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## Improving the LIS Income Measure: Microdata Estimates of the Size Distribution of Cash and Noncash Income in Eight Countries

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# Luxembourg Income Study Working Paper Series

Working Paper No. 13

**Improving the LIS Income Measure: Microdata Estimates  
of the Size Distribution of Cash and Noncash Income in  
Eight Countries**

**Brigitte Buhmann, Aldi Hagenars, Richard Hauser, Peter  
Hedstrom, Flip de Kam, Michael O'Higgins, Peter Saunders,  
Günther Schmaus, Timothy Smeeding and Michael Wolfson**

**August 1987**

*(scanned copy)*



DRAFT

(Comments Welcome)

IMPROVING THE LUXEMBOURG INCOME STUDY (LIS) INCOME MEASURE:  
MICRODATA ESTIMATES OF THE SIZE DISTRIBUTION OF CASH AND  
NONCASH INCOME IN EIGHT COUNTRIES

for presentation at Session of the 19th IARIW Congress

Rocca di Pappa, Italy

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by

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## I. INTRODUCTION

The problems of measuring, valuing, and imputing noncash income to household cash income microdata files are formidable for any one country. While a few countries (e.g., United States, Netherlands) have accomplished this task with some difficulty and while others have achieved at least a partial microdata accounting of these income sources (Germany, Australia, Switzerland, United Kingdom), some countries (Canada, Sweden) have never before systematically attempted such a task. Moreover, none of these countries have ever attempted a joint project aimed at producing measures of noncash income which are comparable across countries. Under the auspices of the Luxembourg Income Study (LIS), and with the support of several national and international research sponsors, we are just beginning this task.

The primary purpose of this paper is to report initial progress on our project: some of the difficult conceptual and empirical measurement issues that have arisen, and our initial resolution of the issues. At this formative stage of our project it is particularly important to have feedback from a body of international scholars such as the IARIW.<sup>1</sup> The paper begins with a description of the existing LIS database and its usefulness and then turns to conceptual issues in Section III. Our paper will also have some empirical content. The next (fourth) substantive section of the paper indicates the aggregate importance and variance in noncash expenditures across our seven countries, while the fifth or penultimate section of the paper presents some initial comparisons of income change for the elderly and nonelderly in the U.S. and Holland.

Before we turn to these matters, however, the jointly determined goals and criteria which guide our project should be made explicit. Our primary goal is

to improve upon measures of economic well-being and the size distribution of well-being within and between countries by adding important components of nonmoney income to the LIS cash income database. It is our belief that significant differences in measured inequality across and within population groups arise because of the ignorance of noncash income.<sup>2</sup> This project will allow future LIS researchers to choose more correct and complete measures of income to characterize economic well-being within and between countries and population sub-groups.

In selecting components of nonmoney income for imputation, we seek to measure those noncash income sources which have a deliberate (large) and differential impact on private incomes within or between countries. Conceptually acceptable but quantitatively insignificant types of income are deliberately ignored (e.g., most food subsidies). Finally, as with the LIS project itself, the principle of international comparability is our *sine qua non*. Because one of our most important products is the improvement of the LIS database, it is important to produce measures of noncash income components which are robust across countries. Adherence to this principle sometimes results in abandonment of preferred measurement techniques and adoption of less accurate but wholly comparable approaches to noncash income measurement (e.g., see imputed rent below). With these principles as guidelines, we turn to the conceptual issues of what to include and how to measure and value it.

## II. THE LUXEMBOURG INCOME STUDY (LIS)

The LIS database experiment began in April 1983. Its purpose is to gather in one central location, the Center for Population, Poverty, and Policy Studies (CEPS), in Luxembourg, sophisticated microdata sets that contain comprehensive

measures of income and economic well-being for a set of industrialized welfare states. Because of the breadth and flexibility afforded by microdata, each researcher is free to make several choices such as definition of unit (family, household, etc.); measure of income; and population to be studied (e.g., males, females, urban families, elderly households). This truly comparable microdata creates a potentially rich resource for human resource and related policy research.

The LIS databank currently contains datasets from Australia, Canada, Germany, Israel, Norway, Sweden, Switzerland, United Kingdom and the United States. Datasets from Holland, Denmark, Finland, France, and Spain will likely be added in 1988. Table 1 gives an overview of these datasets: country, dataset name and size, income year, data sampling frame, and representativeness of the population.

(Table 1 here)

The database consists of income microdata sets prepared to common plan, based on common definitions of income (by source), taxes, and family and household composition and characteristics. Spouses' earnings and average annual wage rates (earnings divided by hours worked) are separately recorded as well. This resource has already proved extremely useful in both basic and applied social and economic research concerned with such human resource issues as:

1. The distribution of household income and the relative income positions of the old and the young; urban and rural residents, and other groups of policy interest, e.g., single parents.

