousand households spread over 1503 villages and 971 urban localities, and a multi-stage stratified sampling design has been adopted for the survey.

The income of individual members and household income reported in household surveys are subject to certain limitations because income is a constructed variable and there is no uniform definition of income. The problem of defining income arises from the fact that households produce goods and services for sale in the market as well as for self-consumption. The non-monetised part of household income is difficult to account for. Data from the IHDS has information on the monetised value of household products, and this has been incorporated in preparation of the base data. However, as Deaton (1997) has highlighted, it is difficult to obtain the income of the self-employed engaged in agriculture or family business. In the present data, income for the self-employed, particularly for those engaged in agriculture, animal husbandry and casual work, are found to be missing, more so for females than for males. In this study, the missing income for such individuals are being imputed using income reported from those of similar age, sex, education level and occupational categories. The advantage of the NTA framework is that only the age pattern of labour income is estimated from the micro data and the aggregate level of income is made consistent with the NIPA. The aggregate controls used in the NTA accounting framework are based primarily on the United Nations 1993 System of National Accounts (United Nations 1993) and there are few items in the National Accounts Statistics, India, which deviate from the United Nations 1993 System of National Accounts.

It is generally the higher-income group that tends to under-report income, and this is also the case for the IHDS. The number of households reporting asset income from such sources as land, rents, bonds, insurance and interest from savings is only 10 per cent of the surveyed households and this looks to be a clear indication of the concealment and

under-reporting of the asset income of households. Likewise, households from the higher-income group under-report dis-savings, unlike households from the lower economic strata. Benefits from such public transfer programmes as the National Old Age Scheme (NOAS), the Widow's Pension Scheme and the National Maternity Scheme are not adequately covered and reported by 13 per cent of the sampled households. Although the IHDS has made the attempt to capture savings, this is also under-reported in the survey, as one can observe from comparing the level of savings with the National Account's figure on household savings.

b. Methodology and Assumptions

Economists often employ a theoretical lifecycle model to explain the consumption patterns and saving behaviour of individuals by age and different phases of life (Ando & Modigliani 1963; Modigliani & Brumberg 1954). In its simplest form, the lifecycle model suggests that individuals earn income and consume goods and services during their productive period. In general, during their productive period of life, the workers borrow against their expected stream of future earnings during the early phase of their working life to start their families; during the middle phase of their working life, they pay off their early career debts and surplus income, or excess of income over consumption, is either saved or invested for future consumption (Nyce & Schieber 2005).

The economic lifecycle of individuals can be studied more comprehensively in terms of the age patterns of labour income and consumption. The LCD at each age is the excess of consumption over labour income. We consider consumption for healthcare, education and others, which can be either publicly funded, self-financed, financed by other members of the household or borrowed. Other private consumption includes such things as food, social functions and religious ceremonies, housing and durables, while other public consumption includes such things as defence, research and development, and infrastructure. In what follows, we describe methods for age allocations of consumption for healthcare and education, and other consumption, made by the government and households, in consistency with the NIPA. The methodology adopted here is based on the approach followed in a multi-country project, including India, on the NTA framework outlined in Mason et al. (2009),[2] with modification to suit available data in India at the micro and macro levels.

Labour income is estimated as the sum of salary and wages, share of self-labour in input from operating surplus or entrepreneurial income of net indirect taxes. The compensation of employees is equal to wages and salaries and the employer's social contributions. In the absence of information on the share of self-labour input from mixed income, two-thirds of the total mixed income is assumed to be the entrepreneurial income. The age profile of employee compensation is estimated using survey data. The age profile of the labour income of the self-employed and family workers is also estimated from the survey, with unreported income being imputed by mean reported income, controlling for age, sex, education level and occupational categories.

For the age allocation of private consumption for food, we have adopted an empirical equivalent scale. Most expenditure data are collected for households rather than individuals. Moreover, some goods are jointly consumed so that allocating their consumption to individuals inevitably involves arbitrary rules. In any setting, allocating consumption to individuals is difficult. Engel's method uses the share of food in the household budget as the welfare metric. Engel's method has been used extensively, but is

widely criticised on conceptual grounds. The consensus among researchers is that Engel's method yields an upward biased estimate of the cost of children. On *a priori* grounds, we can only say that Engel's method will generally yield a biased result (Deaton 1997).

The Rothbarth method uses expenditure on adult goods, e.g. tobacco, alcohol and adult clothing. Thus, the amount consumed does not depend in any direct way on the presence of children. The Rothbarth method rests on the assumption that that consumption of adult goods is demographically severable in the household's utility function. Under this assumption, the presence of children in the household affects the consumption of adult goods only because the total expenditure available to adults declines when children are present. There are several practical difficulties with the Rothbarth method that limit its application, as noted by Deaton (1997), one of which is that expenditure on goods cannot be used as an indicator of welfare, and thus, cannot be used to generate equivalence scales.

