

## INCOME DISTRIBUTION AND POVERTY IN 13 OECD COUNTRIES

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## INTRODUCTION

This article reports on developments in income distribution and poverty for 13 OECD countries (Australia, Belgium, Canada, Denmark, Finland, France, Germany, Italy, Japan, the Netherlands, Norway, Sweden and the United States), in the one to two decades ending in the early to mid-1990s.<sup>1</sup> There are four broad conclusions:

- Inequality in the distribution of disposable income and poverty have increased over the past two decades in some, but by no means all, OECD countries.
- Market income has become more unequally distributed in most countries, but the relative contribution of earnings and of self-employment and capital income varies considerably across countries. Widening wage-rate distributions have been important, but changing patterns of employment at the level of the working-age population have also played a role.
- Taxes and transfers substantially reduce income inequality and poverty in a given year. They have also tended to offset increased inequality of labour and capital income - partly reflecting endogenous response (*e.g.* of taxes) to changes at the level of market income. The increase in the share of taxes and transfers in total income has been an important factor underlying this development.
- Not all population groups have been affected to the same degree and in the same manner by the tax-and-transfer system: retirement-age households and the unemployed appear to have benefited the most, while children have gained the least. A larger share of the total number of poor may now be found among the working population.

Previous OECD work highlighted several issues which are relevant for this study. Atkinson *et al.* (1995) examined cross-country differences in income distribution using the Luxembourg Income Study (LIS) data, which have been adjusted to make them more internationally comparable. However, this study provided less information on changes in income distribution over time.<sup>2</sup> The *OECD Employment Outlook* addressed the issue of full-time earnings inequality and low pay (OECD, 1993 and 1996a) and earnings mobility (OECD, 1997a). The present study seeks to

throw further light on the impact of changes in market income on the overall income distribution and on how the tax-and-transfer system has responded.

This study provides additional background material to OECD work on labour-market reform. The *OECD Jobs Study* and follow-ups (OECD, 1994 and 1997b) laid out a comprehensive strategy aimed at improving the labour-market performance. Measures to improve labour-market incentives were a major element of the recommendations. Higher employment ensuing from such reforms can lead to a narrowing in the distribution of earnings and income in cases where households move from zero to positive earnings on gaining employment. However, policy makers are faced with potential policy dilemmas: reforms which permit further widening of wage-rate distributions could create a new class of the working poor, while less generous income-transfer systems would lead to increased difficulties for those without market income. This study does not purport to resolve these issues. Rather, it is intended to provide a clearer idea about what has been happening over the past few decades, possible reasons for these changes and the groups which appear most affected, on average.

This study is organised as follows. Methodological and data issues are raised in section two, while section three provides a short description of overall trends in the distribution of disposable income and poverty. The remainder of the study discusses some of the sources of this change in overall inequality and the experience of some of the groups affected. Section four examines the impact of various components of market income; and section five focuses on the role and impact of the tax-and-transfer system. Section six provides some evidence on the role of employment. A final section looks at the impact of the tax-and-transfer system on average incomes and poverty of selected population groups.

## DATA AND METHODOLOGY<sup>3</sup>

### Data

This study uses a common approach to analyse national data on the distribution of household income. Data were collected on the basis of a questionnaire completed by national authorities or experts who drew on the country files most appropriate for comparisons over time. The specific years chosen differed across countries - in most cases reflecting data availability. The maximum time period covered is from a year around the mid-1970s to one in the early to mid-1990s, but over half the countries provided data starting in the mid-1980s (Belgium, Denmark, Finland, France, Germany, Italy, Japan and Norway). While broad indicators are presented for the two sub-periods of the mid-1970s to the mid-1980s and the mid-1980s to the mid-1990s, detailed analysis focuses on the longest period available for each country. These data are representative samples of the population at a

### Box A. Source and nature of the data

Detailed data on the distribution of household disposable income by type of income, age of individuals and a variety of household characteristics have been collected through a common questionnaire sent to experts in each country. Data were drawn from national sources rather than international data sets based on comparable definitions - such as those in the Luxembourg Income Study. Nonetheless, a common classification of the data was imposed by the questionnaire.

Data were requested for three years: one in the mid- to the end 1970s, one in the early to mid-1980s and one in the early 1990s (see Table 1 for precise years). However, for Belgium, Denmark, Finland, France, Germany, Italy, Japan and Norway, the earliest years range from 1979 to 1986 and the time span is limited to around ten years.

The population coverage of the surveys is, in general, the resident non-institutional population, but sample sizes vary considerably. For countries with particularly small samples, *e.g.* Australia and Germany, or for small changes over time, the movements may not be statistically significant. This risk is higher for decompositions by household type, particularly when considering the sub-population of the poor.<sup>1</sup>

The data are cross-sectional and do not take into account dynamic changes in the situation of individuals over time. The study uses "snapshots" of the population which change between periods: for example, individuals in the bottom 5 per cent of the distribution in one period are not necessarily the same as those in the second period.

Measurement problems are likely to be particularly important at the extremes of the distribution. Many countries have experienced an increase in the degree of homelessness which household surveys usually fail to pick up because they only include households with a fixed residence.

