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POVERTY, INEQUALITY, AND FAMILY LIVING STANDARDS IMPACTS ACROSS SEVEN NATIONS: THE EFFECT OF NONCASH SUBSIDIES FOR HEALTH, EDUCATION AND HOUSING

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The main aim of this paper has been to summarize the impact of noncash income—health and health education benefits, and imputed rent—on living standards, income distribution and poverty in seven nations at the beginning of the 1980s using the Luxembourg Income Study database. Our results do not give rise to a pattern of national differences in poverty rates or income inequality which are markedly different from that which emerges from previous LIS research based on cash income alone. While these results may be sensitive to the techniques used to measure and value noncash benefits in this paper, it appears that noncash income reinforces the redistributive impact of conventional (cash) tax-transfer mechanisms rather than acting to offset them in any major way.

Note: This paper summarizes a six-year project which was conducted in conjunction with, and under the auspices of, the Luxembourg Income Study. Sponsors have included the United States National Institute on Aging, the United States National Science Foundation, and the LIS member countries. The authors would also like to thank an anonymous referee, Dirk Wolfson, and various individuals who helped us as project participants. These include Grant Cameron, Wolfhard Dobröschke-Kohn, Flip de Kam, Peter Hedstrom, Brigitte Buhmann, Michael O'Higgins, Uwe Warner, Julie Tapp, and Inge O'Connor. A shorter and less complete draft of this paper was presented to the 22nd General Conference of the IARIW in Films, Switzerland, August 1992. However, the authors retain the right to all errors of commission and omission. Additional information on the LIS research project may be obtained from Smeeding, care of Luxembourg Income Study at CEPS, B.P. 65, L-7201 Walferdange, Luxembourg.

Introduction

Economic resources, including both cash and noncash income, determine the economic well-being of households in all nations. Cash income is the most widely employed measure of household economic well-being, but it excludes considerable amounts of resources received in a noncash form. These include health care, housing, education, child care, transportation, food, and other subsidies from governments or from other third parties (i.e., employers), production for own consumption by farmers and by other individuals living mainly in rural areas, and in-kind transfers received from relatives, friends and others in the form of food, clothing and/or shelter. Moreover, the distribution of these resources may vary systematically by country, by regime or by population subgroup, thus affecting measures of relative economic well-being among households.[1] The omission of noncash income from microdata based measures of economic well-being is not purely unintentional. In most countries aggregate income in-kind is measured by systems of national income and/or social accounting. However, the problems inherent in the measurement, valuation, and imputation of noncash income to *individual* households on the basis of microdata files are formidable. While a few countries (e.g., United States, Netherlands) have partially accomplished this task with some difficulty and while others have achieved at least some limited microdata accounting of selected 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 internationally comparable among such nations.

The authors of this paper and several colleagues have been working on such a project in Western nations for the past several years under the auspices of the Luxembourg Income Study (LIS). This paper presents a summary of the results of this project as they relate to income inequality, living standards for several types of families, and poverty measurement. Additional detail is available by contacting the authors and also in Smeeding, Saunders and Jenkins, *et al.* (1993).

The remainder of this paper discusses the importance of noncash income in Western nations, and summarizes our conceptual and empirical approach to measuring the size and impact of noncash income in seven of the countries participating in the LIS project. For data reasons, the scope of the project is restricted to noncash incomes associated with education (schooling), health services, and, for five of the seven countries, comparative estimates of noncash housing benefits accruing to home owners. The paper encompasses noncash benefits accruing to individuals as a result of direct (subsidized) public

[1]Noncash income does *not* include off the books cash or noncash income (grey economy) and hence, this topic is not discussed in this paper. While we do not include any of the Reforming Socialist Economies (RSEs) in this paper, it should be noted that many such countries, including Poland and Hungary, have elaborate systems of national accounts, consumption studies, and income distribution estimates which include a wide range of goods and services provided in-kind. Yet even these nations exclude large amounts of these subsidies. For more on this topic, see Smeeding and Torrey (1991) and Teglarsky and Struyk (1990).

provision, tax concessions and provisions subsidized by employers for health and education benefits. After explaining the methodology and data sources, the paper discusses and analyzes the results, focusing specifically on comparisons of the distribution of noncash income across countries. A classification according to life-cycle category and family-type allows the results to be analyzed more thoroughly and highlights the role of noncash income in redistribution both across and within the life course of individuals and families and its impact on the living standards of such families. Particular attention is given to comparisons of the distributions of final (cash plus noncash) income in each country as well as to the impact of noncash income on the incidence and structure of relative poverty.

Noncash Income and the Luxembourg Income Study Project

Comparative research on the distribution of economic well-being has made considerable progress in recent years. That progress has been facilitated by advances in both methodological procedure and data availability. Methodologically, recent income distribution research has achieved greater clarity on questions relating to the appropriate unit of analysis, the basis for ranking those units and their weighting in deriving aggregate measures of inequality (Atkinson, 1983; Atkinson, Rainwater and Smeeding, 1993). These developments have permitted analysis of the distribution of income among households to translate more readily into the distribution of economic well-being among individuals. Much, though not all, of the empirical application of this new methodology has been undertaken within a comparative context. That, in turn, has been made possible by advances in data availability, specifically by the production of microdata sets which generally conform to agreed upon and standardized concepts and definitions.

At the forefront of this research effort has been the Luxembourg Income Study (LIS), an international, cooperative research endeavor which began in 1983 with the aim of improving comparative measures of economic well-being. There are, in fact, three distinct components of the research undertaken as part of the LIS project. The first involves the reorganization of national microdata sets in order that they conform to a common, standard, conceptual and definitional framework. The second involves the use of the data thus generated to analyze various aspects of economic well-being and inequality within a comparative framework. The third is to make the standardized data sets easily available to the international research community, in order that researchers within national boundaries can utilize them, confident in the knowledge that national differences in data concepts and definitions have, as far as possible, been eliminated. The LIS database currently covers over 20 countries with data covering various periods from 1969 to 1990.

Analysis of the effect cash transfers and benefits on income distribution for the countries included here can be found in Smeeding, O'Higgins and Rainwater (1990), and in O'Higgins, Schmaus and Stephenson (1989). In fact, all of the research undertaken as part of the LIS project to this point has been based on measures of cash income. The income concepts around which the LIS database

has been constructed—factor income, gross income, disposable income and equivalent income—are all based on a conception of income expressed in terms of cash only. Noncash elements which form part of income in its broader meaning have, with few exceptions, been excluded.[2] This segregation was inevitable in the early phases of the LIS project, but its continuation has become increasingly difficult for at least two reasons. First, because economic well-being is, in fact, determined by more than just receipts of cash income, there is a need to begin to expand cash income measures to reflect a broader range of noncash components. Second, studies based on cash income may give a distortionary picture of the impact of government budgetary policies because within this limited framework government (cash) transfers and (direct) taxes do not balance—even in the remote sense which characterizes the actual overall fiscal situation—but also because governments may seek to achieve their redistributive goals through programs which provide noncash benefits rather than just through tax-transfer mechanisms. This means that measures of economic well-being based on disposable cash income are subject to the vagaries of the overall fiscal structure within countries, and that comparisons of both the level and distribution of well-being between countries are dependent upon the existing fiscal structures. Particularly as we seek to understand and compare the distribution of income in the Reforming Socialist Economies of Eastern Europe and Russia with that of the U.S., we need to broaden our comparative measures of the distribution of well-being. This paper should be seen as a first exploratory step in this direction.

The Significance of Noncash Icome

Noncash income may be provided to private households by governments, by private third parties such as employers, or by the household itself as in the case of imputed return from durables such as owned housing or automobiles. By far the largest amounts of noncash benefits are provided by governments. Governments tax and transfer large amounts of total personal (factor) income—ranging from 20 percent (in the U.S.) to over 40 percent (in Sweden)—proceeding from market-determined factor income to final income. In most countries, cash income transfers constitute less than half of government expenditures. Hence, not all of the income taxed away by governments, even counting only direct taxes, emerges as contributing to the post-tax, post-transfer disposable cash income of households. The amounts taxed (or borrowed in the case of deficit financing) but not transferred in cash constitute noncash income components. While not all such components may be measured, valued and imputed to households, large parts of public noncash income transfers in the form of health care, education and housing can be so imputed, at least in principle. Moreover, health care and education are

[2]"Near-cash" income—that is, payments made in flexible currency denominations, such as food stamps in the U.S., or cash benefits contingent on meeting certain needs, e.g., university scholarships or housing allowances in Sweden or the U.K., are already included in LIS disposable income on the grounds that these benefits that are denominated in money terms and are very nearly equivalent to an equal cash transfer in the eyes of the recipient.

