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# Intergenerational public and private sector redistribution in Sweden 2003

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**ABSTRACT** We describe intergenerational redistribution in Sweden the year 2003. The high Swedish tax ratio of around 50-60 percent of GDP per capita is partly explained by every individual getting a lot back in terms of transfers and part in government consumption. Another reason is that most transfers are taxed, which results in double counting some tax payments. Here we attempt to correct the age profile of net tax payment for these effects and compare these to the gross profiles. On a per capita basis we find, using this netting, that the mean age of tax payers drops from 55 to 48 and that the taxes paid falls by 23.2 percent. We also look at age profiles of private and public consumption, and net private consumption, i.e., the difference between private disposable income and private consumption. We find that private net redistribution flows mainly from middle and old age to young ages, while net public transfers flow to both young and old.

**Svensk sammanfattning:** Rapporten studerar intergenerationell omfördelning i Sverige för 2003, både den som sker genom offentlig sektor men även genom hushåll. Typiskt för Svenska institutionella förhållanden är dels en hög skattekvot kring 50-60 procent av BNP per capita dels en betydande offentlig konsumtion och transfereringar. Att skattekvoten är hög kan dock även förklaras med betydande dubbelräkning i vissa skattebetalningar genom att många offentliga transfereringar beskattas. Vi beräknar åldersprofiler över korrigerade skattekvoter som tar hänsyn till denna rundgång och jämför med okorrigerat mått. Vi finner att genomsnittsåldern för skattebetalaren förskjuts från 55 till 48 och att skatteinbetalningen faller med 23.2 procent när skattekvoten korrigeras för denna rundgång. Vi undersöker också åldersprofilerna för privat och offentlig konsumtion, och privata nettotransfereringar. Ett resultat är att privata nettotransfereringar i huvudsak går från gammal till ung, medan offentliga nettotransfereringar går till unga såväl som till äldre.

## **1. Introduction**

Intergenerational redistribution in Sweden takes place through the public sector to an unusually large extent. The universal character of the benefit systems as well as the health care and education system results in a very high tax ratio of around 50-60 percent of GDP per capita making many economists (also in Sweden) wonder how the economy can work under such a tax burden (Thakur et al. 2003). Part of the answer is probably that virtually every individual gets a lot back in terms of transfers and part in government consumption. Another part may be that most transfers are taxed thus alleviating some otherwise troublesome marginal income effects but also effectively double counting some tax payments. Here we attempt to correct the age profile of net tax payment for these effects and compare these to the gross profiles. We also present patterns of private and public consumption. Taken together these reveal, as could be expected, that the sum of private and public consumption results in a very smooth life consumption. Lastly we describe briefly how net consumption, or savings, varies over different age groups.

### **1. Institutional background**

The Swedish welfare state is based on a quite extensive redistribution of resources across age cohorts. Due to the public organization of the redistribution this also holds across the members of any given birth cohort. Social policy is quite deliberately designed to promote dual-earner families rather than bread-winner households. Most transfer systems are tied to the individual's labor force participation providing quite extensive income insurance to most of the population. There are exceptions to this rule like students and self-employed. Occupational benefit systems are in general not directly tied to individual employers but organized through collective agreements encompassing whole sectors of the economy.

A major part of public consumption and tax collection is organized through local municipalities providing education at primary and secondary level as well as comprehensive public child care facilities and elderly care. The health care system is organized at the regional county level where also regional communication and transports are managed.

Thus it may seem to be a fairly decentralized system. It must be noted though that within this system an elaborate regulation redistributes tax resources across the municipalities and counties according to demographic and geographic profiles and other key factors in order to ensure fair or equal conditions for the provision of social services over the whole country. This considerably weakens the link between the local tax base and the local provision of public services.

#### **1.1. Social insurance**

The social insurance systems encompass much more than a public pension system. The central parts are administered by the Swedish Social Insurance Agency. Parental income insurance is provided both at child birth and in the event of children falling sick. Sickness insurance is compulsory and coverage provided by the employer for the first two weeks and only thereafter by the Swedish Social Insurance Agency. Health care

provision at nominal fees (with a low annual cap) is available to all including subsidized prescription medicine. Privately provided health care is mostly financed by the government at the same conditions as the publicly provided care. Dental care for adults though is largely non-public with only a small subsidy. However, for children up to 20 dental care is publicly financed. Unemployment insurance is provided through a number of unemployment funds in general connected with the trade unions but financed mainly through the government, fees accounting only for some 5 percent of benefits. Currently the new government intends to increase the share of self-financing and lower benefits.

Schools are free. Also private schools are financed by the government, up to the secondary level. Day care for small children is provided with heavily subsidized and in general means tested fees. There is some rationing still in the day care system but today it is in general available for almost all pre-school children, at least for day time care. Provision of child care at inconvenient hours is provided but with rather large local variation. Child allowances at an amount of approximately 12 000 SEK (\$1 500) per year and child are given to all parents up till the children are 16 (the per capita amounts are increasing somewhat with the number of children in the family) and, provided the children go to upper secondary school (more than 90 percent do), are extended as a study allowance until children are 19. Tertiary education is provided for free (except literature) but with rationing based on previous grades. A study loan system with a rather large subsidy is available for all students. Currently almost half of a birth cohort will enroll in tertiary education.

These are the main universal systems but in addition there are also means tested support systems available at locally varying conditions. Elderly care and transportation for all people with difficulties in using other public and private transportation is also provided with some variation; whether publicly or privately provided and there are local variants of fee systems and the extent of services but the bulk is government financed (also if privately provided). Housing subsidies have been cut back heavily since the 1970s but are still available at a means tested basis and mostly support single household parents and some poor pensioners. There are also numerous support systems for mentally or physically challenged people at all ages.

Although there are a lot of minor exceptions, income insurance is provided for the majority in the labor force but only up to a ceiling, but above this ceiling there are generally occupational insurance or private alternatives. In order to be fully covered you have to be qualified by some minimum of workforce participation and reasonable income in the near past. Labor force participation is therefore high, in general much higher than in other European countries, in particular for women and elderly. The systems have intentionally been designed for this and are aimed to support dual-earner families. Single earner families are supported as they fall below a poverty line but the bread winner (generally male but not always) has to earn fairly high income in order to keep standards of living at the average level.