Problems of under-reporting of incomes exist for all countries, particularly for self-employment and capital and property incomes (where there is considerable variation in definitions as well)<sup>2</sup> and in income transfers (particularly for income-tested benefits). Under-reporting for capital income may be concentrated in certain groups (Atkinson *et al.*, 1995). In some countries, data on tax payments are derived from simulation models (Germany, Italy and the United States). Self-employment income is included with earnings in Canada and Germany. Much of capital income is not included in Belgium and, possibly, Italy. For France, market income data are net of social security contributions and, consequently, only direct taxes on income are reported.

For two countries there are breaks in data series, due to changes in the income concept or changes in the sampling procedure:

- For the Netherlands, there were changes in the tax system in the early 1990s, but data for 1985 were made consistent by national authorities with those for later years. The change over the entire period was established by linking the growth of the various indicators from 1977 to 1985 (old tax system) with the growth from 1985 to 1994 (new tax system).

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- For Sweden, there was also a change in the tax system between 1990 and 1991 but there was no way of linking the period 1975 to 1990 with the period 1991 to 1995. In this case, the change over the entire period was established by linking the growth of indicators in the earlier period with the growth in the later period. Changes from 1990 to 1991 are, thus, not included.<sup>3</sup>

Finally, in Italy, the organisation undertaking the income survey changed in the early 1990s and this may have improved the sampling and measurement of lower income households, thus exaggerating changes over time. There is no way of adjusting for this effect.

In several countries (Belgium, Germany and the Netherlands), zero household disposable incomes were eliminated from the sample. This may weaken the cross-country comparability of those inequality indices which are especially sensitive to individuals at the bottom of the distribution (such as the MLD). Finally, there may be differences in the cyclical position of economies in various years. The years for which data were collected are not always at the same cyclical position. For further details on the data sets see Burniaux *et al.* (1997), Annex 1.

Additional data drawn from LIS files used national data to examine the impact of taxes and transfers on poverty. These data covered slightly different time periods but results appeared broadly consistent with those described above.

1. Confidence intervals for inequality indices and their changes were not estimated.
2. Since the last two components have serious measurement problems they have been aggregated together.
3. It should also be noted that data for Sweden are affected by the fact that all individuals over 18 are treated as independent households even when they are living with their parents. This means that income distribution indicators may be biased upwards. In addition, the breakdown by age group and by family type are also affected. Since there has been a large increase in the members of over 18 living with parents, this effect has become magnified over time.

moment in time. Thus, those individuals included in the sample in the first period may not necessarily appear in samples for later periods.

There is less cross-country comparability than with the LIS data, although a number of problems, described in Box A, are common to both.<sup>4</sup> Such problems are almost certainly less significant for comparisons over time. Nonetheless, available years were not always at the same cyclical position. Further, these samples may not always accurately reflect changes over time at the extremes of the distribution: household surveys usually exclude individuals without a fixed residence and developments such as increased homelessness may not be picked up.<sup>5</sup> At the top

**Box B. The income concept: “equivalent disposable income per household member”**

All incomes, taxes and benefits are reported on an annual basis. Household disposable income ( $Y_i$ ) includes earnings, self-employment incomes, realised property incomes,<sup>1</sup> cash transfers less direct taxes and social security contributions paid by individuals. Current income is deflated by using the consumer price index (CPI) relative to the initial year (all incomes are expressed in national currencies of the initial year).

The unit of observation is the household, defined as a collection of individuals sharing the same housing unit, although the family is used in some countries. Equivalent disposable income per household member is total household disposable income divided by household size, with an additional correction to allow for household economies of scale. Each individual is then attributed the adjusted income of the household. For instance, if  $Y_i$  denotes the total disposable income of household  $i$ , the “adjusted” income of each member  $j$  of household  $i$  ( $W_{ij}$ ) is:

$$W_{ij} = \frac{Y_i}{S_i^\varepsilon},$$

where  $S_i$  is the number of members in household  $i$  and  $\varepsilon$  is the correction for household economies of scale, usually referred to as the equivalence-scale elasticity. The smaller the value for  $\varepsilon$ , the higher the assumed economies of scale in consumption. A value of one implies no economies of scale, and is equivalent to per capita income. A value less than one implies that household welfare can be maintained with a less than proportionate increase in resources as an additional member is added. A value of zero is equivalent to using household income, *i.e.* it assumes no increase in needs with household size. There is no consensus on the correct elasticity. This study uses a value of 0.5, but see Burniaux *et al.* (1998) for the estimate using an elasticity of one.

1. This component also includes private transfers such as private pension receipts which are important, for example in the United States.

end of the distribution, households are often assigned an arbitrary income to maintain confidentiality (top coding) and thus movements at the very top of the distribution may be missed or distorted if rules for top coding change, as was the case for the United States, or major changes in the distribution occur in this segment. Under-reporting or other measurement problems may not remain constant over time. Finally, breaks in the data occurred for the Netherlands and Sweden, and only

partial corrections were possible. In the case of Italy, because of improvements in the measurement of low-income households in the early 1990s, the widening in the income distribution over time may be overstated (Box A). This highlights the need for caution in interpreting these results.<sup>6</sup>

### The income concept

The key concept for measuring the distribution of income and degree of poverty is *equivalent household disposable income* per individual (Box B). The income of all members of the household is combined and then divided by the square-root of the number of individuals in the household,<sup>7</sup> to allow for differences in household size and for the existence of household “economies of scale” in consumption, *i.e.* that “needs” do not rise in direct proportion as the number of persons in the household increases.<sup>8</sup> On the assumption that households generally pool income, equivalent household disposable income is attributed to each individual in the household. Thus, children are assumed to benefit equally from household income, even though only the parents usually receive income in their own right. Individuals were then ranked according to their equivalent income and the various measures of income distribution and poverty were calculated. Equivalent household disposable income is broken down into: earnings; self-employment and capital income; transfers received from general government; and direct taxes and social security contributions paid by individuals.<sup>9</sup> The sum of the first two of these components is referred to here as “market income”.