TABLE 1

ESTIMATES OF CASH (PENSIONS AND UNEMPLOYMENT BENEFITS) AND NONCASH (HEALTH AND EDUCATION) SOCIAL EXPENDITURES AS A PERCENTAGE OF GDP IN 1960, 1975, AND 1981

	Cash			Noncash			Noncash-Cash Differences[a]		
Country	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
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.	4.8	8.1	7.9	4.9	10.0	9.7	0.1	1.9	1.8
(West) Germany	9.9	14.1	13.9	5.5	12.0	11.78	−4.4	−2.1	−2.2

Source: OECD (1985).

Note: Noncash Social Expenditure includes the cost of direct health and education benefits from all levels of government. Employer and other third party benefits are not included.

[a]Subtracts cash from noncash benefits.

the largest government noncash subsidies in each of the seven nations examined here.[3]

Not only is the size of noncash income important, its distribution may also have considerable effects on the distribution of well-being between different classes of households. Consider, for example, public health and education benefits. Most would argue that health benefits provided by governments and insurance companies are most valued by older citizens who are more likely to make use of medical services. Similarly children (and/or families with children) are most likely to enjoy benefits from education subsidies in a given year. One would thus expect that differential gains and losses would be realized across different household types. Since the value of noncash benefits is likely to be disproportionate to net (cash) income, these income components might also have large distributional effects by income class, as well as by demographic group.

For all of these reasons, the distribution of disposable cash income may yield misleading inferences about the relative well-being of various types of households both within and across countries. If we accept the axiom that the more comprehensive the definition of income used the better is the measure of welfare, then measuring, valuing and imputing noncash income will give a more complete picture of well-being than that afforded by cash income alone.

An indication of the aggregate importance of public noncash health and education benefits in the seven countries in our study is provided in Table 1.

[3]Within each of the countries examined here, health and education subsidies are the only noncash benefits separately accounted for by the OECD (1985). They are the largest two types of noncash benefit in each of the nations studied here. Education varies from 5.2 percent of GDP in Germany to 7.1 percent in the Netherlands, with the U.K. the median country at 5.8 percent of GDP in 1981. Health care subsidies vary from 4.2 percent in the U.S. to 9.9 percent in Sweden. However, correcting the U.S. aggregate to reflect tax subsidized employer benefits for health care brings the U.S. total to about 8.0 percent of GDP. The next lowest nation to the U.S. was the U.K. at 5.4 percent of GDP. Thus correcting for U.S. employer subsidies reduces the range of estimates across countries. The median nation in terms of health care subsidies was Canada at 5.6 percent of GDP in 1981.

Noncash expenditures are shown relative to the major elements of cash transfer spending (pensions and unemployment benefits), both being expressed as a percentage of Gross Domestic Product (GDP). The estimates overstate the ratio of noncash to cash benefits because the OECD noncash expenditures may include some cash items (e.g., education allowances paid in cash to tertiary students), while coverage of cash benefits is restricted to pensions and unemployment benefits. Together, these shortcomings are not likely to be of sufficient importance to fundamentally change the picture indicated in Table 1.[4] In 1981, in all countries except West Germany and the Netherlands, OECD's noncash expenditure exceeded expenditure on cash transfers.[5] The difference was almost 5 percent of GDP in Canada, and exceeded 4 percent and 3 percent of GDP in Australia and Sweden, respectively. Between 1960 and 1975, noncash benefits grew faster than cash benefits. However between 1975 and 1981 the pattern was reversed, as cash transfer spending rose sharply relative to GDP while noncash spending fell relative to GDP everywhere except in the Netherlands and Sweden. In the Netherlands, noncash expenditure fell slightly below cash transfer spending after the mid-seventies due to the rapid rise in cash transfer spending, particularly disability benefits. West Germany is the only country where cash transfer spending has consistently exceeded noncash expenditure, owing largely to the generous West German public pension system. While the aging of the population may further increase public pension outlays in these nations over the next several decades, noncash benefits still generally dominated cash benefits during the 1979–81 period during which we observe and measure household income in this paper.

These data confirm that the total size of public noncash benefits is such as to present the possibility that their inclusion as part of income might well influence the overall level of economic well-being and its distribution. However, the ranking of countries according to the levels of cash and noncash spending is similar, except for Canada whose noncash ranking is well above its cash transfer ranking. This suggests that governments have not used cash transfer and noncash benefit programs as substitutable methods of achieving their social objectives. It thus 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) at least if the equalizing redistributive impact of cash and noncash incomes are similar. The figures in Table 1 indicate that the cross-country variation in aggregate noncash expenditure is less than the variation in spending on cash transfers. The variation in noncash spending in turn largely reflects cross-country variations in health expenditure, spending on education being a broadly similar proportion of GDP in all countries (O'Higgins, 1988 and footnote 3). These points aside, however, the main message

[4]For instance, family benefits in the form of child allowances, maternity leave, and other types of benefits lumped together by OECD are excluded. They totalled less than 7 percent of social expenditures in each of the countries studied here in 1981. As mentioned earlier, OECD does not distinguish noncash subsidies other than health care and education.

[5]We will refer to West Germany throughout this paper because the measurements and data were collected subsequent to 1950 and prior to 1990 when East and West Germany were separate states.

to emerge from Table 1 is that noncash income is of sufficient quantitative significance that it need be taken account of in any comprehensive measurement of income and assessment of economic well-being.

Conceptual, Methodological and Empirical Issues

Conceptual Approach

In practice, the range and type of noncash income to include in a project such as this is enormous. It has already been noted that government is not the only source of noncash income to private households. The goods and services from which noncash income is derived may also be provided by private third parties such as employers or charitable organizations, or by the household itself in the form of home-grown food or implicit rent on owner-occupied housing. These items may be delivered and subsidized directly or, in the case of government provisions, indirectly via tax expenditures or regulatory policies. Employer provided benefits such as health-care insurance in the United States may also attract government support if they, or employee contributions, receive concessionary tax treatment. Ideally, one would like to include the net incidence of all types of government and non-government benefits (and to subtract all taxes and charges) and to assign the benefits in cash equivalent terms to each household. Such a task would be daunting to say the least (e.g., see O'Higgins and Ruggles, 1981; Ruggles and O'Higgins, 1981, for consistent attempts at such an incidence study in the U.K. and U.S.). Practically, such an exercise was beyond the range and scope of our collective project. The jointly determined goals and criteria which have guided our project choices for selecting noncash benefits should therefore be made explicit.

Our primary goal was to improve upon measures of economic well-being and the size distribution of well-being within and between countries by adding quantitatively important and practically measurable components of noncash income to the LIS cash income database. Moreover, in selecting components of noncash income for imputation, we sought to measure the flow from those sources of noncash income which have a deliberate (large) and differential impact on private incomes within or between countries. Conceptually acceptable but quantitatively insignificant noncash income components were for this reason deliberately ignored. The principle of international comparability was our *sine qua non*. Since one of our main objectives was the improvement of the LIS database, it was important to produce measures of noncash income components which were robust across countries. Following this principle we sometimes chose to abandon preferred measurement techniques available for practical implementation in only one or two countries and adopted instead less accurate but wholly comparable approaches to noncash income measurement across all countries, or at least across a majority of countries, involved.

For instance, we were forced to exclude those goods and services for which we either did not have the requisite data needed to impute a value to them (higher or tertiary education subsidies) and/or were not of great overall significance at the time of the income surveys with which we were working (child care and transportation services). We also excluded, reluctantly, noncash income in the

form of chronic (long-term) health care subsidies—provided in the form of both domiciliary and institutional care—for the frail elderly and for younger people with severe disabilities. This was partly due to lack of reliable comparative data on the cost of these services, but also because the institutionalized population is excluded from most household survey datasets. Finally, we did not control for differences in spending for education *within* nations. While these differences may be relatively small in some countries, they can also be very large. For instance, the variance in education spending in the U.S. can be 100 percent or more across states. To the extent that these expenditure levels also vary with income, e.g., lower education expenditures for poor minority children in the southern United States, we may overstate the value of educational benefits to some groups simply because we fail to control for variance within larger nations.

