

# NATIONAL TRANSFER ACCOUNTS FOR PAKISTAN

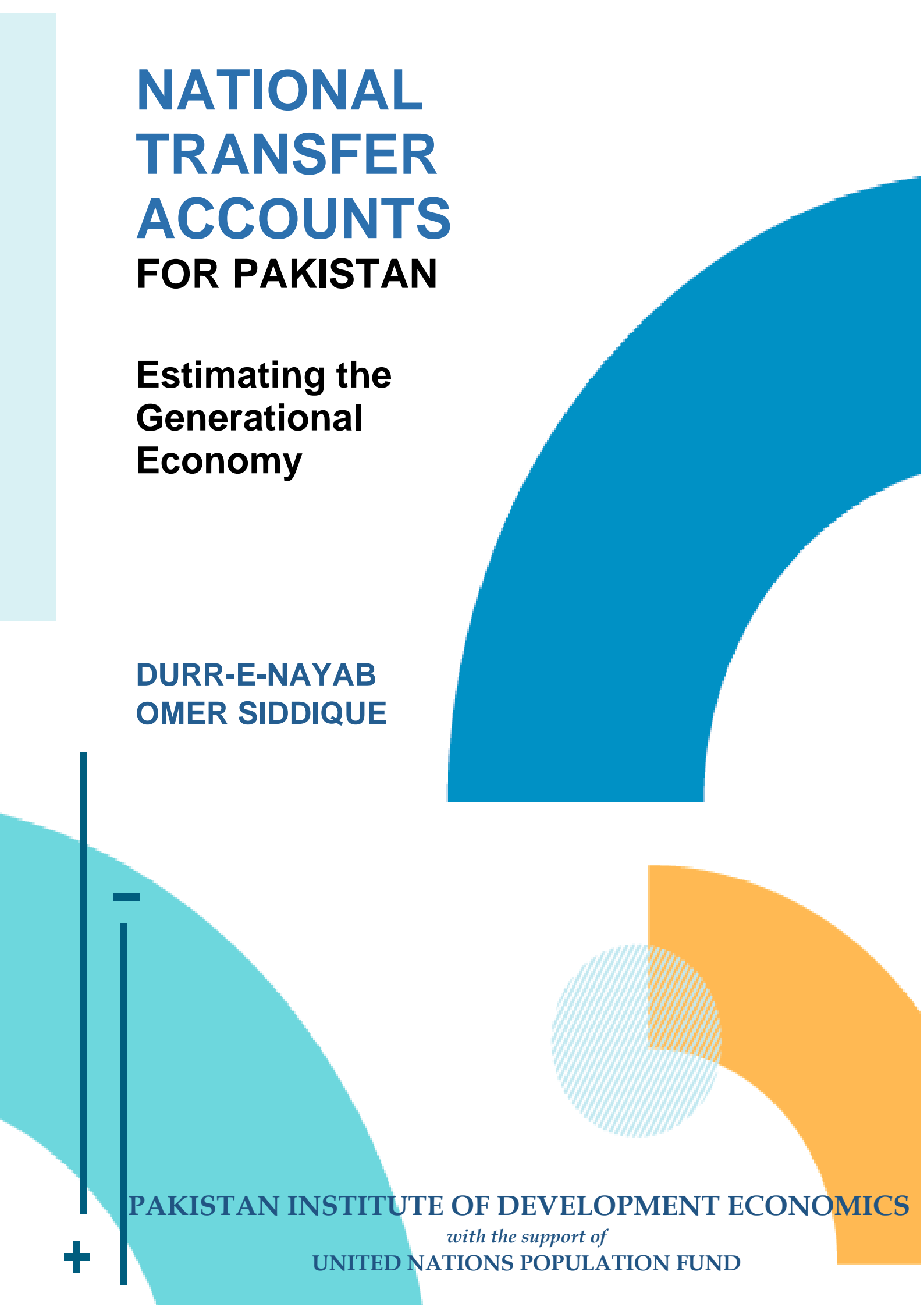
Estimating the  
Generational  
Economy

DURR-E-NAYAB  
OMER SIDDIQUE

PAKISTAN INSTITUTE OF DEVELOPMENT ECONOMICS

*with the support of*

UNITED NATIONS POPULATION FUND



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&

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ECONOMICS ISLAMABAD

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## Disclaimer

The views and opinions expressed in this report are those of the authors and do not necessarily reflect those of the UNFPA.

## Authors

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# 01

## BACKGROUND

There is much talk of reaping the demographic dividend in Pakistan, but no verifiable evidence is available on its magnitude. To benefit from the demographic transition underway in the country, the policymakers must be aware of the macroeconomic implications of changes in the age-structure changes taking place. To reap the full benefits of this opportunity, public allocations should be made in such a way that it brings home the dividends provided by the peculiar demographic scenario presented by the fertility transition taking place in the country. Albeit slowly, fertility rates are lowering in the country leading to an increased proportion of the population in the working-age group, thus, bringing the dependency rates down.

The National Transfer Accounts (NTA) can fill this gap by quantifying the wealth flows taking place in a population through an improved understanding of the generational economy. Adopting NTA at the national level is recognition of how population growth and changing age structure can influence economic growth, public finances, and other related aspects of the macroeconomy. The NTA helps to construct accounts that measure how people at each age produce, consume, and share resources, and save for the future, at both private and public levels. The account complements the UN System of National Accounts (UNSNA), demographic data, and various important economic indicators.





The purpose of the NTA is to investigate the age pattern of attaining and consuming resources by quantifying the economic life-cycle. Consumption is a part of the economic life-cycle for which we need resources in the form of labour income. Nevertheless, the level of consumption depends on various factors including preference, prices, interest rate, events, and political influence. Consumption varies with age as, generally, young and old age groups are the ones who consume more than what they produce, i.e. their consumption is more than their income. This shows that their economic life-cycle (consumption minus production) is in deficit. Contrary to this, the working-age group produces more than their consumption and have a surplus life-cycle account. The youth not only require resources for their basic needs but also for their human capital investment, i.e. investment in their education, training and capacity building, while older, apart from basic needs, require huge resources for their declining health.

The total and average consumption not only varies by age but also according to the population structure of a country. Developed economies, with an increasing elderly population, have different age-specific consumption patterns from developing countries having a high proportion of the young population. Also, in developing economies like Pakistan, consumption does not solely require an individual decision rather it depends on the collective decision within the family.

Life-cycle accounts incorporate consumption and labour income where consumption is further classified as public and private consumption. Private consumption is the value of consumption of goods and services by individuals or households both of which are further classified by the purpose of consumption, i.e. education, health, and consumption of goods and services other than health and education. The unit of analysis in the NTA is the individual but most of the data for private estimates are available at the household level. For the purpose, it is required to convert this household data to individual-level data. Therefore, every individual is assigned a share in total household consumption through proper methods identified in the NTA methodology (UN, 2013). The public estimates are drawn from the macro data and the macro-controls for the NTA are calculated using the national aggregate data.

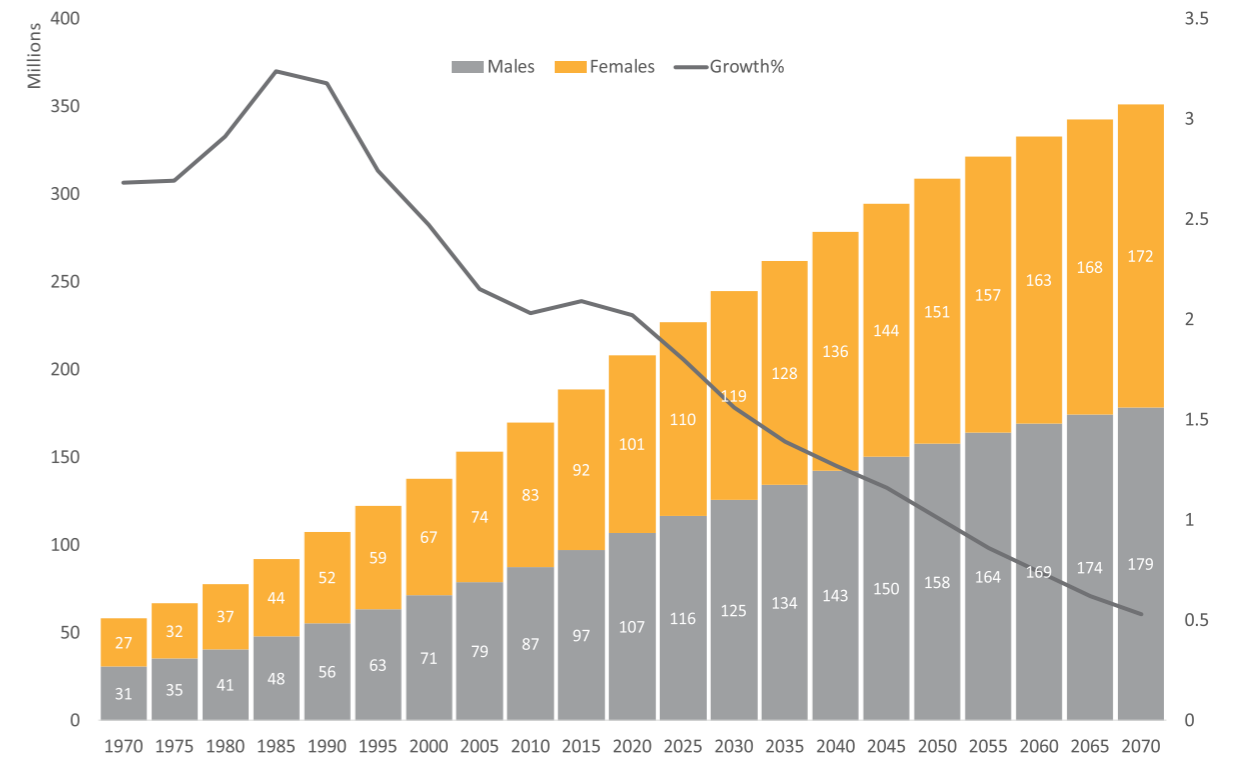
The present study estimates the NTA for Pakistan as it provides the opportunity to look at the economic indicators through the perspective of age. It is critical to understand the economic life-cycle of the country as the population of the country is going through changes in its age structure. The estimations through the NTA can help design public policies ranging from healthcare, education, gender equality, reproductive health and social protection to economic, social and political implications of population ageing and generational equity.

### 1.1 Demographic Profile of Pakistan

Before we go into the details of the NTA estimates, it is useful to have a quick overview of the state of the population in Pakistan. Figure 1 presents the population of the country from 1970 projected for another fifty years from now. The size of Pakistan's population would be huge with over 350 million people residing in the country (see Figure 1). The figure also presents the population growth rate for Pakistan and it would not be before 2050 that the rate would get around one per cent per annum. This huge population size is a result of a continued high fertility rate and the momentum provided by it, reflecting in the future population growth.

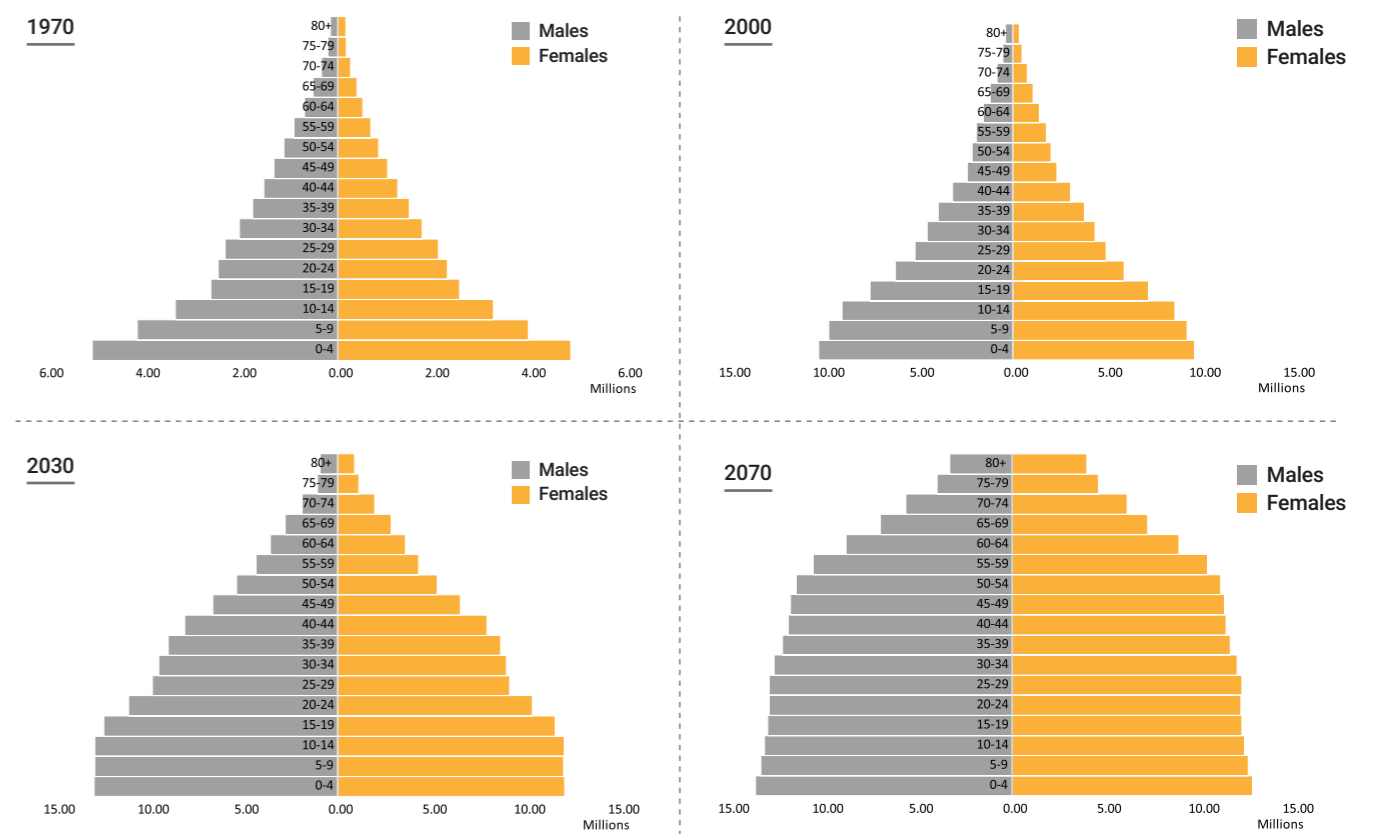
As stated earlier, and emphasised in the NTA, it is not just the size of the population but its structure that has important implications for a country and the policy formulation linked to everything including health, education, employment, and infrastructure. Pyramids are the best way to present the age-sex structure of any population and Figure 2 presents the same for Pakistan in the years 1970, 2000, 2030, and 2070. As can be seen from Figure 2, Pakistan's population has a classical pyramid up till the year 2000, with the wider base reflecting high fertility level in the country. Within 30 years (1970 to 2000) the population in the 0-4 age group doubles from approximately 10 million to around 20 million. The momentum provided by these numbers can be gauged from the next two pyramids (2030 and 2070) where the base starts getting cylindrical but with huge numbers.

**Figure 1**  
Population Size and Growth in Pakistan: 1970 to 2070



Source: World Population Prospects, UN, 2017 revisions.

**Figure 2**  
Age-Sex Structure of Pakistan: 1970, 2000, 2030, and 2070



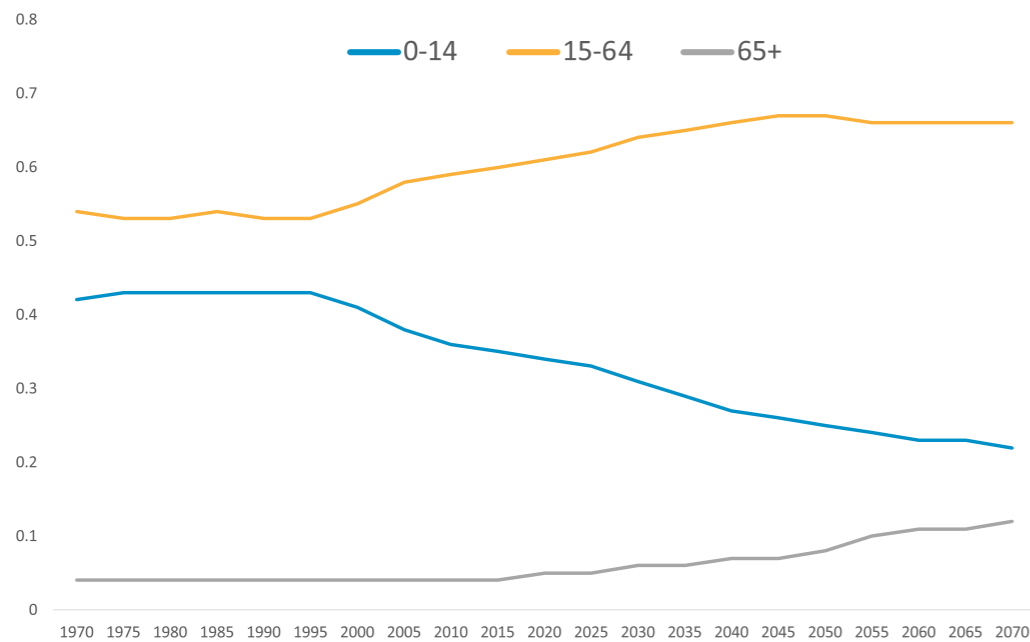
Source: World Population Prospects, UN, 2017 revisions.

For the sake of inter-generational wealth flows, different ages have different implications. However, three age-groups represent the population dynamics best in any population, which are 0-14 (the young), 15-64 (the working ages) and those aged 65 and above (the elderly). Figure 3 presents the size of each of this age-group in Pakistan from 1970 to 2070. In Figure 3-A we can see the proportion of the 0-14 age group declining

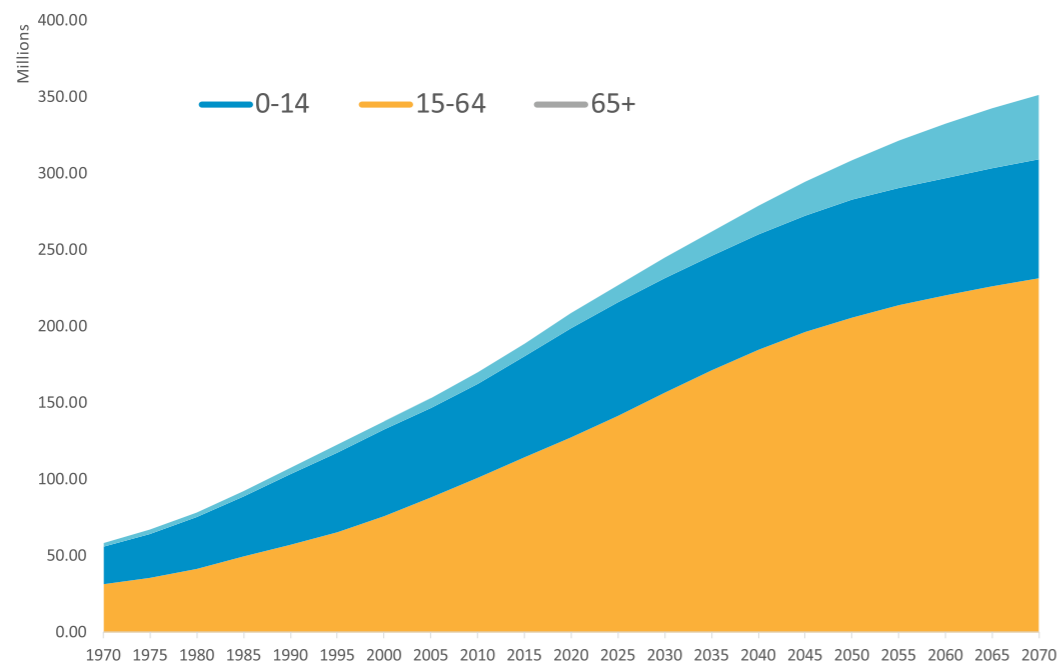
with time, and that of the elderly and the working ages increasing over the years. The numbers, as can be seen in 3-B, are the largest in the 15-64 age group. The proportion declines but due to the population echo the numbers in the 0-14 age group, after an initial increase, remain almost consistent (Figure 3-B). The proportion and the number of the elderly in the country show a continuously increasing trend (Figures 3-A and 3-B).

**Figure 3**  
Population Size and Proportion by Age-Group: 1970 to 2070

3A: Proportion of population by age-group



3B: Population by age-group



Source: World Population Prospects, UN, 2017 revisions.

# 02 OBJECTIVES

The estimation of the NTA for Pakistan is to strengthen our understanding of the linkages between population dynamics and development, and their macroeconomic implications for the country. The Accounts aim to estimate: how much people earn and consume at every age; how do people, especially the young and the old who consume more than they produce, support themselves; and whether it is through the private or public sources that any existing deficit is filled.

Pursuing these objectives, the discussion to follow is structured around sections dealing with: an overarching conceptual framework of NTA; methodology and data used; and the main NTA age profiles, namely income, consumption, life-cycle deficit, and reallocations. Consumption and reallocations include both public and private sources. For each of these NTA items, the report briefly describes the method of calculation; provide per capita and aggregate estimates; present graphical representations for both; and describe the results.



# 03

## CONCEPTUAL FRAMEWORK

The study uses the established NTA methodology to estimate the accounts for Pakistan. According to this methodology, the NTA consists of 3 accounts:



These accounts together become part of the total NTA, which is calculated in three major steps. These steps are:

- Step 1: Estimate per capita age profiles from household surveys then smooth the results;
- Step 2: Use population data to construct a preliminary aggregate age-profile;
- Step 3: Adjust the aggregate profile and the per capita profile to match a macro control taken from the national accounts.

The conceptual framework used for estimating the NTA can be summarised in these words, “a system of macroeconomic accounts that measures current economic flows by age in a manner consistent with the United Nations System of National Accounts. NTA

measures age-specific labour income, asset income, consumption, transfers and saving, accounting for flows within households, between households, through the public sector and with the rest of the world.” (UN, 2013).

At its simplest level, the complete NTA conceptual framework can be presented by the following equation:

$$\underbrace{C - y^l}_{\text{Life-Cycle Deficit}} = \underbrace{y^A - S}_{\text{Asset Reallocations}} + \underbrace{\tau_g^+ - \tau_g^-}_{\text{Net Public Transfers}} + \underbrace{\tau_f^+ - \tau_f^-}_{\text{Net Private Transfers}}$$

Age Reallocations
Age Reallocations

Where:

**C** = Total consumption

**yl** = Labour income

**yA** = Total asset income

**S** = Total savings

**τ+g** = Public transfer inflows

**τ-g** = Public transfer outflows

**τ+f** = Private transfer inflows

**τ-f** = Private transfer outflows





# 04

## METHODOLOGY AND DATA

The present study is a continuation of the pioneering work done at PIDE on the demographic dividend<sup>1</sup>. The previous work, however, did not quantify the dividend and the present study aims to do so using the methodology given by the NTA system. Since the methodology is available in the NTA manual, giving details of the data required and the formulas applied to calculate the life-cycle income-consumption estimates, it is not described in detail here.

The methodology designed to construct the NTA has massive data needs and requires individual and/or household micro survey datasets along with public expenditure data conforming to the SNA. Issues in the estimation process include data availability, cleaning, weighting, and smoothing. For estimating various segments of the NTA in Pakistan, the data constraints are daunting. Data needs as prescribed by the NTA methodology are:

**Economic life-cycle:** includes estimations of consumptions and labour income. Consumption consists of public and private consumption. Public consumption data comes from macroeconomic/public data, while private consumption comes from micro-survey data. Consumption is divided into education, health, and other consumption. Labour income comes from survey data. Although the basic NTA estimate does not include giving value to unpaid labour, given its trends in Pakistan, the current study has borrowed the methodology provided by the NTA's variant National Time Transfer Account (NTTA) to quantify unpaid labour.

<sup>1</sup> Nayab, D (2006), 'Demographic Dividend or Threat in Pakistan?', The Pakistan Development Review 48:1.





Public transfers: include the activities of all units of government (federal and provincial), social insurance funds, and all non-market, non-profit institutions that are controlled and mainly financed by the government.

Private transfers: include households, private enterprises, and non-profit institutions serving households. This includes transfers at both levels, inter-household, and intra-household.

Public asset-based reallocations: include asset income and saving. Public assets include public capital stock and public credit, debt, and property. The NTA uses macro control and age profile from general tax to estimate public assets.

Private asset-based reallocations: include income and saving. Inflows and outflows of private asset income and savings are to and from a household head.

The present study has made use of the following datasets for the estimation of the NTA:

1. Pakistan Social and Living Measurement Survey 2011-2012
2. Household Income and Expenditure Survey 2011-2012
3. National Health Accounts 2011-2012
4. National Accounts 2011-2012
5. Public spending data including that of the Public Sector Development Program 2011-2012 and data from the Ministry of Finance.
6. Balance of Payment Statistics (State Bank of Pakistan).
7. Financial Statement Analysis of the Financial Sector 2011-2015 (State Bank of Pakistan).
8. Federal Annual Budget Statement 2011-12 (Ministry of Finance)

Every effort was made to access newer data so that the NTA estimates are more recent, but the macro data became the biggest hurdle in doing so. While newer data is available for the private/micro estimates, but lack of macro data constrained using it. Same year data was, therefore, preferred to be used to have a more internally consistent estimate. Besides, this being

the first exercise in the country to estimate the NTA, the aim is to provide the best possible platform that can provide a foundation for any such exercise in future. National Accounts data of Pakistan, though claimed to be following the SNA, lacked a lot of information that is needed for the estimation of the NTA.

# 05 SNAPSHOT OF PAKISTAN'S NTA ESTIMATION

Before we go into the details for each profile constructed for the estimation of the NTA for Pakistan, the summary of the account is presented here first. Let us first start with enlisting the input parameters used for the estimation. The inputs are as follows:

## A. Economic life-cycle Input Parameters

### i Labour Income

Labour earnings  
Self-employment and unpaid labour income

### ii Consumption

#### Private Consumption

Education  
Health  
Other

#### Public Consumption

Education  
Health  
Other

## B. Private Age Reallocation Input Parameters

### i Private Transfers

#### Private inter-household transfers

Private inter-household inflows  
Private inter-household outflows

#### Private intra-household transfers

Private intra-household inflows  
Private intra-household outflows

### ii Private Asset-Based Reallocations

#### Private Property Income

Private property income inflows  
Private property income outflows

#### Private Capital Income

Private capital income inflows  
Private capital income outflows

#### Private savings

## C. Public Age Reallocation Input Parameters

### i Public Transfers

Public cash inflow  
Public in-kind inflow  
Public cash outflow  
Public net flow

### ii Public Asset-based Reallocations

Public property income inflows  
Public property income outflows

#### Public Savings

Based on the above-mentioned inputs the NTA estimated for Pakistan shows that it is mainly through private asset-based reallocations and private transfers that the individuals fund their life-cycle deficit. Public sources do contribute but the role of the private far outweighs them.

