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Noncash Benefits and Income Distribution

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Luxembourg Income Study Working Paper Series

Working Paper No. 150

Noncash Benefits and Income Distribution

Elisabeth Steckmest

December 1996



Noncash benefits and income distribution

by

Elisabeth Steckmest

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Preface

In order to fully appreciate the public sector's role in the distribution on income, it is essential to consider not only cash but also noncash transfers. This is particularly true in a country like Norway with a large public sector and a welfare state that relies heavily on noncash transfers.

This analysis is limited as far as explaining the mechanisms behind the distribution of noncash income. Instead we measure the impact of the major noncash transfers (health and education services) on disposable household income and on the income distribution.

There are great variations in the characteristics of the welfare services in different countries, both with respect to the amount on noncash welfare spending and with respect to the distributional impact of these expenditures. We therefore want to compare the impact of noncash income in Norway with the impact in other countries (Sweden, the United Kingdom and the United States).

This report has been funded by the Research Council of Norway. I would like to thank Professor Askildsen for supervising my work on this report. Also, warm appreciation for the help of the LIS staff in making the statistical work manageable.

Bergen, November 1996.

Elisabeth Steckmest

Abstract

This report gives the results derived from a cross-sectional analysis of the distributional effects of noncash benefits in four countries. The results of the Norwegian data suggest that the distribution of benefits influences the relative income position of household groups. The main beneficiaries of the free education system in Norway are, not surprisingly, households with children. Noncash health benefits particularly improve the situation of the elderly. When the income measures are adjusted for household size and composition, the spread in relative mean income across the different groups is reduced.

To measure the impact of income inequality we use income per decile group before and after the inclusion of in-kind benefits. If we look at the population as a whole, we see that households on the bottom part of the distribution receive more than those at the top. Disaggregating the population by household types, we find that for certain types, mainly families with children, cash income is correlated with noncash income.

We compare the results from Norway with those of Sweden, the UK and the US, and find the largest impact on the *level* of household income in the Scandinavian countries. Benefits from noncash health and education equalizes the *distribution* of income with the largest effect in Sweden and the United States.

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I) Introduction

Studies on the distribution of income show that Norway has a relatively low level of income inequality compared to other countries¹. These studies normally use some measure of cash income. The impact of public expenditure on programs such as health care, education and housing is frequently ignored in studies of income distribution. However, one of the main methods by which the Norwegian authorities seek to achieve their redistributive goals is through programs which provide noncash benefits. Studies based on cash income may therefore give a distortionary picture of the impact of government redistributive policies as noncash transfers are excluded.

Not only is the size of noncash income important, its distribution may also have considerable effects on the distribution of well-being among different types of households. Consider for example public education benefits. It is more likely that households with children are the ones to benefit from education subsidies in a given year. One would thus expect that differential gains and losses would be realized across household types. Also, as the value of noncash benefits is likely to be disproportionate to cash income, these income components might have large distributional effects by income class, as well as by demographic group.

For these reasons the distribution of disposable cash income may yield misleading inferences about the relative well-being of various types of households. In-kind benefits increase the amount of income families have available to devote to other consumption. A more accurate measure of income is one which consists of private income plus government cash and noncash benefits, less taxes. There is great uncertainty, however, as to which taxes and benefits should be included in the final income measure, about how to measure their value and about their incidence. These uncertainties are clearly problematic, but the aim here is to move further towards an understanding of the impact of key benefits in-kind.

In this paper we want to measure income inequality in Norway by including both cash and noncash income. This is a cross-sectional or «snap-shot» study of the distributional effects of services which are provided in-kind through government spending on education and health care. This is done by measuring the distribution of income before and after the inclusion of noncash benefits in the income measure. We have not tried to explain the mechanisms behind the distribution of these benefits.

As the characteristics of welfare programs vary between countries, we want to compare the Norwegian results with those of other countries. Sweden and the United Kingdom were

¹ See O'Higgins et. al. (1989) and Buchmann et al. (1988).

included due to the similarities to the Norwegian welfare system - the United States because of the differences in the nature of its welfare system.

The first part of this paper discusses the significance of noncash income measured by the size of cash and noncash government spending. Chapter 2 explains the methodology and data sources used in this analysis. A short description of the measurement procedures is also included. The next chapter presents the results, analyzing the distribution of noncash income between household types. Particular attention is given to the impact of noncash benefits on income inequality. Chapter 4 then goes on comparing the results of Norway with those of Sweden, the United Kingdom and the United States. A discussion of the results is provided in Chapter 5. Information on the imputation procedures is given in the appendix together with detailed tables of some of the results from our estimation of cash and noncash income.

Noncash benefits

Expenditure on welfare benefits constitute a large part of total government outlays in Norway. Government spending on the main welfare services (social security, education, health, housing and cultural, religious and recreational affairs) was over 230 billion NOK in 1990 (£23 billion), or 64 percent of total outlays. The largest single item was social security which represented half the total welfare spending, education and health each representing one-fifth. Public welfare spending has increased dramatically in the 1980's. In 1990, welfare spending (in constant prices) was 130 percent higher than in 1970². The growth of noncash benefit programs in the 1980's is illustrated in Table 1.1.

Table 1.1: *The cost of public noncash benefit programs in Norway, 1980-90 (in 1990 prices, mill. NOK)*

Type of benefit	1980	1982	1984	1986	1988	1990
Total government outlays	291 758	290 367	302 486	328 856	352 298	366 747
Education	38 163	37 595	39 199	40 684	42 937	46 212
Health	38 794	38 977	41 112	44 146	47 084	46 794
Social security	82 354	87 169	94 465	101 521	114 238	126 997
Housing	8 960	5 748	3 883	5 021	5 235	4 539
Culture, religion and recreation	7 594	8 010	8 402	8 944	9 570	8 722
Welfare spending, total	175 865	177 499	187 061	200 316	219 064	233 264

The increase in public expenditure on education was less than the increase in total government outlays. The highest increase has been on social security spending with a rise of over 50 percent. Health expenditure grew at approximately the same rate as total government outlays. While housing subsidies have fallen during the 1980's, spending on cultural, religious and recreational affairs has increased by 15 percent. In total, welfare spending has remained stable as a percentage of total government outlays (around 60 percent)³.

Social security spending is mainly paid out in cash and is therefore included in the conventional measures of disposable income. Welfare benefits provided in-kind (education, health care etc.) are, for the most part, ignored in measures of personal income and well-being. We see,

² Source: NOU 1993:17

³ Source: Central Bureau of Statistics, National Accounts 1991.

It is important to note that an increase in welfare spending does not necessarily mean an increase in the availability or quality of welfare services.

however, that the noncash benefits constitute a significant part of government transfers. An indication of the aggregate importance of public noncash benefits for the other countries in our study is presented in Figure 1.1. Noncash expenditures, defined as government final consumption expenditure less defense spending, are shown relative to the major element of cash transfer spending (social security benefits), both being expressed as a percentage of GDP.

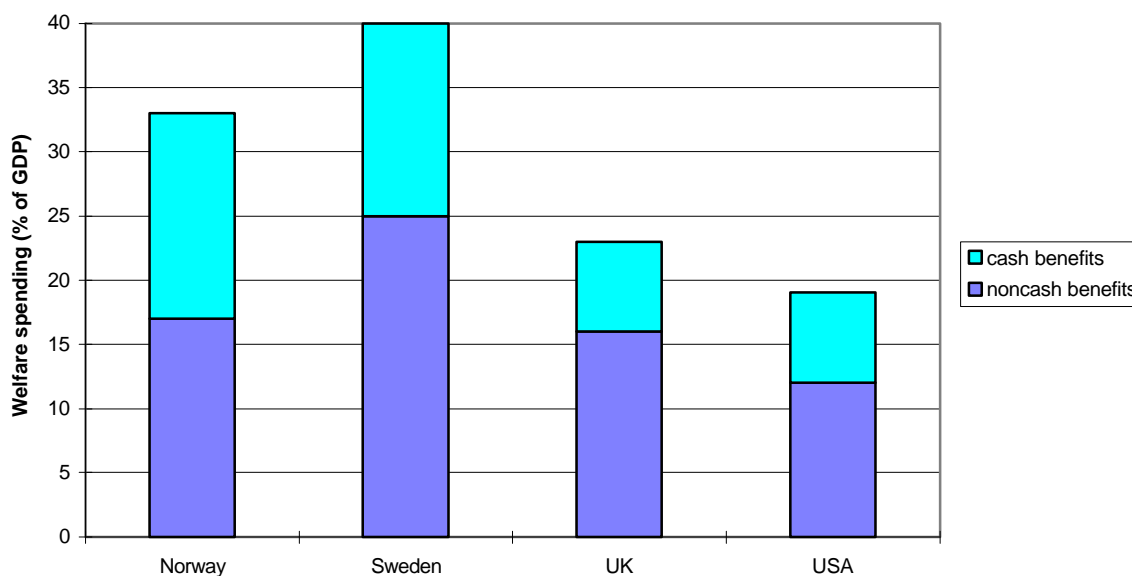


Figure 1.1: Cash and noncash benefits as a percentage of GDP 1986
(source: United Nations 1991)⁴

In all countries noncash expenditure exceeded expenditure on cash transfers. The difference was only 1 percent of GDP in Norway, but around 10 percent of GDP in Sweden and the UK. These data confirm that the size of public noncash benefits is such as to present the possibility that their inclusion as part of income might influence the overall distribution of income. However, the ranking of countries according to the levels of cash and noncash spending is similar. This suggests that governments have not used cash transfers and noncash benefit programs as substitutable methods of achieving their redistributive goals, but rather as complementary methods. It further implies that while the inclusion of noncash income will increase measured economic well-being, it may also cause the observed degree of inequality of final income to be more equal than that of disposable income (both across and within countries) if the equalizing redistributive impact of cash and noncash incomes are similar.

⁴ United Nations (1991). Defense figures for the US is taken from Statistical Abstract of the United States 1990, US Department of Commerce, Bureau of the Census.

The main message to emerge from Figure 1.1 is that noncash income is significant and needs to be taken into account in any comprehensive measure of income.

Results from other studies

Much of the work in this paper is similar to that of Smeeding et al. (1992). Their research summarizes the impact of noncash income (health, education and housing) on income distribution and poverty in seven nations using LIS data from the beginning of the 1980s (Norway is not included). Their results show that the effect of noncash income on the average income levels is greatest for middle-aged families with children and the very elderly. The biggest relative losers in most countries are younger families without children, childless couples and those approaching retirement age. The size of the relative gains for families with children are greater than those for the elderly in all countries. The addition of housing benefits changes this picture only marginally.