Three broad classes of benefits were included in our study: imputed rental ncome from home ownership (in all but the U.K. and Australia where the LIS version of the datasets excluded the data needed to make such imputations), health care and education. Tertiary education spending and its associated noncash income was excluded because the LIS tapes did not permit those studying in tertiary institutions and their subsidies to be identified. Cash scholarship support of living expenses for tertiary education was identifiable for those who received such support. However, these are a very small minority of such students in most of the countries studied.

In the area of housing benefits, data limitations and comparability forced us to focus on imputed rent to owner occupiers. Housing benefits paid in the form of cash allowances were already included in the LIS database. Other types of benefits were too elusive to include in most countries. These include purchase subsidies for low-income home buyers (Netherlands), and the net value of subsidized rental housing (U.S., U.K.).

Thus, this study estimates noncash income provided by government and employers in most of the health and education areas, and in the area of imputed rental value for owner-occupiers. Noncash income provided through tax expenditures are also included, although these are implicitly incorporated into the LIS cash income framework because they affect taxable income and are thus allowed for when deriving disposable income from gross income. In a limited sense, therefore, the project can lay claims to incorporate all three elements of Titmuss' social divisions of welfare spending (public, occupational and fiscal) at least within the education and health areas. The inclusion of housing benefits reflects some mixture of public subsidies and of home production.

Imputation Rules

Having described the scope of noncash income, the next set of issues relates to the identification and valuation of noncash benefits necessary for the imputation of noncash income. Again, given space constraints it is only possible here to describe our methods in general terms.[6] Our imputation procedures were based

[6]Clearly other analysts could make alternative judgements about rules for inclusion or exclusion of benefits, or for imputation and valuation of benefits within or across countries. We are able to only outline a subset of the detailed choices we made in this paper. For additional detail on our choices, see Smeeding, Saunders, Jenkins *et al.* (1993), Chapter 2.

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(i) In order to impute noncash income, account must be taken of both benefits and costs, with only the resulting net subsidy being imputed to households. Thus, the benefits associated with a partial subsidy are included as noncash income, just as any costs (whether third-party charges or taxes) must be subtracted from total (gross) benefits. If there is no subsidy, households pay market prices and thus receive no noncash income.[7]

(ii) The total (gross) value of noncash benefits is assumed equal to the amount of money a government (or employer) spends on each item. No attempt has been made to estimate the recipient or cash equivalent value of noncash benefits. This implies that the recipient's value of noncash income may be overstated in some cases, particularly for those families on low incomes who might well have chosen to spend the monetary value of noncash subsidies in other areas had these been provided as cash transfers.[8]

(iii) The household which directly receives each noncash benefit is assumed to be the only household to benefit. We thus disregard all general (social) or specific (private) externalities, largely because of the practical impossibilities of estimating them.

(iv) We include both operating and capital outlays when allocating public noncash benefits for education and health care. Annual capital outlays have been estimated where data on interest and depreciation were available; where they were not, five year averages of actual capital expenditures have been used.

We now turn to specific imputation procedures which we have followed. In the field of *education subsidies*, our analysis has been restricted to public elementary (primary) and secondary schooling. The benefits of current (operating) and capital outlays have been allocated to families with children in education. Our estimation methods involve calculating, for each level of education, average outlays per student from data on total outlays and student enrollments, and imputing these averages as noncash income to families with children participating in each level of education. Adjustments for early-leavers ("drop-outs") have been made and public subsidies for private education (which are important, in Australia, for example) have been allocated on a randomized basis. Since the resulting noncash incomes are allocated to all students, whether they attend public (government) or private schools, we assume that subsidies to government schools are of value and thus also provide benefits to those with children in private schools, and likewise that government subsidies to private schools are of value to those with children in government schools. In contrast, families whose children "drop-out" of school are assumed to place a zero value on their foregone opportunity of school attendance. Finally, we have deducted property tax payments from homeowners in order

[7]The indirect effects of government subsidies or taxes on market prices, e.g., housing, were also excluded. The implicit counterfactual is therefore that the market price is the price which would prevail in the absence of any government intervention via taxes or subsidy.

[8]While recipient or cash equivalent valuation is the ideal, and while market value will on average overstate the value of noncash benefits to low income households, one can find cases where this may be false. For instance, in the case of poor health, a low income family may value health insurance subsidies above their market value.

to arrive at a net subsidy figure. This is because property taxes are the major financing mechanism for local schools in most countries in the study.[9]

In the field of *health care subsidies*, our imputations have been based on a risk-related insurance premia approach. That is, we view health care as an insurance benefit received by all coverees, independently of their actual use of health care benefits, and also that the benefits (and hence premia) differ by age and gender in line with differences in need. According to this line of argument, insurance premia should be actuarially adjusted (age and sex related) to account for differences in the need-related value of being covered by health insurance. Thus, benefits received are estimated by age and sex-specific outlays spread over all coverees in each age-sex cell of the population. The actual cells used to estimate benefits and the method for allocating nontax (user) charges for health insurance are derived from national data sources on utilization rates for different elements in the health care system, differentiated by age and gender, and national data on the incidence of any tax or user charges. In cases where freely available public health insurance is all that exists (e.g., in Sweden), gross benefits only are imputed, the taxes to support them already being deducted. In cases where public and private third-party charges are levied on households and employers (the Netherlands, U.S. and West Germany) an allocation of costs is also specified. In the case of direct payments to providers (e.g., out of pocket charges, deductibles, etc.), no imputation of costs or benefits is undertaken. Finally, in cases where total third-party premia equal expected benefits (i.e., no subsidy is realized), no imputation is made. Thus, only subsidized and insured benefits and payments to insurers are taken into account here.[10]

For *housing*, the correct measure of implicit rent is the opportunity cost of the housing used, i.e., the counterfactual private market rent minus cost of owning (including depreciation, property taxes, maintenance, etc.). However, these data are not available for all countries. Alternatively in competitive markets, the implicit rental value of owned homes can be measured as a fixed interest return on the net worth of the home. Economic theory holds that ignoring transactions costs and differential risk, investment funds (financial capital) will flow between sectors to equilibrate the marginal rate of return on all types of investments. Hence, the implicit rate of return on housing equity will equal a safe private market rate of return (or the return on relatively riskless long-term government bonds) on an equal value of investment. The annual rate of return which is used in this case is approximated by a 2 percent real return (2 percent on top of the change in overall consumer prices for a country in the year studied). Inflation plus 2 percent was, thus, multiplied by home equity to estimate imputed rent.

In summary, our imputation methods have involved combining the existing LIS data set with additional data on noncash expenditure aggregates, on the utilization rates of education and health services, and on estimates of the net

[9]Where property txes are not used in this way (e.g., in Australia), the deduction of property taxes from noncash education benefits was not undertaken. Further, we have ignored the potential incidence of property taxes on renters.

[10]In the U.S., the 12 percent of the population without health insurance were not assigned benefits. While this properly reflects the value of their insurance coverage, it likely also understates the value of health care benefits which they actually receive due to provision of free or charity care.

worth of homeowners. In order to achieve this, we have had to combine familiarity with the existing LIS data with detailed knowledge of the national data sources which comprise LIS, an understanding of the structure and operation of the education and health insurance schemes in each country and expertise in bringing other national data sources to bear on how the detailed allocation of noncash benefits was to be imputed.[11]

Other Measurement Issues

There are a number of additional issues that have to be discussed before turning to our results. These are discussed only briefly, so that readers can gain a basic understanding of our actual procedures. The first such issue relates to our choice of the basic *unit of analysis*. Noncash benefits have to be imputed to income units, i.e., to persons, families, or households. Our emphasis is on the distribution of noncash benefits between families defined to include either a group of two or more related persons living together as a family and sharing their housekeeping, or single persons who are assumed to independently keep their own housing units. This definition implies that two unmarried individuals sharing the same living quarters are treated as independent families. The bias implicit in this treatment is to ignore economies of scale in housing (and other domestic arrangements) among unmarried people living together.

The major exceptions to these general rules are in the Netherlands and Sweden where, again as noted earlier, unmarried persons living together in a marriage-like relationship (i.e., sharing living quarters, facilities and expenses) are counted as a single family, and in Canada, where related generations of families (e.g., elderly mother and adult children) are treated as separate economic units, even where they live together. In general, while these procedures treat some households or families differently than others, they come closest to the preferred and usual definition of families within each country.