## **1.2. Tax system**

Practically all income earners pay most of their income taxes to the municipality and county (municipality and county taxes vary with a few percentage points around 30 percent as a flat rate on labor income). On top of this high income earners above an

indexed ceiling pay another 20-25% to the state. The ceiling currently corresponds to something like 300 000 SEK or \$45 000 USD in annual income.

However, on top of this there are also quite substantial payroll taxes and social insurance fees as well as occupational insurance systems so that actual wage costs tend to be 45-55 percent higher than nominal gross wages. A minor base amount is deductible as are some work related expenses, mainly part of commuting costs.

Capital income on the other hand is taxed at a flat rate of 30% against which interest payments and capital losses are deductible. There are separate property and wealth taxes but taxes on gifts and inheritances have been abolished and parliament is just about to decide on a termination of wealth taxes.

Substantial value-added taxes on consumption (at different levels dependent on type of consumption 6, 12 or 25 percent) and some other indirect taxes provide another layer of the tax system. Taxes on energy, tobacco and alcohol are prominent among the indirect taxes and motivated by public health and environmental reasons.

Private firms and companies are also taxed, but rules allowing for deductions and tax smoothing through reservations and similar devices in practice means that Swedish enterprises are fairly lightly taxed and many employees use small firms as tax shelters for part of their income.

## **2. Basic age profiles of income, taxes and consumption for 2003**

### **2.1. Age profiles of gross taxes and transfers**

In Sweden, many public transfers including pensions, sickness allowances, unemployment benefits, etc., are taxed as income. This creates a significant within-year feedback, that is, a circular flow through the tax and transfer system that tends to blow up the actual intergenerational flows between individuals. For example it is calculated by an official government report (SOU 2003:110) that the annual feedback over an individual's whole life amounts to 45 percent of the entire redistributed resources.

If this taxation were removed cross-country comparisons would become easier to interpret since many countries do not have taxable transfers to the same extent as Sweden and other European countries as the Netherlands for example. In the Intergenerational National Transfer Account project we are interested in the redistribution of resources between generations. As taxable transfers vary by age, e.g., pensions are paid out in old age while other transfers might be more evenly distributed over life; we are in the present chapter interested in comparing the tax ratio by age group in Sweden's tax and transfer system when this feedback effect has been removed. But first we consider the age profiles of gross taxes and transfers.

The data used here are from the Longitudinal INdividual DAta set (LINDA). LINDA is a large micro-data set drawn from income registers and population censuses.<sup>1</sup> It consists of a large panel of individuals, about 300 000 individuals annually (about 3% of total

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<sup>1</sup> For more information about LINDA, see Edin et al. (2000).

population), representative of the Swedish population from 1960 to 2004. The data base also contains information on all family members of a sampled individual, as long as they remain in the household. In the following the 2003 sample is used.

The major part of the tax base includes *factor income*, i.e., labor income and capital income, and *taxable transfers*.

*Taxable public transfers* include public sickness allowance, pensions, and unemployment benefits. They also include taxable parental allowances, study allowances, and some other transfers.<sup>2</sup> *Nontaxable public transfers* include the nontaxable parts of sickness allowances, pensions, and study allowances, which on average are fairly negligible. The main parts of this category are family support transfers (social allowance, housing allowances, and child allowances).

In Sweden, there are also important *taxable non-public transfers* arising from collective agreements between unions and employers' associations, especially the occupational pensions paid out at old age. These give important income insurance; especially for high income earners as the public pension system do not replace incomes above a certain threshold. As is clear from Figure 2, the occupational pensions are especially important in order to smooth the transition into lower retirement income. Also, in case of, e.g., unemployment and sickness, collective agreements provide additional income cover to individuals. Note that these non-public transfers are taxed as ordinary income but financed outside the public system via contributions from employers. These contributions are not recorded in the individual tax and transfer register data, which we have used here. It is not straightforward to estimate these contributions as they vary with the type of collective agreement. Individuals hence receive substantial income support if retired or unemployed, etc., that is not financed via the tax bill. One view would be to consider these taxable non-public transfers as postponed earnings taxed when withdrawn, and not as transfers. This is the assumption for this analysis.

*Taxes* include income tax, capital tax, tax on real estate, net of deductions, etc. For *self-employed*, who represent about 10 percent of the workforce, value-added tax, national insurance contributions, payroll tax, and pension contributions are also included. For *employed* such contributions are made by the employer and not registered in these data. For the main part of the sample we therefore have no information on social insurance contributions and payroll taxes (SIC), which seems to be the case for many countries.<sup>3</sup> One way to correct for social insurance contributions (SIC) is to adjust the gross labor income to the aggregate control given in national income accounts. We then have to assume that SIC represents a constant proportion of the gross labor income. This measure of SIC is then added to the above measure of taxes. Using national income accounts for the year under study (2003), we find that about 51.6 percent of the aggregate compensation to employees including aggregate SIC is not accounted for in LINDA. This is hence attributed to SIC. Note also that the contributions made from

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<sup>2</sup> In Sweden saving in private pension insurance grants tax deductions although a cap on the amount is about to be instituted. For now, the tax effect of such subsidized savings in private pension insurance is neglected. Also, parental allowances (as well as child allowances received by the parent) are attributed to the parent and not the prime beneficiary of the time with parent, i.e. the child.

<sup>3</sup> Indirect taxes (on, e.g., alcohol, gas, tobacco and so forth) are not included in our tax measure either.

employers towards the non-public transfers mentioned above will be included in our estimate of SIC.

