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How Welfare Services are Used and Redistribute Households' Economic Resources

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How welfare services are used and redistribute households' economic resources¹

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Abstract

Denmark was the only OECD country in 2009 with a higher percentage of GDP than Sweden going to individual public consumption. Examining which welfare services households consume gives a more nuanced picture of their economic welfare than simply describing welfare in terms of disposable income. Including welfare services gives virtually everyone, apart from the elderly, a more even distribution of economic welfare measured as a Gini coefficient (reduced with 11.7 percent). The major users of welfare services are primarily families with children and pensioners. Over a hypothetical life cycle we illustrate the public sector's cumulative net cost for an average woman and an average man. The net cost development is the same until the age of 20. At the age of 66, a woman's net cost is about SEK 3 200 000 higher than a man's.

1. Introduction

Distribution policy has three instruments to work with: taxes, transfers and publicly provided welfare services for private consumption.⁵ The first two instruments affect households' disposal income. Sweden has a good social safety net, virtually free education and highly

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⁵ Public consumption expenditure is presented as classified in COFOG (Classification of the Function of Government). See Appendix 2 for a list of the sub-groups we cover in the study.

subsidised health care and social protection⁶. In other countries, such as the US, individuals pay for these things themselves to a far greater extent, either through their own insurance premiums and/or at the point of use. Disposable income⁷ is often used when studying households' economic welfare. Disposable income is a limited measurement of households' economic welfare, as publicly funded welfare services are not included, which has previously been pointed out by the Canberra Group (Canberra Group, 2001, p. 24). By extension this implies a systematic underestimation of households' economic welfare.

One step in further qualifying the picture of households' economic welfare is to adjust disposable income by the public welfare services consumed by households. This generates a measurement that better describes different social groups' economic welfare. In this study we only take into account public production referring to *individual* services and not *collective* services such as defence, police and the judicial system. In that way a more adequate variable for cross-sectional comparisons of households' economic welfare in different countries is obtained, see for example Harding et al. (2007) and Paulus et al. (2009), which show how consumption of welfare services is distributed in seven European countries. All countries show a more even distribution of household economic welfare. The levelling effect of welfare services is generally somewhat greater for countries that have a greater income spread at the outset (Smeeding et al., 1993).

In 2009 public sector consumption expenditure was SEK 858 billion.⁸ In this study we allocate to households/individuals a large part of the welfare services they have used. These welfare services corresponded to more than 60 percent of total public consumption expenditure in 2009. Welfare services for individuals are mainly found in the areas of education,⁹ social protection, health care, and recreation and cultural activities. We have individual data for most of these welfare services; i.e. who used the services and the subsidies received. Consumption of welfare services, in particular in health care and social protection, is constructed as an insurance system without payment of insurance premiums. When a welfare service is consumed the service is delivered and sometimes a contribution (user charge) is paid. This means that it is possible to calculate the adjusted disposable income of individuals/households on the basis of an individual/household approach¹⁰. Because earned income is to some extent dependent on age we have chosen to report our results for different age groups and their household types. The value of welfare services then corresponds to the group's mean value, regardless of whether they use the services or not. This result is then the same as an insurance approach would have given, i.e. the insurance premium the group's individuals would have had to pay (given that our reported groups are the same as the insurance premium groups).¹¹

⁶ The following are included in social protection: Elderly care, support and service for persons with certain functional impairments, special transport services, labour market measures, family day care and out-of-school care.

⁷ Disposable income is defined in the economic literature as the sum of income from work (salary and income from business activities) and capital plus positive transfers (for example sickness benefit and pension) minus tax and other negative transfers. A breakdown and description of the different groups in the calculation of disposable income is given in Appendix 1.

⁸ Total tax revenue consists of approximately 60 percent taxes and contributions referring to work, 30 percent tax on consumption and the remaining 10 percent is tax on capital income.

⁹ Preschool is included in this group.

¹⁰ Using the individual approach, distribution analyses can be made to study the use of different welfare services and evaluate the targeting accuracy of welfare services.

¹¹ The insurance approach is based on allocation of the aggregated amounts to individuals after appropriate distribution assumptions.

However, we have no information on what welfare services are worth to the individuals. Suppose that instead of being offered a place in a preschool for a child, a household would receive SEK 100 000 per year to buy the service. Would the household use the entire amount to buy the service or would it choose a cheaper preschool place? Only in such experiments would we obtain information about how households value welfare services. We assume that the individual values the welfare services at the amount of subsidies they receive. There is much to indicate that the value is underestimated in relation to a market value. In international studies the production cost is assumed to be the same as the market value, which in our case is the subsidies plus any social insurance contributions. However, we do not take into account any additional contributions. This means that we, in an international perspective, systematically underestimate the adjusted disposable incomes. It is important to be aware that the results in this study are driven by the household the individual belongs to, the assumptions made to spread welfare subsidies (when there are no individual statistics) to their users and our assumption of how individuals value welfare services.

Table 1: Actual public sector expenditure (on consumption) and expenditure the study can attribute to individuals/households distributed by purpose, 2009.

Purpose	SEK billion	Percent	Distributed SEK billion*
General public services	79.6	9.3	-
Defence	38.5	4.5	-
Public order and safety	42.1	4.9	-
Economic affairs	59.6	6.9	-
Environmental protection	2.2	0.3	-
Housing and community amenity	4.4	0.5	-
Health	219.7	25.6	169.7
Recreation, culture and religion	23.8	2.8	23.7
Education	204.6	23.8	200.9
Social protection	183.3	21.4	127.4
Total	857.9	100	521.7

Note: * refers to SEK billion that the study allocates to individuals/households. Individuals who have emigrated or died during the year are not to be included.

Source: Statistics Sweden, National Accounts

The purpose of this study is to try to show how welfare services are distributed and how individual/household resources are redistributed and affect public sector net cost for an average man or woman. However, it is not possible to calculate how great the redistribution would have been if these welfare services had not existed. That is because the gross incomes would not have been the same if today's welfare society had been different. We do not know the counterfactual outcome. What we can study is the overall picture of public welfare services at individual/household level in specific age groups and household types. In addition we can study how households' economic welfare and its distribution is changed after assigning welfare services.

The following text gives an account of the data and population used. After that there follows a detailed description of who uses welfare services and how the services change households' economic welfare and its distribution. The public sector net cost for an average man and an average woman is then presented from a life-cycle perspective. Concluding comments are then given.

2. Data

2.1 Model and population

Statistics Sweden's tax-benefit simulation model FASIT¹² was developed primarily to calculate budget and distribution effects of changes in the tax and transfers system. In this model it is possible to calculate cost changes at municipal and national level for publicly subsidised welfare services.¹³ By changing the costs for the welfare services in question the model allows simulations of different cost outcomes in a five-year period.

Since public welfare services have no market value it is customary to assume that the market value is the same as the production value (the total of the subsidy, administrative costs and any own contribution), see for example Jones et al. (2008), Marical et al. (2006) and Smeeding et al. (1993). There are two methods to calculate individuals' adjusted disposable incomes: *a*) use the aggregated expenditure in the National Accounts and allocate this expenditure to individuals/households on the basis of a model approach *b*) use individuals'/households' actual consumption of welfare services, in other words the subsidies they have actually received. To a great extent FASIT has access to individuals' actual consumption of welfare services and in these cases the latter method is used when we calculate individuals' adjusted disposable incomes. This makes it possible for example to study the targeting accuracy of welfare services. However, we have no individual data for welfare services in culture and recreation, for example, and we therefore allocate the aggregated subsidies in accordance with different model assumptions.