TABLE 1: AN OVERVIEW OF LIS DATASETS

COUNTRY	DATASET NAME, INCOME YEAR (AND SIZE <sup>1</sup> )	POPULATION COVERAGE <sup>3</sup>	BASIS OF HOUSEHOLD SAMPLING FRAME <sup>8</sup>
Australia	<u>Income and Housing Survey,</u> 1981-82 (45,000)	97.5 <sup>4</sup>	Dicennial Census
Canada	<u>Survey of Consumer Finances,</u> 1981 (37,900)	97.5 <sup>4</sup>	Dicennial Census
Germany	<u>Transfer Survey,</u> 1981 <sup>2</sup> (2,800)	91.5 <sup>7</sup>	Electoral Register and Census
Israel	<u>Family Expenditure Survey,</u> 1979 (2,300)	89.0 <sup>5</sup>	Electoral Register
Norway	<u>Norwegian Tax Files,</u> 1979 (10,400)	98.5 <sup>4</sup>	Tax Records
Sweden	<u>Swedish Income Distribution Survey, 1981 (9,600)</u>	98.04	Population Register
Switzerland	<u>Income and Wealth Survey,</u> 1982 (7,036)	95.59	Electoral Register and Central Register for Foreigners
U.K.	<u>Family Expenditure Survey,</u> <sup>2</sup> 1979 (6,800)	96.5 <sup>6</sup>	Electoral Register
U.S.A.	<u>Current Population Survey,</u> 1979 (65,000)	97.54	Dicennial Census

<sup>1</sup> Dataset size is the number of actual household units surveyed.

<sup>2</sup> The U.K. and German surveys collect subannual income data which is normalized to annual income levels.

<sup>3</sup> As a percent of total national population.

<sup>4</sup> Excludes institutionalized and homeless populations. Also some far northern rural residents (Inuits, Eskimos, Laps, etc.) may be undersampled.

<sup>5</sup> Excludes rural population (those living in places of 2,000 or less), institutionalized, homeless, people in kibbutzum and guest workers.

<sup>6</sup> Excludes those not on the Electoral Register, the homeless, and the institutionalized.

<sup>7</sup> Excludes foreign-born heads of households, the institutionalized, and the homeless.

<sup>8</sup> Sampling Frame indicates the overall base from which the relevant household population sample was drawn. Actual sample may be drawn on a stratified probability basis, e.g., by area or age.

<sup>9</sup> Excludes nonresident foreigners and the institutionalized, but includes foreign residents.

2. The distribution of earnings for both men and women, their change over the worker's life cycle, including the transition to retirement.
3. Comparative studies of the workings of the welfare state and its policies towards the elderly, the disabled, and the unemployed.

The LIS database has been used to study income poverty, the relative economic status of one-parent families, of children, and of the elderly, and the overall distribution of government cash transfers versus direct taxes.

LIS has now moved beyond the initial experimental stage to provide a databank that can be perpetually updated and expanded to include the most recent data available for any and all nations with high quality income micro-data sets that choose to participate. The datasets will be updated during 1988, adding 1985 cross-section datasets and the initial waves from several new European household panel studies. Additional information about using the dataset can be obtained by writing to LIS (see cover sheet).

The purpose of the noncash project is to further enhance the LIS database, i.e., to provide additional depth and flexibility for researchers interested in using a broader definition of well-being in their research. All LIS countries, except Norway and Israel, are included in the noncash project. In addition, we have included the Netherlands because of their excellent microdata on noncash income and their anticipated membership in LIS.

### **III. CONCEPTUAL CHOICES**

In general, our study seeks to identify sources of private household well-being provided in-kind or from noncash sources and to accurately measure and impute these to LIS household incomes. These sources may be of a consumption (e.g., housing, food, health care) or a human capital investment (e.g.,



education, health care) nature. Not all goods and services provided in-kind by governments or other third parties qualify. Pure public goods and services are quantitatively significant (e.g., defense, recreation services and environmental improvements) but are hard to measure on an individual (family) basis because of lack of knowledge about their value to the household. The value of some of these "goods", e.g., nuclear weapons, may even be negative to some households. Hence we concentrate on goods and services which have some consistent evidence of providing a measurable private benefit to families or households which receive them. Usually this benefit can be increased by private market willingness to pay for subsidized goods or their close substitute (e.g., food, housing, medical care). However, in some cases (e.g., education), willingness to forego a "free" public subsidy in favor of a private market alternative may indicate that the public subsidy has no value to the eligible nonrecipients.

These principles "narrow" the range of choices to food, health care, housing, child care, heating/cooling, education, and transportation services received by households at a cost below their market price. These goods may be provided by governments, private third parties such as employers or charitable organizations, or by the household itself (homegrown food, implicit rent on owner occupied homes). They may be delivered or subsidized directly or indirectly via tax expenditure or regulatory policy.

From this "universe" of goods and services some types of noncash income can be quickly eliminated. Public sector transportation subsidies, heating/cooling subsidies, and homegrown food are not quantitatively significant and/or present severe difficulties in measurement across our countries. Most regulatory or pricing policies for food and other goods generate

net rents to producers or consumers, but counterfactual prices are hard to estimate.<sup>3</sup> Tax expenditures, on the other hand, are less clear cut cases. While they are forms of pricing policies, thus creating counterfactual estimate problems, they are large and widespread. We have decided at the next stage of our project to at least provide estimates of their aggregate value, and possibly then to distribute them across households in later work. Other emerging subsidized goods and services such as subsidized child care are not yet widespread enough to become important in all of the countries which are included in this project. These deliberate and unavoidable restrictions have narrowed our initial focus to the following types of goods: health care services, education services, and housing services.