**Box 1: Summary of Pakistan NTA**

$$\frac{C - y^l}{2,856,342.60} = \frac{y^A - S}{2,554,958.99} + \frac{\tau_g^+ - \tau_g^-}{4,020,705.35 - 4,200,849.87} + \frac{\tau_f^+ - \tau_f^-}{622,901.00 - 141,372.87}$$

301,383.6

2,856,342.60

$C$ (total consumption) = 7,114,713.62	$\tau_g^+$ (public transfer inflows) = 4,020,705.35
$y^l$ (labour income) = 4,258,371.02	$\tau_g^-$ (public transfer outflows) = 4,200,849.87
$C - y^l$ (life-cycle deficit) = 2,856,342.60	$\tau_g^+ - \tau_g^-$ (net public transfers) = -180,144.53
$y^A$ (total asset income) = 4,153,922.63	$\tau_f^+$ (private transfer inflows) = 622,901.00
$S$ (total savings) = 1,599,033.63	$\tau_f^-$ (private transfer outflows) = 141,372.87
$y^A - S$ (asset reallocations) = 2,554,958.99	$\tau_f^+ - \tau_f^-$ (net private transfers) = 481,528.13
$(\tau_g^+ - \tau_g^-) + (\tau_f^+ - \tau_f^-)$ (net transfers) = 301,383.6	

It can be seen from Box 1 that private asset reallocation is the primary source of funding the life-cycle deficit, and not the transfers, either public or private. We would see that in detail as we go further in this report.

# 06 LIFE-CYCLE DEFICIT

It would not be wrong to state that estimation of the life-cycle deficit and how it is funded forms the core of the NTA construct. All other profiles fit in to solve this puzzle. Thus, before going into the constituting profiles, let us start with the life-cycle deficit in Pakistan as estimated in this study. Figure 4 shows the average per capita consumption and labour income in Pakistan by age. Consumption includes all kinds of consumptions, from both public and private sources, and labour income includes labour earnings and those earned while being self-employed or unpaid. As one would expect, younger cohorts consume while earning nothing or a negligible amount of labour income. The income-consumption gap is even wider for the older ages where the elderly, though earn some income, consume way more than it.

**Figure 4**  
The Life-cycle Deficit: Per Capita Labour Income and Consumption (thousand rupees)

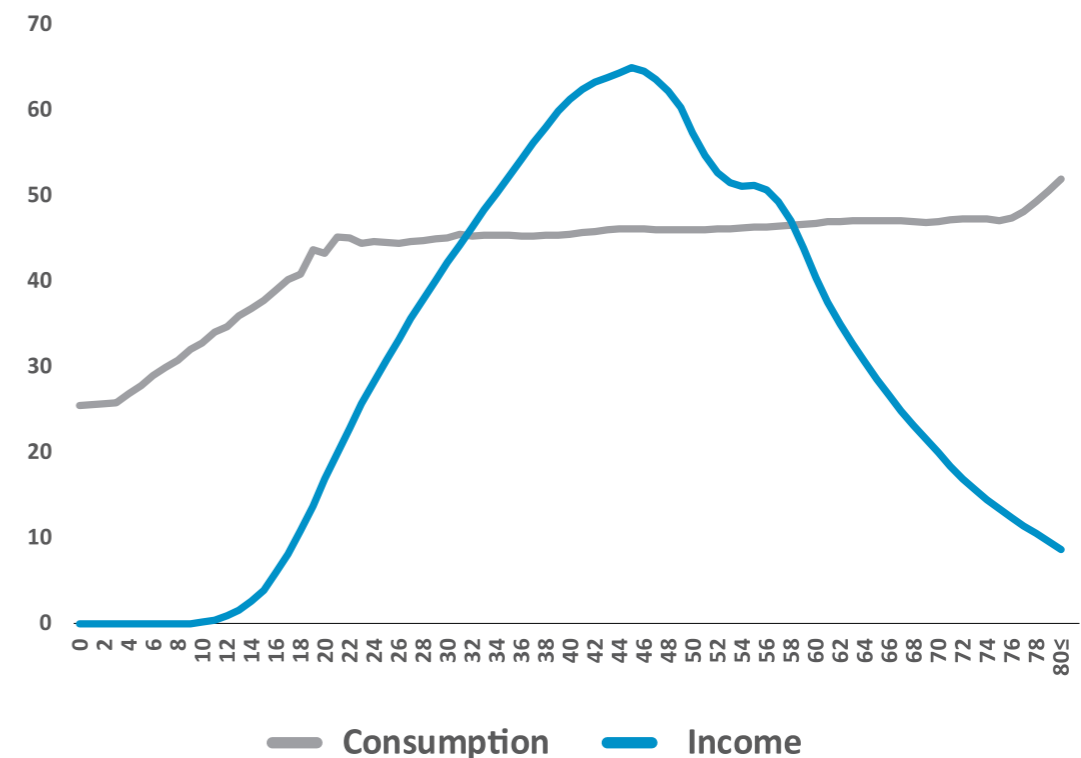
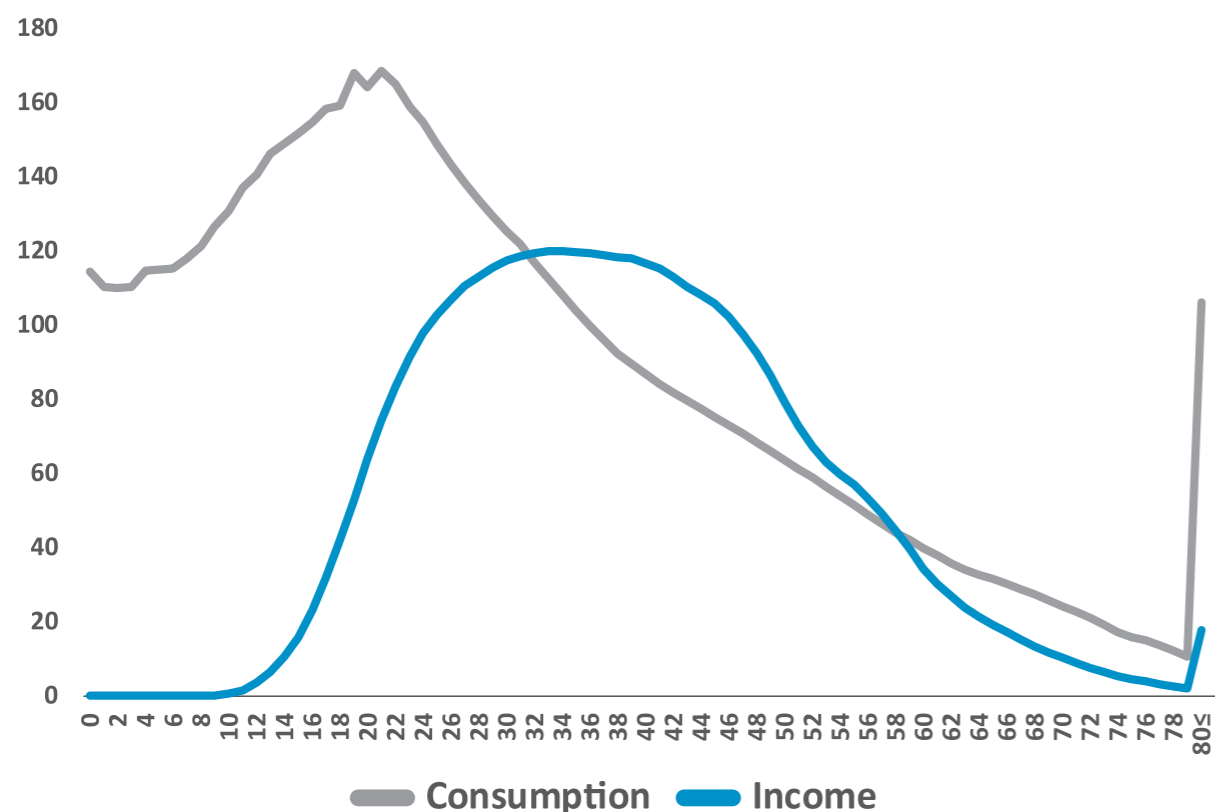




Figure 5 presents the aggregate labour income and consumption by age. The effects of the age structure of the population are reflected in the aggregate figures of how much is earned and consumed in totality by each age in the country. The aggregate consumption is the highest for the adolescents (those aged 14-29 years) and begins to decline after the age of 30. The observed trend is understandable with the median age being 22 years in the country. Talking of aggregate income, the ages 25 years to 45 years are the most productive. Age structure accompanied by labour

productivity contribute to this trend. The proportion of the population aged over 45 years begins to reduce in the population, reflected in the declining aggregate income. After age 60 both start to decline, the proportion of the population and those who earn, as can be gauged from the trend exhibited in Figure 5. It may be clarified here that the spike at the ages 80 and above in the figure, and all similar subsequent figures, is because of clubbing everyone aged 80 or more in one group making the size of the group large.

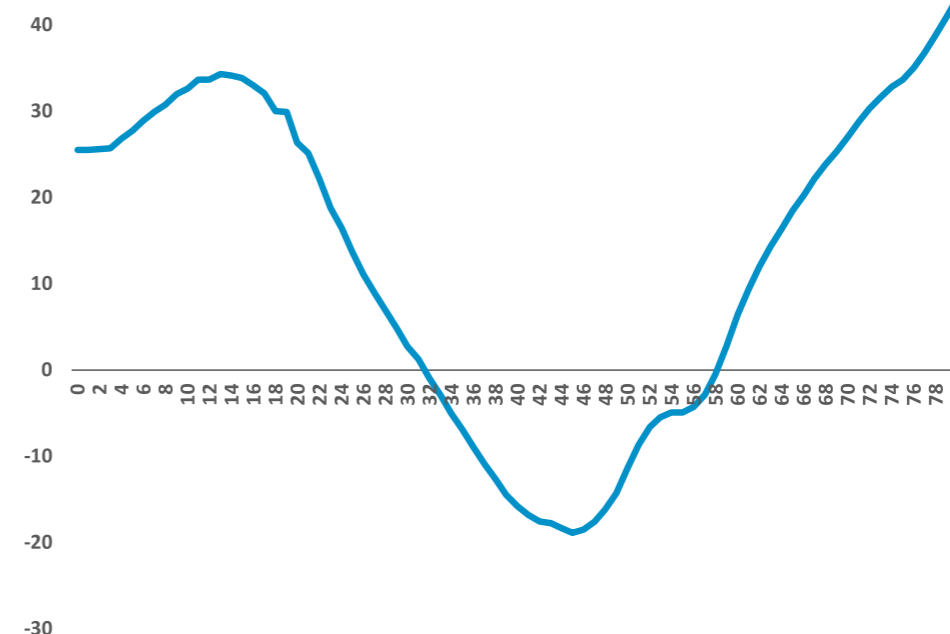
**Figure 5**  
The Life-cycle Deficit: Aggregate Labour Income and Consumption by Age (billion rupees)



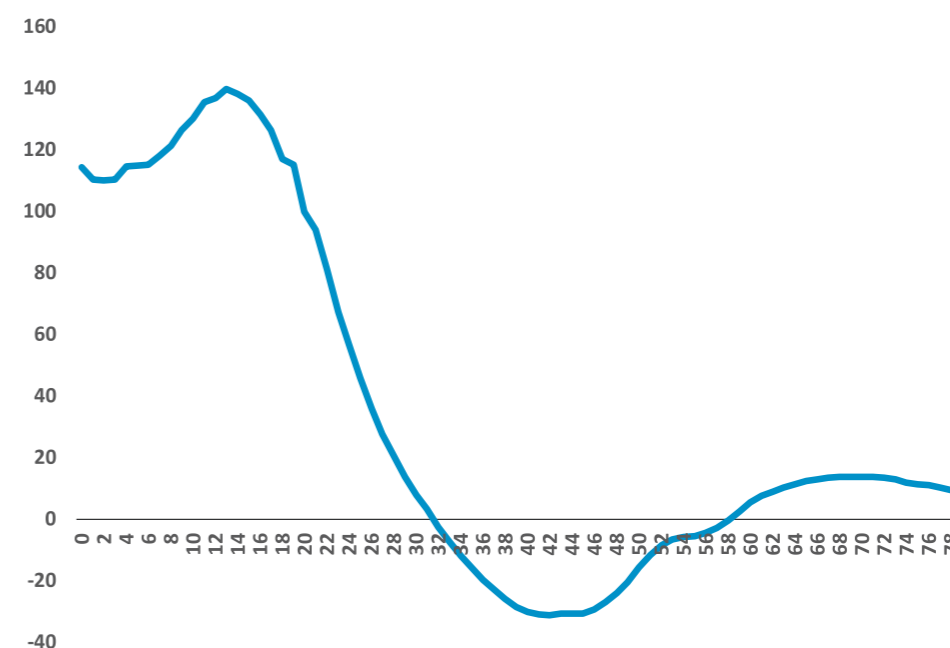
This brings us to the all-important life-cycle deficit. As can be seen from Figure 6, the deficit is highest for the older ages. Once the population grows over 60 years the deficit begins to increase monotonously. Likewise, the younger ages consume more than they earn, if they earn at all, leading to a net deficit. It is for the ages 28 years to 61 years that the per capita life-cycle deficit is in surplus. These trends conform to the whole notion of

the demographic dividend that emphasises the phase of demographic transition where the dependency rates are lower leading to a higher proportion in working ages and, thus, higher-income generation and productivity (Lee, Lee & Mason, 2006; Lee and Mason, 2011). The surplus peaks at the age 45 years and starts to decline after that, till the time it turns into a deficit by age of 62.

**Figure 6**  
Per Capita Life-cycle Deficit (thousand rupees)



**Figure 7**  
Aggregate Life-cycle Deficit (million rupees)



The impact of the current age structure of Pakistan is well-mirrored when we look into the aggregate life-cycle deficit prevalent in the country. As Figure 7 shows, the deficit is the highest for the younger ages, especially those aged in teens. Large cohorts present in these ages inflate the per capita deficit to such proportions.

The older cohorts, despite having a higher per capita deficit (see Figure 6) have a lower aggregate deficit because of a smaller proportion of the population in these ages (see Figure 3 for population proportions in each age group)



- 7.1 Labour Income
- 7.2 Consumption
  - 7.2.1 Education Consumption
  - 7.2.2 Health Consumption
  - 7.2.3 Other Consumption
  - 7.2.4 Total Consumption

# 07

## LIFE-CYCLE ACCOUNTS

This section deals with the NTA profiles constructed to estimate the life-cycle deficit or surplus for each age. Both per capita and aggregate estimates are given for each profile along with a brief account of how it was constructed and what it means.





## 7.1 Labour Income

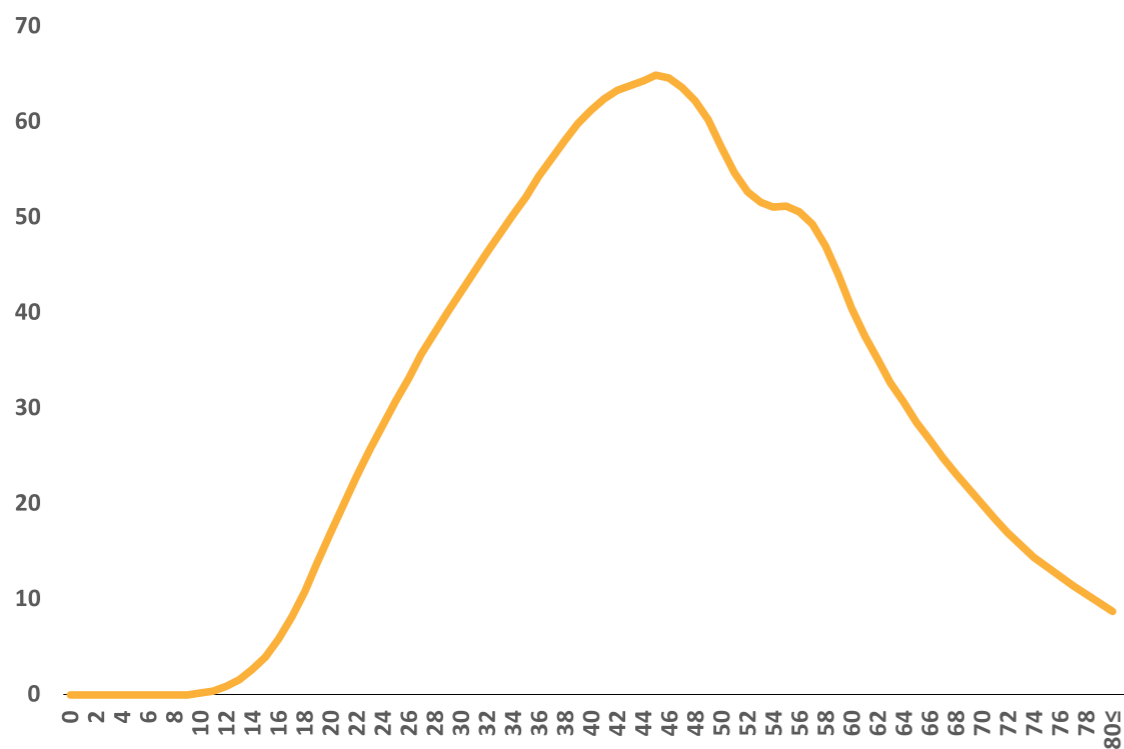
Labour income is estimated using two kinds of earnings, namely labour earnings and self-employment labour income. The present study also gave value to the work of those who reported working but were not paid for their effort, and this estimate becomes part of the self-employment income. Labour earning is income received by an employee from an employer in return for their labour. This income includes wages and salaries before paying any taxes. All fringe benefits also become part of this estimate. The data for per capita labour earnings were taken from the Household Income and Expenditure Survey (HIES), which has individual-level information for every member's economic activity and income, while the macro controls for the aggregate came from the national accounts data on the compensation of employees and mixed-income. According to the NTA methodology (UN, 2013), two-thirds of the mixed-income is allocated to self-employed income.

The other component of the labour income, the self-employment labour income, is estimated as a two-third share of mixed-income. Mixed-income is the return to labour of those who are self-employed.

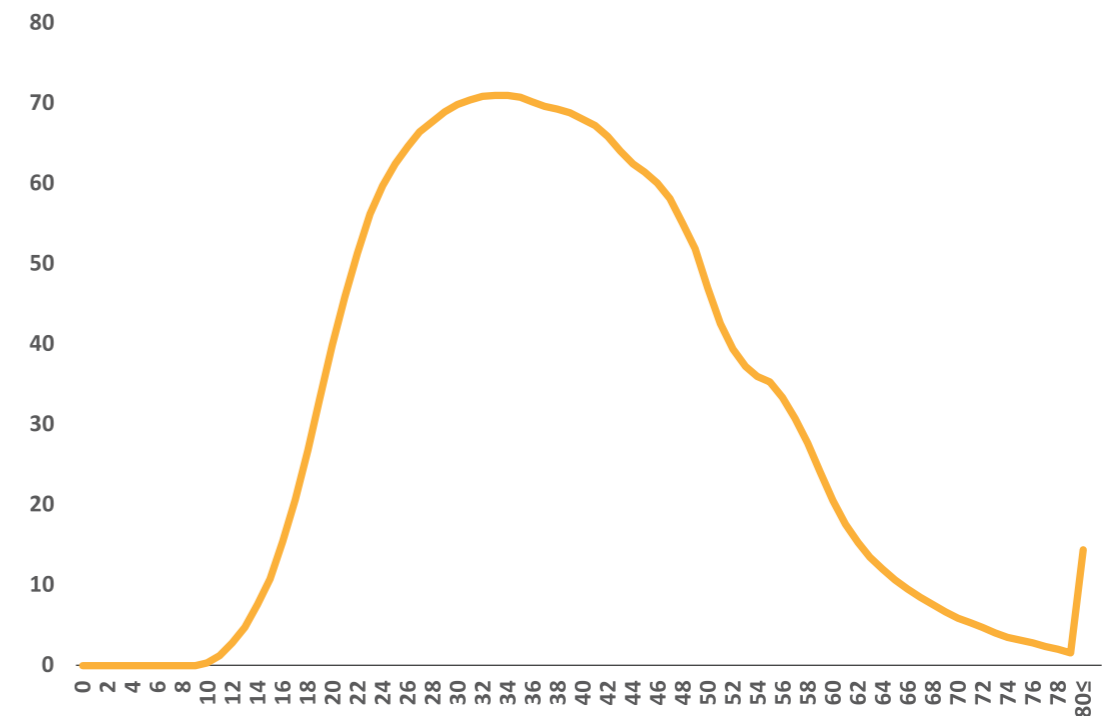
Two-thirds of the gross mixed-income is allocated to the labour income while the remaining one-third to capital. The NTTA methodology gives value to any unpaid workers in the household too. It does this by not allocating all the income of self-employed persons to them if there are unpaid workers in the household. Going by the method provided, self-employment income earned by a household is aggregated and this amount is then allocated to the self-employed and unpaid family workers in the household. The allocation of the amount is done on the basis of the weights calculated for each age by using the labour earning profile already estimated. This method helps overcome the underreporting of income by those who work as unpaid family workers. The estimations so reached are then smoothed using Friedman's Supersmoother as provided by the R statistical package.

Figure 8 presents the average per capita labour income, including both kinds of labour incomes elaborated above. The per capita income begins to increase after the age of 16 and keeps on increasing. As expected, the labour income peaks at the mid-40s and begins to decline after that. Looking at the aggregate labour income, we see the income peak at the mid-30s. Along with the amount earned, it is also the effect of the age structure leading to this pattern.

**Figure 8**  
Per Capita Labour Income (thousand rupees)



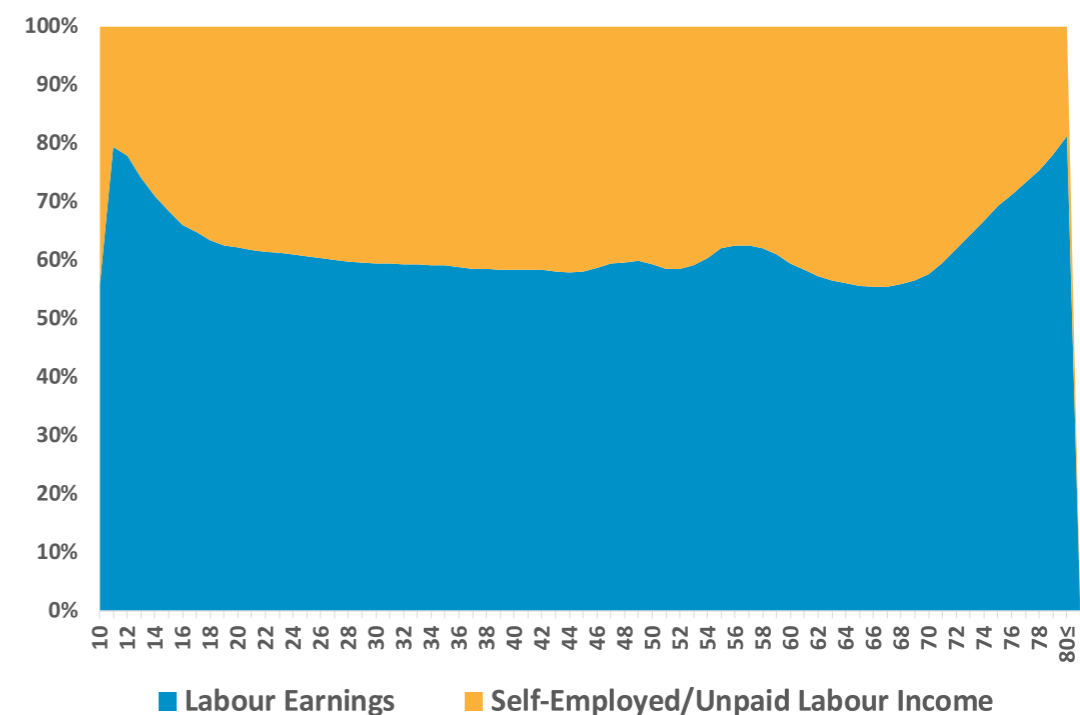
**Figure 9**  
Aggregate Labour Income (billion rupees)



It would be of interest to see the share of each kind of income in the total labour income, disaggregated by age. This estimation is presented in Figure 10, and it can be seen that labour earnings are higher than

self-employment labour income for all ages. The self-employment labour income does not exceed the labour income for any age.

**Figure 10**  
Per Capita Labour Earnings and Self-Employment Labour Income: Percentage Share in Total Labour Income

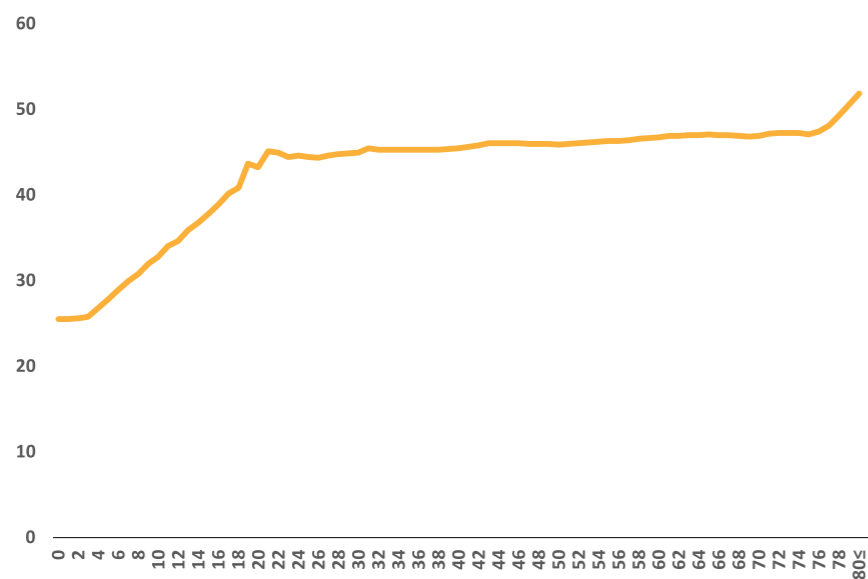


## 7.2 Consumption

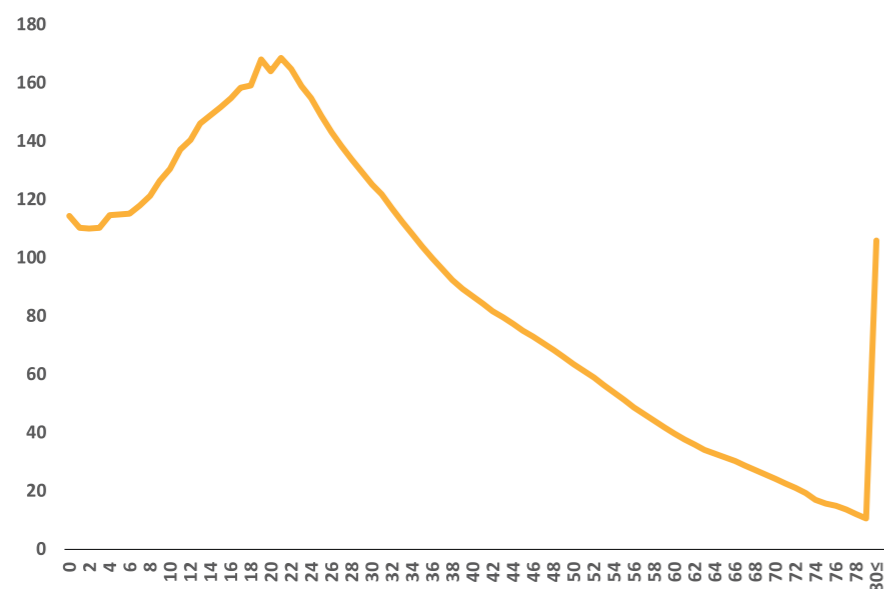
The consumption profile in NTA comprises two components, private and public, which in turn have many sub-profiles. The sub-profiles estimated for Pakistan include one each for education, health, and all other consumption, both for private and public consumption. Before going into the sub-profiles let us look at the total consumption first. Figure 11 presents the total per capita consumption in Pakistan. The

average total consumption begins to increase with age and having a spike during adolescence stabilises at a certain level before increasing for the older ages (Figure 11). The aggregate consumption is presented in Figure 12 and we can see that, as a result of the age structure and consumption pattern, the amount is highest for the ages 19 to 22 years old. After these ages, it continues to decline monotonically, and the increase is visible at the right end of the figure is only because of consolidating all ages equal and more than 80 years into one age category.