Having defined families for the purposes of analysis, the next step is to specify a number of different *family types* for measuring the impact of subsidies on family types. The results presented in the following section of the paper disaggregate families in two different dimensions, according to eight family types (Appendix Table A-1 contains the frequency distribution of families by type of family.) In relation to this disaggregation, we adopted the following exclusive and exhaustive categorization which was chosen in part because of its relevance for both analytical and policy purposes:

1. Families with Children (children are 17 or younger),
   (a) Non-aged couples (head under 65, couple may or may not be married)
   (b) Single parents (one adult only plus children),
   (c) Other families with children (including a few units with head 65 and over);

[11]Thus, while the focus of our research effort has been explicitly comparative, what we have attempted would almost certainly not have been possible except as a joint venture undertaken by a group of national researchers committed to such a task.

2. Elderly Families (head 65 or older),
   (a) Single elderly persons (one person unit 65 or older),
   (b) Elderly couple (head 65 or older);
3. Non-aged Families Without Children,
   (a) Single persons,
   (b) Childless couples (of any marital status),
   (c) Other childless families (more than two adults or families with young adults age 18 or over).

As already noted, the basic income concepts we have used are those developed as part of the LIS project and other research in the area (Smeeding, O'Higgins, and Rainwater, 1990). However, to the familiar (cash income) concepts of factor income, gross income and disposable income, we now add the concept of disposable income and imputed noncash income in the form of education and health care, and another which includes housing as well. These will be called "full income 1" (health and education only) and "full income 2" (health, education and housing).

Since family size and structure have a considerable influence on the well-being of individual family members, account must be taken of differences in family need in order to derive measures of individual well-being for poverty measurement. This is done by applying a set of *equivalence scales*—which express relative family needs—in order to derive measures of equivalent income, or family income adjusted for family needs. Equivalent income is a preferable measure of individual well-being to per capita family income because the latter makes no allowance for economies of scale in family financial arrangements. We regard the extent of such economies as an empirical issue which is incorporated into the scales themselves, and not something which is a matter for pre-judgement.

There remains the question of which set of equivalence scales to use, an issue on which there currently exists little consensus, but which is known to influence cross-country comparisons of inequality and poverty, at least under certain circumstances (Buhmann, Rainwater, Schmaus and Smeeding, 1988). We have selected as our base case a simple set of equivalences that lie about midway between the two extreme scales produced by recent research on the topic. These scales allocate a weight of 1.0 for the first adult in each family, 0.4 for each additional adult in the family and 0.3 for each child. They approximate what Buhmann *et al.* (1988) refer to as the Budget Studies/Program equivalences. These are based in turn on equivalence scales estimated from budget study data on expenditure patterns for different family types, as well as on family size differentials in benefit levels built into social programs. The scales imply, for example, that a single parent with one child and a married couple with two children have needs which are 30 percent and 100 percent greater than the needs of a single adult, respectively.

Although these equivalence scales have been used to derive equivalent disposable cash income, the question arises of whether the same scales should be applied to adjust noncash income. Since noncash income does not depend upon family size or structure (only on characteristics pertaining to individuals)—which suggests that there are no economies of scale in noncash income—we decided to aggregate all noncash income for the family as a whole

and express that in per capita terms. Our welfare-based measure of final family income is thus equal to the sum of equivalent (or adjusted) disposable cash income and per capita noncash income. This income concept is referred to as adjusted or final income (1 or 2) in subsequent tables and discussion referring to poverty. When investigating the effect of noncash income on living standards by family type or on the overall income distribution equivalence adjustments to incomes are not made.

Levels of Noncash Income and Living Standards

The Level of Noncash Income

The overall mean amounts of (unadjusted disposable) cash and noncash income are presented for each country in Table 2. The figures in the top panel for each country are expressed in national currencies, while the figures in the lower panel are standardized relative to each country's mean disposable income. It is important to recall that the noncash incomes shown in Table 2 are net of all costs and charges, including only the *net* subsidy from government and/or employers. This explains the differences between the patterns shown in Table 2 and the (gross) government expenditures shown in Table 1. Despite these differences, the ranking of countries according to the relative importance of noncash income on the two comparable elements (health and education) is broadly similar. The two exceptions are Australia, whose ranking is higher according to Table 2 than Table 1, and the U.K. whose rank changes from fifth according to Table 1 to second according to Table 2. Given these changes, and the fact that noncash health and education income averages 16.6 percent of disposable income, ranging from 13 percent in the U.S. and West Germany to almost 22 percent in the U.K. and Sweden, the importance of noncash income is again reinforced. The health component of noncash income is greater than the education component in all countries except Canada, U.K. and the U.S. In the U.K., this mainly reflects the high level of noncash education income, while in the U.S. it reflects the relatively low net subsidy to health care. The differences between these categories in Canada are fairly small.

The addition of housing benefits makes many of these differences more pronounced. While on average, housing income in-kind is less than education and health, the distribution of housing benefits across countries is very different than the distribution of the other types of benefits. Canada and Germany have the largest amounts of noncash income of this sort, particularly Canada. As a result the final ranking of noncash income in the five countries with housing as well leaves Canada at the top of the heap followed by Sweden and Netherlands. West Germany and the U.S. bring up the rear.

Living Standards

The effect of noncash income on the average income levels of household types—the effect on living standards of different household types—is shown in

Table 3 (for health and education only) and Table 4 (including housing). Living standard impact was calculated by comparing overall average group income—unadjusted disposable income and final income—to the national mean. Net differences in impact by family type are shown at the bottom of each table.

The bottom panel of Table 3 indicates that, relative to average incomes, noncash income is greatest for middle-aged families with children and the very elderly. The biggest relative losers in most countries are younger families without children and childless couples, so-called "yuppies," 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. Among families without children, relative losses are generally greater for couples than for the other groups. The impacts on the elderly are generally more modest than one would have thought given their relatively higher benefits from health care. The differences in health subsidy for the aged versus other groups (adults, children) are clearly less than the differences in education which directly benefit only one group: families with younger children.

Before the addition of noncash income, single parents with children, single adults—aged and nonaged—and aged couples had below average disposable incomes. Nonaged married couples, with and without children, and larger families—generally those included under "other"—had higher incomes. Since we did not adjust these incomes for family size, we clearly create upward bias in the measured well-being of "other" categories. Still, the addition of noncash income in the form of health and education most improves the position of single parents with children. Single aged persons gain a small amount and aged couples hold their own (except in Sweden where the gains are large for the aged). The childless nonaged lose—both the couples and others who already had above average incomes, and also nonaged single persons whose cash incomes were below average to start.

If one were to double the living standards of the singles (or double the incomes of the couples), they would be much closer to each other, indicating that overall living standards per capita are more for these people than shown in Table 3. Single parents with children—the least well-off group in cash terms in several of these nations—appear to gain most from this exercise. Their full incomes remain below average (except for Germany and Sweden), but they are higher once income in-kind is added in, than they were before.

The addition of housing benefits (Table 4) changes this picture only marginally. The aged now gain more—due particularly to the higher fraction which own homes in Canada and the U.S.—but otherwise the "winners" and "losers" are still, respectively, the childful and the childless. It, thus, appears that the benefits of home ownership as we have measured them, are fairly evenly distributed across the eight groups of family types shown here.

Inequality

The effect of these benefits on the overall size distribution of income is captured most simply in Table 5 (health and education only) and Table 6 (adding in education). No adjustments to income are made for family size or type. The bottom panel of each table again captures the difference due to noncash benefits.

TABLE 2
OVERALL MEAN AMOUNTS OF CASH AND NONCASH INCOME IN NATIONAL CURRENCY BY COUNTRY

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TABLE 2

OVERALL MEAN AMOUNTS OF CASH AND NONCASH INCOME IN NATIONAL CURRENCY BY COUNTRY

Country (Year) (1)	Disposable Income (2)	Education (3)	Health (4)	Health and Education (3+4) (5)	Housing (6)	Total Noncash Income (3+4+6) (7)	Final Income 1: Health and Education Only (2+5) (8)	Final Income 2: All Noncash Benefits (2+7) (9)
I. Amounts in National Currency								
Australia (1981–82)	14,699	948	1,124	2,072	na	na	16,741	na
Canada (1981)	21,505	1,631	1,537	3,168	2,820	5,988	24,673	27,498
Netherlands (1983)	31,377	2,502	3,037	5,539	1,800	7,339	36,916	38,716
Sweden (1981)	64,283	5,399	8,653	14,052	3,717	17,769	78,335	82,052
U.K. (1979)	5,290	638	509	1,147	na	na	6,437	na
U.S. (1979)	14,338	1,091	774	1,865	508	2,373	16,203	16,711
West Germany (1981)	31,302	1,573	2,497	4,070	2,626	6,696	35,372	37,998
II. As Percent of Disposable Income								
Australia	100	6.5	7.7	14.1	na	na	114.1	na
Canada	100	7.6	7.1	14.7	13.1	27.8	114.7	127.9
Netherlands	100	8.0	9.7	17.7	5.7	23.4	117.7	123.4
Sweden	100	8.4	13.5	21.9	5.8	27.6	122.0	127.6
U.K.	100	12.1	9.6	21.7	na	na	121.7	na
U.S.	100	7.6	5.4	13.0	3.5	16.6	113.0	116.6
West Germany	100	5.0	8.0	13.0	8.4	21.4	113.0	121.4
Simple Average[a]	100	7.9	8.7	16.6	7.3[b]	23.4[b]	116.6	123.4[b]

[a]Simple average is sum divided by the number of countries with each type of income.
[b]Averaged over five countries.