The next significant problem arises in measuring the value of these services and distributing them to households. As a starting point, we have decided to impute values based on government cost of provision (or market value for non-government provided goods). While the theoretically correct measure of the net improvement in household well-being from these goods and services requires estimating their recipient or cash-equivalent value, this is a separable problem which can and will be dealt with in later work. Of more immediate importance is providing conceptual frameworks which allow government costs or market values to be distributed accurately across households. Each of our chosen areas of concentration presents a unique difficulty in this regard.

**Housing:** Publicly subsidized housing services are provided by lowering costs for both renters and owners. For renters, public housing benefits are best measured as the difference between the market value of housing services and their cost to the renter whether provided via supply or demand side subsidies. Public subsidies for owners are hard to deal with because of the

stock-flow problem which they present, and because of direct versus indirect approaches to subsidy. Direct public provision of low cost home ownership loans (Netherlands) can have the same quantitative value as indirect owner subsidies via the income tax deductibility of home mortgage loans (USA), thus presenting considerable measurement difficulties. The largest source of income in-kind to homeowners, however, is the nontaxed (or not fully taxed) implicit rent received by owners in all countries. While some country income measures (e.g., United States) totally ignore the value of implicit rent (i.e., the receipt of in-kind housing services by owners from below market prices paid for their homes), all countries undertax it. In theory, the correct measure of implicit rent is the opportunity cost: market rent minus cost of owning (including depreciation, property taxes, maintenance, etc.). But these data are not available for all countries. Rather, because of the availability of market value data for owned homes in all but one country, we will measure implicit rent as a fixed interest return on the net worth in ones own home in our study.<sup>4</sup>

**Education:** Recent studies and international attention given the quantity and quality of publicly provided education and the high private return to such investments (e.g., Haveman and Wolfe [1984]) have led us to seriously consider the formidable microdata income measurement problems which education subsidies present. As with all investment goods, education presents the problems of how much benefit to count, at what time to count it, and for whom. For instance, public elementary and secondary schooling subsidies may be interpreted as benefitting children (as investments in their future well-being); as benefitting families with children (having current value as free child care, if nothing else); and as benefitting society at large (due to the externalities

associated with a better educated society). Because of "student" identification problems, subsidies for post-secondary schooling will be harder to impute to recipients. At this time we have decided to narrow our focus and to consider operating expenditures for public education as a benefit to families with children, that is, as equal to average outlays per student times number of students.

Health Care: Perhaps the largest and most controversial benefit to impute is subsidized health care expenditures from governments and/or employers (Smeeding and Moon [1981]). At least four alternate strategies for benefit imputation arise:

- a) cost to the system
- b) contributions by payers
- c) equal insurance premia
- d) risk rated insurance premia

The first, cost to the system, approach was used by the Social and Cultural Plan Bureau of the Netherlands [1981]. Essentially it allocates actual costs incurred (cost of health care benefits paid on behalf of recipients) to recipients. However, it was decided that measured well-being is at best negatively affected by ill health, and so this approach was ignored.

The second approach is to value health care according to the amount of contributions made by a household, employer, or other taxpayer (in the case of general revenue financing). To accomplish this valuation there is no subtraction of contributions to national health care systems by workers or families because benefits are valued at the cost of contributions. Rather, employer contributions are added to workers' incomes as benefits received. Worker and employer contributions for the health insurance of others (e.g., poor and

elderly) are, however, treated as "public goods" by this approach. Unfortunately, while this approach is arguably the easiest and most accurate from an imputation point of view, it is much less satisfactory from a conceptual viewpoint.

The third and fourth approaches treat health care as an insurance benefit received by coverees independent of their actual use of health care benefits. Essentially households place a value on protection against medical care costs in time of need. The good received is an insurance policy. However, these two approaches differ according to how to value this benefit to recipients. Approach c) argues that most national health care plans offer "cradle to grave" protection for virtually all citizens. Over the life cycle health care needs will vary in predictable ways, but in any one year each person should receive an equal value amount which is simply equal to total public expenditures (plus overhead costs) divided by all coverees.

The final approach, the one used in Section V below, and the one most likely to be used in this project in the long run, argues that precisely because needs differ by age (and perhaps by gender, as well), likely benefits also differ by age. The insurance premia should be actuarially adjusted (age related) to account for these differences in need related value.

One final area of controversy concerns the valuation of other (non-medical) types of contributions to life and disability insurance schemes and funded pension schemes. Essentially the third and fourth health insurance approaches argue that benefits should be counted by coverees as insurance premia. But what of other similar contributions to social security plans for disability, unemployment, and the like? Benefits from unfunded or "pay-as-you-go" schemes such as these are traditionally counted as cash income to recipi-

ents. To also count their insurance coverage value to nonrecipients would be double counting. A similar argument can be made for age related social retirement benefits: subtract the contributions from workers (and/or employers) today and count them as income when retired. But what of employer contributions to fully funded deferred benefit plans, e.g., occupational pensions? Should these be counted as current income to persons on whose behalf the contributions are made? While no project decision has been reached on this issue at this time, they have been initially included as benefits in Section V below.