## TRENDS IN THE DISTRIBUTION OF DISPOSABLE INCOME AND POVERTY

Three widely used inequality indices are presented in the first three columns of the top panel of Table 1 - the Gini coefficient, the mean log deviation (MLD) index and the squared coefficient of variation (SCV) - to describe changes in the distribution of equivalent household disposable income (see Box C for further description of the main features of these indexes). Increases in all three inequality indices occurred in four of the five countries for which data were available from the mid-1970s to the mid-1980s. Over the period from the mid-1980s to the mid-1990s, the indices show a fairly clear increase in seven of the 13 countries shown. For the other six countries, there was no clear trend: either changes in the Gini coefficient were clustered around zero and/or the different indices point in different directions. In Australia, Canada and, particularly, Sweden, the movements in the earlier period (declines in Australia and Sweden, increases in Canada) tended to be offset in the second, such that inequality changed little over the two decades.

Table 1. Trends in income inequality and poverty, early 1970s to mid-1990s: household disposable income

Sub-periods	Income inequality						Poverty		
	Gini		SCV		MLD		Poverty rate		
	Final level	Per cent change	Final level	Per cent change	Final level	Per cent change	Final level	Percentage point change	
Australia, 1975/76-1993/94		30.6	5.2	37.5	14.7	17.8	13.1	9.5	-2.4
	1975/76-1984	31.2	7.2	35.9	9.8	17.6	11.5	12.2	0.3
	1984-1993/94	30.6	-1.9	37.5	4.5	17.8	1.4	9.5	-2.7
Belgium, 1983-1995		29.9	2.3	47.2	19.2	26.9	-3.6	10.8	-7.7
Canada, 1975-1994		28.4	0.2	30.9	7.8	14.3	-5.8	8.9	-2.3
	1975-1985	28.9	2.2	37.5	30.8	15.3	1.0	9.7	-1.5
	1985-1994	28.4	-1.1	30.9	-17.5	14.3	-6.8	8.9	-0.8
Denmark, 1983-1994		21.7	-4.9	22.9	2.0	8.8	-14.3	5.0	-2.0
Finland, 1986-1995		23.1	9.1	24.3	47.7	9.0	14.8	4.9	-0.2
France, 1979-1990		29.1	-1.7	65.1	2.1	29.5	-13.6	6.8	-1.5
Germany, 1984-1994		28.2	6.4	32.4	-6.3	13.5	13.0	9.1	2.9
Italy, 1984-1993		34.5	12.7	58.4	44.7	24.0	41.2	14.2	3.9
Japan, 1984-1994		26.5	4.9	29.6	21.7	12.6	13.5	8.1	0.8
Netherlands, 1977-1994		25.3	11.8	23.9	20.2	11.6	29.8	8.9	3.7
	1977-1985	23.4	3.3	22.5	13.4	9.5	7.0	2.7	0.7
	1985-1994	25.3	8.2	23.9	6.0	11.6	21.3	8.9	3.0
Norway, 1986-1995		25.6	9.4	30.5	8.1	13.1	31.1	8.0	1.1
Sweden, 1975-1995		23.0	-1.0	21.7	36.9	11.0	2.1	6.4	-0.2
	1975-1983	21.6	-7.0	13.6	-13.8	9.0	-17.0	5.3	-0.7
	1983-1995	23.0	6.5	21.7	58.9	11.0	23.0	6.4	0.4
United States, 1974-1995		34.4	10.0	44.1	25.4	21.9	20.3	17.1	1.6
	1974-1985	34.0	8.8	42.9	21.9	21.4	17.5	18.3	2.8
	1985-1995	34.4	1.1	44.1	2.9	21.9	2.4	17.1	-1.2

Note: The inequality indices are based on equivalent household disposable income per individual using an equivalence-scale elasticity of 0.5. See Box C for a description of indices and considerations that need to be taken into account in interpreting these results. Poverty rates are the share of individuals in the population with equivalent household disposable income less than 50 per cent of the median income of the distribution. Percentage point changes of poverty rates measure the absolute difference in the value of the indicator.

Source: OECD.

### Box C. Inequality indices

Income distributions can be summarised by an index number. The following three indices are presented in Table 1 and used elsewhere in the report (see Burniaux *et al.*, 1988, Annex 1 for the precise formulae). However, these do not all give the same results, in part because they are sensitive to movements in different parts of the distribution.