TABLE 3

EFFECT OF NONCASH INCOME (EDUCATION AND HEALTH ONLY) ON LIVING STANDARDS: NET BENEFITS AS A PROPORTION OF OVERALL AVERAGE INCOME BY FAMILY TYPE AND COUNTRY

Family Type	Country						
	Australia	Canada	Netherlands	Sweden	U.K.	U.S.	West Germany
I. Disposable Income							
Families with Children							
a. Nonaged couples	119	119	115	159	122	126	125
b. Nonaged single parents	50	58	69	99	71	55	93
c. Others[a]	163	151	127	128	176	146	149
Elderly[b]							
a. Single person	37	42	56	56	31	41	50
b. Couple	66	80	82	100	58	87	87
Nonaged without Children							
a. Single	60	59	58	68	58	61	65
b. Couple	117	119	118	140	120	125	119
c. Other[c]	154	135	120	na	135	135	139
II. Final Income 1: Health and Education Only							
Families with Children							
a. Nonaged couples	125	126	121	167	137	133	131
b. Nonaged single parents	61	71	79	114	91	70	100
c. Others[a]	170	158	147	153	176	158	159
Elderly[b]							
a. Single person	39	47	56	69	33	43	48
b. Couple	68	84	84	111	57	86	86
Nonaged without Children							
a. Single	55	53	51	59	52	55	60
b. Couple	108	108	104	124	104	114	112
c. Other[c]	147	126	115	na	119	126	133
III. Difference (II-I)							
Families with Children							
a. Nonaged couples	6	7	6	8	15	7	6
b. Nonaged single parents	11	13	10	15	20	15	7
c. Others[a]	7	7	20	24	0	12	10
Elderly[b]							
a Single person	2	5	0	13	2	2	−2
b. Couple	2	4	2	11	−1	−1	−1
Nonaged without Children							
a. Single	−5	−6	−7	−9	−6	−6	−5
b. Couple	−9	−11	−14	−16	−16	−11	−7
c. Other[c]	−7	−9	−5	na	−16	−9	−6

[a]Other families with children include those with at least one parent over age 65 or children living with more than three adults.

[b]Elderly are families with head or spouses over age 65.

[c]Other families without children include those with three or more adults.

TABLE 4

EFFECT OF NONCASH INCOME (EDUCATION, HEALTH AND HOUSING) ON LIVING STANDARDS: NET BENEFITS AS A PROPORTION OF OVERALL AVERAGE INCOME BY FAMILY TYPE AND COUNTRY

Family Type	Country						
	Australia	Canada	Netherlands	Sweden	U.K.	U.S.	West Germany
I. Disposable Income							
Families with Children							
a. Nonaged couples	119	119	115	159	122	126	125
b. Nonaged single parents	50	58	69	99	71	55	93
c. Others[a]	163	151	127	128	176	146	149
Elderly[b]							
a. Single person	37	42	56	56	31	41	50
b. Couple	66	80	82	100	58	87	87
Nonaged without Children							
a. Single	60	59	58	68	58	61	65
b. Couple	117	119	118	140	120	125	119
c. Other[c]	154	135	120	na	135	135	139
II. Final Income 1: Health and Education Only							
Families with Children							
a. Nonaged couples	na	125	122	166	na	131	133
b. Nonaged single parents	na	72	77	116	na	71	96
c. Others[a]	na	157	149	152	na	156	160
Elderly[b]							
a. Single person	na	49	55	70	na	47	49
b. Couple	na	89	83	110	na	89	86
Nonaged without Children							
a. Single	na	51	50	61	na	55	59
b. Couple	na	109	104	122	na	114	112
c. Other[c]	na	128	115	na	na	126	135
III. Difference (II-I)							
Families with Children							
a. Nonaged couples	na	6	7	7	na	5	8
b. Nonaged single parents	na	14	8	17	na	16	3
c. Others[a]	na	6	22	24	na	10	11
Elderly[b]							
a Single person	na	7	−1	14	na	6	−1
b. Couple	na	9	1	10	na	2	−1
Nonaged without Children							
a. Single	na	−8	−8	−7	na	−6	−6
b. Couple	na	−10	−14	−18	na	−11	−7
c. Other[c]	na	−7	−5	na	na	−9	−4

[a]Other families with children include those with at least one parent over age 65 or children living with more than three adults.

[b]Elderly are families with head or spouses over age 65.

[c]Other families without children include those with three or more adults.

For the most part, noncash benefits from education and health are equalizing, increasing the income share at the bottom and decreasing it at the top (Table 5). Effects are largest by far in Germany, followed by the U.K. and Canada. Effects are least in the U.S. and even slightly disequalizing in Sweden at the top of the distribution. The rank order of nations in terms of the income shares of the lowest quintile are unaffected by the addition of health and education benefits with the exception of Germany which jumps to the highest with Sweden second. In all nations, the bottom quintile does better with noncash benefits included. The U.S. still has the lowest share for the bottom quintile, but it is now much closer to Australia (second lowest) than before. Effects on the top quintile are generally small except in Germany. Here rank order changes slightly, with Germany again becoming the most equal (lowest upper quintile share), and Sweden moving to second most equal. The rest of the rankings remain intact.

The addition of housing benefits (Table 6) has a substantial impact in Germany, greatly reducing the size of the gains in distributional equality made by health and education. Noncash benefits are still equalizing in West Germany, but not nearly so much as they were when only health and education were counted. No doubt this is in part due to the relatively small fraction of German households which are home owners (35 percent). In contrast, the addition of housing benefits is decidedly more equalizing in the Netherlands, Sweden and Canada. In these nations, the housing effects reinforce those of health and education. The Netherlands now has the most equal final income distribution with the highest bottom quintile share and the lowest top quintile share. Sweden is second and Germany in the middle. The U.S. remained most unequal with Canada second. The large amounts of noncash housing benefit in Canada therefore, seemed to have only a modest import on their overall inequality rankings.

Clearly, the relationship between the relative size of benefits and their distributional impact is complex. The U.S. has the smallest total expenditure, yet has a larger impact than in Sweden. Sweden, on the other hand, has the largest noncash sector but the overall least distributional effect. Canada and the Netherlands tend to have the largest equalizing impacts from all three types of noncash benefits combined. West German housing benefits counteract the strong equalizing impact of health and education, leaving only a modest net impact on distribution.

Poverty

Measuring Poverty: Methods

Of the many dimensions of comparative economic well-being that we are in a position to investigate comparatively on the basis of noncash income, perhaps their poverty impact is most important. The effect of noncash income on living standards and on the distribution of final income have been presented. Neither of these made adjustments for family size or need. Poverty measurement must, however, address these issues.

