# THE EFFECTS OF NET TRANSFERS ON LOW INCOMES AMONG NON-ELDERLY FAMILIES

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# INTRODUCTION

Equity issues feature prominently on the policy agenda in all OECD Member countries. The existence of progressive tax rates, various income maintenance programmes and complex social-safety nets demonstrate the willingness of societies to modify market outcomes through a certain degree of redistribution of incomes. A number of analyses in the 1980s (*e.g.* Saunders and Klau, in: OECD, 1985) have shown that these policy instruments might create unwanted side-effects on the incentive side. It is therefore important to assess whether social policy is in fact achieving its stated aims of alleviating low incomes.

This study examines the effects of net transfers – cash transfers minus income taxes – on low family incomes across 11 OECD countries which have quite different social regulations and provisions and different approaches towards social policy: Australia, Belgium, Canada, France, Germany, Ireland, the Netherlands, Noway, Sweden, the United Kingdom and the United States. Three additional countries – Austria, Luxembourg and Italy – are included in the analysis of indicators of low post-tax and transfer incomes. The analysis is based on micro data from the Luxembourg Income Study (LIS).[1] Two important caveats should be noted at the outset:

- First, the period of observation refers to a single year in the mid- to end-1980s, and therefore the results reported in this paper may not correspond to the current situation with regard to income distribution and levels of poverty in these countries.
- Second, although the underlying income data have been standardised to be as comparable as possible, there still remain differences in definitions and concepts (see below). The study will therefore focus on relative changes in several low-income indicators rather than on comparisons of absolute levels.

The study covers the sub-population of non-elderly families. Analyses comparing income micro-data for a year in the early 1980s with a year in the mid- to end-1980s across countries (*e.g.* Rainwater and Smeeding, 1991) show some shift in the incidence of poverty from the elderly to the non-elderly in many countries. The study pays particular attention to families with many children and single parents. A separate section will examine child poverty. These socio-demographic groups have been shown in recent studies to be particularly vulnerable to insufficient resources.

# I.   CONCEPTUAL AND METHODOLOGICAL ISSUES

## A.   Definition of poverty and low income

The various approaches used in the literature to measure low incomes and poverty all have in common the establishment of a cut-off-line below which persons or families are considered to have inadequate income (low income cut-off-line) or to be poor (poverty line). Sometimes, poverty is defined in terms of household expenditure rather than income (*e.g.* EUROSTAT, 1990). This study uses low (disposable) income as an indicator for poverty because it focuses on the capacities of individuals and families to participate in the mainstream of their society rather than on their actual spending behaviour.

Poverty and low incomes can be defined in three different ways:

*i)* the absolute approach (or, as Hagenaars and de Vos, 1987, put it, "having less than an objectively defined absolute minimum");

*ii)* the relative approach ("having less *than* others");

*iii)* the subjective approach ("feeling *you do not* have enough *to* get along").

The adoption of a particular approach to define low income is not an academic question; the absolute number and also the structure of the population in poverty may vary considerably according to the method chosen.[2]

The absolute approach, which is the basis for most "official" definitions of low income, defines an absolute subsistence minimum in terms of basic needs (for food, clothing, housing, etc.) The aggregate cost of these goods and services then constitutes the low-income line.[3] The arbitrary nature of the choice as to what constitutes basic needs is the main disadvantage of this approach. And even if there is a consensus at the national level of what goods and services are basic, it is virtually impossible to construct a basket of products which are judged to be basic at an international level.

The relative approach tries to overcome these difficulties by defining incomes as low with respect to the incomes of the population as a whole, for example by setting a low-income line at a certain percentile of the income distribution. It thus takes into account the different levels of well-being within a society and how it changes over time. Relative measures also allow one to compare income situations across countries, because they are independent of a specific country's definition of basic needs. Traditionally, international comparative studies have made use of relative methods to determine low-income lines, *e.g.* EUROSTAT (1990), OECD (1982, 1994), and ILO (1978).

Both absolute and relative measures may be regarded as objective indicators of low income. By contrast, subjective measures of low income are based on public opinion surveys on income levels considered to be "just sufficient". Such measures thus avoid the problem of the arbitrary choice of basic needs made by experts. Initial research in Europe and the United States based on subjective measures suggests that the derived low-income levels lie, in general, above those

calculated with traditional absolute or relative measures (Deleeck and Van den Bosch, 1989; De Vos and Garner, 1989). The subjective approach appears quite attractive because the low-income level is defined by the concerned population itself. However, such surveys are very rare, and the precise formuiations of the questions on minimum income differ considerably. Thus, subjective standards may vary across time and, moreover, across countries. Therefore, while subjective approaches may provide useful methods to measure the low-income population in a particular country at a particular time, they are not for the time being suitable for comparative research.
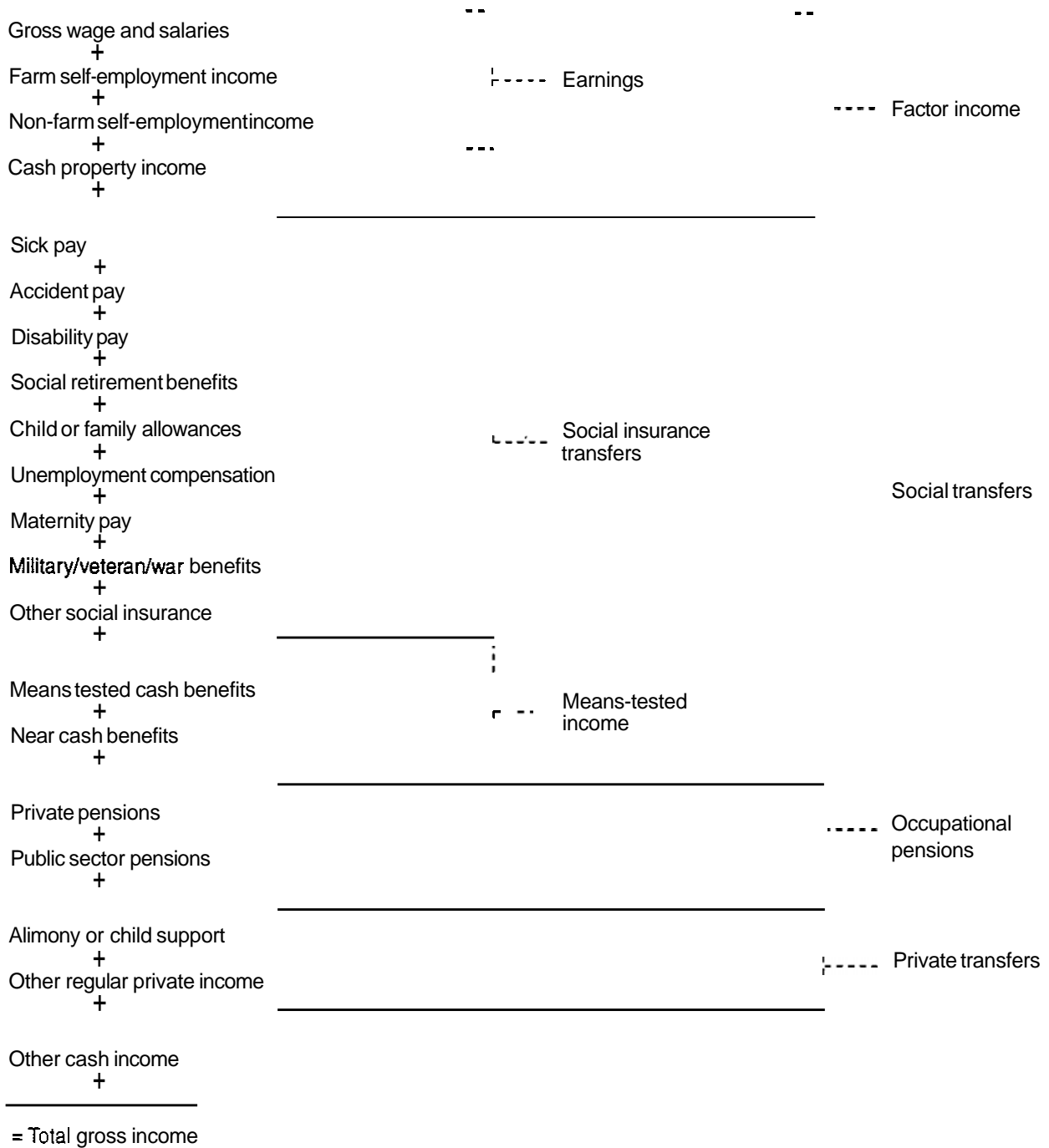
This study uses a relative approach, defining low incomes as a certain fraction of disposable income. As a reference point, the median income level is preferred to the mean income as it reflects better the most widely shared life style (*i.e.* the resources needed for it). As a reference distance, 50 per cent of the median income is proposed (this definition was first suggested by Fuchs, 1967). In order to test the sensitivity of results, two additional distance levels will be presented: **40** per cent and 60 per cent of the median income.


## B.   The income concept


The income concept used for the analysis in sections II through IV is that of annual family income, adjusted for family size (the adjustment procedure is discussed in the following section). Total gross income of a family is defined as market income plus public social transfers and private transfers such as child alimony. Market income includes earnings, property income in cash, occupational and private pensions. Disposable income is defined as gross income minus income tax and compulsory social security contributions. Figure 1 illustrates the relations between the different aggregates.[4]

All income aggregates refer to money income, including near-cash income elements such as food stamps. This means, that any income in kind – particularly imputed money values for education, health, housing, care and household production – is excluded from the estimates. An analysis of seven OECD countries included in the LIS data base suggests that imputed values for education and health constitute between 13 per cent (United States, Germany) and 22 per cent (Sweden, United Kingdom) of disposable income (Smeeding *et al.,* 1993). In all countries, the percentage of these incomes in kind is particularly high for non-aged single parents and families with children. Preliminary estimates of money values for non-market household production (Chadeau, 1992) show that these are high relative to GDP and suggest that indicators of income inequality would be reduced, if imputed values of income derived from household production were added to money incomes. Also, the complex issue of intra-family transfers cannot be tackled sufficiently with the available micro data. Commonly, it is assumed that individuals share total family resources equally.[5] This needs to be taken into account when interpreting the results in sections II, III and IV.

# Figure 1. **Structure of** income **variables**

Gross wage and salaries
+
Farm self-employment income                    ┊---- Earnings
+
Non-farm self-employment income                                              ---- Factor income
+
Cash property income
+
_____

Sick pay
+
Accident pay
+
Disability pay
+
Social retirement benefits
+
Child or family allowances             ┊----- Social insurance
+                                             transfers
Unemployment compensation                                          Social transfers
+
Maternity pay
+
Military/veteran/war benefits
+
Other social insurance
+
_____

Means tested cash benefits
+                                  ┊-- Means-tested
Near cash benefits                     income
+
_____

Private pensions                                                ----- Occupational
+                                                                     pensions
Public sector pensions
+
_____

Alimony or child support
+                                                               ┊---- Private transfers
Other regular private income
+
_____

Other cash income
+
_____
= Total gross income

Market income = Factor income + occupational pensions.
Disposable income = Gross income − mandatory contributions for self-employed − income tax − mandatory
    employee contributions.

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## C. Adjustment of incomes for family size and definition of the reference population

One can assume that, due to economies of scale, the needs of a family for resources grow with each additional member, but not proportionally. With the help of equivalence scales, each family type in the population is assigned a value in proportion to its needs. When family size is used as the sole determinant for adjustment: equivalence scales can be represented by one single parameter, the equivalence elasticity, *i.e.* the power by which needs increase as family size increases:

$$N = S^e, \text{ or}$$

$$e = \frac{\ln(N)}{\ln(S)}, \ 0 \leq e \leq 1$$

where   e: equivalence elasticity

N: economic need (proxied by disposable income/economic well-being)

S: family size

The equivalence elasticity, e, can thus range from 0 (when unadjusted family disposable income is taken as the income measure) to 1 (when *per capita* family income is used). The smaller the value for e, the higher are the assumed economies of scale.

In selecting a particular equivalence scale, it is important to be aware of the potential effects on the size of the low-income population, its composition, and the relative positions of countries in international comparisons. The research of Buhmann *et al.* (1988) suggests that, in general, adjusted low-income rates are lower at higher elasticities.' As for the composition of the low-income population, almost by definition, the larger the elasticity, the greater the share of large families (thus children) among the low-income population and the smaller the share of single persons (thus elderly) and older married couples. However, at the same time the ranking of countries in cross-country comparison is, in general, not affected by the use of different equivalence scales.