The following are included in the calculation of public individual services in FASIT: 1. Health and medical care (including outpatient/primary care, inpatient care, dental care and pharmaceuticals), 2. Education (with all forms of education plus preschool), 3. Social protection (elderly care, support and service for persons with certain functional impairments, special transport services, labour market measures, family day care and out-of-school centres) and 4. Recreation and cultural activities. Data on subsidies is mainly taken from Statistics Sweden but also from the National Agency for Education, the National Agency for Higher Education, the Swedish Public Employment Service, the National Board of Health and Welfare, Apoteket AB and the Swedish Social Insurance Agency.

The population on which the simulation model is based is the Statistical Analysis Register (STAR). STAR is a register-based sample of about 670 000 individuals. In the study we limit ourselves to studying individuals registered as resident in Sweden throughout 2009. Heads of household have then been supplemented with data on husband/wife/children. Altogether STAR contains more than 1.6 million individuals. As STAR is only register-based, the household type single adult with no children is overstated and the married/cohabiting without common children household type is understated. In practice this means that the disposable income of single people without children per consumption unit is understated due to too high a weighting of consumption. This misclassification will be reduced when the register of dwellings can start to be used (expected to be ready in 2013).

¹² Swedish abbreviation of Distributional Analysis System for Income and Transfers.

¹³ FASIT makes it possible to describe different groups' distribution profile as regards income, wealth, taxes and important transfers – for example pensions, housing supplement, financial assistance, sickness and parental benefit and study support.

2.2 Consumption unit scale (equivalence scale)

To be able to compare consumption potential in families of different composition it is customary to adjust household income by the number of people who are to live on these incomes. The existence of economies of scale means that realistic and comparable income levels are not obtained by only dividing the household income by the number of household members. A dwelling for a family of five normally does not cost five times the amount an equivalent standard dwelling for one person costs. In households certain items such as televisions, telephones and daily newspapers are often shared.

To calculate comparable incomes a “consumption unit scale” is used (equivalence scale) that gives each household a total "consumption weight" depending on its composition. To obtain comparable incomes between different types of household the total household income is divided by the household's total consumption weight. Comparisons are made between consumption units instead of per capita. It is important to note that the equivalence scale is calculated on the basis of subjective values. The one used in Sweden, which has been drawn up in collaboration between Statistics Sweden, the Swedish Consumer Agency, the National Board of Health and Welfare and the National Board of Housing, Building and Planning, is different from the one recommended/used by the OECD, for example. The study reports disposable income in SEK per consumption unit (SEK/CU). This means that all family members of a household have the same disposable income. On the other hand, public consumption, welfare services, are calculated per individual. This means that household members' adjusted disposable incomes differ because welfare services target individuals. For example, the cost of a preschool place is assigned to the family member who is at the preschool and is not allocated per consumption unit in the family types.

Table 2: Consumption weight per household member

Equivalence scale	Consumption weight
Single person household	1.00
Cohabiting couple	1.51
Additional adult	0.60
First child 0–19 years	0.52
Second and subsequent children	0.42

Note: Swedish consumption unit scale drawn up by Statistics Sweden in collaboration with the Swedish Consumer Agency, the National Board of Health and Welfare and the National Board of Housing, Building and Planning.

Source: Statistics Sweden

3. Results

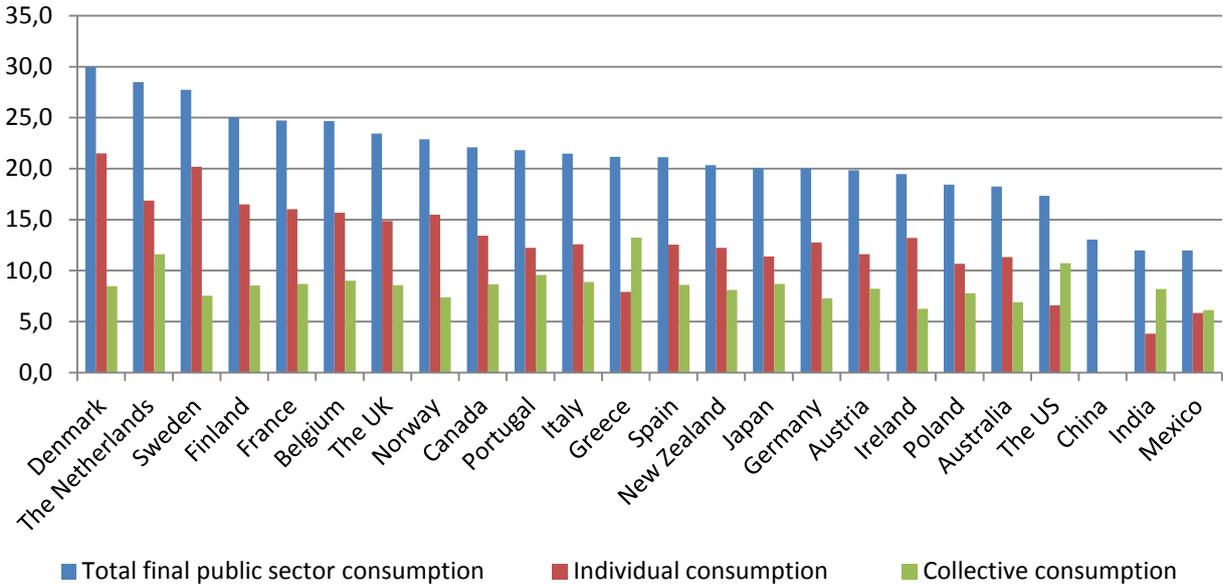
According to the National Financial Management Authority (2011) about 60 percent of public sector revenues in 2009 were from taxes on labour, which is equivalent to SEK 869 billion. Both direct and indirect taxes on labour are included here.¹⁴ Tax on consumption was about 29 percent (SEK 428 billion) of revenues. The remaining 11 percentage points came from taxes on capital (SEK 160 billion). In total this means that public sector revenues for 2009

¹⁴ Direct taxes are taxes on income and wealth. Indirect taxes are levied on turnover of goods and services and consist of VAT and excise duties on alcohol and tobacco, for example.

were about SEK 1 457 billion.¹⁵ Public sector consumption in 2009 was equivalent to SEK 858 billion, while positive transfers to households and non-profit institutions serving households (NPISH) was SEK 552 billion. Public sector consumption was about 55 percent higher than its transfers. Public sector transfers affect individuals' and households' disposable income whereas public sector consumption affects adjusted disposable income.

In Sweden the population can if necessary utilise many individually targeted subsidised welfare services, such as social protection, health and medical care and education. One specific area is preschool, which is very highly subsidised thanks to the maximum charge reform (introduced in 2002) that also affects the supply of labour. For example, it gave a higher employment rate for single mothers (see for example Flood et al., 2004). It also reflects the difficulty of calculating households' disposable incomes in the absence of welfare services. In total, general public sector consumption was 28 percent of GDP. Of central public sector consumption, 73 percent can be linked to individually targeted welfare services (which corresponded to 20 percent of GDP). In Figure 1, where general public sector consumption for a large proportion of OECD countries is reported, we see that only Denmark spent more as a percentage of GDP (22 percent) on individual consumption. In percentage terms the reported OECD countries with the lowest figures were: India (4 percent), USA (7 percent) and Greece (8 percent), and.

