Consumption over Income of the Elderly in India: An Analysis based on National Transfer Accounts Methodology

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Abstract: This paper applied the National Transfer Accounts framework to estimate age profiles of consumption and income over the lifecycle and to identify the substantial period of dependency of the elderly in India. This paper particularly focuses on the elderly population as in post-retirement they have insufficient income or no income in general. In this context, this paper attempts to estimates inter-age monetary flows of consumption and labor income along with consecutive economic lifecycle deficit and its implication which will help to formulate social policy towards the elderly. Findings suggest that given the age profile of consumption and income over the lifecycle in India, child dependency is for the first 33 years of life while old-age dependency occurs from 62 years and above. The economic surplus period lasts for 29 years from 33-62 years. This paper explores that the elderly incur 24.7 percent out of the total lifecycle Deficit, which is 2.8 percent of the GDP in 2011-12. Overall implications show that stronger policy efforts are required to improve productivity levels, formal and informal jobs, and social security for the elderly.

Keywords: Economic Lifecycle, Intergenerational Transfers, Lifecycle Deficit, National Transfer Accounts (NTA).

Introduction

The world population is undergoing a thorough change in the age distribution due to the demographic transition from high to low fertility and mortality. Transition happens at different times and speeds, marked sometimes by baby booms and bursts and, at other times, by mortality crises. There exists a very close and compact relationship between demographic and economic behaviors. It is to be noticed that, socio-economic development impacts mortality and fertility, on the flip side, these two demographic indicators determine the population age structure. Population Ageing is one of the most important demographic phenomenon of the twenty-first century, reflected in increasing longevity, declining fertility, and increasing proportion of the older population. Although every country in the world will experience population ageing, industrialized countries have experienced it already, and many developing countries are expected to experience it soon. India is the second-most populous country around the world and currently going through this age structure transition with a profound impact on the economy and society. The rise in the older population tends to increase the demand for comprehensive care disproportionately. Under these circumstances, social security is an area that needs to be broadened and strengthened to meet the fastest growing aged population, and demand for healthcare resources.
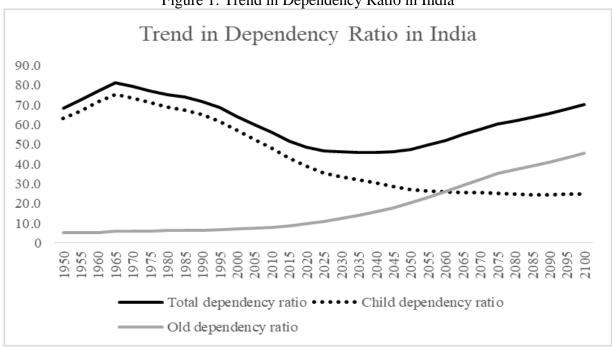
At present, there are around 104 million elderly in India. In 1961, the 60+ population was 24 million; which increased to 33 million in 1971, 43 million in 1981, 57 million in 1991, 77million
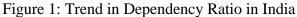
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in 2001, and 103 million in 2011 (Census of India, 1961-2011). According to projections by (Rajan and Aliyar 2008) the elderly population in India is expected to reach 298 million by 2051 and 505 million by 2101. Percentage-wise, the proportion of the elderly has increased from 5.6 percent of the total population in 1961 to 8 percent in 2011. (Kelly and Schmidt, 1995) concluded that population size and density have a transitional impact on economic growth. In demography, Dependency Ratio is one of the important indicators for understanding population aging better, as it describes the burden of the elderly on the working population. Figure 1 shows that initially, the decline in the total dependency ratio would be majorly due to a decline in youth dependency and after a certain point of time, the total dependency ratio has risen due to old-age dependency ratio shows an increasing trend, having grown from 5.4 percent in 1960 to 7.9 percent in 2011. So, the statistics shows that increasing aged population imposes wide ranging challenges to government and policy makers.