- The Gini coefficient can be derived from the Lorenz curve, which plots cumulative shares of the population, from the poorest upwards, against the cumulative share of incomes that they receive. If incomes were equally distributed, the plot would trace a diagonal 45° line ("line of perfect equality"). At the other extreme - if the richest individual received all income - the Lorenz curve would lie along the horizontal axis, and then rise 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, taken as a ratio of the whole triangle.
- The SCV (Squared Coefficient of Variation) index is the sum of the squared deviations of the income of each individual from that of the population mean, divided by the square of mean income.
- The MLD (Mean Log Deviation) index is the average of the log ratios of the income of each individual to the mean income (see Box E).

These three indices have different ranges: all have a lower bound value of zero (in the case of perfect equality), but the upper bound is one for the Gini and the Atkinson indices, infinity for the SCV and  $[1 + \log(100)] \log(\text{mean income})$  for the MLD. Thus, changes of similar magnitude across the various indices may indicate quite different changes in the degree of inequality depending on the indicator. Each index also differs in its sensitivity to changes at various points in the distribution. Relative to other indices, the Gini coefficient is less sensitive to changes in income at the two extremes of the distribution. The MLD is more sensitive to changes at the bottom of the distribution, while the opposite occurs for the Squared Coefficient of Variation (SCV). All indices are presented multiplied by 100.

The poverty rate (Table 1, right-hand column) - defined as the proportion of individuals falling below one half of median equivalent household disposable income<sup>10</sup> - rose in two of the five countries for which data are available since the mid-1970s, and in six of the 13 for which data are available since the mid-1980s.<sup>11</sup>

Thus, while income distribution has widened and poverty rates increased in some countries, these trends are not common to all countries. The next two sections describe some of the sources for these differences, using the longest available time period for all countries.

## MARKET INCOME AND INEQUALITY

A comparison of inequality indices for disposable and market income (see Table A1) indicates that market income is distributed less equally than disposable income (or, alternatively, that taxes and transfers offset inequality at the level of market income). However, comparisons of the trends in inequality of market income and disposable income provide no indication of the role of individual income components on patterns of overall income inequality. Furthermore, they do not make allowance for interaction of one component with others: for example, a widening in the distribution of market income is generally accompanied by offsetting changes in the distribution of tax payments and these interaction effects need to be allocated in some way to individual components. (These issues are dealt with in greater detail in Box D.)

Two different approaches are used below to highlight the degree of inequality of individual income components and their impact on changes in overall inequality. The first approach, which relies on an extension of the familiar Lorenz curve, shows how various income sources are distributed across deciles with population ranked in ascending order of equivalent household disposable income. Table 2 shows the share of market income and of its components which is received by the bottom three, middle four and top three deciles (referred to as “lower-income”, “middle-income” and “higher-income” groups). This approach indicates, for each income component, where shifts have been occurring in the distribution. Panel 1 of Table 2 confirms the widening in the distribution of market income over the past decades: higher-income groups gained income shares while middle and lower-income groups tended to lose, although not by the same amounts across countries. The breakdown of market income into earnings<sup>12</sup> and self-employment and capital income shows that the distribution of both components widened, with this increase somewhat more widespread and important for the latter.

The second approach uses a method owing to Shorrocks, 1982 (see Box D) to assess the contribution of each income component to overall inequality for the beginning and the end years (Table 3). A key feature of this decomposition is that it allocates the interactions (or correlation) between income components according to a number of “reasonable” restrictions. Using this method, the left-hand panel of Table 3 shows the contribution of each component to the inequality of household disposable income for end years. The sum of all components adds up to 100, but since net taxes and transfers reduce inequality, the contribution of market income is greater than 100. It should be noted that, according to this approach, any income component which is equally distributed across individuals makes a zero contribution to overall inequality.

### Box D. The Shorrocks decomposition

The Shorrocks (1982) decomposition defines the contribution of individual income components to total inequality in a way which satisfy a number of "reasonable" empirical and theoretical restrictions. Using this method, the sum of the contributions of each income component equals total inequality and these contributions can be applied to any inequality index. The contribution of each income component does not change if they are considered in a different order; if the ranking of individual observations is different; or if the number of income components considered varies. If there are only two income components, and the distribution of the second is simply a permutation of the first, then their contributions are equal. Finally, if all individuals receive the same amount of income from that component, the contribution of that component to total inequality is zero.

The table illustrates some of the characteristics of the Shorrocks method by comparing it with the results of other decomposition methods using, for convenience, the SCV index for the US in 1995. Column 1 shows the contributions of four income components to the SCV according to the Shorrocks method; column 2 shows the SCV for each component assuming that all other components are equally distributed; column 3 shows how the total SCV would change if a component were equally distributed, while holding all other components unchanged; Column 4 shows how the SCV would change if a component were removed from total income; and finally column 5 shows the SCV for total income as each component is "added in", beginning with labour income and ending with taxes. The bottom line shows the sum of the contributions of the components for each method.

#### United States (1995)

	1	2	3	4	5
Earnings	0.49	0.80	0.17	2.12	0.69
Capital and self-employment income	0.16	0.25	0.08	0.09	0.08
Transfers	-0.01	0.04	-0.05	0.18	-0.15
Taxes	-0.20	0.18	-0.57	0.19	-0.19
Total	0.44	1.26	-0.38	2.57	0.44

Comparing the Shorrocks decomposition (column 1) with the "adding-in" method (column 5), total inequality is the same (bottom line), but the contributions of individual components differ. The "adding-in" method attributes the inequality due to the covariance of two components to the last one added-in, whereas the Shorrocks method is invariant to the order in which components are considered.