Figure 1: Public sector final consumption as a percentage of GDP, showing total public sector consumption, individual consumption and collective consumption in 2009



Source: OECD

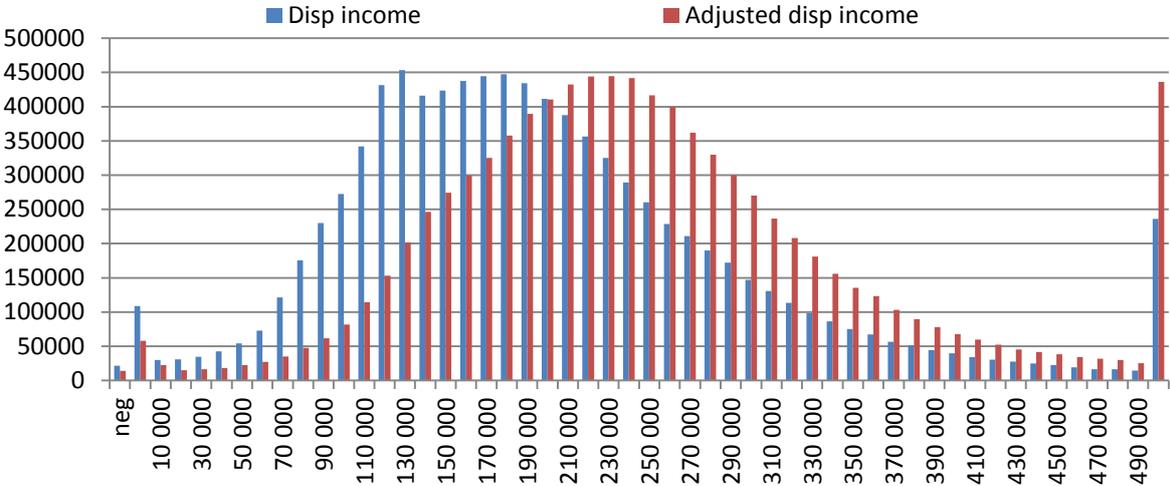
The welfare services allocated to individuals in Sweden corresponded to just over 57 percent of public sector consumption (SEK 492 billion). The remaining 43 percent is spent for the most part on collective goods/services such as economic affairs, environmental protection, defence, police and the judicial system.

When we allocate public sector consumption to those using the services we see in Figure 2 how individuals' distribution of adjusted disposable incomes is more to the right than the

¹⁵ Total tax is broken down into SEK 501 billion from production, SEK 525 billion from households and SEK 431 billion from consumption/use.

distribution of disposable incomes. For the 2009 income year the average value for individuals' adjusted disposable income was SEK 269 600, while the average value of disposable income was SEK 215 500 per CU (the median value was SEK 242 100 and SEK 190 300 respectively). This means an increase equivalent to 25 percent of the mean value and 27 percent of the median value. What is notable is the great increase in individuals who had an adjusted disposable income of SEK 500 000 or more, from 236 000 to 436 000, an increase of almost 85 percent or just over 200 000 individuals. An explanation of this is older people who received large amounts in social protection and/or health and medical care, about 55 percent pensioners (65 years or older). For people under the age of 65 it is in principle welfare services in the areas of support and service for persons with certain functional impairments and health and medical care that bring them over the SEK 500 000 threshold.

Figure 2: Distribution of individuals and their disposable and adjusted disposable incomes in 2009, in SEK.



Note: Disposable income is described as SEK per consumption unit and adjusted disposable income as SEK per consumption unit adjusted by the average welfare consumption of household members. All members of the household are allocated the same disposable income (SEK/CU). Source FASIT, Statistics Sweden.

As age is a proxy variable for individuals' experience we argue that their salaries are a function of their age. For the great majority of households, their income from work is higher than their disposable income. Our choice of groups is based on the fact that income from work is largely dependent on age and family situation. Consequently we have decided to report on the basis of age groups (determined by age of head of household¹⁶): a) 19-34, b) 35-54, c) 55-64, d) 65-74 and e) 75+ and broken down by most common family types. Single parents, regardless of age, and pensioners in particular received positive transfers to such an extent that their disposable income was higher than the factor income. In these groups factor income was unevenly distributed, above all for single parents. This inequality is reduced with the help of the transfer system and further reduced after including consumption of public welfare services. Moreover we can note from Figure 3 that disposable average income falls after the

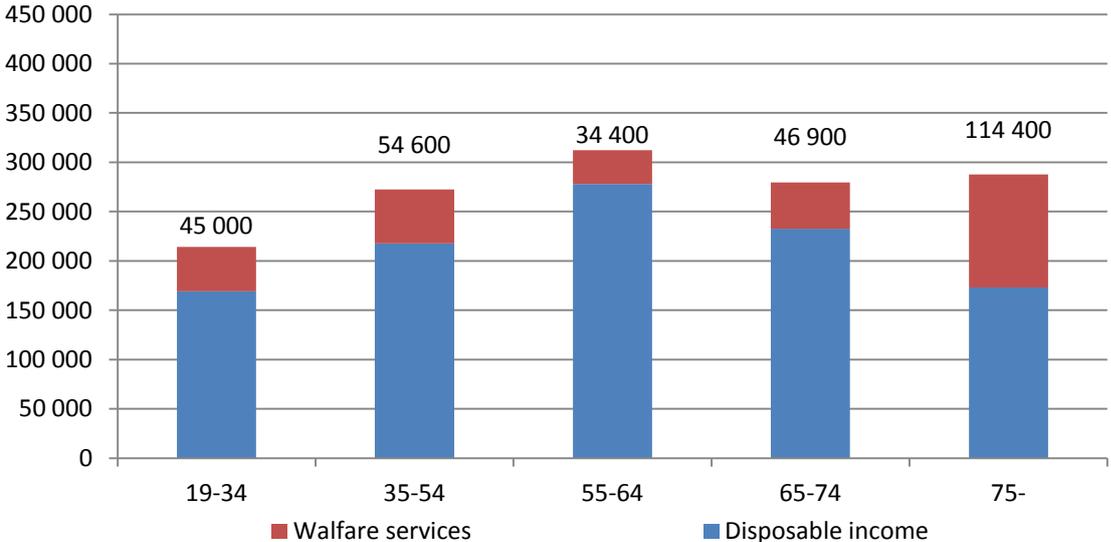
¹⁶ The head of household is the person in the housekeeping household who has the highest earned income. One problem with the housekeeping household is for example that in a multi-generational household all members have the same family identity but belong to different family types. Consequently we make the qualification that when the head of household is between the ages of 65-74, for example, there may only be the family types single, older than 64, and cohabiting, older than 64 with no children. If there is a person living at home (for example their child who is older than 19) that person forms a separate household.

individuals are no longer gainfully employed, but that the level of the adjusted average disposable income is more or less retained.

The major areas of expenditure, in total, on public sector consumption are: education, social protection and health, which means that welfare services are a function above all of age, income and type of household. The average disposable incomes and welfare subsidies vary between age groups; see Figure 3. The younger age groups had a higher average of welfare services, much due to household members being in education (19-34 year-olds: almost SEK 45 000, 35-54 year olds: almost SEK 54 600). The individuals (heads of household) whose age was between 55-64, i.e. a group that is relatively healthy, well-established in the labour market and if they have children living at home they are in the upper teens, had the lowest average welfare consumption, just over SEK 34 400. The next age group, 65-74 year-olds, had an average welfare consumption of just over SEK 46 900. The people who were aged 75 or more had the highest average welfare consumption of more than SEK 114 400, which is the result of large costs linked to services within social protection.