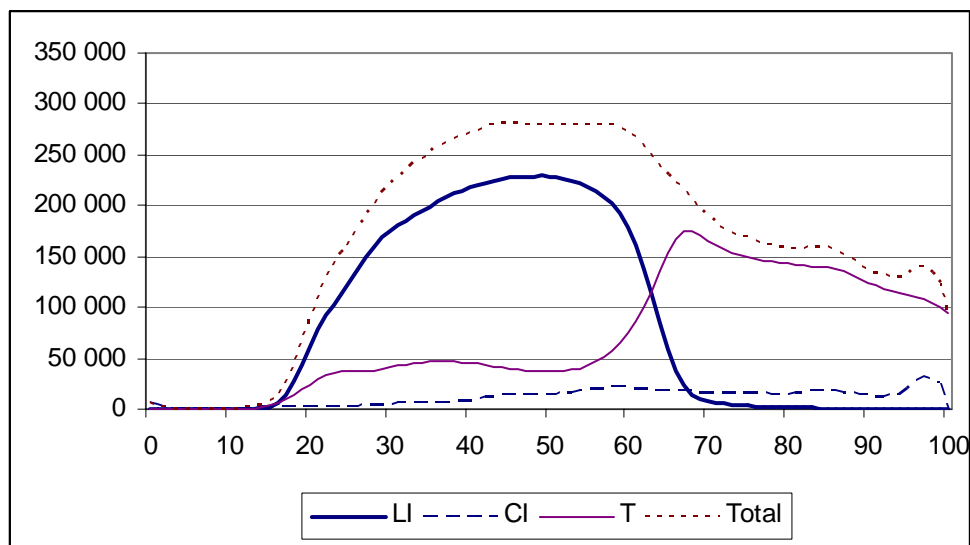


Figure 1 Age profile of labor and capital incomes (LI and CI), transfers (T), and total, averages, SEK, 2003 (not adjusted to aggregate)

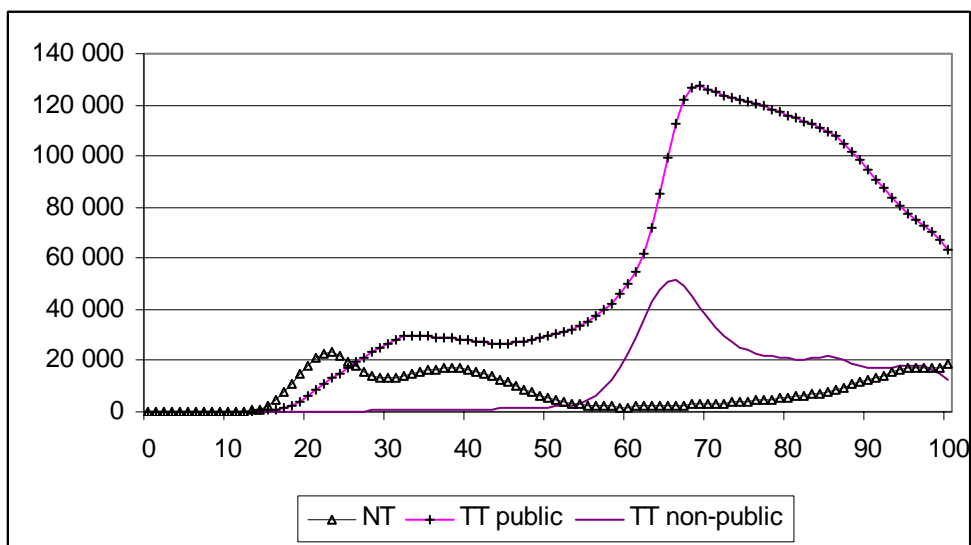


Figure 2 Age profile of transfers: non taxable transfers (NT), public taxable transfers (TT publ), and non-public taxable transfers (TT non-public), averages, SEK, 2003 (not adjusted to aggregate)

But first, in Figure 1 and Figure 2, we present the unadjusted smoothed levels of the different income components using LINDA. One can note that incomes increase from age 18 to age 50 from being practically zero before age 15. Incomes associated with work then decrease dramatically at the age when most retire and are replaced by taxable transfers, mainly pensions from public or non-public sources. Non-taxable transfers are significant parts of income only during early adulthood and then slowly decrease as

children moves out of the household to increase somewhat again towards the end of life. The latter tendency is highly likely to be a cohort effect though since the oldest pensioners are more dependent on non-taxable transfers than the younger cohorts with higher income pensions will be.

## 2.2. Computation of age profiles of net taxes and transfers

One contribution of the present chapter is to analyze net tax ratios by different age groups, something which we believe have not been done systematically before. Removing the circular flow that is created for the individuals by the taxation of public transfers reduces the income as well as the tax payment.

The main methodological difficulty lies in computing tax rates for parts of the income, or attributing shares of the total tax (*excluding* SIC) to each income component, as it is the total income that determines taxes. The method here is deliberately simple and chosen more in order to initiate a discussion than as a final solution. We will employ an *average method*, i.e., each income component's share of total tax (excluding SIC) is determined by the income share. Hence the same average tax rate applies for all income components.

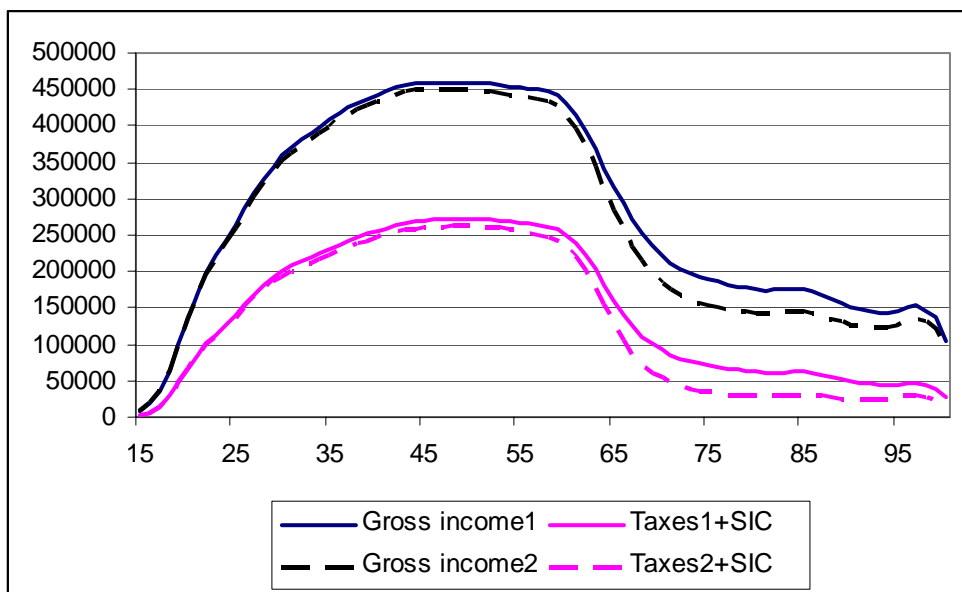


Figure 3 Average gross incomes and taxes; (1) including the feedback and (2) excluding the feedback, SEK

Figure 3 shows gross incomes and taxes (both *including* SIC) with and without the “feedback”. The feedback biases the impression of which age groups actually are the main tax contributors to the public sector. As we would expect the age profile of net tax contributions is more hump-shaped over life than the observed gross tax age profile. Taxes on public transfers become substantial parts of the gross taxes after retirement when they account for the bulk of collected taxes. The reason is of course that public transfers become increasingly important by age.