Figure 1: Trend in Dependency Ratio in India

Source: UN population data

Changing Status of Elderly

With declining fertility, the traditional support system for the old people has been gradually weakening. Globalization, modernization, and migration together have change the age-old joint family system in India as well as the attitudes of the young working population towards life, which resulting in the widening of the generation gap. In comparison to rural areas, more women in urban areas, are engaged in the job market and are unable to play their caregiver role well enough for the elderly. Old people are being left behind in villages forced to deal with loneliness and lack of proper care. Presently, the elderly people rely on self-income, savings, familial transfers, and public transfers to meet their consumption needs. According to the 2011 census, about 12 percent of the workforce (approximately 58 million people) is covered under various pension schemes. Covered individuals belong to the organized sector, while the remaining 88 percent of the

workforce that is mainly occupied in the unorganized sector (self-employed, daily wage workers, farmers, etc.) is hardly covered under any kind of social security measures. Public expenditure on health hovers at around 1 percent of the Gross Domestic Product (GDP), while that on education is, below 3 percent of the GDP (Government of India 2011).

A plethora of studies have used dependency ratio and other important crude measures of the population to describe the changing age structure of the population and their impact on socio-economy, (Bloom et al., 2010; Zacharia and Rajan 1997; Bloom et al. 2010), the implications of social security system (Asher 2013), and opportunities and challenges of age transition. However, very few attempts have been made to examine the macroeconomic perspectives of lifecycle deficits (LCD), and intergenerational allocations particularly with regard to the elderly in the Indian context. This study makes an attempt to understand the excess consumption over labour income of the elderly in India. So, while contributing to the literature on aging, this study is going to explain the magnitude of lifecycle deficit that the elderly are (60 years and older) struggling with and to what extent the elderly people are dependent on others in monetary terms, by using the National Transfer Accounts (NTA) framework. This paper is organized as follows. Section 2 presents the literature review and the theoretical framework. It is followed by definitions, data source, and methods in section 3. In section 4, the main findings of the analysis are presented. Discussion, Conclusion and Policy implication are presented at the end.

Literature Review and Theoretical Framework

The economic lifecycle is marked by two dependency periods, one at the beginning and other at the end of an individual's life (Lee, 1994). The duration of dependency varies noticeably with economic development. For example, specifically, child dependency lasts longer than old-age dependency begins earlier in developed nations, compared to developing countries, where people start working at a younger age and remain in work force for a longer time The age structure transition is the outcome of demographic transition and has economic consequences. Some recent studies have measured the magnitude of the dependency in monetary terms based on consumption and labor income in each group (Lee and Mason, 2010).

Children, in every society, are unable to support themselves until they are in their mid-teens to early twenties, and after retirement elderly start losing their job. So, the period of dependency occurs first at the beginning and then at the end of the life span. The age profile of a population's age structure is termed as the dependency burden, that is, the number of working-age adults relative to the number of children and elderly (Queiroz and Turra, 2010). The construction of the economic lifecycle is based on the flow of consumption and labor income across the life cycle. It describes the estimates of economic flows across age groups that arise largely because children and the elderly consume more than they produce and depend on the working age population for reallocation (Lee et al., 2008)

The theoretical analysis of the reallocation of resources across different ages and transfers, has been done under many frameworks in the economic literature. A common framework that is often utilized is the overlapping generations models (OLG). The OLG framework presents the economic activities that take place, where different generations of people coexist and make some kind of deals with one another. It is a response to the seminal works of Samuelson (1958) and

Diamond (1965). The framework has been used for analyzing optimal population growths, and economic fluctuations among others. However, analyses based on the OLG framework makes many strong assumptions that are difficult to rationalize in national economic systems. For example, some of the models assume that the life cycle is divided into two broad age groups that do not take account the phase of child dependency and they assume that the life cycle starts from the entry in the labour market (Lee 1994). (Arthur and McNicoll 1978) added extra features to this model by introducing mathematical demography into the Samuelson model and pointed out the importance of the age profiles of labor income and consumption. (Willis 1988) extended the research by precisely counting both public and private transfers, savings, and asset operations. On the other hand, Lee (1994a, 1994b) further extended this framework, with an emphasis on the implications of patterns of intergenerational transfers through specific public and private sources.