Economic inequality is usually measured using Gini coefficients, whose values vary between 0 and 1, where 0 indicates that the incomes are evenly distributed and 1 means total inequality. With the help of the Gini coefficient we can establish that consumption of welfare services - health and medical care, education and social protection - was unevenly distributed and used to a greater extent by low income/vulnerable households. The household types that consumed most welfare services were single households with 2 or more children and people over the age of 74. Households' economic welfare measured as adjusted disposable income was more evenly distributed for most of the groups than when measured as disposable income. Older people and their households had in some cases a more uneven distribution of economic welfare, which is natural as parts of social protection are costly. If we only study the distribution of total welfare services we see that single households with 2 or more children had Gini coefficients of 0.350 to 0.372, depending on the age of the household's heads. The corresponding figures for single households without children were 0.650-0.729, regardless of age. The differences in Gini coefficients probably reflect an underlying sorting mechanism, i.e. individuals who are in great need of assistance are single people without children. At the same time we see that the Gini coefficients were lower for households defined as cohabiting with children, which may indicate problems regarding the sorting mechanism. When studying the distribution of economic welfare among households the Gini coefficient for disposable income was 0.300, while the corresponding figure for adjusted disposable income was 0.265. This means a more even distribution of welfare, reduced by the equivalent of 11.7 percent.

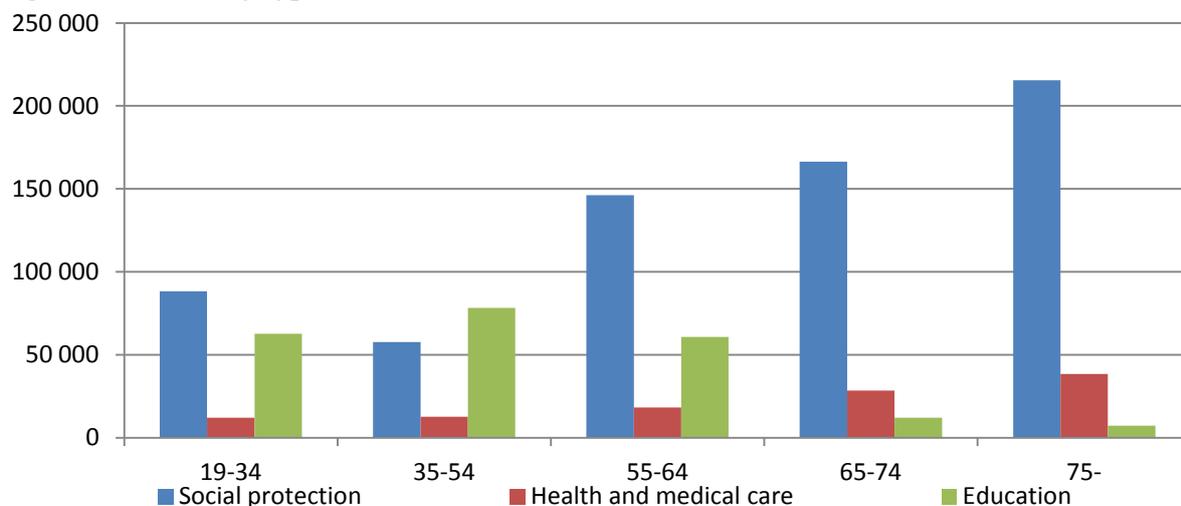
Figure 3: Disposable and adjusted disposable income by age group and the age group’s average value of welfare services (age of head of household, regardless of family type)



Note: Disposable income is described as SEK per consumption unit and adjusted disposable income as SEK per consumption unit adjusted by the average welfare consumption of household members.
 Source: Statistics Sweden, FASIT.

It is worth noting that there are households in the reported groups that do not use welfare services. This means that the mean value for welfare services for a reported group was considerably lower than the subsidy for the households using the service. This result also reflects the difference between two approaches: the individual and the insurance approach. We can illustrate this with the individuals who consume the social protection service, for example. The mean value for the groups 65-74 and 75 year-olds was SEK 15 700 and SEK 73 600 respectively (insurance approach values). If instead we only study the individuals who really consume the welfare service the mean values were considerably higher: SEK 166 400 and SEK 215 500 respectively (individual approach values). Figure 4 shows the mean values for the individuals who actually consumed the various welfare services. Appendix 3 then shows the mean values for factor income from employment, transfers, disposable income, welfare services, adjusted disposable income and Gini coefficients per age group and family type.

Figure 4: Mean value for the households who use the welfare services: education, social protection and health and medical care reported per age group (age of head of household, regardless of family type)



Note: education for older people usually means Folk High School courses. Welfare services are calculated as the average consumption of household members.

Source: Statistics Sweden, FASIT.

3.1 Transfers and welfare services in a life cycle perspective

The Swedish welfare system is built up around three instruments: taxes, transfers and publicly provided welfare services. Depending on age, income and life situation the welfare system redistributes resources according to individual need. During the life cycle of an individual there are periods when the need for welfare services and transfers is great and vice versa.¹⁷ By taking the economic conditions of 2009 as a starting point and framework we can use FASIT 2009 to illustrate how an average individual contributed to the welfare system in the form of negative transfers and how much that individual received in public welfare services and positive transfers. We assume that the economy is in equilibrium, where economic growth is equal to the real interest rate and inflation. If we allow the age of the individual (by gender) to vary in FASIT 2009 it will still calculate the mean value for an average woman or man per cohort in 2009 prices.¹⁸ Each cohort's mean values are used to reflect how an average individual receives/contributes over his or her life cycle. By extension this means that we will obtain a rough estimate of public sector net costs for an average man or woman and their development. The mean values we calculate by gender and cohort are: a) positive transfers b) negative transfers and c) welfare services. The negative transfers now include employers' social insurance contributions and self-employed social insurance contributions. In addition, we try to calculate how much the individual pays in via VAT and excise duties. In this section we report in SEK per individual instead of SEK per consumption unit. We do this to be able to estimate the public sector net costs per individual over his or her life cycle.¹⁹

Households' shared transfers are divided equally between the adults, while individual incomes and transfers/welfare services fall to the individual receiving the payment despite the

¹⁷ Hussenius and Selén (1994) show that about 25 percent of income taxes are an annual circular flow, 50 percent is redistributed over a lifetime and the remaining 25 percent constitute a redistribution from people with high lifetime incomes to people with low lifetime incomes.

¹⁸ In this study we set a limit of 79 years, due to poor quality of elderly care statistics.