This can also be seen by studying the tax ratio. We compute two measures; one that includes the feedback ( $TR1$ ) and one that excludes the feedback ( $TR2$ ),<sup>4</sup> which we depict in Figure 4.<sup>5</sup>

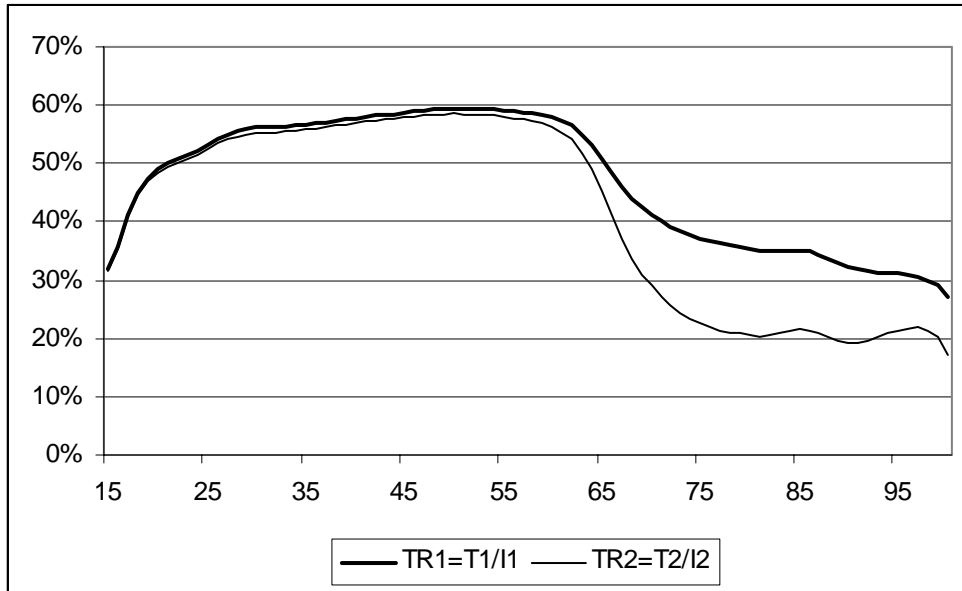


Figure 4. Average tax ratio including the feedback ( $TR1$ ) and excluding the feedback ( $TR2$ )

The main result is that, in age groups where a substantial share of total income is public transfers, the net tax ratios are substantially smaller than gross tax rates. Up to age 60, when the average tax rate reaches its peak over life, the net and gross tax ratios are about equal; the rates peak at almost 60 percent around age 55. Around age 65 both the average gross tax rate and net tax rates fall, but the net tax rate falls much faster. As can be seen from this figure it is mainly for the elderly (65+) that the net and gross tax ratio differs. For instance for individuals in their 80s the gross tax ratio is about 35 per cent while the net tax ratio is only around 20 per cent. When using net tax rates excluding the feedback, we find, on a per capita basis, that the mean age of tax payers drops from 55 to 48 and the mean age of public transfer recipient increases from 71 to 73; the taxes paid falls by 23.2 percent and public transfers received drops by 17.1 percent.<sup>6</sup>

<sup>4</sup> These are given by, respectively,  $TR1 = \frac{LI^{Tax} + CI^{Tax} + TT_{nonpubl}^{Tax} + TT_{publ}^{Tax} + SIC}{LI + CI + NT + TT_{nonpubl} + TT_{publ} + SIC}$  and

$$TR2 = \frac{LI^{Tax} + CI^{Tax} + TT_{nonpubl}^{Tax} + SIC}{LI + CI + NT + TT_{nonpubl} + (TT_{publ} - TT_{publ}^{Tax}) + SIC},$$

where  $LI$  is labor income,  $CI$  is capital income,  $NT$  is non-taxable transfers,  $TT$  is taxable transfers, and  $SIC$  is social insurance contributions. Using national income accounts,  $SIC$  is estimated as 51.6 percent of  $LI + TT_{non-public}$ .

<sup>5</sup> Note that  $TR1$  and  $TR2$  are calculated as the ratio of the mean of numerator and the mean of denominator (by age group).

<sup>6</sup> It can again be noted that these tax rates underestimate the real tax rate as it does not include all components, e.g. payroll taxes and direct taxes. On the other hand, in the case of sickness insurance the

For anyone not familiar with the Swedish context the levels of the tax rate may seem astonishing. The high average tax rates over 50 percent that we get, however, are hardly visible for the “average” person since it mainly is a consequence of the added effects of social insurance contributions and payroll taxes because these are paid by the employer. Only in higher income brackets do such high rates actually apply to any substantial part of individual visible income. For the very rich they will most likely be lower since capital taxes are flat (and deductions and tax shelters much more easily available).

### 2.3. Private consumption

Turning to consumption we use expenditure data collected via a survey. The estimated age profiles of private consumption are obtained from the Swedish expenditure data (HUT 2003), which are household level expenditure data collected in a survey of 4 000 randomly drawn individuals in ages 0-79 years old from the Total Population Register (RTB), thus the 80+ population is not covered. The sample person and the persons belonging to his/her household (defined by the household having their main meals together) define the survey unit. All household expenses were noted in writing during a two-week period in 2003. In a telephone interview questions were posed about less frequent or irregular expenditures. Data were complemented by tax register data on land leases, fees for unemployment insurance and union membership.<sup>7</sup>

The following groups of private consumption are studied in the NTA project:

- CFE Private education consumption: tuition fees, books and fees, school supplies for all school levels including pre-school and tutoring expenditures.
- CFH Private health consumption: out-of-pocket health expenditure and reimbursement to health providers by private health insurance companies.
- CFK Private capital consumption: imputed rental value of owner-occupied housing, and flow of services from consumer durables
- CFX Private other consumption

There are some difficulties in adapting the HUT data to these classifications.<sup>8</sup> Note also that expenditure is not the same as consumption. In Sweden, the public sector heavily or totally subsidizes some good or service consumption, especially in the health and education sectors. The part that is subsidized is here considered as public consumption but we cannot estimate this from the expenditure data. A description of public consumption data is given in the next section.