#### IV. QUANTITATIVE SIGNIFICANCE

It is important for the reader to realize the quantitative significance of the valuation and imputation issues which we have discussed above. Three tables (2, 3, 4) have been provided for this purpose.

(Tables 2, 3, 4 here)

Table 2 presents estimates of direct public subsidies for noncash income as a percentage of national output (GDP). The first set was produced by the authors for purposes of guiding imputations. The second set are generally comparable 1981 OECD figures for health and education only. The difference between OECD and author figures are mainly due to slight differences in definitions and yearly accounting periods. The country estimates are low because they exclude tax expenditures and all forms of noncash income which are not direct public subsidies (e.g., implicit rent and employment related benefits) but because they also include such items as health care outlays for the institutionalized, they may overestimate the size of imputation-relevant benefits. However, they are very close to the actual size of noncash public

TABLE 2: TWO ESTIMATES OF DIRECT PUBLIC NONCASH INCOME TRANSFERS  
AS A PERCENTAGE OF GDP AT THE TURN OF THE DECADE

COUNTRY/YEAR	AUTHOR'S OWN ESTIMATES OF HEALTH, EDUCATION AND HOUSING <sup>1</sup>				OWN vs OECD (1981) ESTIMATES FOR HEALTH AND EDUCATION <sup>2</sup>	
	HEALTH	EDUCATION	HOUSING	TOTAL	OWN <sup>3</sup>	OECD
Australia (1981-82)	3.4	5.4	0.9	9.7	8.8	10.5
Canada (1981)	5.7	5.0	0.5	11.2	10.7	11.8
Germany (1981)	5.5	4.0	0.4	9.9	9.5	11.7
Netherlands (1980)	4.2	8.5	1.0	13.7	12.7	13.1
Sweden (1981)	7.3	6.0	4.5	17.8	13.3	15.5
Switzerland (1981)	3.1	5.0	0.2	8.3	8.1	n/a
U.K. (1981)	4.6	5.2	2.2	12.0	9.8	11.2
U.S.A. (1980)	5.0	3.9	1.3	10.2	8.9	9.7
Sample Averages	4.9	5.4	1.4	11.7	10.3	10.4

<sup>1</sup> Estimates exclude tax expenditures, near cash subsidies, employer provided benefits to nonpublic health insurance, implicit rent, and capital expenditures for education.

<sup>2</sup> Both own and OECD estimates include direct social expenditure outlays only by all levels of government.

<sup>3</sup> Sum of first two columns.

Sources: OECD [1985] and unpublished tables from authors.

TABLE 3: 1984 MEASURES OF TOTAL AND UBSIDIZED HEALTH CARE EXPENDITURES AS PERCENT OF GDP, AS A PER CAPITA AMOUNT, AND RELATIVE TO AGE

COUNTRY	PUBLIC HEALTH	OTHER <sup>3</sup> SUBSIDIZED	PUBLIC PLUS OTHER AS % TOTAL	TOTAL HEALTH	EXPENDITURES PER CAPITA <sup>2</sup>	RATIO OF EXPENDITURES ON	
						THE ELDERLY (65 or over)	TO REST OF POPULATION
Australia	3.3	2.8	80	7.8	\$ 994		4.9
Canada	6.2	b	74	8.4	1275		4.5
Germany	6.4	0.1	79	8.1	1079		2.6
Netherlands	6.8	b	79	8.6	1011		4.5
Sweden	8.6	b	92	9.4	1445		5.51
Switzerland	2.8	n/a	n/a	7.8	n/a		3.61
U.K.	5.3	b	90	5.9	658		4.3
U.S.A.	4.4	4.3	81	10.7	1637		3.91

b = less than 0.1 percent

<sup>1</sup> Ratio of public expenditures, not total expenditures.

<sup>2</sup> Converted to dollars using OECD purchasing power parities.

<sup>3</sup> Other subsidies come from employers or private charity acting as third party payers.

Sources: OECD [1987]; unpublished tables from authors.



TABLE 4: ESTIMATES OF CASH (UNEMPLOYMENT AND PENSIONS)  
AND NONCASH (HEALTH AND EDUCATION) SOCIAL EXPENDITURES  
AS A PERCENT OF GDP IN 1960, 1975, AND 1981

COUNTRY	CASH			NONCASH			NONCASH-CASH DIFFERENCES		
	1960	1975	1981	1960	1975	1981	1960	1975	1981
Australia	3.5	5.7	6.4	5.2	11.7	10.5	1.7	6.0	4.1
Canada	4.3	6.6	6.9	5.4	12.1	11.8	1.1	5.5	4.9
Germany	9.9	14.1	13.9	5.5	12.0	11.7	-4.4	-2.1	-2.2
Netherlands	5.4	11.4	14.0	5.8	13.5	13.8	0.4	2.1	-0.2
Sweden	4.6	8.4	12.3	8.0	12.9	15.5	3.4	4.5	3.2
U.K.	4.3	7.0	8.8	7.1	11.8	11.2	3.8	3.8	2.4
U.S.A.	4.8	8.1	7.9	4.9	10.0	9.7	0.1	1.9	1.8

