

MAXIMISING SOUTH AFRICA'S DEMOGRAPHIC DIVIDEND

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ABSTRACT

Based on 2005 estimates of National Transfer Accounts for South Africa, this paper investigates the resource flows across ages within the generational economy. The paper provides estimates of the lifecycle deficit and describes the financing of the deficit. The final section of the paper discusses the first and second demographic dividends and looks at potential policy options that would help the country maximise the benefit that arises through the demographic transition.

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South Africa, National Transfer Accounts, Demographic Dividend, Lifecycle Deficit

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1. INTRODUCTION

South Africa's highly unequal society is reflected in its economy, in which a sophisticated modern sector with high incomes exists alongside a low income informal sector. High levels of unemployment and widespread poverty remain two of the most pressing socioeconomic issues facing the country. One of the policy responses has been to gradually expand the country's social welfare system. As a result, South Africa has, by middle income country standards, a reasonably well-developed welfare system that covers children, the elderly and the disabled. Thus, by early 2013, there were roughly 16.1 million grant beneficiaries in South Africa (SASSA, 2013, p.1).

South Africa has a relatively young population, with around half the population under the age of 25 years. Population growth generally ranged between 2.0 and 2.5 percent per annum since the mid-1960s, until the advent of the HIV/Aids pandemic that slowed population growth dramatically during the 2000s. Fertility rates have been in decline since at least 1960. South Africa's four race groups each began the demographic transition in order of declining income: Whites, whose mean incomes have historically been highest, were first to experience fertility and mortality declines, followed by Asians, Coloureds and then Africans. As a result, the South African population is poised for significant aging over the next century. This process of aging has important implications for the provision of public services, the labour market, and the need for retirement savings, amongst others.

The aging of South African society represents an important opportunity. The transition from high fertility and high mortality, to low fertility and low mortality results in a transitory shift in the composition of the population until a new steady state is achieved. Specifically, since mortality declines before fertility, the demographic transition creates a boom generation: a series of cohorts that are unusually large. The immediate effect is to place pressure on working-age cohorts, who face increased demands on the resources earned. However, as fertility falls and these large cohorts age, the working age population grows relative to the dependent population. This fall in dependency releases resources that can be used to raise living standards, invest in human capital or save, and is termed the first demographic dividend.

This paper uses the National Transfer Accounts (NTA) methodology to analyse the demographic dividend that will arise as the South African population ages. The NTA methodology focuses on what is referred to as the generational economy, defined as: (1) the social institutions and economic mechanisms used by each generation or age group to produce, consume, share, and save resources; (2) the economic flows across generations or age groups that characterize the generational economy; (3) explicit and implicit contracts that govern intergenerational flows; (4) the intergenerational distribution of income or consumption that results from the foregoing (Lee and Mason, 2011, p.7).

There are four activities that are central to the generational economy, namely working, consuming, sharing and saving (Mason and Lee, 2011*b*, p.7). Consumption occurs throughout the lifecycle, although the level varies by age. Working, however, does not occur across all ages, particularly amongst the very young and the very old. As a result, the young and old are typically unable to finance their consumption on their own. Sharing and saving, then, represent the only means through which the young and old are able to bridge this gap.

This paper estimates the full set of National Transfer Accounts for South Africa for 2005, using a variety of data sources including household survey data, national accounts data and published administrative data. Based on these accounts, the demographic dividend will be quantified. Importantly, the policy implications of the preceding findings will be explored in the final section of the paper, with a particular focus on how South Africa can capture and

maximise the potential benefits presented to it by its changing demographic composition over the coming decades.

2. THE NATIONAL TRANSFER ACCOUNTS FRAMEWORK

Given that the NTA methodology is extensive and detailed, this section provides a brief conceptual overview of the methodology, which has been developed and refined through and international research effort. The technical detail of the methodology can be located in the NTA manual (Mason et al., 2009), as well as various other publications (see, for example, Lee and Mason, 2011).

The key technical aim of NTA is to be able to quantify economic flows for single-year age cohorts, from the very youngest to the very oldest. These economic flows are important because they reflect a fundamental feature of all societies: the economic lifecycle (Mason and Lee, 2011a, p.55). For any individual, inflows must equal outflows and the following identity holds: $Y^l + Y^A + \tau^+ = C + \tau^- + S$. In other words, individuals can receive resource inflows in the form of labour income (Y^l), asset income (Y^A) and transfer inflows (τ^+), and they have three ways in which to use them: consumption (C), transfers to others (i.e. transfer outflows) (τ^-) and savings (S). Rearranging the terms, the NTA is governed by the following identity for each age cohort (x), first presented by Lee (1994):

$$C(x) - Y^l(x) = \tau^+(x) - \tau^-(x) + Y^A(x) - S(x) \quad (1)$$

On the left side of the identity is the lifecycle deficit – the difference at each age between consumption and labour income. Where consumption is greater than labour income, the lifecycle deficit is positive (a lifecycle surplus, where labour income is greater than consumption, is then negative). Consumption includes both private consumption (e.g. private spending on food, education, or entertainment) and public consumption (consumption spending by the state on education, health or other items).

The first two terms on the right side of the identity, $\tau^+(x) - \tau^-(x)$, are net transfers. Transfers are unique flows in that they involve no quid pro quo (Lee, 1994, p.18). As with consumption, transfers can be either private or public transfers, depending on the identity of the other party. Private transfers can occur within households or between households, e.g. remittance flows between households, or the transfer of food and shelter from a parent to a child within a household. Public transfers occur between individuals and the state, with public transfer outflows being taxes and inflows being cash or in-kind transfers from the state. Through transfers, resources can be transferred across generations, with the transfers mediated by households or the state.

Finally, the final two terms on the right side of the identity, $Y^A(x) - S(x)$, are known as asset-based reallocations. Once again there is a public-private split, with both types of flows used to reallocate resources across ages. For example, resources are transferred from younger to older ages through the process of saving for retirement: saving for retirement during the working ages represents an outflow at that age, while dissaving during retirement represents an inflow at older ages. Asset income can be earned from assets owned (by individuals or the state), but asset income can also be paid to others.

There are a couple of important points to be made with respect to National Transfer Accounts. First, the unit of analysis in the NTA is the individual. All flows within the economy are allocated to individuals through various methods and assumptions. Although this is very useful from the perspective of understanding the impact of aging on the economy, it means

that flows within and often between households are difficult to allocate directly using survey data. Thus, for example, household consumption of certain items is allocated on the basis of equivalence scales, since it is not possible to discern consumption at the level of individuals within the household.

Second, and this is one of the key differences between NTA and the System of National Accounts (SNA), the NTA consolidates all private sectors (i.e. households, financial and non-financial corporations, and non-profit institutions serving households) into one. Thus, “asset income for each age group comprises all asset income, including the operating surplus of corporations, whether distributed through dividends or not [and] private saving includes both household and corporate saving” (Mason and Lee, 2011a, p.60).

Third, the NTA uses basic prices to estimate consumption and labour and asset income. This means that “income and consumption are valued prior to the assessment of taxes on production and products, also known as indirect taxes”, with the implication that public transfer outflows include all taxes (Mason and Lee, 2011a, p.60).

The overall process that is followed in the estimation of the various flows is as follows. First, the aim is to estimate an age shape for the given flow. The age shape or the age profile is essentially a line graph of the mean per capita value of the flow (on the vertical axis) at each age or for each age cohort (with age on the horizontal axis). Next, the per capita age profile is combined with a national population distribution to arrive at an aggregate value for the age profile. For example, the national population distribution is combined with the age profile of employment earnings to derive an aggregate value for employment earnings for the economy (i.e. number of individuals in each cohort multiplied by the mean per capita value for each cohort). Third, an aggregate control value is calculated on the basis of national accounts and other data. The ratio between these two aggregates, the aggregate value derived on the basis of the survey and population distribution data vs. the aggregate value derived from national accounts data, is used to adjust, multiplicatively, the estimated age profile either upwards or downwards. The various age profiles are then aggregated to derive the profiles of transfers, asset-based reallocations and the lifecycle deficit.

3. SOUTH AFRICA'S LIFECYCLE DEFICIT

3.1 Labour Income

Neglect of the broader education system and the systematic denial of equal opportunities under apartheid have left South Africa as one of the most unequal societies in the world. This situation has been exacerbated since 1994 by the continuation of the skills-biased and relatively capital intensive economic growth path followed by the South African economy. The Gini coefficient – an inequality measure where a value of zero indicates perfect equality and a value of one perfect inequality – for South Africa is consistently estimated within the range of 0.60 and 0.80, depending on the data used. Based on income data in the National Income Dynamics Survey (Wave 2, 2010/2011), the Gini coefficient is estimated at 0.68 (Finn et al., 2012, p.33).

Labour income is composed of employment earnings and self-employment earnings. Overall, labour income (YL) totals roughly R790.1 billion in 2005, of which R713.0 billion (or 90.2 percent) is employment earnings.¹ Figure 1 presents the per capita age profiles of labour income and its components, relative to mean labour income for 30 to 49 year olds.²

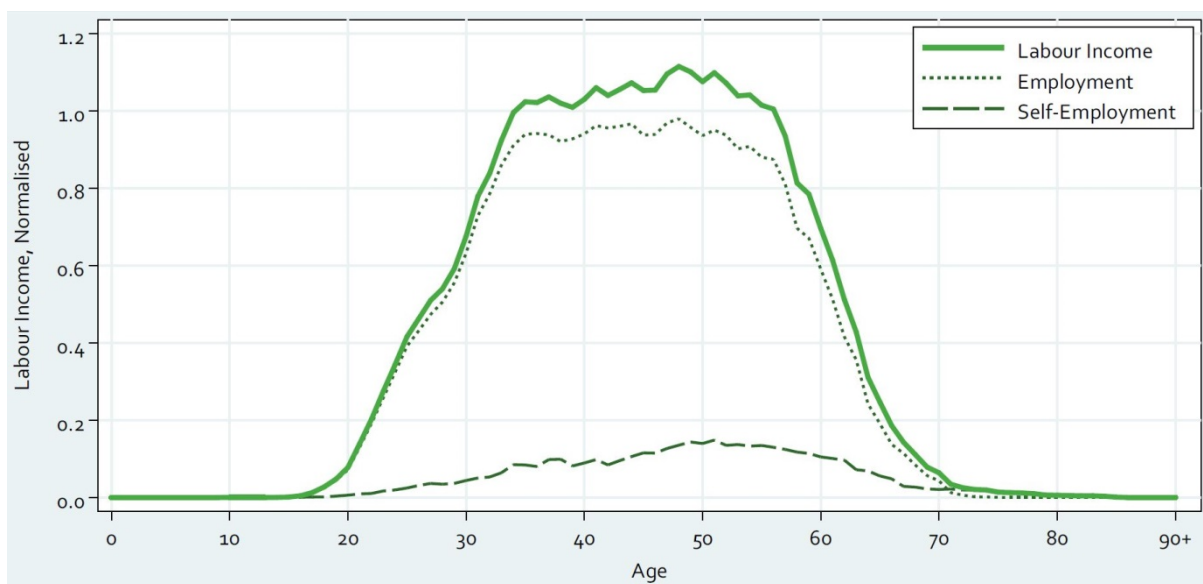
¹ For an overview of the data used to construct the various age profiles presented here, see Appendix A.

² Flows presented in this paper have all been normalised in this way, unless otherwise stated, and values are quantified as proportions of 'peak labour income'.

Perhaps a key feature of the labour income profile is its relatively late increase above zero. Labour income for 25 year olds is just 41.6 percent of peak labour income, of which 94 percent is derived from employment. Peak labour income is reached at age 35 and rarely exceeds that level by more than ten percent in the 20 cohorts whose normalised labour income exceeds 1.0. While employment earnings are relatively constant from the mid-thirties to the mid-fifties, self-employment income increases with age, peaking between the ages of 48 and 55. However, self-employment earnings are far outweighed by employment earnings, which only accounts for less than 80 percent of labour income amongst those under the age of 16, and those over the age of 63.

The considerable difference in employment and self-employment earnings relates to relatively low rates of pay in the informal sector, low levels of engagement in the informal sector and a relatively weak small business sector in South Africa. The ILO International Labour Organisation (2011) estimates that the informal sector accounted for 17.8 percent of total employment in 2010, a very low proportion when compared with other African countries (only Mauritius has a lower proportion at 9.3 percent in 2009). Even amongst middle income countries, the informal sector is small: it accounts for 24.3 percent of Brazilian non-agricultural employment in 2009, and roughly one-third in Argentina, Costa Rica, Mexico and Uruguay. Productivity in the South African informal sector is also relatively low, with “productivity in the modal formal firm [being] several times higher than in the modal informal firm” (Gelb et al., 2009, p.6).

Figure 1: Labour Income, 2005



Source: Own calculations.

The rise in the employment earnings profile is delayed relative to other NTA countries, a result of high youth unemployment rates, which exceeded 60 percent between the ages of 15 and 23 years in 2005, using the expanded definition of unemployment, and only fall below 40 percent after age 29. Another contributing factor is educational enrolment that is relatively high at 42 percent amongst 20 year olds and 18 percent amongst 22 year olds, thereby delaying labour market entry.

Another important feature of the age profile is the pace at which it declines after the age of 58 years. On average, normalised labour income declines by more 8.6 percentage points per year of age from age 57 to age 65, at which point it is just one-quarter of peak labour income. This is certainly related to age-eligibility for the state old age pension, which at the time was 60 years for women and 65 years for men. Given its relatively generous size – at

R820 per month, it is equivalent to 23.9 percent of peak labour income – it is not unexpected that it might incentivise exit from the labour market around the age of eligibility. At the very least, there are significant numbers of individuals in their late 50s and early 60s for whom there is little difference between labour income and the state OAP.

3.2 Consumption

Within NTA, consumption is comprised of private consumption and public consumption. Within each, education and health consumption are distinguished, due to their particular relationships with age.

3.2.1 Private Consumption

Private education consumption represents all spending by households on education. As such, the characterisation ‘private’ does not refer to the type of institution, but rather distinguishes spending on education by households from spending on education by government. Private education consumption covers spending by households on tuition, school supplies (including books and stationery), and tutoring and extra lessons.

In the absence of data linking expenditures on education to specific household members, some method of allocating household education expenditures to household members attending an educational institution must be found. The most common method involves a regression model that estimates household consumption of education as a function of the number of enrolled members and the number of enrolled members of each age (Mason et al., 2009, p.13). Unfortunately, the IES 2005/06 contains no information on enrolment status of household members, and its standalone nature does not allow for any linking of other datasets that may contain such information. Instead, we turn to the General Household Survey (GHS) 2005, which includes information on individuals' attendance status and highest level of education. Within the IES 2005/06, tuition and attendance fees are disaggregated by level – preschool, primary, secondary, tertiary – and, while other education-related expenses are often not disaggregated by level, some are. Private consumption of education is therefore dealt with separately by level of education, specifying ‘college’ (post-secondary non-tertiary colleges and tertiary institutions known then as technikons) and ‘other’ in addition to preschool, primary, secondary and tertiary. Spending that cannot be allocated to a particular educational level is dealt with separately. Age-specific attendance rates – proxies for enrolment – are estimated from the GHS 2005 for each of the six educational categories.