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A comparison of column 1 with columns 2 to 4 helps understand the impact on inequality of a component which is equally distributed across all individuals (Sections four and five). Taking transfers as an example, the Shorrocks decomposition assigns virtually none of the contribution to them, since transfers are fairly evenly distributed across households in the United States. This fact is demonstrated by small difference between the value for transfers in column 1 and in column 3 (which shows the change in the overall index if that component were exactly evenly distributed). However, column 4 (the impact on the SCV if transfers were removed) also shows that total inequality would rise in the absence of transfers. Thus, while a component which is equally distributed may show up as having a negligible contribution to inequality in the Shorrocks sense, it may modify the inequality arising from other components. More specifically, a zero contribution from transfers in a Shorrocks sense does not mean that (equally distributed) transfers do not have a proportionately larger impact on incomes at the bottom of the distribution (see Table 5). Indeed, Shorrocks shows that the contribution of any income component is the average of: *a*) the degree of inequality due to that component, assuming that all other components are equally distributed (column 2); and, *b*) the change in inequality if that component were equally distributed, given the distribution of all other components (a reduction in the case of an equally distributed transfer) (column 3).

The middle and right-hand panels of Table 3 make allowance for the size of individual components in disposable income. The shares of the income components are shown in the middle panel: all things held the same, the larger its component, the larger the contribution to inequality. The values in the right-hand panel - referred to as "within-component" inequality, *e.g.* contributions corrected for its size - are derived by dividing data in the first panel by those in the second panel. These show by how much inequality would change for marginal changes in the importance of the component in total income and is an indicator of the degree of inequality within each component.

Using this approach, earnings account for most of the inequality in any one year (most often exceeding 100 per cent), except for Belgium and Italy where capital and self-employment income is dominant. To a large degree, this reflects differences in the relative size of the components: "within-component" indicator (right-hand panel) suggest that self-employment and capital income are, in all countries, more unequally distributed than earnings. However, these results need to be treated with care as the large cross-country differences in the share of capital income shown in the middle panel of Table 3 also reflect differences in data quality and the inclusion of self-employment incomes with earnings in Canada and Germany.

Table 2. **Allocation of income components across income groups**  
**Panel 1**

Per cent, and changes in percentage points

	Earnings			Capital and self-employment income			Market income		
	3 bottom deciles	4 middle deciles	3 top deciles	3 bottom deciles	4 middle deciles	3 top deciles	3 bottom deciles	4 middle deciles	3 top deciles
Australia, 1993/94	3.5	33.5	63.0	10.6	33.9	55.5	4.7	33.6	61.7
Changes, 1975/76-1993/94	- 5.8	- 4.2	10.1	- 8.5	3.4	5.2	- 6.5	- 2.8	9.2
Belgium, 1995	4.8	36.0	59.2	5.1	16.2	78.7	4.9	31.4	63.8
Changes, 1983-1995	0.3	- 0.1	- 0.2	- 2.2	- 6.4	8.6	- 0.3	- 1.9	2.1
Canada, 1994	5.6	32.9	61.5	9.0	36.9	54.1	6.0	33.4	60.6
Changes, 1975-1994	- 0.5	- 3.5	4.1	- 7.2	2.7	4.5	- 1.0	- 2.9	3.8
Denmark, 1994	6.7	38.7	54.6	14.4	30.8	54.8	7.8	37.6	54.6
Changes, 1983-1994	- 1.0	- 0.9	1.9	- 5.8	- 3.9	9.6	- 2.0	- 1.2	3.2
Finland, 1995	6.3	36.1	57.6	20.0	32.3	47.8	10.2	35.0	54.8
Changes, 1986-1995	- 3.4	- 2.0	5.4	- 3.2	- 1.4	4.5	- 1.8	- 2.3	4.1
Germany, 1994	7.5	34.6	57.8	11.0	31.3	57.7	8.0	34.2	57.8
Changes, 1984-1994	- 0.2	- 0.8	1.0	- 1.5	0.7	0.8	- 0.2	- 0.8	1.0
Italy, 1993	9.3	35.4	55.3	5.6	20.0	74.5	8.1	30.6	61.3
Changes, 1984-1993	- 3.1	- 2.2	5.3	- 2.2	- 2.5	4.6	- 2.8	- 2.3	5.1
Japan, 1994	13.0	36.5	50.5	17.8	27.5	54.7	13.7	35.1	51.2
Changes, 1984-1994	1.1	- 1.1	- 0.1	- 5.5	- 3.8	9.4	- 1.2	- 0.8	2.0
Netherlands, 1994	8.3	37.6	54.2	8.8	30.3	61.0	8.4	36.3	55.4
Changes, 1977-1994	- 5.7	0.2	5.5	- 0.1	5.0	- 4.9	- 4.7	1.1	3.6
Norway, 1995	8.7	40.8	50.5	9.5	22.8	67.7	8.8	37.0	54.2
Changes, 1986-1995	- 3.1	- 0.2	3.4	- 0.8	- 2.6	3.4	- 2.6	- 0.8	3.5
Sweden, 1995	7.2	35.5	57.2	17.3	28.8	53.9	8.0	35.0	57.0
Changes, 1975-1995	- 0.2	- 1.8	2.1	- 2.1	- 6.6	8.7	- 0.5	- 2.2	2.7
United States, 1995	7.6	33.9	58.5	7.5	26.8	65.7	7.6	32.8	59.6
Changes, 1974-1995	- 1.1	- 3.3	4.4	- 1.6	1.0	0.6	- 1.2	- 2.6	3.8