Further, the effect of noncash benefits from education and health on the overall distribution of income are, for the most part, equalizing. The effects are largest in Germany, followed by the UK and Canada. Effects are least in the US and even slightly disequalizing in Sweden. In Germany the addition of housing benefits reduces the gains in distribution equality made by health and education. In contrast, the addition of housing benefits is decidedly more equalizing in the Netherlands, Sweden and Canada.

Both the US Bureau of the Census and the Central Statistical Office in the UK have published a series of reports on the effects of benefits and taxes on household income⁵. Although there are some measurement differences, our evaluation methods are similar. In the UK survey from 1986 they have imputed the largest two items of in-kind benefits, health and education services. Other items for which imputations are made are school meals and milk, housing and travel subsidies. Taken together, the absolute value of these benefits show no clear relationship with income for non-retired households. However, as a proportion of post-tax income, benefits decrease from 60 percent in the lowest quintile group to 10 percent in the highest quintile group, indicating that this expenditure contributes to the reduction in income inequality. Retired households derive significant benefits from health services and, to a lesser extent, the housing subsidy and travel subsidies. In total, the receipts of benefits in kind produce only a marginal reduction in dispersion.

⁵ Central Statistical Office (1988) and US Bureau of the Census (1988).

Benefits covered in the 1986 US survey include food stamps, school lunches, Medicaid coverage, Medicare coverage, rent subsidies, energy assistance, and coverage under employer provided health insurance and pension plans. The addition of Medicare (medical care for the elderly) reduces income inequality slightly by raising the share of aggregate income received by the two lowest quintiles. The effect on the income distribution of Medicaid (health care for the poor), food stamps, school lunches and rent subsidies is to raise the share of aggregate income received by the lowest quintile of households from 4.2 to 4.7 percent. It has no statistical significant effect on the other four quintiles. A major type of private sector income received in noncash form is employer contributions to the health insurance plans of employees. The effect of these health supplements is to raise median household income by 4 percent. The employer contribution had no significant effect on inequality.

Few studies have looked at the importance of noncash income on the income distribution in Norway. Herigstad did a study in 1986 on the correlation between household income, cash transfers and the use of public services⁶. The noncash benefits include, among others, health care, education and child care services. Health care services seem to have little or no impact on the distribution of income. Noncash education income result in households with children and single parent households increasing their relative income positions. Herigstad finds a positive correlation between the use of child care services and high income households with young children. This positive correlation also exists for education and cultural services. The overall result of government transfers seems to be a slight reduction in income inequality.

⁶Herigstad (1986).

II) Methodology and Definitions

Concepts and Definitions

The choice of income concepts, unit of analysis and inequality measures is enormous. In this paper we concentrate on the distributional effects of services which are provided in-kind through government spending over a single year. However, the period of measurement could just as well be for a whole life time, evaluating to what extent people get back at one stage of their lives what they have put in at another. A full discussion of the conceptual problems faced in this type of analysis will not be given, but we will briefly describe our choice of income and inequality measures and the classification of income units.

Cash income

In assessing the economic position of a household there are a number of indicators that we could choose from: Income, expenditure, wealth - just to mention some. Each indicator may also have different definitions. Even a term like «income» is not as straightforward as it may appear. There is a wide divergence between income as defined for the purpose of income tax and the definition which say an economist would accept.

In our study disposable income is used as a measure of cash income. The redistributive effect of the noncash benefits cannot be judged just by looking at who benefits. You also have to look at who pays for it through the tax system. It is the net effect of benefits and the taxes which finance them which is crucial. In order to measure the redistribution we therefore use disposable income as our income measure. The definition of disposable income in the LIS database is illustrated below. Factor income is equal to the sum of labor and property income. Cash benefits to households and private and public pensions together with cash income transfers from other households adds up to total gross income. After deducting mandatory contributions and personal income tax, we have disposable income.

The definition of disposable income in the LIS database

Income and wages	+
<u>Cash property income</u>	+
<i>Factor Income</i>	
Social Transfers	+
(sick pay, disability pay etc.)	
Occupational Pensions	+
Private Transfers	+
(alimony, child support etc.)	
<u>Other Cash Income</u>	+
<i>Gross Income</i>	
Income tax	-
<u>Mandatory contributions</u>	-
<i>Disposable Income</i>	

Noncash income

In recent years it is recognized that we need to employ a wider income concept in fiscal incidence studies. To the disposable income measure we have therefore added the value of indirect noncash benefits. The aim is to derive a final income measure consisting of private income plus government cash and noncash benefits less taxes. Such a final income measure is intended to provide a more accurate guide than the standard cash income measures to the resources available to families or to the living standard achieved by families.

Despite the consensus of a need for a wider income measure, there is still a debate about which benefits should be included in the final income definition, about how to measure their value, and about their incidence. On the valuation issue, the standard methodology is to value services at the cost of their provision to government (see, for example, Evandrou et. al. 1992, and Smeeding et. al. 1993). It is recognized that recipients may value benefits in kind quite differently from cash benefits and that the degree of efficiency in delivering social wage services may vary (which affects cost and thus imputed value). Alternative methodologies are, however, seen as too problematic.

Even among measurable and significant noncash incomes, there are numerous types of noncash incomes which could be included. We have had to narrow our focus on subsidized health care services and educational services. As was indicated in Chapter 1 these benefits constitute a large part of total government transfers. It is also possible to impute these benefits to households in the LIS database. Finally, as part of our objective is to compare economic well-being between countries, we need to select measures of noncash income components which are fairly robust across countries.

The unit of analysis

When measuring the distribution of well-being it may seem natural to use the individual as the unit of analysis. However, the distribution of income between persons does not give a complete picture of the distribution of well-being as the family structure has a large impact on a person's economic position. The well-being of a woman earning 150 000 NOK per year and living by herself is not the same as if she lived with a husband earning 400 000 NOK. Using persons as a unit of analysis does not account for economies of scale within the household and for increased economic security when there are several income earners.

In this study we therefore use the household as the basic unit of analysis. The problem is that the definition of households varies between each country⁷. This makes it difficult to do cross country comparisons of variables which are sensitive to the variation in household definitions. For example, a more restricted definition of households in Sweden means that household income should be relatively higher than the figures indicate⁸. To correct for these variations and to take account of the difference in household size, we have used equivalent household income.

Equivalent household income

The income measures show actual money income received by households and so are intuitively easy to understand. However, they may give a misleading impression of the relative living

⁷ In Norway a household includes all persons which the respondent considers to belong to the household. In most cases it also includes household members which are temporarily absent (students away from home, husbands away from home at work or on military duty, etc.). All persons who share the same usual place of residence are considered a member of a household in the US. Households in the UK include one person living alone or a group of people living at the same address and having meals together and with common housekeeping. And finally, Sweden defines its households as one or two adults with or without children.

⁸ We did some comparisons of relative income between household types based on two different household definitions, and found only small differences.

standard of different types of families, because they take no account of the number of people supported by each family's income. For example, two families with a final income of 200.000 NOK will be assumed to enjoy the same standard of living, even if one consists of 6 people and the other only of one person. One way to take such differences into account is to weigh household results by the number of persons in each unit. The question is what share of household income each person should receive. The most widely used method is to apply an equivalence scale to household income. This method takes the family size into consideration like per capita income, but it also considers economies of scale within families.

There remains the question of which set of equivalence scales to use, an issue on which there currently exists little consensus. The range of potential equivalence scales that can be used to adjust incomes for size and related differences in needs, span a wide spectrum. In a paper by Buchmann et al. they tested the sensitivity of various income inequality and poverty measures to different equivalence scales. They found that the choice of equivalence scale systematically effected comparative absolute and relative levels and rankings of countries with respect to measured inequality and poverty. Because of these sensitivities, one must be careful in interpreting the results of cross-national comparisons of inequality and poverty. One way to get around this problem is to look at income inequality within fairly homogeneous groups such as single person households or couples aged 65 or older⁹. This is done in Chapter 3 of the paper.

In the remaining sections which measures income inequality, we have chosen to use the OECD equivalence scale factor. These scales allocate a weight of 1.0 for the first adult in each family, 0.7 for each additional adult in the family and 0.5 for each child. The scale implies that a single parent with one child and a married couple with two children have needs which are 50 percent and 170 percent greater than the needs of a single adult, respectively.

The OECD equivalence scale has been applied to the household's total cash income, while total noncash benefits have simply been divided by the number of people in the household. This procedure follows recent international practice (see, for example, Smeeding et al. 1993 and Harding 1995) by assuming no economies of scale in the use of welfare services (at the household level). Our measure of final household income is thus equal to the sum of equivalent disposable income and per capita noncash income.

⁹ Aaberge and Wennemo (1988)

Classification

The economic position of households is described using various characteristics, such as age of the household head, and the number of persons in the household¹⁰. We have classified each household according to these characteristics. The household classification used is summarized below. These categories are mutually exclusive and combine to the total of all households in a country.

Classification of households

Households with children (children are 17 or younger)

- nonaged couples (head of household under 65, couples may not be married)
- single parents (one adult plus children)
- other households with children (more than two adults or head 65 or over)

Elderly households (head 65 or older)

- single elderly persons
- elderly couple

Nonaged households without children

- single persons
- childless couples (of any marital status)
- other childless households (more than two adults or children 18 or older)

The measurement of inequality

One of the most popular methods of examining the impact of government programs on income distribution is to rank all families or individuals by their income, divide them into 10 or 5 equally sized groups (deciles or quintiles) and then examine the change in income shares of each group before and after receiving benefits from the government. When ranking families by their incomes, income is really being used as a proxy for a measure of their standard of living or their welfare. However, it is not clear which income measure provides the best measure of a

¹⁰ The household head is defined as the person having the highest gross income or the one who owns the household accommodation (or is legally responsible for the accommodation). When two members of different sex have equal claim, the male is taken as head of household. When two members of the same sex have equal claim, the elder is taken as head of household.

family's standard of living, and fiscal incidence studies have used different benchmarks against which to assess the redistributive impact of government programs¹¹. In this study we rank income units into deciles (and quintiles) of equivalent disposable income and then rerank them into deciles (and quintiles) of equivalent final income to gauge the overall impact on income shares.

Finally we will use the Gini coefficient as a summary measure of inequality of the distribution of cash and final income (cash plus noncash income). The Gini coefficient takes values between 0 and 1 - the highest values indicate greater inequality. The importance of noncash income is measured by comparing the Gini coefficient from the distribution of disposable income relative to the distribution of final income.