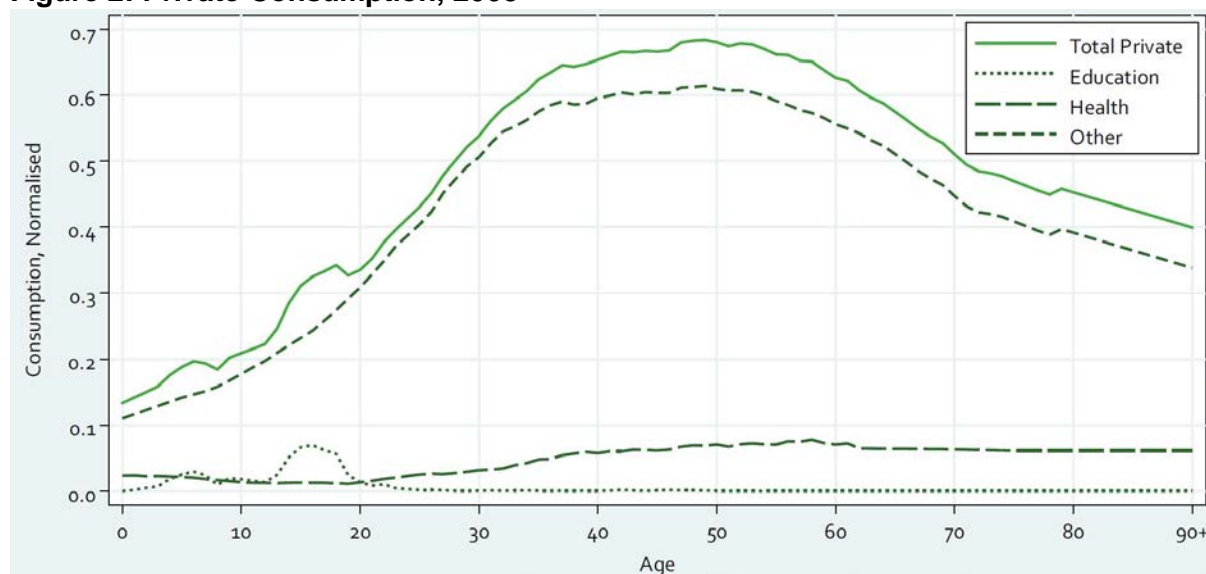
The process of deriving age profiles of spending on a particular level of education is as follows. Attendance rates by age for that level of education are summed within each household. Spending is estimated as a function of these summed attendance rates across the relevant ages. In other words, for primary education, age-specific attendance rates are summed within households from ages 6 through 14, and these summed attendance rates are entered as independent variables in the regression explaining spending. Coefficients on the independent variables represent spending per age (e.g. primary education spending on 10 year olds) and are allocated to all individuals of that particular age in each household. Within each household, allocated coefficients are summed across ages for that particular level of education (e.g. across all six to 14 year olds in the case of primary education). Spending is allocated to a particular individual on the basis of that individual's share within the sum of the coefficients. Once these allocations have been made, across all levels of education, age profiles are generated in the standard way, rendering per capita expenditure on private education by individual year of age, which are then aggregate controlled.

Since the IES 2005/06 does not allocate health spending to specific household members, private consumption of health is allocated on the basis of utilisation. The GHS 2005 is once again used, this time to construct an age profile (in five-year age groups) of utilisation rates using data on whether or not individuals visited a medical practitioner in the month preceding the survey. The data reveals a standard J-curve for utilisation rates: utilisation amongst infants under the age of one, is 13.2 percent; falling to below six percent for those between 11 and 20 years; and then gradually rising again to over 25 percent amongst individuals over the age of 75. Although various options of allocating health expenditure were investigated, the only method that yielded satisfactory results was the method described for education above.

All other consumption by households is allocated to individuals using an equivalence scale. The use of an equivalence scale is preferred within the NTA methodology to other methods due to the fact that they generate more reliable results (Mason et al., 2009, p.15). In terms of the chosen equivalence scale, adults aged 20 and over are assigned weights of one, while children aged four or younger are assigned a weight of 0.4. Between the ages of four and 20, individuals are assigned a weight on the assumption that there is a linear increase in the value from 0.4 to 1.0, i.e. for each year over the age of four, the weight increases by 0.0375. Within each household, then, weights in terms of this equivalence scale are summed across individuals and expenditures are allocated to individuals in proportion to their weight within the total weight for the household. This equivalence scale is adjusted slightly for allocating alcohol and tobacco consumption by setting weights equal to zero for children under the age of 15 years in the case of tobacco, and for children under the age of 17 years in the case of alcohol (16 and 18 years being the legal ages for smoking and alcohol consumption in South Africa).

Other private consumption represents all consumption spending as reported in the IES 2005/06, less consumption spending on education and health. However, in their revision of the consumer price index (CPI) weights, Statistics South Africa made significant adjustments to certain types of expenditures (Statistics South Africa, 2008a, pp.6-8). Specifically, adjustments were made to four categories, namely food and non-alcoholic beverages; personal care items; restaurants; and alcoholic beverages and tobacco. These adjustments do not affect the aggregate control value used, but may alter the shape of the other private consumption profile, as well as that of consumption taxes (various food items are VAT exempt, while excise duties are levied on alcoholic beverages and tobacco). For food and non-alcoholic beverages, the adjusted value was 30.5 percent higher; for personal care it was 42.0 percent higher; for restaurants it was 55.3 percent higher; and for alcoholic beverages and tobacco it was 440.6 percent higher, reflecting massive under-reporting in this category.

The age profiles of private consumption and its components are presented in Figure 2. Private consumption is dominated by other consumption, which typically accounts for more than 80 percent of total private consumption. The only times when this proportion falls below 80 percent are associated with the two peaks in the private education consumption profile between ages four and seven, and between ages 14 and 17. Private education consumption is very low relative to peak labour income. At its peak in the mid-teens, private education consumption ranges between five and seven percent of peak labour income and by age 23 is below one percent.

Figure 2: Private Consumption, 2005

Source: Own calculations.

Similarly, private health consumption is low relative to peak labour income, but tends to be greater than private education consumption. It is only during the teenage years that private education consumption is significantly higher than that of health. Private health consumption follows the J-curve pattern, falling from 2.3 percent of peak labour income for infants under the age of one, to below 1.2 percent for 18 and 19 year olds, before rising again and peaking at just under eight percent in the late fifties. Other private consumption rises rapidly from less than 12 percent of peak labour income for children under the age of two years, to 30.9 percent by age 20 and to 50.6 percent at age 30. For those between the ages of 42 and 53, other private consumption ranges between 60 percent and 62 percent of peak labour income, falling quite steeply thereafter. By age 75, other private consumption is just 40.9 percent of peak labour income.

Given the dominance of other private consumption, total private consumption has a similar age profile. There are two local peaks associated with education consumption and the gap between total and other private consumption grows with age as a result of rising health consumption. Total private consumption peaks at more than two-thirds of peak labour income for cohorts between the ages of 44 and 54 years.

3.2.2 Public Consumption

Public consumption of education can be disaggregated by the type of institution or level of education. Using provincial and national budgets, total consumption spending on education is disaggregated into spending on pre-primary, primary, and secondary education, Further Education and Training (FET), university (tertiary, or higher, education), adult basic education and training (ABET) and 'other' education. To ensure compatibility with national accounts data, relative shares of each level of education within total spending are used to assign portions of the aggregate control value. Within each level of education, a cost per user is then calculated and multiplied by the number of users of a specific age. This amount – the total spend on an age cohort for a given level of education – is divided by the population estimate for that age cohort to arrive at per capita spending for that cohort for that level of education.

Public health consumption is allocated using data from the GHS 2005, which asks respondents whether they consulted a health worker as a result of illness or injury in the preceding month and whether the consultation took place in the public or private health

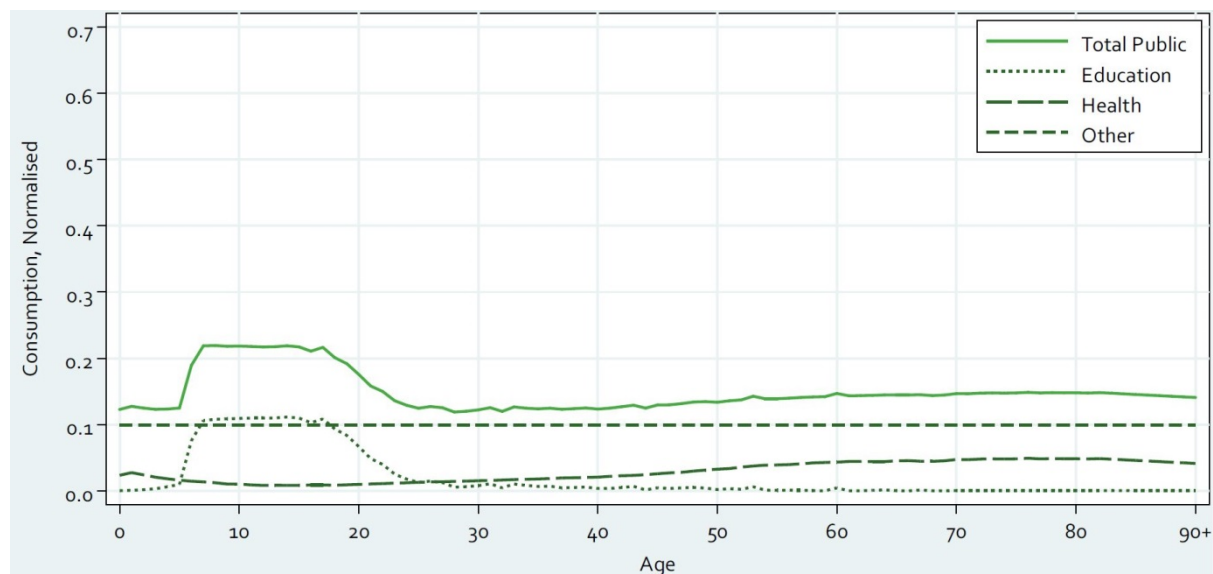
sector. These questions enable the construction of a public sector health utilisation age profile. With no direct evidence on differing costs per consultation by age or by institution (e.g. hospital vs. clinic), age-specific mean utilisation rates are used to allocate consumption. In effect, this assumes a constant cost per consultation across institutions and by age.

Other public consumption includes all other government consumption apart from education and health. There are two types of expenditures that fall within this category, namely those that vary with age and those that do not. In instances where consumption varies by age typically, programmes that are targeted or differentiated by age some differential allocation by age may be possible and preferred. However, where consumption does not vary by age, it is allocated on a simple per capita basis.

Using the same scale as in Figure 2, Figure 3 shows that public consumption is relatively small relative to private consumption and relative to peak labour income. Public consumption of education is insignificant prior to the age of six – the first year of compulsory schooling – at which point it rises to 7.6 percent of peak labour income. Between the ages of seven and 17, public education consumption is around 11 percent of peak labour income and it falls gradually to under two percent of peak labour income by age 24. Public consumption of health follows a similar J-curve pattern to private health consumption, but it only exceeds three percent of peak labour income for the first time at age 49. At its highest level, public health consumption reaches 4.9 percent of peak labour income in the late seventies. Other public consumption is just shy of ten percent of peak labour income for all ages, given that it is allocated on a per capita basis.

Together then, public consumption is just over 12 percent of peak labour income for children under the age of five, rising steeply to 21.9 percent by age seven on the back of increased public education consumption. It is stable at this level until age 17, after which it declines in line with falling public education consumption. By age 28, public consumption is at its lowest point at 11.9 percent of peak labour income. As age continues to increase, so too does public consumption, peaking at just under 15 percent for individuals in their seventies and early eighties.

Figure 3: Public Consumption, 2005



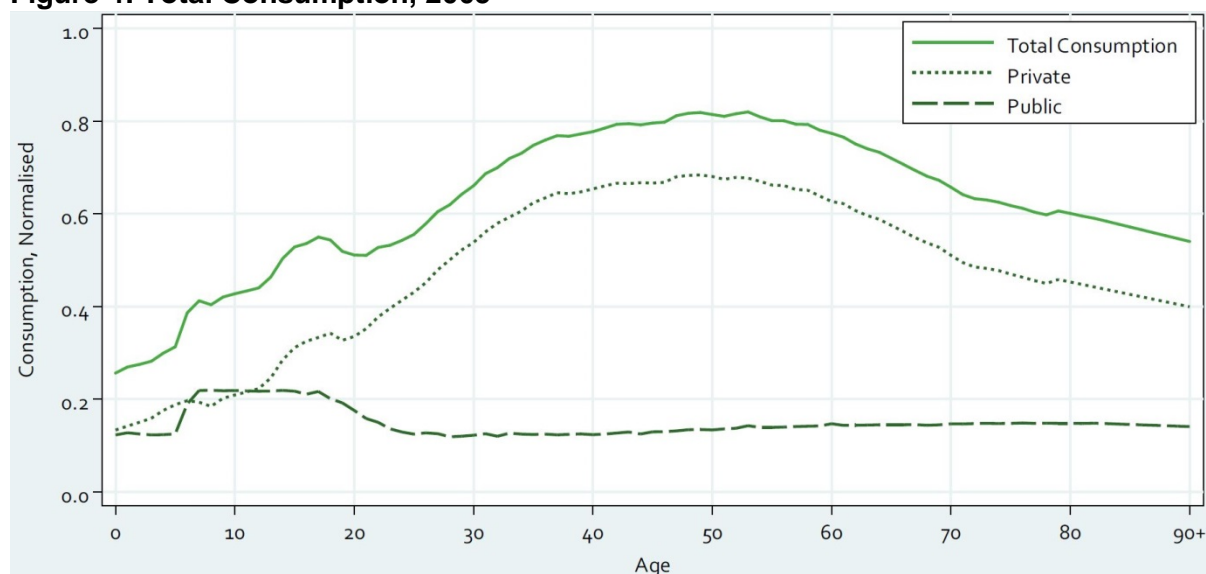
Source: Own calculations.

Within total consumption, as alluded to earlier, private consumption is dominant (Figure 4). Private consumption typically accounts for more than 70 percent of total consumption and it is only amongst the young that this is not the case. Public consumption is roughly equal to private consumption amongst children under the age of two, and for those between six and 13 years of age. In fact, during the most of primary schooling years, public consumption exceeds private consumption. However, public consumption falls as a share of total consumption to under 17 percent by age 35 and, although it increases again from around age 50, it never really exceeds one-quarter of total consumption.

Total consumption, therefore, rises from one-quarter of peak labour income at age zero, to 55 percent at age 17 on the back of increased education consumption, both public and private. Falling slightly to 51 percent at age 21, it again increases, driven by private consumption. At age 47, total consumption exceeds 80 percent of peak labour income for the first time and it remains above this threshold until age 56. Interestingly, and somewhat uniquely amongst NTA countries, total consumption then falls consistently and significantly with age: it falls below 70 percent of peak labour income at age 67, and below 60 percent at age 81. By the late eighties, total consumption is just 55 percent of peak labour income and around one-third below its own peak level.

This continual and significant decline in total consumption amongst older cohorts is an important finding and suggests weaknesses in the institutions – whether public or private – that, in most other countries, ensure that consumption amongst the elderly is maintained at levels comparable to that amongst prime working-age cohorts. Given South Africa's economic history over the past half-century and rising incomes particularly since the mid-1990s, the observed pattern of total consumption is not simply a cohort effect. This is particularly evident when considering the age profiles of consumption in other developing countries and in countries that have experienced more rapid economic growth in the last few decades than South Africa. In effect, the problem appears to be related to the institutions that regulate the 'sharing' activity within the NTA framework, specifically inter-household sharing (or transfers) and the public transfer system.