If the Engel method is biased upwards and the Rothbarth method is biased downwards, then the true value would lie somewhere in between. An informative age pattern can be calculated by applying the equivalency scale to actual household-level survey data, and then averaging across the imputed consumption by individuals of a given age in all households. A critical review of different approaches to arriving at a suitable equivalence scale can be found in Lee *et al.* (2008).

Based on the empirical evidence from countries of diverse economies involved in the multi-country NTA project in this study, the age allocation of private expenditure on food is based on an equivalence scale which is taken as 0.4 for children below four years of age, increasing linearly from 0.4 to 1 for individuals between 4 and 20 years, and staying constant at 1 thereafter for individuals 20 years and above. The age profile of food consumption is then estimated by applying this equivalence scale to the household expenditure as available in the IHDS. For the age allocation of non-food expenditure, housing and durables, we have adopted the same equivalence scale as that in the case of food expenditure.

The regression approach is being adopted for individual age allocation of household education expenditure. Let E_i^e denote the ith household expenditure on education, N_{ij} be the number of persons of age j in the household, and D_{ij}^e be a dummy used as an indicator for members of household of this age enrolled for education; we then regress this as:

$$E_i^e = \sum_j \beta_j N_{ij} D_{ij}^e + \sum_j \alpha_j N_{ij} \bar{D}_{ij}^e$$

Consequently, the estimated education expenditure for members of household of age j enrolled for education is:

$$\hat{E}_{ji}^e = D_{ji}^e \left(E_j^e \hat{\beta}_i^e \right) \Big/ \sum_i \hat{\beta}_i^e N_{ji}$$

A similar regression method is used for individual age allocation of household expenditure on healthcare.

When it comes to methodologies for the age allocation of public expenditure on education, health, and defence, infrastructure, research and development, we have used corresponding age patterns from data sources that have information pertaining to age. Out-of-pocket expenditure on healthcare for the utilisation of public health facilities, by the individual age of out-patients and in-patients, is available from the survey of morbidity and healthcare. In the case of India, the total public expenditure on education for the various levels of education—lower primary, upper primary, secondary and higher

education—are available, and so are the respective number of students enrolled in public academic institutions. This is used for the computation of age-specific per capita cost of public expenditure on education by level of education. The prescribed formal age for lower primary, upper primary, secondary and higher education are, respectively, 6–10 years, 11–13 years, 14–17 years and 18–24 years. The per capita cost of public expenditure on education and level-specific school attendance derived from the household survey mentioned in the section on data sources are multiplied with single-year age distribution of the census for the corresponding age range prescribed for different levels of education to obtain the age profile of consumption for public education.

The age allocation of public expenditure on things other than health and education is on a per capita basis. To scale the age allocations of public and private consumption to be consistent with the NIPA for each sector—education, health and other sectors, we use the population weighted procedure and adjusted age profiles are worked out as:

$$C_{ix}^a = (NIPA) \times \frac{C_{ix}N_i}{\sum_i C_{ix}N_i}$$

where C_{ix} is the unadjusted age profile for sector x and specific for age i, and N_i is the population of age i. $(NIPA)_x$ is the expenditure for sector x, available in the National Accounts Statistics, and are shown in Table 2.

The NTA framework for supporting LCD and the intra-household transfers algorithm used in the NTA are reproduced from www.ntaccounts.org (see the Appendix for a complete and comprehensive appraisal of the discussion in the present paper).

Lifecycle Deficit (LCD)

From the perspective of an individual, public and household expenditures are referred to as consumption in the NTA framework. Public and private consumption for health, education and all other forms of consumption for the accounting year 2004–2005 consistent with the NIPA are considered. Consumption at older ages primarily reflects expenditures on health and social assistance programmes besides expenditures on food and non-food basic items. Expenditure on human capital, that is, on children's education and healthcare, is embedded in the consumption by children in the school-going age groups. Human resource development enhances the productivity of future generations of workers and contributes to the resource pool for inevitable population ageing. The consumption of public and private goods and services by the population in the working age groups depends on unemployment, productivity, days worked, extent of support to dependent members and savings. The consumption needs of the old and young populations compete with one another. Table 3 shows aggregate public and private consumption, labour income and LCD by broad age groups.

The total public and private consumption for education, health and all other consumption in India, consistent with the corresponding figures in the National Accounts for the accounting year 2004–2005, are in the second column, and for the other broad age groups 0–19 years, 20–29 years, 30–49 years, 50–64 years and 65 years and above, in the following columns. The population of age groups 65 years and above and under 20 years, respectively, constitute 6.5 per cent and 32.4 per cent of the share of total consumption, while the share of consumption of the working age groups of 20–29 years, 30–49 years

TABLE 3

Aggregate labour income, consumption and lifecycle deficit by broad age groups, India, 2004–2005.[1]