The first step in this exercise is to select a poverty line. We decided against the use of an absolute poverty line, partly on the grounds that the concept itself conveys an unwarranted objectivity, but also because it would result in levels of

Quintile Share of Income

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TABLE 5

EFFECTS OF NONCASH INCOME ON THE OVERALL INCOME DISTRIBUTION BY COUNTRY

Quintile Share of Income	Country						
	Australia	Canada	Netherlands	Sweden	U.K.	U.S.	West Germany
	I. Disposable Income[a]						
Lowest	5.4	5.4	6.9	8.3	5.9	4.7	7.0
Second	11.7	12.0	13.2	13.2	11.4	11.3	13.1
Middle	18.0	18.2	18.0	17.6	18.2	17.7	17.7
Fourth	24.9	25.0	23.7	24.3	25.0	25.5	24.1
Highest	40.0	39.4	38.2	36.7	39.5	4.7	38.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	II. Final Income 1:[b] Health, Education Only						
Lowest	5.7	6.1	7.6	8.6	6.2	5.3	10.2
Second	11.8	12.4	13.2	13.0	11.6	11.6	15.7
Middle	17.9	18.4	18.3	17.2	18.6	17.7	18.8
Fourth	24.9	25.0	23.8	24.4	25.4	25.4	22.7
Highest	39.7	38.1	37.2	36.8	38.2	40.0	32.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	III. Difference (II-I)						
Lowest	0.3	0.7	0.7	0.3	0.3	0.6	3.2
Second	0.1	0.4	0.0	−0.2	0.2	0.3	2.6
Middle	−0.1	0.2	0.3	−0.4	0.4	0.0	1.1
Fourth	0.0	0.0	0.1	0.1	0.4	−0.1	−1.4
Highest	−0.3	−1.3	−1.0	0.1	−1.3	−0.7	−5.5

[a]Disposable income includes all forms of cash income net of income and payroll taxes.
[b]Final income 1 adds the market value of health and education benefits to disposable income.

poverty which differed according to the national standard of living as well as to the distribution of income within each nation. It would, thus, conflict with the widely held view among scholars working in this arena that a poverty standard cannot be established independently of the economic and social context within which needs arise and are defined (Smeeding, Rainwater and O'Higgins, 1990).

We, thus, regard the choice of a relative poverty measure as much more defensible. Here we pick a poverty line which is equal to the same fraction of the median level of living (median disposable cash income after adjustment for differences in need using the equivalence scale) in each nation. The use of this relative poverty line implies that differences in living standards across countries are irrelevant to the measurement of national poverty rates. The choice of a relative poverty measure does, however, make the level of poverty in a country dependent on the distribution of resources (adjusted cash or cash plus noncash income) within each nation. We have chosen to measure the incidence of poverty as the percentage of all families with adjusted incomes (cash or cash plus noncash) below half of median adjusted income, even though there is nothing special about half as compared to 40 percent or 60 percent or some other percentage of adjusted median income. Our basic poverty standard, thus, contains an explicitly subjective element which we accept as inevitable in any exercise such as this.[12]

[12]We will, however, test the sensitivity of our results using alternative poverty lines set at 75 percent and 125 percent of the half median disposable income poverty standard.

TABLE 6

EFFECTS OF NONCASH INCOME ON THE OVERALL INCOME DISTRIBUTION BY COUNTRY

Quintile Share of Income	Country						
	Australia	Canada	Netherlands	Sweden	U.K.	U.S.	West Germany
	I. Disposable Income[a]						
Lowest	5.4	5.4	6.9	8.3	5.9	4.7	7.0
Second	11.7	12.0	13.2	13.2	11.4	11.3	13.1
Middle	18.0	18.2	18.0	17.6	18.2	17.7	17.7
Fourth	24.9	25.0	23.7	24.3	25.0	25.5	24.1
Highest	40.0	39.4	38.2	36.7	39.5	40.7	38.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	II. Final Income 2:[b] Health and Education, and Housing						
Lowest	na	6.2	9.3	8.9	na	5.9	7.2
Second	na	12.4	14.6	13.3	na	11.9	12.8
Middle	na	18.5	18.3	17.4	na	17.9	17.7
Fourth	na	25.4	23.1	24.1	na	25.1	24.8
Highest	na	37.6	34.7	36.3	na	39.2	37.6
Total	na	100.0	100.0	100.0	na	100.0	100.0
	III. Difference (II-I)						
Lowest	na	0.8	2.4	0.6	na	1.2	0.2
Second	na	0.4	1.4	0.1	na	0.6	−0.3
Middle	na	0.3	0.3	−0.2	na	0.2	0.0
Fourth	na	0.4	−0.6	−0.2	na	−0.4	0.7
Highest	na	−1.8	−3.5	−0.4	na	−1.5	−0.5

[a]Disposable income includes all forms of cash income net of income and payroll taxes.

[b]Final income adds the market value of health, education and housing benefits to disposable income.

These choices still leave unresolved the issue of whether the same poverty standard should be used to measure poverty on the basis of cash income alone and according to the sum of cash and noncash income. There are good arguments both ways here. It can be argued to be most appropriate to define the poverty line on the same basis as that used to define income itself. Thus, a cash poverty line should be used in conjunction with cash income, but when noncash income is included in the income measure, the poverty line should be re-defined accordingly so as to comprise cash and noncash elements.[13] The main disadvantage of this approach is that it is difficult to unravel the impact of noncash income on poverty when the poverty line itself is also changing.

Since our interest is primarily in estimating the impact of noncash income on poverty, we have rejected this approach in favor of one where the poverty line is fixed independently of the definition of income. We thus use a poverty line based on median adjusted disposable cash income throughout our analysis. This allows us to see what difference the inclusion of noncash income makes to the incidence of relative poverty when a common poverty standard is used. This approach is no different in principle from that used in studies which estimate the effects of government taxes and transfers on poverty by using a common (cash

[13]An obvious contender would be to set the poverty line equal to one-half of median adjusted final income rather than median adjusted disposable income.

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Measuring Poverty: Results

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income) poverty standard to compare poverty estimates based on pre-tax, pre-transfer (cash) income and post-tax, post-transfer (cash) income.[14]

Regardless of the choice of poverty line, the issue of how noncash income is valued is very important. As explained earlier, we value noncash income at its market value or cost to the government. We therefore assume that £800 (or $2,500) of education benefits for a family with one child is equal to an £800 (or $2,500) transfer in cash. Since low income families with few cash resources might choose to spend noncash transfers differently if they were given in cash instead of in education outlays or the cost of medical insurance, the decision to count them in income at their government cost or market value may lead to an overestimate of the true level of well-being of such families. Stated differently, a family offered a choice between £800 of education expenses or a lesser amount of cash income (e.g., £600) might prefer the cash. If so, the £800 imputed value of the noncash transfer overstates the true increase in the economic welfare of the family. For this reason, differences between the estimates of poverty before and after the receipt of noncash income should be treated as the maximum impact of noncash income. To the extent that families would value these benefits at less than market cost, their real incomes and hence, their poverty rates will change by less than is estimated here.

In computing the effect of noncash income on poverty, we only present results based on health and education or final income 1. The addition of imputed rent for homeowners is thus not captured in the following analyses.

Measuring Poverty: Results

Since we have chosen a common cash income based poverty line, the effect of adding in noncash income can only be to reduce poverty. And, in fact, this is what we find in Table 7. However, the results of adding in health and education benefits varies across the seven nations studied. In terms of the absolute reduction in poverty, noncash income has the biggest impact in the U.K. followed by Canada, Australia, and the U.S. The impact in the remaining three countries—West Germany, the Netherlands, and Sweden—is much smaller, partly because poverty was already much lower in these three countries. Since the poverty rates were initially highest in the first group of four countries, these differences are less marked when expressed in proportionate terms, but they nonetheless, remain.

The only significant change in the ranking of national poverty rates occurs in the U.K., where noncash income has the largest (absolute and proportional) impact on poverty. The ranking of all other countries stays much the same whether noncash income is included or not. The U.S. has the lowest ranking according to both income measures, and looks worse relative to the other countries on the basis of final income than on the basis of disposable income.

When poverty is measured using final income, the distinction between the four European countries and the three remaining larger and younger, former colonial nations becomes more marked. Within these European nations, there is

[14]See, for example the poverty studies by Smeeding, Torrey and Rein (1988). A common (cash-based) poverty standard was also used by Paglin (1980) and by the U.S. Bureau of the Census (1982), in their calculations of the impact of noncash benefits on poverty.

TABLE 7

FAMILY POVERTY RATES IN SEVEN NATIONS BASED ON ADJUSTED DISPOSABLE INCOME AND FINAL INCOME I

Country (Year)	Adjusted Disposable Cash Income		Adjusted Final Income I		
	Amount[a]	National Rank	Amount[b]	National Rank	Difference[c]
Australia (1981-82)	15.1	2.5	7.4	2	7.7
Canada (1981)	15.1	2.5	7.2	3	7.9
Netherlands (1983)	6.6	6	4.7	5	1.9
Sweden (1981)	5.6	7	4.3	6.5	1.3
U.K. (1979)	13.5	4	4.3	6.5	9.2
U.S. (1979)	18.5	1	12.1	1	6.4
West Germany	7.5	5	5.4	4	2.1

Note: Poverty rates are calculated as the percentage of families with adjusted incomes less than half of national median adjusted disposable cash income.