Figure 4: Total Consumption, 2005



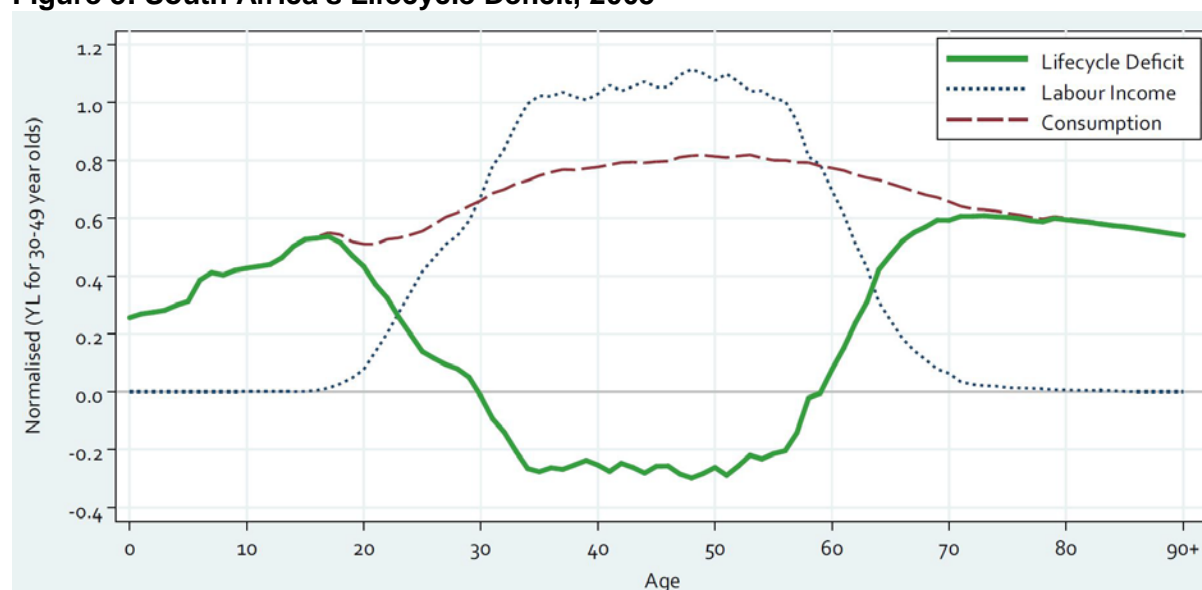
Source: Own calculations.

3.3 The Lifecycle Deficit

The lifecycle deficit is the difference between consumption and labour income. The labour income and consumption profiles presented above are combined in Figure 5 with the

resulting lifecycle deficit. The LCD curve displays the standard shape: positive and rising at the youngest ages; then falling in the ages of early labour market activity as labour income begins to rise; turning negative (to surplus) as labour income continues to rise; stabilising in surplus as both labour income and consumption stabilise; then rising rapidly and returning to deficit as retirement age is reached. Relative to mean labour income of 30 to 49 year olds, the LCD rises from roughly 25 percent at birth to just over 50 percent between the ages of 14 and 18 years. The deficit then falls rapidly and, by age 34, the normalised surplus is almost 27 percent. The surplus then ranges between 25 percent and 30 percent until age 52, whereafter it declines and turns to deficit once more. From age 66 onwards, the normalised deficit breaches 50 percent and remains close to 60 percent until the mid-80s, declining very gradually thereafter.

Figure 5: South Africa's Lifecycle Deficit, 2005



Source: Own calculations.

Overall, South Africa's surplus lasts 30 years, from the ages of 30 to 59 years. While this places South Africa towards the middle of the group of NTA countries in terms of the duration of the surplus. Nevertheless, the transition to surplus comes relatively late in South Africa: only two NTA countries – Nigeria and Senegal – are not generating surpluses by age 30, when South Africa (and Brazil) begin to produce a surplus. Similarly, by age 60, when South Africa returns to deficit, only three other NTA countries (Nigeria, Sweden and Uruguay) are still producing a surplus.

Per capita age profiles, however, mask the extent of aggregate flows as they do not account for population structure. By weighting per capita profiles with age-specific population estimates, it is possible to generate an aggregate age profile, and these are presented in Figure 6. The aggregate age profile reveals that, since the South African population is relatively young, by far the larger portion of the lifecycle deficit is located amongst young people under the age of 30 years. Indeed, just 12.0 percent of the total surplus is accounted for by cohorts aged at least 60 years.

Details on the aggregate flows that make up the LCD are tabulated in Table 2. These estimates are disaggregated into five broad age-groups. The estimated value of the lifecycle deficit for the population as a whole is R336.4 billion in 2005, with consumption totalling R1 126.5 billion and labour income R790.1 billion. The table shows that those under the age of 20 years have an aggregate lifecycle deficit of R338.2 billion, roughly equivalent to the deficit for the population as a whole. A further deficit of R80.0 billion is estimated for individuals in their twenties and this is approximately three-quarters greater than the deficit

estimated for those aged 65 years and older. In contrast, a total surplus of almost R128 billion is estimated for individuals aged between 30 and 64 years.

The analysis confirms strong age-based patterns in consumption and earnings for South Africa. As a result of the interaction between consumption – which rises rapidly for young people, stabilises and then declines from age 65 in particular – and labour income – which rises from early working ages, peaks between the ages of 40 and 55, and declines rapidly around the retirement age – a lifecycle surplus is generated between the ages of 30 and 59 years. In aggregate terms, the lifecycle deficit is largely concentrated amongst the young, with the deficit for those under the age of 30 equivalent to almost one-quarter more than the deficit for the population as a whole.

Figure 6: Aggregate Labour Income and Consumption, 2005



Source: Own calculations.

4. FINANCING SOUTH AFRICA'S LIFECYCLE DEFICIT

4.1 Net Transfers

4.1.1 Public Transfers

Public transfers may be classified as either inflows (e.g. social grants) or outflows (e.g. value-added tax). Public transfer inflows consist of cash transfers to individuals and households, as well as in-kind transfers. In-kind transfers refer to “goods and services received directly from government agencies” (Mason and Lee, 2011a, p.66) and are, therefore, equivalent to public consumption – education, health and other consumption – as detailed above.

The South African government has extensive social grant programmes targeted towards the poor, and specifically towards children and the elderly. Indeed, in the 2005/06 fiscal year, approximately R50 billion (equivalent to 3.2 percent of 2005 GDP) was spent on social grants. The state old age pension (OAP) is the largest programme, accounting for 38.4 percent of the total, followed by the child support grant (CSG) and disability grant (DG), which each account for 27.8 percent of the total. The remaining grants – the war veterans grant, foster care grant, care dependency grant, grant-in-aid and relief of distress grant – together account for 6.0 percent.

Two other cash transfers explicitly modelled here are receipts from the Unemployment Insurance Fund (UIF) and the Workmen's Compensation Fund (WCF). Unemployment insurance in South Africa is a social insurance programme, funded through employer and employee contributions of one percent each of covered earnings. The WCF provides benefits related to work injury and illness and is funded through employer insurance premiums. The UIF reported paying out R2.9 billion in unemployment, illness, maternity/adoption and dependent benefits, with unemployment benefits accounting for roughly three-quarters of the total amount. The WCF reported paying out just less than R2.1 billion over the same period.

Table 1: Lifecycle Deficit Detail, 2005 (R billions)

Component	Total	0-19 years	20-29 years	30-49 years	50-64 years	65+ years
Lifecycle Deficit	336.4	338.2	80.0	-111.0	-17.3	46.0
Consumption	1127.0	342.2	207.9	369.7	154.3	53.0
...Private Consumption	820.8	188.2	156.7	308.2	126.9	41.0
.....Education	24.6	22.3	1.8	0.4	0.0	0.0
.....Health	66.2	13.7	8.2	25.4	13.8	5.1
.....Other	730.0	152.1	146.7	282.4	113.1	36.0
...Public Consumption	305.7	154.0	51.2	61.5	27.3	12.0
.....Education	73.4	60.4	9.7	2.9	0.4	0.0
.....Health	37.3	11.2	4.6	10.2	7.7	3.8
.....Other	195.0	82.4	36.9	48.4	19.3	8.0
Less: Labour Income	790.1	3.9	127.9	480.3	171.6	6.5
...Employment Earnings	713.0	3.6	119.8	437.2	147.8	4.6
...Self-employment Earnings	77.2	0.3	8.1	43.1	23.7	1.9
Population Share (Percent)	100.0	42.3	18.9	24.8	9.9	4.1

Source: Own calculations.

Cash transfers from the state are allocated to those individuals for whom the transfers are intended. In other words, the old age pension is allocated to elderly individuals, while the child support grant is allocated to the child beneficiary (even though the grant is paid to the child's primary caregiver). The IES 2005/06 data on grant income required significant cleaning, with many individuals reporting too much grant income from a particular grant, while others reported receiving grants for which they were age-ineligible. To resolve these issues, the following procedure was followed. For each grant, an upper bound for each grant type was calculated using the grant amounts for 2006/07. Grant incomes above this amount are either incorrect or represent a misclassification of grants. In the case of old age pensions, nearly 200 observations report state old age pensions in excess of the relevant upper bound value. For these individuals, amounts reported as old age pensions are reclassified as private pensions.³

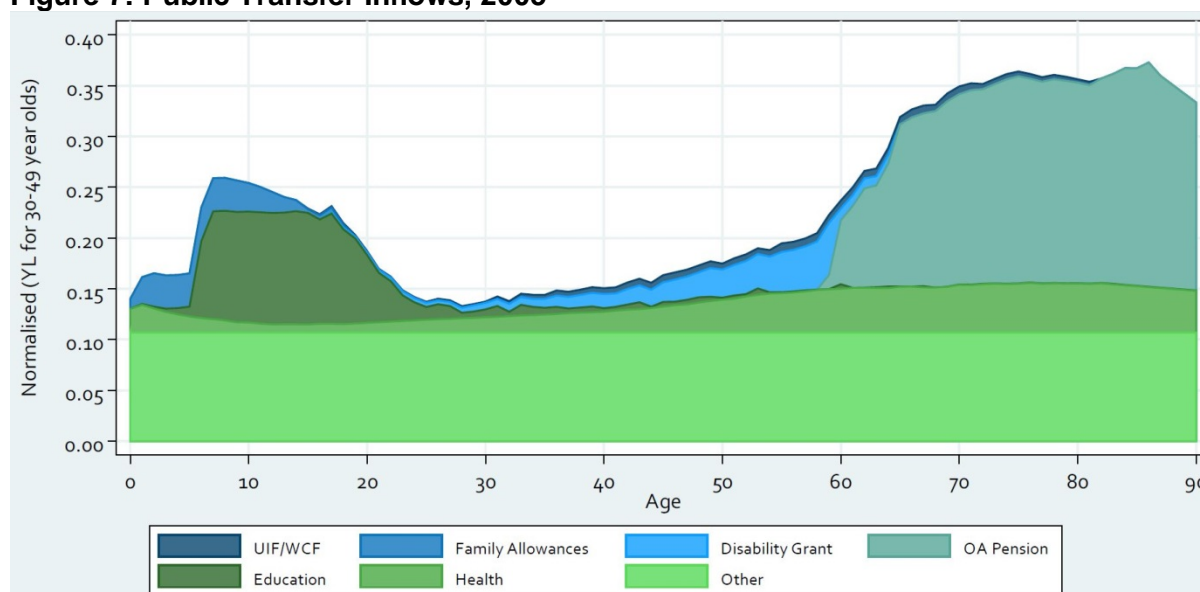
Grant income is also adjusted to reflect legal age cut-offs associated with each grant. Thus, disability grants are reclassified as old age pensions for individuals of pensionable age, since this conversion is stipulated within the disability grant policy. Similarly, individuals who are not of pensionable age, but report receiving state pensions have their pensions

³ These adjustments bring down the number of individuals who claim to be receiving state old age pensions from 2.4 million to just under 2.2 million individuals, which is in line with the official number of beneficiaries.

reclassified as private pension income. Various allocation rules are implemented to shift grant income between household members where it is apparent that respondents have misidentified the grants they received.

Figure 7 presents the age profiles of cash and in-kind transfers from the state to individuals. By far the largest cash transfer in per capita terms is the old age pension. Inflows associated with the pension rise rapidly once the age of eligibility is reached: at age 60, OAP inflows average just 6.3 percent of mean labour income amongst 30 to 49 year olds, rising to 16.0 percent by age 65 and remaining between 18 percent and 22 percent for those aged 69 years and older. Amongst the youngest members of South African society, there are transfer inflows from the state in the form of family allowances. Normalised per capita family allowances quickly rise to over three percent of mean labour income amongst 30 to 49 year olds by age two, remaining around that level until age eight. Thereafter, transfers decline to 2.5 percent by age 11 and below 0.5 percent after age 14.

Figure 7: Public Transfer Inflows, 2005



Source: Own calculations.

The third significant public transfer inflow is the disability grant. Individuals are only eligible for this grant from the age of 18 and it is converted to an old age pension at ages 60 and 65 for women and men respectively. In line with the expected incidence of disability, inflows from the state in terms of disability grants rise gradually. Per capita disability inflows only breach one percent of mean labour income amongst 30 to 49 year olds at age 36, and two percent at age 46. At age 59 the age after which disability grants are converted to old age pensions normalised per capita inflows average five percent, after which they decline precipitously. Finally, inflows related to the UIF and WCF are small, peaking at less than 0.9 percent of mean labour income amongst 30 to 49 year olds at age 55.

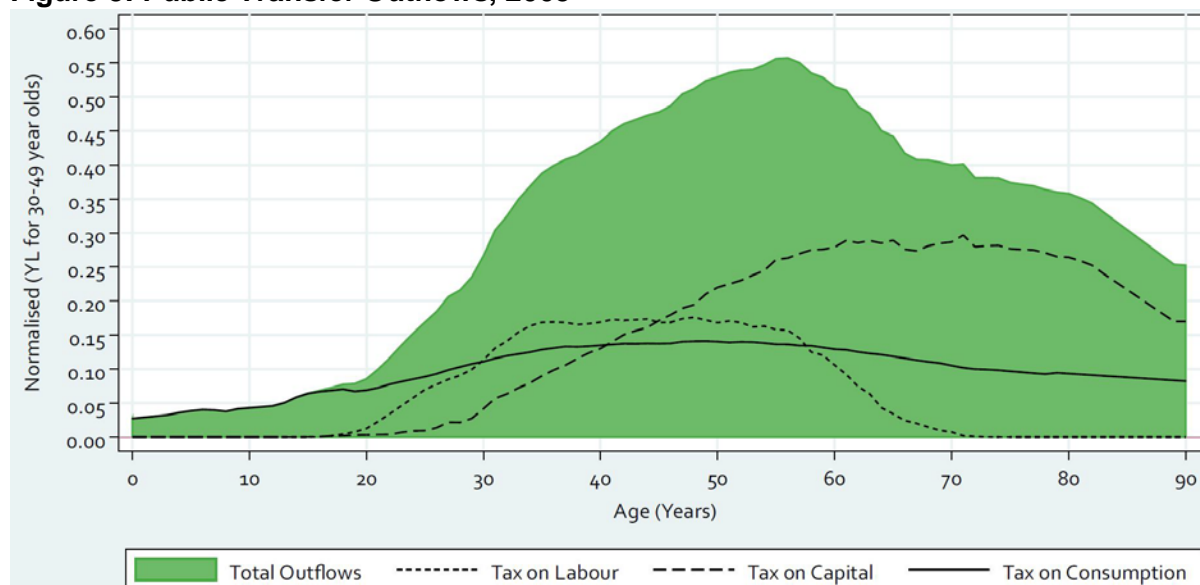
In terms of in-kind transfers, inflows are biased towards younger ages since public consumption of education is so large. Even though health consumption is higher on a per capita basis for older individuals, it remains significantly lower than consumption of education. Overall, therefore, public transfer inflows are particularly high amongst the elderly – specifically from around age 60 onwards – and amongst primary school-aged children. For those aged more than 60 years, public transfer inflows are equivalent to between 25 percent and 37 percent of mean labour income amongst 30 to 49 year olds. Amongst children aged between seven and 13 years, public transfer inflows are roughly one-quarter of the level of mean labour income amongst 30 to 49 year olds.