¹⁹ It is possible to refine this presentation through special study of the life cycles of particularly interesting groups.

fact that cohabitants/spouses by and large have joint finances.²⁰ Subsidies for preschool and school accrue to the children and not the parents so as to be able to reflect what an individual costs.²¹ In addition, we add employer's and self-employed social insurance contributions to the individual's negative transfers. Companies and self-employed pay these contributions, but they are entirely linked to the individuals' earned income. These contributions are to largely cover the positive transfers received by the individual after retirement. In this exercise we try also to calculate what the state receives from individuals via VAT and excise duty on consumption. These are substantial sums: SEK 163 billion in VAT and SEK 60 billion in excise duties (according to the National Accounts reporting of household expenditure) for 2009. The result is presented in Figures 5-7. Figure 5 shows us that men's and women's transfers and welfare services follow each other fairly well over time, apart from certain differences in levels after the age of 20. Women withdrew more parental benefit, which is shown in the bulge at the age of 25-45. Further, it can be seen from Figure 5 that the period in which an individual is growing up is associated with major costs to the state through the subsidised welfare services in the area of education (the major areas are preschool, compulsory school and upper secondary school). After the age of 18 the positive transfers are greater than the welfare subsidies and continue to be so until the end of the reporting period (79 years). It is noteworthy that public sector expenditure on individuals' welfare services are equivalent to about SEK 4 000 000 regardless of gender. The increase in positive transfers reflects pension payments when individuals cease gainful employment. We see that 5 years after retirement occupational pension diminishes and the positive transfers thus become considerably lower.

If we add what an average man or woman pays/receives annually to or from the state we can see from Figures 6 and 7 that the public sector accumulated net costs when individuals are 20 years old are almost SEK 2 300 000, regardless of gender. These costs consist almost entirely of welfare services. The net cost curves for the sexes thereafter start to diverge because women have a lower labour supply and are gainfully employed in occupations with generally lower pay. The net cost is at its lowest around the age of 64 for a man and 63 for a woman, but the gender difference is about SEK 3 700 000. After the age of 63 the net costs again start to rise. The development between the sexes is about the same. At the age of 79 the woman has a total net cost of about SEK 1 260 000 while the net cost for the man is about SEK 1 660 000, a difference of about SEK 2 920 000. However, it is extremely important to take into account that in this exercise we make a model assumption of VAT and excise duties that corresponds to an individual savings rate of 8 percent and that VAT and excise duties amount to 14 percent of household expenditure, no matter of age. Public sector total revenue from VAT and excise duties corresponds to the equivalent expenditure in the National Accounts' reporting of households (SEK 163 billion in VAT and SEK 60 billion in excise duties). We see from Figures 6-7 that some of the state's largest sources of revenue are employers' and self-employed social insurance contributions, as well as VAT and excise duties levied on individuals' expenditure. These curves are considerably lower than the net cost curve when employers' social insurance contributions, self-employed social insurance contributions, VAT and excise duties are not included.

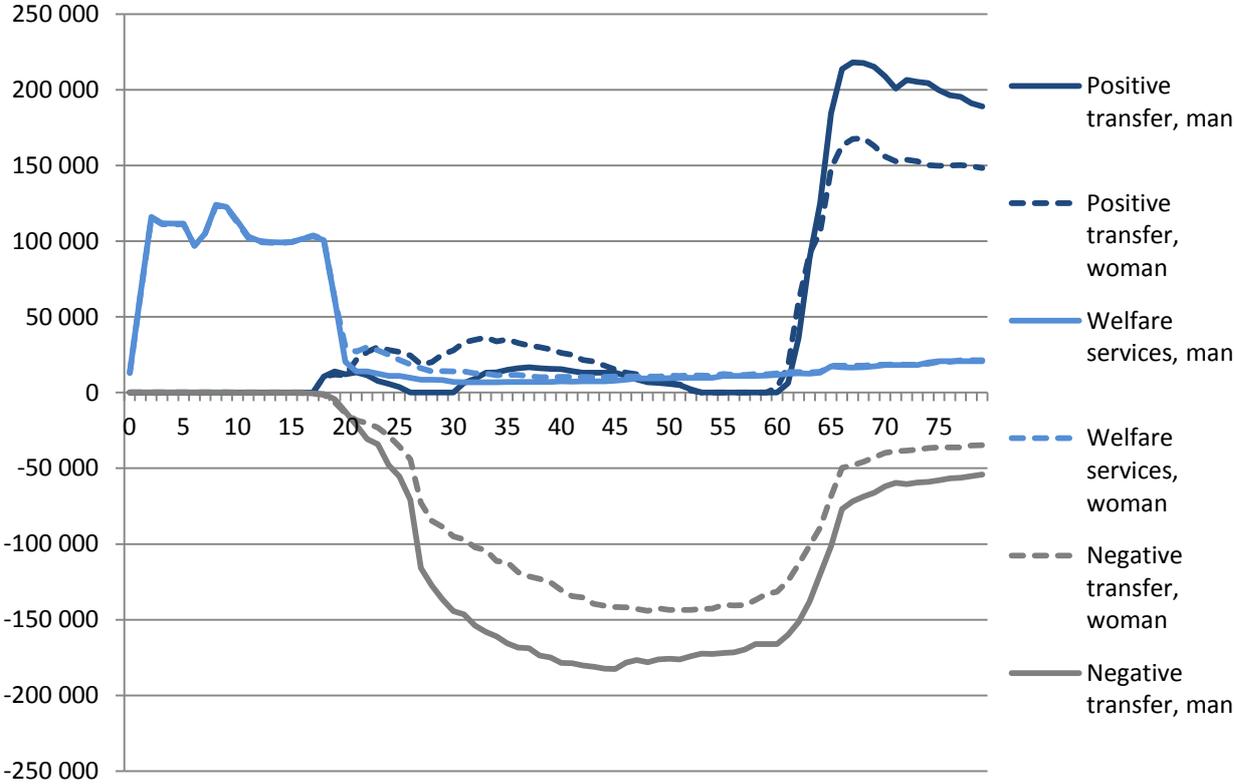
An underlying problem in all discussion of income calculations are mean or median values. To check the sensitivity of the results to extreme values we also carried out the calculations

²⁰ Women generally have a lower labour supply than men while their children are small. This means they have lower disposable incomes, negative transfers and in the long term lower positive transfers.

²¹ This assumption is not entirely uncontroversial as more people would probably argue that this subsidy benefits the parents and means an increase in their labour supply.

above in median terms. Public sector cumulative net cost does not differ appreciably from the results reported in Figures 5-7. However, we see a clear difference in the level of the accumulated net cost for both sexes. At the age of 79 the net cost is SEK -4 500 000 for the man and SEK -730 000 for the woman.²²

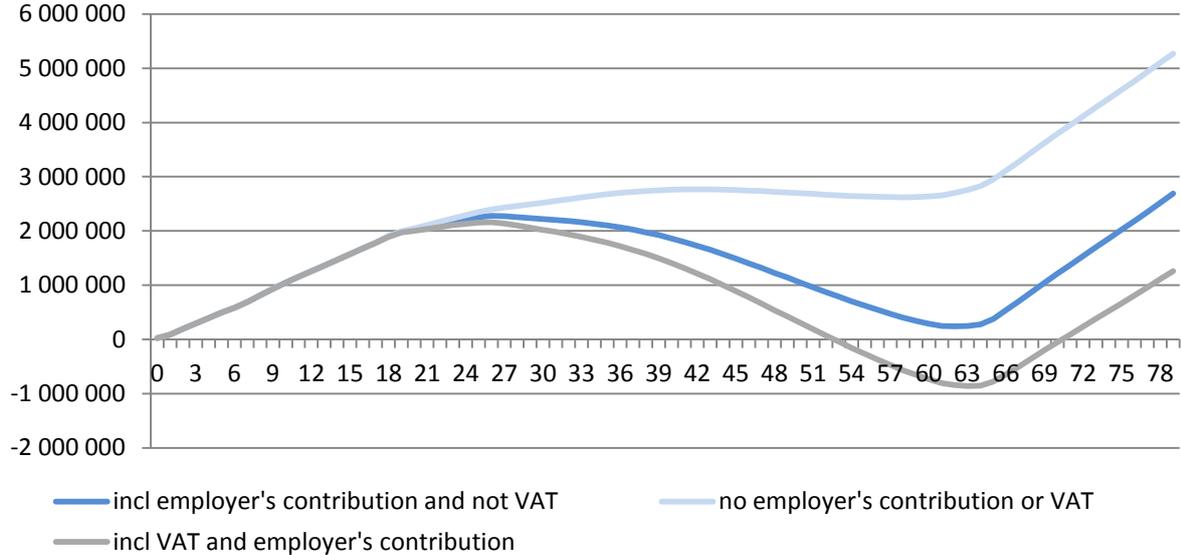
Figure 5: Average transfers (positive and negative) and welfare services for an average woman and man respectively aged 0-79, in SEK