**Figure 11**  
Per Capita Total Consumption (thousand rupees)



**Figure 12**  
Aggregate Total Consumption (billion rupees)



### 7.2.1 Education Consumption

Calculations for consumption include consumption by individuals on education, health, consumption on owner-occupied housing and all other consumptions on goods and services except health and education. The consumption of education, health and other goods and services are calculated separately because their consumption patterns are very different by age. We first deal with education consumption and its related sub-profiles.

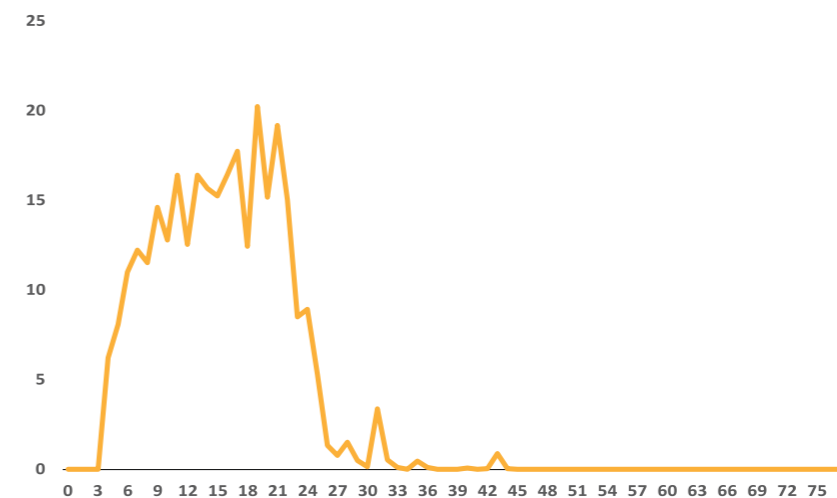
#### a. Private Education Consumption: Per Capita and Aggregate

The HIES dataset contains information on education consumption for individuals during the last one year, therefore, the relevant information is extracted directly from the dataset to construct the per capita age profile. Data is available in the education section of the survey with cost breakdown in tuition fee, admission

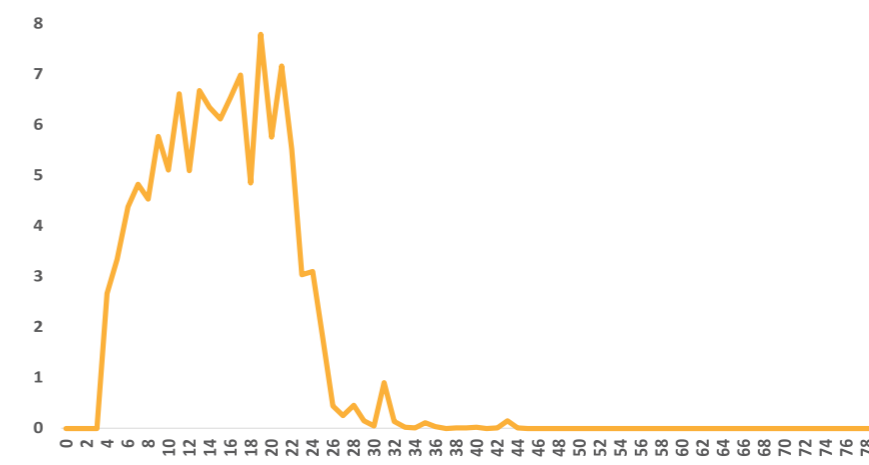
fee, registration, books and other school supplies, transport and other education expenses. In some cases, respondents were unable to give disaggregated information, but total education consumption is still available which is used to estimate the profile. For the aggregate estimation, the macro control came from the national data on private consumption expenditure on education. It may be mentioned here that unlike most profiles, those for education are not smoothed because of their peculiar age distribution.

Figure 13 presents the per capita private education consumption in Pakistan. It shows that expenditure on education starts from age 4, increasing sharply afterwards. It remains within a certain range, with slight fluctuations, until it starts to decline at age 22. Consumption on education drops sharply and remains low up till age 40. The aggregate education consumption (see Figure 14) shows a trend replicating the pattern exhibited by the per capita estimation.

**Figure 13**  
Per Capita Private Education Consumption (hundred rupees)



**Figure 14**  
Aggregate Private Education Consumption (billion rupees)



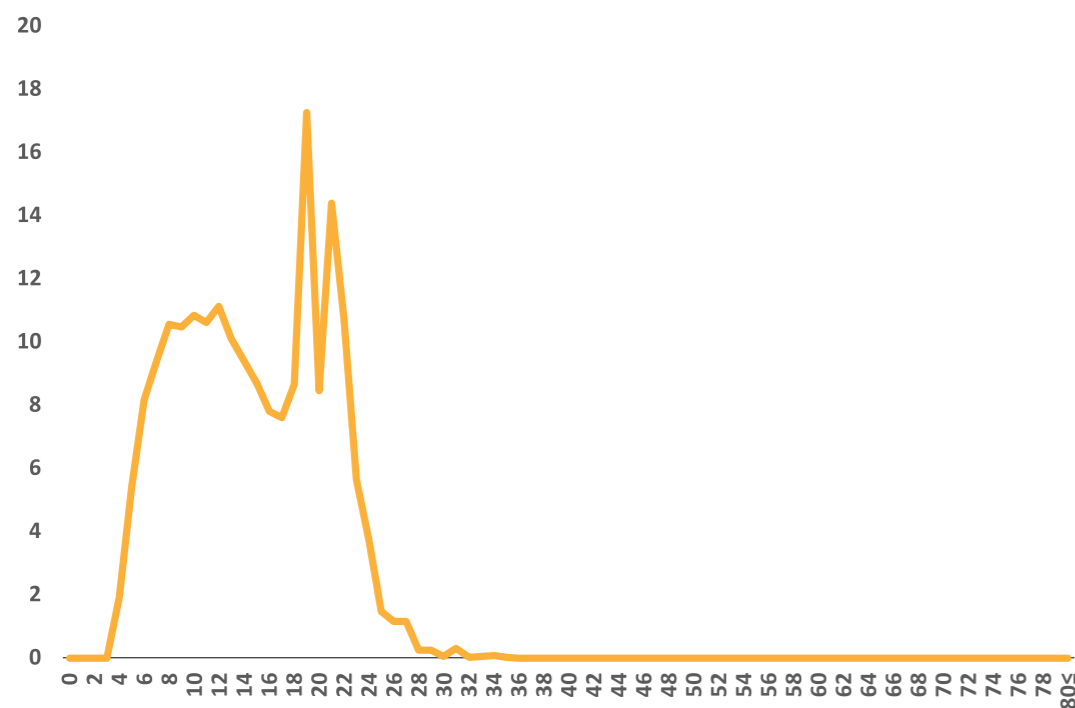
**b. Public Education Consumption: Per Capita and Aggregate**

This profile includes consumption of educational services provided by the public sector at all levels, namely primary, secondary, tertiary, and professional levels. Formal public education consumption by age is estimated by calculating the unit cost per student for each level of schooling. Public education enrolment rates by age and level were calculated using PSLM dataset and administrative information provided by National Education Management Information System (NEMIS) (GOP, 2013). The number of students enrolled in each level divided by the population at each age gives us the enrolment rates. To estimate the per capita spending at each age the enrolment rate was multiplied with the unit cost. This was repeated for enrolment at all levels, and the per capita consumption of public education at each age was calculated by adding across the primary,

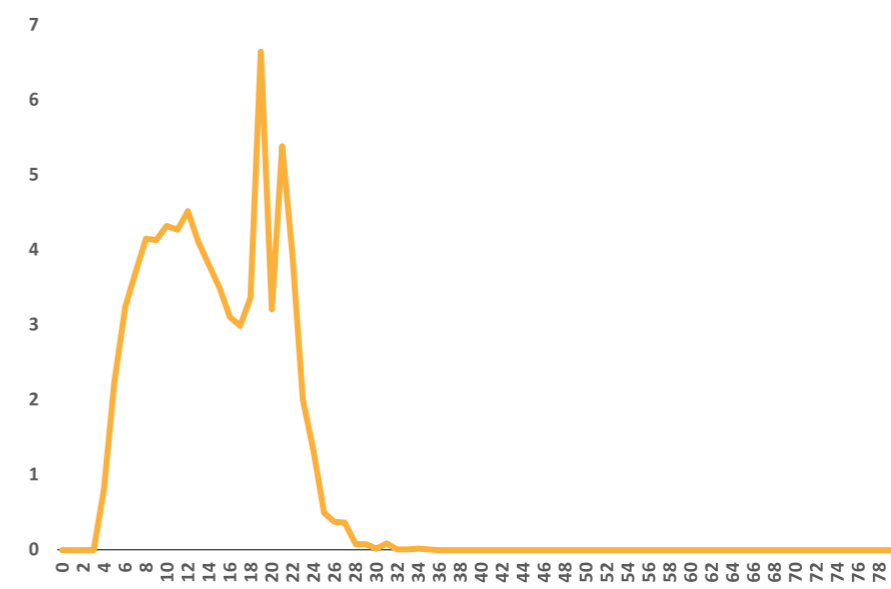
secondary and tertiary levels of education. The NTA methodology assumes that the unit cost of public education does not vary within each level. Since informal public education consumption does not target any age, it is allocated equally to everyone. Total public education consumption by age is, thus, calculated by adding up both, formal and informal consumption, by age.

Two important points need to be made here. One, the consumption includes at both the levels, national and provincial. Since education is a provincial subject after the 18th amendment, most of the primary, secondary, and some of the tertiary education is funded by the provinces. Two, like the private education consumption profile, public education consumption profile was not smoothed due to the peculiar pattern of education consumption. Based on the method stated above, Figure 15 and 16 present the per capita and aggregate public education consumption.

**Figure 15**  
Per Capita Public Education Consumption (hundred rupees)



**Figure 16**  
Aggregate Public Education Consumption (billion rupees)



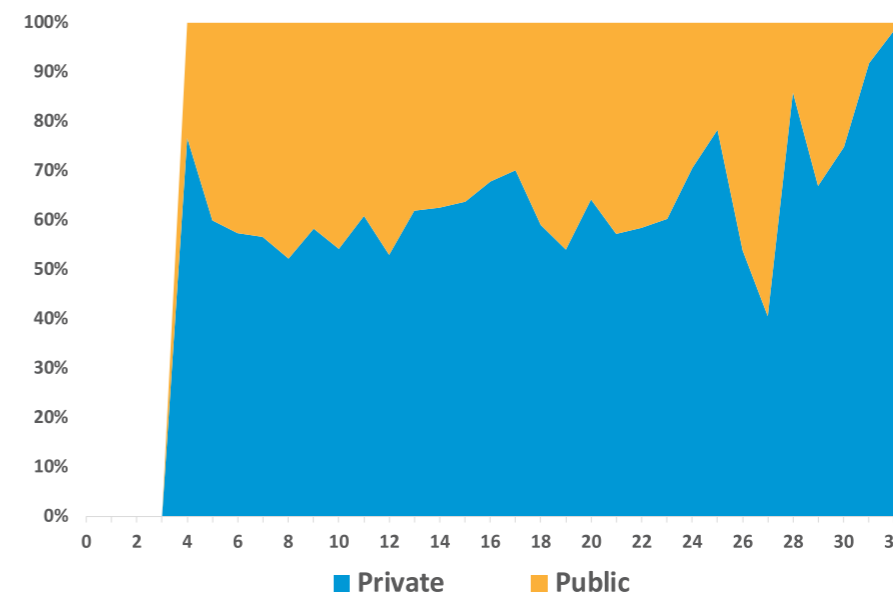
Just like the private education consumption, the public education consumption profile shows similar patterns for the per capita and aggregate estimates. The consumption is at the highest level at around 20 years of age, reducing consistently after that (Figure 15 and 16).

**c. Total Education Consumption: Public and Private**

Are they public or private sources that finance education in Pakistan more dominantly? Going by Figure 17, that

presents aggregate estimates for both public and private education consumption, it is evident that it is primarily private sources financing education for all ages and levels of education, barring a few. With the rather low public allocations for education in the country, which often comes under criticism, this estimate reflects on the state and priority accorded to education in the country.

**Figure 17**  
Share of Public and Private in Per Capita Education Consumption: Proportions in Total Education Consumption



### 7.2.2 Health Consumption

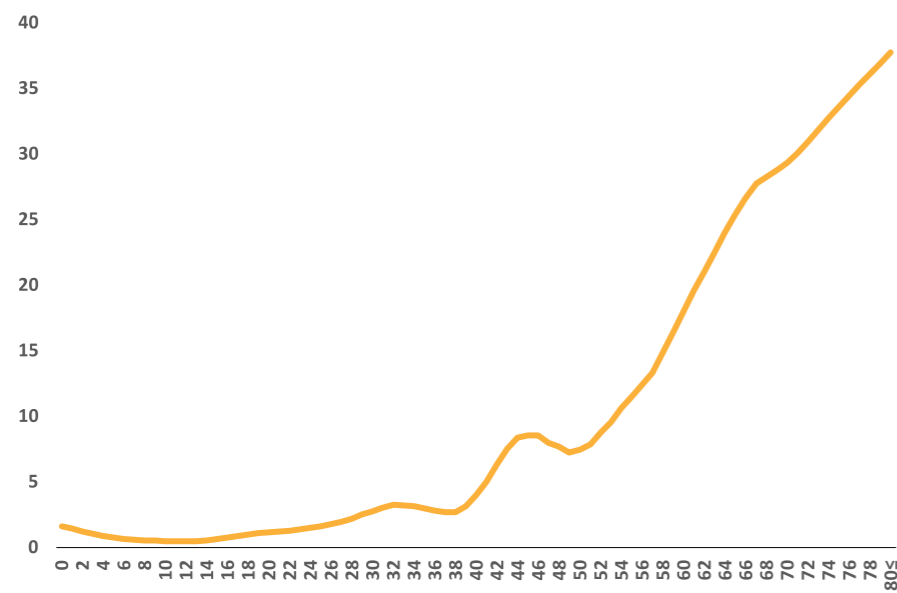
Like education, health consumption profile also has two components, private and public.

#### a. Private Health Consumption: Per Capita and Aggregate

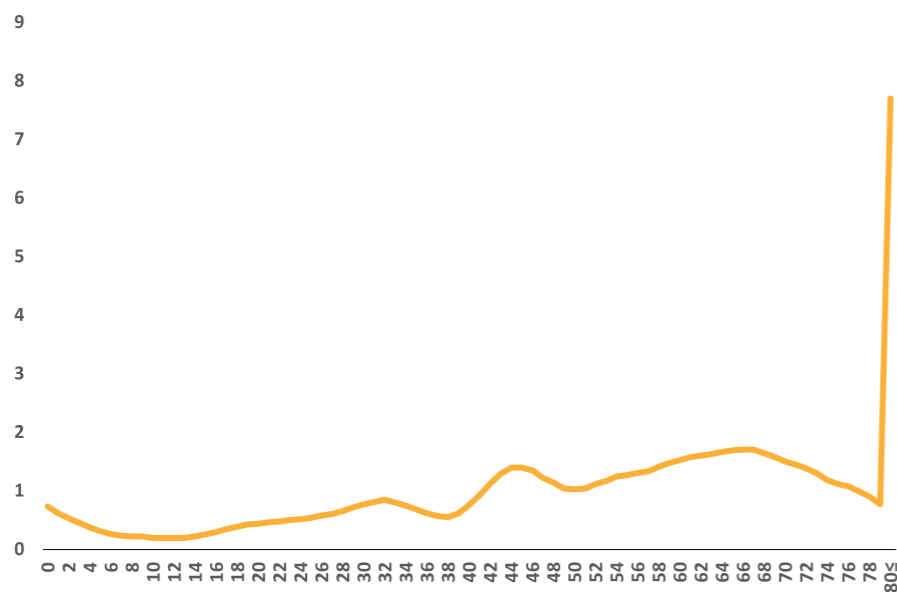
Pakistan conducts periodic National Health Accounts (NHA) survey and the data provides all the information that is needed to construct the private health consumption. This includes information linked to

doctors' consultation fee, medicines, laboratory tests, and hospital services. It also provides information on payments that are initially made but are covered by some kind of insurance or are refunded in any way. The latter are included in health consumption instead. Using the NHA, the per capita profile was constructed directly by tabulating all kinds of health expenditures by age. The profile so constructed was smoothed by R program's Supersmoother before applying the macro controls. Figure 18 and 19 present the per capita and aggregate private health consumption.

**Figure 18**  
Per Capita Private Health Consumption (hundred rupees)



**Figure 19**  
Aggregate Private Health Consumption (billion rupees)



The health expenditures decline after childhood for a few years and then begin to increase, taking a sharp upward turn after the age of 50. The increase continues to remain rapid through all the ages after it, for both per capita and aggregate age profiles.

#### b. Public Health Consumption: Per Capita and Aggregate

Public health consumption includes healthcare services provided by the public sector, including consultation fee, medicines, pathology tests, healthcare initially purchased by individuals but reimbursed through public finances, and services provided by government-run clinics. Data available from the Ministry of Finance on allocation to the health sector, at different levels and types of health services, was used to construct these profiles.

Like education, health also is a provincial subject now so public expenditures at the provincial level too were included in the estimation. Healthcare expenditures, that were collective in nature vis-à-vis the age were given weights based on private health spending. This gave us a better estimate than allocating the amount equally among all ages, assuming that each individual would be using the same amount of these services.

The per capita public health consumption is presented in Figure 20 and we can see a trend similar to what we saw for private health consumption, albeit with different values. This is because the weights used for per capita public health consumption are based on the pattern found in private health consumption.

**Figure 20**  
Per Capita Public Health Consumption (hundred rupees)

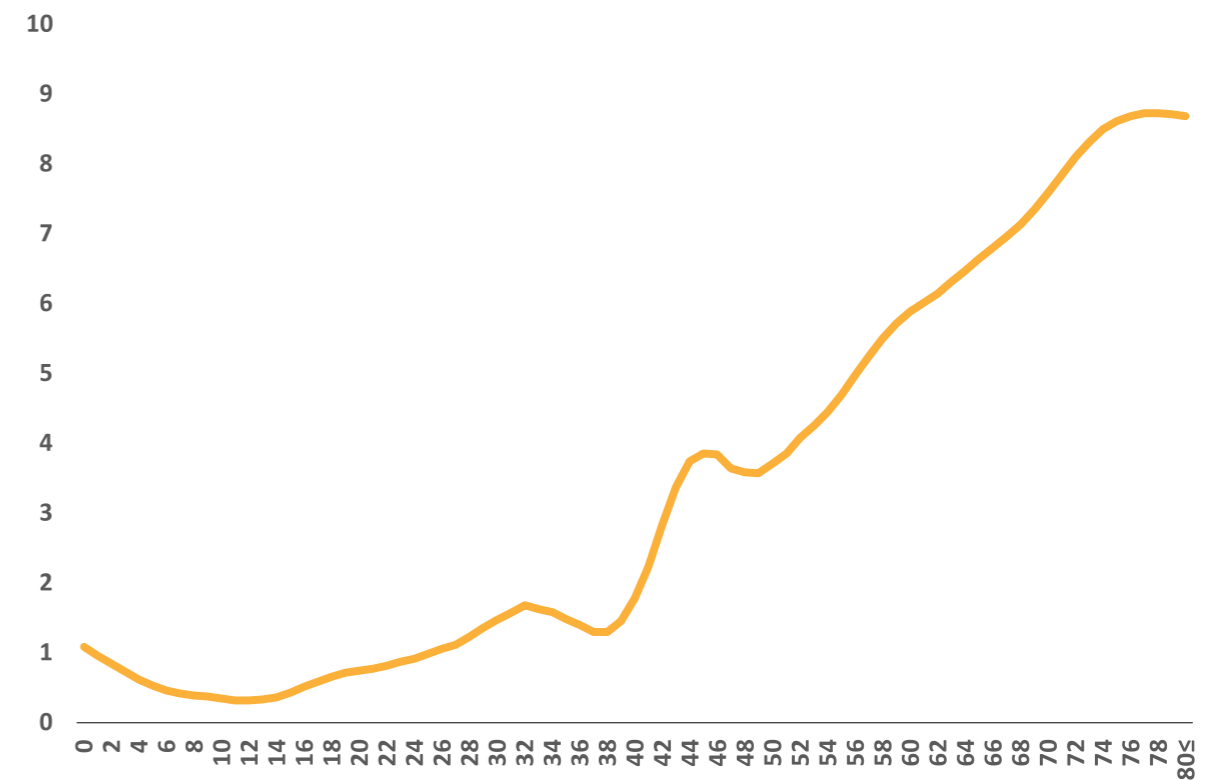
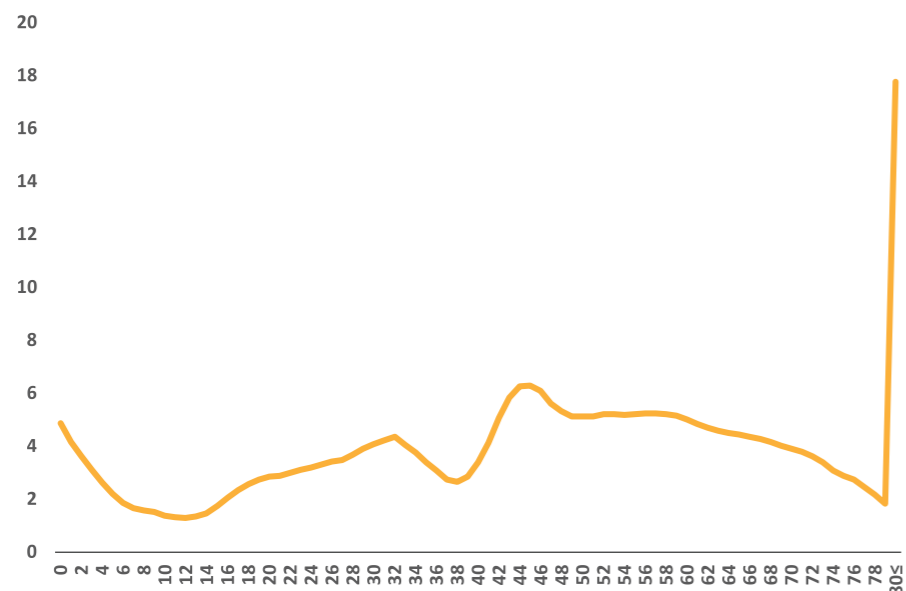


Figure 21 presents the aggregate public health consumption by age. We can see that the total public spending on health is higher for early ages, because of both higher per capita consumption and the age structure, and then declines for early teen ages. As

one would expect, the aggregate spikes for the oldest age category, and that is because of high per capita consumption and all ages above 80 years being clubbed together.

**Figure 21**  
Aggregate Public Health Consumption (billion rupees)

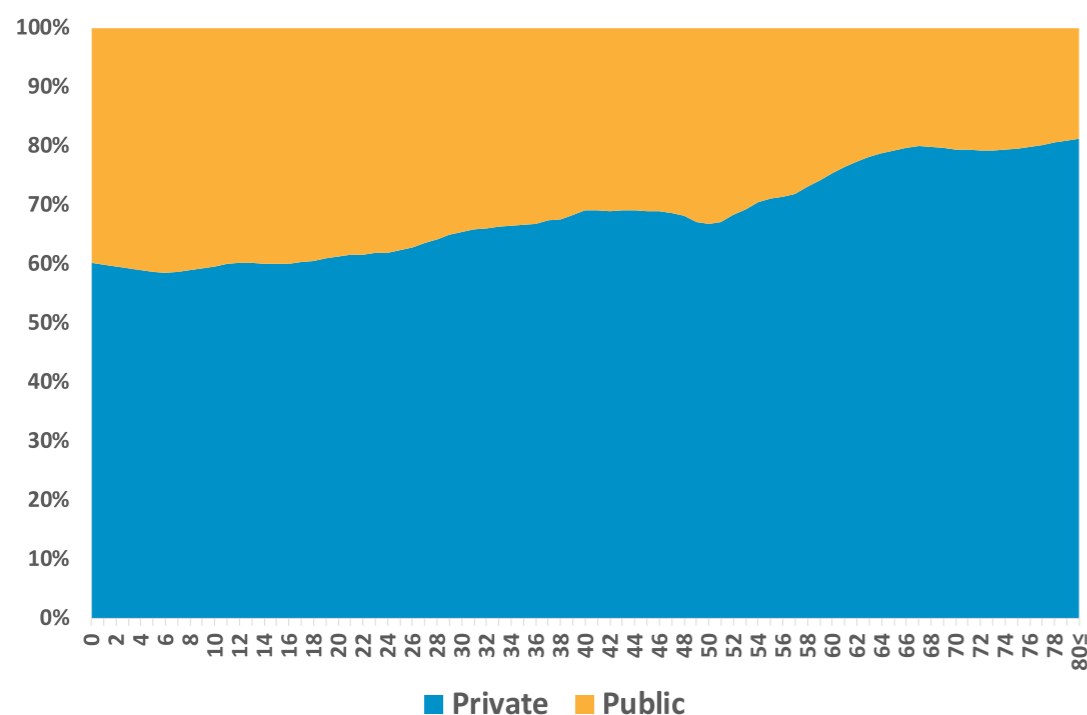


**c. Total Health Consumption: Public and Private**

It would be interesting to see the share of public and private in the total per capita health consumption at each age. Figure 22 presents this information and we can see that the share of public health consumption

in total per capita health consumption is higher for the early ages and reduces as we go up the ages. Per capita public share is lowest for the 80 and above ages. It is worth noting that for no age public health consumption exceeds private health consumption.

**Figure 22**  
Share of Public and Private in Per Capita Health Consumption: Proportions in Total Health Consumption



**7.2.3 Other Consumption**

Individuals consume much more than education and health, and all the other consumption is included in the NTA profile labelled 'other consumption'. This too has two components, public and private.

**a. Private Other Consumption: Per capita and Aggregate**

It includes consumption by households on any goods and services other than health and education. The data for this profile was used from the HIES dataset and the consumption items include both durable and non-durable goods. Non-durable items include food items, fuel and lighting, tobacco, personal care items and services, household laundry and paper items, and other housing expenditures. The durable items include household textile, furniture, kitchen equipment, and personal durable items. The data for the consumption of these different items are present for different time period preceding the survey, i.e. some items are consumed monthly, fortnightly and yearly, so all the consumptions were first converted into yearly use. All consumption items, except tobacco, are added to get one variable of other private consumption. The information for private consumption is available on the household level in the dataset. To convert it to the individual level, the equivalence scale based on the method prescribed by the NTA methodology is applied. This method gives weight to individual members in total household

consumption according to their ages. For those aged 4 and younger, it assigns a constant proportion of 0.4. This proportion increases linearly from ages 5-19 and equals to constant proportion of 1 for adults age 20 and above. The variable of these weights is then aggregated at the household level to get the sum of weights for all members of a household. Individual weights divided by the sum of household weight yields the proportion of the individual share.

For tobacco, a slightly different procedure is followed because the pattern of tobacco consumption by age is different from the consumption of other goods and services. For age 0-14, it is assumed that tobacco is not being consumed in these ages, hence zero value is assigned to them. For the rest of the ages, 5-year age groups are created and a value of 1 is assigned in case of presence of that age group and zero if not. These variables are aggregated at the household level to estimate the members of that age group in a household. Regression is then run, without constant, in which the dependent variable is set to be household tobacco consumption while independent variables are the number of household members in each age group. The beta coefficients yielded against each dummy variable of age groups gives us the weight for each age to be used to construct the profile. The resulting per capita profile, using this method, is presented in Figure 23 below.