Within the NTA framework, transfer inflows equal transfer outflows since for each outflow (or giver) there is an inflow (recipient). This applies to both private and public transfers and, in the case of the latter, implies equality in in- and outflows at both the aggregate and the programme level (Mason and Lee, 2011a, p.67). Public transfer outflows consist of taxes and social contributions paid and its age profile depends on the tax source, the age distribution of the tax source and any age variation in tax rates. Indeed, NTA does not distinguish social contributions from taxes. Instead, it distinguishes seven tax sources, namely labour income, asset income, consumption, asset holding, asset transactions, the rest of the world (ROW), and other. The source of each tax depends on the party, resource or activity assessed. Thus, for example, taxes on wages and earnings are paid out of labour income, while taxes on consumption are paid out of consumption.

Tax revenues are either pooled in a general revenue fund or may be earmarked for use within a specific programme. An example of earmarked funding for specific programmes is that of pensions, which are often funded from payroll taxes. Similarly, a tax on fuel that is earmarked for road maintenance or grants from overseas governments for sole use within education would be other examples. In the case of pooled revenues, public transfer outflows for different programmes would have the same age profiles, while in the case of earmarked funds this is not true. Where there is fiscal federalism and different tiers of government are able to raise their own revenue in the form of taxes and are responsible for funding specific programmes, different age profiles of public transfer outflows will exist: [education] may be funded at the local level from property taxes while national [defence] is funded at the central level out of value-added taxes, for example (Mason and Lee, 2011a, p.68).

The first step in estimating the age profile of public transfer outflows is calculating age profiles of labour income (for taxes on labour income), asset income (for taxes on asset income) and consumption (for taxes on consumption). These profiles are presented in Figure 8. Taxes on labour income, which include payroll taxes for unemployment insurance, follow the shape of the labour income age profile and only begin to rise from zero at age 15. Remaining above 15 percent of mean labour income amongst 30 to 49 year olds between the ages of 33 and 56 years, taxes on labour begin to decline, first gradually and then rapidly, falling below one percent by age 70. Similarly, taxes on consumption follow the shape of private consumption and, for the youngest cohorts, are the only taxes paid. Taxes on consumption never reach as high as tax on labour income at its peak, ranking instead between 12 percent and 14 percent between the ages of 33 and 64 years.

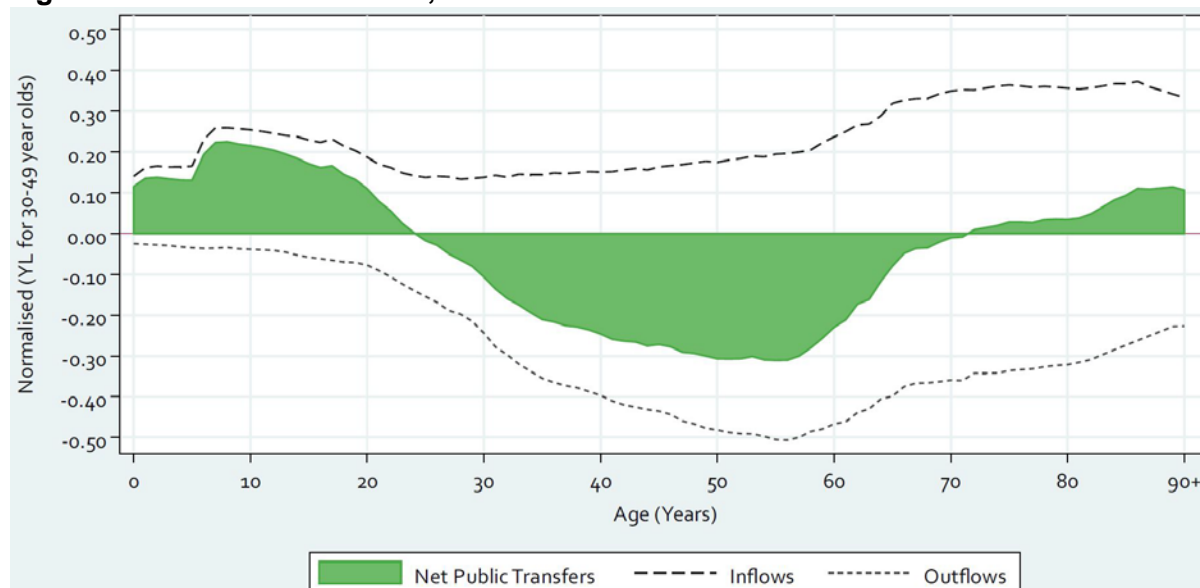
Taxes on capital, however, are quite different. NTA methodology assigns household-level asset income to household heads and, since household heads tend to be older than other household members, the age profile is skewed towards the right. Not all asset income is assigned to household heads, though, since some asset income categories (e.g. interest income) are reported at an individual level in the IES 2005/06. Tax on capital (or asset income) is very low for young people, only surpassing 2.5 percent of mean labour income amongst 30 to 49 year olds at age 29. However, from age 45 onwards, taxes on asset income are larger than those on both labour income and consumption and accounts for more than half of total taxes for individuals aged 58 and above. Indeed, for those aged 69 to 86 years, taxes on asset income account for 70 percent to 75 percent of total public transfer outflows.

Figure 8: Public Transfer Outflows, 2005

Source: Own calculations.

Total public transfer outflows peak in the fifties at more than 55 percent of mean labour income amongst 30 to 49 year olds. This peak is due to the fact that taxes on capital are nearing their peak, while taxes on labour have not yet begun their rapid decline. Up to the age of 20, total public transfer outflows are relatively low, but gradually increasing in line with the gradual rise in consumption. However, once labour income begins to pick up, taxes on labour rise quite rapidly, resulting in a rise in total public transfer outflows from 8.6 percent of mean labour income amongst 30 to 49 year olds at age 20 to over 40 percent by age 37. From there on, the rise in total public transfer outflows is essentially driven by the rise in taxes on asset income, while the decline after age 56 is largely the result of falling taxes on labour income until around age 70 and falling taxes on capital from around age 80.

Combining public transfer inflows and outflows yields net public transfers, the age profile of which is presented in Figure 9. Significant public transfer inflows at young ages, combined with low outflows, mean that net public transfers are positive until the mid-twenties. Very young children have relatively small net public transfer inflows due to the fact that South Africa does not have significant educational or childcare programmes targeted at children below the age of six years. Indeed, inflows at these young ages are essentially cash transfers from the state in the form of the various family allowances. Net public transfers peak at ages seven through 12, during which time they range between 20 percent and 23 percent of mean labour income amongst 30 to 49 year olds.

Figure 9: Net Public Transfers, 2005

Source: Own calculations.

At age 25, net public transfers become negative. The relatively rapid shift from net inflows to net outflows is the result of the decline in in-kind education transfers (an inflow) and the rise in outflows, driven primarily by taxes on labour. Normalised net outflows grow larger quite rapidly until the mid-thirties, breaching 21 percent at age 35, and more slowly thereafter. The largest normalised per capita net outflows are experienced by those in their fifties, with those aged 49 to 57 years typically experiencing net outflows of 30 percent. From the late fifties, however, falling taxes on labour combine with rising inflows to reduce the net public transfer outflow such that individuals aged 72 and above once again experience net public transfer inflows. Net inflows remain low throughout the seventies and into the early eighties, only surpassing five percent at 83 years, due to the existence of relatively large outflows associated with taxes on asset income. As these taxes fall, so the normalised net public transfer inflow for individuals in their eighties rises rapidly, although they barely reach half the peak net inflows recorded for children.

4.1.2 Private Transfers

There are two types of private transfers: inter-household transfers and intra-household transfers. Inter-household transfer inflows refer to all private transfers received by residents and include flows from other residents (i.e. domestic) and from non-residents (i.e. from the rest of the world). Similarly, inter-household transfer outflows include all private transfers made by residents, irrespective of whether the recipient is resident in the country or not. Net inter-household transfers are positive when inter-household transfer inflows are larger than outflows, and vice versa in the case of negative inter-household transfers.

Within the NTA framework, only current transfers are included. This means that inter-household transfers of a capital nature – bequests or dowries, for example – are excluded. Further, by not accounting for the value of time transfers, the value of transfers to children and the elderly is underestimated, as is the case for transfers from women.⁴ Within NTA, inter-household transfers involve only household heads. In other words, it is assumed that it is only household heads who make or receive inter-household transfers. Age-profiles are

⁴ These time transfers are often significant and may vary in response to country-specific conditions, with consequences for cross-country comparisons. The incorporation of time into the NTA methodology is an area of on-going research. Similarly, work is being done on how to account for capital transfers.

estimated directly from the IES 2005/06 and are aggregate-controlled using information on net private transfers from national accounts.

While private transfers from the rest of the world are small in most countries, in some instances they may be substantial. These remittances may be treated in one of two ways, depending on whether foreign workers are considered to be residents of the sending country. If they are, remittances are considered to be part of the labour income of the household in the sending country from where the worker originates as opposed to a transfer from the rest of the world. In the case of South Africa, which has historically received a large number of migrant workers from other countries, remittances sent and received are considered inter-household transfers. This is due to a lack of household survey data pertaining to the origin or destination of remittances received or sent.

In contrast “intra-household transfers are estimated indirectly as the balancing item between private consumption and disposable income . . . for each household member” (Mason and Lee, 2011a, p.72), with disposable income being labour income plus net private transfers plus public cash transfer inflows less taxes paid. Household members who are in deficit – their disposable income being less than their consumption – receive transfers from household members in surplus. However, in households where disposable income is insufficient to cover private consumption, household heads make “additional intra-household transfers out of asset income and, if necessary, by dissaving” (Mason and Lee, 2011a, p.72). Where disposable income at the household level exceeds private consumption, any surplus disposable income is transferred to the household head who saves it.

Since the household head owns all household assets within the NTA framework, all income generated by those assets flows to the head. Consumption of durables – including services from owner-occupied housing – by household members is, therefore, ‘funded’ by a transfer from the household head to each member equal to the value of that member’s durable consumption (Mason and Lee, 2011a, p.72). In most instances, however, data limitations mean that only owner-occupied housing is treated in this way, and this is also true for the South African estimates presented below.

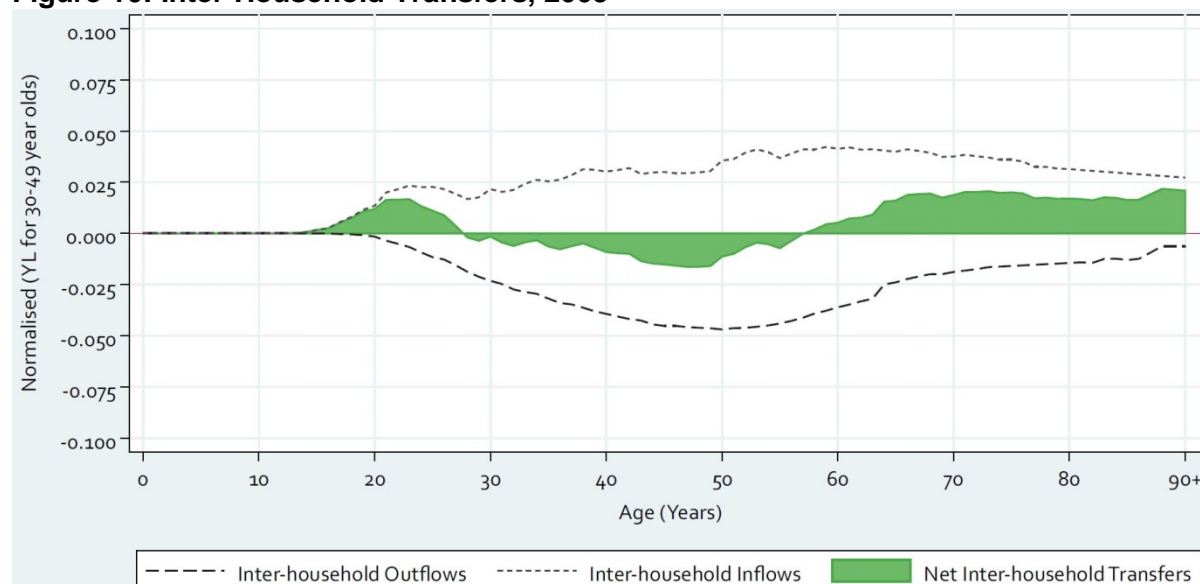
Net inter-household transfers – which is equal to net private transfers since net intra-household transfers are, by definition, equal to zero – are estimated at R1.8 billion. Although there is an aggregate control for net private transfers, this is not true of its component inflows and outflows. NTA methodology suggests three possible ways to adjust survey estimates of inter-household inflows and outflows to ensure that net private transfers remain equivalent to the aggregate control value. First, it is possible to apply a single adjustment factor to both inflows and outflows that will ensure consistency with the aggregate control value. Second, separate adjustment factors can be applied to inflows and outflows. Third, either inflows or outflows (but not both) can be adjusted to ensure consistency of net transfers with the aggregate control value. None of these three methods is better or worse than the others per se and the choice of which method to use should ideally be informed by knowledge of the data and local conditions. A key factor here is the degree to which the household survey data can be trusted. In the case of the IES 2005/06, specifically, most would agree that there are likely to be significant problems in the collection of this type of data. Further, given the fact that often significant adjustments are required to reconcile results from the survey with those from other data sources, there is no compelling reason to trust estimates of either inflows or outflows to such an extent that they are accepted and the other flow is subject to the full adjustment. In other words, the third option does not seem appropriate.

In deriving aggregate control values for inter-household transfer inflows and outflows for South Africa, the approach was to choose that method that resulted in the smallest adjustment. The first option yields an adjustment factor of -0.204, implying a massive adjustment in absolute terms as well as a change in directionality. This is due to the fact that

the aggregate control reflects a net inflow, while the survey estimates yield larger outflows than inflows. The second method yields far more plausible adjustment factors of 0.854 for outflows and 1.192 for inflows (i.e. a 14.6 percent downward adjustment of outflows and a 19.2 percent upward adjustment of inflows), and these adjustment factors are used to ensure net private transfers equal R1.8 billion.

Total inter-household transfer inflows are estimated at R32.8 billion, while outflows are estimated at R31.0 billion. These values are quite small, representing less than one-quarter of one percent of labour income. This small size is revealed in the necessity for a much larger scale in Figure 10, when compared with other flows, and the fact that at no point do per capita inflows or outflows exceed five percent of mean labour income amongst 30 to 49 year olds. The figure reveals that inter-household inflows are received by adults of all ages and, although this is technically true for outflows, mean outflows only breach 0.5 percent of mean labour income amongst 30 to 49 year olds at age 22. While inter-household transfer inflows rise relatively gradually from the early twenties to the late fifties, outflows rise more rapidly and peak around age 50.

Figure 10: Inter-Household Transfers, 2005



Source: Own calculations.