		Broad age groups				
	Total	**0–19**	**20–29**	**30–49**	**50–64**	**65 +**
Lifecycle deficit	429,516	583,062	58,499	−267,329	−39,687	94,971
Total consumption	1,975,615	640,114	377,019	572,539	256,732	129,211
Public consumption	319,098	159,705	41,492	66,958	32,177	18,766
Education	60,505	58,905	1,600	0	0	0
Health	74,441	20,737	7,742	21,931	14,292	9,739
Others	184,152	80,063	32,150	45,027	17,885	9,027
Private consumption	1,656,517	480,409	335,527	505,581	224,554	110,446
Education	38,221	31,798	6,423	0	0	0
Health	80,895	12,767	8,678	26,271	19,584	13,595
Others	1,537,401	435,844	320,426	479,310	204,971	96,851
Labour income	1,546,099	57,052	318,520	839,868	296,419	34,240

[1]The figures are in crore Indian rupees (INR), one crore = 10 million.

and 50–64 years are, respectively, 19.1 per cent, 29 per cent and 13 per cent. The consumption of those 65 years and above is largely on healthcare, and that of children under 20 years, on education. The age pattern of aggregate consumption reflects the age distribution of India's population, with a large number of children and a not so sizeable, but increasing, population of elders 65 years and above. This age pattern of consumption not only captures the age structure of India's population, but also provides an indication of present priorities in public programmes and the focus of intra-household allocation.

The aggregate labour income by broad age groups is shown in the last row of Table 3. Labour income includes wages and salaries of employees with fringe benefits, in addition to the value of labour of those who are self-employed. The existence of child labour and the continuation of economically gainful activities by the elderly emerge from the fact that the contribution of children under 20 years and elderly 65 years and above to the total labour income are 3.7 per cent and 2.2 per cent, respectively, which are too little to meet their consumption needs. The consumption of private and public goods and services for health, education and all other consumption by the population 65 years and above and those under 20 years are 3.8 and 11.2 times their respective labour income, while for all age groups, consumption is 1.3 times the labour income. These results clearly suggest the need for further increasing the support system to consolidate public investment for old age healthcare. One of the options for this is to harness the favourable age structure by creating a conducive economic and political environment.

The excess of consumption over labour income, i.e. LCD, by broad age groups, are shown in the first row of Table 3. The lifecycle surplus of the population 30–49 years and 50–64 years are evident as these groups consume less than their aggregate labour income, that is, 0.7 and 0.9 times their respective aggregate labour income. Figure 1 graphically summarises the age patterns of aggregate labour income, consumption and LCD at the aggregate level.

As can be seen from Figure 1, in the case of India, the LCD, i.e. the gap between what is consumed and what is produced, is very large at the young ages and relatively smaller at the old ages at the aggregate level.
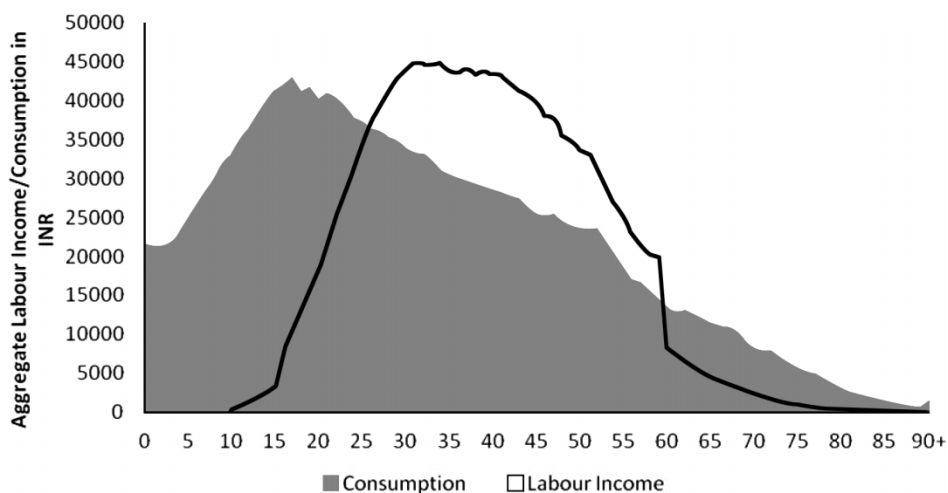
FIGURE 1

Aggregate labour income, consumption and lifecycle deficit in India, 2004–2005.

Figure 2 shows the percentage share of public and private consumption for health, education and all other consumption. In the private sector, consumption in areas other than education and health constitute 77.8 per cent of total consumption, while private health and private education constitute 4.1 per cent and 1.9 per cent, respectively, of total consumption, making the share of private total consumption 83.8 per cent of total consumption. On the other hand, the share of public consumption on education, health and all other consumption are 3.1 per cent, 3.8 per cent and 9.3 per cent, respectively, making up 16.2 per cent of total consumption.