Buhmann *et al.* (1988) and OECD (1994) review a large inventory of some 50 equivalence scales. Scales derived by self-assessment from household surveys imply relatively low values for e (between 0.2 and 0.4) and typically underestimate the costs of additional family members. "Statistical" equivalence scales – for example the scale suggested in OECD Social Indicators (1982)[8] – have relatively high elasticities (around 0.7). As the following analysis will focus on public policy actions to alleviate poverty, a "policy-based" equivalence scale with an elasticity of 0.55 will be used to adjust family incomes. Such a scale represents values which are inherent in many social programmes of OECD Member countries, and also comes quite close to equivalence values found in several surveys on household consumption expenditures.

Non-elderly families have been chosen as the reference population in sections II and III. These are defined as families in which the head is aged under 60. Unfortunately, data for Italy and the Netherlands are only available on a household rather than a family basis. **Also,** a particular unit definition for Sweden based on tax units is likely to result in overestimates of low incomes for this country.[9] For considerations on child poverty in section IV, estimates are based on the reference population of children. This means that low-income rates are calculated by defining the number of children living in low-income families with respect to the total population of children. Children are defined according to the classification of the LIS data sets, *i.e.* as unmarried persons under the age of 18 living in the family.

## D. The measurement of low incomes and poverty

### 1. Head-count ratios, low-income gap and low-income distribution

A commonly used low-income measure is the head-count ratio, *i.e.* the number of persons or families with low incomes as a proportion of the total population. This so-called "low-income rate" is therefore defined as:

$$LIR = \frac{q}{n}$$

where q = number of units having incomes below z

n = total population

z = low-income threshold

The low-income rate provides useful information on the incidence of low-income situations but does not capture the intensity of such situations. For example, poverty would be considered more serious in a country where the average income of the same number of poor falls further below a given cut-off line. Comparing low-income rates between countries without paying due attention to the income levels of the low-income population may therefore be insufficient for policy considerations. A common indicator of this intensity is the average low-income gap (ALG), which is defined as the difference between the average income of the low-income population and the low-income line, as a percentage of that line:

$$ALG = \frac{z - \bar{y}_q}{z} = \frac{1}{q} * \sum_{i=1}^{q} \frac{z - y_i}{z}$$

where q = number of persons having incomes below z

z = low-income threshold

$y_i$ = income of the $i^{th}$ individual of the low-income population

$\bar{y}_q$ = average income of the low-income population

However, a third aspect of low income must also be taken into account, namely the fact that some low-income families are poorer or richer than others. The low-income rate says nothing about the distribution of incomes among low-income families. This aspect of poverty is also ignored by the low-income gap as it measures the distance below the average low income and the low-income line and is therefore insensitive to redistribution among the low-income population.

A summary statistic used to characterise the distribution of incomes is the Gini coefficient (G) which lies between 0 – when all incomes are distributed equally, and 1 – when there is perfect inequality.[10] The literature contains various methods to express the Gini coefficient; a common formula is:

$$G = \frac{2}{n^2 * \bar{y}} * \sum_{i=1}^{n} i * (y_i - \bar{y})$$

where the $y_i$ are ranked in ascending order by their subscripts.

Summarising these different aspects, the extent of poverty in a country depends on:

*i)* the number (or fraction) of persons/families below a defined low-income standard, as measured by the low-income rate (LIR);

*ii)* the severity of the low-income situation which can be proxied by the average low-income gap (ALG); and

*iii)* the distribution of income among the low-income population, proxied by, for instance, the Gini coefficient.

## 2. Synthetic indicators: the Sen poverty index

Sen (1976) developed an approach to combine these three elements into a single indicator of poverty for a given poverty line. His proposed measure consists of the head-count ratio multiplied by the sum of the income-gap ratio and the Gini coefficient of the poor weighted by the ratio of the mean income of the poor to the poverty-line income level. The Sen Index is thus defined as:

$$S = LIR * (ALG + \frac{y_q}{z} * G_p) = LIR * [ALG + (1 - ALG) * G_p]$$

where LIR = low-income rate (head-count ratio)

ALG = average low-income gap (income shortfall)

$y_q$ = mean income of the poor

z = poverty line

$G_p$ = Gini coefficient of income inequality among the poor

In short, the Sen index can be interpreted as a weighted sum of poverty gaps of the poor. The values for the Sen index lie in the closed interval [0,1], with **S** = 0 if everyone has an income above the poverty line, and S = 1 if everyone is below the low-income level and the income distribution is characterised by perfect inequality or else, if everyone has zero income. Like many summary statistics of

income inequality, the Sen index assumes an ordinal approach to comparisons of welfare (for a discussion of the analytical foundations of the Sen index, see Forster, 1994: 38f).

The Sen index is equal to the low-income rate multiplied by the average low-income gap (LIR * ALG)[11] in the case of perfect income equality among the low-income population, and equal to the low-income rate (LIR) in the case of perfect inequality:

$$S = LIR * ALG \quad \text{for } G_p = 0$$
$$S = LIR \quad \text{for } G_p = 1$$

In the first case, *i.e.* when all the poor have the same income, the lower the income of the poor, the closer will S be to LIR; and the larger the proportion of the poor, the closer will S be to ALG.

The Sen index is a useful measure for cross-country comparisons of poverty, because it combines the incidence, the intensity and the distribution of low incomes in a single indicator. Traditional measures such as the low-income rate and the average low-income gap fail to capture one or the other of these elements of poverty and provide therefore an incomplete picture when comparing poverty levels across countries. This is particularly important for the analysis of the effects of net taxes and transfers on low-income groups across countries since these might result in different (sometimes opposite) changes for one or the other components of poverty.


## II. NON-ELDERLY FAMILIES: THE IMPACT OF NET TRANSFERS ON LOW INCOMES


### A. Low-income rates

The percentage of families below a certain income threshold provides a basic indicator of the importance of low incomes among non-elderly families. It should be stressed that a low-income threshold z does not represent a break-even point below which a person (or family) suddenly becomes poor. Instead, low-income lines serve to define several classes of low income. Table 1 presents such low-income classes, from 20 per cent to 70 per cent of the median disposable income. The estimates refer to post-tax and transfer incomes of non-elderly families.

Three groups of countries can be distinguished in Table 1:

   *i)* Australia, Canada and the United States (especially at the top end of the scale) all have low-income rates well above the average in all income segments.

   *ii)* Some continental European countries – Austria, Belgium, Germany, Luxembourg and the Netherlands – are at the bottom in all of the segments. Within this grouping, Luxembourg has the lowest values for the

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**Table 1. Cumulative percentages of non-elderly families with low incomes**

| | Per cent of median income | | | | | |
|---|---|---|---|---|---|---|
| | 20 | 30 | 40 | 50 | 60 | 70 |
| Australia 85/86 | 2.2 | 4.4 | 8.9 | 15.7 | 21.3 | 27.3 |
| Austria 87 | 0.4 | 1.2 | 3.0 | 6.2 | 11.2 | 17.6 |
| Belgium 85 | 0.7 | 1.1 | 2.3 | 5.4 | 11.6 | 21.3 |
| Canada 87 | 2.5 | 4.7 | 10.5 | 15.4 | 21.1 | 27.8 |
| France 84 | 1.7 | 3.4 | 5.2 | 8.9 | 15.0 | 23.1 |
| Germany 84/85 | 0.4 | 1.6 | 3.8 | 8.5 | 14.5 | 21.9 |
| Ireland 87 | 2.2 | 3.4 | 5.5 | 15.7 | 23.4 | 30.3 |
| Italy 86 | 0.8 | 2.7 | 5.6 | 10.1 | 17.3 | 27.3 |
| Luxembourg 85 | 0.4 | 0.8 | 1.7 | 4.5 | 10.6 | 20.1 |
| Netherlands 87 | 0.8 | 1.2 | 2.4 | 4.7 | 11.3 | 20.7 |
| Noway 86 | 1.4 | 3.3 | 4.7 | 7.8 | 12.3 | 19.4 |
| Sweden 87 | 1.8 | 4.1 | 6.9 | 10.6 | 16.1 | 21.6 |
| United Kingdom 86 | 1.8 | 3.0 | 5.6 | 12.4 | 20.6 | 28.1 |
| United States 86 | 4.0 | 8.8 | 13.9 | 18.7 | 24.4 | 30.6 |
| Average (unweighted) | 1.5 | 3.1 | 5.7 | 10.3 | 16.5 | 24.1 |

Notes: Income concept used is disposable income adjusted for family size. using an equivalence scale with an elasticity of 0.55.
Non-eiderly families: families headed by a person aged less than 60.
Source: LIS micro data base.

very low income segments (below 20 and 30 per cent); this means that the poor population in this country is concentrated towards higher cut-off lines (50 and 60 per cent). In Germany, the poor population seems to be more equally distributed within the segments.

*iii)* The remaining European countries – France, Ireland, Italy, Norway, Sweden and the United Kingdom – have low-income rates close to the average, but there are different patterns according to the segment. In the 50 to 70 per cent range, for instance, France and Noway have low-income rates significantly below the average, whereas Italy and Ireland have rates close to those of the first country group.

Table 1 also reveals some country-specific patterns: some countries (Italy) have below-average rates in the lowest income segment (below 20 per cent) but above-average rates when moving to higher low-income segments. Other countries (Noway, Sweden) show the opposite picture. Both Ireland and the United Kingdom have above-average rates for the poorest population, average or below-average rates for the segments often defined as the "core" of the poor (below 40 per cent), and above-average rates for the population "near poverty" (60 and 70 per cent segment).

In the following, poverty among non-elderly families is first measured with respect to their market incomes and then compared to poverty measured in terms of disposable incomes. This allows an analysis of the combined effect of income

## Low incomes and public expenditures on social transfers

There is widespread agreement that public spending influences the level as well as the composition of poverty. However, the magnitude of this influence, sometimes also its direction, are controversial issues. In some OECD countries, there is an increasing concern about persistent dependency of low-income families on public transfers.

By providing basic security in the case of old-age, sickness, disability, unemployment and family situation, the welfare state tries to limit the extent of poverty. There are, however, substantive differences amongst countries in the extent and the generosity of the public social sector. Some studies analyse the relationship between the size of the welfare state and cross-national variations in poverty. Gustafsson and Uusilato (1989: 6), for example, claim that "the bigger the welfare state the smaller is the poverty rate."

This hypothesis can be illustrated by a simple cross-section regression for the 14 countries included in this study. The independent variable, the size of the welfare state, is proxied by total public expenditures on pensions, unemployment, family and other allowances as a share of GDP. Health and education expenditures are not included since they constitute in-kind transfers and the poverty estimates are based on disposable incomes. The dependent variable is the low

Figure A I.    Low-income rates and public social transfer expenditures
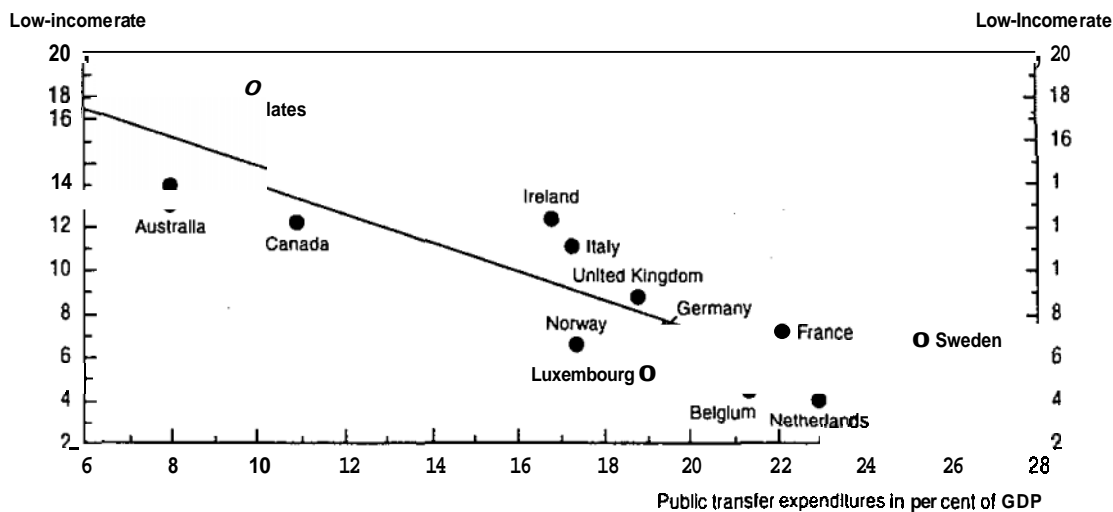


Note:  Low-incomerate defined as percentage of persons in families with incomes below 50 per cent of the median adjusted income.