The Luxembourg Income Study (LIS)

The Luxembourg Income Study (LIS) began in 1983 with the aim of improving comparative measures of economic well-being. The database contains social and economic data collected in household surveys from different countries. National data sets are reorganized to conform to a common standard with the same conceptual and definitional framework. The income concepts around which the LIS database has been constructed are all based on income expressed in terms of cash only. Noncash elements which form part of income in its broader meaning have, with a few exceptions, been excluded.

The LIS databank currently covers over 60 data sets from more than 30 countries covering the period 1968 to 1994. In our study we have chosen four countries in the LIS data bank from the years 1986/87. These are: Norway 1986, Sweden 1987, the United Kingdom 1986 and the United States 1986. More detail about the individual data sets are given in Appendix 2.

Imputation

In this section we explain the primary imputation procedures. After a brief summary of the principles behind the imputations, a more detailed description is given for health care and education separately¹².

¹¹ The procedure used by Smeeding et al. (1993) is to rank households into quintiles on the basis of disposable income and then rerank them on the basis of final income. The study by Evandrou et. al., the British Central Statistics Office and Hardig, rank families by their equivalent disposable income.

¹² A detailed description of the imputation procedure for each country is given in Appendix 1.

For both types of benefits capital and operating outlays are included when adding the benefits of public expenditures. As a measure of capital outlays, we have used a five year average of capital expenditures (in constant prices). We chose to use capital expenditure rather than capital outlays (or user cost of capital) for two reasons: Firstly, data on interest rates and depreciation is not easily available. Secondly, the methods used to measure capital outlays vary considerably between countries. There are also uncertainties as to the validity of the different methods¹³.

A household which receives noncash income is the only income unit to benefit. We disregard externalities to other households or society at large. This is done because in most cases it is not clear to what degree other households benefit. Quantification of the extent to which nonrecipient households benefit is impossible.

The value of noncash benefits is equal to the amount of money that the public sector spends on each item. We do not attempt to estimate recipient or cash equivalent value.

There are two main elements required to impute noncash income benefits: 1) total expenditure on noncash provisions in each area, and 2) information on the demographic (age and gender) profiles of those utilizing these noncash provisions. These two pieces of information are combined to impute noncash benefits to individuals. These individual noncash provisions are then aggregated up to calculate the receipt of noncash income by each household.

Health care

Health care is treated as an insurance benefit received by coverees independent of their actual use. The benefits are counted as income to the extent that they free up resources that could have been spent on medical care. Expected benefits differ by age and gender to account for differences in expected utilization. Data are available on the average cost for the government of providing health care services and on the utilization of these services by age and gender (patient statistics). It is therefore possible to estimate the average per capita public expenditure on health care of different age and sex groups. Using this information, an imputed benefit from the health service can be allocated to each individual in the LIS database. These benefits are then aggregated for members of the household to yield figures on a household basis, so that not only the age and sex composition but also the size of the household determines the attribution of health service benefits.

¹³ OECD (1993).

Age and sex are by no means the only possible determination on which to base the allocation, but age is certainly a very important factor¹⁴.

Education

Education benefits are set equal to the cost per student in primary and secondary education. The value of the benefit attributed to a household will then depend on the number of people in the household in primary and secondary school age. Benefits are measured by imputing both capital and operating expenditures for public education.

We do not have data on parents who send their children to private schools and thereby choose to forego free or heavily subsidized education. Expenditure on private education has therefore been excluded, and education benefits are allocated to all school aged children¹⁵.

It must be emphasized that this analysis provides only a very rough guide to the kinds of household which benefit from government expenditure, and by how much.

¹⁴See Appendix 1.

An alternative method is one used by Norwegian authorities. They have a system which classifies patients into groups according to their illness and treatment (called the DRG system). In this way the variation in the cost of different types of treatment is accounted for. By looking at the composition of patient groups within each hospital, they are able to get a better estimate of the expenditures needed for health care services. This method of estimating health care costs is beyond the scope of this project.

¹⁵ Private education in Norway is also heavily subsidized.

III) The Impact of Noncash Income in Norway

By Household Type

We now present the results of our imputations, and examine their distributional implications. First we discuss the mean amounts of cash and noncash income received by different household types. Second, we look at the change in the relative income position of the different households, and finally we analyze the results after adjusting for household size.

Mean Amounts

Table 3.1 shows the increase in mean income caused by benefits-in-kind for different population groups¹⁶. If we examine the average noncash income received by the population as a whole, we can see that considerable resources are allocated to households in the form of noncash benefits. The average Norwegian household received 27 621 NOK in noncash income in the form of education and health care subsidies in 1986. This was approximately 17 percent of the average disposable cash income.

Looking at average disposable income we find an inverse u-shape relationship between average income and age, with income among the youngest and oldest particularly low. Including noncash income makes the pattern a little more hump-shaped. For example, families with heads aged 35-44 improve their incomes from 133 percent of the sample mean to 142 percent. The average incomes of young and elderly family heads change little.

The bottom panel shows the effect of noncash income on average group incomes by different household types. Education expenditure were imputed to families with children of primary and secondary school age. For families with school aged children noncash income was between 58 000 NOK and 31 000 NOK. Health income is more evenly distributed across families. The differences that do exist are not very surprising given the pattern of utilization. Imputed expenditures are greater for young children and elderly people than for people of other ages, and for women relative to men¹⁷. Thus families with relatively high health noncash income include those headed by someone over 75 years, and families with children. In general, families with children had the largest absolute gains.

¹⁶ The calculations summarized in Table 4.1 make no adjustment for differences in needs using equivalence scales.

¹⁷ See Appendix 1.

Table 3.1: Average cash and noncash income by age of household head and by household type, Norway 1986

	(a) Disposable income	(b) % of mean	(c) Noncash education	(d) Noncash health	(e) Final income (a) + (c) + (d)	(f) % of mean	(g) Difference (f) - (b)
All households	160 588	100	15 015	12 606	188 209	100	
Age of head							
-25	86 080	54	8 082	7 843	102 005	54	0
25-34	160 877	100	8 644	11 270	180 791	96	-4
35-44	214 213	133	40 616	12 439	267 268	142	9
45-54	220 028	137	29 069	11 320	260 418	138	1
55-64	181 384	113	6 410	12 237	200 031	106	-7
65-74	118 449	74	782	14 358	133 589	71	-3
75-	79 646	50	57	17 213	96 916	52	2
Household type							
1 adult, under 65	92 297	58	1 371	4 734	98 402	52	-6
1 adult, 65 or over	64 440	40	0	11 498	75 938	40	0
2 adults with children	214 741	134	34 053	15 201	263 995	140	6
2 adults, under 65	190 209	118	341	11 272	201 822	107	-11
2 adults, 65 or over	130 113	81	0	20 365	150 478	80	-1
1 adult with children	119 029	74	30 849	10 579	160 457	85	11
other fam's w/children	263 460	164	58 051	15 218	336 729	179	15
other fam's w/out children	218 946	136	10 484	14 680	244 110	130	-6

Changes In Relative Income Position

The distribution of benefits affects group mean incomes relative to the overall mean. We can see from Table 3.1 that the main beneficiaries of the free education system in Norway are household with heads aged between 35 and 54 while noncash health benefits particularly improve the situation of the elderly. Considering both types of noncash income, we find that the age group which gains the most from noncash transfers are those aged between 35-44 and 75 and over. However, the different households maintain much the same relative positions.

These results are echoed in the breakdowns by composition type. From the figures in the bottom panel once again, one can see that families with children are those who gain most from the noncash programs. Other families without children, in contrast, are worse off relative to the mean when noncash income is included¹⁸. The change in the relative position of elderly households is insignificant. High noncash education incomes received by young households seem to cancel out the overall effect of noncash income to the elderly.

Adjustments for Household Size

For reasons discussed in Chapter 2, equivalence scales have been used to adjust family income for needs related to family size and age. The implications are that large households will move down the income distribution while single person households will improve their relative income positions. This adjustment has an effect on group mean incomes independent of the effect of noncash income. Table 3.2 summarizes the results of the equivalence adjusted cash and final income.

For all groups, the equivalence adjustments is greater than the noncash income adjustment. Sometimes it moves in opposite directions. For instance, the equivalence adjustment for families with heads aged 35-44 decreases their relative mean incomes, while noncash benefits improve the position of the age group. The reduction in the income position of middle aged households (head aged between 35 and 54) implies that this population group contains several large households. The elderly and young households increase their income relative to the mean. This means that these households consist, for a large part, of single persons or couples without children. Household income will increase relative to the mean as there are fewer people who share the total household income.

¹⁸ It is important to note that if child care subsidies were included in the analysis, families with children, particularly single parents, would gain more from noncash transfer programs than these figures indicate.

Compared to the results from Table 2.1, the effect of noncash income is smaller and in some cases the change in the relative mean incomes move in opposite direction from that of the unadjusted estimates. The equivalent noncash adjustments seem fairly insignificant for all age groups.

For our household types, the differences between the adjusted and unadjusted estimates are even more dramatic. Families with children still gain from noncash adjustments, but they loose ground relative to their critical position because of the family size adjustment. The adjustments increase the relative positions of single households and couples without children.

Taking the two adjustments together, the spread in adjusted final relative mean income is below that found in Table 2.1. The effect of both types of adjustments is, therefore, to reduce the spread in relative mean incomes across the groups shown here.

Table 3.2: Disposable cash income, adjusted cash income, and adjusted final income by age of household head and by household type, Norway 1986¹⁹.

	(a) Disposable Income Unadjusted	(b) Disposable Income Adjusted	(c) Final income Adjusted	(d) Difference (b) - (a)	(e) Difference (c) - (b)
All households	160 588	187 694	197 833		
Age of head	% of mean	% of mean	% of mean	% difference	% difference
-25	54	73	74	19	1
25-34	100	103	102	3	-1
35-44	133	107	109	-26	2
45-54	137	115	115	-22	0
55-64	113	117	115	4	-2
65-74	74	91	91	17	0
75-	50	73	76	23	3
Household type	% of mean	% of mean	% of mean	% difference	% difference
1 adult, under 65	58	108	106	50	-2
1 adult, 65 or over	40	76	78	36	2
2 adults with children	134	95	96	-39	1
2 adults, under 65	118	131	127	-13	-4
2 adults, 65 or over	81	90	90	9	0
1 adult with children	74	80	84	6	4
other fam's with children	164	103	106	-61	3
other fam's no children	136	113	111	-23	-2

¹⁹ With *adjusted* we mean income adjusted for household size and composition using the OECD equivalence scale. *Final income* is the sum of disposable income and noncash income.