Source: OECD [1985]

subsidies in each country. The two most noteworthy points in the table are, first, that noncash public subsidies are quantitatively significant, and second, that substantial differences exist across both categories of subsidy and across countries. For instance, Netherlands and Sweden have the highest public noncash outlays, 13.7 and 17.8 percent of GDP, respectively. While Holland spends 8.5 percent of GDP on education subsidies (but see endnote 6) as compared to 4.2 percent on health, Sweden spends more on health (7.3 percent) than on education (6.5 percent). The least generous countries in terms of direct public subsidies are the USA, Australia, and Germany. But these low figures may be in part due to other nonpublic subsidies, e.g., employer benefits for health care, which are not counted in these estimates.

For instance, Table 3 indicates that if other (mainly employment related) health care subsidies (second column) are added to the public estimates, the Australian percentage in Table 2 would increase by about 2.8 points and the U.S. estimate by 4.3 points, bringing them much closer in line with other countries, both in terms of overall noncash subsidies (Table 2) and in terms of the total percentage of health care outlays which are subsidized, as shown in Table 3. Table 3 also indicates that both health care outlays per capita and expenditures on behalf of the elderly (or nonelderly) are large and variable across our eight country set. Of particular interest are the elderly-non-elderly ratios which vary from 2.6 in Germany to 5.5 in Sweden.

Finally, Table 4 indicates that public noncash social expenditure benefits exceed public cash social expenditures in all countries other than Germany and The Netherlands. While growth in social pension outlays have narrowed the gap between elderly and nonelderly in recent years and may continue to do so, increasingly elderly populations also bring higher health care outlays.

Moreover, recent international interest in the importance of human capital (education) outlays, especially for advanced and technical education, may also bring continued growth in public education subsidies. An illustration of the order of magnitude of these benefits relative to gross money income for elderly and nonelderly families is found in the following section of the paper.

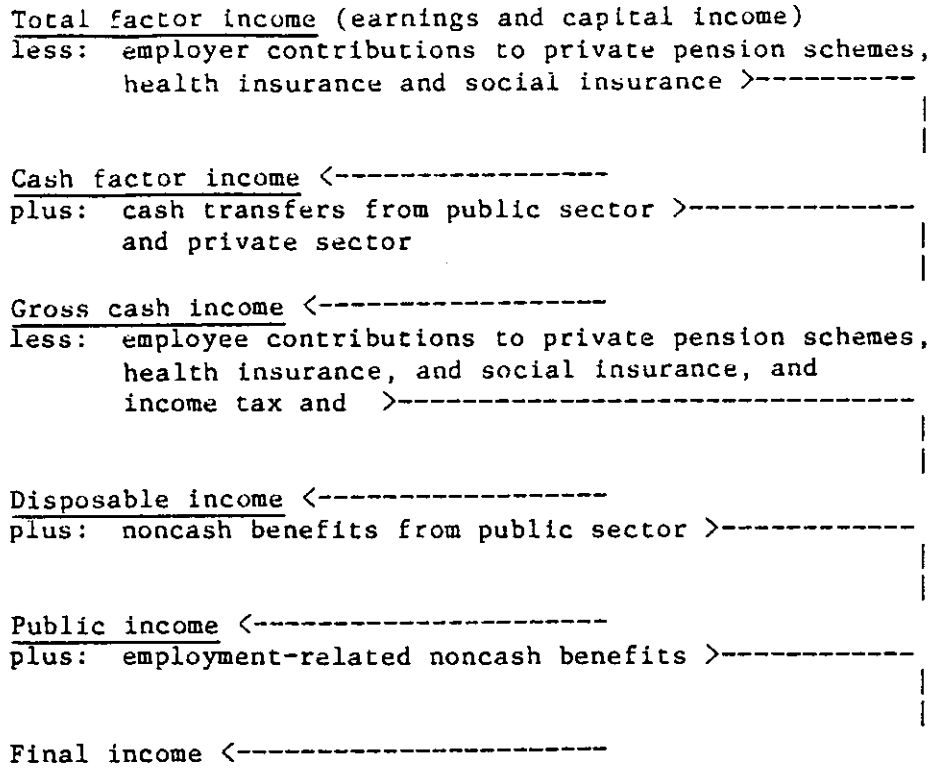
## V. PRELIMINARY SIMULATION RESULTS

Conceptual Bases of Estimates: Noncash benefits have to be imputed to income units, i.e., persons or households. The emphasis here is on the distribution of noncash benefits over households which are defined as (1) a group of two or more persons living as a family together and sharing their housekeeping, and (2) single persons who independently keep their house. This definition is identical for both countries. The position of households may be described using various characteristics, such as household income, the age of the head of the household, and the number of persons in the household. Only two characteristics will be used here to describe households and to rank them in our tables:

- (1) Income of household (the various versions of which are explained below), and
- (2) Age of head of household. Two categories are discerned: non-elderly (head's age below 65 years) and elderly (head's age 65 years and over).