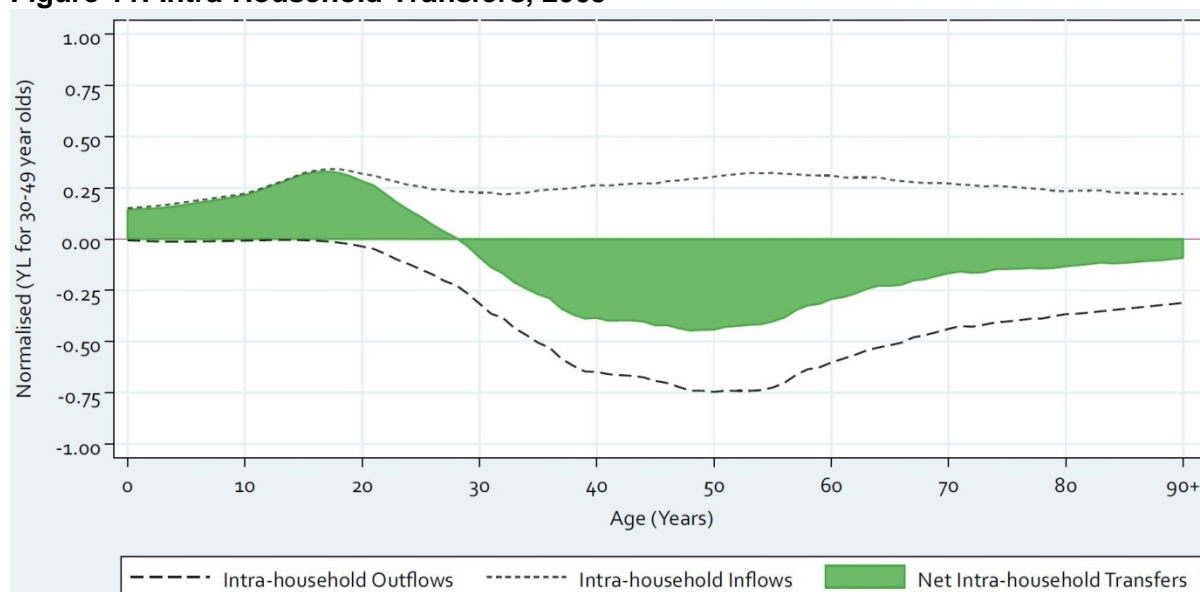
In combination, inter-household transfer in- and outflows result in a pattern of net inflows to those under the age of 28 years and to those over the age of 58 – in other words, the evidence indicates net flows from working age individuals to young adults and the elderly. Between these two ages, individuals experience net outflows that increase until the late forties. Peak net inflows amongst the young – just under 1.7 percent of mean labour income amongst 30 to 49 year olds in the early twenties – are quite similar in magnitude to those amongst older individuals. Thus, on average, inter-household transfers to elderly individuals are not very different in magnitude from those flowing to individuals between the ages of 21 and 23 years, despite the fact that outflows tend to be larger amongst older individuals.

Intra-household transfers are significantly greater than inter-household transfers, since the former represents the key channel through which private consumption by non-employed household members is likely to be financed. Indeed, intra-household transfer inflows (and outflows) are estimated at roughly R500 billion in 2005, equivalent to one-third of GDP. Intra-household inflows are relatively stable across ages, ranging between 15 percent and 34 percent of normalised labour income and between 22 percent and 34 percent for those aged at least 10 years (Figure 11). There are two peaks in inflows – one between ages 16 and 19

(with inflows equivalent to around one-third of normalised labour income), and between ages 53 and 55 (around 32 percent of normalised labour income) – while inflows to children are lowest.

In contrast, the variation in intra-household outflows is considerably larger. Until age 16, intra-household outflows are virtually unheard of and remain, for the most part, below one percent of normalised labour income. From around age 20, though, there is a rapid increase in the value of intra-household outflows such that, by age 42, per capita outflows average two-thirds of normalised labour income. The largest per capita outflows are generally found between the ages of 40 and 60 years, with a continual decline observed thereafter. This pattern is not inconsistent with expectations, since it is typically individuals in their forties and fifties who have the highest labour incomes.

Figure 11: Intra-Household Transfers, 2005



Source: Own calculations.

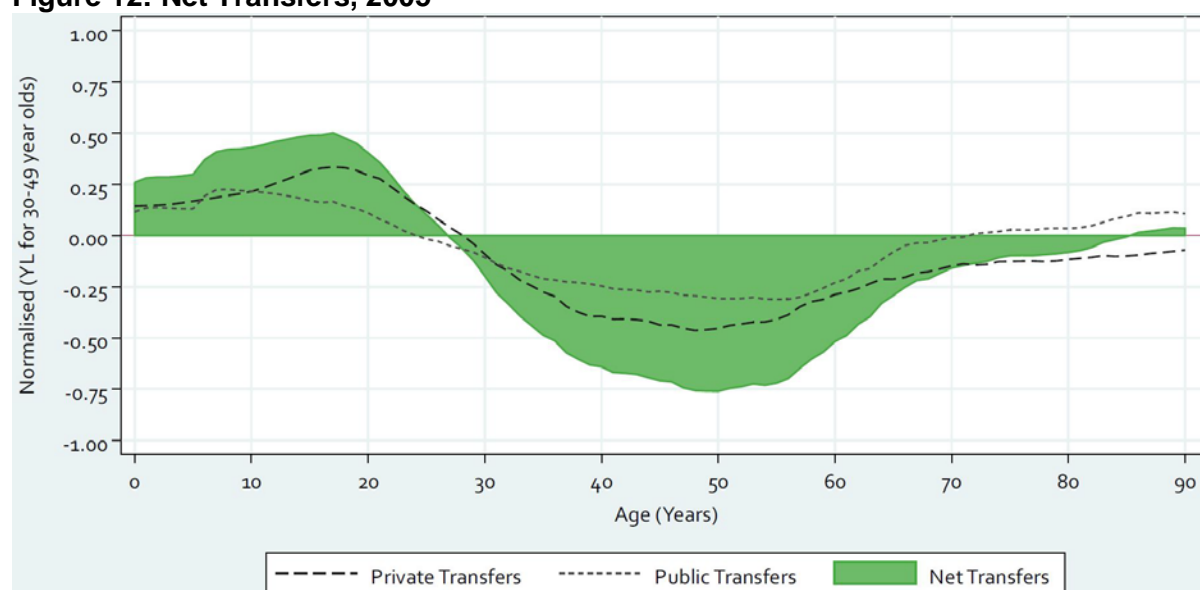
Net intra-household transfers are positive (i.e. inflows) for young people. That intra-household transfers remain positive until the age of 28 reveals a considerable dependence amongst young adults, whose labour income is relatively low compared with their consumption, on older adults. Indeed, the age at which intra-household transfers turn from positive to negative (29 years) is one year younger than the age at which individuals move into the period of lifecycle surplus. Individuals experience increasing net intra-household transfer outflows until the late forties, after which it declines. This decline is relatively rapid until around age 70, and slows thereafter. The figure, therefore, reveals two important features of the South African private transfer system: first, young adults are dependent on intra-household transfer inflows until a relatively old age; and, second, the elderly remain important sources of intra-household transfers and provide support to other household members right through to their nineties.

Given the very small size of inter-household transfers, net private transfers – as the combination of net inter- and intra-household transfers – is very similar to the latter. Net private transfers are positive until age 28, peaking at one-third of normalised labour income at age 17. Net private transfer outflows exist for all ages from 29 years and, at their peak, range between 40 percent and 47 percent of normalised labour income between the ages of 41 and 55 years. Amongst the elderly, net private transfer outflows are slightly reduced by the inter-household transfer inflows they receive.

4.1.3 Net Transfers

Net private transfers combine with net public transfers to form net transfers, the age profiles of which are presented in Figure 12. Net public and net private transfers follow similar patterns: positive at young ages, becoming negative for those in the prime working ages, with outflows peaking between 45 and 60 years of age and falling in size thereafter. There are, though, some important differences between the two sets of transfers. Net public transfers are generally smaller in magnitude than net private transfers, the only real exceptions being for those up to the age of 10 years and those in their late twenties. Further, although net public transfers turn from outflows to inflows amongst the elderly, net private transfers remain negative, indicating continued support of household members by the elderly.

Figure 12: Net Transfers, 2005



Source: Own calculations.

The age profile of net transfers, therefore, follows a broadly similar pattern to that of public and private transfers. Net transfer inflows rise from around 25 percent of normalised labour income at age zero to a peak of 50 percent at age 17. Thereafter, however, net transfer inflows decline rapidly, falling by more than five percent of normalised labour income per year of age until the age of 39 years. Transfers turn negative by the age of 27, with outflows largest amongst those between the ages of 48 and 50 years, during which time they are in excess of 75 percent of normalised labour income per capita. From age 56, however, per capita outflows decline rapidly, falling below 30 percent of normalised labour income by age 65. For those over the age of 65, there is a gradual decline in the magnitude of net transfer outflows, which eventually become net inflows from age 86 as net public transfer inflows continue to rise.

4.2 Asset-Based Reallocations

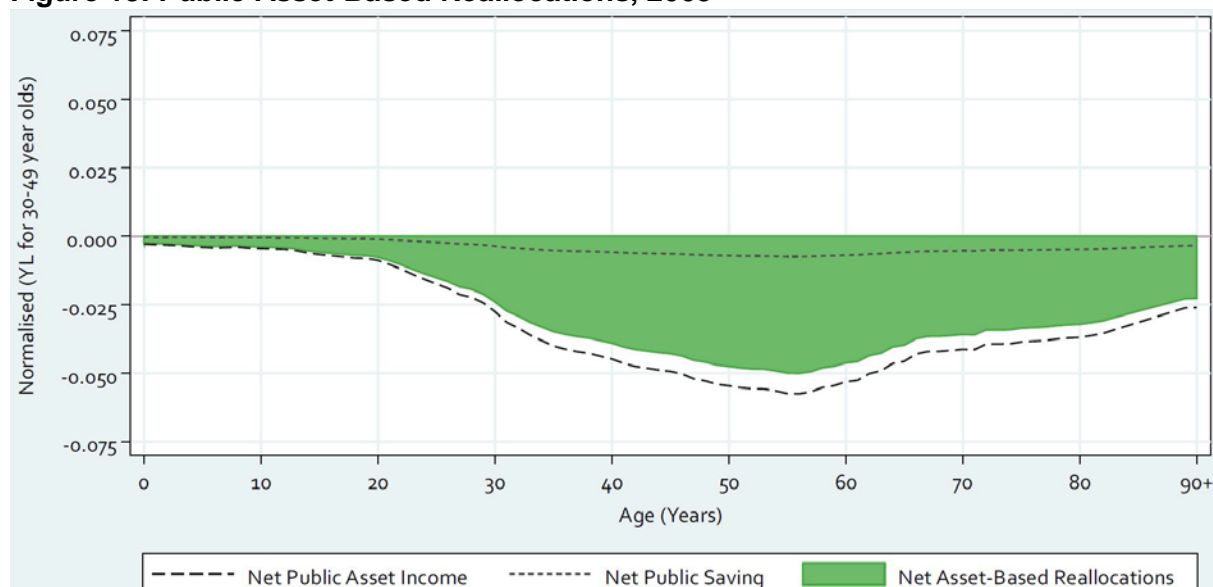
Asset-based reallocations are financial flows that arise from asset-related transactions, whether in the public or private sectors. The two main types of flows are asset income, consisting of capital income and property income, and saving. Capital income includes net operating surplus and capital's share of mixed income. Property income, as defined in national accounts, consists of "interest (income and expense), distributed income of corporations, reinvested earnings on direct foreign investment, property income attributed to

insurance policyholders, and rent (i.e. the return to land and subsoil assets)” (Mason and Lee, 2011a, p.70).

It should be noted that asset income is notoriously difficult to capture and there is significant under-reporting of asset income in the IES 2005/06. Total income from capital and property (asset income) captured in the IES 2005/06 is estimated at just R10.7 billion, compared with R244.8 billion as recorded in the national accounts (Statistics South Africa, 2008c, p.12). Unless this under-capturing is random across age, the resulting age profiles generated here will be distorted. Unfortunately, though, there is no readily available alternative data source with which to corroborate, supplement or replace the IES data.

Public asset-based reallocations refer to the inflows and outflows that result from transactions relating to public assets and can be categorised into two types of flows: public asset income and public saving (Mason and Lee, 2011a, p.69). If public asset income is positive, it represents an inflow to taxpayers, while positive public savings represent outflows from taxpayers. Mathematically, public asset-based reallocations are calculated as public asset income less public saving. Flows relating to public assets are allocated to across age groups using general tax age profiles. This means that the profiles of earmarked taxes are ignored. As Mason and Lee (2011a, p.70) note, this approach is motivated on the basis of a counterfactual: “[in] the absence of public asset income or public borrowing, general tax revenues would have been greater (given public spending) . . . [and therefore] the asset-based inflow is allocated to age groups in proportion to the general taxes they pay”.

Age profiles of net public asset income, net public saving and net public asset-based reallocations are presented in Figure 13. Due to public sector dissaving in 2005, the net public saving age profile lies below the horizontal axis. However, on a per capita basis this dissaving is very small and rarely exceeds 0.7 percent of normalised labour income. Since saving is distributed across age using the general tax profile, the largest per capita flows are observed for those in their mid-fifties. Net public asset income was more strongly negative, but still small relative to other flows. Net public asset income outflows only breached three percent of normalised labour income at age 31 and peak at just under 5.8 percent in the mid-fifties. Thereafter, it declines again to below four percent of normalised labour income by age 81. Net public asset-based reallocations follow a very similar pattern to net public asset income, although it peaked roughly 15 percent lower than the latter due to the effect of public dissaving.

Figure 13: Public Asset-Based Reallocations, 2005

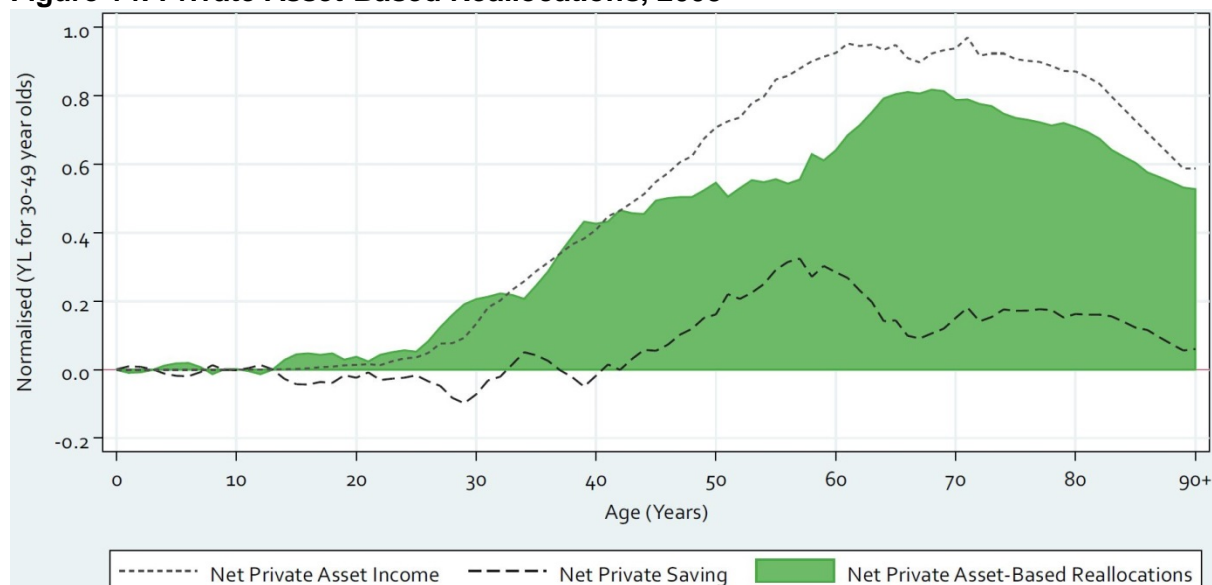
Source: Own calculations.