Source:  LIS micro data base; OECD Social data base.

*(continued on next page)*

-income rate (50 percent level) for the entire population (*i.e.* including elderly persons, as old-age pensions are also included in total public expenditures on social transfers). Figure **A.I** shows that there is a significant negative correlation between these two variables across countries. The regression equation is:

$$LIR = 20.4 - 0.66 * SOC$$

with $R^2 = 0.667$, and standard error of coefficient $= 0.13$

When the dependent variable is defined at the 60 percent income level, the correlation is even stronger:

$$LIR = 28.5 - 0.76 * SOC$$

with $R^2 = 0.761$, and standard error of coefficient $= 0.15$

In both cases, three groups of countries can be distinguished: the United States and Australia both have the highest low-income rate and the lowest social spending as a share of GDP. On the other hand, the Scandinavian and continental European countries (except Italy) have relatively low poverty rates and high public transfer expenditures. Within this group,. the difference between the two Scandinavian countries with respect to public transfers is noteworthy. Canada, the United Kingdom, Ireland and Italy lie in between.

taxes and transfers on low income.[12] A separate assessment of the effects of social transfers alone is not very meaningful, as a significant decrease in poverty for a certain population group due to social transfers may partly be offset by a relatively high burden of personal taxation for the same group. In some countries this is the case, for example, for low-income families with many children.

The estimates for two of the eleven countries reported below have to be treated with special care: the results for France (before net transfers) are not fully comparable with the other countries, as social security contributions (unlike the other countries) are not regarded as part of the personal income tax, and are therefore excluded. Also the results for Sweden are not fully comparable with those of other countries, as explained in section I. For reasons of sensitivity testing, poverty estimates for three low-income bands are presented: 40, 50 and 60 per cent below the median income level.

## B. Sen indices and components of low incomes

As set out in section I, overall poverty as measured by the Sen index can be decomposed into incidence, intensity and income inequality. The respective values, referring to disposable incomes, are shown in the first three columns of Table 2. When analysing the results for the resulting Sen indices shown in

Table 2. **Sen poverty measure and its components for disposable incomes, percentage change and relative contribution of components after accounting for net transfers**

Non-elderly families below 50 per cent **of** median income

| | Indicators for low disposable incomes | | | | Reduction in Sen index (percentage change) (5) | Relative contribution of components | | |
|---|---|---|---|---|---|---|---|---|
| | Low-income rate LIR (1) | Low-income gap ALG (2) | Gini (poor) Gp (3) | Sen index S (4) | | Low-income rate LIR (6) | Low-income gap ALG (7) | Gini (poor) Gp (8) |
| Australia 85/86 | 15.7 | 30.7 | 0.1952 | 6.94 | 47.9 | 25% | 44% | 31% |
| Austria 87 | 6.2 | 24.0 | 0.1187 | 2.05 | n.a. | n.a. | n.a. | n.a. |
| Belgium 85 | 5.4 | 25.0 | 0.1748 | 2.06 | 78.1 | 91% | 4% | 6% |
| Canada 87 | 15.4 | 33.2 | 0.1890 | 7.05 | 41.4 | 43% | 33% | 24% |
| France 84 | 8.9 | 33.3 | 0.2185 | 4.26 | 60.7 | 86% | 8% | 5% |
| Germany 84/85 | 8.5 | 23.2 | 0.1340 | 2.84 | 71.0 | 43% | 32% | 25% |
| Ireland 87 | 15.7 | 24.9 | 0.1730 | 5.94 | 70.0 | 51% | 31% | 18% |
| Italy 86 | 10.1 | 27.3 | 0.1616 | 3.94 | n.a. | n.a. | n.a. | n.a. |
| Luxembourg 85 | 4.5 | 22.4 | 0.1513 | 1.54 | n.a. | n.a. | **n.a.** | n.a. |
| Netherlands 87 | 4.7 | 28.8 | 0.1971 | 2.01 | 82.8 | 73% | 19% | 8% |
| Noway 86 | 7.8 | 35.5 | 0.2292 | 3.93 | 53.7 | 57% | 28% | 15% |
| Sweden 87 | 10.6 | 41.0 | 0.1485 | 5.28 | 60.2 | 62% | 17% | 22% |
| United Kingdom 86 | 12.4 | 27.6 | 0.1907 | 5.13 | 72.1 | 57% | 25% | 17% |
| United States 86 | 18.7 | 39.5 | 0.2326 | 10.02 | 22.8 | 17% | 43% | 40% |
| Average (unweighte( | 10.3 | 29.7 | 0.1796 | 4.50 | 60.1 | 55% | 26% | 19% |

Nofes: Income adjusted with an equivalence elasticity of 0.55. LIR, ALG.and Sen index multi ed by 100.
    Relative contributions estimated by linear approximation of Sen index (explanation rate! bove 92 per cent, except for Ireland. Netherlands and Sweden:
    85 per cent).
    Definitions and methods of indicators: see Section I.
Source: LIS micro data base.

column (4), the cross-country patterns derived e rlier with the use of the low-income rate become more accentuated. Five groups of countries can be distinguished:

*i)* first, the European countries Austria, Belgium, Germany, Luxembourg and the Netherlands with Sen indices significantly below the average;

*ii)* a second group of European countries – Norway, France and Italy – which have indices just below the average;

*iii)* third, the remaining European countries – Sweden, Ireland and the United Kingdom – with indices just above the average;

*iv)* fourth, Australia and Canada with poverty indices above the cross-country average;

*v)* fifth, the United States has very high low-income indicators which result in a Sen index that is more than double the average of all 14 countries.

Looking at its decomposition, it can be seen that the high rates of the fourth country group are due mainly to the high incidence of low incomes (expressed in the low-income rate); the intensity and distribution of low income in this group are closer to the average of all countries.[13] This contrasts in particular with the case of Norway, which has a low-income intensity and distribution patterns well above the average but below-average low-income incidence, which results in a relatively low Sen index. To a lesser degree, the same pattern can be found for the Netherlands and France. Another particular case is Ireland, with high low-income incidence but well below-average intensity and inequality among the poor; the net result is a Sen index which **is** not that much in excess of the sample average.

Figure 2 traces values for Sen indices related to market income on the horizontal axis and Sen indices, once allowance is made for taxes and transfers, on the vertical axis. The results refer to the 50 per cent low-income cut-off line. It can readily be seen that poverty is reduced in all countries after accounting for net transfers: all country points are situated below the 45°-line (the "line of no change"). This also holds true for the 40 per cent and 60 per cent low-income segments and the two specific demographic groups studied in section III, as will be seen below. This means, *ceteris paribus,* that the tax/transfer systems in all the countries studied succeeded in one of their prime aims: redistributing income towards vulnerable families.

A second finding from Figure 2 is that the rank ordering of countries changes when allowance is made for taxes and transfers. A third general result is that the differences in the levels of Sen indices between low-poverty and high-poverty countries are larger after accounting for net transfers than before: the highest Sen index for market incomes is two-and-a-half times higher than the lowest, whilst the highest Sen index for disposable incomes is five times higher. Both findings imply that poverty is reduced in some countries more than in others by workings of the tax and transfer system.

The absolute magnitude of poverty reduction can be seen as the vertical distance between the 45°-line and the country point. High reduction rates for Sen poverty indices are observed for the following countries: the Netherlands,

Figure 2. Sen index before and after accounting for net transfers
Non-elderly families
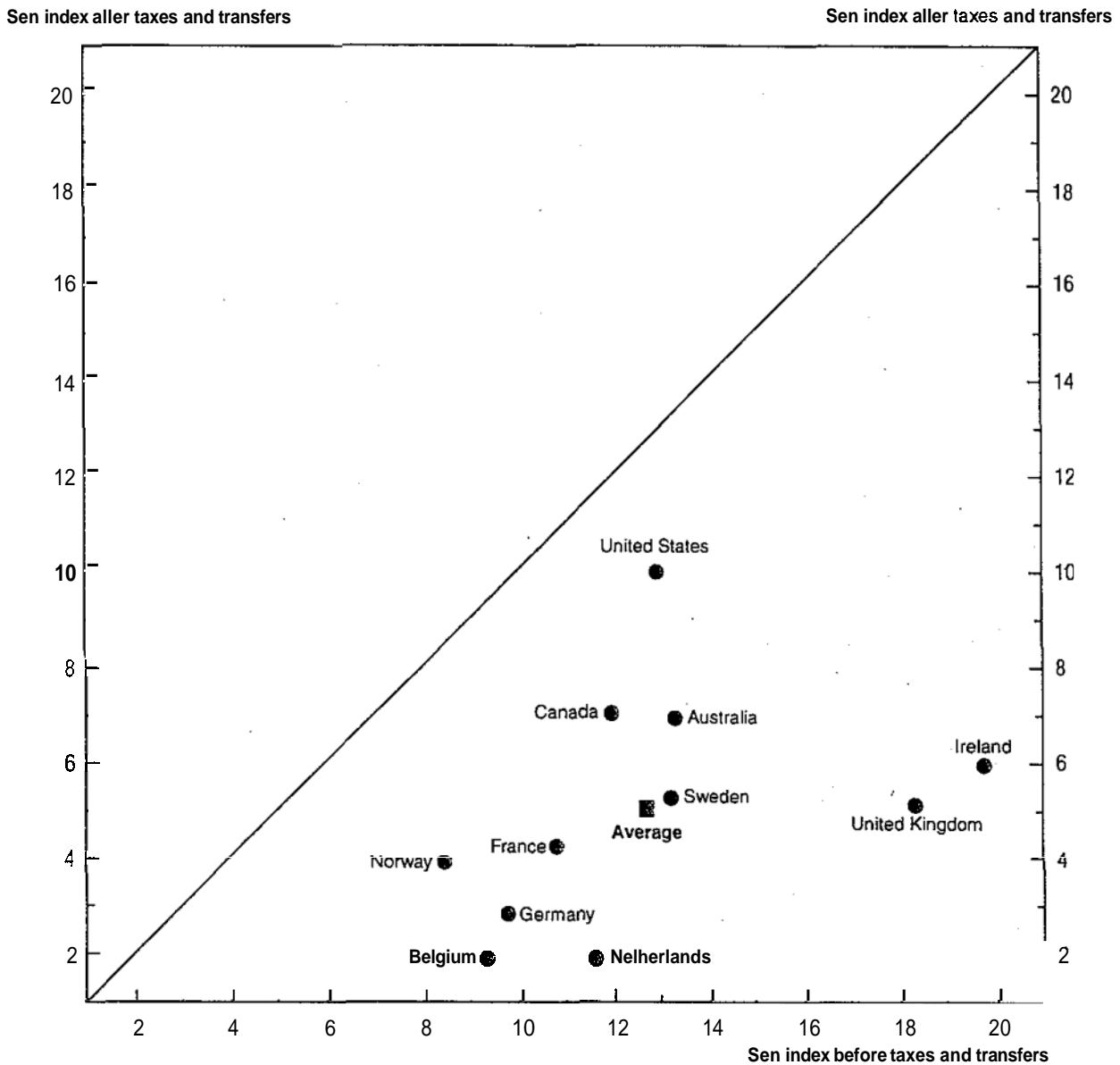
Notes: Sen indices at the 50 per cent cut-off level.
 Average: unweighted country sample average.
*Source:* **LIS** micro data **base.**

Belgium, the United Kingdom, Germany and Ireland. The smallest reduction is in the United States.

Looking at the absolute values of S for market incomes, it can be seen that poverty **is** highest in Ireland and the United Kingdom, and lowest in Norway, Belgium, and Germany. Once allowance is made for taxes and transfers, the

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United States, Canada and Australia have the highest values for S, and Belgium, the Netherlands and Germany have the lowest values. Ireland and the United Kingdom are outliers: combining the highest poverty levels across countries before net transfers and close to average after accounting for net transfers. The opposite holds for the United States: the Sen poverty index is close to the average before allowance is made for net transfers, but twice the average of all the countries under study after accounting for taxes and transfers.

## C. Components of poverty reduction

Column (5) in Table 2 shows the percentage change in the overall Sen index, when allowance is made for taxes and transfers. The overall effect of net transfers is to reduce poverty in all countries studied. The average reduction across the country sample is 60 per cent: from 23 per cent in the United States up to around 80 per cent in Belgium and the Netherlands.