**Figure 23**  
SPer Capita Private Other Consumption (thousand rupees)

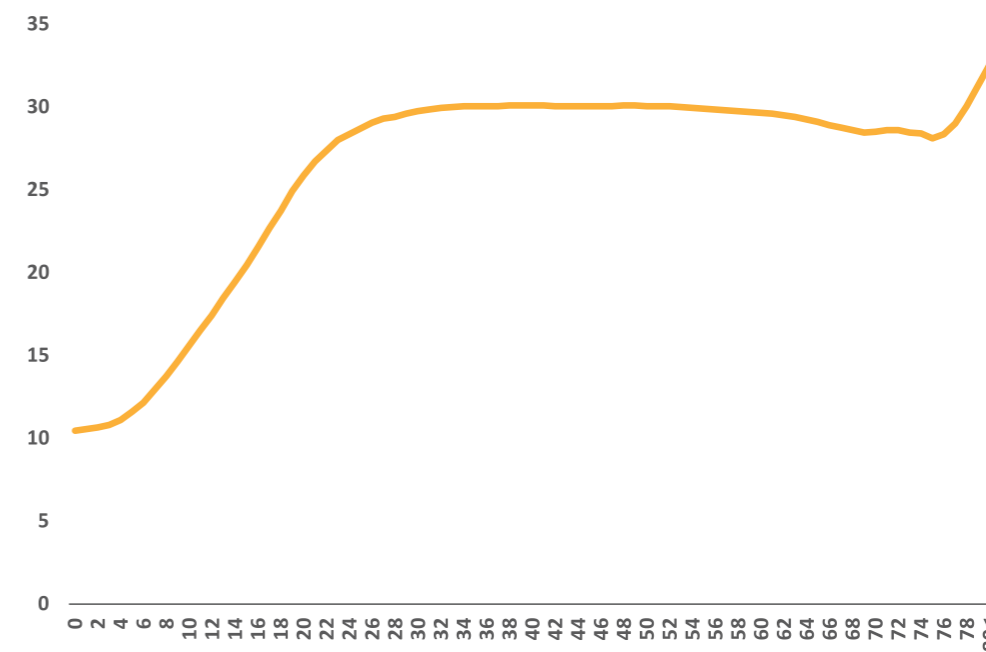
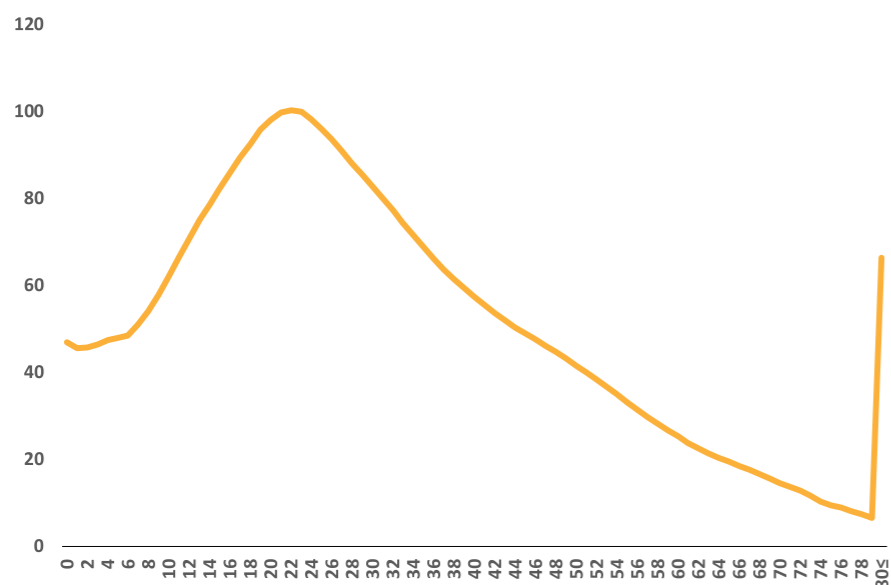




Figure 23 shows that the other consumption begins to increase with age, stabilising at around age 25 years of age. The oldest age category, 80 and above, again shows a small hike in the per capita private

other consumption. Reflecting the age structure, the aggregate private other consumption peaks at the early 20s, as can be seen from Figure 24. After these ages, the trend shows quite a steep decline.

**Figure 24**  
Aggregate Private Other Consumption (billion rupees)

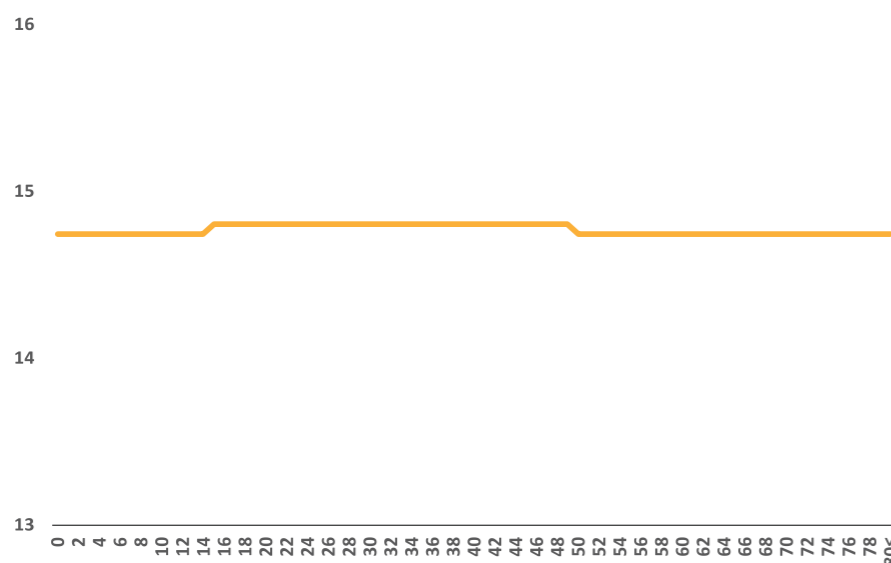


**b. Public Other Consumption**

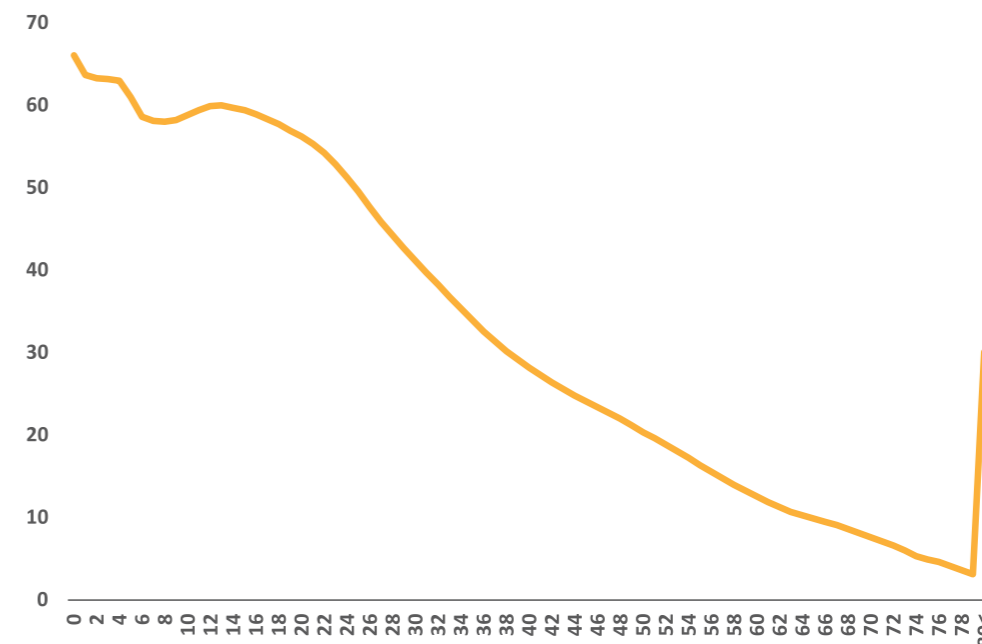
The NTA methodology divides public other consumption into two types. One that is collective in nature and the other that is individual in essence. The prior includes consumptions like agriculture, transport, defence, law and security, justice, administrative expenditures and infrastructure. These consumptions are allocated to all members equally. On the other hand, are consumptions that are more focussed, targeting a certain age group,

like vocational programs for youth. Figure 25 presents the per capita public other consumption and it is almost a horizontal line, because of equal allocation for most of the public consumptions. There was no need to smooth this profile because it does not show any abrupt changes/elbows. Figure 26 showing the aggregate public other consumption, shadows the age structure and the consumption is highest for the early ages and continues to decline with age.

**Figure 25**  
Per Capita Public Other Composition (thousand rupees)



**Figure 26**  
Aggregate Public Other Consumption (billion rupees)

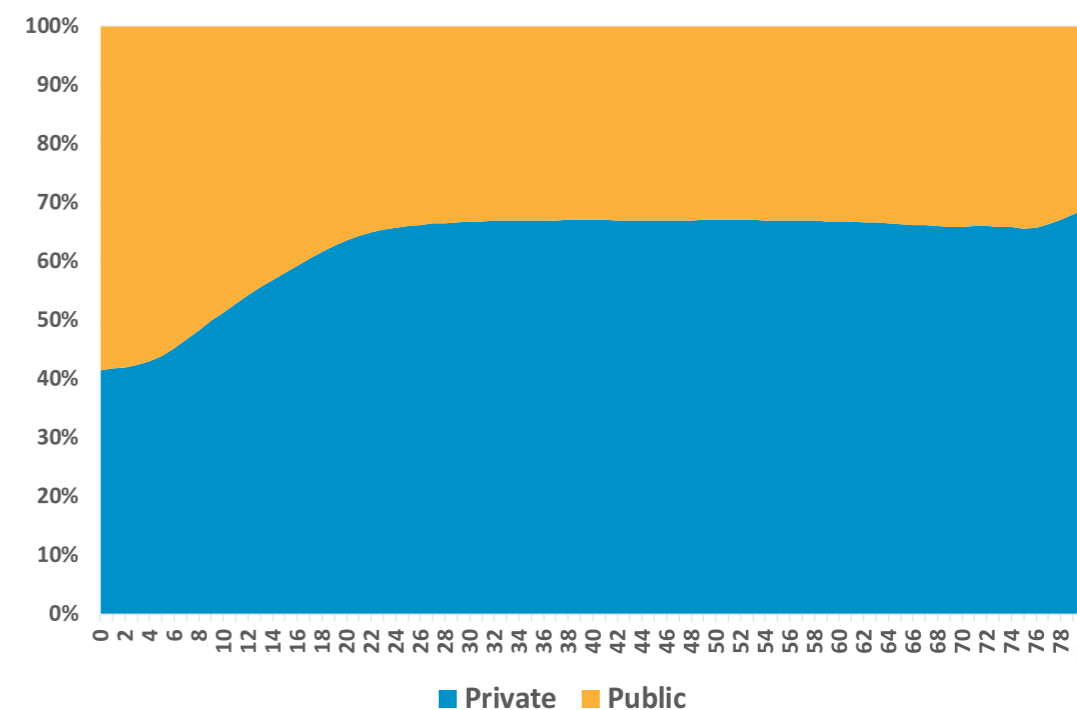


**c. Total Other Consumption: Public and Private**

Figure 27 shows the share of public and private in total other consumption for each age. We can see that it is mainly the private other consumption contributing to the

total other consumption for all ages. The share varies a little across ages but the public other consumption does not exceed the private other consumption for any age.

**Figure 27**  
Share of Public and Private in Per Capita Other Consumption: Proportions in Total Other Consumption



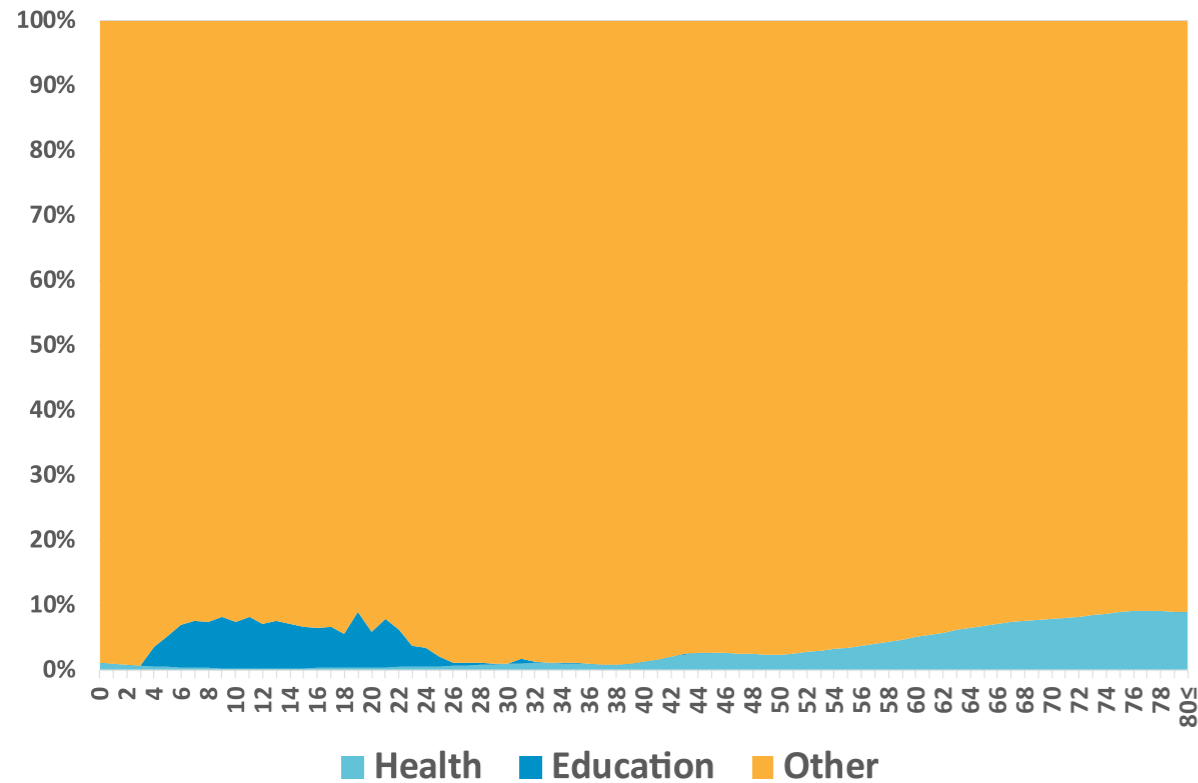


### 7.2.4 Total Consumption

Which component of consumption comprises the biggest chunk of the total consumption? It is interesting to see the contribution of each sub-profile, namely health, education and other consumption, in the total consumption. As in the previously presented profiles, we estimate the share of each type of consumption in total

per capita consumption for each age. Figure 28 shows that other consumption forms the major chunk for all ages. Patterns differ in age for health and education consumption. For the younger ages, it is the education consumption that follows other consumption while for older ages it is the health consumption that at the second number (see Figure 28).

**Figure 28**  
Share of Health, Education and Other Consumption in Per Capita Consumption: Proportions in Total Consumption



# 08 PRIVATE AGE REALLOCATIONS

The life-cycle deficit is funded through private and public age reallocations. Private age reallocations are those mediated by households, families, and other private institutions. The private age re-allocations are divided into two parts, transfers and asset income. Transfers are further subdivided into inter- and intra-household transfers. Both transfer inflows (received by household residents) and outflows (given to other households) are required for inter and intra-household transfers.

The data used for constructing this account was taken from HIES, which has modules containing relevant information. Data for these transfers are available at the household level, but instead of assigning it to the individuals the value of the total transfers is assigned to the household head. In our data, we have information on durable and nondurable goods and services received or given as gifts or assistance from/to other households (inflow and outflow). Using all the relevant data of households, values for all transfer categories are summed up to get transfer inflows and transfer outflows. The value of each household is assigned to its head, while the rest of the members of the household are assigned zero value. Aggregating the transfers by single years of age, an average value for each age is obtained. The ages having no heads have a zero value.

#### CONTENTS

- 8.1 Private Transfers
  - 8.1.1 Private Inter-household Transfers
  - 8.1.2 Private Intra-Household Transfers
- 8.2 Private Asset-Based Reallocations
  - 8.2.1 Private Asset Income
- 8.3 Private Savings

Private asset income has further two classifications, i.e. capital and property income. Capital income incorporates imputed rent of owner-occupied housing and on-third share of mixed-income, which was calculated while estimating labour income. Property income is divided into interest, dividend and rent, for both inflows and outflows. The HIES data provides this

information for property income inflows and outflows, which was used to estimate the required NTA profiles. These values also are available at the household level and are assigned to the household head, which are aggregated by age to get the average value for each age. A simplified scheme of private age reallocations is shown in Box 2 below.

**a. Private Inter-Household Transfer Inflows: Per Capita and Aggregate**

The per capita private transfer inflows are presented in Figure 29 while aggregated values for the inflows can be found in Figure 30. Both figures show that the trend for inflows increases with age before declining for older

ages. The exhibited trends are due to the age pattern of headship found in the data used for the purpose. Since all inflows are allocated to the head, the pattern of inflows by age are primarily reflective of the ages of the household heads in the country.

**Box 2: Private Age Reallocations**

**Private age reallocations** = private transfers + private asset-based reallocations

**I. Private transfers** = inter-household transfers + intra-household transfers

**Inter-household transfers** = inter-household inflows – inter-household outflows

**Intra-household transfers** = intra-household inflows – intra-household outflows

**Net private transfers** = private transfers inflows – private transfers outflows

**II. Private asset-based reallocations** = private capital income + private property income

**Private capital income** = private capital income inflows – private capital income outflows

**Private property income** = private property income inflows – private property income outflows

**Net private asset-based allocations** = private asset-based allocations inflows – private asset-based allocation outflows

**III. Private savings**

**8.1 Private Transfers**

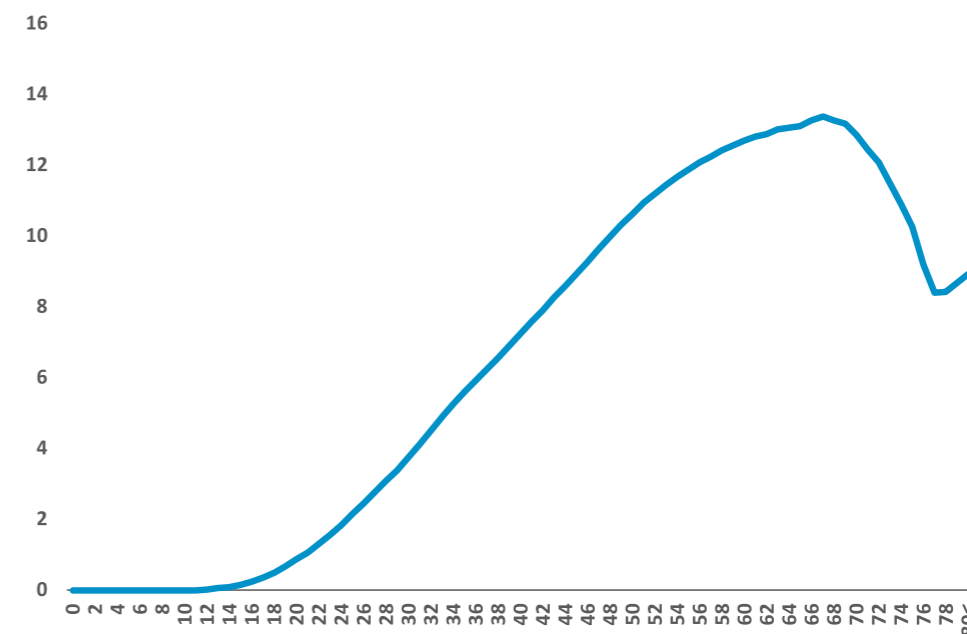
Private transfers are composed of flows between household (inter-household transfers), or transfers between households and rest of the world, and intra-household transfers (transfers within a household). Most of the private transfers flow, i.e. shifting of resources from one party to another, transfers across ages, in this case, are voluntary. Net private transfers are calculated as the difference between private

transfer inflows and private transfer outflows. Private transfer inflows are the sum of private inter- and intra-household inflows. Similarly, private transfer outflows are the sum of private inter- and intra-household outflows.

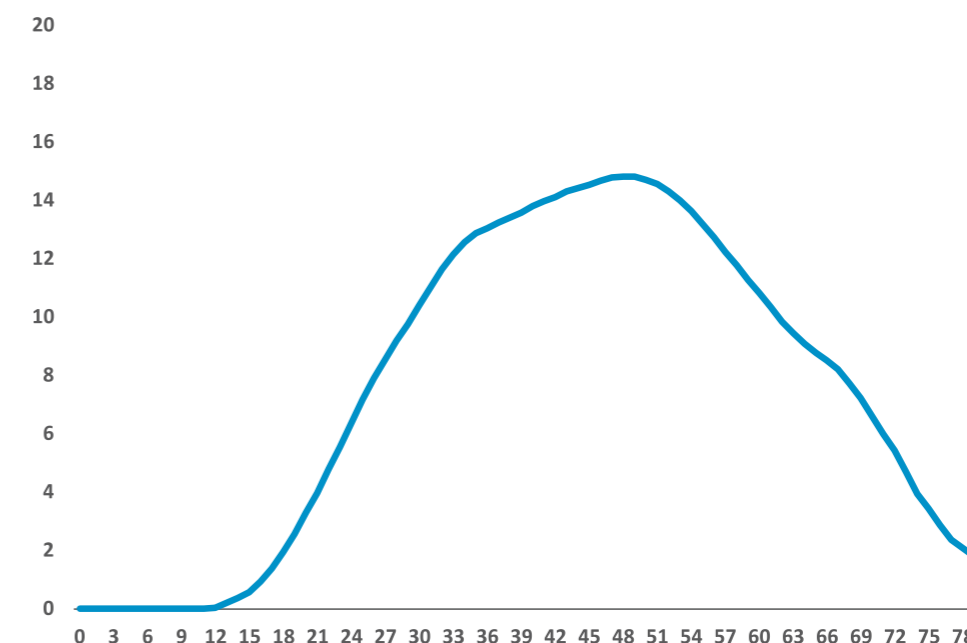
**8.1.1 Private Inter-Household Transfers**

Following the methodology provided by the NTA manual, we start with estimating the private inter-household transfers.

**Figure 29**  
Per Capita Private Inter-Household Transfer Inflows (thousand rupees)



**Figure 30**  
Aggregate Private Inter-Household Transfer Inflows (billion rupees)

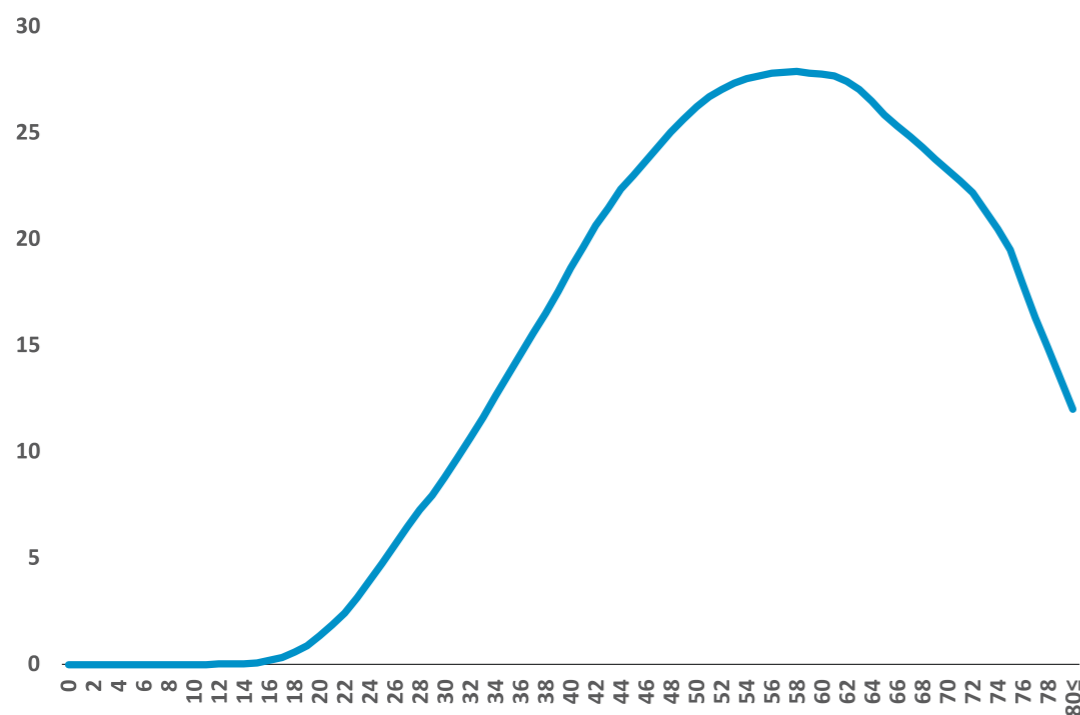


**b. Private Inter-Household Transfer Outflows: Per Capita and Aggregate**

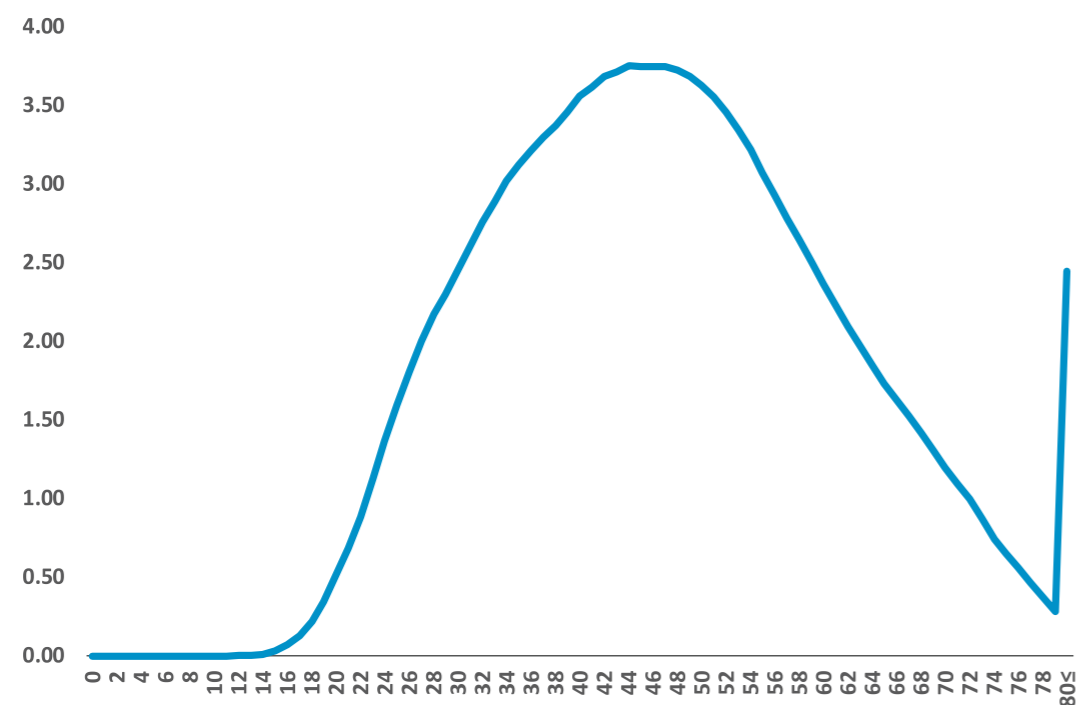
Households do not just receive transfers but also give to other households. Just like inflows, the NTA methodology suggests allocating all the transfers to the head of the household. Figure 31 and 32 present

the per capita and aggregate private inter-household outflows, respectively. The flows, both inflow and outflow, increase with age. The effect of the age of headship of the population has a visible impact on these patterns as well.