Work in this field, also highlighted different issues related to age, economic flows, and economic growth Feldstein (1974) suggested that public pension programs demotivate savings rates, while others developed altruistic models of intergenerational transfers, arguing that familial transfers neutralize fiscal policy (Barro 1974; Becker 1991; and Becker and Tomes 1976). In the case of familial transfers working people try to compensate future generations by increasing their saving and accumulating wealth, thus offsetting the increase in public debt. Ando and Modigliani (1963) stated that the desire to provide for consumption in retirement explained saving and capital accumulation in the United States, while (Kotlikoff and Summers 1988) argued that a more important motivation for saving and wealth accumulation was the desire to make intergenerational transfers. The National Transfer Accounts (NTA) framework deals with aspects like labor income, consumption, deficits, and intergenerational transfers of resources. The NTA approach helps to construct an age-specific national economic input and output system. The accounts allocate consumption and production to single years of age.

Indian Context

Traditionally, the Indian society has held the elderly in high regard and respected their decisions. A family was considered complete if there was at least one aged person. Intergenerational co-residence worked as a social mechanism for old age security, still holds ground in traditional societies given the limited public support system. Asian countries have shown only a modest declining trend of co-residence of elderly parents and their children (Knodel and Debavalya, 1997; Rajan and Kumar, 2003). There exists a bi-directional flow of resources, both financial and in-kind, from the older to the younger generation and vice versa. Ladusingh and Narayana (2011) in their study concluded that in the absence of familial transfers, particularly intra-household transfers, the young and the old in India would not be able to consume essential goods and services. Narayana (2011) showed that the elderly faced about 34 percent of the total LCD in 2004-05. The paper has demonstrated that public transfers to elderly were not adequate and that asset allocations were financed by dissaving. Bawdekar and Ladusingh (2012) empirically studied the nature and pattern of time transfers between co-residing and non-co-residing parents and their adult married children in an urban setting in India. By analyzing 673 representative sampled households, they concluded that reciprocal time transfers between adult children and their parents constituted a central feature of the intergenerational support system, regardless of the co-residency status. Ladusingh (2013) analyzed the lifecycle deficit by gender for India and concluded that throughout the lifecycle, the per capita annual labor income of a woman was lower than that

of a man. Even at the peak age of earning, it was only about one-sixth of a man's per capita labor income at the corresponding age.

Definition, and Data source

Lifecycle Deficit (LCD) refers to excess consumption over t labor income of persons of each age. Columns 1 and 2 in Table 1 list the aggregate controls and their measurement in National Accounts Statistics. According to NTA, consumption is comprising both the public as well as private consumption focusing on education, health, and others. Labor 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 business enterprise). Public and private transfers and asset-based reallocations are the main sources of funding for LCD. India's National Account Statistics (NAS) defines the private sector as the household account and the public sector as administrative departments, departmental and non-departmental enterprises, and quasi-government bodies.

Table 1: Definition and measurement of aggregate controls

Aggregate control Variable	Measurement of the aggregate control variable
Labor income	Compensation of employees + (2/3) of mixed-income + net compensation of employees from the rest of world (ROW)
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 of other goods	
Public	Expenditure on non-education and non-health under GFCE
Private	Expenditure on non-education and non-medical care and health services under PFCE
Lifecycle Deficit	Total Consumption – Labour Income

Source: Narayana and Ladusingh (2009)

Macro aggregate controls for the labor income, consumption for health, education, and other goods for public and private households for the financial year 2011-12 are compiled from the National Accounts Statistics (Government of India 2013). The variable and measurement descriptions of India's aggregate controls for income and consumption are summarized in Table 1. Table 2 calculates the aggregate labour income and private and public consumption of health and education and other consumption for all ages for the financial year 2011-12 as given by the National Accounts Statistics of India. These aggregate controls were used to derive age profiles of labour income and consumption.