What components play the leading role in lowering the Sen index? The identification of the predominant component provides information about the extent of targeting in the different tax/transfer systems. If, for example, net transfers result in a reduction of the low-income gap and the income inequality among the poor but not in a reduction of the low-income rate, this may indicate a certain targeting to the poorest sections of the population. If, on the other hand, the low-income rate decreases at the same time as intensity and income inequality among the poor increase, this may suggest that net transfers have mainly been allocated to the better-off among the poor.

The evidence from the LIS data sets summarised in Tables 2 and 3 suggests that targeting of net transfers to the poorest segments seems to be strongest in Australia, Canada and the United States and, to a lesser degree, in Germany, Ireland, Norway and the United Kingdom. There is no clear pattern to be observed for the remaining countries.

Columns (6), (7) and (8) in Table 2 give estimates for the relative contribution of the three components which can be attributed to the reduction in overall poverty.[14] On average, at the 50 per cent cut-off level, the reduction of low-income incidence, *i.e.* in the number of poor, accounts for 55 per cent of the reduction in overall poverty. About one-quarter can be attributed to the reduction in low-income intensity, and the remaining fifth to the reduction in income inequality among the poor.

There are, however, substantial differences across the countries studied. Only in two countries − Australia and the United States − is the contribution of both low-income intensity and inequality to the reduction of overall poverty higher than that of low-income incidence: the reduction in the number of poor only accounts for 17 per cent (United States) and 25 per cent (Australia) of the overall reduction in poverty, when allowance is made for net transfers. On the other hand, in two European countries − Belgium and France − about nine-tenths of the poverty reduction due to net transfers can be attributed to the change in the

## Table 3. Percentage change of Sen poverty measure and its components after accounting for net transfers

Non-elderly families

| | | Market Income = 100 | | | |
|---|---|---|---|---|---|
| | | Low-income rate LIR | Low-income gap ALG | Gini (poor) Gp | Sen index S |
| Australia 85/86 | < 40% of median | 58.2 | 55.1 | 52.2 | 36.5 |
| | < 50% of median | 89.2 | 53.9 | 44.8 | 52.1 |
| | < 60% of median | 103.9 | 63.6 | 48.0 | 67.1 |
| Belgium 85 | < 40% of median | 14.4 | 101.7 | 93.5 | 14.2 |
| | < 50% of median | 23.8 | 94.0 | 87.0 | 21.9 |
| | < 60% of median | 38.8 | 88.8 | 70.4 | 32.2 |
| Canada 87 | < 40% of median | 66.5 | 64.7 | 58.5 | 45.2 |
| | < 50% of median | 81.1 | 71.3 | 60.2 | 58.6 |
| | < 60% of median | 93.0 | 74.0 | 64.2 | 69.9 |
| France 84 | < 40% of median | 35.9 | 95.7 | 87.1 | 33.7 |
| | < 50% of median | 43.2 | 89.6 | 88.6 | 39.3 |
| | < 60% of median | 55.1 | 80.8 | 82.5 | 46.3 |
| Germany 84/85 | < 40% of median | 35.5 | 36.4 | 27.5 | 14.7 |
| | < 50% of median | 68.5 | 38.9 | 27.7 | 29.0 |
| | < 60% of median | 99.3 | 44.3 | 31.4 | 46.1 |
| Ireland 87 | < 40% of median | 23.3 | 71.4 | 66.2 | 17.9 |
| | < 50% of median | 59.7 | 43.5 | 40.9 | 30.0 |
| | < 60% of median | 78.3 | 51.1 | 39.3 | 42.1 |
| Netherlands 87 | < 40% of median | 13.3 | 72.3 | 87.9 | 10.8 |
| | < 50% of median | 24.9 | 62.8 | 66.5 | 17.2 |
| | < 60% of median | 57.4 | 45.9 | 47.9 | 29.8 |
| Norway 86 | < 40% of median | 45.6 | 74.7 | 62.9 | 34.9 |
| | < 50% of median | 66.1 | 64.6 | 61.1 | 46.3 |
| | < 60% of median | 84.8 | 75.4 | 57.6 | 63.2 |
| Sweden 87 | < 40% of median | 44.5 | 74.0 | 35.2 | 29.9 |
| | < 50% of median | 57.6 | 75.5 | 38.4 | 39.8 |
| | < 60% of median | 72.5 | 77.2 | 40.8 | 51.1 |
| United Kingdom 86 | < 40% of median | 25.9 | 63.8 | 55.5 | 18.0 |
| | < 50% of median | 51.7 | 48.3 | 42.1 | 27.9 |
| | < 60% of median | 76.9 | 50.2 | 39.4 | 41.0 |
| United States 86 | < 40% of median | 86.9 | 72.3 | 61.5 | 64.4 |
| | < 50% of median | 96.4 | 80.3 | 66.8 | 77.2 |
| | < 60% of median | 105.6 | 83.2 | 71.4 | 87.7 |
| Average | < 40% of median | 40.9 | 71.1 | 62.6 | 29.1 |
| | < 50% of median | 60.2 | 65.7 | 56.7 | 39.9 |
| | < 60% of median | 78.7 | 66.8 | 53.9 | 52.4 |

*Notes:* Income adjusted with an equivalence elasticity of 0.55. LIR, ALG and Sen index multiplied by 100.
Definitions and methods of indicators: see Section I.
*Source:* LIS micro data base.

number of low-income families. At the same time, there is little change in the low-income gap for those families in Belgium and France which remain poor. Also, the income distribution among poor families in these two countries does not change substantially. In the remaining European countries (except Germany), the reduction of the low-income rate accounts for at least half of the reduction of overall poverty. In Canada and in Germany, the relative contribution of each of the three elements is more similar.

How sensitive are these results to different low-income benchmarks? In other words, how do the indicators and their reduction rates change when the low-income cut-off line is 40 per cent or 60 per cent, rather than 50 per cent, of median income? Table 3 shows the values of the Sen poverty index and its components for these different benchmarks (market income = 100). Not surprisingly, in all countries the Sen poverty index is reduced more when the low-income cut-off line is 40 per cent than when it is 60 per cent. This is notably the case in Australia and the United States, where means-testing plays a major role in their social protection systems, overall poverty in the lowest income segment being reduced by two to three times more than for families in the 60 per cent segment. On the other hand, in France and the Netherlands the difference in the reduction of poverty levels between the three segments is not so marked.

As for the different components of the Sen index, Table 3 shows that accounting for net transfers reduces the low-income rate less with increasing low-income benchmarks. The opposite is true, in general, for the reduction of income inequality and, to a lesser extent, of low-income intensity. These patterns are more marked when moving from the 40 per cent to the 50 per cent benchmark, rather than when moving from the 50 per cent to the 60 per cent benchmark. This means that net transfers lead mainly to a reduction in the number of poor families in the lowest income segment, whilst the importance of reductions in low-income intensity and inequality is raising with higher benchmarks. Some exceptions are noteworthy: in Canada and the United States, but also in Germany and Sweden – although on another level – all three components of poverty reduction are lower at higher benchmarks.

## III.   VULNERABLE FAMILIES: SINGLE PARENTS AND LARGE FAMILIES

### A.   Low incomes among single-parent families and families with many children

A number of recent studies conclude that single parent families and families with many children have substantially higher poverty risks than other family types (see, for example, Hauser and Fischer, 1985; Short and Garner, 1989; Gornick and Pavetti, 1990; Sørensen, 1990; Rainwater and Smeeding, 1991; Bradshaw and Millar, 1991; Mitchell and Bradshaw, 1991; Forster, 1993). Also, poverty

estimates for seven member countries of the European Union[15] around 1985 indicate that poverty – defined as percentage of households below 50 per cent of the national mean expenditure adjusted for family size – among single parents is one-and-a-half to two times higher than for all households, and poverty for households with four or more children two to three times higher (EUROSTAT, 1990).

The results from Figure 3 which shows the incidence of post-tax and transfer incomes below 50 per cent of the median adjusted income for non-elderly families and the two demographic sub-groups are in line with these findings. In general, low-income rates among single parents are significantly higher than among families with three or more children which, in turn, have higher rates than all non-elderly families. On average, low-income rates for single parent families are almost three times higher, and those for families with three or more children 50 per cent higher than those for all families, in all three low-income segments. The two Scandinavian countries, in particular Sweden, do not follow this pattern: families with three children or more (in both countries) and single parents (in Sweden) have below-average low-income rates.

Also, Sen poverty indices (after taxes and transfers) for the two demographic sub-groups are higher than for all non-elderly families. The indices and their components are shown in columns (1), (2), (3) and **(4)** of Table **4** (for families with three or more children) and Table 5 (for single parent families). Concerning the

Figure 3.   Incidence of low incomes among non-elderly families
Families below 50 per cent of median income
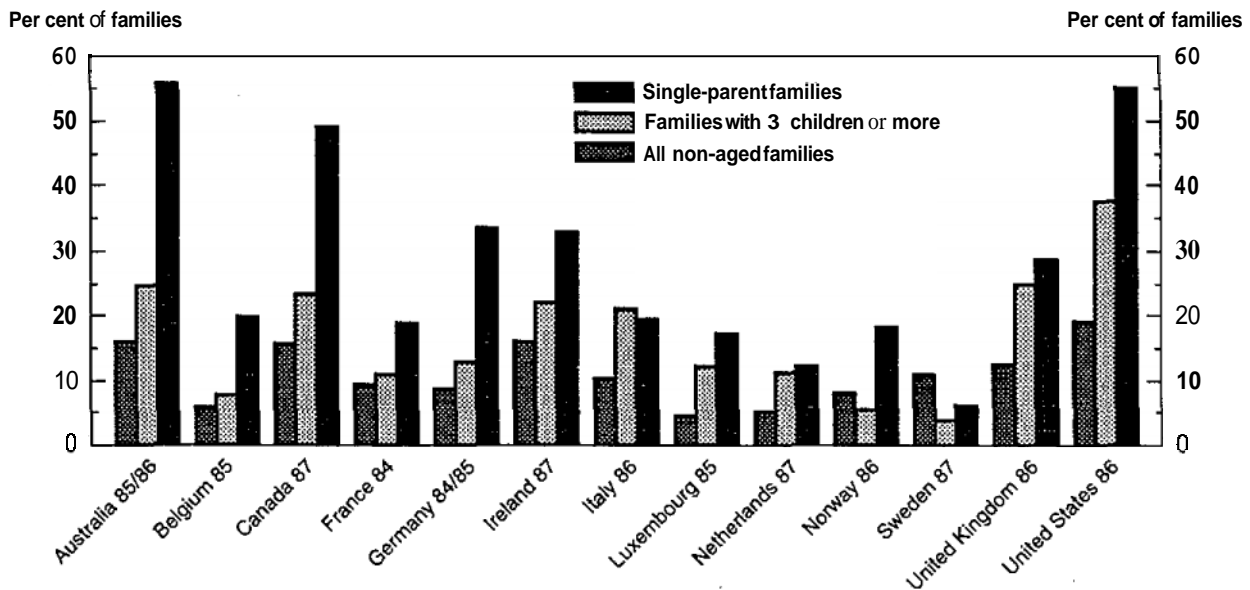


Note:   Income concept used: disposable income adjusted for family size
*Source:*   LIS micro data base.