The mean age of overall consumption of both the public and private sectors taken together is 49.8 years, while the respective mean ages of consumption for these two
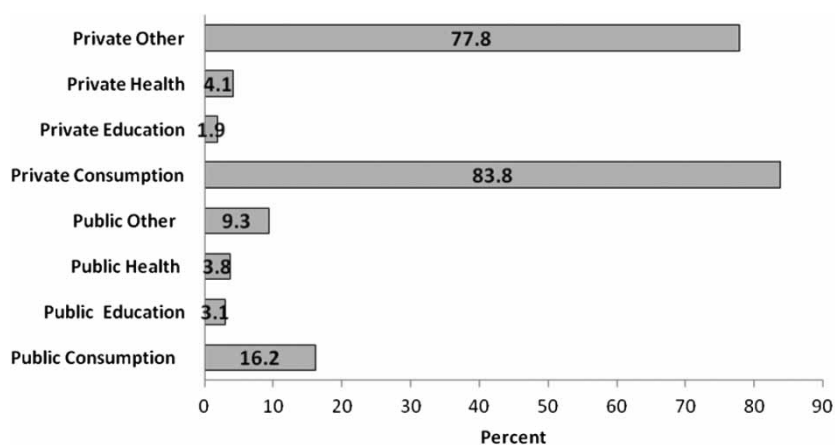

FIGURE 2

Percentage share of consumption for health, education and others, by sectors in India, 2004–2005.

sectors in the aforesaid order are 43.5 years and 50.1 years, respectively. For health consumption in the public and private sectors, the mean ages of consumption are, respectively, 58.4 years and 62.4 years. The higher mean age of healthcare consumption is also indicative of the fact that the need for healthcare increases with advancing age, and the larger share constituted by healthcare is in the form of household out-of-pocket expenditure as the overall share of public expenditure in this sector is very marginal. The average ages of individuals who attended public and private academic institutions and utilised the resources of these institutions are 13.3 years and 14.2 years, respectively.

Other forms of public consumption are on such things as infrastructure and defence, and the mean age of consumption is 45 years, whereas private other consumption relates to consumption for food, clothing, housing, social functions and religious ceremonies, and the corresponding mean age of consumption is 49.6 years.

Figure 3(a) shows the age profiles of the per capita annual public and private consumption on education, health and all other consumption. As far as public consumption is concerned, only the education profile is significant in the school-going age range, while both public and private healthcare consumption escalates with advancing age, but at very old ages, private consumption for healthcare dominates over public consumption. The bulk of per capita consumption is for private purposes, which include food, housing, clothing, social functions and ceremonies. The LCD implication of consumption at young and old ages in excess of their labour income is better captured when the per capita labour income and the per capita consumption age patterns are plotted together, as shown in Figure 3(b).

The age profile of per capita labour income reflects a number of distinctive features. It is an inverse broad U-shaped curve, which shows the existence of child labour starting work for cash at an early age, with labour income increasing steeply till about 35 years, increasing steadily between 36 and 59 years, and thereafter, declining rapidly and tapering with advancing age. The span of time during which individuals earn more than or at least adequate to meet their own consumption needs for public and private goods and services
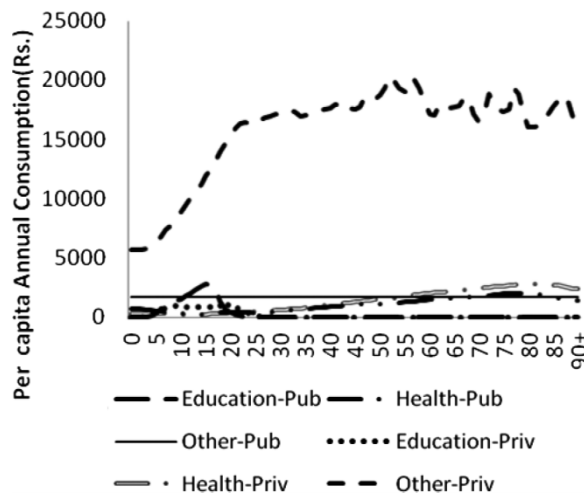

FIGURE 3a
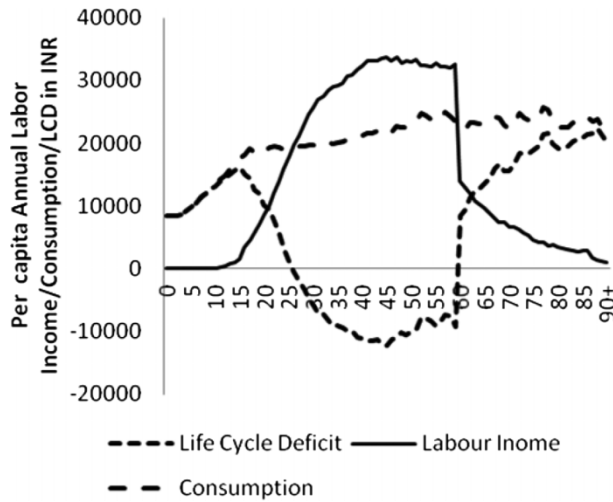Per capita consumption, by sectors.

FIGURE 3b
Per capita labour income, consumption and lifecycle deficit in India, 2004–2005.

is short, about 34 years. The elderly in India continue to work in the lowly paid unorganised sector or to work in their own farms. This is evident in the tapering income profile at the advanced ages.