**Figure 31**  
Per Capita Private Inter-Household Transfer Outflows (thousand rupees)



**Figure 32**  
Aggregate Private Inter-Household Transfer Outflows (billion rupees)



**8.1.2 Private Intra-Household Transfers**

This is perhaps the most important NTA profile among all because the manner in which it brings out the intergenerational transfers no other profile does. As the name tells, it is the transfers taking place among individuals within the same household. Is it transfers to/older from/to younger or the other way around? This profile gives an answer to that. It is a very complex profile as it includes six other profiles to be constructed. These profiles include:

- i. Labour income;
- ii. Public cash transfers;
- iii. Taxes paid;
- iv. Current consumption;
- v. Net inter-household transfers;
- vi. Owner-occupied housing (discussed in the next section)

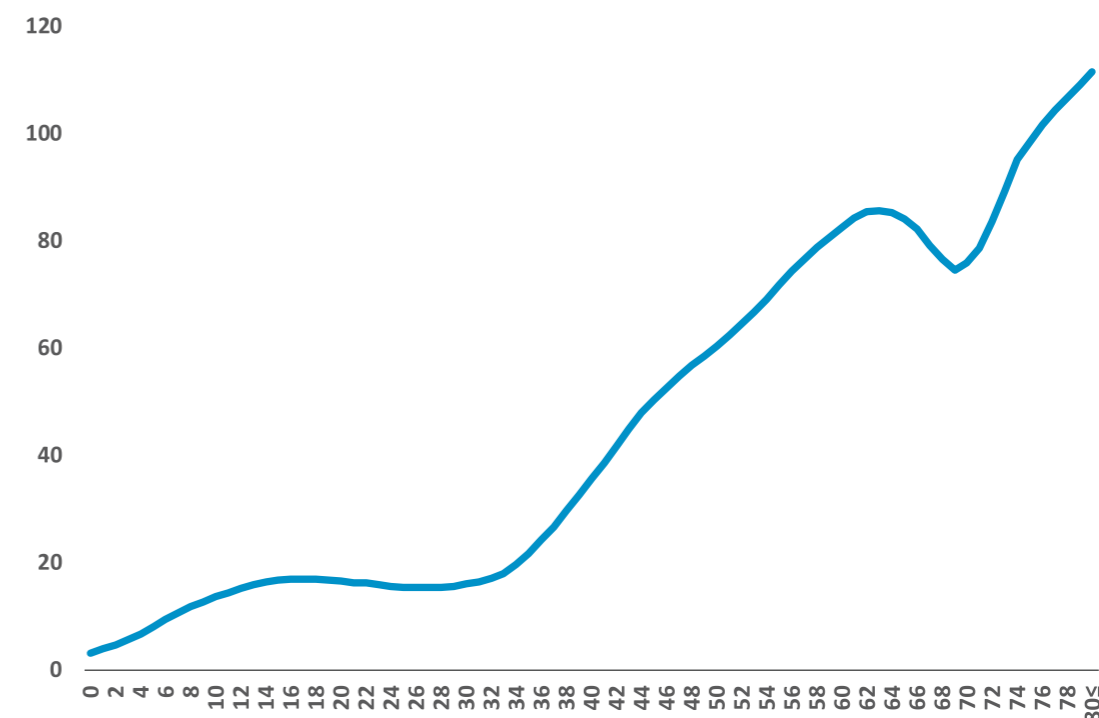
The complete method is not given here as it can be seen from the NTA manual (UN, 2013). In brief, according to the model, members of the household having an income more than their consumption

transfer some of their surplus income to those who have a deficit. If any surplus is still left, it is transferred to the head of the household. Likewise, if some deficit is left even after transferring from members with a surplus to those having a deficit, the head of the household fulfils this gap by dissaving or using asset income. The intra-household inflow and outflow profiles so constructed are aggregated by age, like all other profiles, and smoothed using R statistical package's Supersmoother.

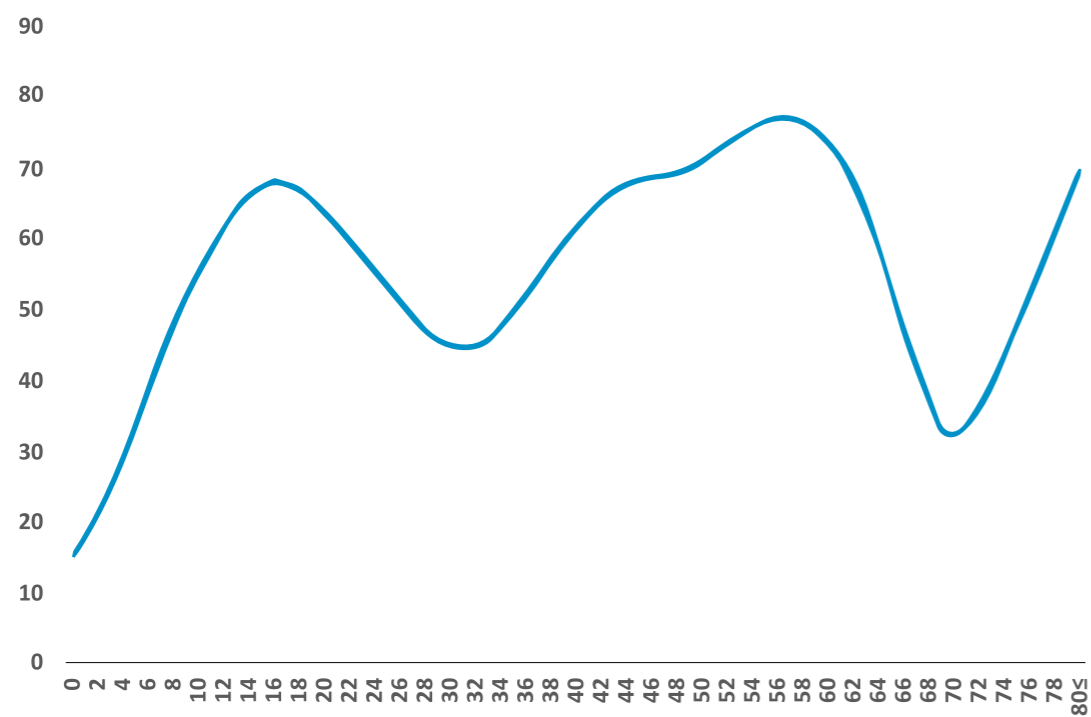
**a. Private Intra-household transfer inflows: Per Capita and Aggregate**

Figure 33 and 34 present intra-household transfer inflows at the per capita and aggregate level, respectively. Trends in both figures show that the inflows generally increase with age. Impact of the age structure of the head of the household is not as strong in this profile as in many other profiles because some of its components are those which are influenced by the head's age while others do not. The inflows are highest for the oldest ages and lowest for the youngest ones. The aggregate profile shows no monotonic trend and the inflows keep fluctuating up and down with age, with the inflows peaking at around age 60 years.

**Figure 33**  
Per Capita Private Intra-Household Transfer Inflows (thousand rupees)



**Figure 34**  
Aggregate Private Intra-Household Transfer Inflows (billion rupees)

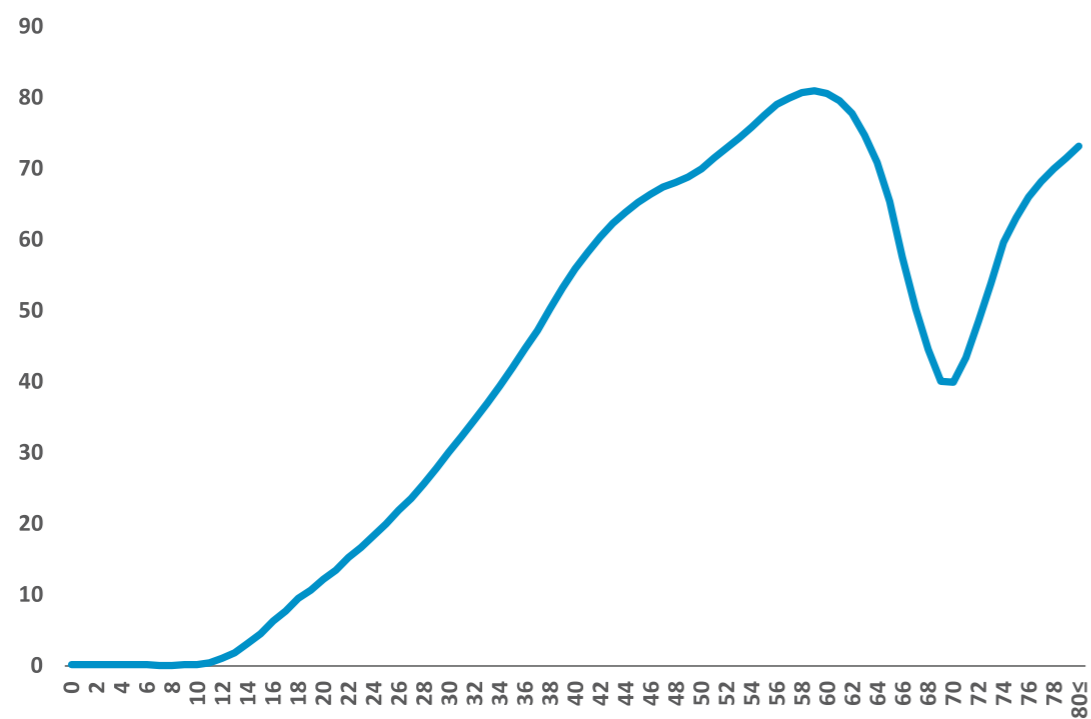


**b. Private Intra-household transfer outflows: Per Capita and Aggregate**

The per capita private intra-households transfer outflows almost shadow the trend found for the

inflows but with a different magnitude. The outflows continue to increase with age peaking at 60 years when it starts to decline only to rise again (Figure 35).

**Figure 35**  
Per Capita Private Intra-Household Transfer Outflows (thousand rupees)



**Figure 36**  
Aggregate Private Intra-Household Transfer Outflows (billion rupees)

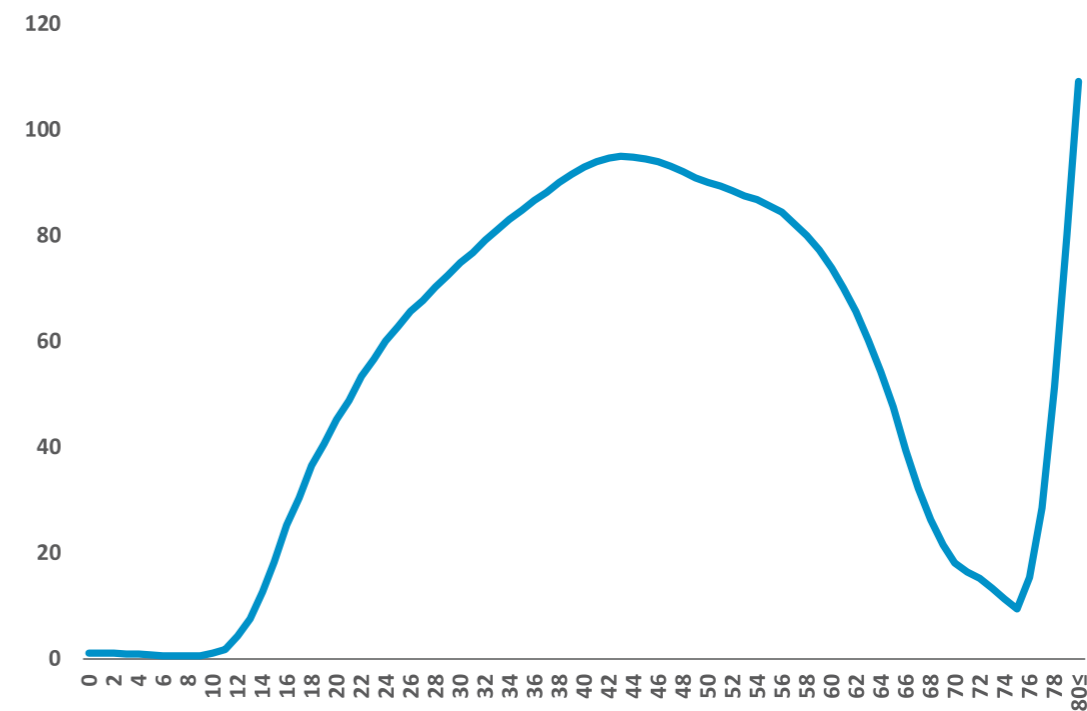


Figure 36 presents the aggregated private intra-household transfer outflows and we see an inverted-U trend. The outflows increase with age, peaking at the 40s and declining after that. The spike for the oldest age group, 80 and above, as mentioned earlier as well, is because of the clubbing of ages.

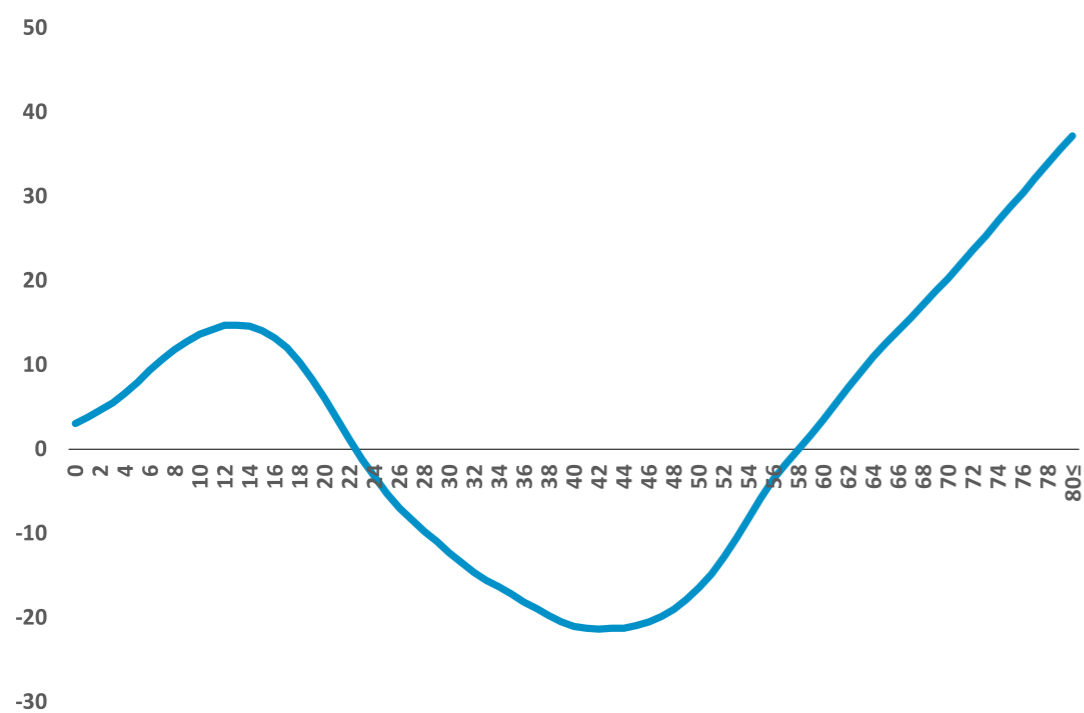
**c. Net Private Intra-Household Transfers: Per Capita and Aggregate**

More than looking at the inflow and outflow trends separately, an estimate of the net transfers gives more context to what we are interested to look at, i.e. the transfers between ages. Figures 37 and 38 present the estimates for net per capita and aggregate private intra-household transfers, respectively. As expected,

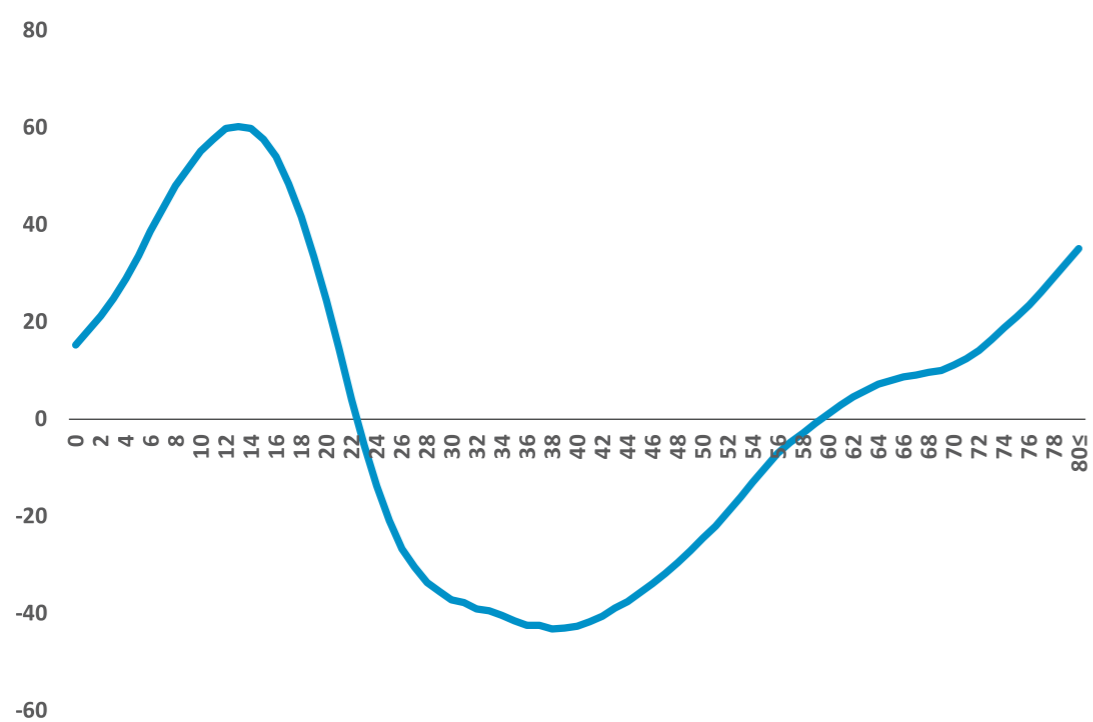
the net flows are from the working ages to the non-working ages. The net inflows begin to increase with age till early teens and by mid 20s outflows surpass inflows (Figure 37). The outflows continue to be higher than inflows till the age of 57 years before the trend reverses. This trend is in conformity with the notion of the demographic dividend (Mason, 2007; Lee, 1994; Lee and Mason, 2011).

The aggregate net private intra-household transfers too show the same trend, and the net flow is highest for the younger ages at around 10-12 years of age. The net aggregate flow reverses in the early 20s nearly until the age of 60 (Figure 38).

**Figure 37**  
Per Capita Net Private Intra-Household Transfers (thousand rupees)



**Figure 38**  
Aggregate Net Private Intra-Household Transfers (billion rupees)



## 8.2 Private Asset-Based Reallocations

In NTA, private asset-based reallocations are defined as private asset income less private saving. Private asset-based reallocations, asset income, and saving, along with private transfers, are economic mechanisms to shift economic resources across ages. People at a younger age may generate resources by acquiring debt. On the other hand, prime-age working adults may save to buy a house, to pay for the education of their children, or to fund their retirement. Older adults may depend on pensions and, or, personal savings to live through their post-retirement life. Asset-based reallocations, a basic feature of the life-cycle, helps explain why labour income and consumption at any age do not follow the same path (UN, 2013; p. 137). With a large informal sector and a quasi-traditional society, as expressed in the living arrangements, private asset-based reallocations are of extra importance and in many cases different from what we might see in many countries.

### 8.2.1 Private Asset Income

The components of private asset income are private capital income and private property income, which are discussed below.

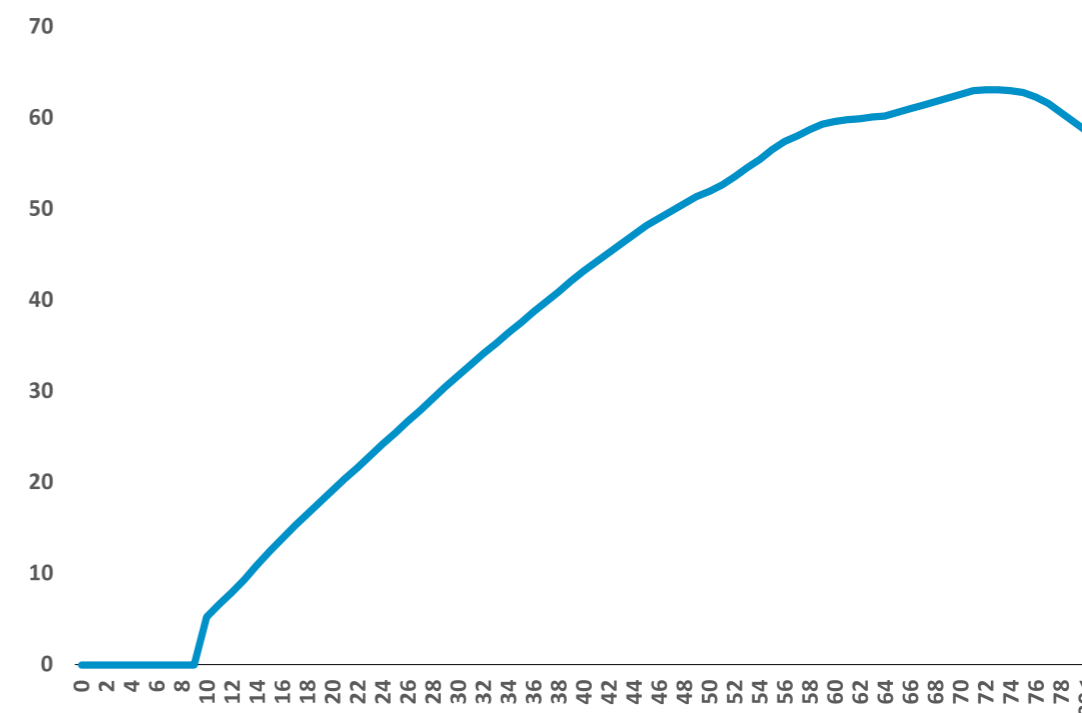
#### I. Private Capital Income

##### a. Private Capital Income: Per Capita and Aggregate

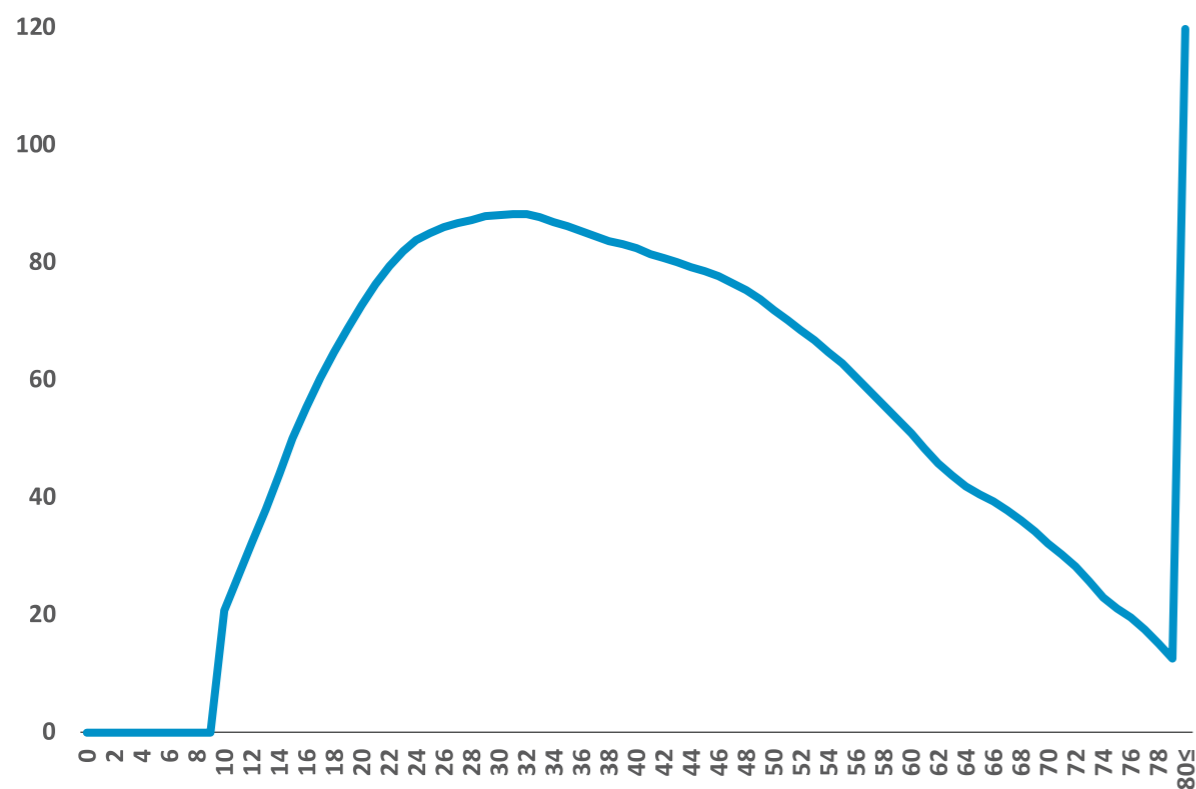
Private capital income includes the capital income of corporations (financial and non-financial), capital from owner-occupied housing, and capital income from mixed-income. Mixed-income is that income from household owned enterprises that cannot be unambiguously attributed either to labour inputs or to capital inputs. The National Accounts figure used to calculate the macro control for capital income is the gross operating surplus of the private sector less consumption of fixed capital.

Figures 39 and 40 present the private capital income corporations at per capita and aggregate levels, respectively. The capital income is zero for ages up to 9 and positive for ages 10 and above. The private capital income increases from ages 10 onward and reaches a peak at the age of 73. Since the ages 80 and above have been lumped together in estimating NTA for Pakistan, the private capital income would otherwise be lower for individuals aged 80 and above (Figure 40).