The income concepts which will be used in the project are summarized in Figure 1.

Figure 1: Schematic representation of income concepts used




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Total factor income is equal to the sum of labor and property income; it is grossed up to include employer's contributions to private pension schemes, employers' social security taxes and employers' contributions to employee social insurance programs and health insurance schemes. After deduction of all these employers' contributions, we have (cash) factor income. Together with cash income transfers (received through the public and private sector) this results in gross (cash) income of households. After deduction of employee contributions to private pension schemes, employee social security taxes, contributions to employee social insurance programs and personal income tax due, we have disposal income. Next, we start adding various types of noncash benefits. First, noncash benefits which households receive through the public sector. This results in public income. Second, we add employment related

noncash benefits. This results in public and insurance income.<sup>5</sup> Finally, we add implicit rent of owner-occupied houses to the owners public and insurance income, to arrive at the final income of households.

**Specific Methodological Assumptions:** To impute noncash benefits to households (persons) several crucial assumptions have to be made. Because these methodological viewpoints are only roughed out in Section III above, we want to make our choices clear here before proceeding. First, it is assumed that a household which receives benefits is the only income unit to benefit, disregarding externalities to other households or society at large. Admittedly, this is a rather strong assumption, as few would deny that good health care, adequate housing and a well functioning educational system do have important positive external effects. The reason to neglect externalities is the simple one mentioned above. In many cases it is not clear to what degree other households benefit and quantification of the extent to which they benefit proves to be practically impossible. A second assumption is that the value of noncash benefits is equal to the amount of money that the public sector (or a private sector employer) spends on each item. Third, health benefits are treated as age related health insurance premia. It should be noted here that we do not take into account public expenditures on physical investment goods, but only "current" expenditures, excluding overhead cost (as far as possible). This approach is taken for two reasons: (1) an investment expenditure may strongly fluctuate from year to year, assigning its total amount in the year of spending might produce a distorted picture, and (2) assigning the flow of benefits of public investment expenditures during a number of years to households in any one year poses insuperable technical difficulties and arbitrary choices of depreciation, interest rates and the like. If necessary, current

public expenditures for goods and services are first divided by the total number of "units of use" (for instance, pupils, hours of social services provided) to derive cost per unit of use (costs per pupil, per hour of social services). Finally, the consumption of pure public goods like defense cannot be determined per individual household. We have chosen to disregard all publicly provided goods and services which have no identifiable individual consumers.

Data: The Netherlands' data are mainly taken from the 1983 Supplementary Survey of Program Users (SSPU'83). This survey, which numbers nearly six thousand households, was organized by the Social Plan Bureau (SPB) in October 1983. Important missing data (for instance, about contributions to private pension schemes and personal income tax due) are calculated by the SPB with a microeconomic model, using available data from SSPU'83 and have been added to the survey data (see Hageraars, et al. [1987] for additional details). The U.S. estimates are based on a dataset created by Smeeding while working at the U.S. Bureau of the Census. The basis of estimates is the 1980 Current Population Survey to which he has imputed benefits, taxes and implicit rent (see Smeeding [1987] for details).

Results: Due to the preliminary stage of the results of this project, we will illustrate one of the types of analyses which we hope to accomplish by comparing aggregate noncash income to elderly versus nonelderly households, and by summarizing their effect on relative income ratios for elderly and non-elderly. While the tabulations are not quite completely comparable (due to the absence of public housing benefits in Holland and rough imputations for education in the U.S.), the information in Tables 5A and 5B, and Table 6 will have to suffice for now.

We first present aggregate values for (i.e., aggregated from microdata) various components of noncash income in Netherlands (5A) and U.S.A. (5B), respectively. The Dutch estimates are in billions of Dutch florens (Dfl), the American estimates in billions of U.S. dollars (\$). For both countries the aggregate value of noncash income is presented for two broad groups: the elderly (head of household 65 years of age or over) and the nonelderly (all other households). Of all households, 21 percent belong to the category of "elderly" in Holland and 16.1 million or 20.3 percent in the U.S.A. Because of this demographic similarity, we feel that we can safely ignore the independent influence of relative demography across our two countries.

(Tables 5A and 5B here)

To begin our comparative analysis, we first look at in-kind transfers. As is to be expected, the elderly receive a relatively large part of the benefits in the form of medical services, about 60 percent in each country. Education benefits, on the other hand, accrue nearly completely to nonelderly households (99 percent) in both countries. Altogether, the elderly receive slightly less than their population share in in-kind benefits in the U.S. (18.7 versus 20.3 percent) due to the enormity of education benefits. In Holland, they receive a larger share, 30.0 percent of the total, due to health benefits for the old outweighing elementary and secondary school education subsidies for the young.<sup>6</sup>

Employment related benefits are more heavily skewed toward the nonelderly in both countries. In both countries about 97 percent go to the nonelderly. Housing income in-kind is relatively much larger for the U.S. elderly versus Holland where it is more evenly spread between the two groups. Most importantly, we feel, is the bottom line estimate that noncash income is 21 percent of gross cash income in the Netherlands and 18.3 percent in the United States.