Private asset income consists of capital income and property income. Private capital income represents the return to private capital (i.e. held by corporations and households) and consists of corporations' and households' operating surplus and the portion of mixed income attributable to capital (Mason and Lee, 2011a, p.74). Flows generated by financial assets comprise property income, with interest, dividends and rent (for land or minerals) being some of the major examples.

The age profile of private asset income is derived through a process of aggregating the age profiles of its components, since each component may have a different age profile. In line with NTA methodology, the aggregate amounts were allocated across age groups using the following age profiles:

- Net operating surplus of households: age profile of imputed rent;
- Capital's share of net mixed income: age profile of self-employment earnings;
- Net operating surplus of corporations and NPISHs: age profile of property income;
- Indirect taxes less subsidies: age profile of property income;
- Interest outflows of households: age profile of interest expense;
- Other private interest outflows: age profile of property income;
- Other property income outflows: age profile of property income; and
- Property income inflows: age profile of property income.

Aggregated, these various age profiles yield the net private asset income age profile presented in Figure 14. It is evident that asset income is substantial at certain ages. While net private asset income is very low until the early twenties, only breaching three percent of normalised labour income at age 24, it rises consistently to breach 90 percent of normalised labour income by age 58. It remains above that level until age 76, after which it declines.

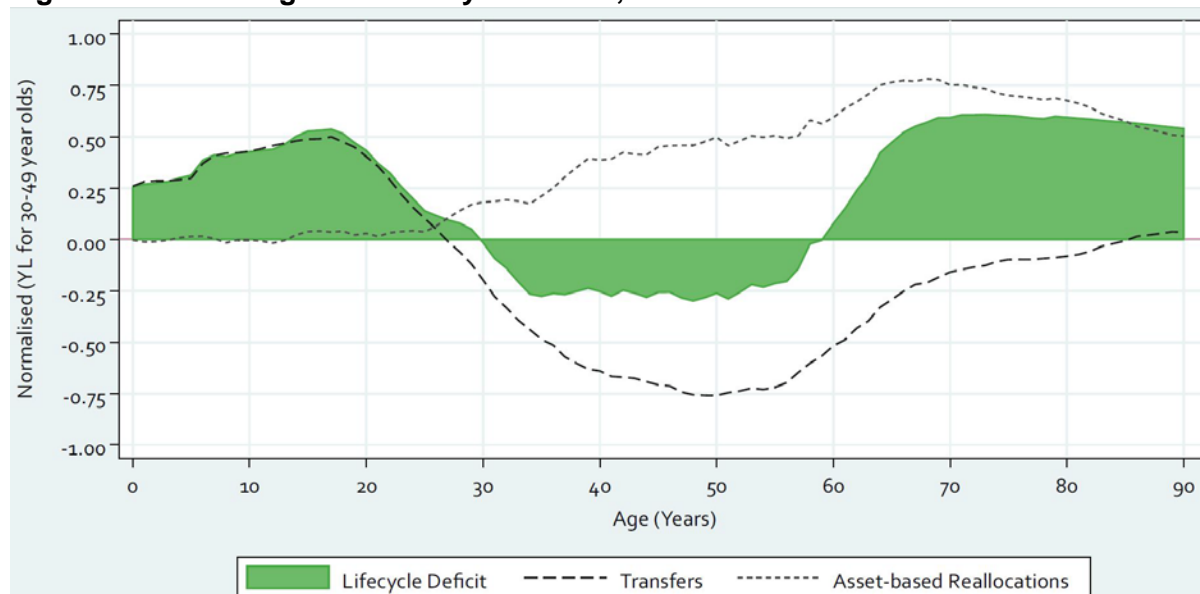
Figure 14: Private Asset-Based Reallocations, 2005

Source: Own calculations.

Private saving is calculated as a residual in order that the accounts balance, in the same way that it is a balancing item in national accounts (Mason and Lee, 2011a, p.75). Private saving inflows can be generated by going into debt or by selling assets, while the repayment of debt or acquisition of assets results in private saving outflows. In terms of the NTA methodology, private saving is calculated at each age, using the NTA identity, as the lifecycle deficit less net transfers less net public asset-based reallocations less net private asset income. The age profile for net private saving shows some instability at young ages, although it tends to be negative (dissaving) until the age of 32 years. Thereafter, net private saving tends to be positive and peaks above 25 percent of normalised labour income between the ages of 54 and 61 years. While net savings declines relatively quickly until the mid-sixties, it remains positive and between ten percent and 18 percent of normalised labour income until the mid-eighties.

4.3 Financing the Deficit at Different Ages

Transfers and asset-based reallocations are the means through which lifecycle deficits are financed. Amongst children and young adults, the lifecycle deficit is financed almost exclusively through net transfer inflows from the state, other households and from within their own households (Figure 15). Asset-based reallocations play a very small role, particularly for those children not yet in their mid-teens. From the mid- to late-twenties, asset-based reallocations surpass transfer inflows in importance, and net transfers quickly turn negative. For adults and the elderly, asset-based reallocations are positive, while net transfers are negative and it is only the magnitudes of these two flows that vary.

Figure 15: Financing of the Lifecycle Deficit, 2005

Source: Own calculations.

Table 2 provides more detail on the financing of the lifecycle deficit and quantifies the Rand values of the aggregate NTA flows. The lifecycle deficit is estimated at R336.4 billion in 2005 for the population as a whole. The deficit is almost entirely financed through asset-based real-locations, estimated at R352.0 billion, with there being a slight net transfer outflow (to the rest of the world) of R15.7 billion. On their own, cohorts aged zero through 19 years account for the full lifecycle deficit, with deficits balancing surpluses in the rest of the population. Roughly three-fifths (60.8 percent) of labour income is earned by individuals aged 30 to 49 years, with just under 22 percent earned by 50 to 64 year olds and 16.2 percent earned by 20 to 29 year olds. As a result, a lifecycle surplus of R110.6 billion is generated by the 30 to 49 year cohort.

Although asset-based reallocation on their own essentially finance the entire aggregate lifecycle deficit, there are significant differences across the five cohorts presented in the table. For the youngest cohort, net transfer inflows finance 98 percent of the lifecycle deficit. Of the R331.6 net transfer inflows, private transfers account for around 57 percent. Amongst 20 to 29 year olds, asset-based reallocations are somewhat more important and represent 30 percent of the lifecycle deficit. Net public transfers are negligible for this cohort, accounting for less than five percent of net transfers. Asset-based reallocations, though, really take on importance for the oldest three cohorts as private asset-based reallocations rise dramatically. Total asset-based reallocations for 30 to 49 year olds are, in absolute terms, almost equivalent to the net private transfer outflow, while for 50 to 64 year olds they exceed the net private transfer outflow by roughly 50 percent. For the latter cohort, asset-based reallocations almost balance net transfers, resulting in a small lifecycle surplus of R17.3 billion.

Table 2: Financing the Lifecycle Deficit, 2005 (R billions)

Component	Total	0-19 years	20-29 years	30-49 years	50-64 years	65+ years
Lifecycle Deficit	336.4	338.2	80.0	-110.6	-17.3	46.0
...Consumption	1126.5	342.2	207.9	369.7	154.3	52.5
...Less: Labour Income	790.1	3.9	127.9	480.3	171.6	6.5
Transfers	-15.7	331.6	56.1	-266.8	-123.7	-12.9
...Public Transfers	-17.5	141.9	2.7	-108.8	-52.7	-0.5
.....Inflows	376.2	177.7	55.9	74.1	40.7	27.8
.....Outflows	-393.6	-35.9	-53.2	-182.9	-93.4	-28.2
...Private Transfers	1.8	189.7	53.4	-158.0	-71.0	-12.4
.....Inter-Household Transfers	1.8	1.2	3.6	-4.2	-0.3	1.5
.....Intra-Household Transfers	0.0	188.5	49.8	-153.7	-70.7	-13.9
Asset-Based Reallocations (ABR)	352.0	6.7	23.9	156.2	106.4	58.8
...Private ABR	391.0	10.3	29.2	174.2	115.7	61.7
.....Private Asset Income	436.5	1.5	15.2	183.7	163.3	72.8
.....Private Saving	-45.6	8.8	13.9	-9.5	-47.7	-11.1
...Public ABR	-38.9	-3.6	-5.2	-18.0	-9.3	-2.8
.....Public Asset Income	-44.7	-4.1	-6.0	-20.7	-10.6	-3.2
.....Public Saving	5.8	0.5	0.8	2.7	1.4	0.4

Source: Own calculations.

Notes: Savings are negative values in the table since saving represents an outflow from a particular individual. Conversely, dissaving is positive (i.e. an inflow).

The data presented in Table 2 can be expressed slightly differently, with a focus on the financing of consumption as opposed to the lifecycle deficit. In Table 3, the contributions of labour income, transfers and asset-based reallocations to the financing of consumption are presented for the five cohorts. In aggregate, labour income and asset-based reallocations are equivalent to 70.1 percent and 31.3 percent respectively of consumption, with net transfer outflows equivalent to 1.4 percent of consumption.

The table again illustrates the shift in importance from transfers, to labour income, to asset-based reallocations as cohorts age. Transfers are key to financing consumption amongst the youngest members of society. Amongst those under the age of 20 years, transfers account for 96.9 percent of consumption and they remain important for 20 to 29 year olds (27.0 percent of consumption) despite the fact that individuals in this age group are earning a significant amount of labour income. Labour income's importance is greatest amongst those between 30 and 64, representing 129.9 percent of consumption amongst 30 to 49 year olds and 111.2 percent amongst 50 to 64 year olds. Finally, asset-based reallocations assume increasing importance as age increases, accounting for 42.2 percent of consumption amongst 30 to 49 year olds, rising to 112.1 percent of consumption amongst individuals aged 65 years or more.

Table 3: Financing Consumption, 2005 (percent)

Age Group	Labour Income	Transfers	Public Transfers	Private Transfers	Asset-Based Reallocations
0 to 19 years	1.1	96.9	41.5	55.4	1.9
20 to 29 years	61.5	27	1.3	25.7	11.5
30 to 49 years	129.9	-72.2	-29.4	-42.7	42.2
50 to 64 years	111.2	-80.2	-34.2	-46	69
65+ years	12.4	-24.6	-0.9	-23.7	112.1
Total	70.1	-1.4	-1.6	0.2	31.3

Source: Own calculations.

Notes: Shares may not add up to 100 in rows due to rounding.

For all cohorts, public and private transfers operate in the same direction and public transfers are smaller than private transfers. For the two youngest cohorts, net public and net private transfers are positive, while for the oldest three cohorts they are negative. The difference between net public and net private transfers is greatest for the cohorts aged 20 to 29 years and those aged 65 years or more. For the former, rising labour income and declining involvement in education result in a rapid fall in public transfers to just 1.3 percent of consumption, while private transfers decline less rapidly. For those aged 65 years or more, lowered labour income puts downward pressure on public transfer outflows, with this cohort also receiving greater public transfer inflows in the form of public health consumption and social security (the old age pension).

Families and other social networks are, therefore, key to financing consumption (or the lifecycle deficit) over the lifecycle. Indeed, for cohorts with net transfer inflows, private transfer inflows are significantly greater than those from the public sector. Although this is not surprising – households are by far the most significant institution through which the needs of children are met – it is interesting that young adults (20 to 29 years) experience both almost neutral public transfers in aggregate, and significant private transfers. This may be related to the fact that labour income accounts for a relatively small proportion of consumption for young adults, due in large part to the high rates of unemployment experienced by this age group. Using a simple average of per capita labour income and per capita consumption for the individual age cohorts between the ages of 20 and 29 years, South Africa has the third lowest ratio of labour income to consumption of the countries for which there is data (63.1 percent). Only Nigeria (38.0 percent) and Senegal (58.9 percent) have lower ratios, while Mexico (65.7 percent) and Brazil (72.3 percent) are the next closest countries to South Africa.

5. MAXIMISING SOUTH AFRICA'S DEMOGRAPHIC DIVIDENDS

5.1 South Africa's Demographic Dividends

The demographic transition – from an equilibrium characterised by high fertility and high mortality, to one characterised by low fertility and low mortality – has important economic consequences. In the initial stages of the demographic transition, mortality falls first, particularly amongst children. This results in a 'boom' generation and a surge in the population growth rate as parents take time to adjust their fertility decisions and populations become younger on average. However, once parents adjust their fertility decisions, fertility falls and the population growth rate declines again.

The early stages of the transition sees an increase in the number of dependent children and, therefore, a rise in the child dependency ratio (the ratio of dependent children to working-age

adults). During this time, working-age adults face increased demands on the resources that they are able to generate through their labour. Over time, however, as these large cohorts of children enter the working ages and fertility begins to decline, the working-age population grows as a proportion of the total population. This begins to free up resources, allowing for greater investment in human, physical and financial capital. The final stage of this transition includes a surge in the size of the elderly population as large cohorts reach retirement age, forcing up the old-age dependency ratio. Ideally, by this stage, a sustainable way of financing the consumption of the elderly – for example, individual retirement savings – has been established.

The demographic transition can boost economic growth in two key ways. The first boost to economic growth occurs as the dependency ratio begins to fall as fertility declines and the working-age population grows as a share of the total population. The decline in the average number of children per working-age adult is associated with a freeing up of resources that would previously have been consumed by additional children, allowing living standards to rise. As Bloom et al. (2003, p.xi) put it, “if most of a nation’s population falls within the working ages, the added productivity of this group can produce a ‘demographic dividend’ of economic growth, assuming that policies to take advantage of this are in place”. This is the first demographic dividend.

The second way in which economic growth may be boosted by the demographic transition – the second demographic dividend – is associated with the phase of population ageing. Rising life expectancy results in increased demand for wealth: working-age cohorts increasingly accumulate wealth to support themselves during old age, a process facilitated by lowered fertility. At the same time, with fewer children, working-age cohorts are able to invest more in the education and health of their offspring. This accumulation of financial and human capital, through capital deepening and higher incomes, may permanently boost economic growth.

One of the important summary measures in NTA is the support ratio, defined as the ratio of total labour income to total consumption for a given year. The support ratio (SR) is calculated as:

$$SR_t = \frac{\sum_a yl(a, t_0) N(a, t)}{\sum_a c(a, t_0) N(a, t)} \quad (2)$$

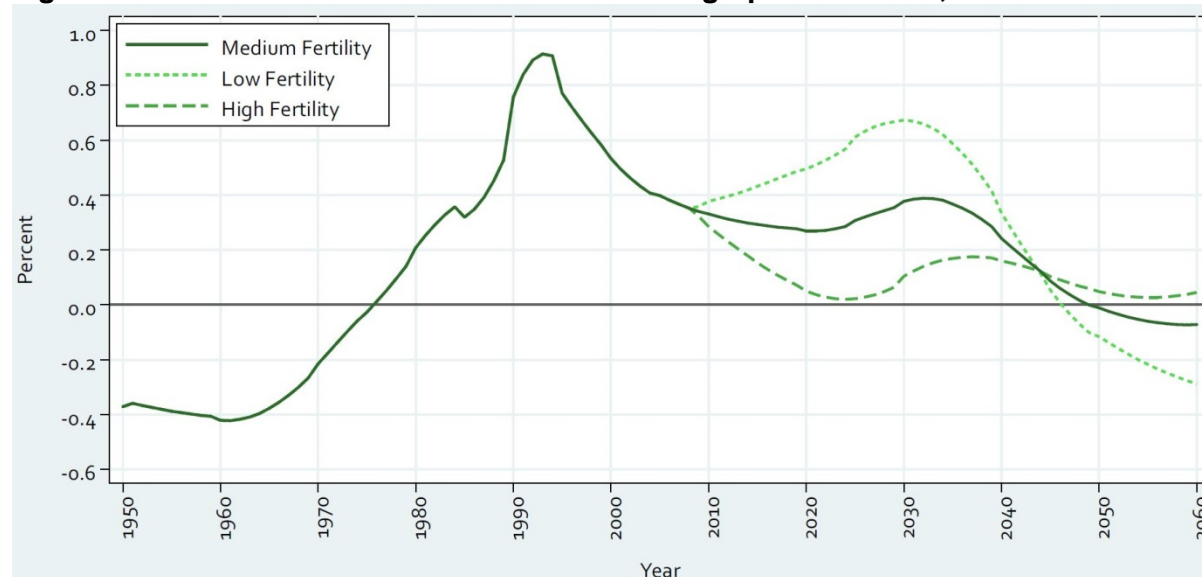
where $yl(a, t)$ and $c(a, t_0)$ are respectively the per capita labour income and consumption age profiles in base year t_0 , and $N(a, t)$ is historical or projected population data. In other words, the support ratio weights alternative age structures using the labour income and consumption age profiles, and represents the ratio of effective producers to effective consumers. The greater the support ratio, the higher total labour income is to total consumption, or the higher the number of effective producers is to effective consumers. By measuring the rate of change of the support ratio over time, it is possible to quantify the first demographic dividend.