**Figure 39**  
Per Capita Private Capital Income (thousand rupees)



**Figure 40**  
Aggregate Private Capital Income (billion rupees)



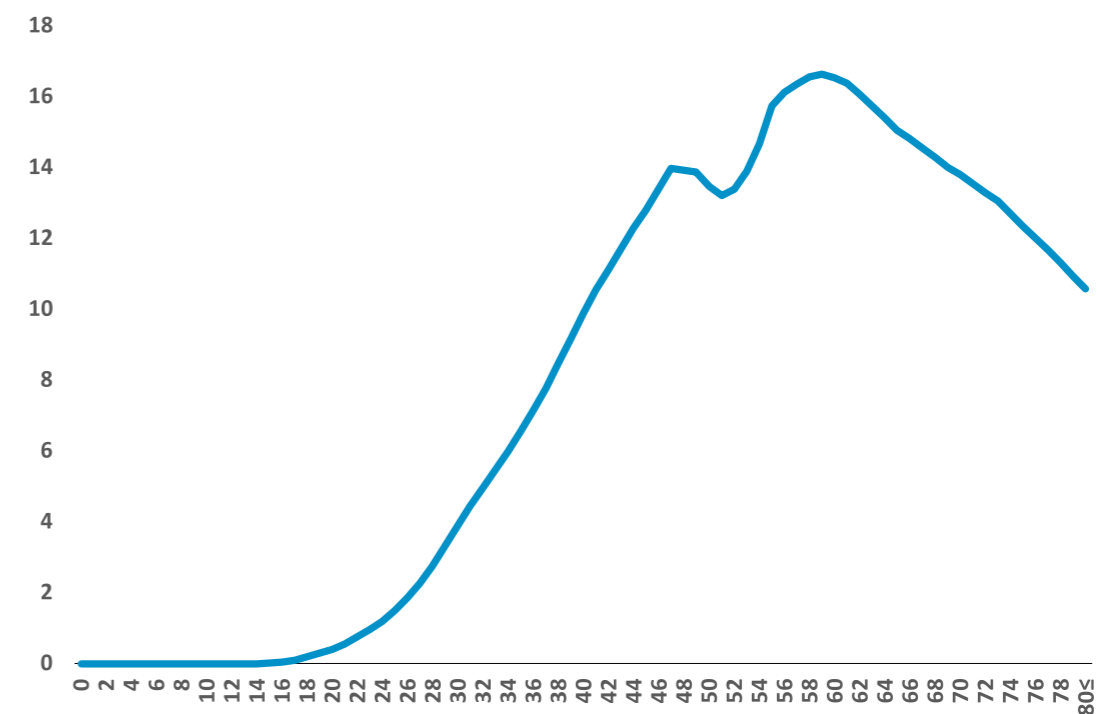
**b. Private Capital Income- Owner-Occupied Housing: Per Capita and Aggregate**

Owner-occupied housing is not an actual expenditure rather the value of the flow of housing services to those who own the house. Value is imputed for such occupied houses by gauging the value it would have in the market if rented. The HIES dataset has this information that was used to build this profile. Owner-occupied housing can be conceptualised as imputed rent that the households pay to themselves of the housing that they own. Therefore, the income from the owner-occupied housing is treated as capital income that accrues to the households from the operation of the rental business. Put differently, it is the income that the occupiers of the owned housing would have received had they rented out their houses. The aggregate figure for capital income from owner-

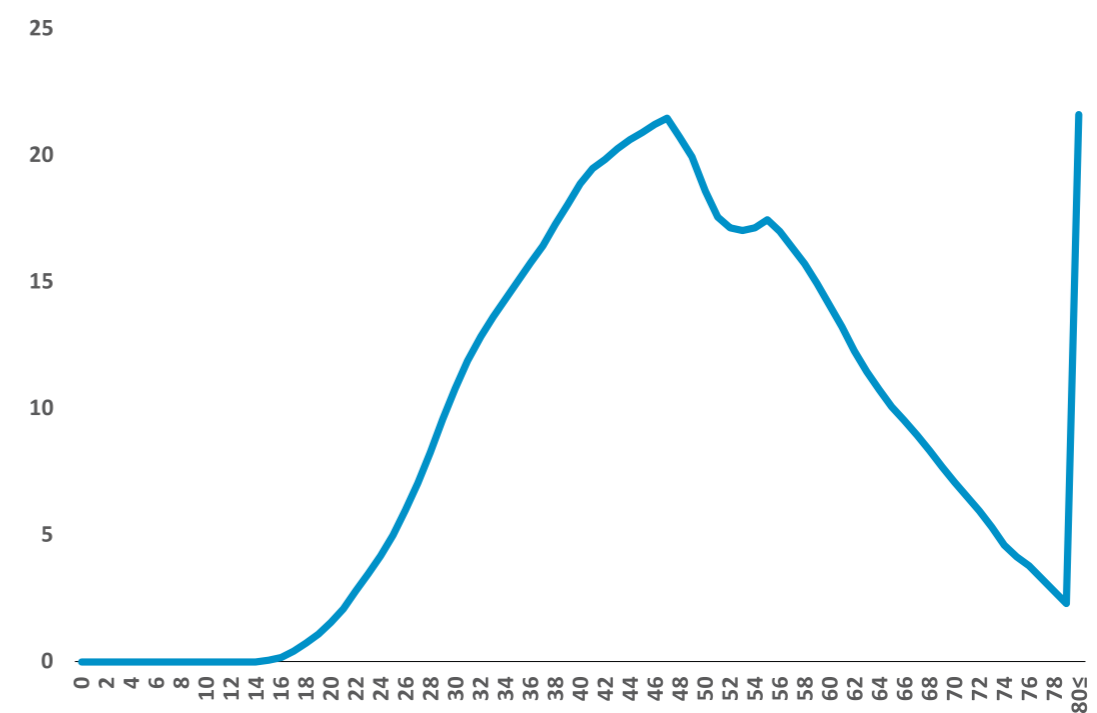
occupied is derived by subtracting the consumption of fixed capital from the gross operating surplus of households. Per capita and aggregate age profiles of owner-occupied housing are presented in Figures 41 and 42, respectively.

Figures 41 and 42 show that the capital income from owner-occupied housing increases with age. The effect of the age of the head of the household is visible in this profile as well because capital income from the owner-occupied housing is allocated to the household's head. Figure 41 shows the capital income from owner-occupied housing peaks near the age of 60 before declining. The aggregate capital income from owner-occupied housing shows the value peaking near the age of 50 years and then monotonically declining (Figure 42).

**Figure 41**  
Per Capita Owner-Occupied Housing Capital Income (thousand rupees)



**Figure 42**  
Aggregate Owner-Occupied Housing Capital Income (billion rupees)





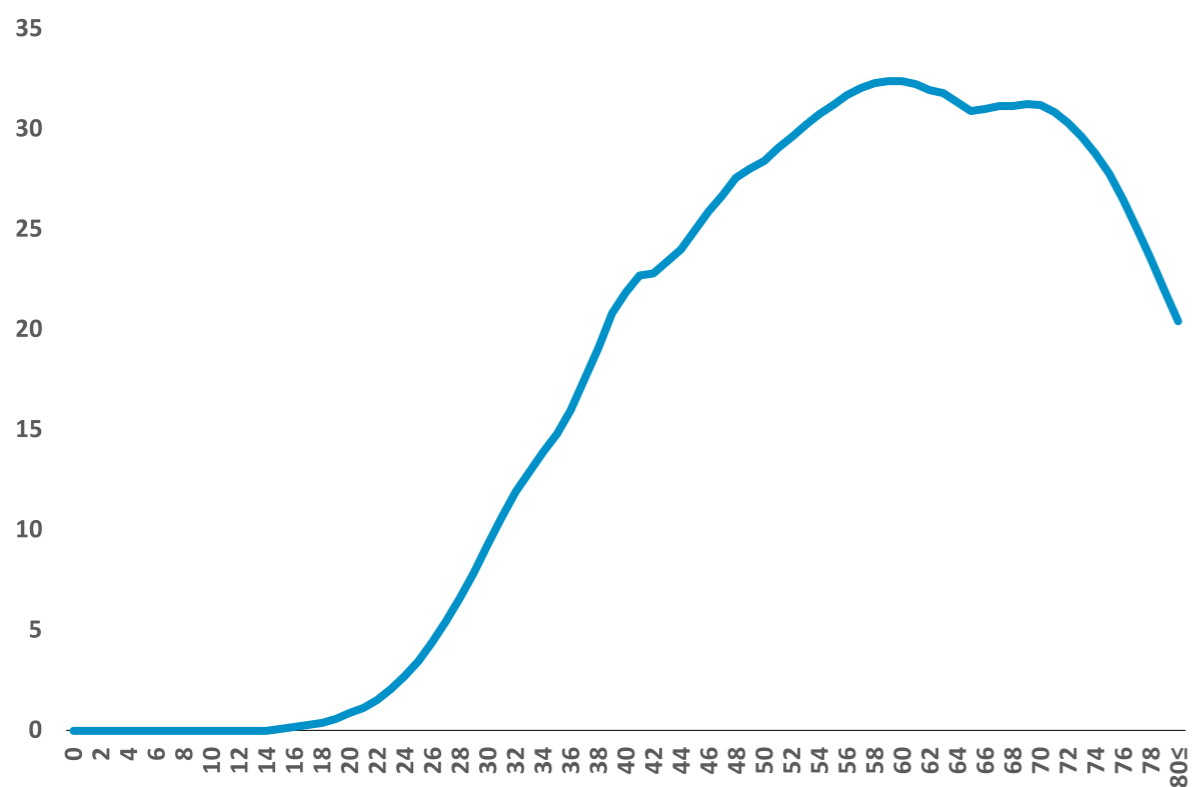
## II. Private Property Income

Net private property income is calculated as private property income inflows less private property income outflows. The private property income inflows are composed of receipts of private interest, private royalties, private rent, and private dividends by the private sector. On the other hand, private property outflows, are payments on accounts of interests, royalties, rent, and dividends. The aggregate-level figures for calculating the macro control to estimate private property income are property income receivables by the private sector.

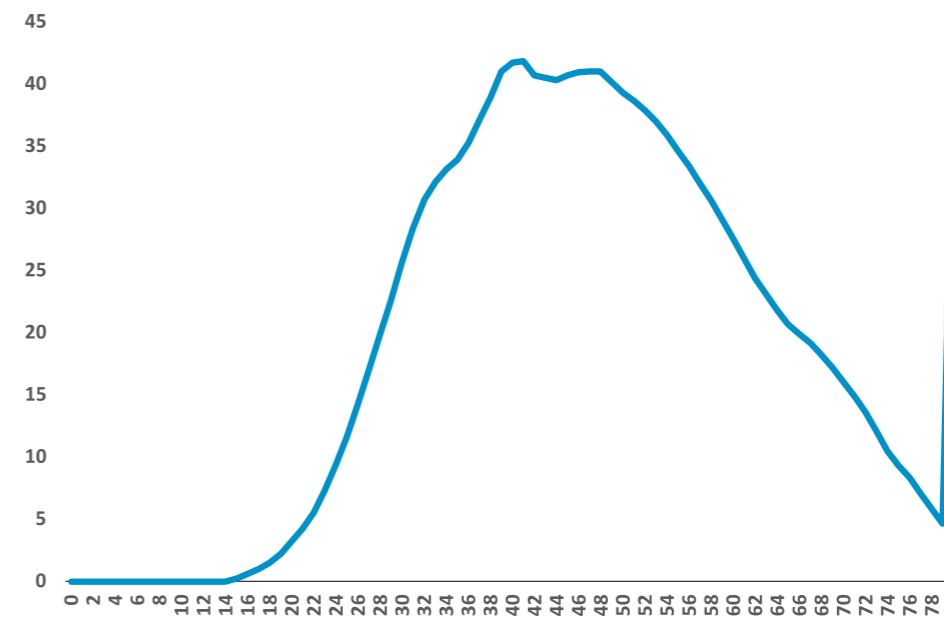
### a. Private Property Income Inflows: Per capita and Aggregate

Figure 43 presents the per capita age profile of private property income inflows. The private property income inflows rise with age and hit the peak at the age of 59 before declining from the age of 60 onwards. The aggregate estimate for the private property income inflows shows a similar trend with the inflows peaking at the early 40s (see Figure 44). The profiles are greatly impacted by the age structure of the head of the households along with the age structure of the total population. That is the reason why the shape of the aggregate age profile is similar to that of per capita age profile. The difference in peak is due to the aggregation, as is the case with other aggregate age profiles.

**Figure 43**  
Per Capita Private Property Income Inflows (thousand rupees)



**Figure 44**  
Aggregate Private Property Income Inflows (billion rupees)



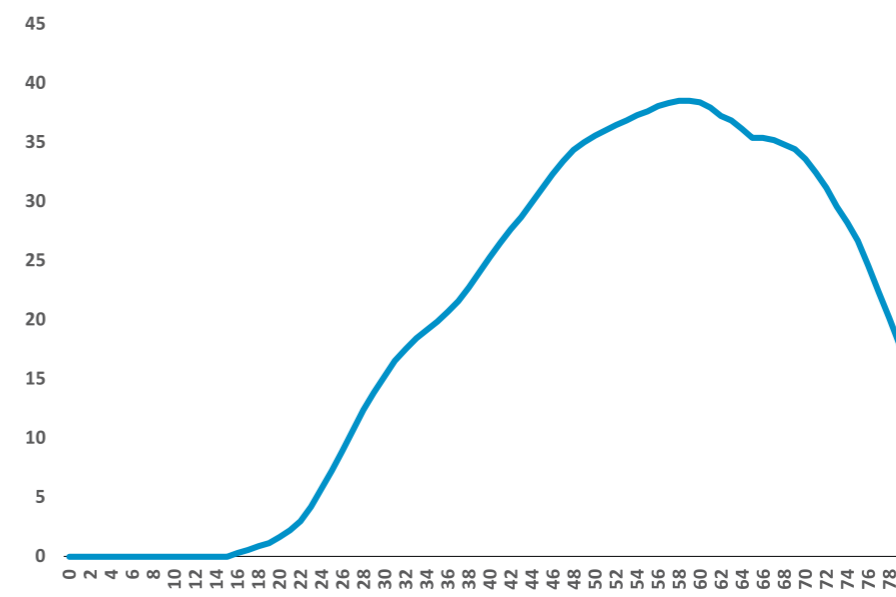
### b. Private Property Income Outflows: Per capita and Aggregate

The age profiles of per capita and aggregate private property income outflows are given in figures 45 and 46, respectively. The National Accounts counterpart for the private property income outflows is the property income of the private sector, including corporations and households. This value of the property income is used as the macro control to estimate per capita

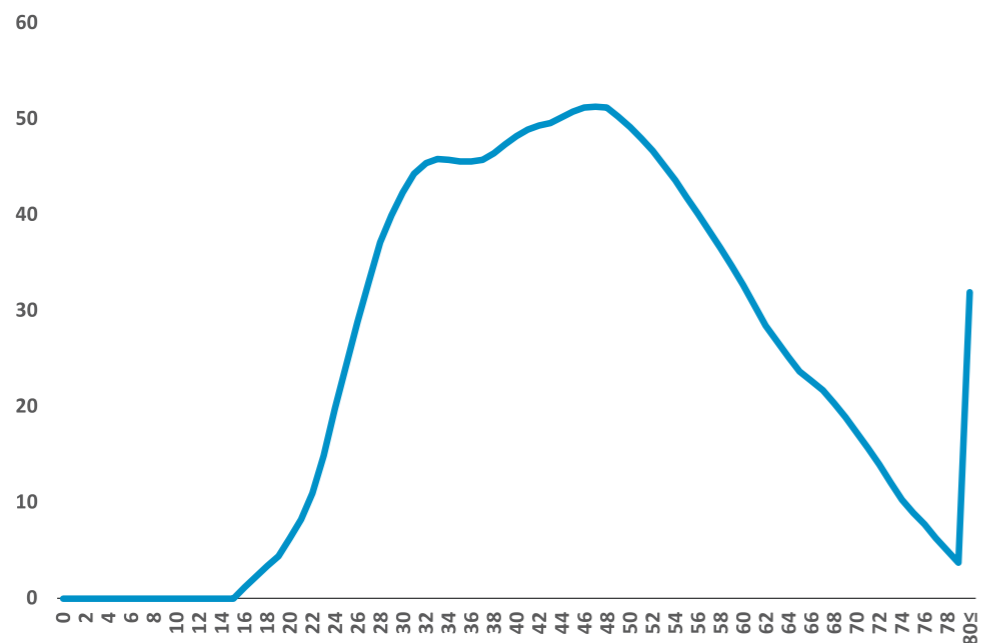
and aggregate age profiles of private property income outflows derived from micro datasets, HIES in this case.

As can be seen from figures 45 and 46, the private property income outflows rise with age till the age working ages and decline thereafter. Also, worth noting is the similarity in the shapes of private property income inflows with that of outflows. The difference lies in the amount being given and received by age each.

**Figure 45**  
Per Capita Private Property Income Outflows (thousand rupees)



**Figure 46**  
Aggregate Private Property Income Outflows (billion rupees)

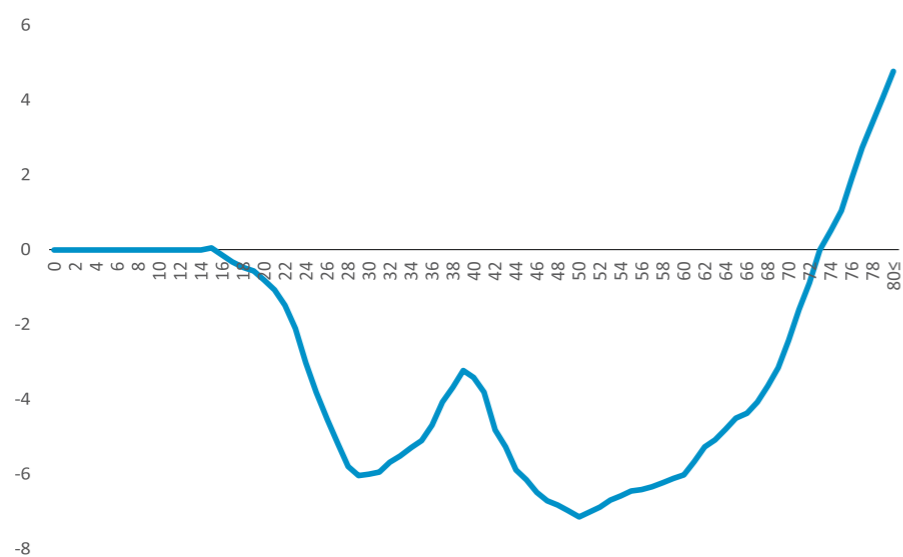


**c. Net Private Property Income Flow: Per Capita and Aggregate**

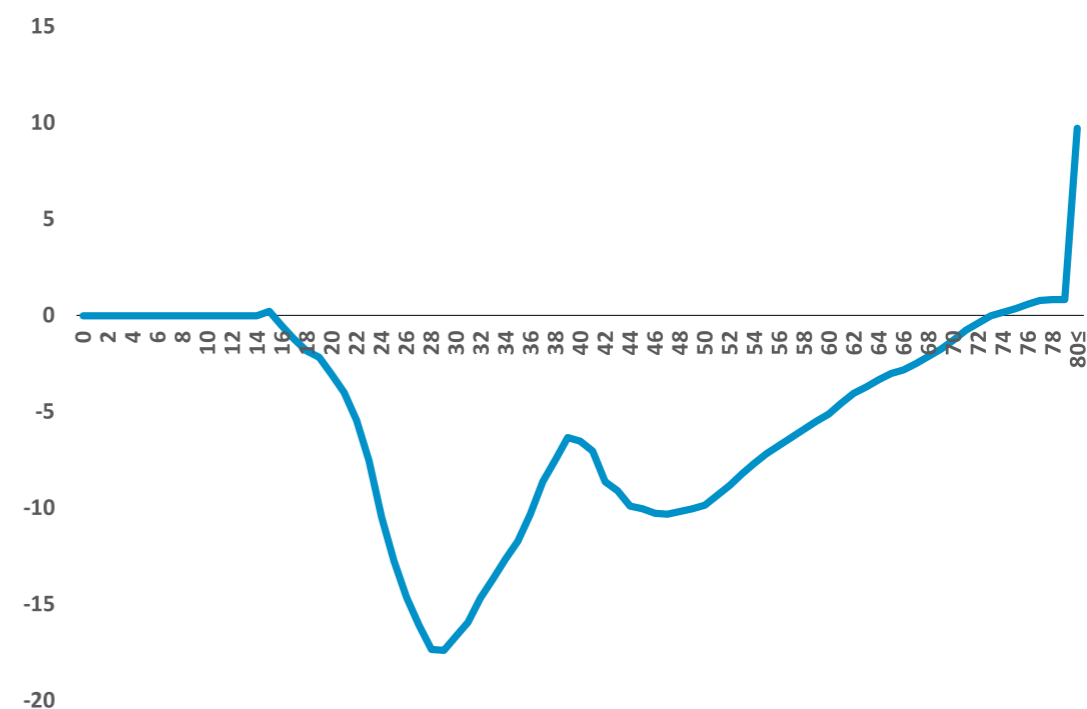
As discussed above, private property income is net of inflows and outflows. Private property income arises as one party pays for the use of an asset owned by another party. Figures 47 and 48 present the net per capita and aggregate age profiles of private property income. We can see from both the figures that inflows are in excess of outflows for those aged under 14 years and above 72 years. Again, it is those

in the working ages who are giving more than they are receiving (see Figure 47). Almost a similar trend is shown by the aggregate account where also the outflows exceed inflows for the working ages and otherwise for the other two age groups, namely the young and the elderly (see Figure 48). The whole idea demographic dividend, linked with the demographic transition and resulting changes in age structure, seems to be working in profiles constructed during this study.

**Figure 47**  
Net Per Capita Private Property Income Flow (thousand rupees)



**Figure 48**  
Net Aggregate Private Property Income Flows (billion rupees)



**8.3 Private Savings**

Estimating private savings is the final step in constructing the private age reallocations account. Private saving is the final balancing item in the NTA, and the age profiles of private savings are constructed directly from other age profiles already calculated. The summary of calculating private saving is:

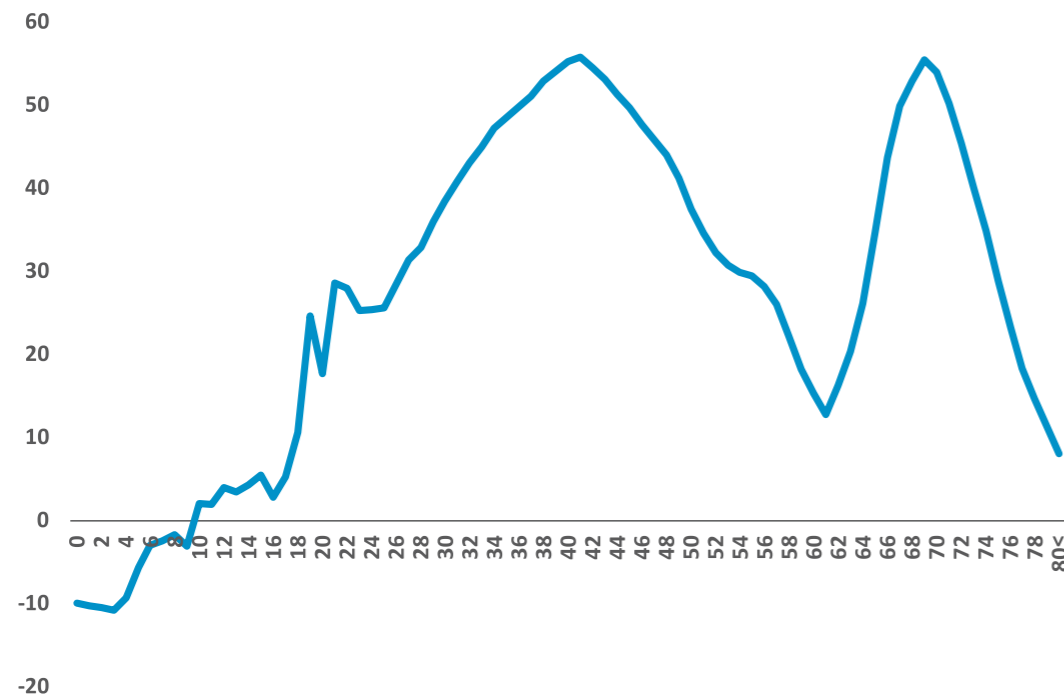
$$= \text{public age reallocations} + \text{private transfers} + \text{private asset income} - \text{life-cycle deficit}$$

Figures 49 and 50 present per capita and aggregate private savings. As one would expect, private savings are negative during the earlier ages and positive after

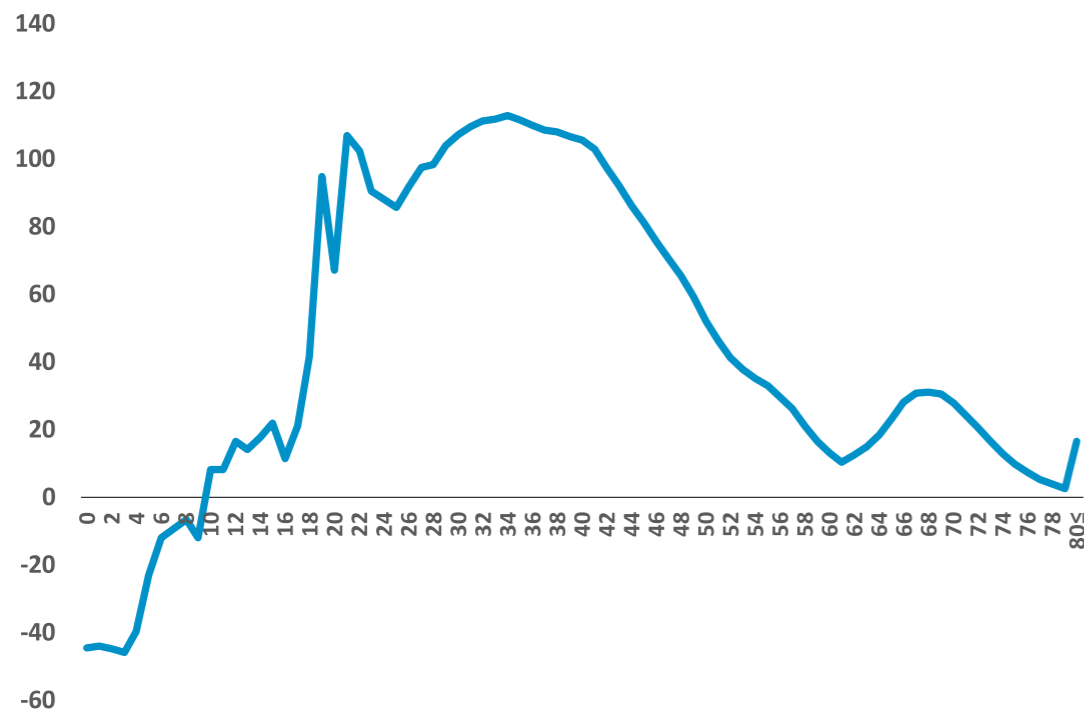
10 years of age, reaching their highest level during the prime working ages. It is worth noting that private savings are positive even for older ages contrary to the trend found in most of the countries where savings are negative at both early and older ages. Reasons for this probably lies in, as discussed earlier in several places, the way all profiles associated with assets, property, and capital are linked with the head of the household. Contrary to many, if not most, countries, head of the household in Pakistan can be someone old who is considered the head more out of respect than any economic reasons. The older ages, thus, have savings although they are not substantial either in per capita or in aggregate terms (see Figures 49 and 50).



**Figure 49**  
Per Capita Private Savings (thousand rupees)



**Figure 50**  
Aggregate Private Savings (billion rupees)



# 9 PUBLIC AGE REALLOCATIONS

Public age reallocations are the flow of current resources across age that is mediated by the government (UN, 2013). Public age reallocations are composed of two economic mechanisms, namely public transfers and public asset-based reallocations, that can be used to shift resources across age. A basic structure of public age reallocations is shown in Box 3.

CONTENTS

- 9.1 Public Transfers
  - 9.1.1 Public Transfer Inflows: Per Capita and Aggregate
  - 9.1.2 Public Transfer Outflows: Per Capita and Aggregate
  - 9.1.3 Public Transfers: Per capita and Aggregate
- 9.2 Public Asset-Based Reallocations
  - 9.2.1 Public Property Income
  - 9.2.2 Public Asset Income: Per Capita and Aggregate
  - 9.2.3 Public Savings

### Box 3: Public Age Reallocations

**Public age reallocations** = public transfers + public asset-based reallocations

**I. Public transfers** = public transfers in-kind + public transfer in cash

**Public transfer inflows** = public transfers in-kind, inflow + public transfers in cash, inflow

**Public transfer outflows** = taxes and other revenues – trade deficit (+)/surplus (-)

**II. Public asset-based reallocations** = public asset-income – public saving

**Public asset-income** = public operating surplus + public property income

**III. Public Saving**

## 9.1 Public Transfers

In NTA, public transfers are referred to as transfers between the public and the private sector, or transfers between the public sector and the rest of the world. These are the transfers that flow from working-age adults, who pay taxes, to the ages in which beneficiaries are concentrated, often children and the elderly, to fund the life-cycle deficit. Public transfers, or net public transfers, are equal to public transfer inflows less public transfer outflows, including public transfer to and from the rest of the world.