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**Table 4.  Sen poverty measure and its components for disposable incomes, percentage change and relative contribution of components after accounting for net transfers**

**Non-elderly families with three children or more below 50 per cent of median income**

| | Indicators for low disposable incomes | | | | Reduction in Sen index (percentage change) (5) | Relative contribution of components | | |
|---|---|---|---|---|---|---|---|---|
| | Low-income rate LIR (1) | Low-income gap ALG (2) | Gini (poor) Gp (3) | Sen index S (4) | | Low-income rate LIR (6) | Low-income gap ALG (7) | Gini (poor) Gp (8) |
| **Australia 85/86** | 24.5 | 32.1 | 0.2061 | 11.29 | 29.2 | −2% | 61% | 40% |
| **Belgium 85** | 7.3 | 20.7 | 0.1292 | 2.26 | 80.6 | 103% | 2% | −5% |
| **Canada 87** | 23.0 | 26.3 | 0.1435 | 8.48 | 49.0 | 33% | 38% | 29% |
| **France 84** | 10.5 | 21.0 | 0.1519 | 3.46 | 85.6 | 71% | 21% | 8% |
| **Germany 84/85** | 12.7 | 22.4 | 0.1496 | 4.32 | 55.1 | 23% | 48% | 28% |
| **Ireland 87** | 21.9 | 20.7 | 0.1273 | 6.74 | 71.7 | 40% | 38% | 21% |
| **Netherlands 87** | 11.0 | 23.9 | 0.1742 | 4.09 | 66.0 | 46% | 40% | 14% |
| **Norway 86** | 5.1 | 34.2 | 0.3091 | 2.78 | 60.9 | 87% | 9% | 4% |
| **Sweden 87** | 3.7 | 24.9 | 0.1310 | 1.28 | 88.7 | 67% | 19% | 14% |
| **United Kingdom 86** | 24.7 | 22.7 | 0.1524 | 8.52 | 70.0 | 49% | 32% | 19% |
| **United States 86** | 37.1 | 38.4 | 0.2107 | 19.06 | 20.6 | −37% | 75% | 62% |
| **Average (unweighted)** | 16.5 | 26.1 | 0.1714 | 6.57 | 61.6 | 44% | 35% | 21% |

*Notes:* Income adjusted with an equivalence elasticity of 0.55. LIR, ALG and Sen index multiplied by 100.
Relative contributions estimated by linear approximation of Sen index (explanation rates above 90 per cent, except for France and Sweden: 70 per cent).
Definitions and methods of indicators: see Section I.
Source:  LIS micro data base.

### Table 5. Sen poverty measure and its components for disposable incomes, percentage change and relative contribution of components after accounting for net transfers

Non-elderly single-parent families below 50 per cent of median income

| | Indicators for low disposable incomes | | | | Reduction in Sen index (percentage change) (5) | Relative contribution of components | | |
|---|---|---|---|---|---|---|---|---|
| | Low-income rate LIR (1) | Low-income gap ALG (2) | Gini (poor) Gp (3) | Sen index S (4) | | Low-income rate LIR (6) | Low-income gap ALG (7) | Gini (poor) Gp (8) |
| Australia 85/86 | 55.6 | 33.2 | 0.1690 | 24.74 | 53.9 | 25% | 45% | 30% |
| Belgium 85 | 19.4 | 27.6 | 0.1886 | 8.00 | 70.5 | 95% | 4% | 1% |
| Canada 87 | 48.6 | 32.1 | 0.1638 | 21.01 | 51.9 | 30% | 43% | 26% |
| France 84 | 18.6 | 32.2 | 0.1970 | 8.47 | 69.6 | 70% | 16% | 14% |
| Germany 84/85 | 33.3 | 25.1 | 0.1785 | 12.81 | 65.5 | 43% | 28% | 29% |
| Ireland 87 | 32.6 | 29.5 | 0.1832 | 13.83 | 63.7 | 57% | 30% | 14% |
| Netherlands 87 | 12.0 | 33.7 | 0.3201 | 6.59 | 85.2 | 91% | 10% | –0% |
| Norway 86 | 18.0 | 39.8 | 0.2869 | 10.27 | 65.2 | 71% | 19% | 10% |
| Sweden 87 | 5.9 | 25.6 | 0.1102 | 1.99 | 92.9 | 67% | 19% | 14% |
| United Kingdom 86 | 28.3 | 21.4 | 0.1319 | 8.99 | 85.3 | 60% | 24% | 17% |
| United States 86 | 54.8 | 41.8 | 0.2197 | 29.91 | 30.3 | 17% | 41% | 42% |
| Average (unweighted) | 29.7 | 31.1 | 0.1954 | 13.33 | 66.7 | 57% | 25% | 18% |

Notes: Income adjusted with an equivalence elasticity of 0.55. LIR, ALG and Sen index m┃ iplied by 100.
  Relative contributions estimated by linear approximation of Sen index (explanation r  s above 88 per cent, except for Australia, France and the United Kingdom (80 per cent) and Sweden (65 per cent)).
  Definitions and methods of indicators: see Section I.
Source: LIS micro data base.

levels of the Sen index for large families after taxes and transfers, three country groups can be distinguished: the continental European countries with Sen values well below average; a four-country group comprising Canada, Australia, Ireland and the United Kingdom (values around average); and the United States with Sen indices far above the average of all countries. As for Sen poverty levels for single-parent families, these are, in almost all countries studied, two to four times higher than those for all non-aged families; only Sweden has a lower Sen index for this demographic group.

How do the three components of overall poverty after taxes and transfers differ between non-aged families on the one hand and the two specific demographic groups on the other? Whilst low-income incidence is significantly higher for both sub-groups, both indicators for low-income intensity and inequality show for most countries lower values than for all families. This is in particular the case for large families. This means that although a larger share of the population of these families is affected by situations of low income, their average equivalence income is closer to the low-income cut-off line and more equally distributed than for all non-elderly families with low incomes. In Belgium and France, for example, this leads to Sen indices for families with three or more children which are close to or below the average for all families.

## B.  The effects of net transfers

The effects of net transfers on the various components of poverty differ to some extent between all non-elderly families on the one hand and the two specific population groups on the other. On average, the reduction rates of the Sen index after accounting for net transfers are similar for large families (62 per cent) and for all non-aged families (60 per cent), but they are slightly higher for single-parent families (67 per cent).

### Families with three children or more

The highest reduction rates for S for families with three or more children can be observed for Sweden, France, and Belgium (see column (5) of Table **4)**. It is in particular the'number of low-income families which decreases to about one-fifth or less of the original level in these three countries, when allowance is made for net transfers. On the other hand, Australia and the United States show overall reduction rates for these families of less than 30 per cent.

The estimated relative contributions of the three components to the overall reduction in poverty are given in columns (6), (7) and (8) of Table **4.** This shows that, on average, the low-income rate contributes less to this change than is the case for all non-aged families, whereas the low-income gap contributes more. This is notably the case in Australia, where the contribution of the low-income incidence is close to zero, and in the United States, where it is negative. This means that the number of low-income families with three children or more is slightly higher after accounting for net transfers. In Germany and Canada, the

drop in the low-income rate accounts for one-third or less of the overall reduction in poverty. On the other hand, in Norway and especially in Belgium, the relative contributions of low-income intensity and inequality are negligible, whilst the decline in low-income incidence accounts for almost all the reduction of overall poverty of large families.

### Single-parent families

In all countries except the United States, the effect of net transfers is to reduce Sen poverty levels for single-parent families to at least half the former level. The highest reduction rates for S – shown in column *(5)* of Table *5* – are recorded in Sweden, the United Kingdom and the Netherlands. In particular, poverty of single parents in Sweden, measured in terms of disposable income, is well below the overall average. On the other hand, reduction rates for S are the lowest across those countries which also experienced the most significant increase of single-parent families within the total population in the 1980s: Australia, Canada and the United States (OECD, 1990*b*).

The relative contributions of individual components to the overall reduction in poverty for single-parent families are, on average, very similar to those for all non-elderly families: the low-income rate accounts for somewhat more than half of the reduction in overall poverty, one-quarter can be attributed to the reduction in low-income intensity, and the remaining fifth to the reduction in income inequality among the poor. For specific countries, the patterns differ between single parents and all families. In Canada and in France, the reduction of the low-income rate contributes relatively less to the overall change in poverty of single parents with corresponding higher contributions from the decline in the low-income gap and greater income equality among the poor. The contrary is true for the Netherlands and Norway.

In Belgium and the Netherlands, almost the entire reduction of overall poverty among single-parent families can be attributed to the change in the low-income rate. The relative contribution of the drop in the average low-income gap is particularly important in the three non-European countries and, to a lesser extent, in Ireland and the United Kingdom. As is the case for the other demographic groups studied, the relative contribution of the Gini coefficient – the reduction in income inequality among the poor – is more important in the United States than in the other countries.

### Sensitivity *to* low-income benchmarks

Table 6 shows for both large families and single-parent families percentage changes for the Sen index and its components (market income = 100), once allowance is made for net transfers. The pattern found earlier for the different low-income lines is even stronger for families at high risk: net transfers reduce the low-income incidence less with increasing benchmarks, whereas low-income inequality and, to a lesser degree, intensity are increasingly reduced with higher benchmarks. While the first part of this "rule of thumb" holds for all countries and

## Tableau 6. Percentage change of Sen poverty measure and its components after accounting for net transfers
### Non-elderly large families and single-parent families

| | | Market income = 100 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Families with three children or more | | | | Single-parent families | | | |
| | | Low-income rate LIR | Low-income gap ALG | Gini (poor) Gp | Sen index S | Low-income rate LIR | Low-income gap ALG | Gini (poor) Gp | Sen index S |
| **Australia 85/86** | c 40% of median | 68.9 | 71.5 | 66.3 | 51.a | 66.6 | 37.8 | 31.8 | 30.4 |
| | c 50% of median | 100.4 | 67.2 | 61.1 | 70.8 | 89.0 | 47.8 | 31.5 | 46.1 |
| | c 60% of median | 117.3 | 77.8 | 65.7 | 90.5 | 95.4 | 60.1 | 34.8 | 58.0 |
| **Belgium 85** | < 40% of median | 12.1 | 120.8 | 113.1 | 14.0 | 18.4 | 117.2 | 130.3 | 21.7 |
| | < 50% of median | 19.0 | 97.9 | 112.0 | 19.4 | 30.6 | 94.2 | 98.0 | 29.5 |
| | c 60% of median | 39.0 | 67.7 | 81.8 | 28.7 | 50.5 | 75.5 | 86.6 | 41.0 |
| **Canada 87** | < 40% of median | 64.6 | 49.8 | 42.7 | 34.1 | 69.1 | 43.1 | 37.4 | 33.5 |
| | < 50% of median | 83.0 | 61.4 | 47.6 | 51.0 | 85.1 | 53.6 | 39.7 | 48.1 |
| | < 60% of median | 104.0 | 63.4 | 53.3 | 67.5 | 91.7 | 65.2 | 43.5 | 59.7 |
| **France 84** | c 40% of median | 13.4 | 68.0 | 65.9 | 9.5 | 32.7 | 67.8 | 55.2 | 22.4 |
| | c 50% of median | 22.1 | 58.0 | 67.3 | 14.4 | 41.9 | 72.2 | 60.3 | 30.4 |
| | c 60% of median | 38.8 | 53.1 | 55.7 | 22.5 | 51.3 | 74.1 | 69.9 | 39.2 |
| **Germany 84/85** | < 40% of median | 45.3 | 49.7 | 57.1 | 26.7 | 41.0 | 41.8 | 36.3 | 20.3 |
| | c 50% of median | 87.6 | 46.0 | 43.4 | 44.9 | 71.6 | 44.2 | 33.6 | 34.5 |
| | < 60% of median | 96.2 | 69.7 | 46.0 | 61.0 | 92.0 | 51.7 | 36.2 | 49.4 |
| **Ireland 87** | c 40% of median | 20.6 | 69.1 | 48.7 | 14.3 | 30.5 | 65.5 | 61.7 | 21.7 |
| | < 50% of median | 69.5 | 35.6 | 30.7 | 28.3 | 57.6 | 57.2 | 56.5 | 36.3 |
| | c 60% of median | 87.4 | 47.0 | 32.4 | 42.3 | 70.0 | 66.6 | 54.3 | 47.6 |
| **Netherlands 87** | c 40% of median | 46.3 | 45.9 | 60.4 | 27.0 | 10.4 | 83.0 | 100.8 | 9.6 |
| | < 50% of median | 65.5 | 42.4 | 50.2 | 34.0 | 16.2 | 80.8 | 101.0 | 14.8 |
| | < 60% of median | 112.3 | 43.4 | 41.3 | 53.8 | 44.8 | 42.1 | 51.9 | 23.1 |
| **Norway 86** | c 40% of median | 32.9 | 67.8 | 101.0 | 28.4 | 37.8 | 70.6 | 71.4 | 29.4 |
| | c 50% of median | 42.9 | 86.9 | 91.7 | 39.1 | 46.8 | 67.1 | 66.9 | 34.8 |
| | c 60% of median | 70.5 | 59.0 | 62.5 | 45.8 | 67.3 | 55.6 | 55.8 | 43.0 |
| **Sweden 87** | < 40% of median | 15.1 | 49.5 | 41.9 | 8.1 | 12.0 | 20.0 | 24.4 | 3.4 |
| | c 50% of median | 21.1 | 52.7 | 39.5 | 11.3 | 15.4 | 46.2 | 26.8 | 7.1 |
| | < 60% of median | 34.8 | 45.5 | 32.4 | 15.9 | 29.5 | 38.4 | 29.2 | 12.2 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| United Kingdom 86 | < 40% of median | 23.3 | 67.0 | 63.8 | 16.8 | 14.5 | 46.3 | 36.8 | 7.6 |
| | < 50% of median | 60.2 | 44.4 | 41.1 | 30.0 | 37.7 | 34.3 | 26.0 | 14.7 |
| | < 60% of median | 84.2 | 53.6 | 38.7 | 45.6 | 68.9 | 34.2 | 24.3 | 26.3 |
| United States 86 | < 40% of median | 93.7 | 65.9 | 52.7 | 63.2 | 88.7 | 60.3 | 45.0 | 55.8 |
| | < 50% of median | 106.0 | 74.7 | 59.7 | 79.4 | 95.3 | 74.2 | 52.3 | 69.7 |
| | < 60% of median | 107.7 | 84.7 | 66.1 | 88.8 | 97.3 | 83.1 | 58.0 | 78.0 |
| Average | < 40% of median | 39.6 | 65.9 | 64.9 | 26.7 | 38.3 | 59.4 | 57.4 | 23.2 |
| (unweighted) | < 50% of median | 61.6 | 60.7 | 58.6 | 38.4 | 53.4 | 61.1 | 53.9 | 33.3 |
| | < 60% of median | 81.1 | 60.5 | 52.4 | 51.1 | 69.0 | 58.8 | 49.5 | 43.4 |

for both family types, there are notable exceptions for the latter part. In particular, in the three non-European countries – Australia, Canada and the United States – the reduction of all three poverty components is lower at the 60 per cent level than at the 40 per cent-level after allowance for net transfers. This might be explained by the existence of means-testing in many social programmes of these countries.