Table 2: presents the aggregate macro controls for labor income and public and private consumption of health, and education, and other consumption for the year 2011-12

Consumption by sector	Public	Private	Total
Education	349076	141949	491025
Health	83906	187922	271828
Others	1288140	4751898	6040038
Labor Income			5779001

Source: extracted from the National Accounts Statistics, 2015; 1 crore=10 million

The study has used data from various sources. Unit-level data is required to calculate the age profile of labor income, and private and public consumption of education, health, and other consumption. The India Human Development Survey round two (IHDS II) (Desai et al., 2015), was the source of unit level data. This was particularly needed for charting the age profile of the variables, at the individual or household level, derived from the family and expenditure survey (FIES). IHDS I is a nationally representative survey covering 200,000 individuals from more than 41,000 households spread over 1,503 villages and 971 urban localities; a multistage stratified sampling design was adopted for the survey. In 2011-12, IHDS-II re-interviewed 83% of these households as well as split households (if located within the same village or town) to trace changes in their lives. With an additional replacement sample of 2134 households, IHDS –II has a sample size of 42,152 households. According to the NTA method, the age pattern of income and consumption is estimated from the microdata and the aggregate level of income is made consistent with the NIPA. Macro aggregate control data for making the per capita age profile estimates consistent with the 2011-12 national accounts figure is derived from National Accounts Statistics (Central Statistics Organization, 2015). Since, the NTA method introduces age into National Income Accounts, and Census 2011 was used as the main source for a single-year population data.

Methodology and Assumption

The methodology used in the study is based on the National Transfer Accounts (NTA) framework as given by Mason et al (2006). NTA is an international and collaborative project with the aim to measure, analyze and interpret the relationship between macro-economic conditions and age structure across the world. It is a newly developed framework, which introduces age into the National Income and Product Accounts (NIPA) and provides a Flow Account framework to compute lifecycle deficit/surplus in consonance with the NIPA. This method helps to estimate the economic contribution of different age groups in monetary terms. The flow identity, which governs the NTA framework, is described below. Equation 1 defines the NTA's Flow Account identity where suffix 'f' stands for the private sector, 'g' stands for the public sector and 'i' for individual or age group.

$$Y_{L,i} + Y_{A,i} + (T_{f,i}^{+} + T_{g,i}^{+}) = (C_{f,i} + C_{g,i}) + S_i + (T_{f,i}^{-} + T_{g,i}^{-}) \qquad (1)$$

In this framework, inflows to individuals of any age consist of $(Y_{L,i})$ is labor income, $(Y_{A,i})$ is asset income, and $T_{f,i}^{+}$, and $T_{g,i}^{+}$ represents private and public transfers respectively. Similarly, outflows consists of Consumption $(C_{f,i}$ and $C_{g,i})$ by private and public (government) sector, savings (S_i), and transfer outflows to the government $(T_{g,i}^{-})$ and to the private sector $(T_{f,i}^{-})$. The left-hand side of the equation shows the total inflows and the right-hand side shows the total

outflows. The process of estimating the age profile of consumption and income is the basis of the economic lifecycle deficit equation in the model. Equation 2 below describes that the people incur a lifecycle deficit incurred by people is financed by a combination of net transfers and asset-based reallocations.

$$(C_{f,i} + C_{g,i}) - Y_{L,i} = (Y_{A,i} - S_i) + (T_{f,i}^+ - T_{f,i}^-) + (T_{g,i}^+ - T_{g,i}^-) \qquad (2)$$

In welfare states, the Government acts as an intermediary for direct or indirect intergenerational transfer of resources between age groups. By definition, lifecycle deficit (LCD) is the excess consumption over labor income at a given age.