Public transfer inflows<sup>2</sup> are the flows received by the beneficiaries of all public programmes. These inflows are of two types: in-kind and cash. For example, public schooling is an in-kind transfer whereas a cash scholarship paid directly to the recipient is a cash transfer. Publicly provided health care, and collective goods and services, including government administration, public safety, and national defence are other examples of in-kind public transfer inflows. In general, therefore, in-kind public transfer inflows are goods and services that are directly provided by government agencies. The in-kind public transfer

inflows are equal to the total public consumption adjusted to exclude taxes minus subsidies, as explained in the NTA manual (UN, 2013; p85). On the other hand, goods and services purchased with the benefit of a publicly provided cash subsidy are cash public transfer inflows.

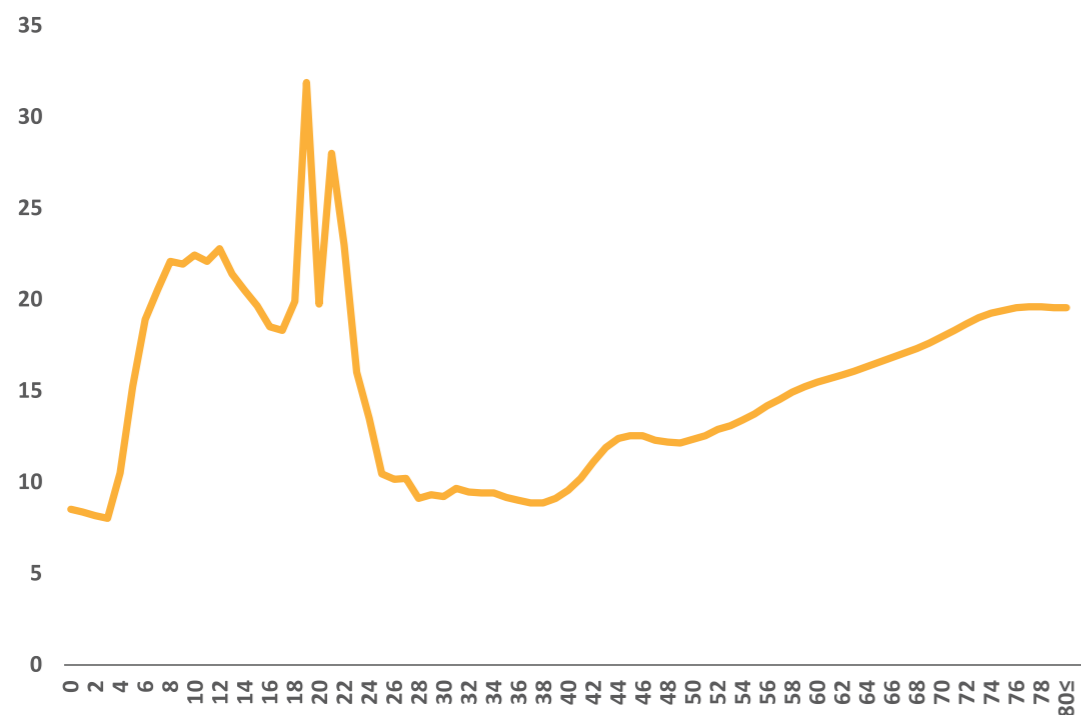
### 9.1.1 Public Transfer Inflows: Per Capita and Aggregate

As mentioned in Box 3, public transfer inflows include inflows in cash and in-kind and, we deal with both separately below.

#### a. Public Transfer Inflows, in-Kind

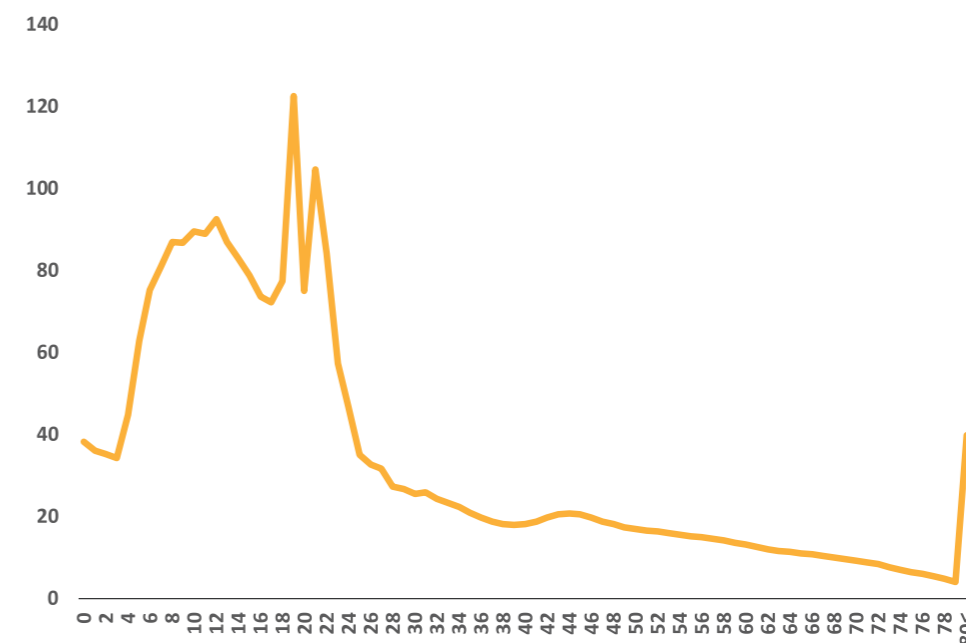
Public transfer inflows in-kind are equal to total public consumption, the age profiles (per capita and aggregate) of public transfer inflows are the same as the age profiles of total public consumption, including education, health, and other consumption. Figures 51 and 52 presents the estimates for per capita and aggregate public transfers in kind. Public inflows in kind are highest during certain years of adolescence (18-24 years) before declining and then rising again for the older ages (see Figure 51). The trend is reflected in the aggregate profile as well (Figure 52).

**Figure 51**  
Per Capita Public Transfer Inflows, In-Kind (thousand rupees)



<sup>2</sup> According to the NTA manual, public transfer inflows are the same as public consumption, including public consumption profiles of education, health, and other consumption discussed earlier. Some countries report the same as public transfer inflows but in the current exercise we are following the precedence of those studies that differentiate public transfers in cash and kind, for both inflows and outflows.

**Figure 52**  
Aggregate Public Transfer Inflows, In-Kind (billion rupees)

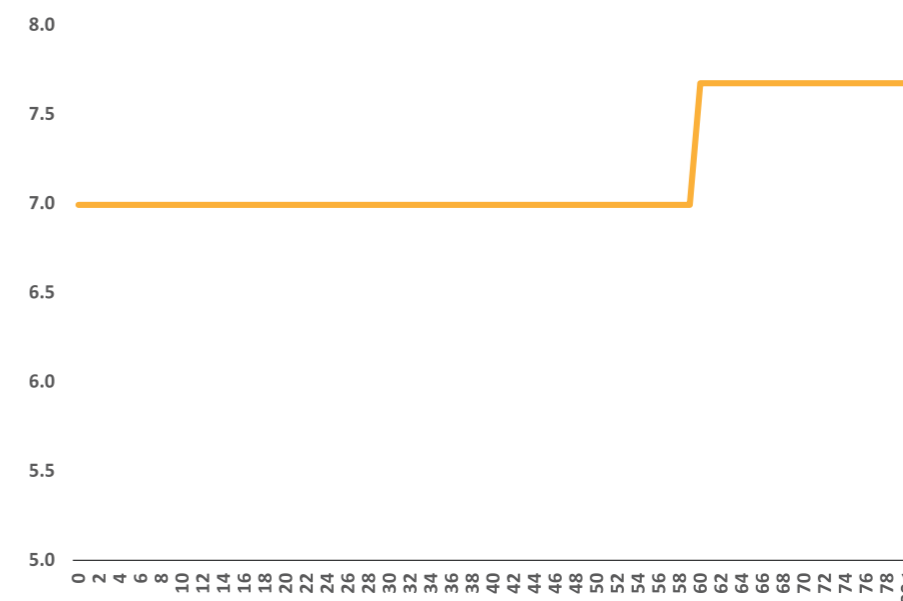


#### b. Public Transfer Inflows, Cash

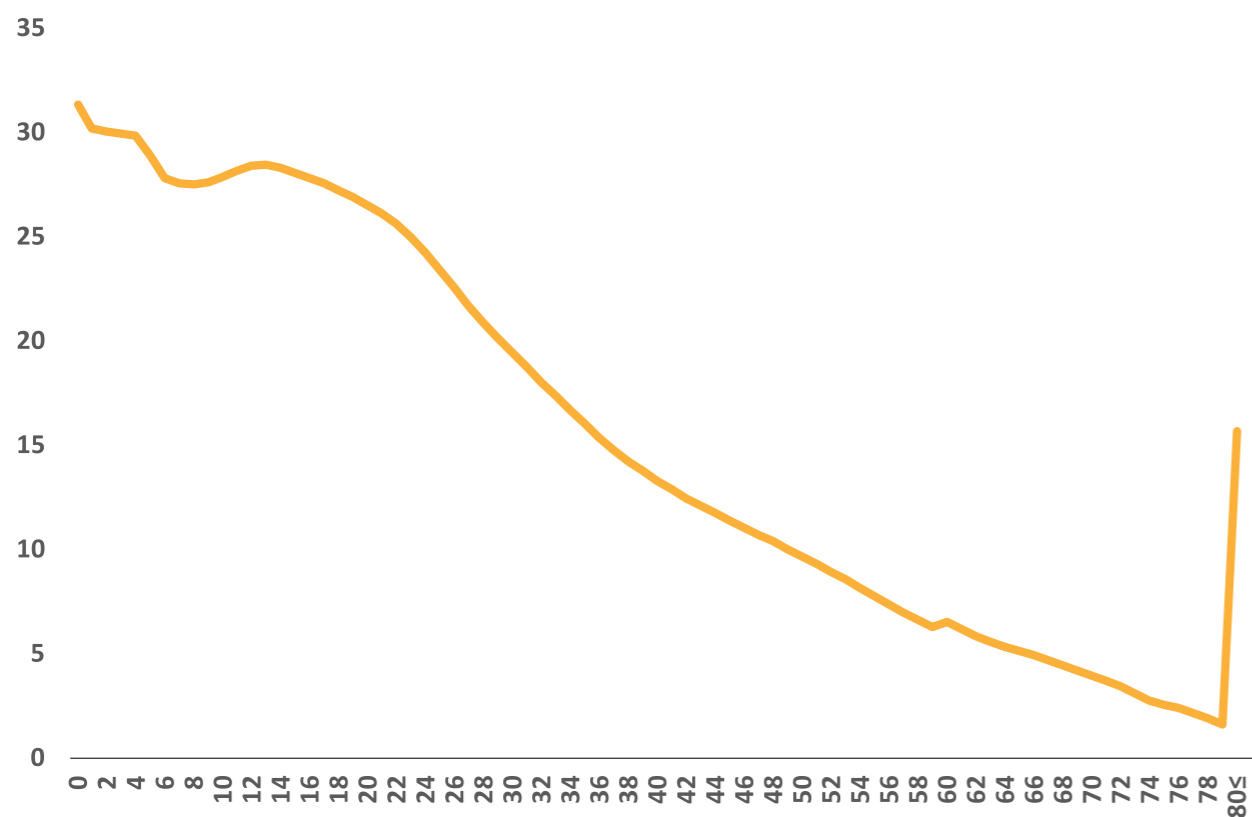
In the case of Pakistan, cash transfer inflows are taking place in various forms that were included in the calculation of this profile. These include social security payments, subsidies, Bait-ul-Maal, and Benazir Income Support Programme (BISP). Figure 53 provides the per capita age profile of public transfer inflows that are paid in cash, while Figure 30 presents the aggregate cash public transfer inflows.

Many of the public transfer inflows in cash are equally divided among the household members, depending upon the nature of the cash transfer, and for that reason, the shape of the per capita age profile can appear to be an almost straight line (Figure 53). On the other hand, the aggregate age profile of the cash transfer inflows mimics the shape of the population age structure used in calculating the profiles.

**Figure 53**  
Per Capita Public Transfer Inflows, Cash (thousand rupees)



**Figure 54**  
Aggregate Public Transfer Inflows, Cash (billion rupees)



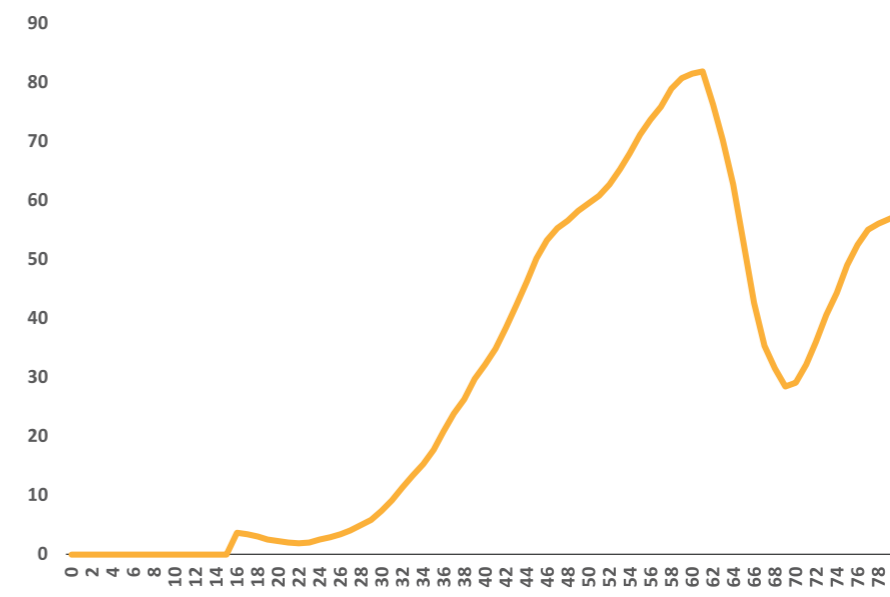
**9.1.2 Public Transfer Outflows: Per Capita and Aggregate**

Government funds many public programmes, such as education and health, which are classified as, from the perspective of individuals in the NTA, public transfer inflows, discussed above. In the NTA, public transfer inflows and outflows are based on the principle that benefits received by one group of individuals must be paid by another group of individuals (UN, 2013; p114). Therefore, public transfer inflows, both in-kind and cash, are funded by public transfer outflows, which include taxes, other public revenues, and social contributions. In the calculation of age profiles of public transfer outflows in NTA, all taxes excluding subsidies are classified as public transfer outflows.

**a. Public Transfer outflows: Taxes and Revenues**

As can be seen from Figure 55, the burden of funding public transfer outflows falls predominantly on the ages that are economically active. What is interesting to note in the figure is that the public transfer outflows rise sharply around after the age of 25 and continue rising until the later working ages, around 57 years of age. The outflows fall sharply thereafter. The reason for outflows to continue rising even at older ages is that contributions and other current transfers, which are included in the calculation of public transfer outflows, besides taxes, are attributed to household heads who can be of older ages in Pakistan due to reasons elaborated earlier.

**Figure 55**  
Per Capita Transfer Outflows: Taxes and Revenues (thousand rupees)



**Figure 56**  
Aggregate Public Transfer Outflows: Taxes and Revenues (billion rupees)

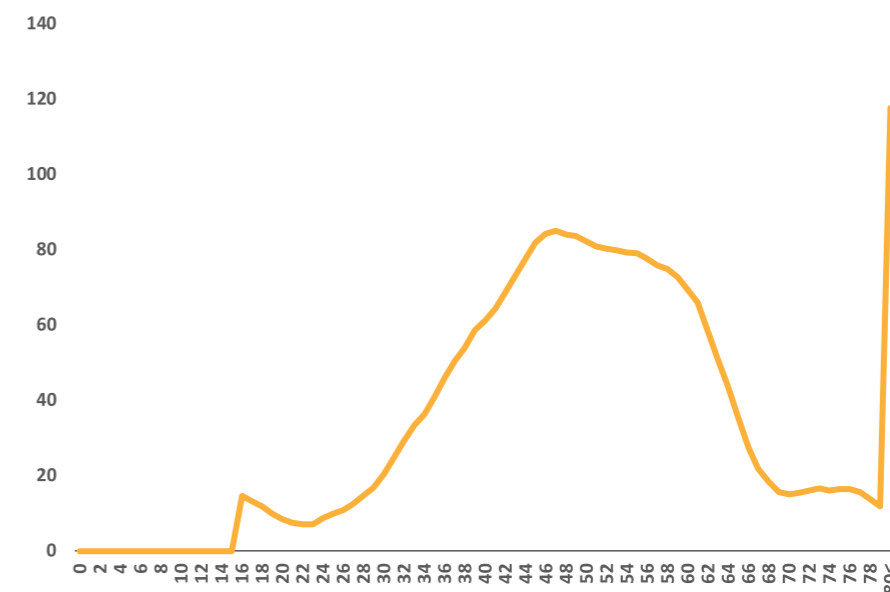


Figure 56 presents the aggregate estimate of the public transfers outflows in cash. The pattern exhibited is according to the convention, with working ages having higher tax outflows, but the spike for the older ages

does appear counterintuitive. Along with clubbing of 20 years in one age category (ages 80 to 99 in the survey data), the only other explanation is of a substantial proportion being head of the household<sup>3</sup>.

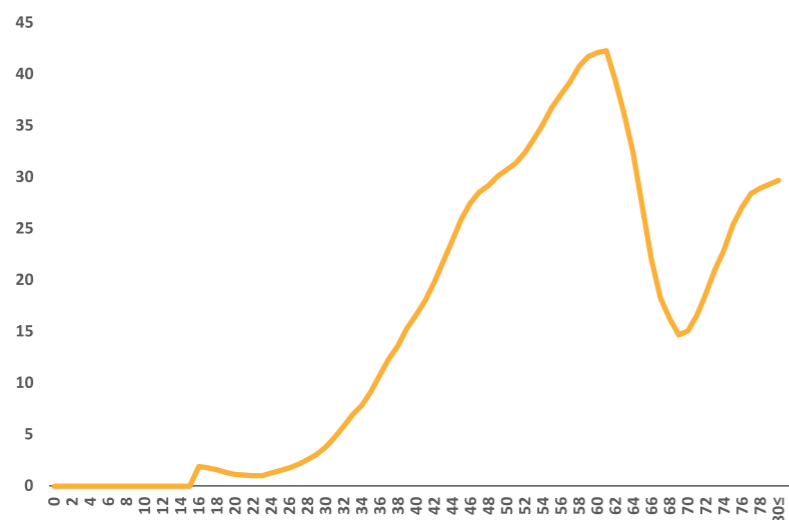
<sup>3</sup> In order to ascertain this assumption data were analysed to investigate ages of the head of the household. More than 10% of the heads were above 65 years of age, and the average age of the head of the household was over 46 years, which is quite high for a population with a life expectancy of 66 years. For the sake of comparison, USA that has a life expectancy of 79 years has a mean age of head of household at 49 years. In Pakistan, relatively speaking, age of the head of the household is somewhat skewed towards older ages.

**b. Public Transfer Outflows: Transfer Deficit (+)/ Surplus (-)**

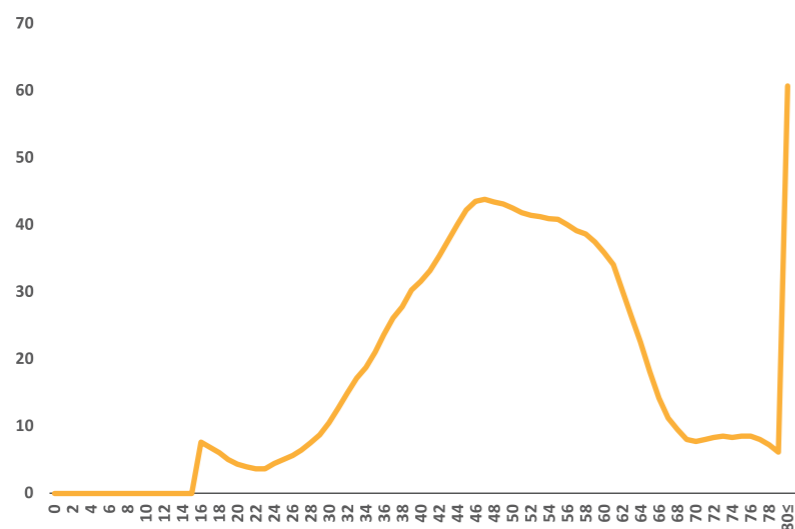
An important feature of public transfers is the transfer deficit (+)/surplus (-). It is a balancing item that measures the shortfall or surplus of public revenues relative to public transfers inflows. This variable embodies the principle that transfer outflows and

transfer inflows must be equal. Transfers received by one group of individuals must be paid by another group of individuals. The obligation to pay may be met through taxes but taxes may not be sufficient. In this case, the transfer deficit embodies the implicit taxes that must be borne in some other form by taxpayers (UN, 2013; p. 114).

**Figure 57**  
Per Capita Public Transfer Deficit/Surplus (thousand rupees)



**Figure 58**  
Aggregate Public Transfer Deficit/Surplus (billion rupees)



The per capita and aggregate age profiles of transfer deficit/surplus are presented in Figure 57 and Figure 58, respectively. The age profiles of transfer deficit/surplus are positive for all the ages. This implies that the tax revenues collected from the private sector including households and other entities are insufficient to fund public services, projects, and

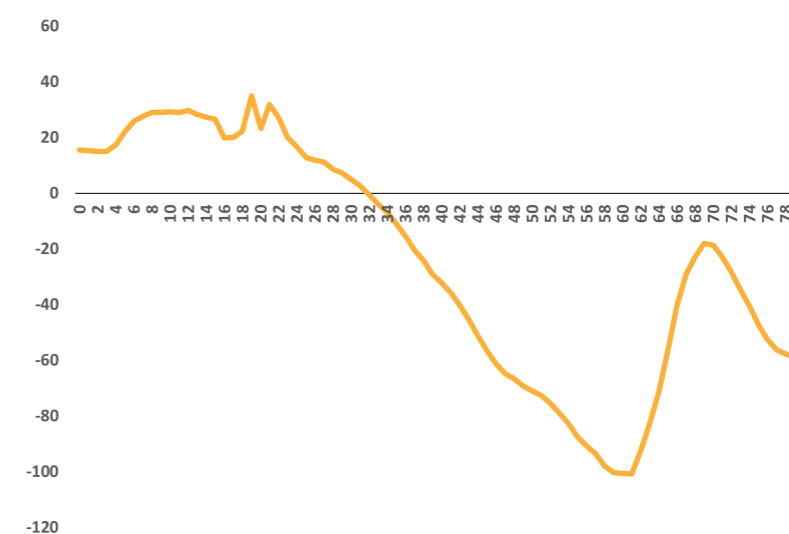
transfers to the general public. This trend is exhibited by all countries having a budget deficit, as can be seen from the NTA accounts of various countries present on the dedicated website (NTA, 2019), and also by the Australian estimates (Rice, Temple and McDonald, 2014).

**9.1.3 Public Transfers: Per capita and Aggregate**

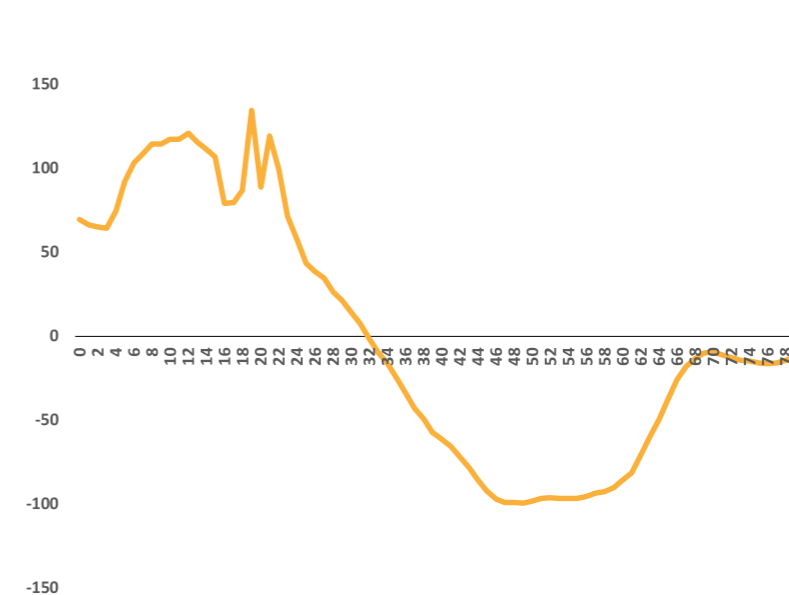
The per capita and aggregate age profiles of public transfers are presented in Figures 59 and 60, respectively. According to these figures, public transfers are shifted from prime-age working adults predominantly to the children and young adults. The children and young adults have large positive transfers probably because of education transfers to them. The older aged population are transferred

public resources for health, but they are not very large. The transfers are negative for the working-age adults because transfers to the children and young adults are borne by them. The picture is complementary to the age profiles of public transfer outflows, which are funded by the people of the same ages that shift public transfers to the children and young adults. Interestingly, in Pakistan, even older people shift public transfers, though not as substantially as the people in their prime ages do.

**Figure 59**  
Per Capita Public Transfers (thousand rupees)



**Figure 60**  
Aggregate Public Transfers (billion rupees)



## 9.2 Public Asset-Based Reallocations

Public asset-based reallocation is another way, apart from public transfers, to fund public age reallocations. According to the NTA methodology (UN, 2013), asset-based reallocations arise because the government owns assets and debt. Inflows occur when government earns public asset income or borrow. Outflows occur when the government have property income outflows, paying interest on public debt, or when governments save (p. 114). As shown in Box 3, public asset-based reallocations are calculated as public asset income less public saving in the NTA.

### 9.2.1 Public Property Income

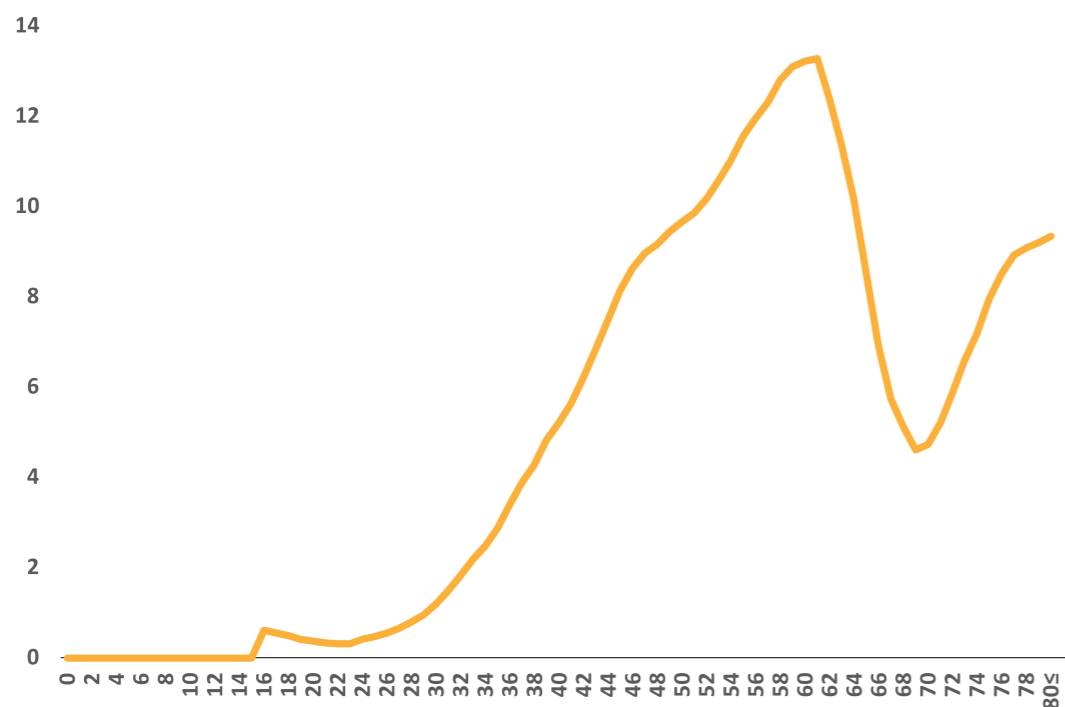
Public asset income is the sum of public property income and public capital income. Public property income, in turn, is net of public property income

inflows and public property income outflows (public property income inflows minus public property income outflows). Public capital income is equal to the operating surplus of government. Typically, public capital income is zero or very small in most of the countries (UN, 2013; p.120).