Note: The positive transfers contain both taxable and non-taxable amounts. The amount the individual pays in tax is then reported as negative transfers. At total level (0- years) this means that for both sexes positive transfers were about SEK 582 billion, negative transfers SEK 927 billion and welfare services SEK 521 billion. Source: Statistics Sweden, FASIT.

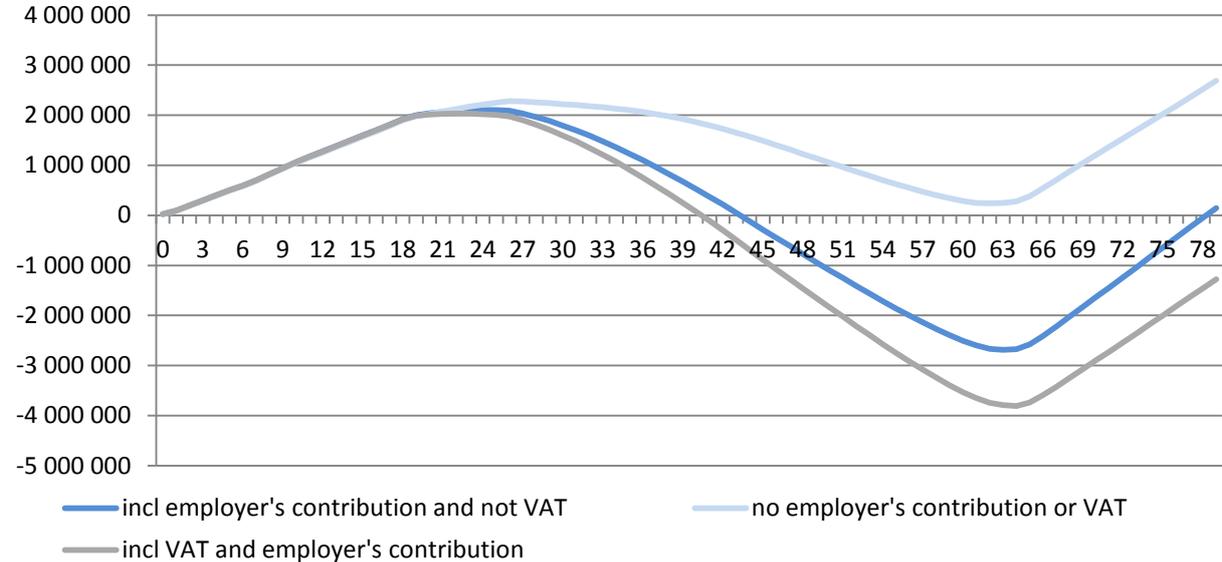
²² Given that the same assumption as earlier is made for tax on consumption. But then the aggregated revenue decreases to SEK 197 billion instead of the previous SEK 223 billion.

Figure 6: Average public sector cumulative net costs for an average woman aged 0-79, in SEK



Note: VAT and excise duties that tax individual consumption are model-based so that the aggregate expenditure (for the FASIT population) corresponds to the levels in the National Accounts for VAT and excise duties (SEK 163 billion in VAT and SEK 60 billion in excise duties). The assumptions made are a savings rate of 8 percent and general VAT and excise duty of 14 percent that tax individuals' disposable income.
 Source: Statistics Sweden, FASIT.

Figure 7: Average public sector cumulative net costs for an average man aged 0-79, in SEK



Note: VAT and excise duties that tax individual consumption are model-based so that the aggregate expenditure (for the FASIT population) corresponds to the levels in the National Accounts for VAT and excise duties (SEK 163 billion in VAT and SEK 60 billion in excise duties). The assumptions made are a savings rate of 8 percent and general VAT and excise duty of 14 percent that tax individuals' disposable income.
 Source: Statistics Sweden, FASIT.

3.1.1 Sensitivity analysis for tax on consumption

The results that include tax on consumption (i.e. VAT and excise duties) are strongly based on the assumptions we make. If the percentage rate we use is changed by one percentage point it

means a change in public sector revenue of about SEK 3 800 000 over the average life cycle of a man. The corresponding change for an average woman is about SEK 3 100 000. To put these figures in perspective we can state that the cumulative cost to the public sector of welfare services is about SEK 4 000 000 regardless of gender for the same period. On the other hand, the impact of a change in the savings rate on public sector revenue is not at all as great. If the man's savings rate is changed by one percentage point the public sector cumulative net costs are changed by about SEK 790 000, while the corresponding figure for the woman is SEK 610 000.

4. Closing comments

In most previous studies of households' economic welfare the households' disposable incomes are analysed. Recently a number of studies have been published internationally which take into account the public sector's individual consumption, that is welfare services such as health and medical care, education and social protection. By taking households' consumption of these welfare services into account we obtain the households' adjusted disposable incomes. In an international perspective, however, we will systematically underestimate households' adjusted disposable incomes. This is because international studies allocate the production value of a welfare service back to the people who use it, while we only allocate the value of the subsidy. This implies an underestimation, as the administrative cost of the welfare service plus any own contribution is excluded. Despite this underestimation, adjusted disposable incomes give a more nuanced picture of households' economic welfare. A further dimension we do not have is the households' actual valuation of the welfare services consumed. The next step could be to compile a time series of households' adjusted disposable incomes over time. In addition it would be desirable to have an international standard of how public welfare services should be allocated when there is no micro data available. In that case international cross-sectional comparisons would be more comparable.