## IV.  CHILD POVERTY AND ITS ELEMENTS

### A.  Children living in low-income families

Recent years have seen an increasing interest in the issue of child poverty (see, for example, Rainwater, 1988; Smeeding and Torrey, 1988; Smeeding *et al.,* 1988; Harris, 1989; Smeeding, 1989; European Centre, 1989; Carter, 1991; Ekert-Jaffé, 1992). The resources of a child are largely determined by the income status of the family he or she is living with. Towards the end of the 1980s, some OECD countries experienced the phenomenon that poverty of children – *i.e.* the number of children living in low-income families[16] – relative to other population graups seemed to be increasing. This is particularly worrisome as the youngest within the society are amongst its most vulnerable members due to their dependency and non-earning capacity.
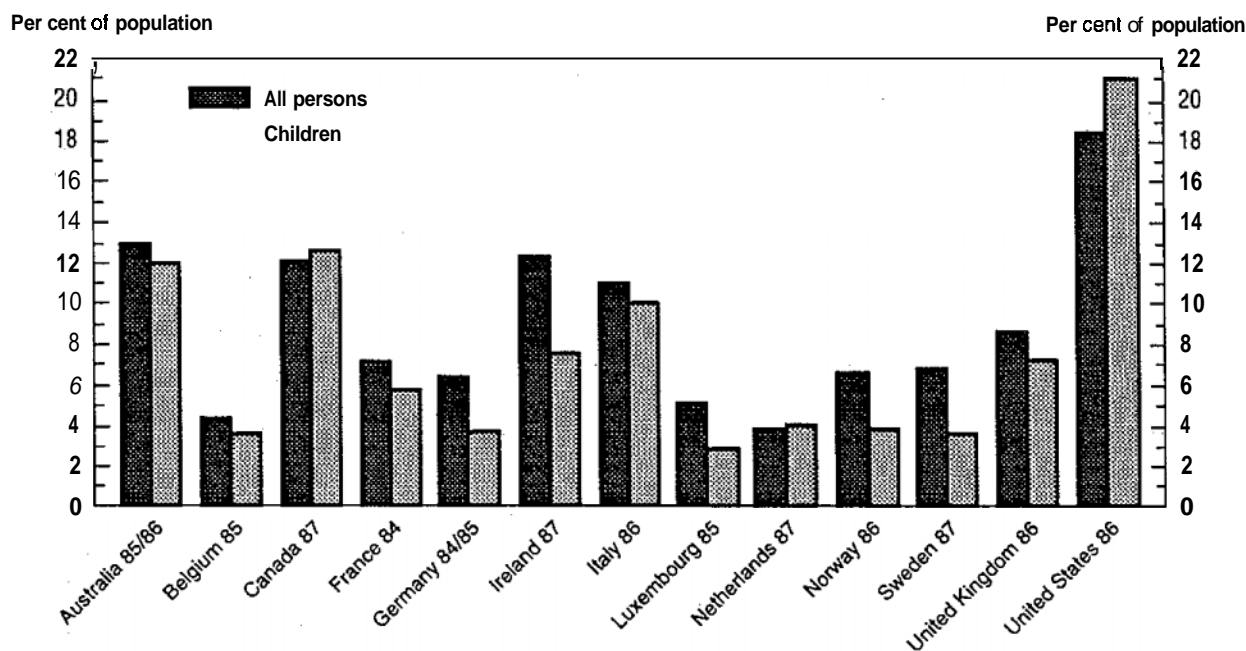
Figure 4 summarises the evidence on low-income incidence after taxes and transfers. It compares the percentages of children below two of the income cut-off lines (40 per cent and 50 per cent below the median disposable income) with the ratios for the whole population. The figure shows that children's low-income rates are, in general, lower than adults' low-income rates except in the United States (at both low-income levels) and Canada (in the 50 per cent segment) but also in Australia and three European countries when moving to lower income segments: Ireland, Italy and the United Kingdom. One of the current policy questions in countries with high low-income rates of children is whether transfer policies should be targeted to "children at risk".

How does the picture change when, besides the low-income incidence, the two other components of poverty are integrated in the analysis? The first four columns in Table 7 show the low-income rate, the low-income gap, the Gini coefficient and the resulting Sen poverty index after accounting for net transfers for children living in low-income families, for the 50 per cent low-income benchmark. In all countries studied, overall Sen indices are lower for children than for non-aged families. Low Sen indices (values below 2) are recorded for Belgium, Germany, the Netherlands, Norway and Sweden; and above average ones for Australia, Canada, Ireland and the United Kingdom. The highest Sen index after taxes and transfers is recorded for the United States.
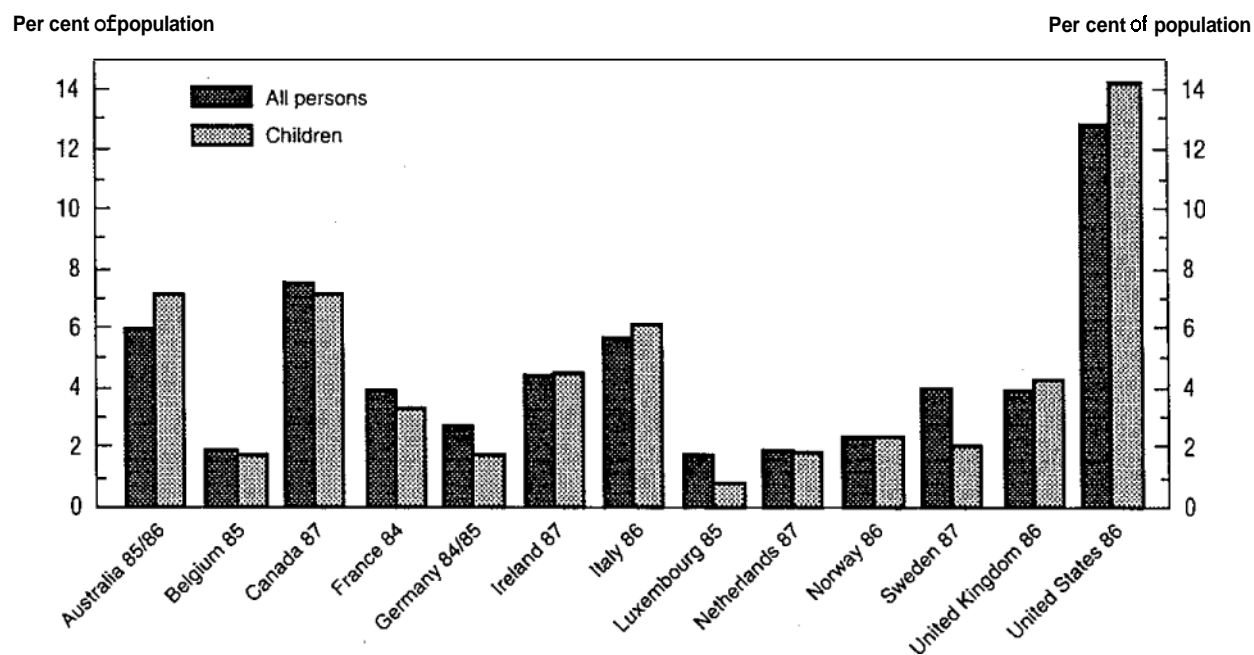
As for the components of child poverty measured after net transfers, the high incidence in Canada is partly offset by a relatively small income gap and one of

# Figure 4.  Percentages of persons with low incomes

## A. Persons below 50 per cent of median income

**Per cent of population**



## B. Persons below 40 per cent of median income

**Per cent of population**



Note:   Income concept used: disposable income adjusted for family size.
Source:   LIS micro data base.

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**Table 7.  Sen poverty measure and its components for disposable incomes, percentage change and relative contribution of components after accounting for net transfers**

Children living in non-elderly families below 50 per cent of median income

| | Indicators for low disposable incomes | | | | Reduction in Sen index (percentage change) (5) | Relative contribution of components | | |
|---|---|---|---|---|---|---|---|---|
| | Low-income rate LIR (1) | Low-income gap ALG (2) | Gini (poor) Gp (3) | Sen index S (4) | | Low-income rate LIR (6) | Low-income gap ALG (7) | Gini (poor) Gp (8) |
| Australia 85/86 | 12.0 | 33.7 | 0.2369 | 5.93 | 54.9 | 52% | 29% | 18% |
| Belgium 85 | 3.6 | 24.4 | 0.1671 | 1.33 | 84.2 | 95% | 4% | 1% |
| Canada 87 | 12.6 | 27.3 | 0.1579 | 4.89 | 58.3 | 48% | 30% | 22% |
| France 84 | 5.7 | 28.9 | 0.1855 | 2.40 | 81.1 | 82% | 11% | 7% |
| Germany 84/85 | 3.8 | 23.4 | 0.1523 | 1.33 | 80.7 | 60% | 24% | 16% |
| Ireland 87 | 7.6 | 38.9 | 0.2931 | 4.32 | 80.8 | 77% | 14% | *9%* |
| Netherlands 87 | 4.1 | 26.1 | 0.2361 | 1.79 | 80.4 | 71% | 21% | 8% |
| Norway 86 | 3.9 | 34.3 | 0.2492 | 1.98 | 69.6 | 73% | 16% | 11% |
| Sweden 87 | 3.7 | 24.6 | 0.1327 | 1.28 | 85.5 | 64% | 20% | 16% |
| United Kingdom 86 | 7.3 | 37.6 | 0.2817 | 4.03 | 81.7 | 77% | 13% | 10% |
| United States 86 | 21.0 | 32.9 | 0.1844 | 9.50 | 40.6 | 25% | 43% | 32% |
| Average (unweighted) | 7.8 | 30.2 | 0.2070 | 3.52 | 72.5 | 66% | 21% | 14% |

the most equal income distributions among the families of poor children across countries. On the other hand, Australia and, in particular, Ireland and the United Kingdom (these two countries have below-average low-income rates for children) have the highest income gaps and a high concentration of low incomes after taxes and transfers, resulting in above-average values of the Sen index for child poverty after taxes and transfers.