Income inequality

To examine the distributional impact of benefits received from government we ranked all households by their income (equivalent income) and calculated the benefits received by each income group (decile). Figure 3.1 shows estimates of the distribution between households of noncash benefits from public health and education. If we look at noncash health income the figure shows a hump-shaped pattern, the use of health care services being highest in the middle income groups. Education seems to be inversely related to income with the lowest deciles receiving relatively more noncash education income. On average, households on the bottom part of the distribution receive more than those at the top.

Given our assumption that the use of the national health service depends on age and sex, the estimates in Figure 3.1 indicate the age distribution in each decile group. As the education benefits are allocated to all school aged children, we also have information on the number of school children in each income group. Relatively high noncash education income among the low-income households suggests therefor a high concentration of families with school aged children. High noncash health income among the middle-income households may indicate a high proportion of elderly households in these income groups.

Given that the absolute value of cash benefits is lower for high-income households, and that their incomes from the market are high, benefits are of much less relative importance at the top. Noncash education and health income represent 15% of cash income of the poorest tenth, but only 2% for the richest tenth. This pattern leads to a reduction in income inequalities.

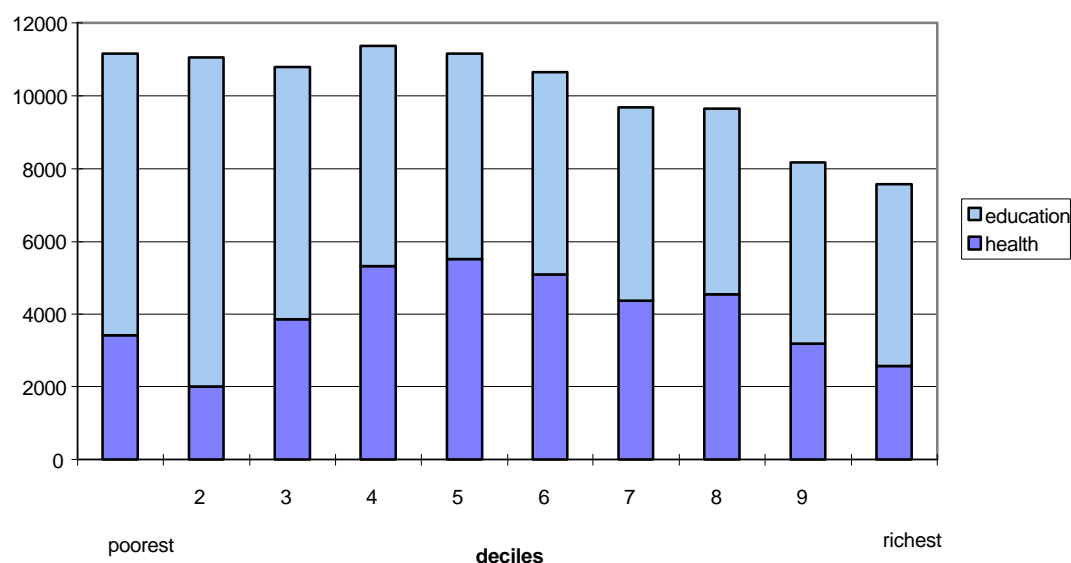


Figure 3.1: *Noncash health and education income, Norway 1986*

When ranking households by their incomes, income is really being used as a proxy for a measure of their standard of living or their welfare. However, it is not entirely clear which income measure provides the best measure of the household's standard of living. Recent fiscal incidence studies have used *equivalent disposable income*²⁰. We observed in Table 4.2 that the use of equivalence scales gave quite different results from the unadjusted income measures. In the table below we have therefore included both income measures. The degree of income inequality is measured by the income shares of decile groups. Income shares for cash and noncash income is given for the sample as a whole.

²⁰ See, Evandrou et al. (1993) and A. Harding (1995).

Table 3.3: *Effect of income adjustments and noncash income on the size distribution of income, Norway 1986*

Decile	Disposable income		Final income		Difference	
	(a) Unadjusted Income share (%)	(b) Adjusted Income share (%)	(c) Unadjusted Income share (%)	(d) Adjusted Income share (%)	(e) Unadjusted (c) - (a)	(f) Adjusted (d) - (b)
10	2.4	4.0	2.6	4.4	0.2	0.4
20	3.8	5.8	3.8	6.1	0.0	0.3
30	5.3	6.7	5.2	6.9	-0.1	0.2
40	6.7	7.8	6.5	7.9	-0.2	0.1
50	8.3	8.8	8.1	8.9	-0.2	0.1
60	10.0	9.8	9.8	9.8	-0.2	0.0
70	11.6	10.9	11.5	10.8	-0.1	-0.1
80	13.3	12.2	13.4	12.1	0.1	-0.1
90	15.7	14.1	16.1	13.7	0.4	-0.4
100	23.0	19.9	22.9	19.3	-0.1	-0.6

Both the addition of noncash income and adjustments for household size tend to reduce the disparities found in the distribution of disposable cash income. The combined effect (the last column) is to generate a much more equal distribution of incomes. The income share of the bottom decile rises by 0.4 points while the share at the top falls by 0.6 points. The effects are small, but unambiguous nonetheless. Adding education and health noncash income components into disposable income reduces measured inequality.

It is possible to check the results by examining a summary measure of inequality, such as the Gini coefficient. The Gini coefficient ranges between a value of 1 when one household holds all the income and a value of 0 when income is equally distributed. The Gini for unadjusted disposable income is 0.331. When the income measure is expanded to include noncash benefits, the Gini is 0.332, denoting a slight rise in the degree of inequality (however, this is well within the margin of error of this kind of analysis). Moving to the equivalent income measure, *adjusted income*, the Gini for equivalent disposable income is .243. After the inclusion of noncash benefits, the Gini for equivalent final income declines to .228. This suggests a reduction in inequality. In sum, income which has not been adjusted for household size or composition shows no proof of a reduction in income inequality. And although the adjusted income measure unambiguously reduces income inequality, the effect is relatively small.

Greater insight into the distributive impact of noncash income can be gained by disaggregation of the overall results according to the different family types introduced earlier. Table 3.4

compares the mean income of households of the quintiles of cash income and noncash health and education income²¹.

Besides increasing the amount of income families have available to other consumption, noncash benefits are intended to redistribute income between the rich and poor. The bottom part of the distribution should therefore receive more noncash income than the top. Looking at the total noncash income received by each household type, we see a positive correlation between income and noncash benefits from education and health for household types 3, 6, 7 and 8. If we further look at each benefit separately we see that the positive relationship is mainly due to the correlation between income and education. This means that high income households have more school aged children than low income households²². This is the opposite of what we saw in Figure 3.1. Clearly the aggregate numbers do not pick up the differences in the distribution of noncash income between the different household types. Table 3.4 indicates that health care benefits show little variation with income for all household types. This issue will be discussed further in the section below.

²¹ Equivalence scales have not been used to estimate the figures in Table 4.4. Disaggregating the population by household type should eliminate most of the differences in household size and composition. In the «other» categories, however, there may still be variations in household size. For example, *other households without children* may be 5 adults living together or it may be one adult and one child 18 or older.

²² Education income in household type *other households without children*, is income received by households with 18 and 19 year olds living with adults and attending secondary school.

Table 3.4: Mean income by decile group, Norway 1986
(rounded to nearest 1000 NOK)

<i>Household type</i>	<i>Decile</i>									
	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>	<i>9</i>	<i>10</i>
<i>I) 1 adult <65</i>										
Disposable	17	43	58	72	86	94	104	117	135	195
Education	5	4	3	1	0	0	0	0	0	0
Health	5	5	5	6	5	5	5	4	4	4
Total*	10	9	8	7	5	6	5	4	4	4
<i>II) 1 adult >65</i>										
Disposable	38	44	47	49	52	56	62	72	86	139
Education	-	-	-	-	-	-	-	-	-	-
Health	11	12	12	12	12	12	11	12	11	11
Total*	11	12	12	12	12	12	11	12	11	11
<i>III) 2 adult+ch.</i>										
Disposable	115	148	166	179	192	207	223	243	279	394
Education	10	19	22	27	33	37	42	48	49	54
Health	15	15	15	15	15	16	15	15	15	15
Total*	26	34	37	42	48	53	57	63	64	69
<i>IV) 2 adult<65</i>										
Disposable	95	129	144	160	176	189	205	221	242	339
Education	2	1	0	0	0	0	0	0	0	0
Health	12	12	12	11	11	11	11	11	11	10
Total*	14	13	12	11	11	11	11	11	11	10
<i>V) 2 adult>65</i>										
Disposable	67	81	90	99	110	124	138	155	179	256
Education	-	-	-	-	-	-	-	-	-	-
Health	22	24	21	21	20	20	20	19	19	19
Total*	22	24	21	21	20	20	20	19	19	19
<i>VI) 1 adult+ch.</i>										
Disposable	34	63	77	89	102	116	133	153	170	240
Education	4	10	15	24	31	35	41	35	42	70
Health	12	10	12	13	10	9	9	9	11	16
Total*	16	20	27	37	41	44	50	44	53	85
<i>VII) other + ch.</i>										
Disposable	123	171	192	211	235	255	280	309	355	501
Education	24	29	47	61	63	68	70	75	72	69
Health	14	15	14	14	14	15	16	16	16	17
Total*	38	44	62	75	78	83	87	91	87	87
<i>VIII) other - ch.</i>										
Disposable	82	121	151	175	192	215	238	265	310	439
Education	5	8	7	6	9	10	12	16	16	17
Health	14	13	13	15	14	14	15	15	17	18
Total*	19	21	20	20	23	24	27	31	33	34

(* total noncash income)

Comments on the results

One of our main objectives has been to improve measures of income distribution by adding quantitatively important and practically measurable components on noncash income. Because of time limits and measurement problems we have not been able to include all the significant noncash income components. Such an example is child care subsidies. If child care was included in the analysis, it would become obvious that families with children, particularly single parents, gain much more from noncash transfer programs than these figures indicate. Another example is unpaid household work. The value of a woman choosing to work in the home rather than receiving income from work outside the home, is not included in the measure of household income. The value of the households well-being will therefore be underestimated in this case²³.

Further, the measurement and imputation procedure of health and education noncash income can be questioned. For example, by only including noncash income from primary and secondary education, we will underestimate the importance of noncash income, particularly in a country like Norway where higher education is provided free. Another apparent limitation in our imputation procedure is that all types of primary and secondary education is treated equally. We know that the average cost of students in vocational training is about twice that of students in ordinary education and that special schools have a higher cost per student than in ordinary schools.²⁴ These differences have been ignored as students in vocational training and special schools can not be identified in the LIS database.