Labor income is estimated as the sum of salary and wages, and, the share of self-employment from operating surplus or entrepreneurial income of net direct taxes. In the absence of information on the share of self-employment income from the mixed-income, two-third of total mixed-income was assumed to be entrepreneurial income. The per capita age profile of the labor income profiles were derived from the survey data. In the case of unreported income, it is being imputed by mean reported income, controlling for age, sex, education level, and occupational category.

According to the NTA method, aggregate consumption consists of education consumption, health consumption, and other consumption. Each component is further divided into private and public consumption. The age profile of private education expenditure is estimated from the expenditures of individuals enrolled in different types of educational institutions by age and level of education. Public education consumption consists of two parts: formal and informal education consumption. The total public expenditure on formal education for - lower primary, upper primary, secondary and higher levels of education - are available in unit level data along with the respective number of students enrolled in government educational institutions. The prescribed formal age for lower primary, upper primary, secondary and higher education is respectively 6-10years, 11-13 years, 14-17 years, and 18-24 years. The per capita cost of public expenditure on education and level-specific school attendance is derived from the household survey. Public informal education consumption is not age-targeted, so it is allocated equally to be everyone. Health consumption is calculated in a similar way to that of education. Publicly funded health consumption consists of health care purchased by individuals and reimbursed through public programs. In the Indian context, out-of-pocket expenditure on healthcare for the utilization of public health facilities, by the individual age of out-patients and in-patients, is available from the survey on morbidity and health care for the reference year.

Private 'other' consumption includes food and beverages, clothing and footwear; fuel and power; furniture, furnishing, and appliances; transport and communication; and recreation and cultural services. Most expenditure data are collected for households rather than individuals. Furthermore, some goods are jointly consumed, or allocating their consumption to individuals involves arbitrary rules. It is difficult to allocating private consumption for other goods and services to each individuals. Under these circumstances, either Engel's Method or the Rothbarth method can be used but both the methods are criticized on conceptual grounds. Based on the empirical evidence of countries of diverse economies involved in the multi-country NTA project age allocation of 'private other' is based on an equivalence scale. The equivalence scale 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 at1 thereafter for individuals 20 years and above. The age

profile of 'private other' consumption was estimated in the present study by applying the scale to the household expenditure as available in IHDS. All private consumption is defined as a net of consumption (indirect) taxes. Public 'other' consumption includes general public services, defense, social security and welfare services, housing and other community amenities, cultural and religious services, and economic services. The age allocation of public expenditure on things other than health and education is on per capita basis.

After computing all the per capita age profiles, the profile was adjusted to their corresponding macro control to be consistent with the National Income and Productive Accounts (NIPAs) figures because the initial estimates of per capita age profiles were not necessarily consistent with their macroeconomic counterparts calculated in Table 2. Thus, per capita profiles were scaled, adjusted by a factor that is constant across age, to ensure that aggregate profiles were consistent with NIPAs. This calculation needed selective adjustment in aggregate controls to derive aggregate and per capita age profiles. A general adjustment procedure to derive age profiles that match with the aggregate controls is as follows:

$$C_{ix} = (NIPA)_x \, C_{ix}N_i / \textstyle\sum_i C_{ix}N_i$$

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, as available in the National Accounts Statistics.

Results

Lifecycle Deficit (LCD)
The economic lifecycle is fundamental element, that refers to the pattern of consumption and labour income of a country. Most countries have to deal with lifecycle deficit as labor income itself cannot equalize all consumption expenditure within the economy. The present study computed consumption and labor income along with lifecycle deficit, of the elderly in India in 2011-12. The results are summarized in Table 3.