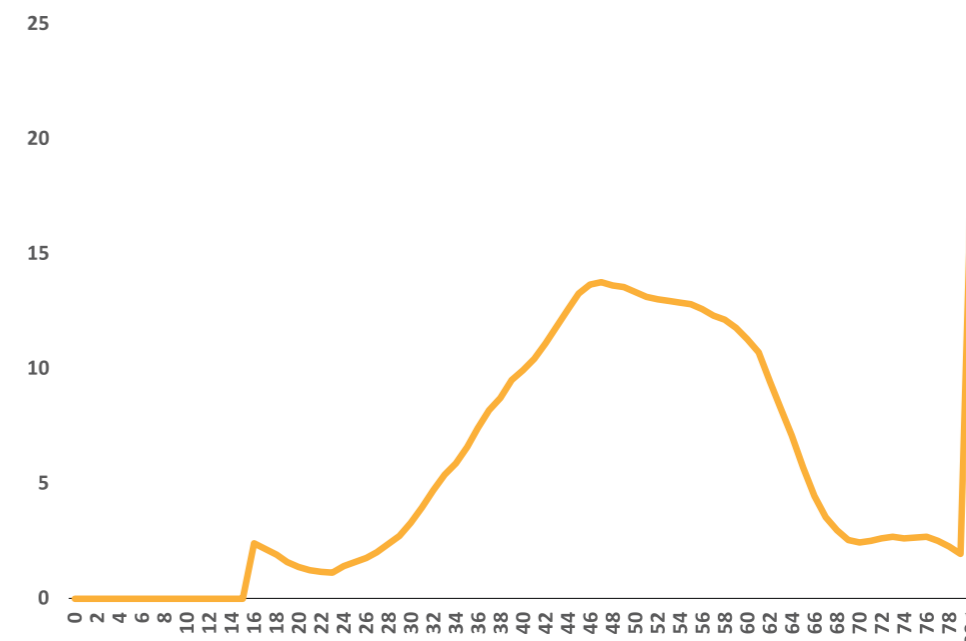
#### a. Public Property Income Inflows: Per Capita and Aggregate

Figures 61 and 62 present the per capita and aggregate age profile of public property income inflows. Even a cursory look at the profiles show that the public property income inflows are identical to net public transfers, thus, both giving a similar shape when the aggregate value is applied. The figures show that public property income inflows are considerable for the population at the end of their working age.

**Figure 61**  
Per Capita Public Property Income Inflows (thousand rupees)



**Figure 62**  
Aggregate Public Property Income Inflows (billion rupees)

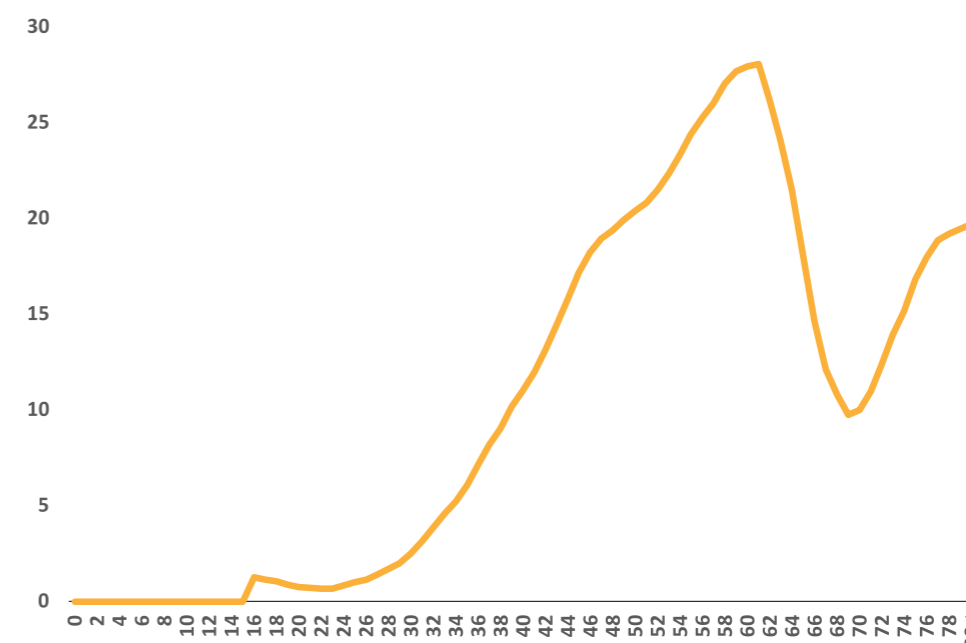


#### b. Public Property Income outflows: Per Capita and Aggregate

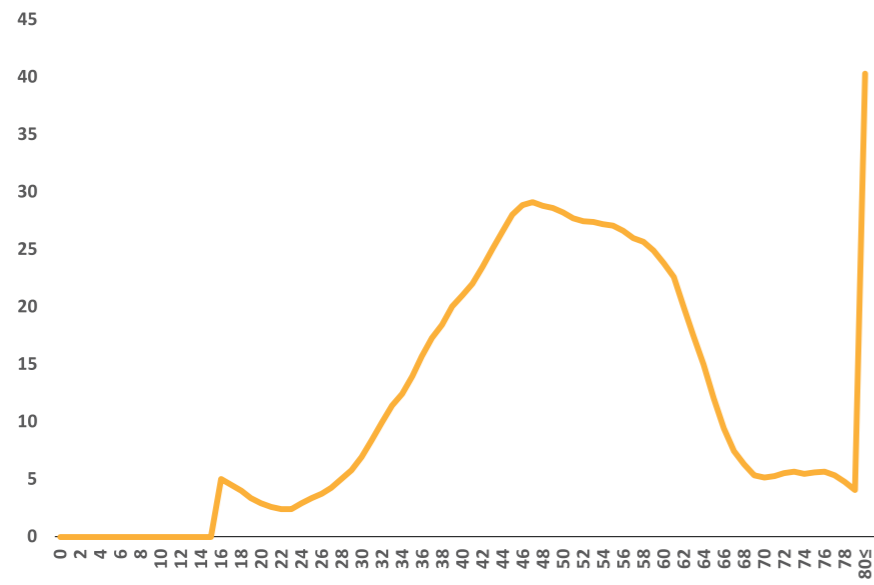
Per capita age profile of public property income outflows is shown in Figure 63 and aggregate age profile in Figure 64 profile. The profiles of public

property income outflows are also identical to the age profile of net public transfers and, therefore, their shapes are similar to that profile. The public property outflows also peak at the later stages of the working-age population.

**Figure 63**  
Per Capita Public Property Income Outflows (thousand rupees)



**Figure 64**  
Aggregate Public Property Outflow (billion rupees)



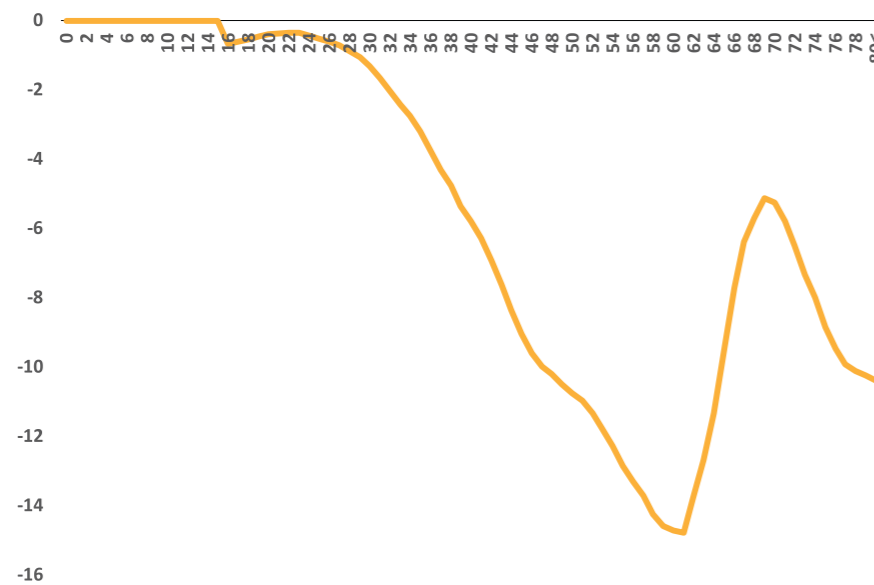
**9.2.2 Public Asset Income: Per Capita and Aggregate**

Figures 65 and 66 present the age profiles of public asset income at per capita and aggregate levels, respectively. As explained above, public asset income is the sum of public property income (public property income inflows less public property income outflows) and public capital income. In Pakistan, public capital

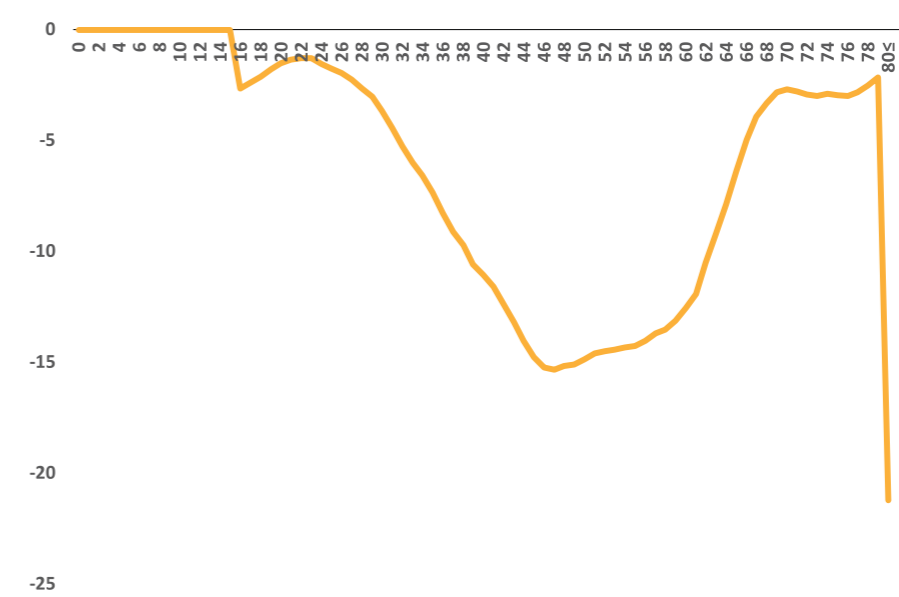
income is zero, therefore the age profiles of public asset income are same as the age profiles of the net public property income (where net public property income = public property income inflows – public property income outflows).

Both the profiles, per capita and aggregate, show that public asset income is negative and that is because public property income outflows are greater than public property income inflows.

**Figure 65**  
Per Capita Profile Public Asset Income (thousand rupees)



**Figure 66**  
Aggregate Public Asset Income (billion rupees)

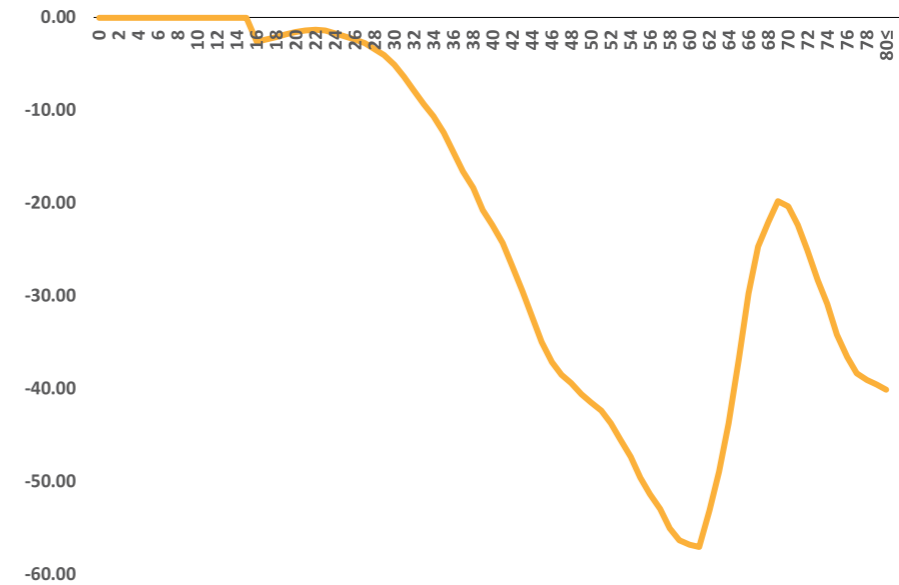


**9.2.3 Public Savings**

Public saving is defined as the total saving of general government. In essence, public saving involves the acquisition of taxes or repayment of the debt, funded by taxes (UN, 2013; p. 127). Figures 67 and 68 are, respectively, the per capita and aggregate profiles of public savings. In NTA, the age profiles of public savings are derived from the profiles of taxes.

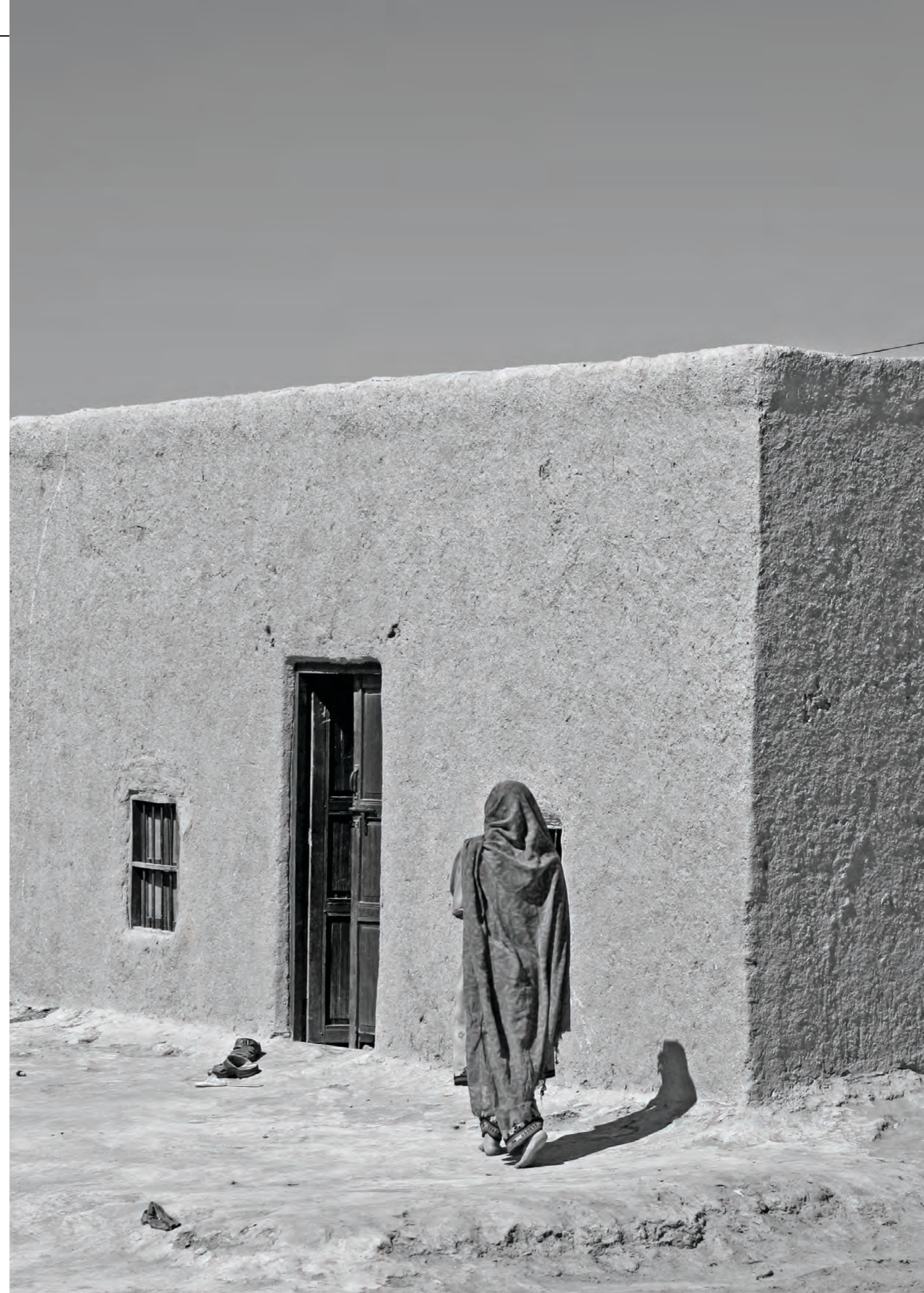
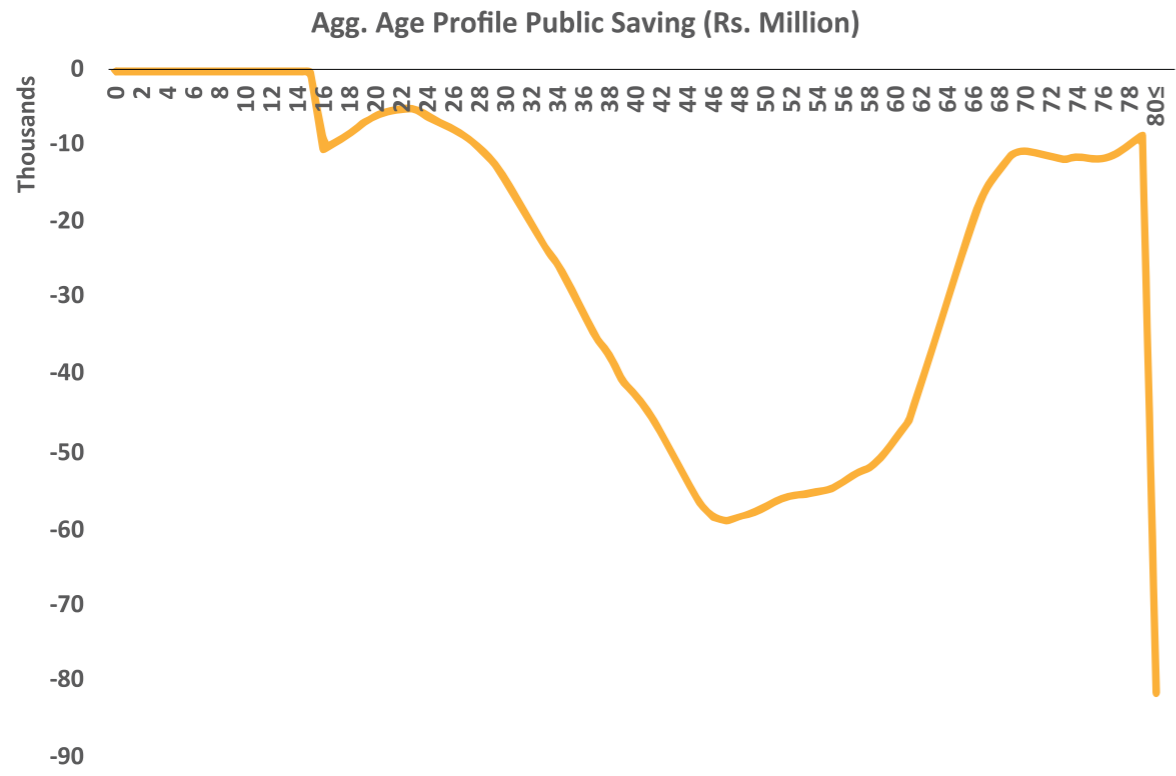
The age profiles of public savings, which are negative for all the ages, reflect that public savings are negative. The public saving in Pakistan, as is the case with most of the developing countries, is negative because the governments do not have enough resources to fund various public expenditures and programs, therefore the governments borrow to fund the expenditures. Borrowing, in turn, requires payment of interest which can aggravate the financial difficulties of a government.

**Figure 67**  
Per Capita Public Savings (thousand rupees)





**Figure 68**  
Aggregate Public Savings (billion rupees)





# 10

## CONCLUSIONS AND POLICY IMPLICATIONS

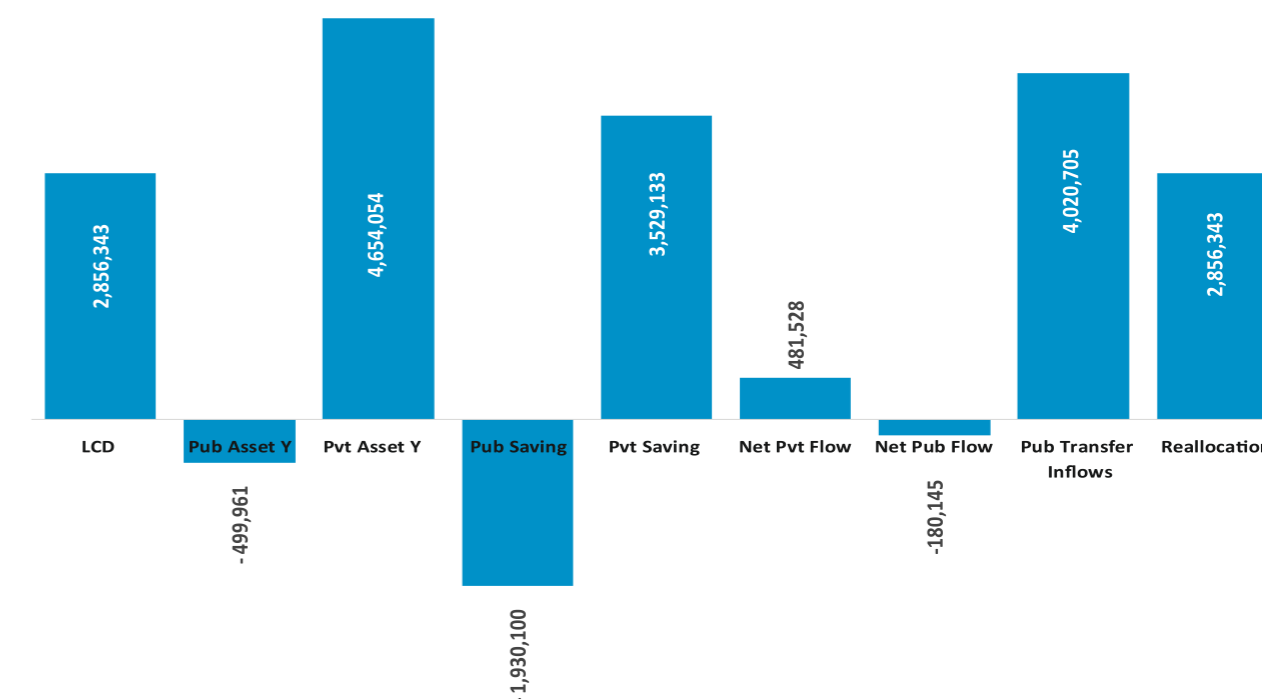
The NTA methodology provides us with an ideal opportunity to understand and measure the link between population dynamics and its economic implications at individual and national levels. It measures the direction and magnitude of intergenerational flows and the relative role played by private and public institutions.

### 10.1 Conclusions

The current exercise to construct NTA for Pakistan is, thus, to estimate how much people of different ages in the country produce and consume, and if there is a gap between the two, how do they fulfil it. Is the deficit funded through private sources or do the public sources have a role to play? In response to these questions, the NTA estimates conclude that:

- A large life-cycle deficit exists for the young and an even bigger one for the elderly, on per capita basis. The prime productive ages are the 40s, having income substantially more than their consumption. The trend conforms to what one would expect from the notion of demographic dividend.
- In continuation of following the demographic dividend thesis, the aggregate estimates show the younger ages consuming the most because of the age structure effect.
- For the young, it is the education consumption and health consumption for the elderly that contributes the most after 'other consumption', which comprises all consumptions other than health and education.
- Education consumption is reliant more on private sources than public ones. This is true for all educational levels.
- Health consumption is highest for the elderly, and irrespective of age private financing of health needs exceeds public ones.
- Private and public age reallocations come into play to fulfil the gap that exists between income and consumption at various ages of the life-cycle, and for Pakistan, the life-cycle deficit is primarily met by private sources, as summarised in Figure 69 below (also presented in Box 1 above).
- Private or public, asset-based reallocations play a more important role than transfers to meet the deficit faced by individuals of different ages.
- Private intra-household reallocations present the whole mechanism of the intergenerational economy the best. The net intra-household reallocations were found to be made to the young and the elderly, from the working ages. In per capita terms, the reallocations were higher for the elderly than the young but when we factor in the age-structure, in the aggregate estimates, the reallocations are then much higher for the young.

**Figure 69**  
Summary of the NTA Pakistan: Life-Cycle Deficit and Sources to Meet it  
(billion rupees)





## 10.2 Policy Implications

The above-stated conclusions have important implications for policymaking in Pakistan. Some of these implications are as follows:

- **Gainful employment:** The NTA estimation for Pakistan clearly shows that outflows from the working ages are meeting the consumption-income gap faced by the young and the elderly. This makes provision of better-earning opportunities for the young imperative. They do not have to provide for their own living but also for those who are dependant on them. Linked to this is asset accumulation while they are productive. We have seen that private asset-based reallocations, along with labour income, are the primary sources of funding the life-cycle deficit. These assets, along with being inherited, are primarily accumulated during the productive years, given the employment remunerates enough. This would help the country reap the much talked about, but yet not materialised, demographic dividend.
- **Public spending on education:** Public spending on education is quite low to train the workers of tomorrow. Quality needs investment and the estimates show that education consumption is just too low to produce the quality needed for the 21st century. Overall education consumption is low with the share of public even lower than private.
- **Public health consumption:** Just like education, private health consumption far exceeds public health consumption. Literature suggests that health expenditures are a major source of pushing households into poverty. The private health consumption being high for all ages in the NTA estimates necessitates increasing public spending on health.
- **Fertility decline:** The whole idea of demographic dividend stems from fertility decline, and Pakistan with its almost stagnant fertility rates is not helping itself. East Asian countries were successful in realising the demographic dividend because of the rapid fertility decline they experienced. The opportunity of reaping the dividend is nullified if the fertility rates are not brought down. Large-scale programmes are needed that encourage the idea of small family size and lower fertility rates on a voluntary basis.
- **Caring for the elderly:** Although the proportion of the elderly is not high in Pakistan, nor is projected to be so in the coming few decades, the numbers are fast increasing. It, therefore, is about time we start planning for the elderly. They are the ones with the largest life-cycle deficit and the highest health expenditure, and with no universal public social security system to rely on, their position can be extra vulnerable due to changes in the family living arrangements. With the trend towards nuclear, from extended or joint, family system increasing, the elderly can be left in a vulnerable situation.
- **Data issues:** Last but not least, data in Pakistan needs vast improvement. Be it microdata or macro its availability and quality are a serious concern in the country. The way the NTA methodology is conceived the estimates are valid for the intergenerational resource flow in a given year only. They cannot be used for the purpose of projection without assuming the population to be stable, and with the current growth trends in Pakistan, it is far from being a stable population. Ideally this exercise should be periodically repeated but the data issues make it a very daunting task. Thus, improving data collection, its availability and ensuring its quality should be on the high priority list of all those concerned.

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