Even though public provision of health care and education is in principle open for everyone, there may still be inequality in the distribution and use of these goods. Our estimates in Table 3.4 show little variation in the use of health care across income groups. However, we know that the availability of health care services varies across regions both in the level and quality of services²⁵. A Norwegian study by Elstad (1991) on the use of public health services in different regions showed that as the capacity of health care services increases, so does the use of these services. Social and economic circumstances such as high divorce rates and a high proportion of blue-collar workers, influence the demand for health care benefits. Further, the study showed that as a person's income rises, the use of health care services *falls*. This result has been supported by Nord (1988) and Dahl (1995). Halsteinli (1993) did a study on the variation in the demand for health services between different counties in Norway in 1994.

²³ Aslaksen and Koren (1993) did a study on the connection between unpaid household work and money income based on Norwegian data. Their results showed that including unpaid household work in the income measure had no impact on income inequality.

²⁴ See NOU 1996:1.

²⁵ Central Bureau of Statistics of Norway (1993)

Socioeconomic variables did not seem to influence the use of health care services. A similar study done by Sørensen, Rongen and Gryppen (1994) found no correlation between personal income and the use of health care services. In a study on the relationship between the households net income and the consumption of noncash benefits, Herigstad (1986) found a positive correlation for noncash benefits such as child care, education and cultural benefits. He found no correlation between the use of health care services and income. Cash transfers seem to have a negative correlation with household income.

In sum, there seems to be no consensus on the impact of social and economic circumstances on the use of public health care. It is therefore difficult to say whether the Norwegian health care system has been successful in providing equal care to everyone, but there is at least no evidence of a «pro-rich» bias.

There may, however, be other noncash benefits which suffer from a bias in the use or availability of these benefits. We know that within the education sector there is still a difference between socioeconomic groups in terms of who receives (public) university education.²⁶

²⁶Central Bureau of Statistics of Norway (1993).

IV) International comparison

In this section of the paper we compare the results of Norway with those of Sweden, the United Kingdom and the United States²⁷. We want to compare both the importance of noncash benefits and the distribution of these benefits. We start out by looking at the overall mean amounts of (unadjusted disposable) cash and noncash income. The figures in the top panel of Table 4.1 are expressed in national currencies, while the figures in the lower panel are standardized relative to each country's mean disposable income. If we examine the average noncash income received by the population as a whole, we can see that considerable resources are allocated to households in the form of noncash benefits. The average noncash income amounts to 17% of the average disposable cash income, ranging from 12% in the UK to 22% in Sweden. In Norway and the US education income is higher than noncash health income while the opposite is true for the other countries. The ranking of countries according to the relative importance of noncash income leaves, not surprisingly, the Scandinavian countries at the top.

Recall from Chapter 1 Figure 1.1 that Sweden has the largest government noncash expenditure compared to GDP. High noncash social expenditure in Sweden (and Norway) thus result in higher noncash income compared to the United States and the United Kingdom.

Table 4.1: Cash and noncash income - all households

Country	Disposable Income	Noncash Education	Noncash Health	Final Income (disposable income plus health and education income)
<i>Amounts (national currency)</i>				
Norway	160 588	15 015	12 606	188 209
Sweden	98 682	10 170	11 654	120 506
United Kingdom	8 723	458	614	9 795
United States	24 343	2 141	1 690	28 174
<i>Percentage of Disposable Income</i>				
Norway	100	9.4	7.8	117.2
Sweden	100	10.3	11.8	122.1
United Kingdom	100	5.3	7.0	112.3
United States	100	8.8	6.9	115.7

²⁷ The estimates of noncash health income for the US are taken from the US Bureau of the Census. The noncash education income have been estimated by the same procedures as for the other countries. For more detail, see Appendix 1.

By Household Type

The effect of noncash income on the average income levels of household types is shown in Table 4.2. The impact of noncash income was calculated by comparing overall group income to the national mean. Net differences in impact by household type are shown at the bottom of each table²⁸. From the figures in the bottom panel in Table 4.2 we see that noncash income improves the situation of all families with children and the elderly, whilst causing the income of families without children to decline. The pattern of change in income for the different family categories are similar in all countries. The US results are not strictly comparable to the other tree country's as the imputation procedures differ. Still, the relative change in income between the different family types are similar.

²⁸ The income measures have been adjusted for household size and composition using the OECD equivalence scale. This is, however, not the case for the US. The estimation and imputation procedures for the US are different from those of the other countries. For more detail, see Appendix 1.

Table 4.2: Cash and noncash income as percentage of mean by household type

Household type	Country			
	Norway	Sweden	United Kingdom	United States
<i>Disposable Income</i>				
<i>Households with children</i>				
couples	95	100	85	126
single parents	80	93	67	57
other	103	91	94	-
<i>Retired households</i>				
single person	76	78	80	43
couples	90	95	83	-
<i>Households no children</i>				
single person	108	96	120	-
couples	131	134	130	125
other	113	-	119	-
<i>Final Income</i>				
<i>Households with children</i>				
couples	96	101	87	134
single parents	84	97	71	73
other	106	96	95	-
<i>Retired households</i>				
single person	78	83	82	42
couples	90	97	84	-
<i>Households no children</i>				
single person	106	96	117	-
couples	127	128	127	115
other	111	-	117	-
<i>Difference</i>				
<i>Households with children</i>				
couples	1	1	2	8
single parents	4	4	4	16
other	3	5	1	-
<i>Retired households</i>				
single person	2	5	2	-1
couples	0	2	1	-
<i>Households no children</i>				
single person (nonaged)	-2	0	-3	-
couples (nonaged)	-4	-6	-3	-10
other	-2	-	-2	-

These results are echoed in the breakdown by age of household head. The households with heads aged 75 and above improve their relative incomes in all countries. The average income

of young/middle aged households improve slightly or remains unchanged. Those who loose out are household heads aged between 25 and 34 and between 55 and 64²⁹.

Income Inequality

We want to compare how successful each country is in redistributing income through their public education and health care systems. The change in inequality is measured by the difference in disposable (cash) income and final income (cash plus noncash income). The income measures are defined as average income per quintile relative to the overall mean³⁰.

Table 4.3: Disposable and final income by quintile groups

Quintile	Country			
	Norway	Sweden	United Kingdom	United States
	<i>Disposable Income</i>			
	<i>(% of mean)</i>			
Lowest fifth	49	45	40	23
Second fifth	73	78	66	55
Third fifth	94	97	85	85
Fourth fifth	115	118	115	124
Highest fifth	170	162	194	211
	<i>Final Income</i>			
Lowest fifth	52	52	43	26
Second fifth	74	81	68	59
Third fifth	94	97	86	87
Fourth fifth	114	115	114	125
Highest fifth	165	155	190	205
	<i>Difference</i>			
Lowest fifth	3	7	3	3
Second fifth	1	3	2	4
Third fifth	0	0	1	2
Fourth fifth	-1	-3	-1	1
Highest fifth	-5	-7	-4	-6

In all countries, noncash benefits from education and health care are equalizing, increasing the relative income at the bottom and decreasing it at the top. The pattern of noncash income seems to be the same in all countries with the largest effect in Sweden. In the US, only the top quintile see a reduction in relative mean income.

²⁹ Cash and noncash income estimates by age of household head are presented in Appendix 1.

³⁰ The reader is again reminded of the differences in estimation procedures between the US and the other countries.

We can check the results by examining the Gini coefficient for all four countries before and after including noncash benefits in the income measure. The coefficient estimates are listed in the table below.

Table 4.4: Gini coefficient of Disposable and Final Income

<i>Income</i>	<i>Country</i>			
	Norway	Sweden	United Kingdom	United States*
Disposable Income	0.243	0.230	0.304	0.483
Final Income	0.228	0.201	0.290	0.408

*Source: US Bureau of the Census

The income measure for the US has not been adjusted for household size. The absolute value of the Gini coefficient should therefore not be compared with those of the other countries. We see, however, that for all 4 countries, noncash income reduces the overall level of inequality. The results show an appreciable decline in the degree of inequality in the US and in Sweden. The redistributive effect in Norway and the UK are limited.

If we again compare Table 4.4 with figure 1.1 we see that Sweden which has the largest total noncash expenditure also has the largest equalizing impact. However, the relationship between the relative size of benefits and their distributional impact is complex. Our measures of income inequality do not tell us about this relationship nor the causality of income inequality. Our analysis can measure the impact of noncash income but it can not tell us about the mechanism behind the change in inequality.

V) Summary and conclusion

The aim of this paper has been to summarize the impact of noncash income - health and education benefits - on the income distribution. We therefore looked at the significance of noncash income and its impact on the level and distribution of household income.

Chapter 1 showed the significance of noncash income. In Norway in 1986, noncash benefits equaled 17 percent of GDP, about the same as cash benefits. In the US, Sweden and the UK noncash benefits were about twice that of cash benefits. Excluding noncash benefits from the noncash income measure means that a significant part of household income is not taken account of. Conventional measures of disposable income will therefore not be an accurate guide to the resources available to families.

The distributional impact by household type showed that the inclusion of noncash income was to reduce the spread in relative mean income across the different household groups. When looking at the population as a whole, we found a similar result. Adding education and health income components into disposable income reduced measured inequality. The results showed an appreciable decline in the degree of inequality in the US and Sweden. The distributional effects in Norway and UK were limited.

One of the key aims for public provision of welfare services is to smooth out the level of income over the life cycle. The impact of noncash income is therefore best viewed within a life cycle context. Education and health benefits are easy to predict from a life cycle context. Education accrues to families with school aged children, while health care benefits are disproportionately high for the elderly. Because single elderly persons and single parents on average have low living standards, these benefits have a large impact on their well-being.

By using disposable income as our measure of income, we look at the net effect of benefits and taxes. We include those who benefit and those who pay for it through the tax system. Since the fairly universal benefits of health care and education are redistributed towards those with lower incomes in the absolute size of the tax payments which finance them, we conclude that these welfare programs have been successful in smoothing out the level of income.

It is difficult to base evaluations of the efficiency of national health insurance systems on before/after comparisons, because there are other factors which may influence the situation from one year to another. Similarly, cross-country comparisons do not allow us to distinguish between characteristics of countries and characteristics of the health and education systems.

However, if this study is repeated over several years we might get an indication of which national education and health care systems are more efficient in reducing income inequality.

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Appendix 1: Imputation procedures and some results

This chapter derives and discusses the methods used to impute noncash income in the different countries. A brief description of the various noncash programs will also be presented. As outlined in chapter 2 the noncash incomes are limited to education and health care incomes only.

Norway 1986

The noncash estimates are derived from the LIS Database for Norway which is again based on the Income and Property Distribution Survey 1986 (Inntekts- og formuesundersøkelsen). These data have been supplemented by government accounts on noncash income aggregates. Health service utilization rates are taken from the Norwegian Central Bureau of Statistics (SSB), as is the data on the number of students in public schools.

