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FIRST ESTIMATES OF UK NATIONAL TRANSFER ACCOUNTS

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Abstract

Europe is ageing rapidly; population projections indicate that the old-age dependency ratio will more than double in Europe between now and 2050. A crucial question is how sustainable the economic institutions which mediate age-related flows in our economies – these are the public sector, the family, and capital markets – are in the face of this population ageing. This paper briefly reviews the concept of National Transfer Accounts (NTA's), which attempt to quantify these economic flows in a manner consistent with National Accounts, presents first estimates of NTA's for the UK in 2007, and provides a short comparison of UK age-related economic flows across some European and other NTA countries. Some applications of NTA's will also be briefly discussed.

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1. Introduction

Increasing life expectancy and, especially, low fertility, are causing the population of European countries to age rapidly. Between now and the year 2050, the old-age dependency ratio (the ratio of the number of those over the age of 65 to those aged between 15 and 64) will rise from 26.3% to 52.8% across Europe and from 25.1% in 2010 to 45.3% in the UK (Harbers, 2008).

Population ageing is of concern because economic transfers between different generations are a very significant – and essential – feature of human societies. Children cannot reach adulthood, and then have children themselves, without substantial investment, usually from their parents. The aged, too, must be reliant on either transfers from others or on their accumulated assets to finance their consumption after they can no longer work. Significant changes in population structure will therefore place the institutions which transfer economic resources under significant stress.

Currently, across most of the developed world, including Europe and the UK, the consumption of the elderly is financed largely by a combination of transfers from public programs and personal savings in capital markets (Lee and Mason, 2010). How resilient these will be in the face of such rapid and historically unprecedented population ageing – and what possible alternatives there may be - is an area of pressing public policy concern. The combination of low fertility and the increasing life expectancy of the aged means that a comprehensive framework, which takes account of both transfers to the young (which are financed primarily by private transfers within the family) and transfers to the old, is necessary. National Transfer Accounts (NTA's) are one such tool.

This paper first briefly summarises the concept of NTA's, described at greater length by Mason *et al* (2008). NTA's measure the direction and extent of intergenerational flows in an economy, as well as the relative importance of the institutions which mediate them (the public sector, the family and capital markets). NTA's extend generational accounting (see Auerbach *et al*, 1999) by incorporating private transfers, potentially mitigating one of the key disadvantages of GA's (see, for example, Buiter, 1997). A key feature of NTA's is that they are designed to be consistent with National Account estimates of income, consumption and savings. They therefore inherit some of the advantages (and drawbacks) of national accounting. Currently, teams from more than 30 countries representing all stages of economic development and all geographic regions of the world are involved in the NTA project, although estimates are not yet available for all the countries involved.

The next aim of this paper is to present first estimates of NTA's for the UK for the year 2007. Besides describing the economic life-cycle and support system of people in the UK, NTA's also provide age-related estimates of individual saving which are consistent with National Accounts estimates, allowing a greater understanding of the structure of lifetime savings and consumption in the

UK. This is of particular concern given the currently low savings rate in the UK (Barrell and Weale, 2010). NTA estimates will also illustrate the differences between resource flows to children and the elderly, both in terms of their size and in their method of financing. This will give some idea of the extent to which changes in population structure will stress different economic and social institutions. The UK NTA results will also be compared with estimates from some other countries involved in the project.

Finally, the paper will briefly examine some potential applications of NTA estimates, some of which are discussed at greater length in Lee and Mason (2010). When complete, NTA accounts will provide a sufficiently long time series to allow the history of intergenerational transfer systems, the consequences and trade-offs between different approaches to financing health care, education and pensions, and therefore the social, political and economic implications of population ageing, to be studied. NTA estimates may also provide a new perspective to some long-standing puzzles in finance, such as the relationship between population demography, consumption and asset prices (see, for instance, Samuelson, 1958, and Mehra and Prescott, 1985), and in economics, such as the extent to which private households offset public transfers through their own intergenerational transfers, bequests, and changes in their savings behaviour (see, for example, Feldstein, 1974 and Barro, 1974). Because NTA estimates provide a complete age-dependent set of resource flows to and from individuals, they permit the construction of a measure of individual wealth which incorporates financial, human capital and transfer wealth. This allows the age structure of consumption and savings to be examined, potentially providing a new perspective to the life-cycle model of savings. Finally, NTA's also provide data which bear on the structure of the family, in particular, the determinants of fertility, complementing a literature going back to Becker and Tomes (1986).

2. Background

The first study of inter-generational equity in the UK was by Hills (1992). He examined the welfare of historical generations in the UK, and found that those born in 1905 did best, although that most generations were in generational balance. Subsequently, Kotlikoff (1995) developed generational accounting, see Auerbach *et al* (1999), which uses cross-sectional estimates of the generational burden of fiscal policy, to estimate the implicit fiscal burden on future generations. The first generational accounting study of the UK, by Cardarelli, Sefton and Kotlikoff (2000), found that the changes in fiscal policy required to treat living and future generations fairly were small relative to other industrialised countries, provided that benefits were linked to prices and health-care expenditure did not grow too rapidly. Banks *et al* (2000) found, though, that cross-sectional profiles in the UK may provide misleading estimates of the expectations of households because there were large differences between the consumption behaviour of different cohorts.

Subsequent to this there appears to have been little academic work on generational equity in the UK. Sefton and Kirsanova (2006) used profiles generated from Generational Accounts to estimate the determinants of saving in the US, UK and Italy. They found that saving was higher in Italy because of the higher deposits demanded by Italian mortgage lenders, but that otherwise there appeared to be few relationships between institutional structures and consumption behaviour. We use NTA's to extend their analysis later in the paper.

Barrrell and Weale (2010) raise some interesting issues in intergenerational fairness in the context of the UK, which currently has one of the lowest savings rates in Europe. In particular, they examine the consequences for inter-generational fairness of changes in land prices, important if assets are owned mainly by the old. Willetts (2010) has written a book alleging substantial inter-generational unfairness in the UK between the baby boom generation and others.

One issue with all studies of intergenerational inequity mentioned, except Sefton and Kirsanova (2006), including generational accounts, is that they ignore the possibility of private transfers, either through *inter-vivos* transfers, or through bequests, which offset the effects of fiscal policy. Willis (1988) and Lee (1994) developed the concept of National Transfer Accounts (NTA's), which incorporate estimates of private inter-generational transfers, to try and obtain a more comprehensive picture of inter-generational flows in economies. In the next section, we briefly present the concept of NTA's, and discuss their advantages and disadvantages.

3. National Transfer Accounts

This section is very brief; for a readable discussion of the principles of NTA's readers are advised to consult Lee and Mason (2010); technical details of their construction can be found in Mason *et al* (2009). NTA's are an attempt to estimate the nature, size and direction of inter-generational resource flows in an economy in a manner which is consistent with National Accounts estimates of economic activity. The basic accounting identity underlying NTA's which must hold for each unit in an economy in a given time period – be it an individual, a household, a cohort, or a generation, is as follows:

$$Y_L + Y_A + \tau_g^+ + \tau_f^+ = C + S + \tau_g^- + \tau_f^- \qquad (1)$$

Inflows on the left-hand side consist of labour income (Y_L), income from capital, which may include land and credit (Y_A), and transfer inflows from the public sector (τ_g^+), and the private sector (τ_f^+). Outflows on the right-hand side consist of consumption (C), savings, representing investment in capital, land or credit (S), and transfer outflows to the government (τ_g^-) and the private sector (τ_f^-).

Rearranging this equation yields the key elements of NT flow accounts:

$$C - Y_L = (Y_A - S) + (\tau_g^+ - \tau_g^-) + (\tau_f^+ - \tau_f^-) \qquad (2)$$

The left-hand side of (2), $C - Y_L$, called the *life-cycle deficit* in NTA methodology, represents the excess of consumption over labour income. The life cycle deficit must be financed in one of three ways, represented by each of the terms on the right-hand side of the equation. The first, $Y_A - S$, asset income less saving, is called *asset-based reallocations*, the second, $\tau_g^+ - \tau_g^-$, payments received less payments made to the public sector, is called *public transfers*, and the third, $\tau_f^+ - \tau_f^-$, payments received less payments made to other individuals, *private transfers*.

In childhood, individuals have a positive life-cycle deficit, because their labour income is zero, but their consumption is not. After they enter the labour market, their consumption typically rises, but their income exceeds their consumption, and the life cycle deficit becomes negative. Finally, when individuals retire and leave the labour market, their labour income falls, but their consumption does not, and the life cycle deficit is positive once more. Therefore, the life-cycle deficit typically has a U-shape over the life-cycle.

At each stage of the life-cycle, individuals finance their life cycle deficit by making or receiving transfers to other agents in the economy – either mediated by the public sector or through families – represented by the "net transfers" portion of the flow equation – or by engaging in asset-based reallocations – either receiving and spending asset income, or saving by purchasing financial or other assets, such as residential housing, or borrowing, using mortgages, credit cards, or other loans.

Because the NTA flow account (2) holds for each individual, it must also hold for any group of individuals. Since the focus of NTA's is the allocation of resources between different generations, the groups chosen are individuals of a given age in the population, although the same techniques could, in principle, be used to study allocations across other groups, such as people living in geographical regions, people with different wealth and income, different housing tenures and sexes, and immigrants and native-born members of the population, to name a few examples.

NTA's provide a standardised methodology across countries for disaggregating by age all interactions between individuals and the public sector (taxes and social contributions paid, services and payments received), all interactions between individuals within households (transfers between spouses, and between parents and their children) and all interactions between individuals and capital markets (asset income received, and savings made).

The focus on individuals implies that assumptions need to be made about intra-household allocation of consumption, and possibly income, where these are shared by households. In formal labour

markets, measuring individual income is straightforward, but in family-owned enterprises, individual contributions can be difficult to measure. Also, consumption of goods jointly owned or consumed by the household – most importantly residential housing – can be difficult to allocate between individuals and some assumptions need to be made.

To ensure consistency with National Accounts estimates, aggregate NTA estimates of private and public consumption, labour income (compensation of employees plus a portion of household entrepreneurial income), saving, asset income, public and (some) private transfers, and their components are adjusted to be equal to their National Accounts counterparts. Thus, NTA's can be regarded as a (vastly simplified) disaggregation of the National Accounts by age and an estimation of the nature, extent, and direction of the consequent average transfers that must take place between people of different ages.

Since NTA estimates are designed to be consistent with National Accounts, they inherit some of their disadvantages as well. Firstly, possibly as a consequence of their industrial roots, National Accounts emphasise physical capital, rather than social or human capital. For this reason, NTA's treat all investment in education and social capital as consumption, even when such investment may be regarded as an age reallocation in the same way as investment in physical or financial assets, and may enjoy a substantial return. Secondly, since National Accounts typically value any non-monetary economic transaction at zero, NTA's inherit this feature. This is likely to be particularly important for economic transfers that occur within or between households where work in the home is a significant feature of the transfers. For instance, in a household where one spouse works inside the home and the other outside it, NTA's will record a transfer from the working spouse to the non-working spouse, even if this transfer is compensated for in the form of (unpaid) work in the home. To the extent that spouses are of similar ages, and if NTA's are not disaggregated by sex (females in many countries still perform much of the work inside the home), this is not likely to cause undue difficulties. Thirdly, there is a substantial difference between the National Accounting treatment of capital gains on assets, and the role that these play in the life-cycle model of consumption. Typically, capital gains on assets are not regarded as income by national accountants, and great care is taken to exclude them from the National Accounts. However, from an individual point of view, capital gains form an important part of the return on assets, and would naturally be regarded as forming part of income. For this reason, the anticipation of capital gains on assets also substantially alters the savings pattern of individual

households.[1] We therefore need to be careful when interpreting NTA estimates of saving and asset income in the light of the life-cycle hypothesis.

NTA's also share some shortcomings with generational accounting. NTA's provide a reasonable estimate of the cross-sectional intergenerational resource flows in a given economy in a given year. However, even NTA per-capita profiles are dependent on the precise population structure in that year, and hence cannot be used for the purposes of projection without making the assumption that the population is stable. When using NTA profiles for projection, we also implicitly ignore cohort changes, and must assume that cross-sectional profiles are appropriate estimates of the longitudinal expectations of individuals. Any behavioural change – cause, for instance by changes in factor prices, or capital market frictions – will result in changes in per capita profiles over time.

Further, as pointed out by Buiter (1997) for generational accounts, NTA's ignore the question of the economic incidence of any particular tax or transfer. Typically, in constructing NTA estimates, the assumption is made that government benefits and taxes are paid or received by the person who was party to the financial transfer. This is especially important for benefits that are targeted at particular groups, such as children, but which are received by parents. But it also has implications in general equilibrium, where the incidence of a tax or transfer – because of its effect on prices – may have quite a different age distribution to the people who actually make or receive the payments. An example might be a payroll tax. If labour supply is fairly inelastic, then the payroll tax may simply drive up wages, and will actually be paid by consumers in proportion to their consumption of labour-intensive goods, rather than by workers. NTA's also ignore general equilibrium effects more broadly, which could be important when performing projections, since changes in fiscal policy and population structure will cause price changes which will change individual behaviour. This is an area of current research (see, for example, Sanchez-Romero and Paxtot (2010)), but one which we shall ignore in this paper.

4. Estimation and Data Sources

Producing NTA's requires individual and household level data on personal consumption, utilisation of public services, such as education and health, labour and investment income, tax payments, private transfers, and benefit and pension receipts, as well as National Accounts data.

[1] Many companies have also started distributing income through share repurchases as well as dividends. Share repurchases would typically cause the prices of shares to rise (paying dividends would cause them to fall).