Table 3: Aggregate Consumption, Labor Income and Lifecycle Deficit of Elderly in India

Indicators	Total (all ages)in INR	Total for Elderly (60+)	% Share of Elderly	% Share within the consumption
Lifecycle Deficit (LCD)	1023890	247633	24.19	
Labor Income	5779001	283598	4.91	
Total Consumption	6802891	531231	7.81	100.00
Public Consumption	1721122	118844	6.91	22.37
Education	349076	0	0.00	0.00
Health	83906	7955	9.48	1.50
Other	1288140	110889	8.61	20.87
Private Consumption	5081769	412387	8.12	77.63
Education	141949	0	0.00	0.00
Health	187922	19387	10.32	3.65
Other	4751898	39300	8.27	73.98

Source: Author's calculation; INR refers to Indian Rupee. 1 crore = 10 Million

Table 3 describes the aggregate as well as the percentage share of labor income, and consumption as well as the lifecycle deficit of the elderly population in 2011-2012. The second column shows the aggregate controls all across the ages. LCD for the elderly population (restricted to the age group 60+) is shown in the third column. The total labor income of all ages is Rs. 5779001 crores in the year 2011-12. Of this, the contribution of the elderly population is Rs. 283727 crores which is quite good considering the work opportunities for the elderly in India. Coming to the country's Lifecycle Deficit (LCD), which is mostly incurred by the young and the elderly population on account of education and health expenditure, the LCD incurred by the elderly population is equal to Rs.247504 crores or 24.17percent of LCD of all ages and (2.8percent) of the GDP. It is to be noted that the elderly people contributed to 7.81 percent of the total consumption, not only that, with 4.91 percent contribution, they also significantly contributed to the production in the country. This means the elderly partially financed their LCD with limited exposure to work, mostly in the agricultural sector and through self-employment. This means the elderly partially financed their LCD with limited exposure to work, mostly in the agricultural sector and through self-employment. In NTA, education and health are two major components of consumption. As the present study focused on the elderly, health is the prime source of public and private consumption of the elderly. Column 4 in Table 3, shows the percentage share of the elderly for each indicator's overall age groups. It shows that the share of private health consumption (10.32 percent) was higher than that of public health consumption (9.48 percent). Column 5 in the table, shows that for the total consumption of the elderly population, the share of private consumption is about 78 percent with a significant chunk (73.98percent) coming from 'private other' consumption. This justifies the fact that apart from health, the elderly people spend a large amount of money on food-nonfood items for their survival.

Consumption

Total consumption includes both public and private consumption on health, education and others. Figure 2 demonstrates the age profile of per capita consumption in 2011-12. The solid line represents the total age profile of total consumption and three curves describe the per capita age profile of education, health and other consumptions. The per capita consumption profile increases sharply from age 8 and attaining an early peak at about 19 years due to investment in education, then taking a little drop after that reaching another peak at age 28, reflecting the age of completing higher education. Then, the curve flattened out in the prime working-age years and increased slightly in the old age. The consumption profile of India shares a similar pattern with the profile of many other countries that a steep rise during childhood with relative stability among working population and the elderly (Lee et al., 2011; Hammer et al., 2015). This implies that retirement does not curtail consumption because the need for food and non-food items remains the same even with advancing age. Besides, there is an add-on expenditure on healthcare with increase in age. It can be observed from Figure 2, that except the per capita consumption for young population, the age pattern of per capita consumption for the elderly population is almost similar to the working-age population.
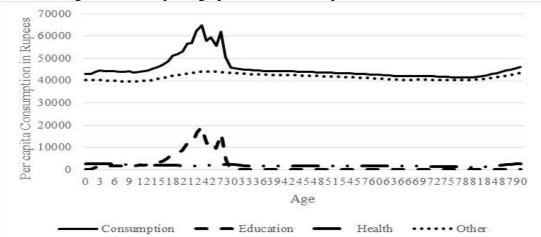
Figure 2: Per capita age profile of consumption in India, 2011-12