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first two weeks of benefits are paid by the employer and thus is not recorded as a transfer which becomes the case when sickness spells extends beyond this limit.

<sup>7</sup> The sample non-response rate was 42 percent, which is quite high. Sample weights compensating for non-response calculated by the Statistics Sweden are used. Nevertheless, a comparison of age profiles for income reported in HUT and LINDA (income data are taken from national registers in both LINDA and HUT) indicates that the HUT sample seems to be representative with respect to these aggregates.

<sup>8</sup> *Insurance expenditures* are included in CFX. *Durable good consumption* is assumed to be the depreciated part, one fifth, of current net investments in durables. Taxes and gifts are not included in consumption since they are considered transfers. Further, *indirect taxes* are excluded from all private consumption/expenditure measures.

HUT gives the total household private consumption (expenditure) but not the individual counterpart. The per capita age profile of consumption has therefore been estimated using the age distribution of the household members and the framework of the NTA project.<sup>9</sup>

In Figure 5 we present the private consumption. It ends at age 80 due to too few data points for 80+. All consumption is smoothed except for education consumption. The reason is that we think that education consumption follows discrete jumps by age (the same assumption applies for public consumption, see below). All levels have been adjusted to the aggregate total.<sup>10</sup>

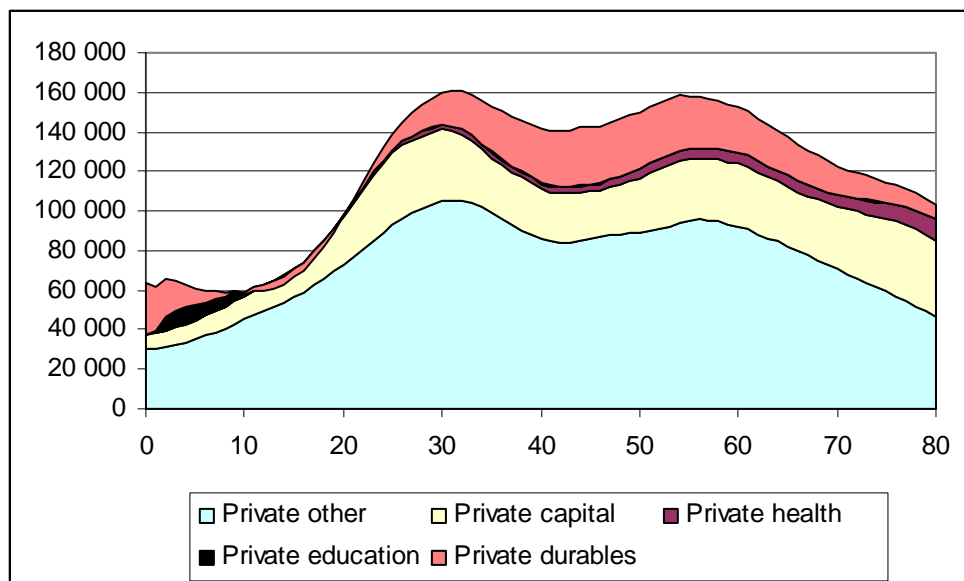


Figure 5 Private consumption, SEK, 2003

Starting with *private education expenses*, we see that these are almost entirely due to child care fees (including fees for after-school recreation centers for junior school children). The amounts are on average very low. There are some minor expenditures associated to adulthood (however not visible in the figure), including student union fees, literature etc., however, most expenses included in CFE are linked to childhood. The expenses for adults might however be explained by age interaction effects, arising from

<sup>9</sup> Hence the individual counterparts of CFE and CFH are estimated by regressing consumption at the household level on the number of household members in the household in each one-year age-group, without an intercept to assure that all household consumption is allocated. CFK (except for durables) and CFX are estimated by assuming an “equivalence scale”-rule. We use an “ad-hoc allocation rule” (equivalence scale). Instead of estimating the per capita shares individuals of age  $x$  will have the predetermined weight  $(1-.6*I(4<x<20)*((20-x)/16)-.6*I(x\leq 4))$  in household consumption, where  $I(.)$  is the indicator function. Durable consumption is estimated in two steps. In the data we know only the *net investment in durables* but not the stock of durables. First we use the same regression method as for CFE and CFH to estimate the age profile of the net investment. Second we assume that all investments have a life of 5 years, implying that one fifth of an investment is consumed for the current age group and the rest is past on the next, which also consume one fifth of the original investment, and so on. Since the initial stock at age 0 this is of course a rather crude approximation.

<sup>10</sup> To avoid influence of underestimated durables the correction factor was calculated without private durable consumption. The correction factor was 1.18, which implies that almost one fifth of aggregate private consumption was unaccounted for in the HUT survey.

the possibility that parents of different age groups choose different education consumption for their kids. It might be that those that raise children relatively later in life choose more private child care alternatives or special talent training like music education – which infer higher private costs – compared to those that become parents at younger ages. A small bump around ages 35-44 is therefore child – not adult – education consumption.<sup>11</sup>

*Private health care consumption* is more substantial, but mainly due to dental care and medicine for adults below 50, then reaching somewhat higher levels.

For *private capital consumption* and *private other consumption* we depict the familiar hump shaped pattern over the life. We also note that CFX and CFK totally dominate in the consumption pattern.

Note that private capital consumption equals housing rentals since the flow of services from consumer durables is presented separately. *Private durable consumption* is initially in life quite high representing the fact that families with new borns allocate a high level of resources to meet the demands of the new family member. Some of these resources are naturally invested in durables such as cars and furniture and so on. Between ages 10-20 the net investments becomes negative implying that the household is disinvesting (selling) in durables. Later in life the household again starts to make large net investments in durables.

## **2.4. Public consumption**

We present public consumption classified into three broad categories: *education* (child care and education), *health* (health care, elderly care and assistance or aid to handicapped), and *other* public consumption (general public administration, defense, police and the administration of justice, trade and industry affairs, environmental protection affairs, supply of housing affairs and social progress, recreational activities, culture and religion). For all but the last category, consumption has been allocated to specific age groups. The age profiles have been estimated from different data sources, and adjusted to fit to national levels. The age profiles are presented in Figure 6.