Our starting point was the 2006 *Expenditure and Food Survey* (EFS) which is the UK survey used to estimate the consumption and expenditure portions of the National Accounts. The survey combines estimates of household consumption over a two-week period with backward-looking estimates of yearly income. It also contains data on receipts of government benefits, investment income, pensions and other important variables for NTA purposes. These are used to estimate age profiles of the various NTA variables, which are adjusted proportionally to ensure that their aggregate values, conditional on the UK population structure in 2007, match the corresponding aggregate totals in the National Accounts where these are available, which we obtained from the 2008 Blue Book. The profiles (except the education profiles) are also smoothed using a weighted Gaussian kernel smoother with variance parameter 2 to eliminate the effects of sampling variation. Table 1 shows the various profiles that were estimated. To estimate our health profiles, we also used data from the *General Household Survey* (GHS) of 2006. We also used profiles from the *Wealth and Asset Survey* (WAS) of 2006-2008 to allocate property income.

Table 1 about here.

Although the EFS is the best available UK data source for estimating NTA's, there are some shortcomings with the survey which impact on the reliability of the estimates we have obtained. The first is that the income and expenditure variables in the EFS are not contemporaneous. The income variable used is a backwards-looking variable, measured over one year, while the expenditure variables measure expenditure over a two-week period using a consumption diary. In using the EFS data to calculate NTA estimates, we must therefore make the assumption that, on average, family income over the last year is representative of income over the two-week consumption survey period. (Aggregate wage changes over the year do not matter provided there is no systematic relationship between the time of interview and labour income – which is unlikely - since we balance to National Accounts estimates anyway).

Importantly, the EFS excludes individuals living in institutions, such as students, those in prison, and, most importantly, those living in residential care homes. While these are a small portion of the overall population, these could cause biases in our profiles, especially for those of student age and for the very old. We are investigating other sources of data to deal with this issue.

Finally, the EFS top-codes age at 80. We therefore have no information on people over the age of 80, and cannot estimate age profiles higher than this age. Since a substantial fraction of the UK is predicted to be over the age of 80 in the future, this is a serious shortcoming. We are investigating

whether our health and social care profiles – important determinants of old-age consumption - can be extended beyond this age, but currently only report estimates to age 80.

Consumption

The EFS reports both individual and household-level consumption data. For the purposes of NTA, we divided household consumption into two main pieces: public consumption of services provided in-kind to households (also called collective consumption), and private consumption of goods and services, which was paid for by the household. Private expenditure was divided into four parts: private expenditure on health, private expenditure on education, private expenditure on housing, and other private consumption, which included food, alcoholic beverages and tobacco, clothing and footwear, furnishings, household equipment and carpets, transport, communication, recreation, restaurants and hotels, and miscellaneous expenditure. Public consumption comprised consumption of health, education, social care, and other public services.

For private consumption, other than education and health, we split household expenditure between individuals using an equivalence scale derived from an extensive search of the literature and which is common to NTA countries (see Mason et al, 2009). The scale assumes that new-borns consume 0.4 of the consumption of an adult, that 20-year olds consume the same as an adult, and that between these ages this proportion increases linearly.

Consumption of residential housing

Private expenditure on housing included rental payments on property, gross of housing benefit, and, for owner-occupiers, imputed rent. Both primary and second dwellings were included. Following Richardson and Dolling (2005), we estimated the imputed rent of owner-occupied housing by setting it equal to predicted private rentals from a regression equation linking private rental data reported in the OFS to house characteristics (including the region in the country, whether there is central heating in the house or not, whether it is social housing or not, the number of rooms, and the type of house). We estimated separate profiles for imputed rent and actual rent paid.

Consumption of private education and healthcare

The EFS reports private education expenditure at a household, not at an individual level. To estimate this profile, we therefore used a regression approach, where we regressed the household's total private

education expenditure on the number of students of each age who were enrolled at school. Where coefficients from the regression were negative, we set these to zero. We then used the adjusted regression coefficients to reallocate total private education expenditure by age in each household and averaged across the sample to obtain a profile. We did not smooth the private education profile.

We followed a similar regression-based approach for private healthcare costs (although this profile was smoothed).

Consumption of public services

To estimate the consumption of public education services, we combined school enrolment data from the EFS with administrative data from the Department of Education, which estimates the annual cost of each student in full-time education. We used separate estimates for primary school, secondary school, and A-levels. We used one profile for further and higher education. Since the EFS excludes students living in residential accommodation, we implicitly made the assumption that the age distribution of students living outside residences is the same as the age distribution of students living in residences when estimating this profile. We did not smooth the public education profile.

Unfortunately, the EFS does not contain any health utilisation data. We therefore relied on health utilisation data from the General Household Survey of 2006, which reports the number of GP visits, the number of overnight stays in hospital and the number of prescriptions for each respondent over a calendar year. We obtained unit cost estimates of each type of care using data from the Department of Health, and combined these with the utilisation data into age profiles which we then smoothed using a Gaussian kernel smoother. We used separate profiles for men and women to take account of their different age profiles of health utilisation. Our unit cost approach makes the assumption that there is no systematic relationship between the cost of a particular intervention and the age or sex of a patient.

Income

We divided income into three components – employment income, self-employment income, which were derived from variables in the EFS, and fringe benefits, which was the value of National Insurance contributions paid by employers on behalf of employees. Each profile was adjusted to the corresponding estimate from National Accounts data. The EFS does not report pension compensation separately, so it was assumed that the age distribution of the value of employer-provided pensions was the same as that of employment income. In the case of defined benefit pension plans – still common

in the public sector, and prevalent among older workers in the private sector in 2007, this assumption may not hold, since pension entitlements paid to older workers are more valuable than those paid to younger workers in a DB scheme.

We smoothed the labour income profiles using the weighted Gaussian kernel smoother.

Public transfers

The EFS has a reasonably detailed list of government benefits which are paid as cash to different households. Following NTA practice, benefits – including any child benefits - were allocated to the individual who received the payment, rather than the individual to whom the benefit was targeted. Benefits included Injury Disablement Benefit, Jobseekers Allowance, Income Support and Incapacity Benefit, Guardian Allowance, Child Benefit, Widow's Benefit, War Pensions, Invalid Tax Allowance, any Tax Credits received as benefits, Christmas Bonus, Disability Living Allowance, Maternity Grant, Severe Disablement Benefit, Attendance Allowance, and any other benefits. Tax credits not paid as benefits were treated as negative taxes, rather than benefits. The profile was smoothed.

A separate profile was estimated for government retirement pensions, which included any National Insurance Retirement pension and Widow's pension. This profile was also smoothed.

Taxes

Separate profiles were estimated using EFS data for Income Tax, National Insurance contributions (including employees, employers and the self-employed), Council Tax, and other direct taxes (such as Television Licenses and Road Tax). Corporation Tax was allocated across age using the reported investment income received by individuals, although it could also reasonably have been allocated by consumption. Indirect taxes (mainly Value Added Tax (VAT)) were allocated according to consumption of VAT-able goods. Each tax profile was smoothed.

Inter-household transfers

The EFS reports some data on cash transfers between households, although the accuracy and completeness of these data is unclear. Since the definition of the variable we use measuring outflows ("Money given to those outside the household"), appears more comprehensive than the variable we use to measure inflows ("Regular allowances received from outside the household"), we adjust the

level of the profile of reported inflows so that it matches, in aggregate, the net transfer to and from households balances the net private transfers to the rest of the world reported in the National Accounts.

Intra-household transfers

A key component of NTA's is the estimation of transfers of resources within households. There are many ways of estimating these. NTA's have adopted a standard model, which is to assume that all household assets are owned by the household head, and that the household head receives all cash surpluses of income over cash consumption from household members, and makes payments to all household members to meet good any deficits of cash consumption over income. (The EFS defines the household head to be that individual in the household who either owns the house or who is legally responsible for the rent. If there are joint householders then the household head is the individual with the higher income.) Any household deficit or surplus is assumed to represent either saving or dissaving by the household, or to be paid for by investment income received by the household, which together represent the balancing item in household income statements.

A consequence of this assumption is that the incidence of any government benefit or tax is shared across the household in proportion to the consumption of the individuals in the household.

There is no macro control for these profiles, although macro-control-adjusted raw variables are used to calculate the cash deficit or surplus for each individual in the household to ensure consistency of these profiles with macroeconomic aggregates. The intra-household transfer profiles are smoothed.

Asset-based reallocations

These are derived as the balancing item which allows household heads to match household income and expenditure. Since we have little information on private asset ownership in the EFS, only average profiles are estimated. Because of the various macro controls that have been used in the other profiles, these will be consistent with aggregate savings plus asset income in the economy as a whole, where investment income excludes capital gains. A distinction is also made between public and private asset-based reallocations.

The final balancing profile is savings. This is obtained by subtracting an estimated age profile of asset income from the total asset-based reallocations profile. In estimating asset income, a distinction

is made between capital income (the net surplus of corporations after distributions, capital's share of household mixed income, and imputed rentals on residential housing) and asset income (interest and dividends). Surpluses of corporations and asset income are allocated using the age profile of financial wealth (financial assets and occupational pension wealth) from the *Wealth and Asset Survey* [2], while imputed rentals on residential housing are allocated using the imputed rentals profile obtained from EFS data. Interest outflows have their own age profile which is estimated using the corresponding variables from the EFS.

Bequests

Bequests are included for completeness. We are still at the interim stage of estimating bequests, and have used an approximate approach here. We estimated bequests by using the age profile of household wealth obtained from the Wealth and Asset Survey, excluding pension wealth. We used separate profiles for singles and couples which were adjusted to ensure that the average profile matched the average reported by the WAS. We applied UK 2007 mortality rates to the household members, and assumed that if the household was a couple, the spouse was the beneficiary of the entire estate. If the household head was single, the bequest was assumed to be received by someone 30 years younger (although if the household head was younger than 48 then the bequest was assumed to be received by a sibling of the same age). The total outflow of bequests obtained using this method was £68bn, which compares well with the total of £59.4bn reported by HMRC for the 2006/7 tax year. A weighted average of the profiles was then taken to reflect the proportion of single and married couples at each age, and the profiles were adjusted so that, in aggregate, they summed to zero based on the UK population in 2007. The British Household Panel Survey (BHPS) contains questions on the bequests received by households, and we will investigate this in our next iteration of the account estimates, although there appears to be significant undercounting relative to HMRC estimates.

5. Results

In this section, we present our estimates of NTA's for the UK. We present most results graphically, and show only important results in the form of tables. Figures can be obtained from the author. Figure 1 shows the per-capita age profile, in £ per person per year, of total consumption (public and private) and total labour income (self-employment, employment and fringe benefits). Consumption

[2] We also used the profile of asset income obtained from the EFS, but as this excluded indirectly held assets (pension funds, insurance policies), which make up approximately 40% of total UK household wealth, we felt using the WAS profile would be more accurate.

of new-borns is around £7,000 p.a., rising to around £18,000 p.a. for eighteen-year-olds, after which it increases slightly as individuals age. The consumption profile is not smooth at younger ages, reflecting public and private expenditure on education. Labour income begins increasing above zero at around age 13, increases steadily till around age 30, when it reaches its peak, at around £27,000 p.a., after which point it remains roughly constant until age 50, and then begins to fall. On average, labour income first exceeded consumption at age 24, and fell below consumption again at age 57.

Figure 2 shows the UK population distribution in 2007, which was used to obtain the aggregate consumption and labour income profiles shown in figure 3. In total, £194bn (14% of GDP) was transferred to the young to finance their consumption before the age of 23, and £214bn (15% of GDP) to the elderly after the age of 57 in 2007. Figure 4 divides the per-capita consumption profile into its component piece. Around one third of the consumption of the young and half the consumption of the very old is public; the remainder is private. The vast majority of the consumption of the middle ages is in the "other private" category. Figure 5 shows the components of aggregate consumption. Figure 6 shows the components of per-capital age reallocations. Private transfers are mainly from the middle-aged, to children, with the very old transferring small amounts of resources downwards. (There is a slight transfer towards those around retirement age, largely caused by transfers from men to women and a slight difference between the ages of spouses). Public transfers occur away from those of middle age and towards the young, but especially the old. Asset-based reallocations are positive at almost all ages, but fall after the age of 70. Bequests, which we do not want to emphasise here, are significant at older ages and cause a net flow from them to those of middle age. As can be seen by comparing figure 6 with figure 7, which shows the corresponding aggregate picture, the constraint that aggregate bequests and aggregate private transfers sum to zero holds in aggregate, but not if per capita profiles are considered, since the number of people at each age is different.

Figure 8 shows the components of per capita asset-based reallocations. Public asset-based reallocations are small, reflecting the relatively low level of the public debt interest burden and public dissaving in 2007. The blue curve, based largely on Wealth and Asset Survey data, shows the receipt of asset income by individuals, illustrating that the ownership of assets peaked at around age 60 in the UK in 2007. The red curve represents dissaving. Consistent with the life-cycle hypothesis, there is some dissaving under the age of 40, large additional saving between the ages of 42 and 66, and dissaving thereafter. These figures include DB pensions, which may cause some of the dissaving at older ages.

Figure 9, which contains the corresponding aggregate values, illustrates that although dissaving by the elderly is significant in per capita terms, in aggregate terms it is dwarfed by the savings of the middle-aged.

The age profiles that we have calculated can also be used to calculate the components of consumption for different age groups. For those aged 0-19, a synthetic cohort (using UK 2007 mortality) would have 27% of their consumption financed by public transfers, 66% by private transfers and the balance by labour income. For those between the ages of 20 and 64, private transfers make up 18% of consumption, public transfers represent around 20% of consumption, with asset-based reallocations making up 17% of consumption. The balance of consumption is financed by labour income. For those over the age of 65, asset-based reallocations comprise 60% of consumption, public transfers 41%, with labour income financing 7% and bequests 8% of consumption.

6. Comparisons with other countries

Using NTA's prepared by other teams in the NTA project, it is possible to perform comparisons between the UK and other countries.[3] We have chosen a subset of developed countries in Europe with NTA profiles, as well as the US and Japan. The NTA's have been calculated for different years in each country. A list of countries included in the comparison is given in Table 2. For the purposes of the international comparison in this section, bequests are ignored and incorporated into asset-based reallocations, since few of the countries in the sample have household-level wealth data which permits them to construct profiles of bequests.