[a]Adjusted disposable cash income is after-tax cash income adjusted for differences in family size using the budget studies program equivalence scale.

[b]Adjusted final income is adjusted disposable cash income plus the estimated market value of in-kind benefits in the form of education and health care.

[c]The difference between the poverty rate based on cash income only and the poverty rate based on cash plus noncash income.

little variation in overall poverty, the incidence of poverty being between 4 percent and 5 percent. In the former colonies, in contrast, poverty ranges from 7 percent to 12 percent—far higher overall than in Europe and with a much more diverse pattern. It is interesting to note that the lowest poverty rate in the non-European countries after the inclusion of noncash income (7.2 percent in Canada) is about the same as the highest poverty rate in continental Europe before noncash income is included (7.5 percent in West Germany). This is a dramatic indication of the extent of the differences between relative poverty rates in the two groupings of countries included in this study.

Differences in the level of poverty and the impact of noncash income are shown by family type in Table 8. We begin by noting the wide variation in cash income based poverty rates across countries. In no country do we find nonelderly couples with or without children, to have double digit poverty rates. In contrast, the poverty rate for nonaged single people exceeds 10 percent in all countries, while single elderly people have the highest poverty rates almost everywhere except in the Netherlands and Sweden. In all countries except the Netherlands and Sweden, the risk of poverty is much higher in families (with or without children) with only a single adult member than in families with two (or more) adults present. Even in the Netherlands and Sweden, single adult families have among the highest poverty rates. The highest poverty rates of all (well over 40 percent) are found among single parent families in Australia, Canada, and the U.S., and poverty rates for single parent families are well above the national average—two to three times the national poverty rate—in all countries except the Netherlands, Sweden and West Germany.

The inclusion of noncash income causes families with children to experience large reductions in poverty in all nations, due mainly to the impact of education

benefits. The effects of health care benefits are mainly beneficial to the elderly. The biggest impact of noncash income in Australia, Canada, and the U.K. is on poverty among single elderly persons living alone, and on elderly couples in the U.K. There is also a large impact on single elders in the U.S., but it is less than the effect of noncash income on single nonaged parents—or so-called lone parents. Here we also find double digit reductions in their poverty in Australia, Canada and the U.K. The impact of noncash income on these two groups (single parents and the single elderly) causes their poverty rates to decline substantially in absolute terms and, in the latter case, relative to the national poverty rate also. This leaves

TABLE 8

FAMILY POVERTY RATES IN SEVEN NATIONS BASED ON ADJUSTED DISPOSABLE INCOME AND FINAL INCOME 1 BY FAMILY TYPE

	Families With Children			Elderly[a]		Nonaged without Children			
Country	Nonaged Couple	Nonaged Single Parent	Other[b]	Single Persons	Couple	Single Persons	Couple	Other[c]	Total
				I. Adjusted Disposable Cash Income[d]					
Australia	8.8	54.4	7.0	46.1	7.7	22.1	5.1	3.2	15.1
Canada	8.9	43.9	8.4	41.8	8.9	22.3	5.9	6.7	15.1
Netherlands	1.6	5.4	19.4	4.9	1.4	15.7	0.9	13.1	6.6
Sweden	3.2	5.4	0.6	1.1	0.3	12.1	2.4	—	5.6
U.K.	3.6	26.3	1.1	50.3	23.5	18.8	2.5	2.8	13.5
U.S.	8.8	48.9	16.7	45.2	17.0	22.4	5.7	9.7	18.5
West Germany	1.3	9.8	4.2	18.1	8.8	11.4	2.2	6.3	7.5
				II. Adjusted Final Income 1:[e] Health and Education					
Australia	2.6	21.0	2.2	8.2	4.9	18.7	4.1	1.6	7.4
Canada	1.5	18.2	1.0	9.4	1.3	20.5	4.3	2.4	7.2
Netherlands	0.4	0.0	9.6	4.9	1.0	15.7	0.8	8.7	4.7
Sweden	0.8	2.8	0.0	0.0	0.3	11.1	1.4	—	4.3
U.K.	0.1	0.4	0.2	18.6	1.1	13.2	1.1	1.0	4.3
U.S.	3.4	21.1	3.9	33.9	8.9	21.1	5.3	7.6	12.1
West Germany	0.4	3.3	0.7	14.6	4.4	10.0	1.7	4.1	5.4
				III. Difference[f]					
Australia	6.2	33.4	4.8	37.9	2.8	3.4	1.0	1.6	7.7
Canada	7.4	25.7	7.4	32.4	7.6	1.8	1.6	4.3	7.9
Netherlands	1.2	5.4	9.8	0.0	0.4	0.0	0.1	4.4	1.9
Sweden	2.4	2.6	0.6	1.1	0.0	1.0	1.0	—	1.3
U.K.	3.5	25.9	0.9	31.7	22.4	5.6	1.4	1.8	9.2
U.S.	5.4	27.8	12.8	11.3	8.1	1.3	0.4	2.1	6.4
West Germany	0.9	6.5	3.5	3.5	4.4	1.4	0.5	2.2	2.1

Note: Poverty rates are calculated as the percentage of families with adjusted incomes less than half of national median adjusted cash disposable income.

[a]The elderly are families with the head or spouse aged over age 65.

[b]Other families with children include those with at least one parent over age 65 or children living with more than two adults.

[c]Other families without children include those with three or more adults.

[d]Adjusted disposable cash income is after-tax cash income adjusted for differences in family size using the budget studies program equivalence scale.

[e]Adjusted final income 1 is adjusted disposable cash income plus the estimated value of in-kind benefits in the form of education and health care.

[f]The difference between the poverty rate based on cash income only and the poverty rate based on cash plus noncash income.

single nonelderly adults as the group who miss out most from the benefits of noncash income, having high poverty rates which are least impacted by education benefits and health benefits.

Sensitivity Analyses

When relatively large numbers of families have incomes close to the poverty line, small changes in the level of the poverty line can have a large impact on estimates of the proportion of the population who are poor. One way to address this issue is to use alternative indexes of the depth of poverty. The "poverty gap" index, for example, is less sensitive than the poverty rate to small changes in the poverty line. An alternative approach to the sensitivity issue is to examine it directly by retaining the same poverty rate measure but to consider changes in the level of the poverty line itself. We chose this latter method.

By recalculating poverty estimates for alternative poverty lines set above and below the benchmark poverty line of 50 percent of median adjusted disposable cash income, the extent of income clustering in the region of the poverty line can be ascertained and its significance for our conclusions assessed. We have, thus, recalculated some of the earlier estimates using poverty lines set 25 percent below and 25 percent above our benchmark poverty line.[15] As before, these poverty lines are used to estimate poverty before and after the inclusion of noncash income (final income 1) in the income measure.

Table 9 presents the results by family type. At the lower poverty line, the pattern of poverty indicated by our benchmark poverty line remains virtually unchanged. In most countries, poverty is highest among nonelderly single people, single parent families, and single elderly people, in that order. At the higher poverty line, poverty amongst the elderly rises sharply, particularly among single elderly people, except in the Netherlands and Sweden where overall poverty among the elderly remains below the national average. The poverty rates of most non-elderly family types remain unchanged relative to the national poverty rate as the poverty line is varied.

As the poverty line varies, the ranking of countries by the overall final income poverty rate also undergoes several noticeable changes. At our benchmark poverty line, the total poverty rate is lowest in Sweden and the U.K., followed by the Netherlands, West Germany, Canada, Australia, and the U.S., in that order. At the lower poverty line, the U.K. clearly has the lowest poverty rate, while the rankings of Australia and West Germany improve and those of the Netherlands and Sweden worsen. At the higher poverty line, Sweden and the Netherlands have the lowest poverty by a considerable margin, while the U.K.'s ranking drops markedly. These changes in poverty rankings mean that comparisons across our seven countries are sensitive to where the poverty line is set, a point noted for cash income based estimates of poverty by Mitchell (1991). The U.S. is the only country whose ranking is unchanged for all three poverty lines. It has the highest poverty in all cases.

[15]These alternative poverty lines thus corresponds to 37.5 percent and 62.5 percent of median adjusted disposable cash income, respectively.