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<sup>11</sup> In an alternative regression for private education consumption we removed these interaction effects by including second order effects. This actually removed the small bump in the first-order effects at age 35-44, hence supporting this reasoning.

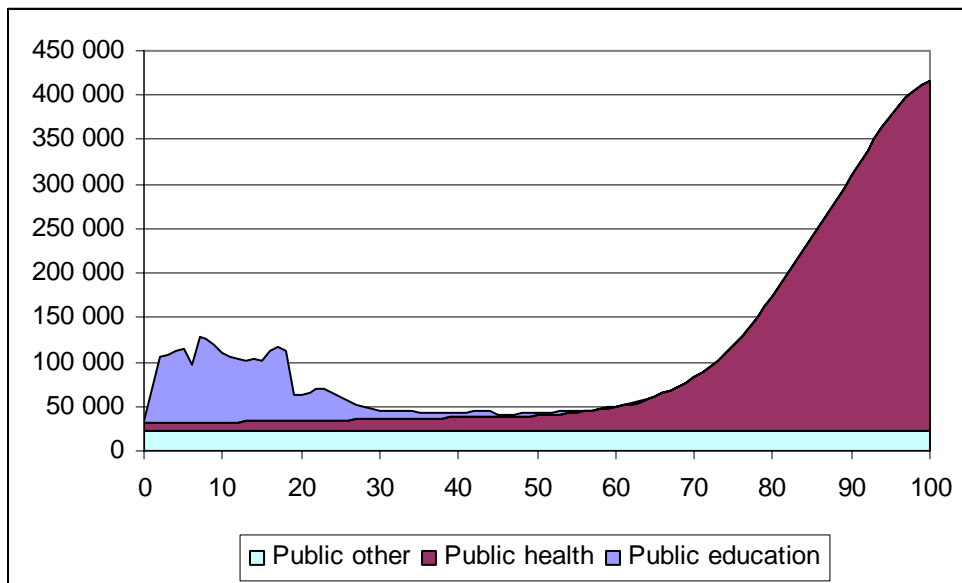


Figure 6 Per capita public consumption by category, in SEK, 2003

From the figure we conclude that the age profiles seem quite realistic. For instance, in childhood and at old age individuals receive relatively high levels of resources from the public sector. In their youth, public sector resources come mainly via child care and education (these making marked jumps at distinct ages), while at old age, the services come through elderly assistance and health care. When controlling for the fact that only few reach such a high age where elderly assistance per capita is so costly, the absolute expenses for elderly assistance does not seem too dramatic. Instead education consumption becomes more prominent (graph not shown).

Note that there are some clear gaps in the (unsmoothed) age profile for public education consumption. These arise from institutional facts, i.e., that child care institutions for most individuals end at age 5. When children turn 6 most go to a pre-school year before compulsory school. School resources fall from about 130 000 SEK to about 100 000 SEK as children age from 7 to 15, which is when they end compulsory school. In upper secondary school (between ages 16 and 19) resources again rise, etc. We assume that the cost per pupil is constant, which may seem questionable. Many schools at compulsory school level are an integrated unit. If a school has a large fixed expenditure cost that is shared across all age groups of pupils then our measure will be too sensitive to fluctuations in the single-year cohort size of pupils.

## 2.5. Total consumption

Figure 7 encompasses total per capita private consumption and total per capita public consumption.

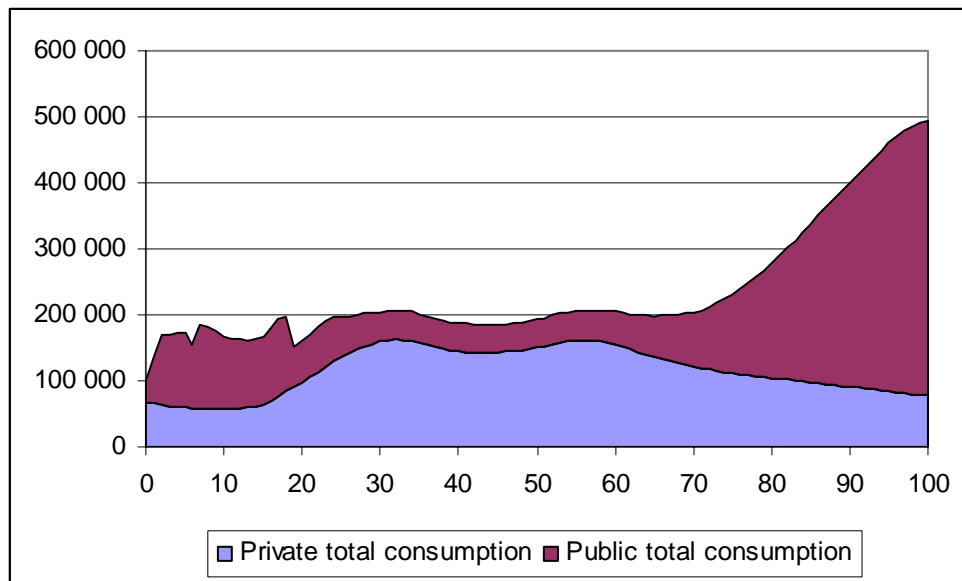


Figure 7 Total private and public consumption per capita, in SEK, 2003<sup>12</sup>

Interestingly, this figure shows that the total per capita consumption profile looks rather smooth for age groups below age 75 (just below 200 000 SEK or \$35 000), hence supporting theories saying that individuals prefer to have *about* the same level of consumption over the whole life cycle and will adapt to the publicly provided consumption possibilities by adapting their private consumption. That is except for the event that you happen to outlive your expected length of life when you will need more care services publicly provided.

The separate components (private and public) appear to be quite good complements, i.e., while private consumption is inversely U-shaped (high in the middle age group), we find that the public consumption on the contrary is U-shaped. The aggregated consumption pattern is therefore much more flat than the two components separately.

## 2.6. Life cycle deficit

By comparing the labor income profile and consumption profile we want to describe the general life cycle pattern of the life cycle deficit, which is the difference between consumption and labor income. Here we use a different measure of labor earnings from that we presented in Section 2. First, as discussed in that section we include non-public transfers in the measure assuming that these represent *delayed earnings*. Second, we adjust the measure to the aggregate total of compensation to labor using national income accounts. In Figure 8 we depict these components weighted by population size and normalized to the labor income of age group 30-49.

<sup>12</sup> Note that the private total consumption is extrapolated with a trend for 80+.