## B. The effects of net transfers

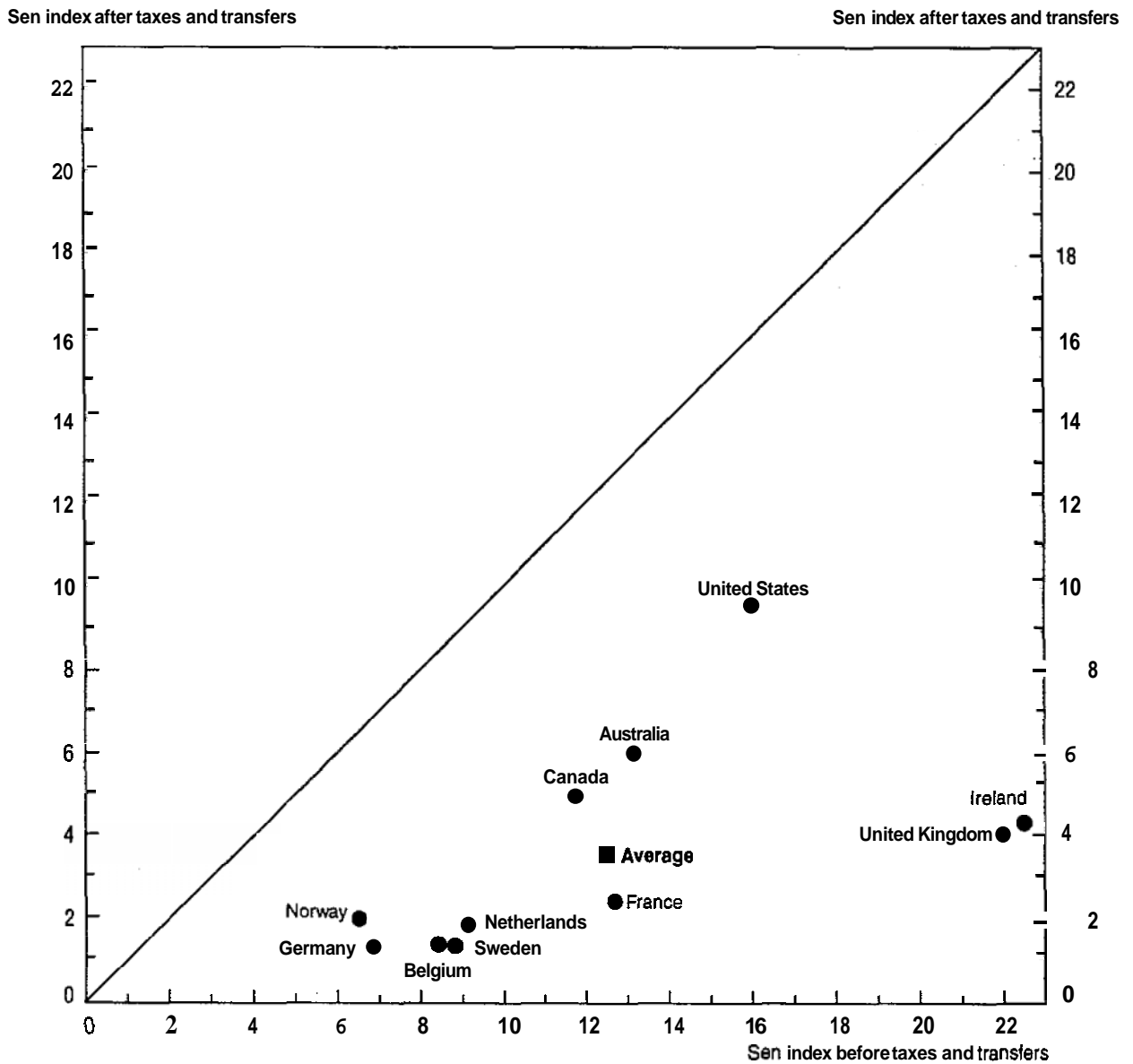Figure 5 compares Sen indices for children before and after taxes and transfers. Child poverty before taxes and transfers, as measured by S, is highest in Ireland and in the United Kingdom and lowest in Germany and in Norway. Once allowance is made for taxes and transfers, overall child poverty based on the disposable income of their families is lowest in Belgium, Germany, and Sweden and highest in the United States. In all European countries, the reduction of child poverty (measured by the decline in S) is higher than in the United States. Reduction rates in Australia and Canada lie in between.

A comparison of Figure 5 with Figure 2 (Sen indices for all non-elderly families) shows roughly the same cross-country patterns: Ireland and the United Kingdom are "outliers" (very high pre-tax and transfer values of the Sen index and average post-tax and transfer values) and the United States is another one (almost average pre-tax and transfer values of the Sen index and high post-tax and transfer values).

Columns (5), (6), (7) and (8) in Table 7 give reduction rates for the Sen index and the relative contributions of its components when allowance is made for net transfers. First, it is noteworthy that net transfers result in all countries in a higher reduction of Sen indices for children than for all non-elderly families, especially in Canada, France, Sweden and the United States. In most countries, these reduction rates are also higher than for the two family types at risk: single parent families and large families.

The high reduction in the Sen index for children is mainly due to particularly high percentage changes in low-income incidence after accounting for net transfers. The relative contributions of the reduction in inequality and intensity are consequently lower than for all non-aged families. On average across all countries, about two-thirds of the poverty reduction can be attributed to low-income incidence: the relative contribution of the low-income rate to the reduction in overall poverty among children in low-income families is above 50 per cent in all countries except the United States. The decline in the low-income gap contributes on average to one-fifth of poverty reduction; the two extreme cases are Belgium where this contribution is as low as 4 per cent and the United States where it is as high as 43 per cent. Greater income equality contributes on average only to about one-seventh of poverty reduction among children in low-income families. A significant contribution is recorded only for the United States (one-third) and, to a lesser

**Figure 5.   S ı index before and after accounting for net transfers**
**Children living in low-income families**



Sen index after taxes and transfers

Sen index after taxes and transfers

Sen index before taxes and transfers

Notes:   Sen indices at the 50 per cent cut-off level.
   Average: unweighted country sample average.
Source:   LIS micro data base.

degree, for Australia and Canada (one-fifth). This would again suggest that in these countries net transfers are particularly targeted to the poorest segments of families with children.

   Table 8 illustrates the sensitivity of these patterns to different low-income benchmarks. It can be seen that, for all cut-off lines, reduction rates d the Sen index and its components are higher for children than for all non-elderly families

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## Table 8. Percentage change of Sen poverty measure and its components after accounting for net transfers

Children living in non-elderly families

| | | Market income = 100 | | | |
|---|---|---|---|---|---|
| | | Low-income rate<br>LIR | Low-income gap<br>ALG | Gini (poor)<br>Gp | Sen index<br>S |
| Australia 85/86 | < 40% of median | 45.2 | 69.6 | 65.7 | 34.1 |
| | < 50% of median | 68.6 | 59.6 | 55.4 | 45.1 |
| | < 60% of median | 92.4 | 61.1 | 51.5 | 59.6 |
| Belgium 85 | < 40% of median | 12.4 | 89.1 | 96.0 | 11.5 |
| | < 50% of median | 16.5 | 94.2 | 96.5 | 15.8 |
| | < 60% of median | 29.3 | 71.2 | 89.8 | 23.3 |
| Canada 87 | < 40% of median | 47.7 | 52.5 | 54.2 | 28.3 |
| | < 50% of median | 68.5 | 59.2 | 48.2 | 41.7 |
| | < 60% of median | 82.2 | 64.3 | 52.3 | 53.6 |
| France 84 | < 40% of median | 18.9 | 85.9 | 77.8 | 16.1 |
| | < 50% of median | 23.1 | 80.1 | 77.7 | 18.9 |
| | < 60% of median | 34.2 | 67.6 | 71.7 | 24.8 |
| Germany 84/85 | < 40% of median | 20.2 | 46.8 | 44.1 | 10.8 |
| | < 50% of median | 39.2 | 45.2 | 38.2 | 19.3 |
| | < 60% of median | 77.9 | 39.2 | 33.6 | 33.7 |
| Ireland 87 | < 40% of median | 16.9 | 82.1 | 66.6 | 14.0 |
| | < 50% of median | 25.9 | 67.3 | 65.8 | 19.2 |
| | < 60% of median | 67.3 | 39.0 | 36.4 | 30.6 |
| Netherlands 87 | < 40% of median | 13.3 | 84.8 | 89.0 | 11.9 |
| | < 50% of median | 28.7 | 56.8 | 71.8 | 19.6 |
| | < 60% of median | 40.9 | 58.2 | 61.3 | 26.7 |
| Norway 86 | < 40% of median | 30.3 | 70.6 | 79.5 | 24.0 |
| | < 50% of median | 40.2 | 71.2 | 68.7 | 30.4 |
| | < 60% of median | 60.9 | 61.6 | 61.0 | 40.9 |
| Sweden 87 | < 40% of median | 20.2 | 45.2 | 37.1 | 9.9 |
| | < 50% of median | 28.2 | 50.6 | 36.5 | 14.5 |
| | < 60% of median | 41.8 | 50.6 | 40.3 | 21.9 |
| United Kingdom 86 | < 40% of median | 16.2 | 79.1 | 70.0 | 13.3 |
| | < 50% of median | 24.7 | 68.8 | 64.1 | 18.3 |
| | < 60% of median | 49.7 | 49.6 | 46.8 | 27.7 |
| United States 86 | < 40% of median | 70.3 | 58.8 | 46.2 | 42.7 |
| | < 50% of median | 90.1 | 64.2 | 51.4 | 59.4 |
| | < 60% of median | 98.1 | 73.1 | 42.7 | 66.9 |
| Average (unweighted) | < 40% of median | 28.3 | 69.5 | 66.0 | 19.7 |
| | < 50% of median | 41.3 | 65.2 | 61.3 | 27.5 |
| | < 60% of median | 61.3 | 57.8 | 53.4 | 37.3 |

Notes: Income adjusted with an equivalence elasticity of 0.55. LIR, ALG and Sen index multiplied by 100.
    Definitions and methods of indicators: see Section I.
Source: LIS micro data base.

and those families at high risk. On average and at the 60 per cent level, for example, each of the poverty components is reduced by at least **40** per cent, which results in a Sen index of almost one-third the size of its former level when allowance is made for net transfers. Second, the "rule of thumb" pointed out above, according to which the reduction in low-income incidence is decreasing and that of intensity and inequality is increasing with increasing low-income benchmarks, also holds for the analysis of the effects of net transfers for children in low-income families.

# V. CONCLUSIONS

This paper has examined the role of the government in redistributing incomes towards families in lower income segments. In order to assess the combined effects of taxes and transfers on incomes, the analysis compared poverty, as measured by market income, with poverty, as measured by disposable income. The analysis is based on micro data from the Luxembourg Income Study from a year around the middle to late **1980s.**

The principal conclusion to draw from this study is that tax/transfer systems play an important role in alleviating poverty in all the countries studied. Measured as the reduction in the Sen index − a comprehensive measure of poverty − the redistribution of incomes towards vulnerable families is particularly strong in European countries and comparatively modest in the United States. Poverty reduction rates in Australia and Canada are relatively low but closer to the country sample average. The decrease in the Sen index after accounting for net transfers is similar on average for all non-elderly families and for large families, but somewhat greater reductions are recorded for single-parent families and, in particular, for children.

The main reason why net transfers reduce the comprehensive measure of poverty is that it takes a greater proportion of families above the poverty benchmark. The decrease in the gap between the benchmark and average incomes of the poor also contributes substantially to poverty reductions, while a more even income distribution among the poor plays a more modest role. A common feature in all countries and for all population groups studied is that net transfers result in lower reductions of low-income incidence when moving to higher low-income benchmarks, whilst the opposite is true for low-income inequality and − to a lesser extent − for low-income intensity: these two components of overall poverty are increasingly reduced with higher benchmarks.

Different patterns across countries can be observed: the relative contribution of reductions in the incidence of poverty, *i.e.* the number of poor families, is higher in European countries than in the three non-European countries studied, where net transfers result primarily in a reduction of the low-income gap and inequality among the poor. This indicates a certain targeting to the lowest income segments in these latter countries.

Many OECD countries have reformed their tax/transfer systems in recent years, and changes are under way in many others. The prime motivation behind these changes has been the desire to reduce the disincentives possibly embedded in these systems. However, it should be kept in mind that one of the principal objectives of the tax/transfer system has been to provide a socially acceptable minimum standard of living, and efficiency-enhancing reforms may compromise this traditional equity goal.

# NOTES

1. For an extensive discussion of the Luxembourg Income Study project, see OECD (1994), (forthcoming).

2. Hagenaars and de Vos (1987) apply eight definitions of a poverty line to a 1983 household survey in the Netherlands (four definitions based on an absolute approach, three on a subjective one, and one on a relative measure): the derived overall poverty rates ranged from 5.7 to 33.5 per cent of the total population.

3. One such example is the current US Social Security Administration Poverty Index, developed by Orshansky (1965, 1969).

4. The derived median disposable incomes are used to calculate the low-income cut-off lines at the 40 per cent, 50 per cent and 60 per cent level. These lines are shown in *Annex 2*.