Education

There are three main stages in the Norwegian educational system. The first level, «grunnskolen», starts at the age of seven with nine years of compulsory schooling. Over 80% of the students continue to the secondary level, «gymnas», a 2-4 year high school/vocational training school³¹. The third stage in the Norwegian system is university education. All levels of the Norwegian education system consists primarily of public schools. The private schools also receive considerable government funds.

In 1986 the total government expenditure on education, including investments, was roughly 33 billion kroner, or about 13% of total public expenditure. About half of the funds goes to primary education (grunnskolen), although the cost per student is higher in university education.

³¹ In 1986 85% of the students who had completed compulsory education continued directly with higher education. This figure has increased over the last few years. In 1991 the continuation rate was 93% (Source: Central Bureau of Statistics of Norway(1993)).

In order to estimate the per student cost to government of primary and secondary schooling we need capital and operating expenditure for public education and the relevant school enrollment rates. The per student costs are then used to allocate schooling outlays to households with children attending school.

The student enrollment figures for 1986 show a total of 522 778 students in primary education and 206 068 students in secondary education. Of the 522 778 students in primary education, 2911 were in special schools and less than 1% were in private schools. The figures on total outlay on primary education did not separate out expenditure on special schools. Expenditure on primary education has therefor been allocated equally on all primary education students.

Running expenditures for primary education in 1986 was NOK 13 384 million. If we add capital expenditures we get an annual per student cost of NOK 27 781 for primary education. The cost of secondary education was NOK 8 109 million in 1986. If we again use an estimated figure for average capital outlays, we get a per student figure of NOK 43 271 in secondary education.

The estimate by the Norwegian Bureau of Statistics (SSB) of per student cost of primary education is 24 700 kroner³². Capital costs have not been included in SSB's figures and this is probably the main reason why their figure is somewhat lower than ours.

Health Care

The Norwegian health care system provides a comprehensive health insurance coverage for all Norwegian citizens. Relatively little revenue is raised from user charges. Although the Norwegian government has opened for private provision of health care, only a small number of patients use these services.

³² Current expenditure per pupil in 1986 by local government.

Published utilization data before 1989 are scarce. Statistics on patients in health institutions broken down by age and sex were discontinued in 1983 due to poor data quality. Only aggregate figures of patient statistics are available between 1983 and 1988. A new system was introduced in 1989. This gives utilization data broken down by sex and nine age groups.

Since we do not have the utilization data for each age and sex group for 1986, we have divided the total number of patients treated by medical institutions in 1986 (4,2 million³³) by the same proportion of patients in each age/sex groups as in 1989³⁴.

According to the National Account Statistics total expenditure on institutional health care was 22 468 million kroner in 1986. This is 9% of total government expenditure. The expenditure data can be broken down into three main categories namely Government Consumption expenditure, Capital expenditure and Transfers. Total expenditure in 1986 on the respective categories was 20 366 million, 1 653 million and 449 million. If we replace capital expenditure in 1986 with a five year average, we get a total figure of 22 703 million kroner. This is allocated according to the number of patients in each sex/age group. Information about the population age distribution was then used to convert expenditure per group to expenditure per capita for each group. The results are shown in the table below.

Table A1.1: Per capita health expenditure by sex and age (NOK)

Age group	Male	Female
0-9	4 441	3 390
10-19	1 866	2 387
20-29	2 432	8 542
30-39	2 392	6 513
40-49	3 602	3 251
50-59	5 154	4 908
60-69	8 654	6 364
70-79	13 612	10 408
80-	18 045	14 553

³³ Central Bureau of Statistics of Norway (1988).

³⁴ We have looked at other years and found that the proportion of patients within each age/sex group in 1989 is similar to those found in other years.

These figures show the expected u-shaped pattern, per capita health spending being highest in the youngest and oldest age ranges. We also see, as expected, a relatively high utilization rate for women in the age group 20-39.

We have been unable to find other estimates to be used for comparison.

United Kingdom 1986

The estimates are derived from the Family Expenditure Survey 1986. These data have been supplemented by noncash income aggregates, health service utilization rates and education statistics from the Central Statistics Office³⁵.

Education

There are three main stages in the UK education system: primary, secondary, and further/higher education. The first two stages are compulsory for all children between the ages of 5-16 and the transition from primary to secondary education is usually made at the age of 11. The third stage of education is voluntary and includes all education provided after compulsory school ends.

We allocate direct public expenditures on compulsory primary and secondary education only. We therefore take no account, for example, of assistance to the private schools, or subsidies to those staying on beyond the minimum leaving age.

Government expenditure on education in 1986 was £17 880 million. This includes all levels of education. Around 20 % goes to primary schools, 30% to secondary schools and less than 5% to special schools³⁶. The expenditure figures are again divided into current and capital

³⁵ Central Statistics Office (1990).

³⁶ Special schools are both day and boarding and provide for handicapped children who cannot be educated satisfactorily in an ordinary school. Hospital special schools provide education for children who are spending a period in hospital.

expenditure. Capital expenditure is about 4% of current expenditure in primary and secondary schools. In special schools it's slightly lower. As a measure of capital cost we have used a 5-year average of real capital expenditure (1986 prices).

Children attending special schools cannot be separately identified in the LIS database. We have therefore reallocated special school expenditures and pupils to primary and secondary categories, in proportion to expenditure and pupil enrollment in the two categories.

For all schools, the total number of pupils in 1986 was 9.4 million. The number of pupils attending primary and secondary education was 4.5 million and 4.1 million respectively. Close to 800 000 pupils were in special schools.

The annual per student cost for primary and secondary schools in 1986 was estimated to £892 and £1335 respectively.

Health Care

We measure public expenditure on public health care by the total public expenditure on the National Health Service (NHS). The NHS provides comprehensive health insurance coverage for all UK citizens. Relatively little revenue is raised from user charges (less than 3% of total government expenditure is paid by patients in 1986).

Current expenditure on health services is divided into three main categories; Hospital and Community health services, Family practitioner services, and Departmental administration and other services. Total UK expenditure in 1986 on the respective categories was approximately £11 963 million, £4 973 and £460³⁷. If we subtract payments by patients, the figures are slightly lower: £11 868 for hospital services and £4 542 for family practitioner. Capital expenditure in 1986 was approximately £1 110³⁸.

³⁷ Expenditure figures broken down by category are listed for years ending 31 March. The figures above are therefore an average between the 1985/86 and 1986/87 figures.

³⁸ Capital expenditures are derived by averaging expenditures (in 1986 prices) over financial years 1983/84 to 1987/88.

Hospital etc. and Family etc. are the two categories which can be related to utilization data. The other expenditures were reallocated to these categories. Central administration expenditure was allocated between the two headings in proportion to expenditure. Capital expenditure was then allocated entirely to the Hospital heading.

Published utilization data broken down by age and sex are scarce, especially for the UK as a whole. To allocate Hospital and Community health services, we use data available for England on numbers of hospital in-patient spells in 1986 broken down by sex and 10 age groups. To allocate Family practitioner service expenditure we use data available for Great Britain on the average number of General Practitioner NHS consultations per person in 1986 broken down by sex and six age groups³⁹.

The tables derived show the share of total service utilization accounted for each age/sex group. Expenditures were allocated to each group pro rata. Information about the population age distribution was then used to convert expenditures per group to expenditure per capita for each group⁴⁰.

³⁹ Source: Central Statistics Office (1986).

⁴⁰ Source for population statistics: Central Statistics Office (1990).

Table A1.2: Per capita health expenditures (Pounds) by sex and age

Age group	Males	Females
a) Hospital		
under 5 years	369	238
5-14	153	122
15-19	136	162
20-24	129	180
25-34	124	213
35-44	129	202
45-54	183	206
55-64	297	246
65-74	455	327
75 and over	765	604
b) Family		
under 5 years	134	119
5-15	67	50
16-44	45	101
45-64	89	84
65-74	112	102
75 and over	179	118

The patterns observed are not surprising. For both sexes, utilization and hence imputed expenditure, falls and then rises with age. In virtually every age group, women have greater utilization rates than men. Clearly expenditure on hospitals etc. is significantly greater than expenditure on Family etc.

At the final stage of our imputation we allocate the estimated per capita health expenditures and the per pupil education expenditures to each family according to its characteristics. The sample data are unweighted for the UK. This practice differs from that for the other countries we analyze, but reflects typical UK practice.

Comparison with the Central Statistical Office (CSO)

Statistics published in the CSO's article «The effects of taxes and benefits on household income, 1986» allows some checks of the sensitivity of results to alternative assumptions about income definitions and imputations⁴¹.

The CSO estimates, summarized in the table below⁴², are also based on the 1986 FES. The CSO results are typically disaggregated by ten household composition groups which we have combined to make as comparable as possible with the LIS household composition definitions. The CSO define child and «retired» (those aged 65 or over) differently, but the proportion of households in each corresponding group is nevertheless quite similar.

The CSO's definition of disposable income is much the same as the LIS one. Average disposable income is lower using the CSO definition, but the pattern of average income between different types of households is the same.

Table A1.3: CSO estimates of cash and noncash income by household type, UK 1986

Household type	Disposable income	Noncash education income	Noncash health income	Final income
All households	7 160	634	789	8 583
2 adults + children	8 339	1 546	997	10 882
1 adult + children	3 582	1 366	587	5 535
1 adult, retired	2 690	1	847	3 538
2 adults, retired	4 814	42	1 283	6 139
1 adult	4 628	93	236	4 957
2 adults	8 592	98	526	9 216
other + children	11 527	2 557	1 059	15 143
other - children	11 171	700	821	12 691

⁴¹ Central Statistics Office (1988).

⁴² The CSO results can be compared to Table A1.8 in Appendix 1.

The CSO allocates government expenditure to impute «benefits-in-kind». Few details are given of their imputation methods, but they appear similar to the LIS ones. One main difference is that noncash education income takes account of tertial education. The figures are therefore somewhat higher than our estimates, and some households without children also receive education income. The noncash health figures are also slightly higher, but again the distribution of noncash benefits across household types is similar.

When we compare average disposable incomes with final income, the CSO estimates show a greater impact of the noncash benefits on final income than the LIS estimates. The households who gain and loose from including noncash benefits are the same.

Sweden 1987

The noncash benefits for Sweden is based on micro data from the 1987 Swedish Income Distribution Survey (HINK). Health and education statistics are taken from Statistics Sweden 1990 and unpublished statistics from the Central Statistics Bureau (Socialstyrelsen and Landstingsförbundet).