Table 2 about here.

While a large range of comparisons is possible between the different countries, we focus here on the methods by which the consumption of the young and the old are financed, which is one of the key outputs of NTA's.

Our first comparison is the age profile of consumption in our sample of countries, shown in Figure 11. For each country, consumption has been scaled so that it is expressed as a proportion of average labour income between the ages of 30 and 49.[4] The UK has somewhat higher average consumption

[3] We would like to thank other teams for making their estimates available in the NTA database. Names of the participating individuals can be found on the NTA website, www.ntaccounts.org.

[4] An alternative would have been to scale by GDP per capita; except for high-savings countries (Japan), the picture remains remarkably similar.

as a proportion of labour income than many other countries, reflecting a heavier capital intensity and possibly a lower savings rate. The UK consumption profile is also much flatter at older ages than Sweden, the US or Japan, but quite similar to other countries in the sample. Consumption at younger ages in the UK is quite similar to all the countries in the sample except Japan.

Figure 12 shows the proportion of consumption at each age which is publicly financed. In this, the UK is lower than average at younger ages, and higher than average at older ages. The US stands out for the low proportion of consumption which is publicly financed, except at younger ages, while Sweden and Hungary finance a greater proportion of consumption publicly at most ages.

We then examine the methods by which consumption is financed at different ages. For this purpose, we construct synthetic cohorts of individuals using UK (2007) mortality tables. We then calculate the total consumption of the cohort, and the total transfers (and labour income) which finance it. We first focus on the consumption of the elderly, and present the results using a triangle plot, shown in Figure 13. Each vertex of the triangle represents one source of financing (asset-based reallocations, labour income, and transfers, both public and private). The closer each point is to a vertex, the more important that source of financing is to consumption. The figure shows that while labour income does vary slightly as a source of financing for consumption of the elderly between the different countries, there is a strong trade-off between asset-based reallocations and transfers.

In Figure 14, we examine the sources of consumption of the young. Since asset-based reallocations should be zero for these cohorts (by assumption), we focus on labour income, and public and private transfers. In the UK and Austria, young people enter the labour force relatively early, but in the other countries, labour force participation is very small among the young, and there is a strong trade-off between public and private financing. Private financing is highest in the UK, and lowest in Hungary and Sweden, with the US, surprisingly, ranking somewhere in the middle because of its generous public school system.

7. Applications

In this section we discuss various potential applications of NTA's. Where these have been treated in the recent volume on NTA's (Lee et al, 2010), we refer the reader there.

Are we life-cycle savers?

The first application we consider is using NTA's to construct a measure of lifetime wealth which incorporates financial, human and social capital. This measure can then be used to test the lifecycle hypothesis. This provides an alternate estimate to those provided by Sefton and Kirsanova (2006), who estimate intra-household transfers as a balancing item in longitudinal wealth profiles. Consider a simple lifecycle model with mortality, but no bequest motives, and no uncertainty:

$$\max_{\{c_0,\ldots,c_\omega\}} \sum_{i=0}^{\omega} \rho^i \pi_i u(c_i) \text{ s.t. } w_{i+1} = (w_i - c_i + \tau_i + y_i)(1+r) \tag{3}$$

where ρ is the individual's annual subjective discount factor, π_i is the probability of survival to age *i*, conditional on being alive at age 0, $u(c_i)$ is the utility of consumption c_i, w_i is financial wealth at age *i*, τ_i is net public and private transfers at age *i*, y_i is labour income at time *i*, and *r* is the interest rate, assumed constant. Assuming CRRA utility with coefficient of relative risk aversion γ and solving this model for optimal consumption in the absence of any borrowing constraints would yield:

$$c_i = \frac{w_i + \sum_{j=i}^{\omega} y_j (1+r)^{i-j} + \sum_{j=i}^{\omega} \tau_j (1+r)^{i-j}}{\sum_{j=i}^{\omega} ((\rho(1+r))^{j-i} \frac{\pi_j}{\pi_i})^{1/\gamma} (1+r)^{i-j}}, \tag{4}$$

where the numerator is the individual's total net wealth from all sources at age *i*, and the denominator, a kind of annuity factor, is obtained by recursive substitution of the Euler equations.

This in turn implies that the average propensity to consume out of total wealth at age *i*, defined as:

$$APC_i = \frac{c_i}{w_i + \sum_{j=i}^{\omega} y_j (1+r)^{i-j} + \sum_{j=i}^{\omega} \tau_j (1+r)^{i-j}}, \tag{5}$$

can be rewritten as:

$$APC_i = \frac{1}{\sum_{j=i}^{\omega}((\rho(1+r))^{j-i}\frac{\pi_j}{\pi_i})^{1/\gamma}(1+r)^{i-j}} \approx r - \frac{1}{\gamma}(r-(1-\rho)-(1-\frac{\pi_{i+1}}{\pi_i})) \quad (6)$$

where the approximation (which derives from the perpetuity formula) holds almost perfectly for infinitely-lived agents with constant mortality rates and low subjective discount rates. So, for individuals with log preferences ($\gamma = 1$), the average propensity to consume out of total wealth less the mortality rate is approximately equal to the individual's subjective discount rate (which by assumption is constant over the life-cycle).

NTA estimates are almost perfect for calculating age-specific average propensities to consume (APC's), using the first line of formula (5). We need to make some strong assumptions: in particular, we assume that the population is in steady-state, and that therefore the cross-sectional NTA profiles can be used as though they are longitudinal profiles (which we need in the above calculation). We also assume a constant discount rate of 4% p.a., productivity improvements of 1.5% p.a., and that public programs and private transfers will fully reflect changes in productivity. We include bequests in transfers, and use the age profile for financial wealth from the Wealth and Asset Survey, which includes pension wealth and residential housing. As in the theoretical work, we ignore uncertainty in our discounting, and we ignore general equilibrium effects. These are important issues which we leave for further work.

Figure 15 shows total wealth and its components in 2007 pounds – the denominator of equation (5) - at each age under these assumptions. New-borns have total wealth of around £500,000, made up mostly of their own human capital, with approximately £100,000 representing the present value of their net private and public transfers. As individuals age, their human capital wealth first rises, and the present value of their transfers, public and private, falls and becomes negative. Average total wealth reaches a maximum value of £600,000 at around age 25. After this age, financial wealth begins to accumulate, making up the majority of wealth by around age 57, but human capital wealth falls rapidly, causing total wealth to decrease. After age 60, human capital wealth quickly dies away, while public transfer wealth – representing the present value of cash and in-kind transfers from the public – increases. After age 73, all types of wealth are falling.

Our calculated estimates of the APC out of total wealth are presented in Figure 16. The APC starts off fairly low for new-borns – around 1.5% - although we do not wish to emphasise these results for young people – and then rises gradually to around 4% by age 18. It stays roughly constant at 4% until the mid-fifties, when it begins to rise. By age 80 it has reached 9%. These estimates compare well with previous estimates for the UK obtained by Sefton and Kirsanova (2006), although our estimates are somewhat higher at older ages than theirs.

We can use the approximation in (6) to derive the implied subjective discount factor at each age for different levels of risk aversion. Results are presented in Figure 17. The lower the assumed risk aversion, the flatter the subjective discount rate profile. This is because more highly risk-averse agents prefer smoother consumption, meaning that any deviations from smooth consumption magnify changes in the subjective discount factor required to generate them. For young individuals with low consumption, their lower-than-average consumption requires a negative discount rate – i.e. the future is more highly valued than the present – to generate their low consumption if their risk aversion is high.

Unfortunately, NTA estimates for other countries do not as yet include average wealth profiles. One area of future work would be to compare these values with estimates from other countries in order to shed light on the determinants of consumption and savings at different ages, in particular, on the role played by different institutions on saving and consumption behaviour.

The cost of raising a child

One output of NTA's is an estimate of the costs of raising children, both financed by the public and privately. This could inform a large theoretical and empirical literature on the determinants of fertility, the transmission of inequality in society, and the role played by the public sector in reducing the private costs of childbearing.

For each country, we construct synthetic profiles, using UK (2007) mortality, and assume productivity growth of 2% p.a., and a discount rate of 4% p.a. We make the assumption that the population is in steady state, and therefore that the cross-sectional profiles we have calculated are good estimates of longitudinal profiles. Under these assumptions, the present value of the consumption of a child from birth to the age of 19 in the UK is £223,000, made up of £143,000 private transfers, £61,000 of public transfers, labour income of £22,000 and (net) savings of £2000.

We then repeat this calculation across our sample of countries, and scale by average labour income between the ages of 30-49. The results are presented in Figure 18. In our limited sample, the average number of years of income required to raise a child to the age of 19 is 8.4 years. Private transfers average 4.4 years. The UK is somewhat above the average for the total (8.6 years), but requires much more private investment in children than other countries in this group (5.5 years of average labour income).

Understanding the implications of the NTA results for childbearing is a huge area. Lee and Donehouwer (2010), compare NTA results with fertility in different countries, and find that there may be a quality-quantity trade-off, with investment per child being higher in countries where fertility is lower.

The response to public transfers – reduce savings or increase bequests?

There is a large economic literature on the response of individual households to changes in public transfers, particularly those which target the elderly. (Public transfers to the young are usually regarded as a response to credit constraint which prevent poorer parents from investing optimally in their children's human capital, at potentially great social cost, in the spirit of Becker and Tomes (1984)). There are two main schools of thought in regard to the provision of public transfers to the elderly. The first, propounded by Feldstein (1974) and many others, is that an increase in public transfers to the elderly will reduce private saving for retirement, and therefore reduce national saving if the public system is unfunded. The second, after Barro (1974), is that the elderly react to the increased transfers by increasing their bequests, compensating the younger generation for the increased taxes that they pay.[5]

NTA's provide cross-sectional data which may shed light on this issue, although when a full time-series of NTA estimates is available, this will be even more useful because it will potentially allow the effects of changes in public programs on the consumption and savings behaviours of different cohorts to be identified.

In Figure 19, we examine the source of financing of the life-cycle deficit of the elderly in our sample of NTA countries. Private transfers are negative (and small) in each country for the cohorts we

[5] Of course, we are simplifying the range of possible choices. The elderly may simply consume more and leave transfers and saving unchanged, or they may work less. A combination of all of these is also possible.

examine, indicating that on average, the elderly in these countries transfer resources to their children. The trade-off between public transfers and asset-based reallocations is exceptionally strong. In countries with high public transfers to the elderly, people rely less on asset-based reallocations to finance their consumption – either by accumulating fewer financial assets to begin with, or by saving more of the income that these assets generate, and bequeathing the assets to their children.[6]

To see which of these holds, we calculate a cohort measure of the savings of the elderly, expressed as a fraction of average labour income between the ages of 30 and 49 in each country. We then regress the proportion of consumption financed by public transfers on this savings measure. The regression results are reported in Table 3, and shown graphically in Figure 20. The European countries, plus the US, are broadly collinear, while Japan is an outlier with a very high savings rate relative to its level of public transfers.

Table 3 about here.

The slope of the line is positive, and statistically significant at a 10% level. It is clear that in high-transfer countries, asset-based reallocations are low not because individuals have not saved assets for their retirement, but rather because the asset income which they earn they choose to save rather than use for their consumption. The more significant public transfers as a proportion of consumption, the higher the absolute amount of saving in old age. Of course, this is not to say that there is no crowd-out of private savings associated with public transfers, and in fact the form of the regression does not allow us to estimate the extent of the crowd-out directly, simply to state that the crowd-out is not perfect. The higher savings of the elderly in high public transfer countries must find their way into higher bequests, and this is an area of future research.

Residential housing and savings patterns

There has recently been some controversy in the academic literature about the relationship between changes in residential house prices and changes in personal consumption. Case, Quigley and Shiller (2005, 2011), find a strong relationship between house prices and aggregate consumption at a regional level in the US, both when house prices rise and when they fall. They find that the effect of changing house prices is stronger than the effect of changing stock prices on consumption. However, aggregate data are unable to disentangle various hypotheses about the cause of this relationship. For instance,

[6] Lee et al (2010) report a small labour supply response to public transfers as well, which we do not focus on here.

there could be a wealth effect driving consumption, there could be a relationship between house price changes and credit constraints in the economy, or there could be a common factor driving both house prices and consumption. To try and disentangle these, Campbell and Cocco (2005) use UK micro-level data and find a strong effect of house prices on consumption, particularly for the old, consistent with a wealth effect. On the other hand, Attanasio et al (2009) and Attanasio and Weber (1995), using the same data, find oddly that the effect is strongest for the young, rather than the old, and that renters typically have consumption which responds in a similar way to changes in house prices than owner-occupiers, suggesting a mechanism other than a pure wealth effect or a relaxation of credit constraints. They suggest that some common factor – they identify income expectations – underlies both the change in house prices and the change in consumption. Both of these will be stronger for the young than for the old.

NTA potentially allows this question to be answered in greater depth than any of these studies. Firstly, important macro-economic variables such as consumption, labour income, savings, and intergenerational transfers, both private and public, are all disaggregated by age in the NTA framework. Preparing NTA's disaggregated by home-ownership status could, in principle, therefore allow the relationship between age, changes in house prices, and any of these variables to be examined. Secondly, NTA's also provide estimates of how resources are transferred between different generations. This potentially allows a much wider set of questions – such as the relationship between inter-generational transfers, private and public, and changes in house prices – to be answered. (There is anecdotal evidence, at least, that increases in house prices in the UK have led to increased inter-vivos transfers from parents to their children to allow the latter to purchase their first homes.) Finally, because NTA's disaggregate consumption into various components, they potentially allow for more accurate synthetic cohorts to be constructed where there have been systematic time-related changes in the balance of consumption between public and private, which may have been the case in the UK over the last 25 years.