The per capita monthly consumption increases sharply from about four years of age till it attains an early peak at about 19 years of age, showing substantial investment for education. It continues to increase up to 26 years of age, which is the age of the completion of education. The labour income and consumption age profiles cross over at 26 and 60 years, indicating that 26–60 years is the economically productive period, while persons under 26 years and above 60 years have economic LCDs.

During the 34 years of economically gainful activities, the per capita consumption rises concomitantly with the rise in per capita labour income, and continues to rise even in the post-retirement ages. It decreases, though, at the very old age. This implies that retirement does not compel individuals to curtail consumption, because the need for consumption of food and non-food items cannot be changed with advancing age, and moreover, there would be an add-on expenditure for healthcare. An important noticeable feature of the age pattern of per capita consumption of public and private goods and services is that even after crossing the prime working ages, the average consumption of the elderly is nearly on par with that of the prime working ages. In the next section, we will explore the means of continuing old age consumption, in particular, in the Indian context.

Public and Familial Support Systems

Public and private transfers are the two main intergenerational support systems. The other means of support are public and private asset-based reallocations. Transfers in the NTA framework refer to reallocations from one age group to another to support the LCD. The intergenerational support system reflects many behavioural and non-behavioural factors. The direction of transfers can be from the younger to the older population and

vice versa. The inflows and outflows are considered from the perspective of individuals as beneficiaries and contributors. Public transfer inflows are benefits received by individuals from the government in-kind or in cash for goods and services for targeted and untargeted programmes mandated by the constitution. The government collects taxes and revenues from individuals to generate resources for funding public programmes, and this constitutes public transfer outflows for contributors.

Table 4 provides the monetary value of public and private current transfers and asset-based reallocations for India for the accounting year 2004–2005. This is organised into three panels. The first panel—transfers and asset-based reallocations—is an aggregation of figures in the second and third panels, which account for public and private transfers and asset-based reallocations, respectively.

Net public and private transfers in the first panel is the sum of net public and private transfers in the second and third panels, and this is also the case for public and private asset-based reallocations. The totality of the net public and private transfers and asset-based reallocations makes up the total intergenerational reallocations. It is evident that

TABLE 4

Intergenerational public and private transfers and asset-based reallocations by broad age groups, India, 2004–2005.[1]

	Total	0–19	20–29	30–49	50–64	65 +
			Transfers and asset-based reallocations			
Total reallocation	429,516	583,062	58,499	−267,329	−39,687	94,971
Public and private asset-based reallocations	395,527	20,038	−16,922	142,122	135,357	114,932
Net public and private transfers	33,989	563,024	75,421	−409,451	−175,044	−19,961
			Public transfers and asset-based reallocations			
Net public transfers	0	81,138	−35,904	−45,406	−5006	5178
Public transfers inflows	558,953	196,080	65,889	155,660	88,468	52,855
Public transfers outflows	−558,953	−114,942	−101,793	−201,066	−93,474	−47,677
Public asset-based reallocations	124,937	25,692	22,753	44,942	20,893	10,657
			Intra- and inter-household transfers and private asset-based reallocations			
Net private transfers	33,989	481,886	111,325	−364,045	−170,038	−25,139
Private transfer inflows	1,213,290	498,342	246,997	264,478	122,272	81,200
Private transfer outflows	−1,179,301	−16,456	−135,672	−628,523	−292,310	−106,339
Net inter-household transfers	33,989	2705	4952	10,695	8894	6743
Inter-household inflows	36,458	2829	5401	11,685	9518	7025
Inter-household outflows	−2469	−124	−449	−990	−625	−282
Net intra-household transfers	0	479,181	106,372	−374,740	−178,932	−31,882
Intra-household transfer inflows	1,176,832	495,514	241,596	252,793	112,754	74,176
Intra-household transfer outflows	−1,176,832	−16,332	−135,224	−627,533	−291,685	−106,058
Private asset-based reallocations	270,590	−5654	−39,674	97,180	114,463	104,275

[1]The figures are in crore Indian rupees (INR), one crore = 10 million.

total reallocations for broad age groups in the first row of the first panel in Table 4 matches that of the LCD in the first row of Table 3 for the corresponding age group.

From the second row of the second panel, it is evident that out of the total public transfer inflow of Rs. 558,9530 million, only 9.5 per cent of it goes to the population 65 years and above, while the share of this transfer to children under 20 years is 35.1 per cent. Everyone, including the elderly and children, contribute to public transfer outflows by way of direct and indirect taxes for the consumption of goods and services, and for labour income and assets. This is shown in the third row, while net public transfers are shown in the first row of the second panel. The net gain from public inflows and outflows for the population 65 years and above is marginal at Rs. 51,780 million, and is just 5.5 per cent of the total LCD of Rs. 94,9710 million. However, the net gain from public transfers to children under 20 years is 15.7 times that to those 65 years and above; this constitutes 14 per cent of the total LCD of Rs. 583,0620 million of children under 20 years. As public consumption is financed by revenue generated by the government, the net sum of the aggregate public transfer inflows and outflows is zero. The first two stack bar diagrams in Figure 4 depict the age patterns of the beneficiaries of and contributors to public transfers.