Country	Families with Chi: Nonaged Couple	Nonaged Single Parent
	I. Poverty Li	
Australia	1.5	9.5
Canada	0.9	9.7
Netherlands	0.3	0.0
Sweden	0.3	1.5
U.K.	0.1	0.0
U.S.	1.7	13.1
West Germany	0.2	2.0
	II. Benchmark Poverty Line =	
Australia	2.6	21.0
Canada	1.5	18.2
Netherlands	0.4	0.0
Sweden	0.8	2.8
U.K.	0.1	0.4
U.S.	3.4	21.1
West Germany	0.4	3.3
	III. Poverty Li	
Australia	5.6	38.4
Canada	3.5	31.3
Netherlands	0.8	3.5
Sweden	1.5	5.8
U.K.	0.4	1.8
U.S.	6.5	31.3
West Germany	0.6	7.0

Note: Poverty rates are calculated half of national median adjusted cash d.

[a]The elderly are families with the h

[b]Other families with children includ with more than two adults.

[c]Other families without children in

SUMMA

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The impact of noncash in Education accrues to families fits—though received by all—inclusion of noncash income th hence average living standards the elderly. In contrast, nonelde

TABLE 9

SENSITIVITY OF FAMILY POVERTY RATES BASED ON ADJUSTED DISPOSABLE INCOME PLUS HEALTH AND EDUCATION BENEFITS (FINAL INCOME 1) BY FAMILY TYPE

Country	Families with Children			Elderly[a]		Nonaged without Children			Total
	Nonaged Couple	Nonaged Single Parent	Other[c]	Single Persons	Couple	Single Persons	Couple	Other[c]	
I. Poverty Line = 0.75 × Benchmark Poverty Line									
Australia	1.5	9.5	1.4	1.3	1.9	10.3	2.2	0.5	3.7
Canada	0.9	9.7	0.5	1.5	0.4	13.9	2.0	0.8	4.0
Netherlands	0.3	0.0	6.3	4.4	0.5	14.0	0.5	6.9	3.8
Sweden	0.3	1.5	0.0	0.0	0.2	7.5	0.6	—	2.8
U.K.	0.1	0.0	0.0	0.7	0.0	4.2	0.1	0.4	0.7
U.S.	1.7	13.1	1.7	12.7	3.0	14.1	2.8	4.6	6.6
West Germany	0.2	2.0	0.4	4.3	1.9	4.9	1.3	1.0	2.2
II. Benchmark Poverty Line = 0.50 × Median Adjusted Disposable Cash Income									
Australia	2.6	21.0	2.2	8.2	4.9	18.7	4.1	2.2	7.4
Canada	1.5	18.2	1.0	9.4	1.3	20.5	4.3	2.4	7.2
Netherlands	0.4	0.0	9.6	4.9	1.0	15.7	0.8	8.7	4.7
Sweden	0.8	2.8	0.0	0.0	0.3	11.1	1.4	—	4.3
U.K.	0.1	0.4	0.2	18.6	1.1	13.2	1.1	1.0	4.3
U.S.	3.4	21.1	3.9	33.9	8.9	21.1	5.3	7.6	12.1
West Germany	0.4	3.3	0.7	14.6	4.4	10.0	1.7	4.1	5.4
III. Poverty Line = 1.25 × Benchmark Poverty Line									
Australia	5.6	38.4	3.2	58.2	10.1	28.8	7.4	3.2	16.0
Canada	3.5	31.3	2.9	32.2	5.6	27.9	6.4	5.9	12.7
Netherlands	0.8	3.5	13.4	5.6	1.4	20.4	1.3	11.6	6.4
Sweden	1.5	5.8	0.0	0.4	0.3	15.4	2.8	—	6.3
U.K.	0.4	1.8	0.6	60.1	24.3	22.4	3.4	5.2	14.0
U.S.	6.5	31.3	7.2	51.2	17.7	29.2	7.8	10.8	18.4
West Germany	0.6	7.0	1.0	29.8	10.4	18.8	2.5	7.3	10.6

Note: Poverty rates are calculated as the percentage of families with adjusted incomes less than half of national median adjusted cash disposable income.

[a]The elderly are families with the head or spouse aged over age 65.

[b]Other families with children include those with at least one parent over age 65 or children living with more than two adults.

[c]Other families without children include those with three or more adults.

SUMMARY AND CONCLUSIONS

The main aim of this paper has been to summarize the impact of noncash income—health and education benefits, and imputed rent—on living standards, income distribution and poverty. Although our valuation methods are open to criticism and may, on average, overstate the value of noncash benefits for those on low (cash) incomes, the results are nonetheless interesting and informative.

The impact of noncash income is best viewed within a life cycle context. Education accrues to families with school-age children, while health care benefits—though received by all—are disproportionately high for the elderly. The inclusion of noncash income thus has the largest impact on the final incomes, and hence average living standards and poverty rates, of families with children and the elderly. In contrast, nonelderly single people, particularly young single people,

and nonaged families without children find their relative income positions are worsened by the inclusion of noncash income. Since single elderly persons and single parents on average have low living standards, these benefits have a large impact on their well-being.

Housing benefits, in contrast, have benefits which are difficult to predict. We show only their impact on living standards and inequality, and here for only five of the seven nations. Patterns of home ownership are likely to benefit the elderly and families with children less than they benefit other groups, though other factors, (e.g., the percent of households who are owners) may be at work as well.

In all cases, nonaged single persons do least well. They are less likely to be homeowners; they do not have school children; and, their health benefits (and needs) are only average—somewhere between the lower benefits (and needs) of children and the higher ones of the aged.

The distributional results were striking mainly because of two factors. The strong equalizing impact of noncash benefits in all countries, and also then, the lack of a large differential net impact on country ranking (with only the exception of Germany where health and education inequality reductions were matched by the disequalizing effect of housing benefits).

APPENDIX TABLE A-1

FREQUENCY DISTRIBUTION OF FAMILIES BY TYPE

	Country						
	Australia	Canada	West Germany	Netherlands	Sweden	U.K.	U.S.
Families with Children							
Nonaged couples	28	27	23	28	20	29	23
Nonaged single parents	4	5	2	3	4	3	6
Others[a]	7	9	7	9	0	7	9
Elderly[b]							
Single person	8	8	16	10	16	12	9
Couple	8	7	10	9	10	10	8
Nonaged without Children							
Single	21	20	18	12	34	12	21
Couple	14	14	14	17	15	15	14
Other[c]	10	11	10	12	na	12	10
Total	100	100	100	100	100	100	100

[a]Other families with children include those with at least one parent over age 65 or children living with more than two adults (children are age 17 or younger).

[b]Elderly are families with head or spouses over age 65.

[c]Other families without children include those with three or more adults, including adults 18 years old or over.

Previous research using the LIS database has shown that, on a cash income basis, poverty in the early eighties was higher among families with children than among the elderly (Smeeding, Torrey and Rein, 1988), and that these patterns changed little during the 1990s (Smeeding, 1992). Furthermore, when noncash benefits for food, housing and health care are counted, poverty among the elderly in the U.S. dropped enormously, further emphasizing the point that the elderly had been doing relatively well (U.S. Bureau of the Census, 1982). However, the

U.S. estimates do not take account of education benefits to the young. When they are so included, the differences between these groups drops dramatically. The two decades up to the 1980s had seen a decline in poverty among the elderly and increased poverty among families with children. These developments helped to fuel the generational equity debate in the U.S. and elsewhere (Preston, 1984).

Our results indicate that once both health benefits and education are counted, noncash income tends to even out fluctuations in the risk of poverty over the life cycle and although single nonaged people miss out relatively speaking, our results suggest that intergenerational inequities may be less than previous research has indicated. What is also clear, however, is that the U.S. is something of a polar case among the seven countries studied here. This suggests that findings for, and debates in, the U.S. do not necessarily apply to other nations. Each country has had to resolve questions of intergenerational equity using a combination of tax and transfer, cash and noncash subsidy programs. Those policies have clearly evened out life cycle income fluctuations in all countries, but this is not to suggest that equity tensions have all been resolved. That is essentially a national question which this kind of research cannot answer.

While different judgements on measuring and valuing noncash benefits might yield different findings, the basic results in this paper do not give rise to a pattern of national differences in poverty rates or income inequality which are markedly different from those which emerge from previous LIS research based on cash income alone (e.g., see O'Higgins, Schmaus and Stephenson, 1989). However, the inclusion of noncash income thus makes the distinction in poverty profiles between the four European countries and the three colonial nations in this study much more marked. Aside from this important finding, it appears that noncash income reinforces the redistributive impact of conventional (cash) tax-transfer mechanisms rather than acting to offset them in any major way.

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