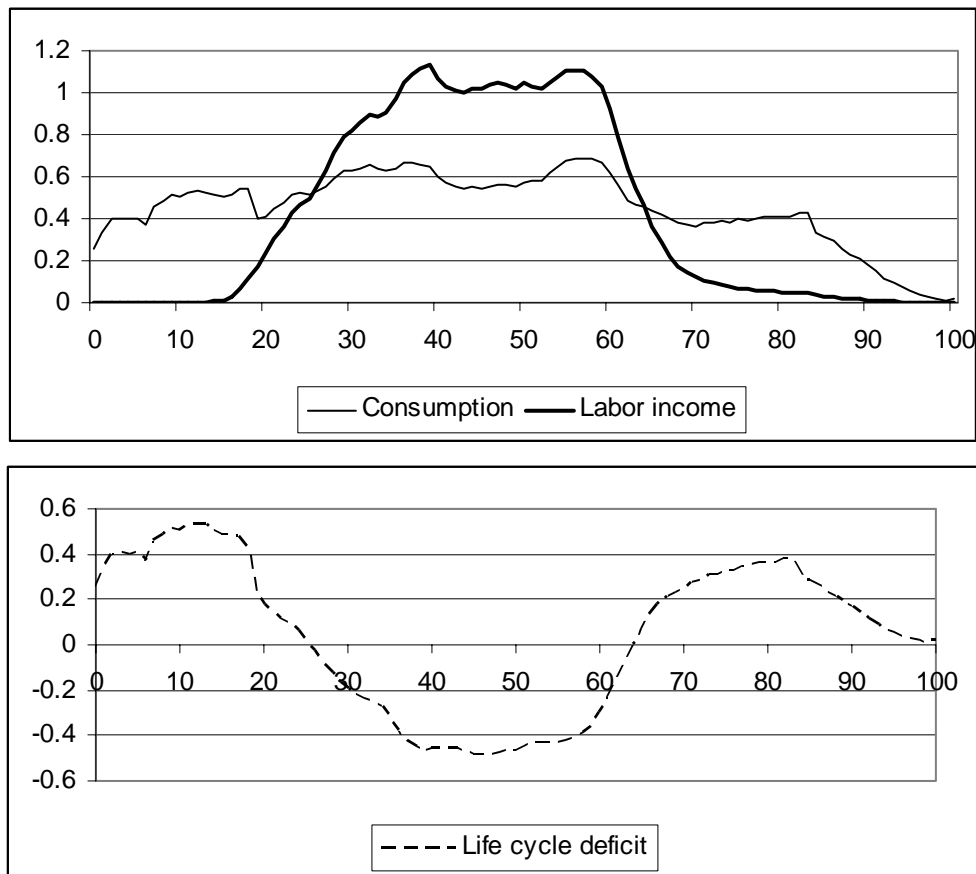


Figure 8 Labor income (incl. non-public transfers), total consumption (private and public), and life cycle deficit, SEK, all weighted by population size and normalized to labor income of the age group 30-49

One can note that when non-public transfers are counted as delayed payment for labor the age profile of labor earnings changes slightly (cf. Figure 1). For instance, the share seemingly working at old age will be exaggerated. There is a deficit during childhood and young adulthood (before age 25) and old age (63+). As mentioned it is also at these ages that the public sector provides the greater part of the total consumption. In the middle period (ages 25-63) there is a surplus, and by comparing the areas between the consumption and income graphs, we conclude that deficits and surpluses in the population as a whole roughly seem to balance. It can be noted that the demographic structure seems relatively favorable w.r.t. labor incomes at the moment since there is an accumulation of high earners in their 50s and 60s (the “baby boom cohorts”). There is also a relatively large cohort born in the 1960s, which, as a group, has high earnings. Comparing the 1960s boom cohorts around 40 and the older baby-boom cohort around 60 we see that the effect on their life cycle deficits differs. For the younger cohort the deficit is a bit more favorable (i.e., less negative), and the reason seems to be that incomes are better rather than their consumption being lower. One would perhaps have expected a higher consumption level of having children still living at home but this seems not to be the case.

## 2.7. Net private and public transfers

The life cycle deficit must be supported by transfers by some kind. It is of interest to study how the net transfer flows go, separately by the public and the private sector. We know that the public sector in Sweden redistribute substantial amounts between different age cohorts. Naturally, also outside the public sector individuals in one age group make important transfers to other individuals in another age group, in order for them to maintain private consumption. Presumably these transfers are made mostly within the (extended) family. Here the focus lies in finding out in which age groups individuals in Sweden had a higher or lower private consumption than their current individual disposable income. This would give an estimate of *net* private transfers. As we still do not know the extent of gifts and bequests at different ages we have no information on actual flows.

In Figure 9 we compare the per capita net private transfer (disposable income less private consumption) with per capita net public transfer (taxes paid less public consumption and public transfers) by age group. Again we normalized the series to the labor income of the age group 30-49. This is hence the inverse of the life cycle deficit, calculated separately for the private and public sectors. Note that this public net transfer is hypothetical and has nothing to do with actual transfers and benefits which we discussed in Section 2.1.

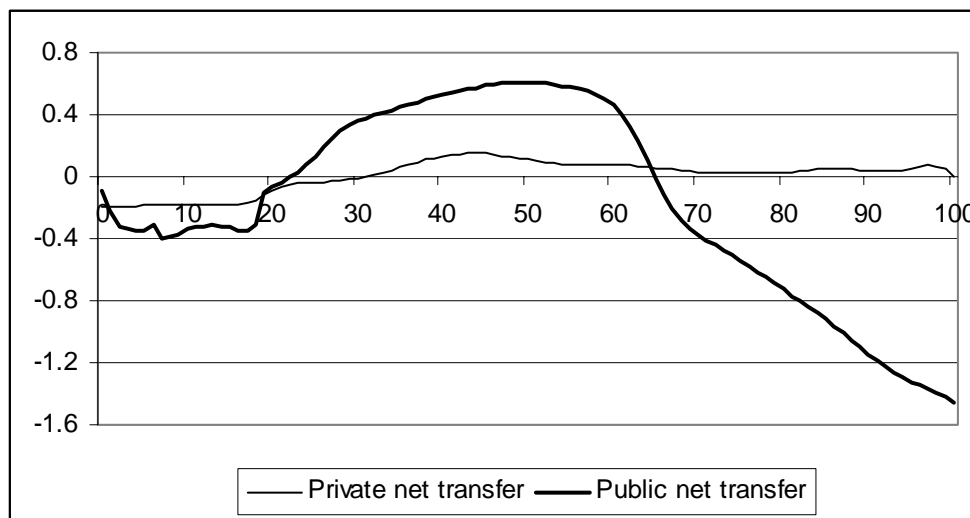


Figure 9 Net transfers, public and private; per capita, normalized to labor income of the age group 30-49.