Table 2. **Allocation of income components across income groups** (cont.)  
**Panel 2**

Per cent, and changes in percentage points

	Transfers			Taxes			Disposable income		
	3 bottom deciles	4 middle deciles	3 top deciles	3 bottom deciles	4 middle deciles	3 top deciles	3 bottom deciles	4 middle deciles	3 top deciles
Australia, 1993/94	58.1	34.6	7.4	1.9	27.8	70.4	13.8	35.1	51.1
Changes, 1975/76-1993/94	1.1	5.2	-6.3	-7.9	-6.0	13.9	-0.4	-1.0	1.4
Belgium, 1995	30.0	45.7	24.3	2.1	29.3	68.6	13.8	36.6	49.6
Changes, 1983-1995	0.0	1.2	-1.2	-1.5	0.6	0.9	0.5	-1.7	1.1
Canada, 1994	41.7	41.0	17.3	2.9	29.2	67.9	14.0	35.9	50.1
Changes, 1975-1994	-7.6	7.2	0.4	-0.7	-2.0	2.7	1.2	-0.9	-0.4
Denmark, 1994	45.8	37.5	16.7	12.7	36.5	50.8	17.6	38.2	44.2
Changes, 1983-1994	3.8	-1.1	-2.7	2.1	-3.0	0.9	0.8	-0.2	-0.6
Finland, 1995	39.8	41.4	18.7	9.5	32.9	57.6	17.5	37.2	45.3
Changes, 1986-1995	2.4	4.4	-6.8	0.3	-1.1	0.8	-0.6	-1.2	1.7
Germany, 1994	38.6	40.1	21.3	5.3	31.7	62.9	14.8	36.1	49.1
Changes, 1984-1994	-5.0	4.9	0.1	-0.5	0.4	0.1	-1.1	-0.1	1.2
Italy, 1993	20.8	44.7	34.5	5.8	29.8	64.4	12.1	34.4	53.5
Changes, 1984-1993	-5.8	0.8	5.1	-4.8	-2.3	7.1	-1.9	-0.7	2.6
Japan, 1994	27.5	37.5	35.0	11.3	29.7	59.0	15.7	36.5	47.8
Changes, 1984-1994	-0.5	4.8	-4.2	-1.3	-1.2	2.4	-0.6	-0.2	0.8
Netherlands, 1994	43.6	35.7	20.7	10.7	34.5	54.7	16.2	36.8	47.0
Changes, 1977-1994	10.0	-2.5	-7.5	-2.2	0.7	1.5	-1.6	0.4	1.2
Norway, 1995	47.7	35.3	17.0	8.3	35.4	56.3	16.0	37.2	46.8
Changes, 1986-1995	2.3	-0.9	-1.4	-1.8	-2.4	4.2	-1.0	-0.4	1.4
Sweden, 1995	31.4	41.4	27.2	10.7	34.8	54.4	17.2	37.9	44.9
Changes, 1975-1995	-8.3	5.9	2.4	3.5	1.2	-4.7	0.3	-0.1	-0.2
United States, 1995	37.2	38.2	24.6	5.2	26.5	68.2	11.5	35.0	53.5
Changes, 1974-1995	-6.8	3.8	3.0	0.3	-3.7	3.5	-1.2	-1.4	2.6

Note: Individuals were broken down into three groups on the basis of the distribution of their equivalent household disposable income. The share of each income component going to each of the three decile groups was then calculated. For example, for Australia, 13.5 per cent of income went to the bottom three income deciles (third from last columns). The share of total earnings going to the same group was 3.5 per cent (first column). Changes for each share over the longest available period are shown in the second line for each country.

Source: OECD.

Table 3. **Contribution of income components to the level of inequality: Shorrocks decomposition**