We see that families with children are the main consumers of welfare services. On average each individual receives about SEK 100 000 per year until the age of 18. For welfare services in the areas of education and health the individual and insurance approaches will be the same as by and large everyone goes to school and uses some kind of health care. On the other hand, the two approaches differ in the area of social protection for the age groups 65-74 and 75 and older. There the average subsidy to these welfare services was SEK 16 700 and SEK 73 600 for the respective group, while the same average value for those who actually consume this type of welfare service was SEK 166 400 and SEK 215 500 respectively. The first value corresponds to the size of premium for the service the individuals would have paid if they had taken out an insurance policy (given the same stratification for the premium calculation). It is above all the economic welfare of families with children and people over the age of 64 that is improved by welfare services provided to households. Even if the average disposable income falls after the age of 64, economic welfare is retained thanks to the welfare services consumed by these individuals. Households' economic welfare is thus more evenly distributed, measured as a Gini coefficient, for virtually all the groups reported (age and family type) and in particular for families with children. Households' economic welfare distribution is on the whole reduced by 11.7 percent. The groups whose economic welfare is reduced least are single people and married people without children, which is a consequence of these households receiving considerably lower subsidies in the area of education. The economic welfare of most people aged 65 and over will be higher due to consumption of social protection welfare services. This result reflects the criticism of the approach "distribution of actual consumption", see for example Aaberge and Langørgen (2006) and Paulus et al. (2009). The criticism targets the fact that no consideration is given to whether the people

assigned large amounts in the health and medical care area also demand these services. It means that when we measure the individual's/household's economic welfare in monetary terms sick people, all else being equal, have a higher level of welfare due to illness. There are some studies that discuss how it is possible to overcome this by introducing an equivalence scale that takes into consideration various people's needs for subsidies in health and medical care and social protection, see for example Aaberge et al. (2010), Berlofffa et al. (2006) and Zaidi and Burchardt (2005). Aaberge et al. (2010) shows for example how the consumption unit scale is separated when consideration is given to transfers and welfare subsidies.

Over a hypothetical life cycle we illustrate the public sector's net cost development for an average woman and an average man. The net cost development for both sexes is the same until the age of 20. Because women generally have a lower labour supply and work in low-income occupations they have a lower taxable income. This also means that the negative transfer is lower and the positive transfer higher until retirement age. Thereafter men's positive transfer is greater thanks to their pension payments being greater. The difference in public sector accumulated net costs between an average man and an average woman is greatest at the age of 66 – almost SEK 3 200 000 (SEK -640 000 and SEK -3 900 000 for the woman and the man respectively). After the age of 65 the difference decreases and at the age of 79 it is just over SEK 2 900 000. For future similar exercises it would be desirable and very interesting to distinguish between individuals' level of education, family situation and regions in order to calculate accumulated net costs. That would be possible to do with FASIT 2010, as there are plans to use the total population instead of a sample, which the STAR population is.

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Appendix 1: Definition of disposable income

Disposable income includes:

Disposable income = factor income + positive transfers - negative transfers

Factor income

- income from work
- mixed income
- capital income
- capital gains, shares, real estate etc. – gross
- capital losses, shares, real estate etc. – gross
- capital gains, shares, real estate etc. – net
- capital losses, shares, real estate etc. – net

Positive transfers, taxable

- pension, annuity, taxable component
- labour market support
- parental benefit, taxable benefits
- sickness and activity compensation
- compensation in connection with sickness, taxable
- sign language training for parents
- grants for research students
- grants from the Swedish Authors' Fund
- daily allowance for voluntary military unit exercise
- care allowance
- daily allowance for refresher and civil defence training
- allowance for care of close relative

Positive transfers, non-taxable

- compensation in connection with sickness
- voluntary pension
- child pension
- child survivors' support
- annuity including private pension
- special pension supplement
- maintenance support for elderly persons
- housing allowance
- housing allowance for conscripts
- housing supplement for pensioners
- special housing supplement for pensioners
- family allowance for conscripts
- introduction compensation for immigrants
- financial assistance, individual variable
- maintenance allowance received, including maintenance advance
- child allowance, after calculation at household level the allowance is divided between the adults in the income distribution survey household
- upper secondary student aid, student grant
- study support (grant)
- study support (loan)

daily allowance in connection with national military service
discharge allowance, in connection with national military service

Negative transfers

tax
repaid study support loan
maintenance allowance paid
general deduction for pension insurance premium etc.
own pension insurance premium in business activities

Appendix 2:

COFOG is an international classification that groups public sector expenditure according to function or purpose. COFOG improves the overview of public sector expenditure and simplifies both national and international comparisons. Several of the COFOG groups are included in the transfer system and are included in disposable income.

The areas covered by welfare services in this report are in bold type.

07 Health

- 07.1 Medical products, appliances and equipment
Pharmaceutical benefits
- 07.2 Outpatient services
Outpatient care/primary care
Dental care
- 07.3 **Hospital services** excl. psychiatric care
- 07.4 Public health services
- 07.5 R&D health
- 07.6 Health n.e.c.

08 Recreation, culture and religion

- 08.1 **Recreational and sporting services**
- 08.2 **Cultural services**

09 Education

- 09.1 Pre-primary and primary education
Preschool
Preschool class
Compulsory school, special needs school and school for pupils with learning disabilities
- 09.2 Compulsory school years 7-9 and upper secondary school
Upper secondary school
Municipal adult education
- 09.3 Post-secondary non-tertiary education
- 09.4 Tertiary education
University
Post-graduate students
- 09.5 Education not definable by level

Education for adults with learning disabilities

Swedish for immigrants

Folk high school

Advanced vocational education and training

09.6 Subsidiary services to education

09.7 R&D education

09.8 Education n.e.c.

10 Social protection

10.1 **Sickness and disability**

10.2 Old age

Special transport services

Elderly care

10.3 Survivors

10.4 Family and children

Child and youth care

Out of school care

Family day care

10.5 Unemployment

Labour market measures

10.6 Housing

10.7 Social exclusion n.e.c.

10.8 R&D social protection

10.9 Social protection n.e.c.

Appendix 3:

Table 1. Average disposable income and adjusted disposable income in SEK per consumption unit grouped by household type. Age of head of household 19-34

	Single, no children	Single, 1 child	Single, 2 or more children	Cohabiting, no children	Cohabiting, 1 child	Cohabiting, 2 children	Cohabiting, 3 or more children	Total
Number of individuals	995 512	70 525	66 078	60 086	268 433	299 951	110 982	1 871 568
Factor income	187 438	83 426	54 771	307 630	201 188	173 762	115 147	178 187
<i>Gini coefficient</i>	<i>0.465</i>	<i>0.568</i>	<i>0.616</i>	<i>0.375</i>	<i>0.330</i>	<i>0.306</i>	<i>0.393</i>	<i>0.444</i>
Positive transfers taxable	15 668	22 522	19 550	13 267	39 896	33 218	30 409	23 148
Positive transfers non-taxable	17 174	35 353	48 604	10 519	11 869	16 062	26 851	18 390
Negative transfers	50 665	26 191	17 770	84 121	61 003	51 317	35 434	50 339
Disposable income	169 614	115 111	105 156	247 295	191 949	171 724	136 973	169 385
<i>Gini coefficient</i>	<i>0.320</i>	<i>0.246</i>	<i>0.185</i>	<i>0.295</i>	<i>0.227</i>	<i>0.195</i>	<i>0.203</i>	<i>0.290</i>
Health	10 864	14 844	13 059	10 899	14 806	12 350	12 736	12 007
Education	18 961	38 927	56 312	12 493	18 063	35 273	46 423	24 938
Social protection	7 591*	5 084	7 402	1 428	1 720	3 651	4 894	5 659
Culture and recreation	2 346	2 099	2 012	2 665	2 487	2 374	2 190	2 350
Total welfare services	39 762	60 954	78 785	27 484	37 077	53 648	66 243	44 955
<i>Gini coefficient</i>	<i>0.650</i>	<i>0.471</i>	<i>0.357</i>	<i>0.583</i>	<i>0.585</i>	<i>0.522</i>	<i>0.436</i>	<i>0.602</i>
Adjusted disposable income	208 757	176 065	183 956	274 446	229 026	225 411	203 293	214 010
<i>Gini coefficient</i>	<i>0.277</i>	<i>0.193</i>	<i>0.137</i>	<i>0.258</i>	<i>0.196</i>	<i>0.160</i>	<i>0.148</i>	<i>0.237</i>
Changes in income <i>Adjusted disposable – Disposable</i>	39 143	60 954	78 800	27 151	37 077	53 687	66 320	44 625
<i>As % of Gini coefficient</i>	-15.5%	-27.5%	-35.0%	-14.3%	-15.8%	-21.9%	-37.2%	-22.4%