A full analysis would require a complete set of NTA's for each year, split by residential housing status. Using the approach of Deaton (1985), we would then construct synthetic cohorts from the time series data and perform analyses on these. This approach is complicated by the fact that people move from one status to another systematically across the life-cycle, becoming renters in their early twenties and then gradually becoming owner-occupiers as they age. Since these changes are not independent of some of the variables of interest – richer individuals will tend to become owner-occupiers earlier – the average consumption of synthetic cohorts of both owner-occupiers and renters will tend to decline over time.

As a first step, we have calculated our estimates of NTA's for the year 2007 separately for owner-occupiers and renters. We used the same methods as described in the previous section. Because we lack separate macro-controls for owner-occupiers and renters, we use the sample totals to split the aggregate controls between the two categories, effectively treating housing tenure status as an extension (actually a doubling) of the age profile.

Figure 21 shows the (smoothed) proportion of our sample at each age who live in a household which is an owner occupier. Roughly two thirds of children live in owner-occupier households. As children leave home, the proportion of owner-occupiers falls to 50%, then rises gradually with age until it peaks around age 60, then falls again. (It should be noted that the data survey excludes individuals living in institutional housing, such as student residences and old-age homes, potentially biasing the proportion upwards at those ages). Rather than presenting all NTA results for each type of household, we focus on some indicative results. It should be emphasised again that these profiles are cross-sectional, rather than longitudinal, indicating that we should not necessarily expect consistency between profiles representing and stock and those representing flows. This is particularly important in the financial assets/savings set of profiles.

Figure 22 shows per capita consumption, labour income and rentals (both imputed and actual) for owner-occupiers and renters at each age. Imputed and actual rentals are surprisingly close together at most ages. Imputed rentals are lower than actual rentals for people around the age of 20, and higher above the age of 60, possibly reflecting students housing, and the effect of children moving out of home and the higher quality of the housing stock of older owner-occupiers.

Consumption by owner-occupiers is higher at almost every age, except at age 20, when there are many students who are in rented accommodation. As individuals age, the difference between the two diverges substantially, reaching around £5,000 p.a. by age 90. The most striking difference, though, is in labour income. The labour income of owner-occupiers is very substantially higher than that of renters at almost every age, sometimes more than double as much. The average labour income of renters is so low that it only covers their consumption for a brief period in their early thirties, indicating a substantial life cycle deficit at virtually every age.

Figures 23 and 24, shown on the same scale for easy comparison, shows how the life-cycle deficit is financed for each of the two categories. Renters show a positive transfer from the public sector at every age, and relatively small asset-based reallocations, indicating that transfers from the public

sector are largely financing their consumption. This is especially true for the elderly above the age of 60, who are almost entirely dependent on public transfers to finance their consumption. Owner-occupiers, on the other hand, show substantially greater private transfers to their children, but lower public transfers, while there is a substantial net transfer to the public sector between ages 20 and 65. Their dependence on the public sector at older ages is much less, and their asset-based reallocations are higher, indicating substantially greater reliance on either dissaving or asset income to finance consumption at older ages. Bequests, given and received, are much higher.[7] We calculate the aggregate transfer through the public sector to renters to be around £104bn or 7.4% of GDP in 2007.

The final set of figures shows the components of the per-capita asset-based reallocations for owner-occupiers and renters, again shown on the same vertical scale for ease of comparison. Renters show a small amount of dissaving at younger ages, a small amount of saving between their mid-forties and mid sixties, and a small amount of dissaving thereafter. The comparison with owner-occupiers could not be more striking. These show a substantially greater amount of saving between their mid-forties and mid-sixties, and a much greater amount of dissaving thereafter.

Financial asset income for owner-occupiers is actually *lower* than the financial asset income of renters at some younger ages, possibly indicating increased accumulation of financial assets in anticipation of purchasing a house, or lower consumption because of living with parents. However, after their early thirties, the financial asset holdings of owner-occupiers begin to accumulate rapidly, reaching a maximum around the age of 60, after which it falls.

8. Conclusion

National Transfer Accounts provide a cross-sectional picture of the age-related transfers in an economy, in a way which permits international comparisons between countries, and which provides insights into many economic questions in different areas.

Although the NTA estimates we have presented here for the UK are interim estimates, and will no doubt change as they are refined, they illustrate that the UK shares many patterns in common with both Europe and the USA. Retired people in the UK, like those in the US, are heavily dependent on

[7] In calculating bequest profiles separately for renters and owner-occupiers, we made the somewhat objectionable assumption that the heirs of owner-occupiers are also owner-occupiers, and likewise for renters. Although this assumption was driven by ease of calculation, in the absence of any reliable information on this point (no UK survey we know of has information about the housing tenure of parents and their non-residential children), it may not be too inaccurate.

asset-based reallocations to finance their consumption, and there appears to be a significant level of dissaving at older ages in the UK. However, like European countries, there are significant transfers of resources away from those in middle age towards the young and the old mediated by the public sector. In common with most countries, family transfers appear to be mostly downward in the UK, with retired individuals still supporting their children, on average.

We have also examined some potential applications of NTA estimates. Some other applications – most notably, the relationship between population structure and asset markets – will only be possible once full time series of NTA estimates are available. However, the evidence that NTA's have already provided to tests of the lifecycle model, the costs of raising children, the issue of the family response to higher public transfers to the elderly, and the different pattern of savings and transfers for owner-occupiers and renters, are tantalising.

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10. Tables

	PROFILE NAME	MACRO CONTROL ADJUSTMENT
1.	Income: employment	1.175
2.	Income: self-employment	1.330
3.	Income: fringe benefits	- [a]
4.	Private consumption: education	1.603
5.	Private consumption: health	0.666
6.	Private consumption: housing	0.385
7.	Private consumption: other	1.548
8.	Government collective consumption: education	0.573
9.	Government collective consumption: health	1.185
10.	Government collective consumption: social care	2.514
11.	Government collective consumption: other	1.799
12.	Government transfers: corporation tax	- [b]
13.	Government transfers: income tax	1.428
14.	Government transfers: property tax	0.962
15.	Government transfers: indirect taxes	2.110
16.	Government transfers: National Insurance contributions	1.433
17.	Government transfers: other taxes	- [c]
18.	Government transfers: non old-age related benefits	2.761
19.	Government transfers: old-age related benefits	1.004
20.	Inter-hh transfers: in	- [d]
21.	Inter-hh transfers: out	- [d]
22.	Intra-hh transfers: in	- [e]
23.	Intra-hh transfers: out	- [e]
24.	Household interest expense	- [f]
25.	Household mixed income	- [f]
26.	Household investment income	- [f]
27.	Household operating surplus (imputed rent)	- [f]

The macro control adjustment column represents the ratio between the variable's macro control taken from the 2008 Blue Book to the total obtained by calculating the weighted total using the survey variables. A value greater than 1 means that the empirical profile undercounts the variable relative to the National Accounts; a value less than 1 implies the opposite.

[a] Profile balances macro control exactly because this variable is included in employment income in the EFS.
[b] Corporation tax allocated using investment income profile.
[c] Other taxes allocated using consumption profile.
[d] Net profile balanced to net inter-household transfers from 2008 Blue Book.
[e] No macro control.
[f] These profiles used to allocate investment income and interest expense, so no macro control.

Table 1: List of profiles estimated

COUNTRY	YEAR
Austria	2000
Germany	2003
Hungary	2005
Japan	2004
Spain	2000
Sweden	2003
UK	2007
US	2003

Table 2: List of countries in NTA sample reported on, as well as the year in which the NTA estimates were constructed.

Dependent variable: Total savings for synthetic cohort age 65+, scaled by YL(30-49)				
	Coefficients	*Standard Error*	*t Stat*	*P-value*
Constant	-1.2223	1.496656	-0.81669	0.445314
Propn of LCD financed by public transfers	0.040326	0.019905	2.025915	0.089167

Table 3: Regression of the total savings of synthetic cohorts of elderly on the proportion of LCD financed by public transfers.

11. Figures

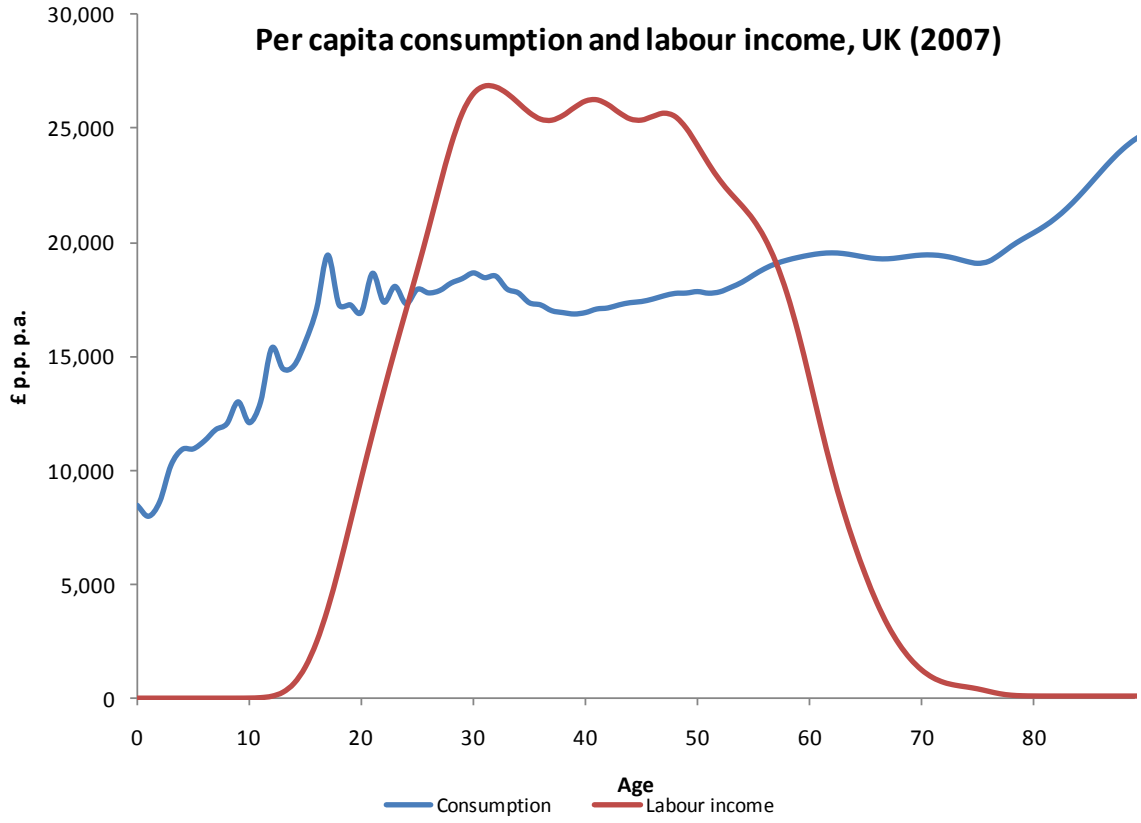

Figure 1: Age profile of per-capital consumption and labour income

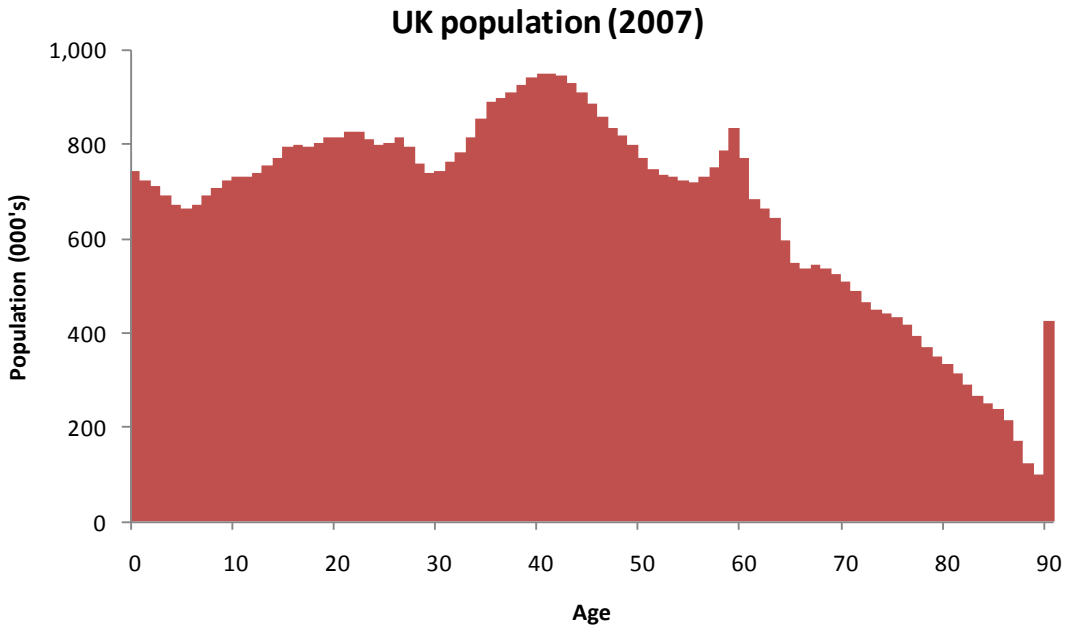

Figure 2: UK population (2007), source: Human Mortality Database, www.mortality.org