Per cent, and changes in percentage points

	Per cent contribution to total inequality of disposable income [1]					Per cent share in income [2]				"Within-component" inequality indicator [1]/[2]			
	Earnings	Capital and self-employment	Transfers	Taxes	Transfers and taxes	Earnings	Capital and self-employment	Transfers	Taxes	Earnings	Capital and self-employment	Transfers	Taxes
Australia, 1993/94	123.8	39.6	-13.5	-49.8	-63.4	88.7	18.8	15.7	-23.2	1.40	2.11	-0.86	2.15
Belgium, 1995	67.5	88.7	-0.5	-55.7	-56.2	81.1	24.8	31.4	-37.3	0.72	1.19	-0.02	1.49
Canada, 1994	137.6	19.6	-7.6	-49.6	-57.2	89.9	12.9	20.3	-23.0	1.53	1.52	-0.37	2.15
Denmark, 1994	134.2	49.3	-19.3	-64.3	-83.5	105.3	16.5	33.1	-54.8	1.27	3.00	-0.58	1.17
Finland, 1995	101.8	66.2	-11.3	-56.7	-68.0	78.8	31.3	23.7	-33.7	1.29	2.12	-0.48	1.68
Germany, 1994	115.9	29.9	0.6	-46.4	-45.8	94.6	15.2	19.8	-29.6	1.22	1.96	0.03	1.56
Italy, 1993	41.4	95.4	4.3	-41.1	-36.8	72.1	32.3	25.4	-29.8	0.57	2.96	0.17	1.38
Japan, 1994	94.8	41.8	4.3	-40.9	-36.6	93.0	16.8	10.8	-20.6	1.02	2.49	0.40	1.99
Netherlands, 1994	131.1	45.4	-12.5	-63.9	-76.4	95.3	20.8	24.9	-41.0	1.38	2.18	-0.50	1.56
Norway, 1995	..	..	..	..	..	89.5	24.2	18.1	-31.8	..	..	..	..
Sweden, 1995	138.3	26.5	4.7	-69.5	-64.8	90.1	7.8	43.9	-41.8	1.53	3.39	0.11	1.66
United States, 1995	109.4	36.4	-1.4	-44.4	-45.8	97.1	18.8	11.0	-26.9	1.13	1.94	-0.13	1.65

*Note:* See Box D for a description of this methodology and how the data should be interpreted, with further details and precise formulae presented in Burniaux *et al.* (1998), Annex 2. The left-hand panel shows the Shorrocks contributions in the latest year (for each country, the sum across columns is equal to 100). The middle panel shows the share of the income component in total income. The shares of taxes appear with negative signs. The right-hand panel is the left-hand divided by the middle panel. This is an index where the contribution of the component is adjusted for its size. In general, a negative sign indicates that the component (*e.g.* transfers) is reducing inequality. However, in the case of taxes (which are shown in the centre panel with a negative sign), a positive sign implies that it reduces inequality and positive changes.

*Source:* OECD.

Table 4 uses the information in Table 3 (and equivalent data for the beginning of the period) to calculate an estimate of the “contribution” of each income component to the change in total inequality, as measured by the Gini coefficient:<sup>13</sup>

The data shown in Table 4 are derived as follows:

- First, the Gini coefficient for the beginning and end years are multiplied by the contributions in the left-hand panel of Table 3. The change in these values over the period (Table 4, third column for each panel) indicates by how much the Gini coefficient would have changed if each component is considered independently - *i.e.* for Australia, the third column shows that earnings would have led to an increase in the Gini coefficient of 13.1 percentage points if there had been no changes in the other components.
- Second, using the middle and right-hand panels of Table 3, the impact for each component (Table 4, third column for each panel) is then decomposed, using a shift-share approach, into the effect of: *a)* changes in the *share* of each component in total income, holding the “within-component” inequality constant over the period (Table 4, first column for each component); and *b)* changes in the “component-specific” inequality (second column) over the period, holding the shares constant. Thus, the first and second columns for Australia indicate that a change in the share of earnings, considered alone, would have increased the Gini coefficient by 2.5 percentage points, while the change in the “within-component” inequality would have increased the Gini by 10.6 points.

Table 4 indicates a complex picture with considerable cross-country variation:

- Market income has been the most important factor driving the change in the distribution of disposable income over the last one to two decades. The contribution of market income increased inequality in all countries except Denmark and, more notably, Sweden. If only changes in market income were considered, the Gini would have increased by more (or fallen by more in the case of a decline) than it actually did, in all countries except Denmark.
- In over half the countries, the declining share of market income in total income has tended to reduce inequality.
- While measurement problems are important for a number of countries, capital and self-employment income led to a (sometimes substantial) widening in the distribution of disposable income in all countries except Denmark and the Netherlands and, to a much lesser degree, the United States.
- Finally, earnings, considered on its own, contributed to a narrowing in the distribution of income in six of the 13 countries covered. Earnings made a large positive contribution to the overall change in the Gini only in Australia, the Netherlands and the United States.

Table 4. **Decomposition of the change in the Gini coefficient by income component**