5. For a theoretical analysis of the neglect of intra-household inequalities on poverty estimates and empirical results for the Philippines, see Haddad and Kanbur (1990). For a discussion of the effects of intra-family transfers on the economic position of children, see Qvortrup (1990).

6. Some comparative studies also adjust the incomes for the age structure of a family. Rainwater (1988) shows for nine OECD countries (around 1980), that adjusting for the age of the family head decreases the overall low-income rate for all countries by 10 to 20 per cent. On the other hand, the rankings between countries were generally not affected.

7. It should be noted, however, that this is not a linear function and that one can get "u-shaped" results when including the two extreme values for e, 0 and 1. Forster (1994) shows that this holds true for the 14 OECD countries under review. This means that one cannot simply calculate low-income rates for two extreme equivalence scales and assume that intermediate scales would lead to intermediate low-income estimates.

8. This scale gives the weight of 1 for each single adult, 0.7 for the second and subsequent adults, and 0.5 for each child, implying an equivalence elasticity of 0.73.

9. The Swedish definition is that of combined tadadministrative units. A specific problem relates to young units: young adults, economically independent but still living with their parents in a household, are counted as separate families; the share of the youth population and, *ceteris paribus,* the level of poverty may therefore be overestimated when using a family definition.

10. The intuition behind the Gini coefficient is the Lorenz curve which is a familiar construction to illustrate graphically the concentration of incomes. It plots cumulative proportions of the population, from the poorest upwards, against the cumulative shares

of incomes that they receive. If all incomes were identical, this would trace a diagonal 45°-line ("line of perfect equality"). In the other extreme case – if the richest unit would receive all the income – the Lorenz curve would lie along the horizontal axis, and then along the vertical axis at the 100 per cent income share ("line of perfect inequality"). The Gini coefficient is defined as the area between the Lorenz curve and the 45°-line as a ratio of the whole triangle. For an extensive discussion of measures of income inequality and the Gini coefficient, see Morris and Preston (1986), OECD (1990a: 220 ff), and OECD (1994).

11. This measure, LIR * ALG, referred to as a poverty index, has sometimes been used as a single poverty indicator (Atkinson, 1987; Sen, 1976).

12. Comparing pre-tax and transfer incomes with post-taxes and transfers assumes away any behavioural responses. In a society without taxes and transfers, there would be more market income at the margin, so the percentage of the population who would in fact be below a given absolute level of incomes without net transfers would be less than the static estimates shown in the paper. On the other hand, this might also change the income distribution through the market.

13. The same pattern can also be observed for the United States in the lowest income segment of 40 per cent below the median (table not shown).

14. In order to estimate the relative contribution of the three components to the change in overall poverty, the following linear approximation of the Sen index has been used:

$$\Delta S = \text{ALIR} * [\text{ALG} + (1 - \text{ALG}) \bullet G_p] + \Delta\text{ALG} * [\text{LIR} \bullet (1 - G_p)]$$
$$+ \Delta G_p * [\text{LIR} * (1 - \text{ALG})] + \varepsilon$$

The explanation rates of this first-order approximation were in general above 90 per cent, unless otherwise stated in the tables. A similar approach has been used by Achdut and Kristal (1993). It should be noted that, through its definition, the Sen index is more sensitive to changes in the low-income rate than to changes in the income gap and in the Gini coefficient.

15. The countries included in this study are: Germany (1983), Spain (1987), France (1985), Ireland (1987), Italy (1985), the Netherlands (1985), and the United Kingdom (1985).

16. For this definition, the reference population is confined to children instead of families. Technically, the population of children is "reconstructed" by multiplying the household sample weights by the number of children in each family.

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Annex 1
## SURVEYS USED FOR LIS DATA FILES

Unweighted household sample size in parenthesis

| | |
|---|---|
| Australia 1985186 | Income Distribution Survey (7563) |
| Austria 1987 | Mikrozensus (11147) |
| Belgium 1985 | The Living Conditions of Households in 1985 (6471) |
| Canada 1987 | Survey of Consumer Finances (10999) |
| France 1984 | Revenus fiscaux (11044) |
| Germany 1984185 | Das sozio-ökonomische Panel, Welle 1/Welle 2 (Socio-economic Panel Study, Wave 1/Wave 2) (5174) |
| Ireland 1987 | Survey of Income Distribution (3297) |
| Italy 1986 | Indagine Campionaria sui Bilanci Delle Famiglie (Bank of Italy Income Survey) (8022) |
| Luxembourg 1985 | Panel socio-economique "Liewen zu Letzebuerg" (Luxembourg Household Panel Study) (2012) |
| Netherlands 1987 | Aanvullend Voorziengengebruik Onderzoek (4833) |
| Norway 1986 | Inteks-og formuesstatistikk 1986 (Income and property statistic 1986) (4975) |
| Sweden 1987 | Inkomstfordelningsundersokningen (Income Distribution Survey) (9421) |
| United Kingdom 1986 | The Family Expenditure Survey (6795) |
| United States 1986 | March Current Population Survey (11614) |
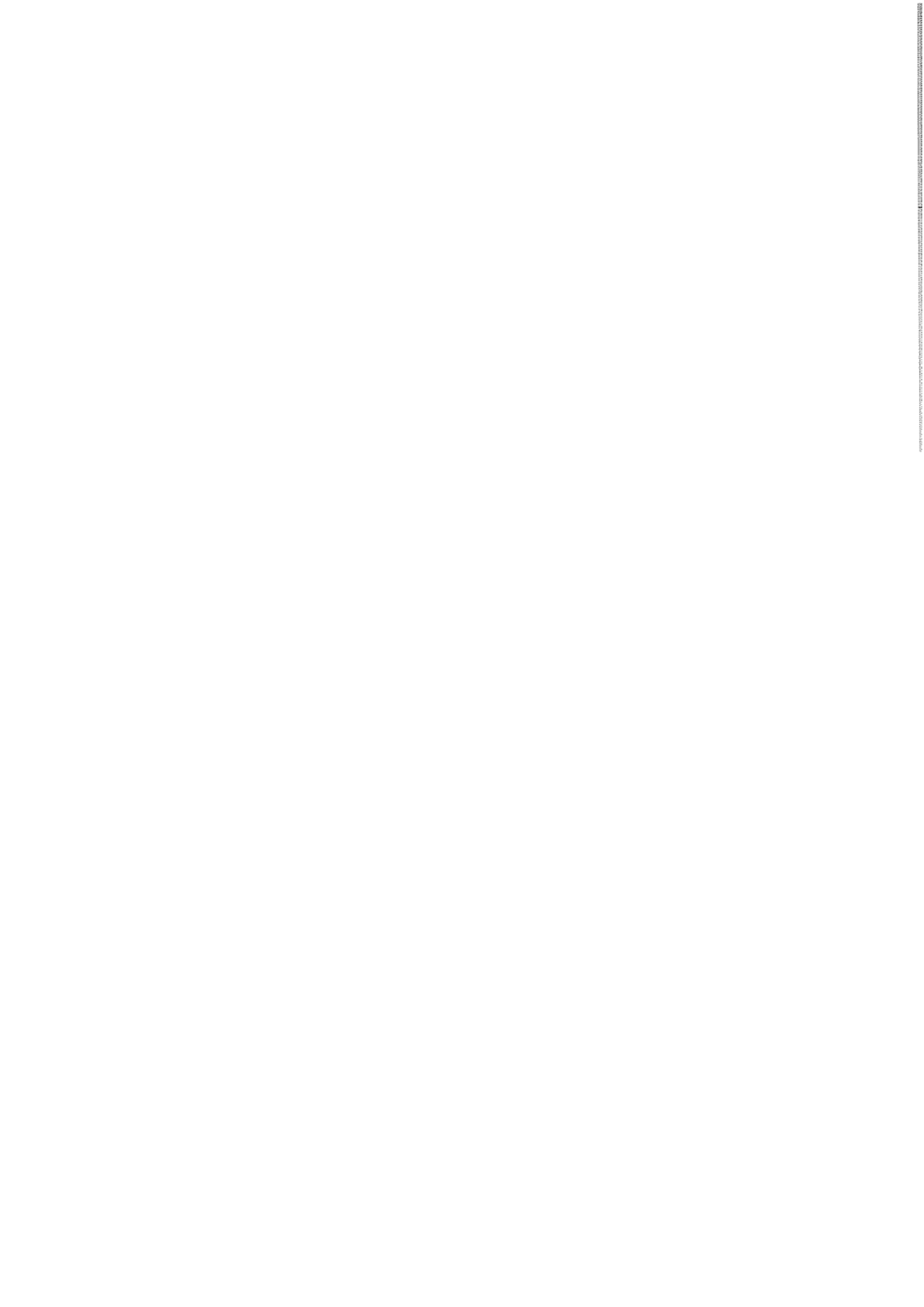
**Annex 2**

# POVERTY LINES IN NATIONAL CURRENCIES

Non-elderly families and all persons

| | | Non-elderly families | Ail persons |
|---|---|---|---|
| Australia 85/86<br>  Australian Dollars | < 40% of median<br>< 50% of median<br>< 60% of median | 4 860.0<br>6 075.0<br>7 290.0 | 4 352.2<br>**5** 440.3<br>6 528.4 |
| Austria 87<br>  Austrian Schillings | < 40% of median<br>< 50% of median<br>c 60% of median | 63 465.1<br>79 331.4<br>95 197.6 | 61 600.0<br>77 000.0<br>92 400.0 |
| Belgium 85<br>  Hundred Belgian Francs | < 40% of median<br>c 50% of median<br>< 60% of median | 1 462.2<br>1 827.8<br>2 193.4 | 1 393.4<br>1 741.7<br>2 090.0 |
| Canada 87<br>  Canadian Dollars | < 40% of median<br>c 50% of median<br>< 60% of median | 6 949.4<br>8 686.7<br>10 424.0 | 6 678.1<br>8 347.6<br>10 017.1 |
| France 84<br>  French Francs | < 40% of median<br>< 50% of median<br>c 60% of median | 24 170.2<br>30 212.8<br>36 255.3 | 23 125.8<br>28 907.2<br>34 688.6 |
| Germany 84/85<br>  German Marks | < 40% of median<br>< 50% of median<br>< 60% of median | 8 437.8<br>10 547.3<br>12 656.8 | 8 044.4<br>10 **055.5**<br>12 066.5 |
| Ireland 87<br>  Irish Pounds | < 40% of median<br>< 50% of median<br>< 60% of median | 1 878.6<br>2 348.3<br>2 818.0 | 1 765.2<br>2 206.5<br>2 647.8 |
| Italy 86<br>  Thousand Italian Lira | < 40% of median<br>< 50% of median<br>< 60% of median | 4 292.0<br>5 365.0<br>6 437.9 | 4 068.0<br>5 085.0<br>6 102.0 |
| Luxembourg 85<br>  Luxembourg Francs | < 40% of median<br>< 50% of median<br>< 60% of median | 185 250.0<br>231 562.5<br>277 874.9 | 178 027.2<br>222 534.1<br>267 040.9 |
| Netherlands 87<br>  Dutch Guilder | < 40% of median<br>< 50% of median<br>< 60% of median | 7 484.8<br>9 356.0<br>11 227.2 | 6 904.8<br>8 631.0<br>10 357.2 |
| Norway 86<br>  Norwegian Kroner | < 40% of median<br>< 50% of median<br>< 60% of median | 40 584.0<br>50 730.0<br>60 876.0 | 39 505.2<br>49 381.5<br>59 257.7 |
| Sweden 87<br>  Swedish Kroner | < 40% of median<br>< 50% of median<br>< 60% of median | 29 760.0<br>37 200.0<br>44 640.0 | 29 294.0<br>36 617.5<br>43 941.0 |
| United Kingdom 86<br>  British Pounds | < 40% of median<br>< 50% of median<br>< 60% of median | 2 117.6<br>2 647.1<br>3 176.5 | 1 910.8<br>2 388.5<br>2 866.2 |
| United States 86<br>  US Dollars | < 40% of median<br>c 50% of median<br>< 60% of median | 5 357.8<br>6 697.3<br>8 036.7 | 5 081.3<br>6 351.6<br>7 621.9 |

*Notes:* **Income concept used is disposable income adjusted** for **family size, using an equivalence scale** with **an elasticity** *of* **0.55.**
   **Non-elderly families defined as families with a head aged less than 60.**
**Source: LIS micro data base.**