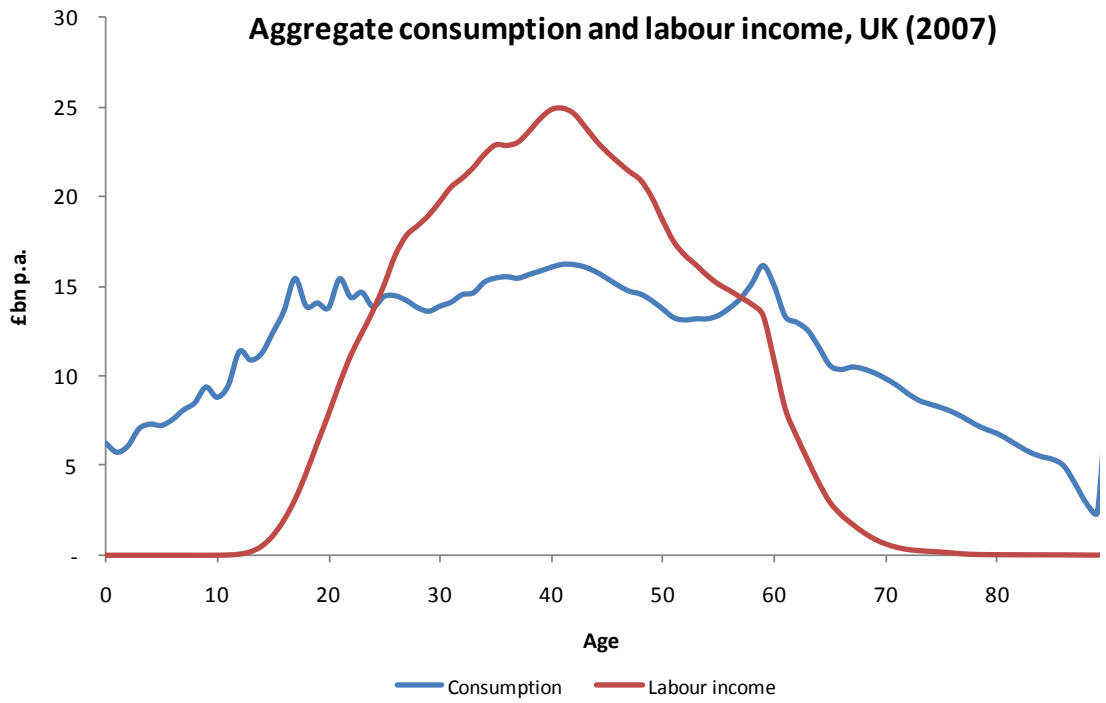

Figure 3: Aggregate consumption and labour income by age

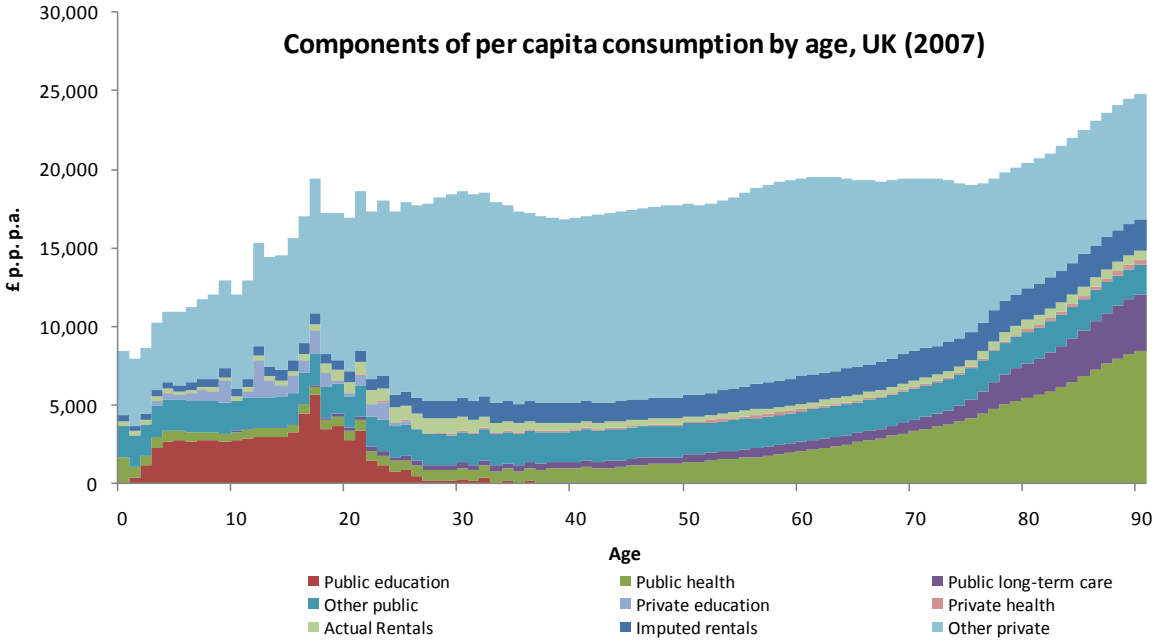

Figure 4: Components of per capita consumption by age

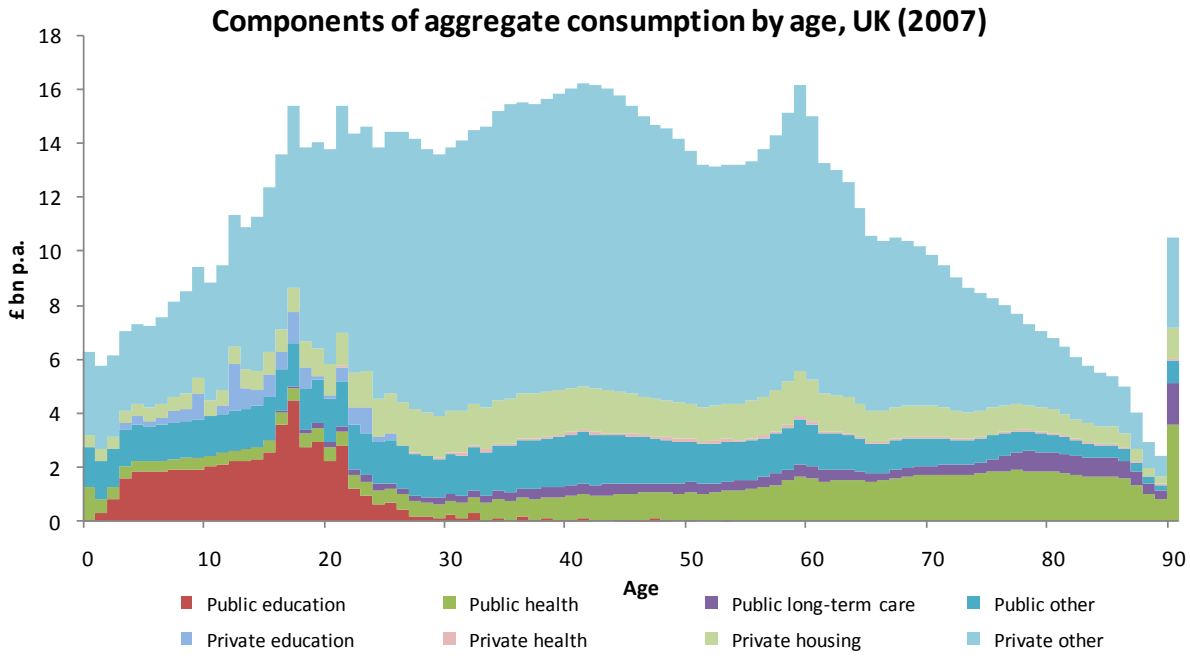

Figure 5: Components of aggregate consumption by age

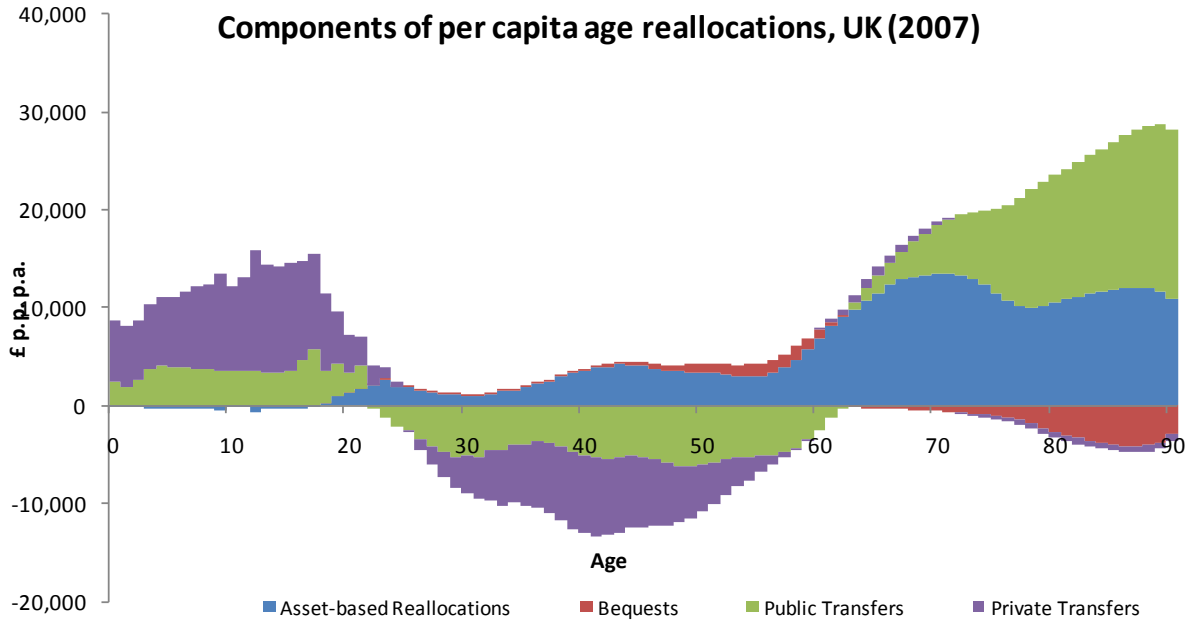

Figure 6: Components of per capita age reallocations by age

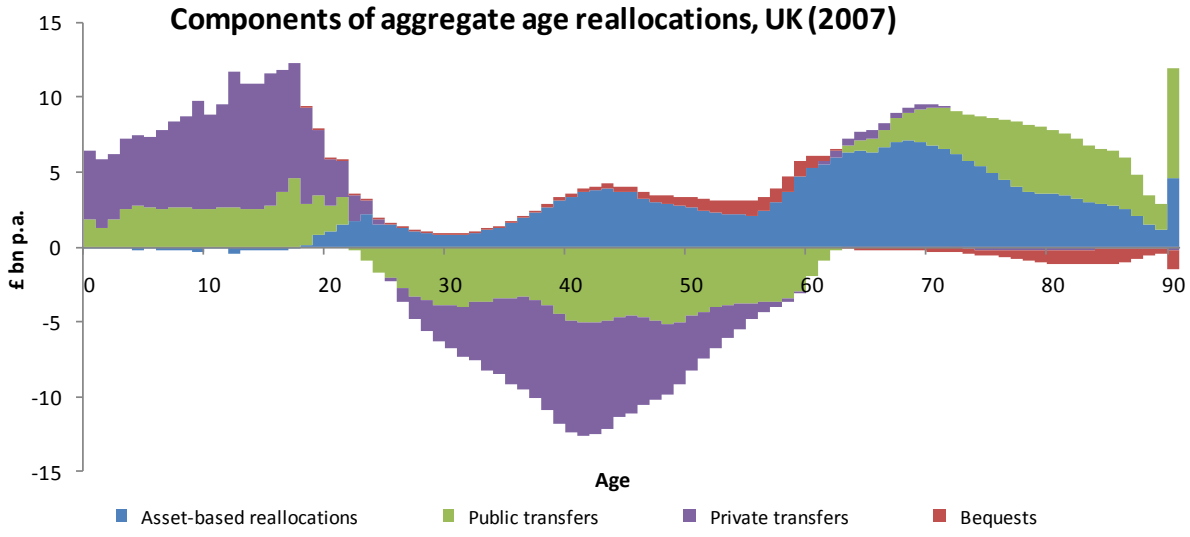

Figure 7: Components of per capita asset-based reallocations by age

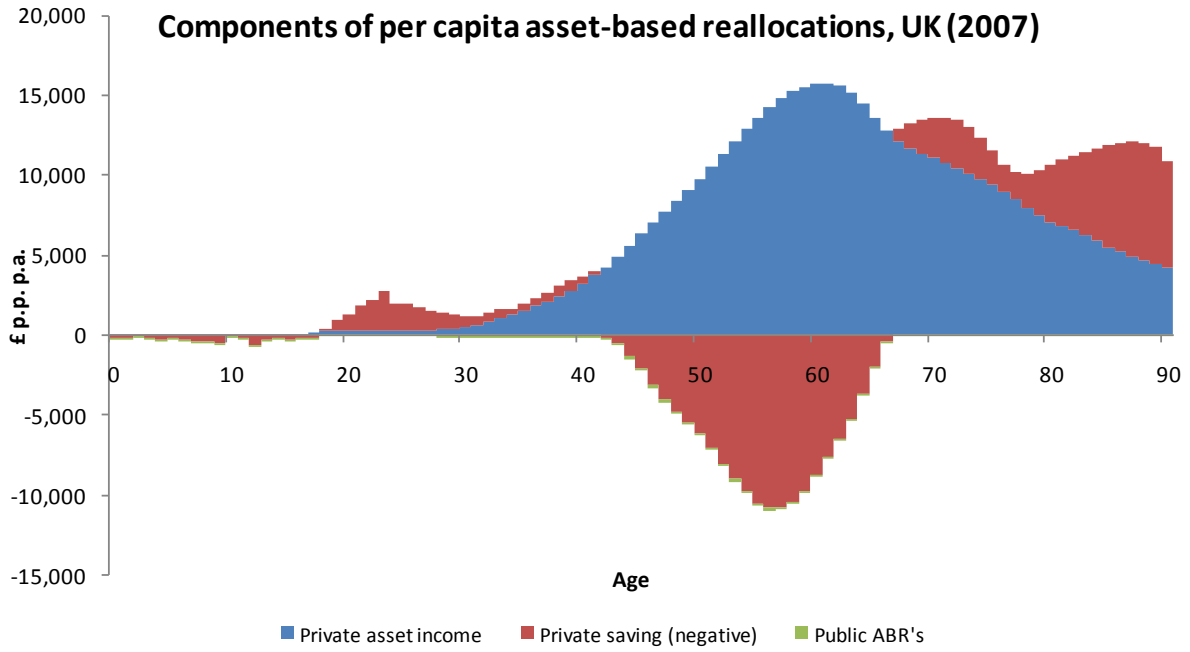

Figure 8: Components of per capita asset-based reallocations by age

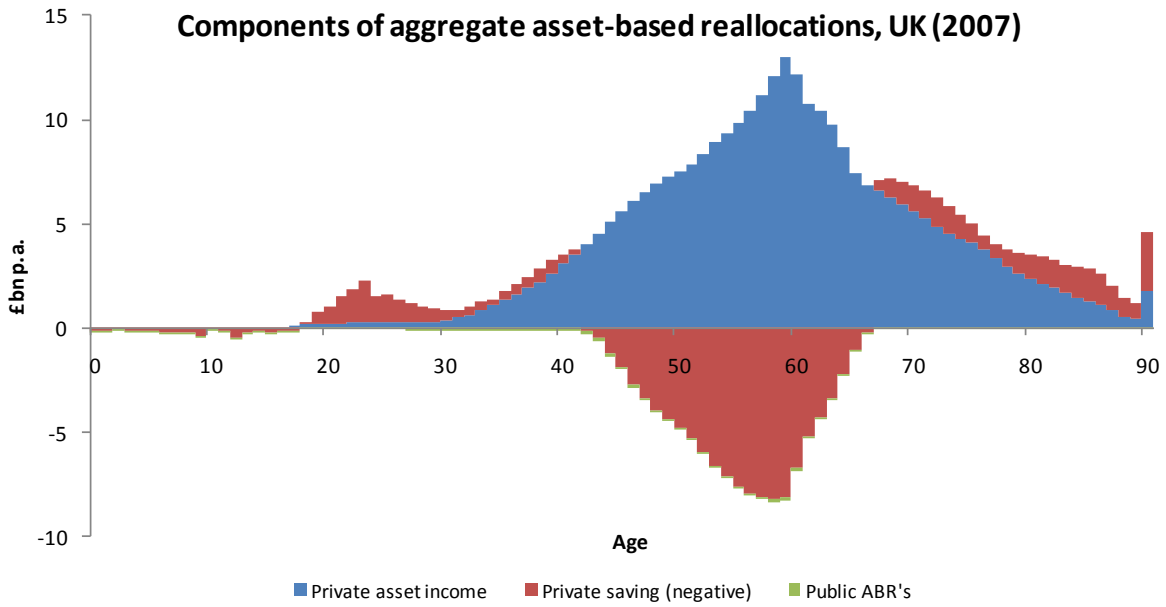

Figure 9: Components of aggregate asset-based reallocations.

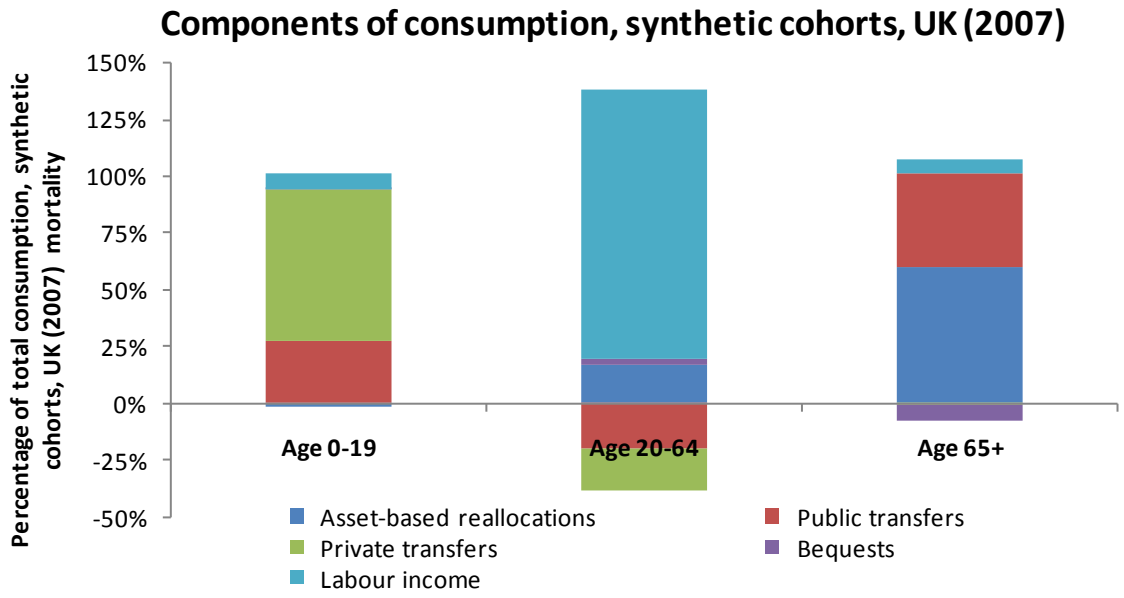