TABLE 5A: NETHERLANDS AGGREGATE NONCASH INCOME, BY AGE, HOUSEHOLDS, 1983 (%)

	ELDERLY		NONELDERLY		TOTAL	
	Dfl (Billions)	%	Dfl (Billions)	%	%	Dfl (Billions)
Number of households (%)		21		79	100	
A. <u>In-Kind Transfers (Total)</u>						
Medical benefits a)	<u>10.3</u>	30	<u>24.1</u>	70	100	<u>34.</u>
Social services benefits b)	<u>9.3</u>	60	<u>6.1</u>	40	100	<u>15.</u>
Housing benefits	0.3	62	0.5	38	100	1.
Education benefits e)	0.2	1	17.5	99	100	17.
B. <u>Employment-related Benefits</u>						
Discretionary contributions (Total)	<u>0.6</u>	3	<u>17.7</u>	97	100	<u>18.</u>
(private pensions)	<u>0.0</u>	0	<u>9.9</u>	100	100	<u>9.</u>
(health insurance)	0.6	6	7.8	93	100	8.
C. <u>Private Housing Income In-Kind (Total)</u>	<u>1.4</u>	12	<u>10.3</u>	88	100	<u>11.</u>
Imputed rent c)	<u>0.3</u>	13	<u>2.0</u>	87	100	<u>2.</u>
Implicit rent d)	1.1	12	8.3	88	100	9.
D. <u>Total Noncash Income (A+B+C)</u>	<u>12.2</u>	19	<u>52.1</u>	81	100	<u>73.</u>
(As % of gross income)		(29)		(19)	(21)	

- a) Health insurance, mental health and health centers
- b) Gezinsverzorging.
- c) Imputed rent is part of taxable income.
- d) Estimated at 2.9% of freehold value.
- e) Includes only operating expenses for public elementary and secondary education.

Source: Hagedaars, et al. [1987].



TABLE 5B: U.S. AGGREGATE VALUE (BILLIONS) OF CASH AND NONCASH INCOME AND TAXES PAID, ELDERLY AND NONELDERLY HOUSEHOLDS IN 1979

<u>INCOME TYPE</u>	<u>ELDERLY</u>	<u>NONELDERLY</u>	<u>TOTAL</u>
(Number Households, Millions)	( 16.1)	( 63.3)	( 79.4)
<u>A. In-Kind Transfers</u>	<u>\$23.9</u>	<u>\$103.9</u>	<u>\$127.8</u>
Medical Benefits <sup>1</sup>	21.7	14.7	36.4
Food Benefits <sup>2</sup>	0.4	6.9	7.3
Housing Benefits <sup>3</sup>	0.9	1.5	2.4
Education Benefits <sup>4</sup>	0.9	80.8	81.7
<u>B. Employment-Related Benefits</u>	<u>4.0</u>	<u>117.5</u>	<u>121.5</u>
Discretionary Contributions (Pensions <sup>4</sup> )	(2.1)	(61.5)	(63.6)
(Health Insurance <sup>5</sup> )	(1.5)	(45.5)	(47.0)
(Other Insurance <sup>6</sup> )	(0.4)	(10.5)	(10.9)
<u>C. Private Housing Income In-Kind<sup>8</sup></u>	<u>\$11.6</u>	<u>\$19.2</u>	<u>\$30.8</u>
Rent-Free Housing	0.5	1.2	1.7
Implicit Rent	11.1	18.0	29.1
<u>D. Total Noncash Income (A+B+C)</u>	<u>\$39.5</u>	<u>\$240.6</u>	<u>\$280.1</u>
(Per Household)	(\$2351)	(\$3803)	(\$3528)
As a Percent of Gross Money Income	22.0	17.8	18.3

Source: Author's tabulations from augmented March 1980 Current Population Survey.  
(See Smeeding [1987])

- <sup>1</sup> Medical benefits include the market value of Medicare, Medicaid, and Veterans' health benefits excluding institutional care.
- <sup>2</sup> Food benefits include the market value of food stamps and free or reduced-price school lunch.
- <sup>3</sup> Housing benefits include publicly owned or subsidized rental housing.
- <sup>4</sup> Pensions include employer contributions for private and public sector employee pension and retirement plans, and for savings and thrift plans.
- <sup>5</sup> Health insurance includes employer or union contributions for private and public sector employee group health plans.
- <sup>6</sup> Other insurance includes employer or union contributions for private and public employee life, sickness or accident, and private disability insurance plans.
- <sup>7</sup> Education benefits include public elementary and secondary school current operating expenses only. Capital outlays and post-secondary subsidies are excluded.
- <sup>8</sup> Housing income in-kind includes those living rent-free in unowned private housing units and the net implicit rental value of owner-occupied homes.
- <sup>9</sup> Elderly households are those with a householder age 65 or older.

Table 6 presents first estimate of how much the elderly versus nonelderly gain on average from each type of noncash income.