In Figure 10 the aggregate population weighted age profiles of net transfers are depicted.



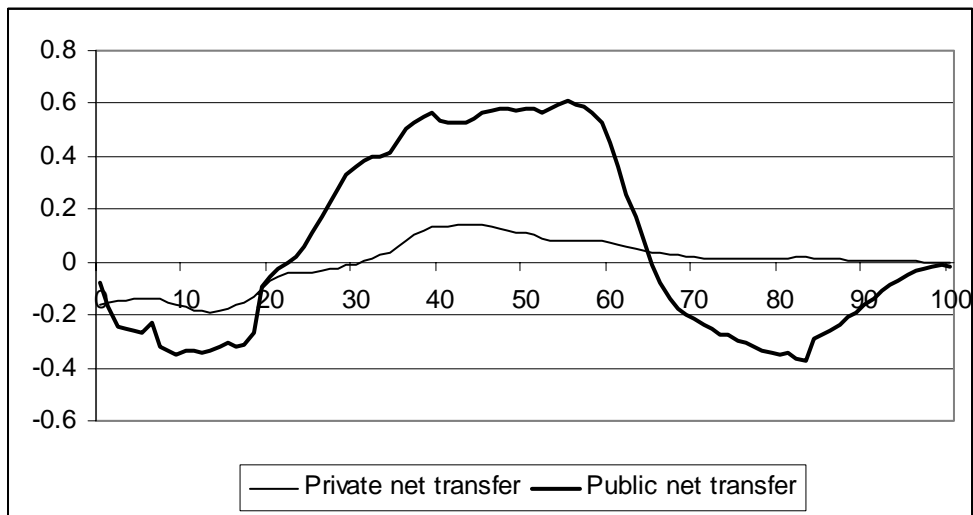


Figure 10 Net transfers, public and private; population weighted and normalized to labor income of the age group 30-49.

These data suggest that an individual's disposable income on average is less than her private consumption during childhood and young adulthood. In these ages individuals must receive net private transfers (or dissave capital). Both private consumption and disposable income start to increase around the age 15, but disposable income increases faster, so that when individuals turn 30, they on average have the option to save or make private transfers to other generations. The level of average private consumption then stays below that of disposable income throughout life.<sup>13</sup> Effectively we thus have no dissaving on average at old age and the representative individual will leave his wealth as a downward transfer either by inter vivo gifts or bequests. Public net transfers, however, are negative after 65. This suggests that in Sweden any life-cycle saving patterns in the aggregate are likely to be reflecting the public saving rather than any household saving. This should have consequences for the choice of micro foundations in macro models.

To maintain private consumption children and young people in their 20s need transfers from cohorts where the disposable income more than covers private consumption. Presumably, the main part of these private transfers comes via the family. In a closed economy a net inflow of transfers in one age group must be matched by an equal net outflow in another age.<sup>14</sup> Data on inheritance would, needless to say, help us understanding more. Ideally we would also like expenditure data that tell us to whom gifts are given. Yet it is obvious that the major part of intergenerational transfers go via the public sector. Particularly at older ages the public sector enables very large consumption in terms of old age care.

<sup>13</sup> However, one should be careful with interpretation for 80+ as we extrapolate private consumption for that age group. Note also that the net private transfer is significantly positive at the 5 percent level for 11 out of the 16 one-year age groups between ages 65-80.

<sup>14</sup> Calculation of the net in- and outflows indeed suggests that they net out almost perfectly; while the net inflow amounts to -3.50 units of prime-age labor income, the net outflow amounts to +3.53 units of prime-age labor income .

### **3. Concluding remarks**

Looking over the whole life, the summed per capita consumption from both the private and public side is quite smooth until 75. Data suggest that private consumption expenditure w.r.t. education, health and elderly assistance is very small. Instead these components dominate public consumption. This lends credibility to the conjecture that Swedes on average count on public consumption to complement their private consumption.

Data also suggest that a deficit in net private consumption (the difference between disposable income and private consumption) during dependency corresponds to an equal surplus at other stages (in adulthood). We have shown that the young experience an inflow of resources and that more mature adults experience an outflow, and that these equal out over the whole population. One should keep in mind however that there is a mixture of both age and cohort effects in incomes as well as in consumption in these data. Nevertheless it is remarkable that our calculations of disposable income and private consumption show no sign of any dissaving at old age. This indicates that the role of household life cycle saving in Sweden has been assumed by the public sector. The state being a very different player in financial markets than individual households, this should have consequences for Swedish macroeconomic models that do not seem to have been discussed much.

From the data and measurement methods we use here, it appears as if the working adults of the population pay a gross tax rate (which includes social insurance contributions and payroll taxes paid by the employer and thus not visible to the employed) of over 50 percent. For the old age pensioners the picture changes much more substantially with net tax rates going down to about 20 percent.

We have not here considered another source of double counting. The dominant part of public consumption is labor cost, which is, of course, also taxed. This will be the case in other countries, too. Since public employment is a higher share of total employment in Sweden than in most countries this may also affect comparisons, however.

It is not clear to what extent we have cohort effects in our cross-section data. From a life cycle viewpoint much of taxes are paid in expectation of future benefits and transfers. A recent analysis at the Ministry of Finance (Pettersson et al 2006) indicates that although there are some cohort differences in the amount of taxes paid and transfers and benefits received over the life cycle, these cohort differences are (given assumptions on future growth and population) surprisingly small in relation to total life cycle income when discounted with the growth rate of per capita GDP. Whether this is an appropriate discount method may be disputable but it does indicate that the main cohort inequalities arise from the growth rate of the economy rather than from the tax and transfer system itself.

It would be interesting to perform further such analyses under the NTA methodology and actually compute the net tax rates over the life cycle, but that will require substantially more data since historically large changes in the tax and transfer systems have taken place.

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