Figure 10: Components of consumption, UK synthetic cohorts (2007)

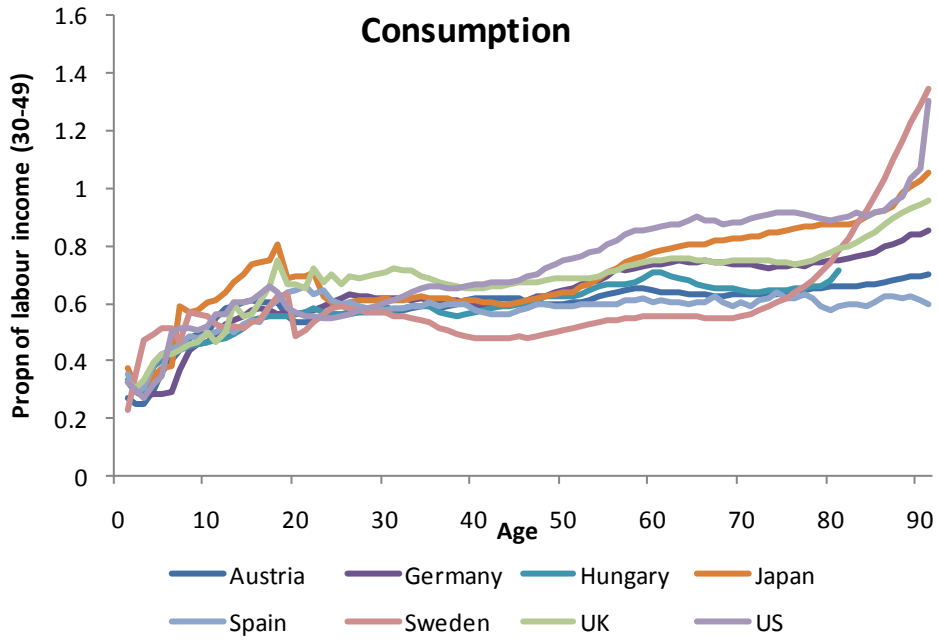

Figure 11: Age profile of consumption, UK and peer countries, synthetic cohorts, various years. Source: www.ntaccounts.org.

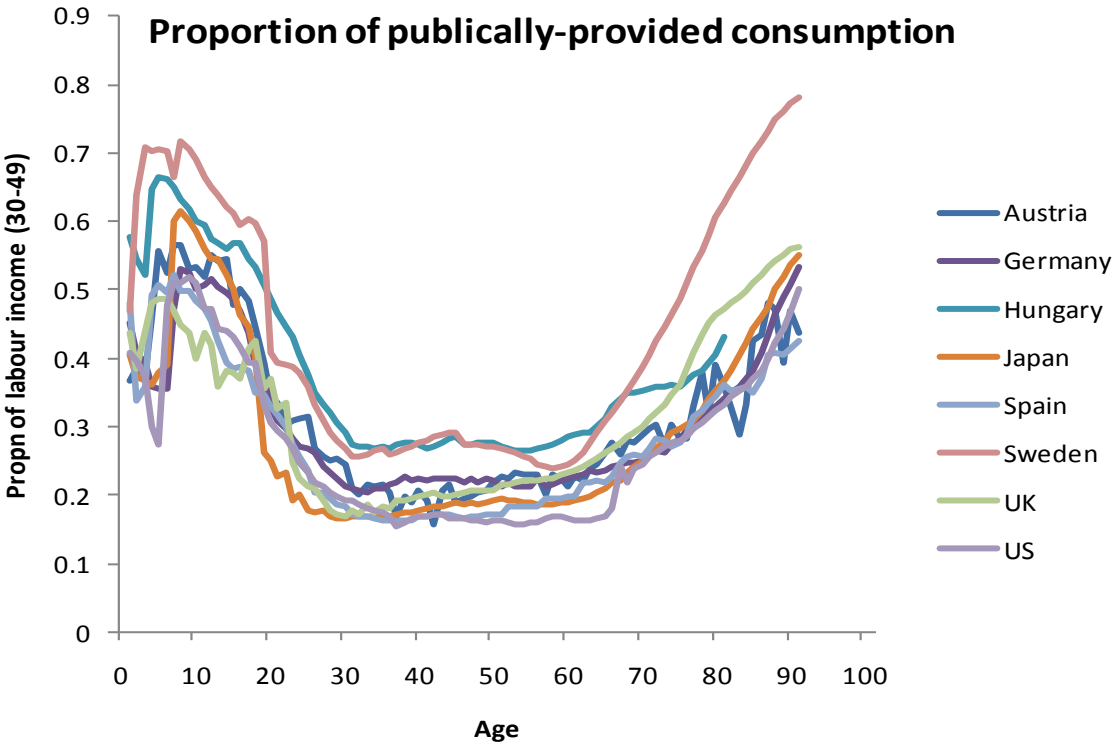

Figure 12: Proportion of consumption which is publicly provided, UK and peer countries, various years. Source: www.ntaccounts.org.

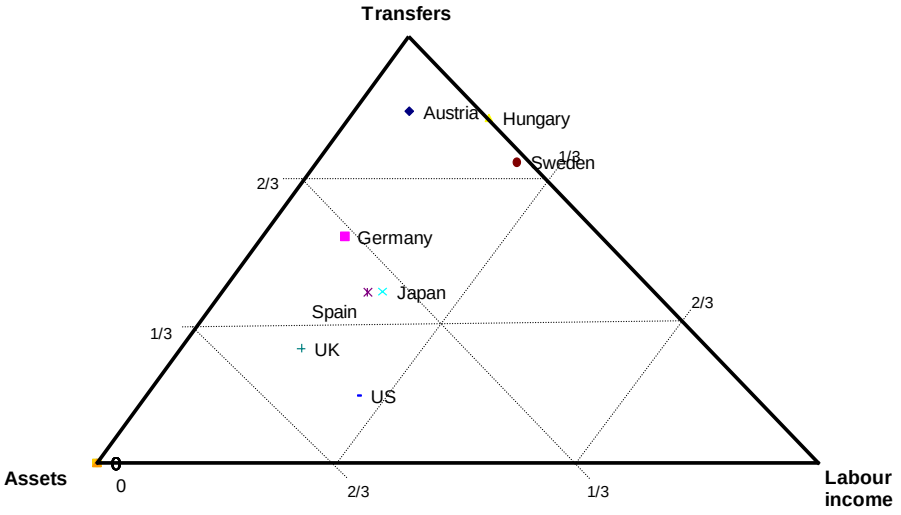

Figure 13: Components of 65+ consumption, UK and peer countries, synthetic cohorts, various years. Source: www.ntaccounts.org.

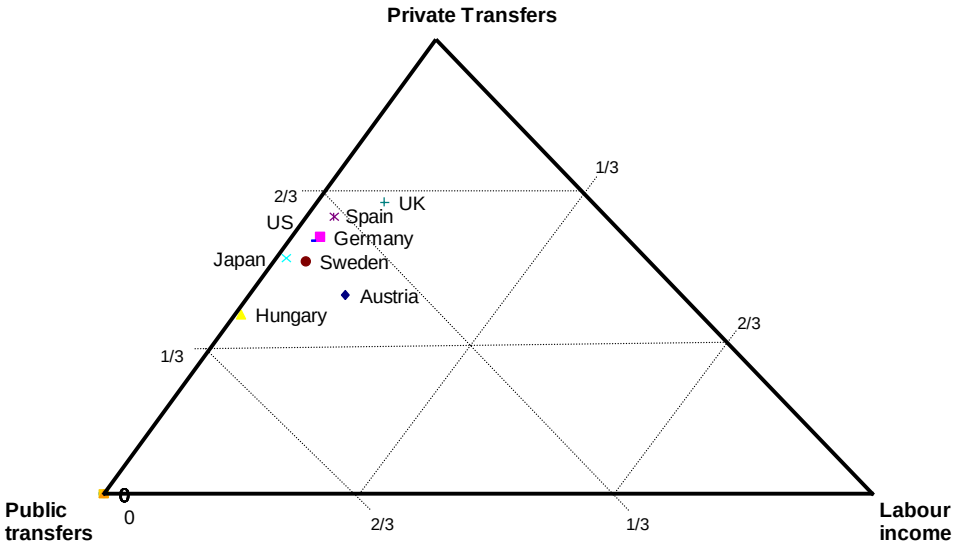

Figure 14: Components of 0-19 consumption, synthetic cohorts, various years. Source: www.ntaccounts.org.