Education

The Swedish education system is basically in three levels. The first level, «grundskola», starts at the age of seven with nine years of compulsory schooling. Over 80% of these students continue to the secondary level, «gymnasium», a 2-4 year high school/vocational training school. University education is the third level of the system. All levels of the Swedish educational system are entirely paid via the government budget, free of charge for those who utilize it. During the first nine years of compulsory schooling and during the high school period, the government also pays for books and other materials and provide free school lunches⁴³.

⁴³ Fritzell, J. and P. Hedström (1992).

We have used the Swedish Statistics Bureau's estimates of per student costs. The cash value of these education benefits have been estimated on the basis of participation rates and total public expenditure on compulsory and secondary education. The imputed benefit for primary school amount to 31 700 SEK and for secondary school to 40 557 SEK. The cost of special schools have not been included in this analysis⁴⁴.

Health care

All Swedish citizens and permanent residents are covered by a health care insurance which covers in-patient and out-patient care. The cash value of the health insurance has been estimated on the basis of data on the utilization of the health care system by different age and sex groups. For each of the age/sex groups, the insurance value was defined as total cost divided by the number of potential patients, i.e., the total cost of hospital care (less patient fees) is divided into the age/sex groups according to the proportion of patients in each group, which is again divided by the proportion of the population in each group⁴⁵.

The results of these imputations are seen in Table A1.3. As one would expect, the imputed cash value of the subsidized health care falls and then increases rather sharply with age, particularly in the age groups 65 years and older.

⁴⁴ The annual cost of special school was 1 769 million. kr. in 1986/87 or about 3% of total public expenditure on education.

⁴⁵ Psychiatric patients are included in these figures.

**Table A1.4: Health expenditure per capita,
imputed values by age groups, Sweden 1987**

Age group	Male	Female
0-4	6 365	4 939
5-9	2 343	1 765
10-14	1 842	1 720
15-19	1 961	2 903
20-24	2 507	5 849
25-29	2 653	8 231
30-34	3 031	7 505
35-39	3 231	5 233
40-44	3 695	4 512
45-49	4 440	4 672
50-54	5 382	4 993
55-59	6 803	5 595
60-64	8 267	6 411
65-69	10 949	8 331
70-74	14 518	11 139
75-79	20 113	15 182
80-84	25 827	20 103
85-89	31 859	26 012
90-94	35 781	29 365
95-	39 234	31 499

United States 1986

The US data set is based on the March Current Population Survey (CPS) 1986. Education statistics are taken from Digest of Education Statistics. The imputation of noncash health benefits was complicated because of the nature of the US health care system. We therefore chose to use noncash health estimates derived by the US Bureau of the Census⁴⁶. A short description of the procedures is provided below.

Education

The US education system is similar to those described for Norway, Sweden and the UK. Mandatory education consists of elementary school (ages 6-14) and high school (ages 15-18).

⁴⁶ For a detailed description of the imputation procedures please see US Bureau of the Census (1988).

The percentage of the student population in 1986 attending private elementary and high schools was 15% and 8% respectively.

School expenditure on education goes to public and private education and is paid by Federal, State, Local and private funds. Public funds to private schools are limited and in 1986 there were no public transfers to private elementary and secondary schools. Since we are only interested in government noncash transfers, private education will not be included in the imputation procedures.

Benefits are measured by imputing both capital and operating expenditures for public education as benefits to families with children. These benefits are equal to average outlays per student times the number of students in the families concerned. School enrollment figures are broken down by level of schooling (elementary and secondary). The latter was adjusted for dropouts (i.e., those leaving secondary school before graduation) totaling 10.5% of the student population. The financial expenditure data are not broken down by elementary vs. secondary. We therefore had to estimate an average per student cost for all students in public primary and secondary schools. Capital expenditure is defined as average capital expenditure over a 5-year period (1986-90). The result is a per pupil figure of \$4 633.

Health Care

Health care subsidies in the United States are provided by governments (Medicare for the elderly and Medicaid for the poor), and by employers. Since insurance coverage varies by age, income, employment status, and other factors, not all US citizens are, in fact, covered by health insurance. Estimates from 1985 (US Bureau of the Census) estimate that over 13% of the population are without health insurance coverage.

Medicaid is the nation's health care financing program for the poor, serving one in ten Americans. It is a means-tested and targeted program intended only for those with limited income and resources. Medicare, in contrast, provides nearly universal coverage for Americans age 65 and older and for those with permanent or total disabilities.

The March supplement of the CPS collects information on the number of persons who were covered by Medicare and/or Medicaid. As described in Chapter 3, Medicare and Medicaid benefits are counted as income to the extent that they free up resources that could have been spent on medical care. The Medicare and/or Medicaid benefits have no income value if the family is unable to meet basic food, housing and income requirements.

The US Bureau of the Census' estimates of mean Medicare and Medicaid outlays per enrollee are provided below (only the figures for the whole country are listed).

	Risk class			
	65 and older	blind/disabled	21-64 nondisabled	less than 21 nondisabled
Medicare	\$2 313	2 975	-	-
Medicaid	1 324	3 040	976	515

The March supplement collects information on the number of persons who were covered by a health insurance plan obtained through an employer or union. The supplement also collects information on whether the employer paid for all, part, or none of the cost of the plan. Various other data sources were used for measuring the amount employers contributed to health plans. Employer contributions were treated as a form of wage and the estimated value of the employer contribution were counted as income.

The estimates of Medicare, Medicaid and health insurance supplement to wage or salary income were then added to the household's income in the CPS data base.

Some Results

On the next few pages we will list some of the results from our estimation of cash and noncash income not provided in the main text. In Tables A1.5 to A1.11 the income measures have not been adjusted for differences in household size and composition. Equivalent income measures are used in Tables A1.12 to A1.14.

Table A1.5: Average cash and noncash income by age of household head, Norway 1986 (NOK)

<i>Mean Income</i>	<i>Disposable income</i>	<i>% of mean</i>	<i>Noncash education</i>	<i>% of mean</i>	<i>Noncash health</i>	<i>% of mean</i>	<i>Final income</i>	<i>% of mean</i>
All households	160 588	100	15 015	100	12 606	100	188 209	100
Age of head								
-25	86 080	54	8 082	54	7 843	62	102 005	54
25-34	160 877	100	8 644	58	11 270	89	180 791	96
35-44	214 213	133	40 616	271	12 439	99	267 268	142
45-54	220 028	137	29 069	194	11 320	90	260 418	138
55-64	181 384	113	6 410	43	12 237	97	200 031	106
65-74	118 449	74	782	5	14 358	114	133 589	71
75-	79 646	50	57	0	17 213	137	96 916	52

Table A1.6: Average cash and noncash income per household type, Norway 1986 (NOK)

<i>Household type</i>	<i>Disposable income</i>	<i>% of mean</i>	<i>Education</i>	<i>% of mean</i>	<i>Health</i>	<i>% of mean</i>	<i>Final income</i>	<i>% of mean</i>
All households	160 588	100	15 015	100	12 606	100	188 209	100
1 adult, under 65	92 297	58	1 371	9	4 734	38	98 402	52
1 adult, 65 or over	64 440	40	0	0	11 498	91	75 938	40
2 adults with children	214 741	134	34 053	227	15 201	121	263 995	140
2 adults, under 65	190 209	118	341	2	11 272	89	201 822	107
2 adults, 65 or over	130 113	81	0	0	20 365	162	150 478	80
1 adult with children	119 029	74	30 849	206	10 579	84	160 457	85
other fam's w/children	263 460	164	58 051	387	15 218	121	336 729	179
other fam's w/out children	218 946	136	10 484	70	14 680	117	244 110	130

Table A1.7: Average cash and noncash income by age of household head, UK 1986 (Pounds)

<i>Mean Income</i>	<i>Disposable income</i>	<i>% of mean</i>	<i>Noncash education</i>	<i>% of mean</i>	<i>Noncash health</i>	<i>% of mean</i>	<i>Final income</i>	<i>% of mean</i>
All households	8 723	100	458	100	614	100	9 795	100
Age of head								
-25	6 796	78	62	14	375	61	7 233	74
25-34	9 272	106	509	111	616	100	10 397	106
35-44	11 130	128	1277	279	651	106	13 058	133
45-54	11 447	131	612	134	568	93	12 627	129
55-64	8 495	97	98	214	535	87	9 127	93
65-74	5 858	67	23	5	608	99	6 489	66
75-	4 874	56	9	2	856	139	5 739	59

Table A1.8: Average cash and noncash income 1986 by household type (Pounds)

<i>Household type</i>	<i>Disposable income</i>	<i>% of mean</i>	<i>Education</i>	<i>% of mean</i>	<i>Health</i>	<i>% of mean</i>	<i>Final income</i>	<i>% of mean</i>
All households	8 723	100	458	100	614	100	9 795	100
1 adult, under 65	5 474	63	0		195	32	5 669	58
1 adult, 65 or over	3 659	42	0		502	82	4 161	43
2 adults with children	10 243	117	1 300		800	130	12 343	126
2 adults, under 65	10 062	115	0		427	70	10 489	107
2 adults, 65 or over	6 429	74	0		899	146	7 328	75
1 adult with children	5 570	64	1 257		594	97	7 421	76
other fam's w/children	13 639	156	1 249		883	144	15 771	161
other fam's w/out children	12 130	139	0		633	103	12 763	130

Table A1.9: Average cash and noncash income by age of household head, Sweden 1987 (SEK)

<i>Mean Income</i>	<i>Disposable income</i>	<i>% of mean</i>	<i>Noncash education</i>	<i>% of mean</i>	<i>Noncash health</i>	<i>% of mean</i>	<i>Final income</i>	<i>% of mean</i>
All households	98 682	100	10 170	100	11 654	100	120 506	100
Age of head								
-25	54 874	56	12 145	119	4 082	35	71 101	59
25-34	105 697	107	6 613	65	9 444	81	121 754	101
35-44	136 952	139	27 866	274	9 901	85	174 719	145
45-54	133 048	135	16 007	157	9 029	78	158 084	131
55-64	111 018	113	2 550	25	10 710	92	124 278	103
65-74	85 264	86	223	2	12 774	110	101 261	84
75-	57 962	59	0	0	25 375	218	83 337	69

Table A1.10: Average cash and noncash income by household type, Sweden 1987 (SEK)