There is one key assumption that is made when calculating the support ratio and first demographic dividend and it has important implications for our understanding of the two measures. The support ratio is calculated by projecting the labour income and consumption age profiles from a single point in time. In other words, the support ratio and first demographic dividend are estimated based on the assumption that the patterns of labour income and consumption observed at that point in time are ‘typical’ and unchanging over time. This means, in the context of labour income for example, that the structure of remuneration in an economy does not change systematically over the period, that labour force participation rates by age do not change and that unemployment rates do not change. From the perspective of consumption, it assumes constant consumption patterns insofar as

they affect our estimates of consumption, but also that the institutional context does not change over time. These are rather strong assumptions, but they can be mediated, in time, by including new estimates of labour income and consumption age profiles from other years.

In Figure 16, estimates of the size of South Africa's first demographic dividend are presented based on the estimated labour income and consumption age profiles for 2005. The projected trajectories of the first dividend until 2060 under three fertility assumptions – low, medium and high fertility – is also presented. South Africa is projected to experience a period of roughly 75 years during which demographic change will be favourable to economic growth. This first demographic dividend is estimated to have begun during the mid-1970s and is expected to continue until at least the mid-2040s. The dividend is, however, not constant over the period, the result of demographic idiosyncrasies not least of which is the impact of HIV/Aids. During the first roughly three decades of the first demographic dividend, the boost to economic growth rises rapidly, peaking around 0.9 percentage points in the early 1990s. However, it does not remain at the level long, initially falling rapidly and then more slowly. Based on the medium fertility assumption, the size of the first dividend will continue to decline until the early part of the 2020s, at which point it will again increase to just under 0.4 percentage points in the following decade.

Figure 16: Estimates of South Africa's First Demographic Dividend, 1950-2060



Source: Own calculations.

This late surge in the size of the first dividend is associated with the impact of HIV/Aids, which has severely impacted South Africa. The rapid spread of the disease in South Africa means that the country has the third highest prevalence of HIV in the world (11 087 per 100 000 in 2011) and the largest population living with HIV (5.6 million in 2011), and has seen life expectancy lowered by five years to 58 years between 1990 and 2011 (World Health Organization, 2013). The spread of HIV/Aids has primarily been amongst cohorts of working age and evidence points to particularly high prevalence rates amongst women between the ages of 20 and 40 years, and men between 30 and 44 years (although prevalence rates are generally lower amongst men). The result is a reduction in the size of the working age cohorts – adults aged 20 to 49 years accounted for 50 percent of all deaths in Southern Africa during the 2005-2010 period, compared with 21 percent in 1985-1990 (UN, Department of Economic and Social Affairs, Population Division, 2011, p.20) – a rise in the dependency ratio and a decline in the support ratio as the number of effective earners declines faster than the number of effective consumers. At the same time, population growth slowed with downward pressure on the number of women of childbearing age within the population, as well as increased infant and child mortality related to mother-to-child

transmission of HIV. Mother-to-child transmission of HIV has, though, been significantly reduced through interventions including the provision of free anti-retrovirals by the state. The effect of the pandemic, then, is to depress the support ratio by reducing the size of the working-age population but then, later, to boost the support ratio by slowing the growth of the elderly population as the cohorts most affected by the pandemic reach old age.

The importance of declining fertility in generating the demographic dividend is also evident in Figure 16. The low and high fertility assumptions differ by 0.5 children respectively below and above the baseline medium fertility assumption. More rapid fertility decline is associated with a larger first dividend that ends slightly sooner than that under the medium fertility assumption, while slower fertility decline reduces the dividend significantly.

5.2 Maximising the Dividends

Under the medium fertility assumption, South Africa is currently almost exactly halfway through the period of positive first demographic dividend, estimated to have started in the mid-1970s. Further, apart from an expected surge in the size of the dividend in the early 2030s, the size of the dividend over the next 30-odd years is likely to be smaller than it is currently, which itself is less than half the peak in the early 1990s. In other words, unlike most other African countries, the policy question in South Africa is not what should be done to maximise a coming, future dividend; instead, the question in South Africa is what can be done within a relatively short timescale to boost the size of the dividend in its final three decades. Perhaps more importantly, what should be done now to ensure that South African society is able to benefit from the second dividend as its population begins to age.

In order to answer this question, the channels through which the demographic dividends are generated need to be identified and, in particular, those channels that have relatively short lags. From a non-NTA perspective, Bloom et al. (2003, p.39) identify labour supply, savings and human capital as the most important channels through which the demographic dividend is realised. In terms of policy that aims to maximise the demographic dividend, these are broadened and discussed below as policies that operate through the labour market, through economic policy and through social policy.

5.2.1 Through the Labour Market

The performance of the labour market is central to the understanding and interpretation of the first demographic dividend. The estimation of the dividend assumes that the patterns of labour income and consumption remain constant over the period under investigation. Since the labour income profile is the outcome of the interaction between age-specific employment rates and patterns of mean remuneration levels, the extent to which the first demographic dividend is realised depends on future labour market performance. Any deterioration in labour market conditions relative to those in the base year would reduce the actual size of the first demographic dividend. Conversely, any improvement within the labour market could potentially boost the dividend.

The South African labour market remains distorted by the effects of apartheid, two decades after the advent of democracy. Inequalities in the provision of education by race group – in both quality and quantity terms – has resulted in a skewed distribution of skills in favour of the White, and to a lesser extent, Asian minorities. At the same time, the growth path followed by the economy for much of the past four decades has been capital- and skills-intensive. As a result, demand for less-skilled workers has declined, while high-skilled workers remain scarce. This mismatch between labour supply and demand is most starkly illustrated in unemployment rates by educational attainment: in 2013, the expanded unemployment rate, which includes both the searching and the non-searching unemployed, for those with only an incomplete secondary education is seven times that of those with

university degrees (42.5 percent as opposed to 6.0 percent) (own calculations, Statistics South Africa, 2013).

The skills mismatch exists alongside significant youth unemployment, with unemployment amongst 15 to 24 year olds estimated at 63.4 percent in 2013, and 37.4 percent amongst 25 to 34 year olds. High rates of unemployment amongst younger cohorts was offered as an explanation for the late rise in labour income in South Africa and the late transition to surplus. An extended period of economic dependence amongst young people is an immediate concern in terms of the additional burden placed on older cohorts, directly as the source of private transfers and indirectly as the ultimate source of public transfers. It also represents a longer-term concern through the 'wage scar' that youth unemployment may cause. Although no estimates of a youth unemployment wage scar exist for South Africa, Gregg and Tominey (2004, p.2), for example, find that youth unemployment imposes a wage scar of around 12 percent to 15 percent at age 42 in Great Britain, although it is lower if repeat unemployment spells are avoided. Youth unemployment, therefore, negatively impacts future earnings potential, constraining the ability of prime working cohorts to generate sufficient future surpluses and limiting the scope for saving and making transfers to other cohorts.

Bloom et al. (2003, p.39) argue that labour supply is one of the channels through which the demographic dividend is realised, noting that the demographic transition increases the supply of labour through the entry of larger cohorts into the labour force and through increased participation amongst women. The South African experience is consistent with this. Since the 1970s, the working-age population has been growing more rapidly than the total population, the difference being the largest during the early 1990s. However, it was only after the removal of apartheid restrictions on the labour market and on the ability of all South Africans to move freely within the country's borders that the full effect of the female labour supply response became evident, to the extent that one of the defining features of the South African labour market during the first decade of democracy has been the feminisation of the labour force (Casale and Posel, 2002). Unfortunately, however, rapid growth in the labour force was not consistently met by similar growth in employment. At the same time it should be noted that labour force participation rates in South Africa are not particularly high – around 61.5 percent including the non-searching unemployed – and there exists scope for further significant increases in labour supply in the future.

The labour market is a critical area in terms of government policy in South Africa, particularly given its centrality to the poverty and inequality challenges the country faces, and it is widely recognised that the economy's current growth trajectory must change if unemployment is to be addressed. Specifically, the consensus is that it is critical that the economy follow a more labour-intensive and a more unskilled-labour intensive growth path. In other words, the economy should grow in a way that is consistent with our large supply of relatively unskilled labour.

Various objectives contained within South Africa's National Development Plan (NDP) (National Planning Commission, 2011) relate to the ideas of increased labour supply and higher levels of employment, both of which are consistent with realising the demographic dividends. Indeed, the NDP notes that South Africa is currently in that stage of the demographic transition when the demographic dividend is available, but notes that this is constrained by "the challenges of HIV/AIDS and joblessness [that] are a burden on those who are working" (National Planning Commission, 2011, p.78). The plan envisages, for example, a decline in the unemployment rate from 25 percent in 2012 to six percent in 2030, rising employment rates in both urban and rural areas, an 11 percentage point increase in labour force participation to 65 percent in 2030, and an expansion of public employment programmes to reach one million people by 2015 and two million by 2030. Similarly, the New Growth Path, developed by the Department of Economic Development, aims to create five

million jobs in the decade up till 2020 (EDD, 2011). One of the channels through which it aims to achieve this is by promoting more labour-intensive activities, particularly in the agricultural and mining value chains, manufacturing and services. Significant progress towards these objectives would certainly improve the country's ability to capture the demographic dividend.

Importantly, though, policy in this area must have a particular focus on young people, who are suffering the brunt of unemployment. Not only must the economy grow in such a way as to increase the total number of jobs, but the ability of young people to access these jobs needs to be enhanced. This might occur through a variety of interventions relating to education, the development of soft skills, practical training and work experience, and addressing spatial dislocations and public transport, amongst others. Importantly, the movement of young people from the education system into the world of work requires facilitation, particularly given the fact that there are substantial numbers that exit the schooling system prior to completing secondary education and the economy is simply not geared towards providing large-scale employment opportunities at this, or even completed secondary, level.

5.2.2 Through economic policy

Economic policy is obviously a very broad area of policy, including monetary and fiscal policy, trade and industrial policy, and infrastructural policy, amongst others. The key focus on economic policy hinges on its links to the labour market. Economic policy should drive growth, seeking to resolve the binding constraints that limit South Africa's growth potential. Although since overtaken by more recent policy frameworks, the Accelerated and Shared Growth Initiative for South Africa (AsgiSA) identified six binding constraints on economic growth that remain pertinent, namely: volatility and level of the currency; the cost, efficiency and capacity of the national logistics system; shortages of suitably skilled labour, amplified by the impact of apartheid spatial patterns on the cost of labour; barriers to entry, limits to competition and limited new investment opportunities; regulatory environment and the burden on small and medium businesses; and deficiencies in state organisation, capacity and leadership (Republic of South Africa, 2006, pp.4-5).

One of the major new policy directions – with very direct links to national transfer accounts – is the future introduction of mandated savings for all working individuals, while the state provides measures that make pensions safe and sustainable. By ensuring that the employed save for retirement, the state can reduce future reliance on the state old age pension system, while also potentially relieving pressure on households by reducing the need for private transfers to finance the consumption of the elderly. South Africans are notoriously bad 'savers' – the gross savings rate has averaged 15 percent of GDP between 2003 and 2012 (own calculations, South African Reserve Bank, 2013) – and, in the absence of mandatory retirement savings, voluntary savings are vulnerable as workers change jobs and access their retirement savings. Mandatory retirement savings should certainly boost the overall level of savings in the economy, with a positive impact on the size of the second demographic dividend.

However, once again, employment is central to the achievement of this objective. Without jobs today, working-age cohorts are unable to save for tomorrow, while wage scarring in response to episodes of youth unemployment will have a long term impact on the amount that can be saved. More broadly though, government should promote an environment that encourages saving, through economic policy as well as by attempting to shift societal norms to place greater importance on saving as opposed to the 'conspicuous consumption' that has proliferated since the end of apartheid.

5.2.3 Through social policy

Education, health and social welfare are three facets of social policy that may potentially be employed to better reap the potential benefits presented by the demographic dividend. A fourth area with particular relevance in the South African is the provision of assets in the form of formal housing, connections to water and electricity networks, sanitation, refuse removal and other such services.

In the arena of social service provision, South Africa has long been characterised by a fractured delivery system. Under apartheid, separate government departments delivered education and health services depending on race and location. Thus, for example, by the early 1990s, there were 14 government departments responsible for education in South Africa. While these departments were incorporated into single national departments post-1994, there is still some degree of fracturing in that provincial governments are responsible for social service delivery in (non-university) education and health.

One of the central problems affecting education and health is the uneven standard of service delivery, with wide variation in quality and performance across provinces. Just as important, though, is the fact that provinces face widely varying initial conditions, with some provinces particularly burdened by the dysfunctional departments inherited from the previous political system and, at the same time, often having to provide services to some of the country's poorest, most deprived and least urbanised areas. One of the responses has been to provide more funding per capita in poorer areas. In terms of education, for example, state subsidies per pupil are calculated using a sliding scale with schools in the most deprived areas (based on Census data) receiving the largest per capita subsidy.

The process of equalisation of spending across race groups – or, rather, the delinking of per capita spending levels from race – has often fuelled perceptions of falling quality in the public health and education systems. Those who can afford to move to private sector provision of healthcare, in particular, have tended to do so. The private healthcare system in South Africa is well-resourced, but covers only a fraction of the country's population. It is estimated that approximately 17 percent of South Africans are covered by private medical schemes, while almost 30 percent of South Africans report using private healthcare services at the time of their last visit (Blecher et al., 2011, p.32). At the same time, Blecher et al. (2011, p.33) estimate that, at the time, private financing accounted for roughly half of total health spending since the 2008/09 fiscal year.

The South African social security system is relatively well developed compared to other African countries and developing countries in general. The system consists primarily of social welfare programmes, rather than social insurance, and has been expanded significantly over the past two decades. The social grants system is extensive, with 16.1 million grant beneficiaries in March 2013 and is focussed on alleviating poverty amongst children and the elderly. The largest grants in terms of the number beneficiaries are the child support grant (CSG), with 11.3 million beneficiaries in March 2013, the old age pension (OAP), with 2.9 million beneficiaries, and the disability grant, with just under 1.2 million beneficiaries (SASSA, 2013). These three grants account for 95.5 percent of all grants paid by the state.⁵

The extent of the system, high access rates amongst the targeted populations and the relatively high value of particularly the old age pension means that the system is able to

⁵ The system has expanded rapidly since the mid-1990s and continues to be extended. Since the 2005/06 financial year, the total number of beneficiaries has increased by nearly 50 percent from 10.9 million, driven primarily by the CSG (+4.3 million) and, to a lesser extent, by the OAP (+0.7 million) (own calculations, National Treasury, 2009; SASSA, 2013).

make a significant impact on poverty. For example, based on data from the 2008/2009 Living Conditions Survey, it is estimated that the old age pension alone reduced the poverty headcount ratio by four percentage points, as well as lowering the poverty gap and squared poverty gap measures (own calculations, Statistics South Africa, 2012b).