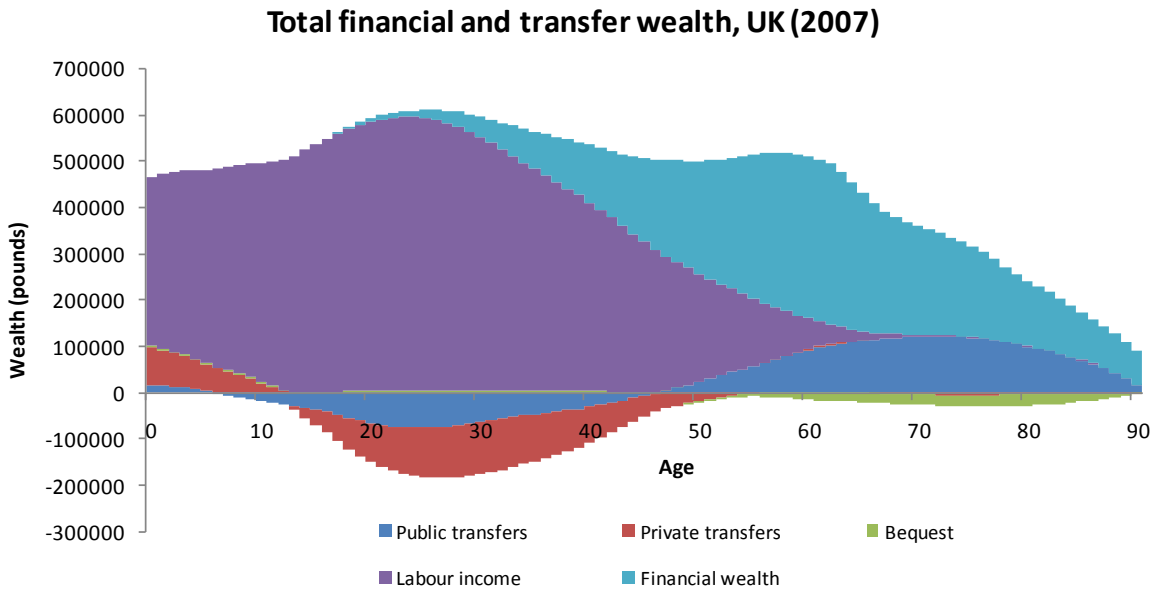

Figure 15: Total financial and transfer wealth, by age, estimated from NTA's, UK (2007).

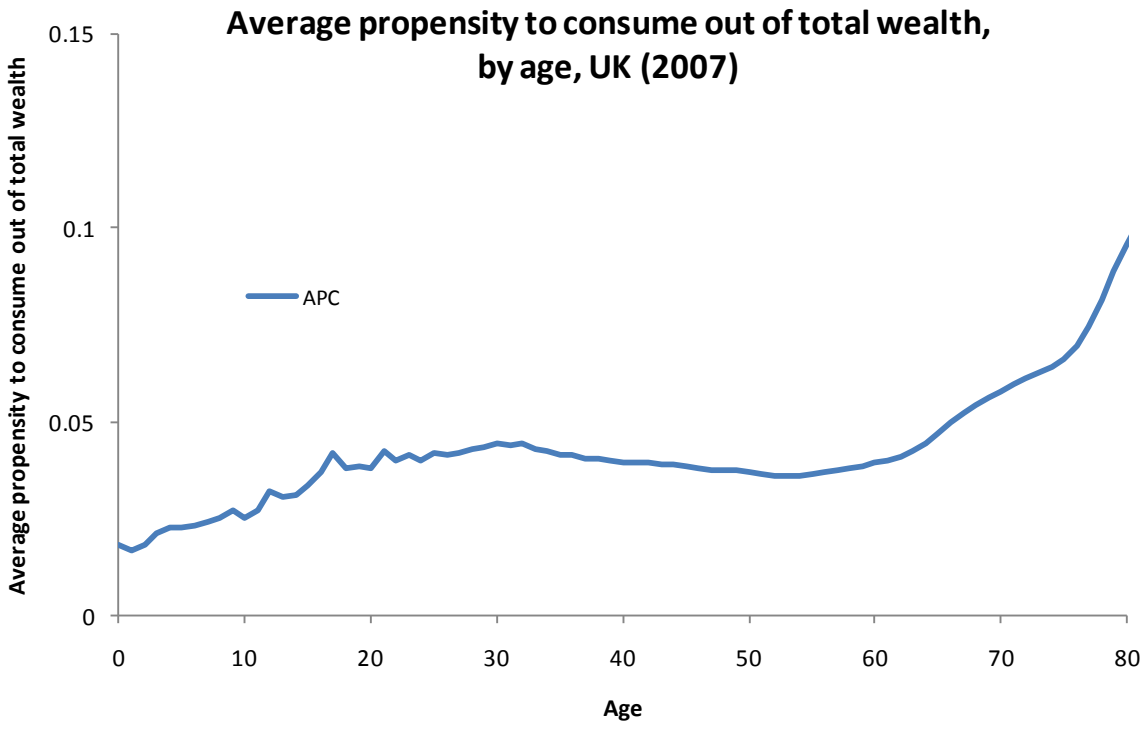

Figure 16: Average propensity to consume out of total wealth, by age, estimated from NTA's, UK (2007).

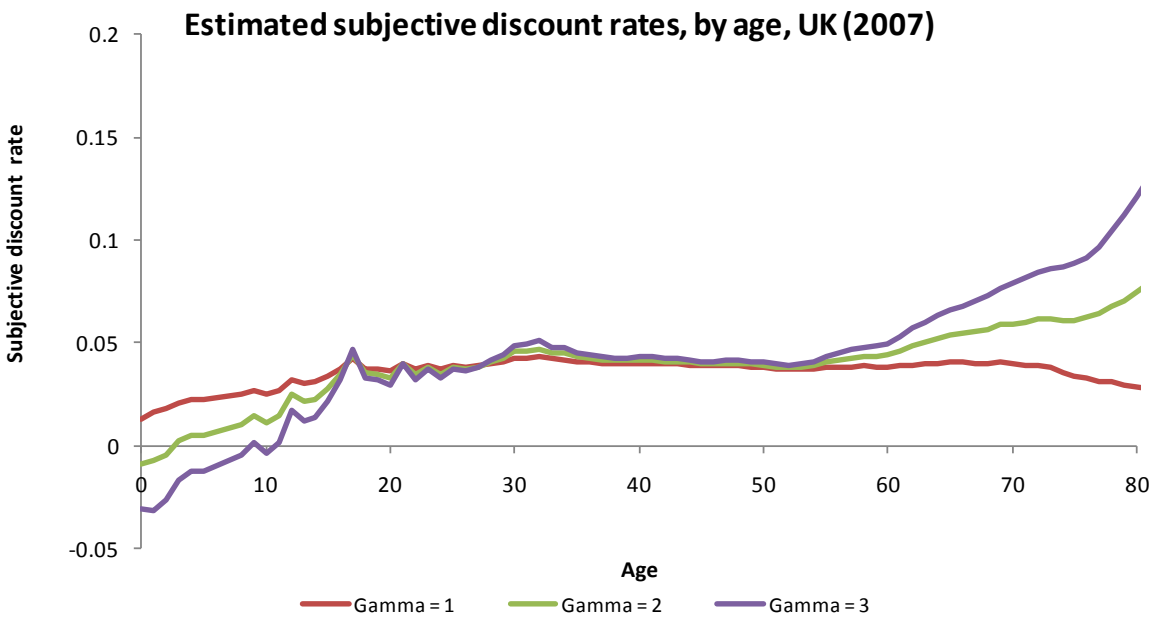

Figure 17: Estimated subjective discount rates, by age, UK (2007)

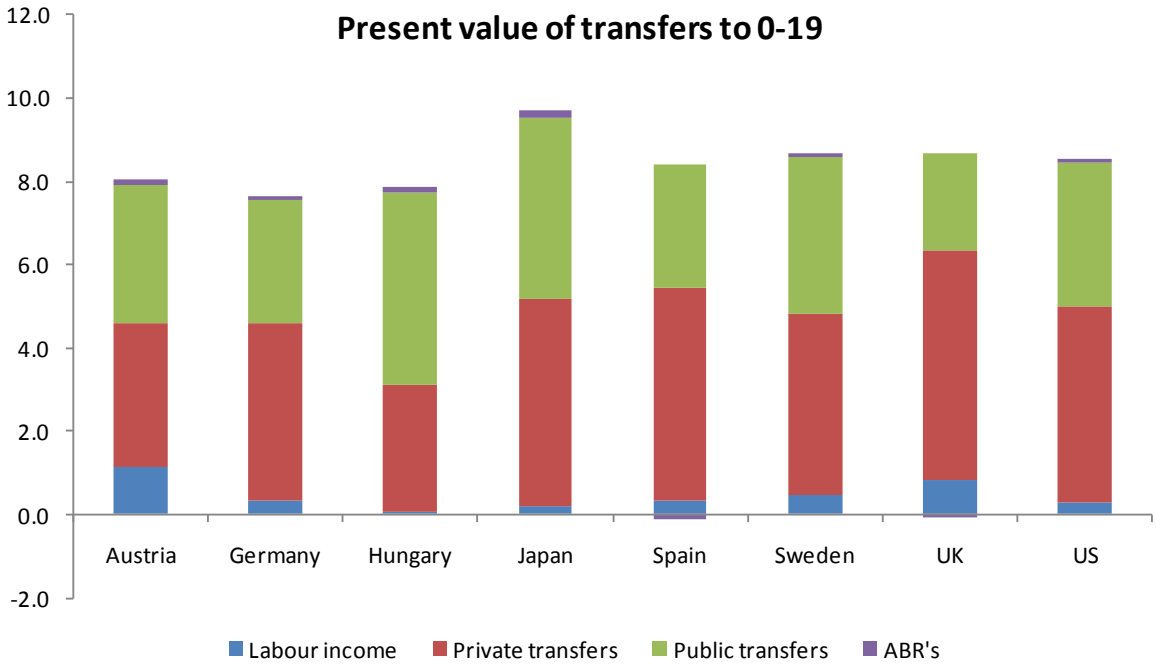

Figure 18: Present value of total transfers to children aged 0-19. Source: www.ntaccounts.org

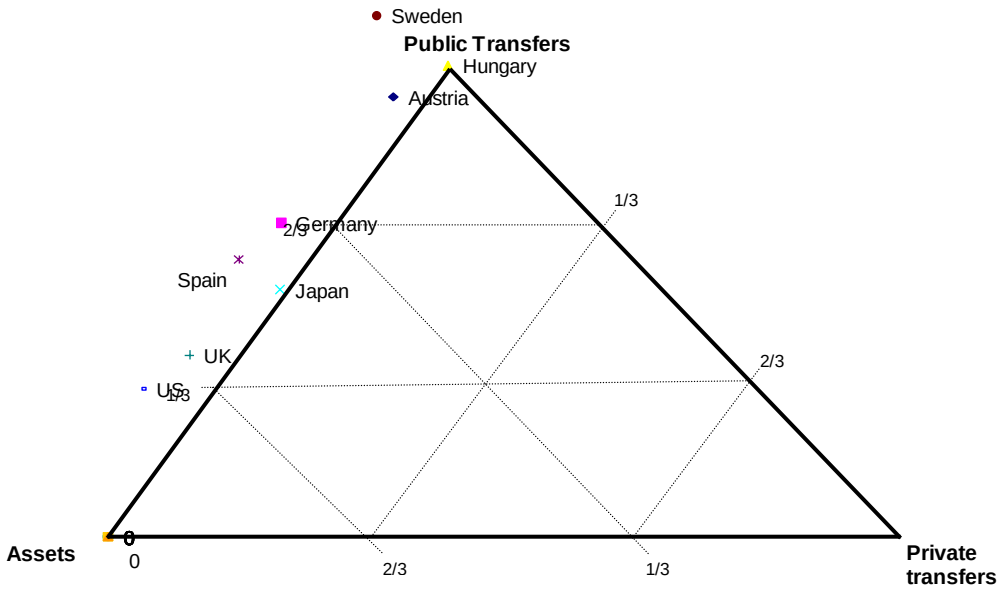

Figure 19: Components of 65+ life-cycle deficit, UK and peer countries, synthetic cohorts, various years. Source: www.ntaccounts.org.

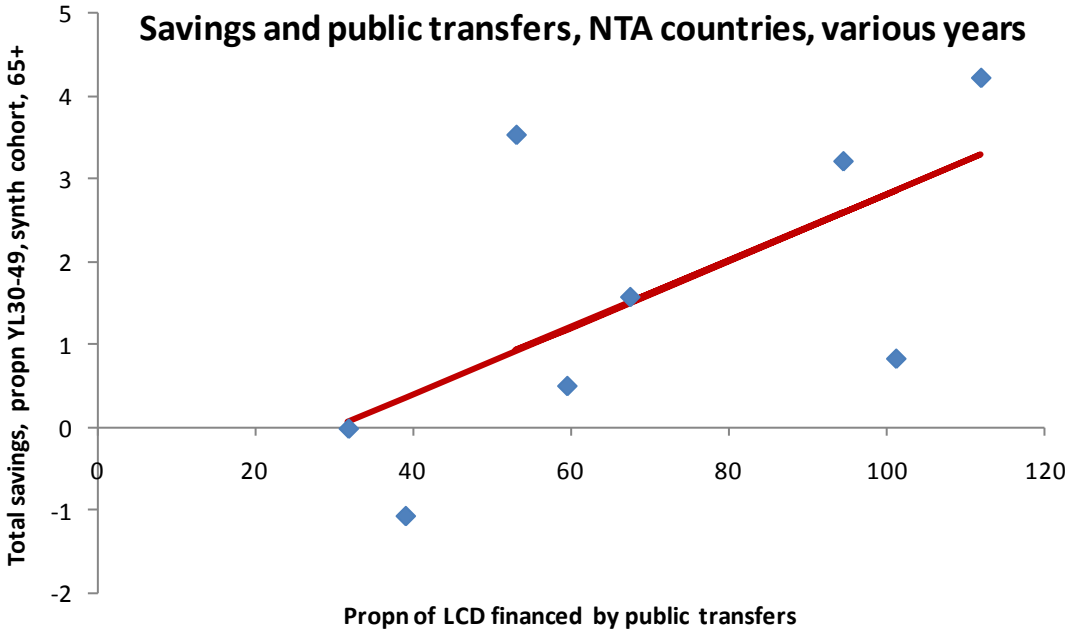

Figure 20: Relationship between proportion of LCD financed by public transfers and total savings of a synthetic cohort, 65+, various countries. Source: www.ntaccounts.org