The resource mobilisation for public programmes is heavily dependent on the large consumer base of the huge population. Indirect taxes levied on sales, value-added tax (VAT), customs and excise account for 63.1 per cent of the total tax revenue. Property and asset-based taxes contribute to 24.2 per cent of public funding. Tax flow to the government from income and direct taxes is only 12.7 per cent of the total tax revenue (Ladusingh 2012).

Public asset-based reallocations, shown in the fourth row of the second panel, is another important component of public support considered in the NTA framework. It consists of two distinct monetary flows to individuals, namely, public asset income and public savings. Public asset is accumulated by the government's purchase of securities, and also includes currency stabilisation funds and sovereign wealth funds. The excess of social contributions or taxes over benefit payments is also accumulated as public asset. Public asset is collectively owned and the income from public asset is an inflow to
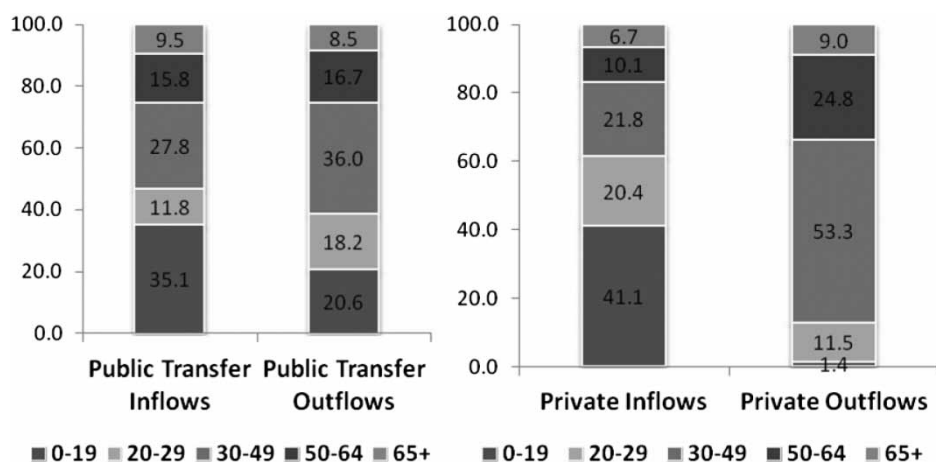

FIGURE 4
Per capita public and private transfers and asset-based allocations, India, 2004–2005.

individuals. Public savings is an outflow for individuals if negative (payment for overseas debt is a typical example), and an inflow for individuals if positive. The net sum of public asset income and public savings constitute public asset-based reallocations, and this is used to finance a part of the LCD. Public asset-based reallocations support 11.5 per cent and 4.4 per cent of the LCD for the populations 65 years and above and below 20 years, respectively, and on the whole, make up 29.1 per cent of the total LCD.

Familial intergenerational support comprising intra- and inter-household transfers and private asset-based reallocations are shown in the third panel of Table 4. Both intra- and inter-household transfers have inflows and outflows, and net values are the sum of these two transfer flows. Further, net private transfers are the sum of net intra- and inter-household transfers. Those 65 years and above get a marginal share of 6.7 per cent of the private transfer inflows. The contribution to intra- and inter-household support from the prime working age group of 30–49 years is the maximum, constituting 53.3 per cent of the total familial support to economically dependent members of households. Those 65 years and above contribute as much as 9 per cent of the total familial support to economically dependent members, and this contribution is largely used for the support of grand-children's education. As those 65 years and above contribute more than what they gained from intra-household monetary transfers, they are not net beneficiaries of intra-household transfers. It is to be noted that like in the case of public transfers, net intra-household transfers is zero as the inflows and outflows of financial transfers within each household balance out. The last two stack bar diagrams in Figure 4 depict the age patterns of beneficiaries and contributors of intra-household intergenerational support.

The LCD for each broad age group, and for all ages, is met by the totality of net public transfers, net intra- and inter-household transfers, and public and private asset-based reallocations of the corresponding age groups. Private asset-based reallocations shown in the last row of the third panel constitute an important means of intergenerational familial support for meeting the LCD. Asset-based reallocations are the composite of two flows: asset income and savings. In the NTA framework, two kinds of asset income are considered, namely, capital income and property income. Capital income is the return to capital. Important forms of property income are interest, dividend and rent. Individuals can accumulate assets when they are young and dispose of it at old age to meet their consumption needs of goods and services. Unlike the case of public asset-based reallocations, in private asset-based reallocations, savings is a form of outflow for individuals. It is for this reason that private asset-based reallocations are taken as the asset income net of private savings. The private asset-based reallocation for all age groups is Rs. 270,5900 million, making up 63 per cent of the total LCD of Rs. 429,5160 million. It is also evident that private asset-based reallocations are positive for the older age groups. As in the NTA framework, all asset income and savings are classified by the age of the household head; the values are zero for children and positive for those from the mid-30s onwards.