(Table 6 here)

While these results are highly preliminary, they are worthy of some attention. As might be expected the ratio of elderly to nonelderly factor incomes is fairly low. The elderly typically have little earnings (due to retirement) and their capital or property cash incomes are not large enough to overcome this deficit. The cash transfer system, particularly social retirement, boost elderly incomes to 52 percent that of the nonelderly in the U.S.A. (1979) and to 58 percent in Netherlands (1983). The direct (income and employee payroll) tax system in both countries benefits the elderly by a great deal, raising their income ratios by eight points each. Similarly, public in-kind transfers boost elderly incomes by more than nonelderly, raising both ratios by four points when moving from disposable to public income. Because employment related benefits tend to benefit younger families, particularly health care and private pension subsidies in the U.S.A., the public and insurance income ratios fall in the U.S. and in the Netherlands, but by a much larger amount in the former (5 percentage points) versus the latter (1 percentage point).

Finally, adding implicit rent has the impact of raising the final ratio in the U.S.A. (due to the high rate of home ownership among U.S. elderly where over 50 percent own their homes outright, i.e., mortgage free) to 0.62, but reducing the ratio to 0.68 in Holland (due to roughly equal ownership and interest subsidies for younger homeowners). In total, noncash incomes raise the elderly/nonelderly income ratios in the U.S. and Holland on net by 2 points each, i.e., from disposable incomes of 0.60 to final incomes of 0.62 in the U.S. and from 0.66 to 0.68 in Holland, though different components of noncash income effect the elderly-nonelderly ratios in different ways in each country. Surprisingly, the largest net gains of

TABLE 6: PRELIMINARY ESTIMATES OF THE RELATIVE EFFECT OF NONCASH INCOME ON THE ELDERLY AND NONELDERLY IN THE U.S.A. (1979) AND THE NETHERLANDS (1983)

<u>RATION OF ELDERLY TO NONELDERLY</u>		
<u>INCOME CONCEPT</u>	<u>U.S.A. (1979)</u>	<u>NETHERLANDS (1983)</u>
Factor Income	0.16	n/a
Cash Factor Income	0.19	n/a
Gross Cash Income	0.52	0.58
Disposable Income	0.601	0.66
Public Income	0.641	0.70
Public and Insurance Income	0.59	0.69
Final Income	0.62	0.68

Sources: Author's preliminary tabulations

the elderly in both countries come from the tax systems which add 8 points to the ratios in each, rather than from noncash incomes as presented here.

#### VI. SUMMARY AND CONCLUSIONS

Future work on this project will not only refine U.S. and Netherlands estimates, but will also add the other countries and experiment with sensitivity analyses of the data to the various components of income and imputation strategies. In particular, the elderly-nonelderly balance seems to depend most critically on the measurement and value of health care and education, with the former more heavily benefitting the elderly and the latter helping younger families. However, additional adjustments for family size, tax expenditures and other income components should not be ruled out. We hope that your comments will help us direct our project in a fruitful way.

#### ENDNOTES

1. We hope to present the complete results of our labors to this body at the 1989 20th IARIW General Conference
2. Actually, the LIS database currently includes some estimates of "near cash" income. These benefits are actually disguised money income in that they are denominated in currency units and have a recipient or cash equivalent value which equals their government cost or market value. Two examples of these benefits are rent supplements in the U.K. and food stamps in the U.S.
3. It is impossible to quantitatively value and distribute the benefits of lower than free market prices to consumers (e.g., dairy products in Sweden) or higher than free market prices to producers (e.g., food products in the U.S. and the Common Market), without estimates of the counterfactual -- the free market price in absence of deliberate public actions to change these prices.
4. This is one good example of how a theoretically preferred methodology is passed over in favor of a less sophisticated but robust measurement technique.
5. Please note the following important point. Only employer contributions to unfunded private pension schemes and to health and related insurance are added to public income. Employer's contributions to employee social insurance programs are not considered a noncash benefit of the employees concerned due to their pay-as-you-go basis. That is, outlays in any given year more or less equal revenues (from contributions) in that same year. Hence, these same outlays constitute cash transfer income for households which receive social insurance benefits. As these benefits are already part of gross income of the households which receive them, including taxes and contributions in employees public and insurance income would be "double counting". Because most, if not all, private pension schemes are funded, we argue that employers contributions

to these schemes constitute a noncash employment-related benefit. Moreover, we reckon private pension benefits to also be a component of the gross (cash) income of households that receive them. Our main argument for this procedure boils down to the observation that pension benefits received are financed out of contributions in the past (of both employers and employees) and capital yields. As a consequence, seen over the lifetime of the employed, there is only double counting as regards employer's contributions paid. Under a typical private pension scheme the latter contributions are far less than half of the value of benefits ultimately received. As it is extremely difficult, if not outright impossible to correct for this factor, we have opted for the approach outlined above.

6. The careful reader may note that the microcomputations for education subsidies in Netherlands (Table 5A) produce different results than the macro figures in Table 2. This is explained by the fact that the macrodata on education include cash living subsidies and operating expenses for higher education. The microdata simulations upon which Table 5A is based count the cash subsidies in money income while also excluding the noncash operating expenses for higher education to be comparable with the U.S.A. results.

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