Figure 21: Proportion of owner-occupiers at each age, UK, 2007. Source: EFS

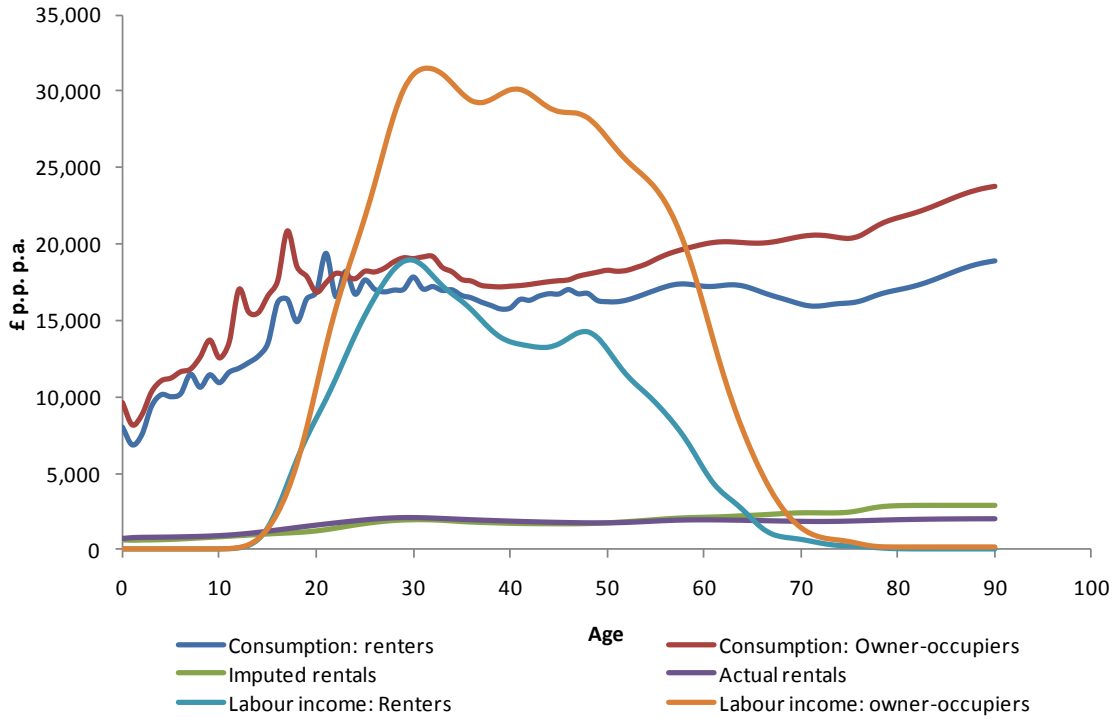

Figure 22: Per-capita consumption, direct housing costs and labour income by age for renters and owner-occupiers.

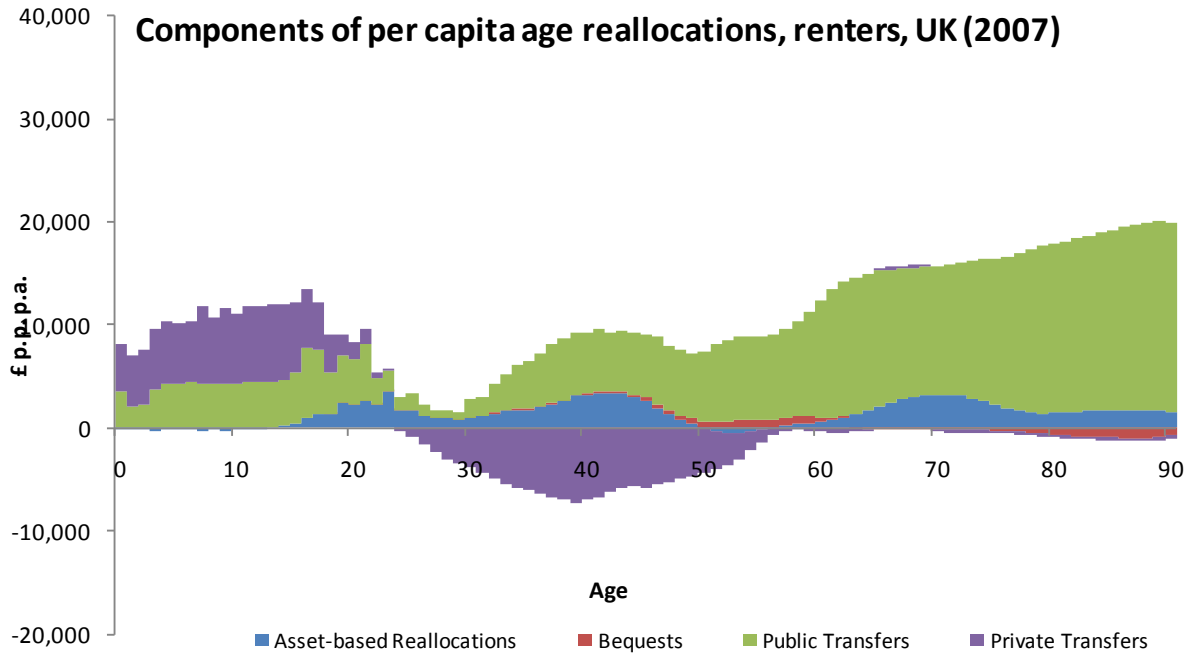

Figure 23: Per-capita age reallocations, renters, UK (2007)

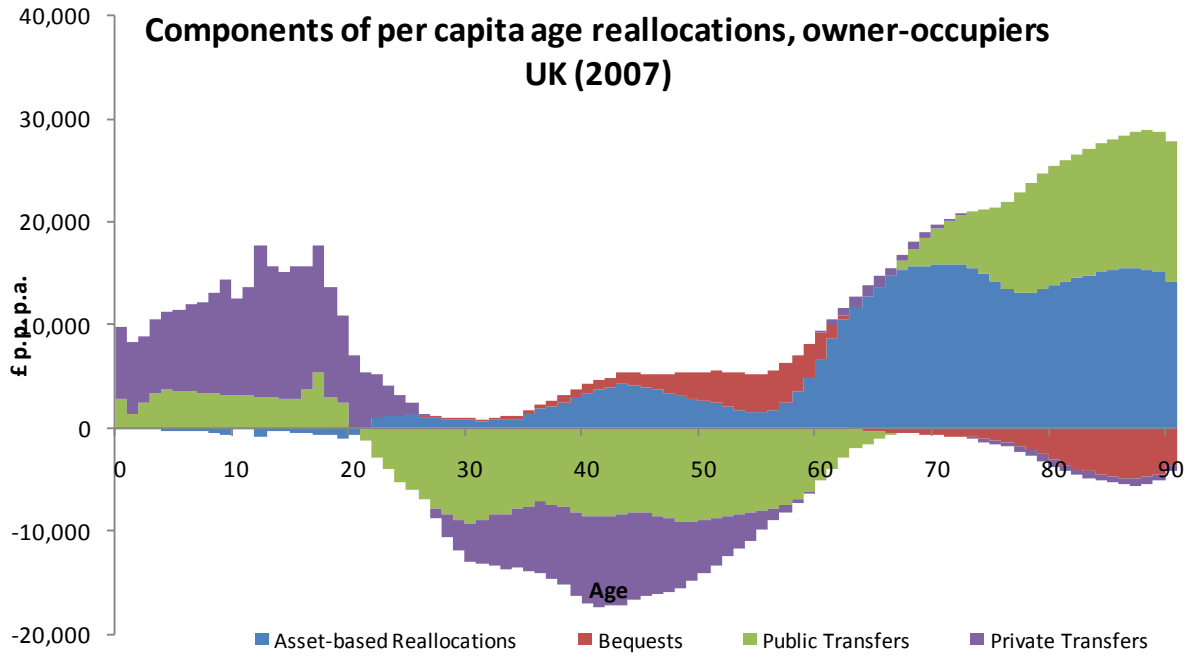

Figure 24: Per-capita age reallocations, owner-occupiers, UK (2007)

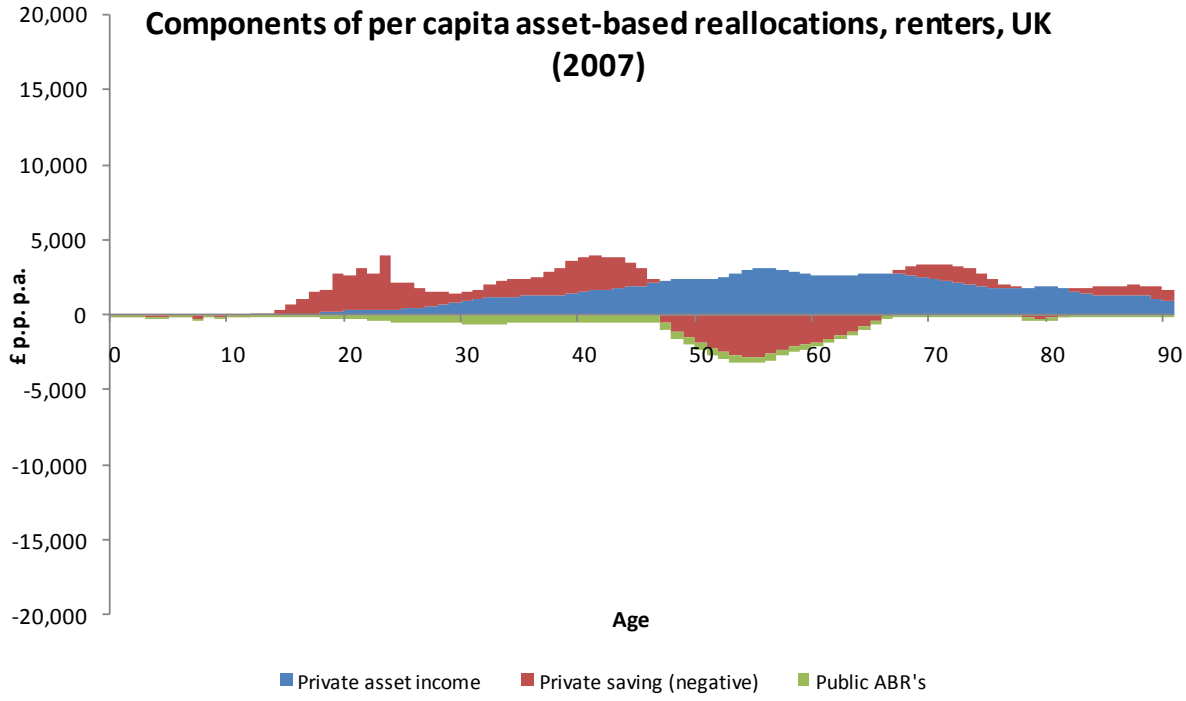

Figure 25: Components of per capita age asset-based reallocations, renters, UK (2007)

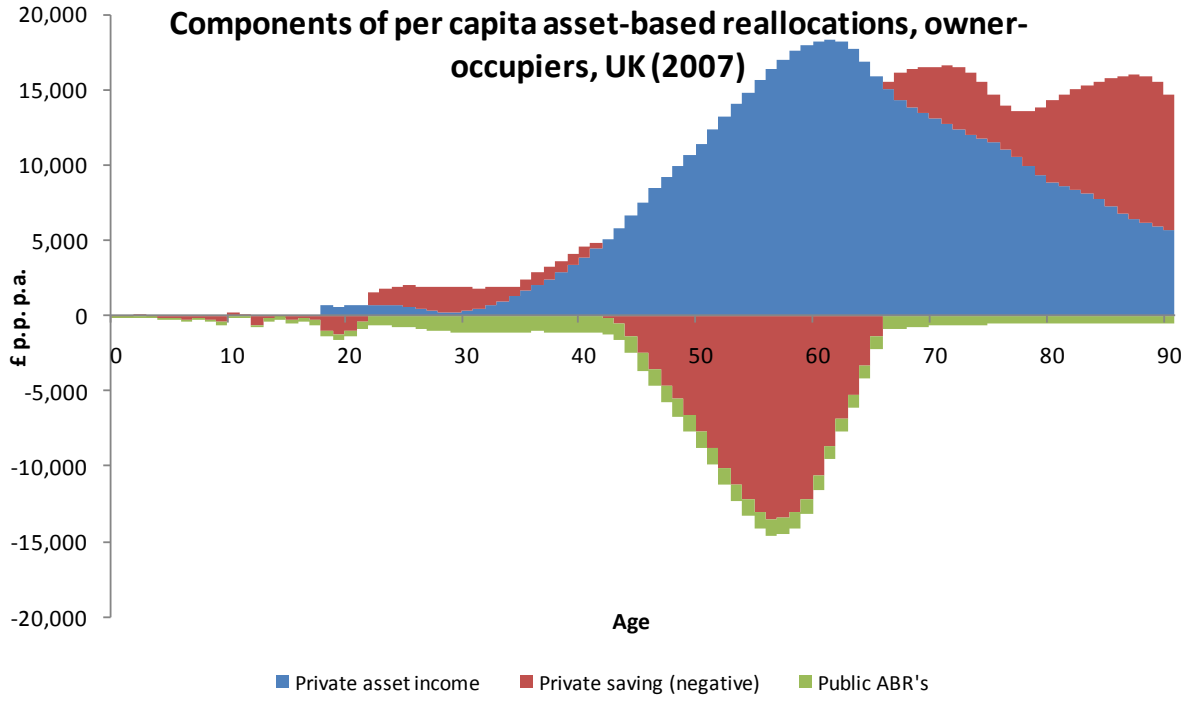

Figure 26: Components of per capital asset-based reallocations, owner-occupiers, UK (2007)