The per capita age profiles of the components of public and private support for the LCD are shown in Figure 5. It is important to note that the intergenerational support system in India flows in two directions, upward from children to parents as well as downwards from parents to children. Children are supported by a combination of public and private intergenerational transfers, while the support system for the elderly varies considerably with age. After the sharp fall in labour income at around age 60, the elderly would depend on asset income while supporting their grandchildren till the late seventies.
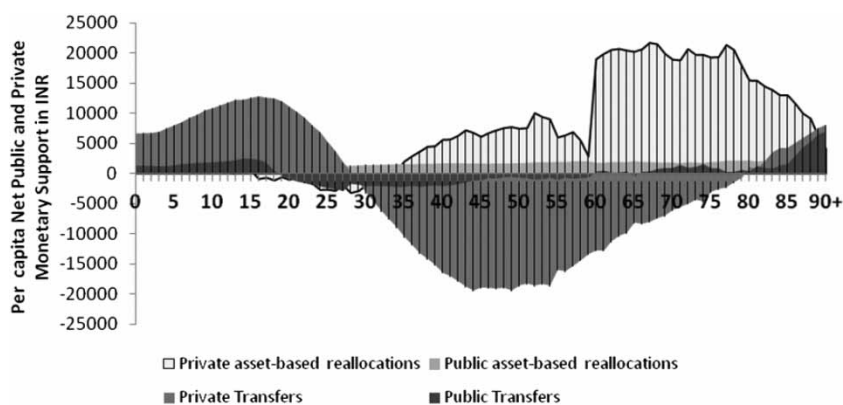
FIGURE 5
Per capita public and private transfers and asset-based allocations, India, 2004–2005.

This finding is contrary to normal perceptions, and the findings of some studies, that the elderly in India are supported by their adult children. The plausible reasons behind this result may be that the majority of the elderly surviving till their late seventies are wealthier, and most studies on the elderly do not capture the asset aspects of support at old age, e.g. owner-occupied housing and informal business. The elderly in their 80s and above depend on their adult children through familial transfers. For the very old, public transfers are also important means of making up the LCD. As much as 63 per cent of the total LCD of the population 65 years and above is supported by private asset-based reallocations. Public in-kind or in-cash transfers support 5.5 per cent of the LCD for the population 65 years and above, and the contribution of public asset-based reallocations is 11.2 per cent. The remaining 20.3 per cent of the population 65 years and above rely on income.

Mason *et al.* (2009) have found that the elderly 65 years and above rely on net familial transfers, which account for 66 per cent of the LCD in China, 33 per cent in Thailand and Taiwan, and 20 per cent in South Korea. Net familial transfers are close to zero or relatively small in the Philippines, Japan, Costa Rica, Chile and Slovenia. Further, Mason *et al.* (2009) have found that assets are most heavily relied upon in the Philippines, Thailand and Mexico, and to a smaller degree, in China and Taiwan. The findings of this study agree, to a large extent, with those of other Asian countries, though with some exceptions.

Summary and Conclusion

The analysis presented in this paper is based on the NTA framework and provides estimates of the age pattern of the LCD, i.e. the excess of consumption over labour income. This study throws light on the magnitude and age pattern of intergenerational public and private monetary transfers, in particular, to the elderly and children to support their excess of consumption over their labour income. The paper has also enabled us to determine the share of public and familial support for old and young dependents. More importantly, we can determine whether the intergenerational support system in India is downwards, that is, from the older to younger generations, or vice versa.

In the accounting year 2004–2005, public in-kind transfers constitute 16 per cent of the total consumption, which includes health, education and other goods and services of mass consumption. The share of public and private consumption for education are, respectively, 3.1 per cent and 1.9 per cent of the totality of the consumption, and the corresponding figures for health are 3.8 per cent and 4.1 per cent, respectively. The productivity of workers can be enhanced through intensive human resource investment. The downward transfers for education from the present generation of workers to the future generation is important because of the economic value of returns to education over the lifecycle of the present generation of children, and because it is a catalyst for harnessing the demographic dividend from the large working population. By the time the present generation of children in school enter the labour force, they can contribute to upward transfers to support the present generation of workers when they retire. Likewise, investment in health is very crucial for increasing the productivity of workers, reducing the opportunity costs of workers and also reducing the disease burden of the population. In view of the poor public investment in education and health, which are, respectively, 2.6 per cent and 1.2 per cent of the GDP in 2004–2005 (Government of India 2011), and in comparison to the level of social sector investment of other Asian countries, which had experienced consistent economic growth, India is inadequately prepared to build up the human resource to reap the benefits of the demographic dividend to the maximum.