The public and private consumption of India captures the demographic profile, as well as reflects the consumption patterns along with the country's fiscal policy. As the study focused on aging population, figure 3 shows the age specific per capita annual private and public consumption of health care for 2011-12, as health is one of the major concerns in old age. The public and private health consumption is higher during infancy, then drops with increase in age, and then increases with advancement of age. The profile of per-capita annual health care consumption is a representation of the age-specific availability of and access to health facilities and targeted programs of the government. An important distinction between per capita annual private and public consumption of healthcare is that, throughout the life, private consumption for healthcare is higher compared to public consumption of healthcare except during the reproductive age and become same after 80 years of age. This implies the lack of proper social security provision in India.
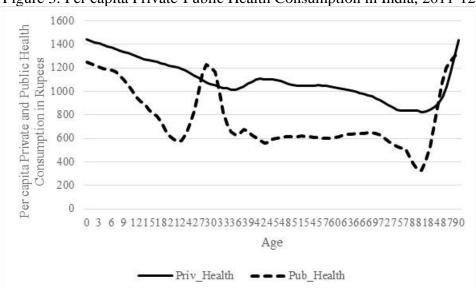
Figure 3: Per capita Private-Public Health Consumption in India, 2011-12

Labor income consists of wages, salaries, and self-employment income. In general, labor income is an inverted U-shaped curve that describes the fact that production is concentrated among working-age adults. According to different studies, the peak in productivity is reached somewhere between ages 40 and 50 (Mason et al., 2009). In Figure 4, the solid black line shows the age profile of per capita labor income in 2011-12. It is noticeable that the age pattern of labor income is characterized by entry of individuals into the labor market at a very young age as child laborers. It then rises steeply up to age 33 years and continues to increase, although at a relatively slower speed, reaching the peak at age 55 years. Thereafter it falls sharply with advancing age. The reason for this sharp decline is that the retirement age in India is 60 years, after which people shift to informal jobs till age 80 years and then exit from the labor force. This implies that the elderly in India continue to work after retirement in low paid jobs or work on their farms to survive. The interaction between income and consumption represents the exact amount of economic lifecycle deficit/surplus of the country. The economic lifecycle deficit (LCD) is the difference between consumption and labor income at each age.
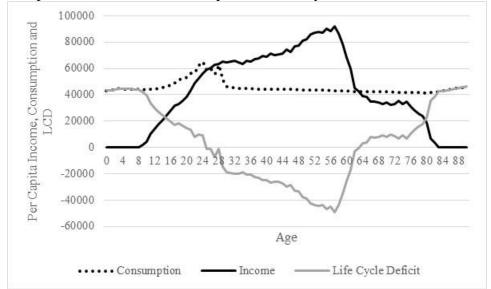
Figure 4: Per capita Labor Income, Consumption and Lifecycle Deficit in India, 2011-12

In Figure 4, the age profile of per capita income by age, per capita consumption and per capita lifecycle deficit have been plotted together for a better understanding. The dotted line represents the age profile of per capita consumption. The consumption curve remains higher than the per capita labor income till age 27 years and incurs lifecycle deficit for the young. Lifecycle deficit occurs also for the elderly beyond age 62 years, when the per capita consumption again becomes higher than the per capita labor income. People in the prime working-age group (age 33 to 62 years) enjoy economic lifecycle surplus due to their labor income exceeds consumption. During the 29 years of economic surplus period, the per capita consumption rises equally with the rise in per capita labor income and continues to rise after retirement. This implies that retirement does not push individuals to reduce consumption, because the demand for food and non-food items cannot be changed with the increasing age and also because old age makes obvious demands for expenditure on healthcare.

The result is consistent with most other studies in that the economic lifecycle in India is characterized by two deficit periods around a period of economic surplus. A study based on Asian countries by (Lee and Mason, 2011) compared labor income and consumption across East and South Asian countries and revealed that a) children in poor countries enter into the labor market earlier compared to those in rich countries and have a higher income, b) due to different social security schemes, labor income drops at age 60 in developed countries, c) and that population aging in developed countries is costlier relative to developing countries. The present paper found that the elderly incurred 24.7 percent out of the total lifecycle deficit, which is 2.8 percent of the GDP in 2011-12.