<i>Household type</i>	<i>Disposable income</i>	<i>% of mean</i>	<i>Education</i>	<i>% of mean</i>	<i>Health</i>	<i>% of mean</i>	<i>Final income</i>	<i>% of mean</i>
All households	98 682	100	108 852	100	11 654	100	120 506	100
1 adult, under 65	63 046	64	67 987	63	4 369	38	72 356	60
1 adult, 65 or over	50 186	51	50 186	46	16 911	145	67 097	56
2 adults with children	164 559	167	201 711	185	14 450	124	216 161	179
2 adults, under 65	147 571	150	148 131	136	11 152	96	159 283	132
2 adults, 65 or over	104 903	106	104 903	96	26 030	223	130 933	109
1 adult with children	101 150	103	134 643	124	9 386	81	144 029	120
other fam's w/children	129 450	131	164 185	151	18 908	162	183 093	152
other fam's w/out children	-							

Table A1.11: Average cash and noncash income by household type, USA 1986 (dollars)

<i>Household type</i>	<i>Disposable income*</i>	<i>Education % of mean</i>	<i>Health* % of mean</i>	<i>Final income % of mean</i>
All households	24 343	2 141	1 690	28 174
1 adult, 65 or over	10 421	0	1 502	11 923
2 adults with children	30 752	5 313	1 795	37 860
2 adults	30 333	39	2 097	32 469
1 adult with children	13 916	5 610	983	120 509

**Source: US Bureau of the Census*

Table A1.12: Equivalent income by income share, Norway 1986

Decile	Disposable income Decile point (% of mean)	Income share (%)	Cumulative income share (%)	Final income Decile point (% of mean)	Income share (%)	Cumulative income share (%)
10	53	4.0	4.0	56	4.4	4.4
20	62	5.8	9.8	65	6.1	10.5
30	72	6.7	16.5	74	6.9	17.4
40	83	7.8	24.3	84	7.9	25.3
50	93	8.8	33.1	94	8.9	34.2
60	103	9.8	42.9	103	9.8	44.0
70	115	10.9	53.8	114	10.8	54.8
80	129	12.2	66.0	128	12.1	66.9
90	154	14.1	80.1	150	13.7	80.6
100		19.9	100.0		19.3	100.0
Mean (NOK)	187 694			197 833		

Table A1.13: Equivalent income by income share, UK 1986

Decile	Disposable income Decile point (% of mean)	Income share (%)	Cumulative income share (%)	Final income Decile point (% of mean)	Income share (%)	Cumulative income share (%)
10	47	2.7	2.7	50	3.0	3.0
20	58	5.3	8.0	60	5.5	8.5
30	66	6.2	14.2	68	6.4	14.9
40	74	7.0	21.2	76	7.2	22.1
50	85	7.9	29.1	86	8.1	30.2
60	98	9.1	38.2	98	9.1	39.3
70	114	10.6	48.8	113	10.5	49.8
80	135	12.4	61.2	133	12.2	62.0
90	170	15.0	76.2	166	14.8	76.8
100		23.8	100.0		23.2	100.0
Mean (£)	10 057			10 441		

Table A1.14: Equivalent income by income share, Sweden 1987*

Decile	Disposable income Quintile point (% of mean)	Income share (%)	Cumulative income share (%)	Final income Quintile point (% of mean)	Income share (%)	Cumulative income share (%)
10	28	2.7	2.7	36	3.6	3.6
20	62	6.2	8.9	67	6.7	10.3
30	73	7.3	16.2	77	7.7	18.0
40	82	8.2	24.4	85	8.5	26.5
50	92	9.2	33.6	93	9.3	35.8
60	102	10.2	43.8	101	10.1	45.9
70	113	11.2	55.0	110	11.0	56.9
80	124	12.4	67.4	121	12.1	69.0
90	139	13.9	81.3	134	13.4	82.4
100	185	18.5	100.0	175	17.5	100.0
Mean (SEK)	142 295			153 716		

Table A1.15: Income by quintile group(dollars), USA 1986*

	<i>Quintile</i>				
	Lowest fifth	Second fifth	Third fifth	Fourth fifth	Highest fifth
Cash income	1 493	1 1596	22 587	36 199	69 691
Tax	135	1 386	3 883	7 469	19 625
Cash benefits	4 205	3 262	2 027	1 494	1 241
Noncash benefits	1 172	1 648	1 651	2 124	2 878
Education benefits	666	1 505	2 139	2 960	3 433
Disposable income	5 563	13 472	20 731	30 224	51 307
Final income	7 401	16 625	24 521	35 308	57 618

Source: US Bureau of the Census.

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Appendix 2: The Luxembourg Income Study

The sample size and the weighted population estimates of the age groups and family types for all countries is given in the tables below. With the exception of Sweden, the age profile of households according to the age of head exhibits an inverse U-shaped pattern. For all countries, the largest proportion of households are those headed by someone aged between 25 and 44.

In Sweden the age profile is rather flat compared to the other countries. The percentage of families headed by someone less than 25 and 75 and above is about the same as for the other age groups⁴⁷.

If we categorize households according to their composition, we see that over one third of all households contain children. Families with two adults and children are the largest group and comprise over 20% of the families. Sweden is again an exception with over 35% single adult households and with only 23% of households containing children.

Norway 1986

The Norwegian data sets are based on the Income and Property Distribution Survey 1986 (Inntekts- og formuesundersøkelsen). The survey is conducted annually and its main focus is to provide information about the structure and distribution of income and property for households and individuals.

The Norwegian Income Survey is weighted to report population estimates, etc. The weighting did not help to adjust for missing data or other nonsampling errors related to income. The sum of survey weights is equal to the total number of units in the sampling frame. However, estimates derived from the sample are not representative of

⁴⁷ The rather large number of young households is a result of the unusual household definition used in the Swedish survey; all people 18 years and older are considered as separate households even if they still live with their parents.

the total population defined by the sampling frame, as the survey does not include persons living in institutions (ca. 50,000 persons).

Table A2.1: Numbers of households by age of household head, Norway 1986

(source: LIS database)

All households	Sample size unweighted	Sample size weighted (1000's)	Percent
All households	4 975	1 708	100
Age of head			
-25	255	116	7
25-34	826	319	19
35-44	1 136	341	20
45-54	840	218	13
55-64	797	245	14
65-74	686	265	16
75-	435	205	12

Table A2.2: Number of households by household type, Norway 1986

(source: LIS database)

Households type	Sample size unweighted	Sample size weighted (1000's)	Percent
1 adult, under 65	505	315	19
1 adult, 65 or over	405	253	15
2 adults with children	1 201	361	21
2 adults, under 65	490	158	9
2 adults, 65 or over	505	164	10
1 adult with children	122	64	4
other fam's w/children	697	142	8
other fam's w/out children	1 050	250	15
All families	4 975	1 707	100

United Kingdom

The name of the UK survey is the Family Expenditure Survey (FES)1986. The FES is a continuous household survey which collects information on the income, expenditure and direct tax payments of each household member aged 16 years and over.

Survey weights have not been assigned in the FES. This practice differs from that for the other countries we analyze. The sample design is theoretically intended to be self-weighting, but in practice this is not completely realized.

Table A2.3: Number of households by age of household head, UK 1986

(source: LIS database)

Household type	Sample size unweighted	Percent
All households	7178	100
Age of head		
-25	390	5
25-34	1341	19
35-44	1396	19
45-54	1083	15
55-64	1114	16
65-74	1110	15
75-	744	11

Table A2.4: Number of households by household type, UK 1986

(source: LIS database)

Household type	Sample size unweighted	Percent
1 adult, under 65	844	12
1 adult, 65 or over	898	13
2 adults with children	1 791	25
2 adults, under 65	1 147	16
2 adults, 65 or over	703	10
1 adult with children	327	5
other fam's w/children	444	6
other fam's w/out children	1 024	14
All families	7 178	100

Sweden 1987

The Swedish analysis is based on micro data from the Swedish Income Distribution Survey (HINK)⁴⁸. The sampling frame for the HINK 1987 consists of a taxation register of all individuals 18 years of age or older.

People living in institutions such as prisons or hospitals are not included in the survey. Military personnel were included in the sample frame, except those who were also at an educational institution. Household members (not heads of households) who were older than 74 years were not included in the survey.

Survey weights have been assigned to each sample case. Although the survey frame was comprised of individuals, the objective of the survey was to estimate variables for the household. The weights were assigned in order to compensate for sampling errors which occurred because of the different units used in the sampling frame and the analytic unit of the survey.

Table A2.6: Numbers of households by age of household head, Sweden 1987

(source: LIS database)

Household type	Sample size unweighted	weighted (1000's)	Percent
All households	9 530	4483	100
Age of head			
-25	1 122	691	15
25-34	1 719	734	16
35-44	2 202	775	17
45-54	1 741	577	13
55-64	1 609	547	12
65-74	784	590	13
75-	353	569	13

⁴⁸ Inkomstfordelningsundersökningen.

Table A2.6: Number of households by household type, Sweden 1987

(source: LIS database)

Household type	Sample size		Percent
	unweighted	weighted (1000's)	
1 adult, under 65	2634	1623	36
1 adult, 65 or over	392	702	16
2 adults with children	3012	835	19
2 adults, under 65	2455	685	15
2 adults, 65 or over	734	454	10
1 adult with children	292	181	4
other fam's w/children	11	4	0

United States 1986

The official name of the US survey is the March Current Population Survey (CPS). The main purpose of the survey is to provide estimates of employment, unemployment, and other characteristics of the US labor force. The sampling frame for the survey consists of a list of all housing units compiled from the most recent decennial census of population and housing. People living in institutions (such as hospitals, nursing homes and long-term care facilities, homes for the aged, penitentiaries, housing for members of the military not living with their families, dormitories at schools and schools) were not included in the survey.

In the CPS a two stage weighting procedure is used. First, the «Base» weight of interviewer households are adjusted to account for noninterviews. Next these weights are adjusted to take into account independent estimates of the total population by age, sex, and racial composition. The sum of the weights reflects the number of households existing at the time of the survey.

Table A2.7: Numbers of households by age of household head, USA 1986

(source: LIS database)

Household type	Sample size unweighted	weighted (1000's)	Percent
All households	12 600	97 811	100
Age of head			
-25	927	6 989	7
25-34	3 025	23 673	24
35-44	2 647	20 292	21
45-54	1 764	13 851	14
55-64	1 700	13 539	14
65-74	1 499	11 662	12
75-	1 038	7 805	8

Table A2.8: Number of households by household type, USA 1986

(source: LIS database)

Household type	Sample size		Percent
	unweighted	weighted (1000's)	
1 adult, under 65	2 338	18 593	19
1 adult, 65 or over	1 191	9 204	9
2 adults with children	2 812	21 366	22
2 adults, under 65	1 750	13 878	14
2 adults, 65 or over	874	6 655	7
1 adult with children	734	5 608	6
other fam's w/children	1 119	8 496	9
other fam's w/out children	1 782	13 991	14