The share of consumption of the population 65 years and above constitutes 8.5 per cent of the total public consumption for health, education and all other consumption, while it is 35 per cent for the population under 20 years. This throws light on intergenerational equity in India. For this, we need to examine not only the current consumption of the elderly and children, but also the net benefit of the intergenerational public and private support system. At the same time, 8.5 per cent of the total public resources are contributed by persons 65 years and above in the form of tax. The net gain of public inflows and outflows for the population 65 years and above supports 5.5 per cent of their total LCD. However, the net gain from public transfers for children under 20 years is 15.7 times that of those 65 years and above, supporting 14 per cent of their total LCD. From this count, the pubic support system in India has not given due attention to the elderly population in terms of the provision of healthcare, the enhancement of the coverage and monetary value of social security, and the maintenance of intergenerational equity. Although the social assistance programme in India has been in place for quite some time, it has yet to make its presence accountable. It is high time, when ageing of population is modest in India, to overhaul the existing social security system and make it viable on a long-term basis. The policy options can include the introduction of an earmarked additional tax of 2–3 per cent for social security, just like the present 2 per cent cess for education, taking advantage of the large working population, and the introduction of corporate sponsorship for institutional healthcare of the elderly.

The population aged 65 years and above accounts for 6.7 per cent of the total private consumption for health, education and all other consumption, while the population under 20 years accounts for 29 per cent. In comparison to their aggregate labour income, the old and young population of the aforesaid age groups consumed 3.8 and 11.2 times their respective labour income. Although the NTA framework does not capture the behavioural aspect of allocation and consumption, the result suggests imbalance in intergenerational equity in private consumption. The share of the benefits

received by the elderly 65 years and above and children under 20 years from familial transfers are, respectively, 6.3 per cent and 42.1 per cent of the total familial in-transfers. However, the elderly also contribute partially or otherwise in supporting other dependent members of the household to a greater extent than their children do, particularly, in terms of education for the grandchildren. The findings in this paper— that in India, the net gain of the elderly 65 years and above from intra-household transfers is negative and that for children under 20 years is 82.2 per cent of their LCD— are contrary to the general belief. The elderly do not gain from intra-household familial support, and children do not provide old-age security. As much as 63 per cent of the total LCD of the population 65 years and above is supported by private asset-based reallocations. This suggests that in India, during the economically productive age, people resort to asset accumulation, and the income from their assets is used as a means of support in their old age. This is partly supported by the rise in household savings, which underlies the notion of the second demographic dividend. However, this is an area which needs further empirical studies as certain assumptions in the NTA framework may not be plausible for the Indian context.

The overall message in this study is that in India, there is a shortage of public funding to meet a greater share of LCD from the population of children and the aged, and this population would not have been able to consume essential goods and services if not for the familial monetary support from intra- and inter-household transfers. Under these circumstances, social security is an area which needs to be broadened and strengthened in view of the persistently high level of per capita LCD, even after crossing the retirement age. Currently, the public pension system covers less than 10 per cent of the total workforce, and even so, it covers only the organised sector, and not those in the heterogeneous unorganised sector, with occupations ranging from shopkeepers to self-employed professionals to daily labourers. India's social security system, if it is not broadened and with plans to take off immediately, will face big challenges due to the rapidly ageing population, given that the consumption of healthcare resources increases disproportionately with age.

ACKNOWLEDGEMENTS

NOTES

1. This is the source of data on labour income from wages and salaries, and from self-employment; on household expenditures on education, healthcare, food, clothing, transport, recreation, social functions and ceremonies; on house rent, money borrowed, household credit, enrolment status of children in public and privately owned educational establishments, and treatment status and place of treatment of individuals for minor and major morbidities.

2. See www.ntaccounts.org.

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APPENDIX
Intergenerational Transfers and Asset-Based Reallocations

In the NTA framework (Mason *et al.* 2009), the LCD, i.e. the excess of consumption (C) over labour income (Y_l), is balanced out by intergenerational public and private transfers and public and private asset-based reallocations as:

$$C(x) - Y_l(x) = \tau_g^+(x) - \tau_g^-(x) + \tau_f^+(x) - \tau_f^-(x) + Y^A(x) - S(x)$$

where τ_g^+ and τ_f^+ are intergenerational public and private transfer inflows, and similarly, τ_g^- and τ_f^- are corresponding transfer outflows. These transfers are from the perspective of individuals. Y_A is the asset income from capital, property and credit, and S is the savings treated as residuals. The government acts as an intermediary body in welfare states for direct or indirect intergenerational transfer of resources between age groups. The current government in-transfers (τ_g^+) consists of in-kind transfers for health, education and other consumption, and cash transfers. The current government out-transfers (τ_g^-) consists mainly of tax payment.

The private intergenerational inflow transfers $\tau_f^+(x)$ to meet the consumption needs for education, health and other consumption, i.e. food and non-food excluding housing, at the household level for members whose labour income fall short of consumption requirements are supported by intergenerational outflow transfers $\tau_f^-(x)$ from members who have disposable income. In addition to intra-household transfers, the NTA flow identity includes inter-household inflows and outflows.

The last term [$Y^A(x) - S(x)$] in the NTA flow identity represents the asset-based reallocations, further disaggregated into public and private reallocations. Asset-based reallocations equal to asset income less savings. Public asset income can include net interest and royalties from land and other rural resources, and services. Private asset

income includes the rental value of an owner-occupied house, and income from dividends, interest and other properties. For intra-household transfers, computation asset income is assigned to the household head and the head acts as an intermediary for transfers to household members having LCD.