Discussion

This paper provides an empirical framework to incorporate age distribution in the economic lifecycle in India based on the NTA methodology. Historically, quantifications of consumption and labour income has not been done by age. To that extent, this paper contributes to the existing policy in India. Consumption expenditure in India is predominantly borne by households (private sector) to finance the lifecycle deficit of the elderly and the young population in India. Therefore, a large degree of transfers goes from the working population to the dependent population such as the young and the elderly. In India, public funding is mainly focused on the young population and women of reproductive age but the elderly remains neglected. One of the feasible ways to reduce the lifecycle deficit is to increase the retirement age as well as generating work opportunities for the elderly.

In general, the age profile of labor income is an inverse U shaped curve which starts from an early age implying the presence of child labor, and then gradually increases with age, reaching its peak in the mid-fifties, afterward the curve declines rapidly with increasing age and continue to tappers till the early nineties. Firstly, Table 3 shows that the total labor income being less than the total consumption by the population results in a lifecycle deficit, with the elderly have faced 24.17 percent of total LCD. According to (Asher, 2006), India's aging population is growing very fast and the consumption of healthcare resources has been increasing disproportionately with age, which stimulating the financial needs for healthcare after retirement.

Older age comes with different kinds of health hazards which tends to raise health consumption. European countries stay longer in the work-force compare to India. The Sweden people, stays longer in the workforce compared to all the other countries in the world. On the other hand, countries in Africa shows longer child dependency with high unemployment and underemployment (Mason et al, 2009). In India, the rapid decline of the labor income curve after age 56 is due to the retirement age generally being fixed in the age 60 in India. Workers engaged in the organized sector, and in the civil and defense services of the country. But a large number of elderly people who are engaged as agricultural labor, casual labor, or who work in the unorganized sector remain uncovered by any kind of protection in old age (Elderly in India Report, 2016). Besides, those who retire from the formal sector have to re-engage in different works to meet up their financial needs. This situation is the reflections of the inadequate social security coverage in India.

The lifecycle deficit implies that there must be some intra and inter household transfers from the surplus ages to the deficit ones. Figure 4 shows the age profile of the per-capita lifecycle deficit in India. The graph indicates that the deficit has to be offset by a surplus area, which is called age reallocations in terms of public and private transfers and asset-based reallocations (United Nations, 2013). Public transfers are distinguished by inflows and outflows of cash and in-kind transfers. Private transfers are distinguished by inflows and outflows of inter and intra-household transfers. Asset-based reallocations are calculated by the public and private sectors.

Conclusion and Policy Implication

This paper attempts to study the economic behavior over the life cycle using cross-sectional data of 2011-12 consistent with the National Income and Product Accounts of the Indian economy while concurrently capturing the age structure of the underlying population. In India, people are mostly engaged in the informal sector, which is basically comprised of low paid and casual jobs. To improve the labor income of the elderly, the government should build appropriate institutions and environment for work. Public and private transfers can play an important role in mitigating the remaining lifecycle deficit. Although public transfers are one of the important ways to protect the elderly, different studies in India have shown that policies for elderly have been inadequate so far (Asher, 2006; Narayana, 2011). India has implemented various schemes, such as MGNREGA (2005) and RSBY (2008), since 2004, focusing on inclusive growth, employment generation, and poverty reduction. These have accelerated employment opportunities for the elderly in India. The Unorganized Workers' Social Security Act (2008) has provided social security to informal workers. Our results highlight that there is an economic deficit in the later years of life due to lack of enough income. Apart from that, there is an add-on expenditure on health due to the changing age structure of the population and increasing life expectancy. Private transfers, asset income, and dissaving, along with public transfers, can take care of the excess consumption of the elderly and help meet their lifecycle deficit. There is a need to take effective measures for improvement in the government health infrastructure to protect the elderly, whose number is rapidly increasing in India. In the case of health insurance, because of the large informal sector, the government needs to strengthen its policies to prevent a large segment of the population from remaining uncovered by any kind of social protection. This paper advocates establishing strong social security policies, strengthening the existing policies, and creating new employment opportunities in formal as well as informal sectors to better meet the needs of the increasing aged population.

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