Since the mid-1990s, significant resources and effort have been targeted at improving living conditions amongst the poor. The removal of restrictions on geographic mobility within South Africa and the opening up of urban job markets resulted in a significant urbanisation trend. Local governments have typically been unprepared for the extent of population growth in urban areas and, as a result, informal settlements – referred to in other countries as shanty towns – are a common feature of the local urban landscape. Government policy has, therefore, focussed on the provision of low-cost housing, the connection of households to the electricity grid, the provision of clean water and sanitation, amongst other things. While significant challenges remain, important strides have been made. For example, it is estimated that 77.6 percent of South African households reside in formal dwellings in 2011 (58.1 percent in 1996), 91.2 percent have access to piped water (80.5 percent in 1996), 94.8 percent have access to a toilet facility (87.6 percent in 1996), while 84.7 percent have access to electricity for lighting (58.2 percent in 1996) (Statistics South Africa, 2005, 2012a). All of these improvements are either direct investments in human capital, or improve the effectiveness of other human capital investments.

A key policy area in thinking about the demographic dividend is certainly education, since it is argued that the decline in fertility that occurs during the demographic transition allows for greater human capital investment. Education continues to be a vexing policy challenge in South Africa. At six percent of GDP, public spending on education is high by international standards (World Bank, 2012). However, significant inequalities within the system persist, with the result that quality is uneven across schools. Van der Berg (2007, p.859) estimates that while Africans accounted for 83 percent of the Grade 12 cohort in 2003, they accounted for only 71 percent of passes, 22 percent of higher grade mathematics passes (with a 50 percent mark or better), and just eight percent of passes with an A-aggregate mark (average over all subjects of at least 80 percent). Such inequalities in education reproduce inequality in the labour market and raising quality in former black schools, therefore, must be a priority for policy.

Most worrying is the fact that “South African schools generally perform at an even lower level than most of their African counterparts, despite greater South African resources, less acute poverty and more educated parents” (Van der Berg, 2007, p.854). Again, this demonstrates some of the inequalities within the system, but also points to systemic failures within education that do not bode well in an era of globalisation, international trade and competition for foreign direct investment. While finance is an important constraint, it would appear that there are other real resource constraints that limit the country's ability to provide quality education to all. As noted 20 years ago, “[competent] teachers, nurses, doctors and community workers are scarce, as is the capacity to produce books, medical supplies, and building materials” (Donaldson (1992:p.147), as quoted in Van der Berg, 2007, p.872).

South Africa faces numerous health challenges, not least of which is the HIV/Aids pandemic. After some initial inaction, the South African government rolled out free anti-retrovirals across the country. This has done much to halt mother-to-child transmission of the disease, as well as extending the productive lives of adults living with the disease. At the same time, tuberculosis is a significant health problem that is compounded by HIV prevalence, as well as overcrowding and inadequate housing and sanitation. Tuberculosis is the leading cause of years of life lost in South Africa (17.3 percent of total years of life lost in 2009), followed by

lower respiratory infection (12.1 percent), HIV/Aids (10.3 percent) and diarrhoeal disease (8.7 percent) (Day and Gray, 2013, p.218).⁶

The National Development Plan has numerous objectives relating to education and health. In education, it emphasises that early childhood development should be a top priority and that children should have at least two years' preschool education (as opposed to no requirement currently); that there should be an improvement in throughput in the secondary education system; that the (non-university) college system should be expanded so that a 25 percent participation rate can be achieved; that 30 000 artisans be produced annually by 2030; that university enrolments should increase by 70 percent to 1.62 million; and that the number of student in mathematics- and science-based degrees should rise to 450 000 (National Planning Commission, 2011). In the area of health, some of the stated goals include raising life expectancy to 70 years; the improvement of tuberculosis prevention and cure; the reduction of maternal, infant and child mortality; and halving the rates of injury, accidents and violence. The state is also in the early stages of implementing a national health insurance programme, broadly along the lines of the UK system. It is hoped that this will facilitate the improvement of health services in the public sector, thereby reducing inequalities in access that currently exist.

There is growing consensus that South Africa cannot afford to expand the social grant system much beyond its current scale. The number of grant recipients now outnumbers the number of employed individuals and is roughly three times the number of individual taxpayers in the country. While there is enthusiasm in certain circles to introduce conditionalities, related to human capital investment in particular, it is not clear that such policies would yield sufficient benefits to justify the additional cost and administrative complexity. School enrolment rates are high and significant strides have already been made in terms of child health, for example. New types of grants have been suggested, including a "workseekers' grant" that aims to facilitate job search. Leveraging grants to facilitate human capital investment or economic activity may be a useful avenue to pursue for future policy. There is, though, an important hole in the social safety net: there is absolutely no access to social welfare for the able-bodied, working-age population who have not been employed in the formal sector. Unemployment insurance can only be accessed by those who have worked in the formal sector. Given South Africa's high rate of unemployment and high proportion of people who have never worked before, this means that the majority of the unemployed are excluded from the system.

6. CONCLUSION

The National Transfer Accounts methodology provides a new way of investigating the resource flows across age cohorts that occur as individuals work, consume, share and save. Apart from enabling the analysis of these flows, the methodology allows us to better understand the ways in which economies might need to adapt and change in response to population aging over time. The results presented in this paper represent the first full set of national transfer accounts for South Africa and has yielded several interesting results.

The estimates reveal that South Africans under the age of 30 and those over the age of 59 consume more than they earn in the labour market, i.e. they have lifecycle deficits. That the very young and the very old should have lifecycle deficits is not unexpected, given legislative and societal norms restricting their involvement in the labour market. In order to finance these deficits, however, the young and the old rely on two very different flows. The deficit amongst young people is financed almost exclusively through transfers, public and private,

⁶ It should be noted that the importance of HIV/Aids in this context may be underestimated since it may not be listed as the primary cause of death.

while that of the elderly is financed almost entirely by asset-based reallocations (specifically asset income). The estimated accounts highlight the impact of youth unemployment in South Africa, which delays the rise in labour income and, as a result, the transition to surplus. The implication of this is that young people remain dependent on others – whether members of their own or other households, or the state – to finance their consumption for a longer period than is the norm in other countries. An extended period of economic dependence amongst young people is an immediate concern in terms of the additional burden placed on older cohorts, directly as the source of private transfers and indirectly as the ultimate source of public transfers. Further, the impact of youth unemployment on future earnings means that the ability of prime working age cohorts to generate sufficient surpluses in the future may be constrained. Such a scenario would have important implications for the patterns of resource flows in the future, limiting the ability of those cohorts to make transfers to other cohorts and save.

One area where South Africa is quite different from other countries is the extent to which per capita consumption levels decline amongst the elderly. Per capita consumption declines from more than 80 percent of peak labour income in the mid-50s, to below 60 percent by age 81 and continues to decline at higher ages. This continual and significant decline in consumption suggests weaknesses in the institutions that, in most other countries, ensure that consumption amongst the elderly is maintained at or close to peak levels. Essentially, the institutions that regulate the ‘sharing’ activity within the NTA framework – inter-household transfers and public transfers – appear not to ensure sufficient levels of sharing to equalise consumption across adult cohorts. Indeed, the sharing processes may be working against the elderly, who are typically located in poor households, in rural areas, and are rarely found to be co-resident with an adult earning above the 60th percentile of wages. Instead of younger generations supporting the elderly, there is evidence to suggest that households are often formed around recipients of the state old age pension in response to high unemployment (Klasen and Woolard, 2009).

Based on the estimated labour income and consumption profiles, South Africa is revealed to be in the middle of its period of first demographic dividend. Estimated to have started in the mid-1970s, under medium fertility assumptions it is expected to end in around 35 years’ time. The second demographic dividend, which arises through greater investment in human, physical and financial capital, though, can permanently raise growth and living standards. Declining fertility has already enabled South Africa to raise investment in child health and education and this should positively impact productivity as these children enter the labour force. However, without jobs, these gains will not be realised, irrespective of their accumulated human capital.

Economic growth underpins the creation of new job opportunities in South Africa and, accordingly, the state should seek to create an environment that is more supportive of private sector growth. While the state is an important employer in its own right, fiscal constraints on public sector employment growth means that the private sector is the only realistic source of jobs going forward. In many instances, such a recommendation is interpreted in the context of taxation and labour legislation, for example. While these are certainly relevant in South Africa, interventions in terms of greater security in the supply of electricity, improvements in the transportation and logistics sectors, and the facilitation of international trade may be just as beneficial.

Growth, however, while necessary, is not a sufficient condition for greater employment. The pursuit of a more labour-intensive growth path represents a critical shift in South Africa's economic trajectory and is fundamental to the creation of employment on the required scale. While significant gains in terms of educational attainment have been made in the past 20 years, the inability of the economy to absorb new labour market entrants in sufficient numbers represents a key limiting factor on the size of both demographic dividends.

The policy priorities for maximising the benefit from the dividend should be formulated in terms of South Africa having already transitioned through the first half of its first dividend period. In this respect, the policy priorities should arguably be to ramp up economic growth and fundamentally shift the labour intensity of production. Broad educational and health policies may suffer from long lead times, but there may be scope for targeted interventions particularly relating to post-secondary non-university education (the FET colleges in particular), as well as artisan training and apprenticeships that would have shorter lags. Further, education and training interventions that target the large group of individuals who leave the secondary schooling system prior to completion and provide them with marketable skills are essential. In health terms, continued emphasis on prevention and treatment of diseases such as HIV/Aids and tuberculosis will help reduce the effective dependency ratio by reducing morbidity amongst working age cohorts.

Successful implementation of these policies will benefit the country's ability to generate a second dividend. The move towards mandatory retirement savings is also an important policy initiative in this regard. While the major infrastructural investments envisaged in South Africa have long lags and would boost the second dividend, they may also have significant employment and economic growth effects during construction. Some of the more systemic educational policy priorities – particularly those targeting quality improvements – would have more of an impact in terms of the second dividend, and this is true of many of the health and related interventions such as provision of housing, sanitation and water.

Pool (2007, p.34) argues that the key to maximising the second dividend is “the successful exploitation of the first demographic dividends. The developed countries that long ago passed through their dividend phase . . . will vary in the degree to which they capitalised on these trends, and thus whether they are also likely to be the beneficiaries of the associated second dividend. Many will have squandered this opportunity.” With South Africa halfway through its first dividend period, having effectively sabotaged itself through the damage wrought by the apartheid system, it will hopefully not have squandered its opportunity too.

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APPENDIX

A.1 Household Survey Data

The key source of information on incomes and expenditures of South African households is the Income and Expenditure Survey, conducted periodically by Statistics South Africa. These are nationally representative household surveys that collect detailed information on individual and household incomes and household expenditures. The First Income and Expenditure Survey (IES) was conducted in 1995 in conjunction with the 1995 October Household Survey, with the second IES conducted in 2000 in conjunction with the September 2000 Labour Force Survey (LFS). In both instances, it is possible to link the IES with the other survey conducted at that time, allowing the incorporation of a wide variety of labour market, socioeconomic and other household information into the dataset.

The 2005/06 IES is the most recent in this series of surveys and differs in various respects from its two predecessors (Statistics South Africa, 2008b, p.1). Firstly, the 2005/06 IES was conducted over a period of twelve months from September 2005 to August 2006, with each household participating for one month of the period and being visited by enumerators at Least six times. Within each month, the national representivity of the survey was maintained. In contrast, the earlier IESs were conducted over a period of around five weeks, with all data being collected from households during a single interview. Secondly, the 2005/06 IES utilised the recall method as well as employing diaries to collect expenditure information, with each household requested to complete four weekly diaries. Earlier IESs used only the recall method to collect data. Thirdly, the 2005/06 IES was not conducted in conjunction with any other household survey, nor did it incorporate detailed socioeconomic or labour market information, meaning that where such information is required to generate age profiles, other household surveys conducted around this time will need to be utilised. With a sample of 24 000 households, the 2005/06 IES is utilised in this study as the key source of income and expenditure data.

Two other household surveys are utilised in this research. The first is the Labour Force Survey (LFS), conducted twice annually by Statistics South Africa between 2000 and 2007. This survey has as its focus the collection of labour market information and is the basis of official labour statistics for that period. The second survey is the General Household Survey (GHS). While this survey contains a relatively extensive labour market module, it is focussed on collecting data on households, their living conditions, and their access to services and assets, amongst other things. The GHS has been collected annually since 2002.

A.2 Other Data Sources

Various other sources of data are used to compile the NTA estimates for South Africa. These are described briefly below.

Population estimates: Population estimates, detailing the number of individuals within each single-year age cohort, are taken from World Population Prospects (2010 Revision), published by the United Nations and use the medium variant on total fertility. At the time that this research commenced, this was the most recent data available and this data source is used by numerous other NTA countries.

National accounts: Data from South Africa's national accounts are used to construct the macro or aggregate control values. These values are used to ensure that the aggregate value for a given NTA flow is consistent with national accounts. In essence, survey or administrative data is used to construct a per capita age profile for a given flow and the aggregate control value (a scalar value) is used to shift the age profile upwards or downwards so that the aggregate value of the flow equals the appropriate national accounts

value (i.e. per capita age profile multiplied by population structure multiplied by aggregate control value equals national accounts value). The South African Reserve Bank (SARB) is responsible for publishing the country's national accounts. National accounts data was downloaded from the SARB online database in mid-2013, by which time no further official adjustments were being made to 2005 data.

Administrative data: Although there is significant scope for the inclusion of detailed administrative data in the construction of the NTA estimates, this has not yet been done. Examples of such data would include, for example, the number of individuals in receipt of a child support grant by age or the number of individuals making use of public primary healthcare facilities by age. It is hoped that it will be possible to access such data going forward for inclusion in future iterations of this research.

Other administrative data from national and provincial budgets, the South African Revenue Services (SARS), as well as detail from ministerial budget votes and other official documents, have been used in constructing these estimates.

Other data: Where required, data from statistical and other releases by Statistics South Africa has been used, as has detail from the Government Finance Statistics (GFS) and International Financial Statistics (IFS), both published by the International Monetary Fund (IMF).

A.3 Data Issues

One of the key challenges of this research is its incorporation of numerous data sources. Thus, the research is exposed to the various data issues associated with each of these data sources. From the perspective of the IES 2005/06, the key concern associated with individual-level data is the possibility of non-random measurement error. Indeed, Statistics South Africa has found it increasingly difficult to access wealthy households as they retreat behind high walls and other security measures. Despite this problem, it is not clear that this would necessarily affect the shape of the age profiles derived from this dataset, as wealth or income would need to be correlated with the age of household members. Nevertheless, there is a possibility that non-response by wealthier households may impact on the age profiles derived from this data.

Expenditure data from the IES 2005/06 was also found to be somewhat problematic due to a significant underreporting of particularly food and personal care expenditures when compared to both earlier surveys and to available macro data. Indeed, the problem was significant enough to necessitate, for example, a 30 percent upward adjustment of food expenditures during the compilation of the new weights for the Consumer Price Index (CPI) (Statistics South Africa, 2008a). This problem was associated with the introduction of the diary method that was used to collect these types of expenditures, instead of the recall method employed in both the 1995 and 2000 rounds of the survey. Statistics South Africa's specific adjustments of expenditure data for the construction of the CPI are taken into account in the construction of private consumption age profiles.



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