Table 2. Average disposable income and adjusted disposable income in SEK per consumption unit grouped by household type. Age of head of household 35-54

	Single, no children	Single, 1 child	Single, 2 or more children	Cohabiting, no children	Cohabiting, 1 children	Cohabiting, 2 children	Cohabiting, 3 or more children	Total
Number of individuals	863 217	191 152	291 803	630 944	442 452	1 243 022	669 550	4 332 140
Factor income	242 822	176 015	131 102	337 683	297 606	283 931	209 411	258 392
<i>Gini coefficient</i>	0.465	0.428	0.475	0.329	0.322	0.308	0.392	0.388
Positive transfers taxable	32 642	22 945	18 225	25 130	26 615	18 467	19 763	23 476
Positive transfers non-taxable	9 529	23 417	37 129	8 224	8 969	12 540	21 384	14 450
Negative transfers	76 219	53 316	39 374	98 630	90 079	85 856	64 879	78 418
Disposable income	208 775	169 061	147 083	272 407	243 111	229 082	185 679	217 899
<i>Gini coefficient</i>	0.314	0.253	0.24	0.249	0.239	0.226	0.259	0.273
Health	17 199	13 578	11 710	12 068	12 713	10 619	10 937	12 608
Education	8 792	44 195	58 458	21 277	27 225	40 348	50 504	32 901
Social protection	14 103	5 605	6 435	3 237	3 440	4 766	5 599	6 547
Culture and recreation	2 474	2 313	2 221	2 536	2 689	2 640	2 419	2 520
Total welfare services	42 567	65 691	78 824	39 117	46 067	58 373	69 459	54 576
<i>Gini coefficient</i>	0.729	0.461	0.350	0.588	0.565	0.489	0.412	0.554
Adjusted disposable income	251 594	233 873	226 923	308 738	288 656	288 587	256 006	272 554
<i>Gini coefficient</i>	0.306	0.196	0.164	0.215	0.205	0.183	0.192	0.224
Changes in income <i>Adjusted disposable – Disposable</i>	42 819	64 812	79 840	36 331	45 545	59 505	70 327	54 655
<i>As % of Gini coefficient</i>	-2.6%	-29.1%	-46.3%	-15.8%	-16.6%	-23.5%	-34.9%	-21.9%

Table 3. Average disposable income and adjusted disposable income in SEK per consumption unit grouped by household type. Age of head of household 55-64

	Single, no children	Single, 1 child	Single, 2 or more children	Cohabiting, no children	Cohabiting, 1 children	Cohabiting, 2 children	Cohabiting, 3 or more children	Total
Number of individuals	491 179	13 700	6 524	816 172	56 456	43 074	15 579	1 442 685
Factor income	222 815	184 329	155 561	359 495	313 726	292 996	197 230	304 846
<i>Gini coefficient</i>	0.539	0.502	0.489	0.406	0.388	0.385	0.543	0.458
Positive transfers taxable	6 903	22 236	34 884	3 431	9 259	13 541	25 027	5 697
Positive transfers non-taxable	73 128	37 751	28 559	79 597	34 951	24 836	25 172	72 797
Negative transfers	80 680	61 263	50 089	123 616	98 358	92 266	64 190	105 507
Disposable income	222 166	183 052	168 915	318 907	259 579	239 107	183 239	277 833
<i>Gini coefficient</i>	0.315	0.298	0.263	0.271	0.286	0.282	0.358	0.303
Health	21 439	15 054	12 620	16 912	14 437	13 082	12 901	18 162
Education	2 985	44 432	55 210	4 630	30 171	39 219	51 600	7 216
Social protection	11 160	5 011	5 517	3 831	3 360	4 110	4 942	6 347
Culture and recreation	2 507	2 403	2 308	2 793	2 701	2 650	2 363	2 677
Total welfare services	38 090	66 899	75 655	28 166	50 669	59 061	71 806	34 402
<i>Gini coefficient</i>	0.689	0.457	0.372	0.593	0.538	0.489	0.406	0.636
Adjusted disposable income	261 006	248 726	245 665	346 923	309 762	301 302	256 022	312 483
<i>Gini coefficient</i>	0.311	0.234	0.192	0.253	0.244	0.228	0.262	0.28
Changes in income <i>Adjusted disposable</i> – <i>Disposable</i> <i>As % of Gini</i> <i>coefficient</i>	38 840 -1.3%	65 674 -27.4%	76 750 -37.0%	28 016 -7.1%	50 183 -17.2%	62 195 -23.7%	72 783 -36.6%	34 650 -8.2%

Table 4. Average disposable income and adjusted disposable income in SEK per consumption unit grouped by household type. Age of head of household 65-74

	Single, no children	Cohabiting, no children	Total
Number of individuals	342 082	452 701	794 782
Factor income	65 979	103 279	87 225
<i>Gini coefficient</i>	0.912	0.805	0.849
Positive transfers taxable	188 369	263 966	231 428
Positive transfers non-taxable	6 439	924	3 298
Negative transfers	69 435	104 461	89 386
Disposable income	191 352	263 708	232 565
<i>Gini coefficient</i>	0.306	0.291	0.313
Health	30 490	27 003	28 504
Education	246	208	224
Social protection	18 270	13 716	15 676
Culture and recreation	2344	2659	2524
Total welfare services	51 350	43 586	46 928
<i>Gini coefficient</i>	0.677	0.638	0.657
Adjusted disposable income	242 633	306 303	278 899
<i>Gini coefficient</i>	0.328	0.28	0.31
Changes in income <i>Adjusted disposable – Disposable</i>	51 281	42 595	46 334
<i>As % of Gini coefficient</i>	6.7%	-3.9%	-1.0%

Table 5. Average disposable income and adjusted disposable income in SEK per consumption unit grouped by household type. Age of head of household 75 and older

	Single, no children	Cohabiting, no children	Total
Number of individuals	472 964	348 175	821 139
Factor income	33 092	41 552	36 679
<i>Gini coefficient</i>	0.969	0.917	0.948
Positive transfers			
taxable	9 947	1019	6 161
Positive transfers			
non-taxable	165 210	223 383	189 876
Negative transfers	51 492	70 352	59 489
Disposable income	156 757	195 602	173 228
<i>Gini coefficient</i>	0.239	0.237	0.25
Health	40 635	35 539	38 474
Education	57	67	61
Social protection	88 855	52 889	73 605
Culture and recreation	2 190	2 415	2 285
Total welfare services	131 737	90 910	114 426
<i>Gini coefficient</i>	0.677	0.694	0.689
Adjusted disposable income	287 273	285 797	286 647
<i>Gini coefficient</i>	0.378	0.283	0.343
Changes in income			
<i>Adjusted disposable –</i>			
<i>Disposable</i>	130 516	90 195	113 419
<i>As % of Gini coefficient</i>	36.8%	16.3%	27.1%