Absolute change

	Earnings			Capital and self-employment income			Market income		
	Part due to change in:		Total [1] + [2]	Part due to change in:		Total [1] + [2]	Part due to change in:		Total [1] + [2]
	Shares [1]	Component inequality [2]		Shares [1]	Component inequality [2]		Shares [1]	Component inequality [2]	
	Shares [1]	Component inequality [2]	Total [1] + [2]	Shares [1]	Component inequality [2]	Total [1] + [2]	Shares [1]	Component inequality [2]	Total [1] + [2]
Australia, 1975/76-1993/94	2.5	10.6	13.1	-0.4	0.8	0.4	2.1	11.4	13.5
Belgium, 1983-1995	-0.4	-2.1	-2.5	2.9	2.4	5.3	2.5	0.2	2.8
Canada, 1975-1994	-2.0	5.3	3.3	1.6	0.9	2.5	-0.5	6.2	5.8
Denmark, 1983-1994	0.3	1.4	1.7	-2.4	0.3	-2.1	-2.1	1.7	-0.5
Finland, 1986-1995	-5.5	0.0	-5.5	4.9	3.4	8.2	-0.7	3.4	2.7
Germany, 1984-1994	-2.2	-1.1	-3.2	2.3	2.2	4.4	0.1	1.1	1.2
Italy, 1984-1993	-0.1	-1.3	-1.3	-1.7	7.7	6.1	-1.7	6.5	4.7
Japan, 1984-1994	3.1	-1.8	1.3	-7.0	7.7	0.7	-3.9	5.9	2.0
Netherlands, 1977-1994	-1.1	9.0	7.9	-0.9	-3.1	-3.9	-2.0	5.9	4.0
Norway, 1986-1995	..	..	..	..	..	..	..	..	..
Sweden, 1975-1995	-2.0	-6.5	-8.5	-1.3	2.0	0.7	-3.3	-4.5	-7.8
United States, 1974-1995	1.3	4.2	5.5	0.1	-0.1	-0.1	1.4	4.1	5.5
	Transfers			Taxes			Total change in Gini		
	Part due to change in:		Total [1] + [2]	Part due to change in:		Total [1] + [2]	Part due to change in:		Total [1] + [2]
	Shares [1]	Component inequality [2]		Shares [1]	Component inequality [2]		Shares [1]	Component inequality [2]	
Australia, 1975/76-1993/94	-2.4	-0.1	-2.6	-11.0	1.6	-9.4	-11.4	12.9	1.5
Belgium, 1983-1995	0.0	-0.4	-0.4	-1.0	-0.7	-1.7	1.5	-0.9	0.7
Canada, 1975-1994	-0.9	0.3	-0.6	-4.0	-1.1	-5.1	-5.4	5.5	-0.1
Denmark, 1983-1994	-1.2	-0.4	-1.6	-2.2	3.1	0.9	-5.5	4.4	-1.1
Finland, 1986-1995	-0.3	-1.2	-1.6	0.6	0.2	0.8	-0.5	2.4	1.9
Germany, 1984-1994	0.0	-1.5	-1.5	0.6	1.4	2.0	0.7	1.0	1.7
Italy, 1984-1993	0.2	1.2	1.4	-0.5	-1.8	-2.3	-2.0	5.9	3.9
Japan, 1984-1994	0.4	0.1	0.5	-0.3	-1.0	-1.3	-3.7	4.9	1.2
Netherlands, 1977-1994	-0.2	-2.1	-2.3	2.1	-1.1	1.0	0.0	2.7	2.7
Norway, 1986-1995	..	..	..	..	..	..	..	..	2.2
Sweden, 1975-1995	-0.9	5.3	4.3	-4.2	7.4	3.3	-8.5	8.2	-0.2
United States, 1974-1995	-0.2	0.7	0.5	-2.6	-0.3	-2.9	-1.3	4.4	3.1

Note: The total change in the level of the Gini is shown in the right-hand column and differs from the values in Table 1, which are per cent changes. A negative sign indicates a negative impact on inequality. See text for method.

There has been a considerable debate over the role of earnings (more specifically, of full-time earnings differentials) on the changing distribution of income. Other OECD findings (OECD, 1993 and OECD, 1996a) have pointed to a widespread widening across countries in the distribution of full-time earnings which are used as a proxy for the wage-rate distribution. But the relation between the distribution of full-time earnings (at the level of individuals) and that of earnings (at the level of households) is a complex one. First, at the level of individual workers, changes in hours worked can account for part of the widening in the distribution of full-time earnings. Second, and more important, changes in the distribution of earnings across households, as measured in this study, also depend on the distribution of employment. For example, Burniaux (1998) finds that increased labour-market participation among women in the 1980s mainly occurred in households with average or above-average incomes; as a result, the increase in women's employment in two-earner households led to a widening of inequalities. This effect has sometimes been magnified (most notably in the United States) by an increased correlation between spouses' earnings (*e.g.* more high earners living in the same household). At the same time, the increase in the share of no-worker (*i.e.* zero earnings) households in many countries (Gregg and Wadsworth, 1996) may also have played an important role in driving changes in income distribution over the past two decades. While these issues will be further elaborated below, the impact of taxes and transfers is examined first.

## **THE DISTRIBUTIONAL IMPACT OF THE TAX-AND-TRANSFER SYSTEM**

Tables 2 to 4 may also be used to illustrate the extent to which the redistributive impact of tax-and-transfer systems has modified the trends found at the level of market income. Table 2, which shows the distribution of taxes and transfers across deciles, indicates that public transfers do not appear to be heavily targeted towards lower-income groups, except in Australia. In seven of the twelve countries, the share of transfers received by the middle four deciles is close to or above their share in the total population, while in Italy and Japan, more transfers are received by the top three deciles than by the bottom three. When looking at changes in the distribution of public transfers, the share received by the lower-income groups has fallen over time (or remained broadly stable) in seven countries, while that going to the middle-income groups and upper-income groups has risen (or remained stable) in nine and five countries, respectively. In contrast, taxes appear to be much more concentrated on the higher income groups: the top three deciles pay considerably more than their share in the total population, while the middle four and, particularly, the bottom three pay less.<sup>14</sup> As the distribution of market income has widened, this pattern has become more accentuated.

A different perspective is presented in Table 5, which shows taxes and transfers for the same three decile groups, but as a share of average income in each decile group. This shows that transfers make up a large share of disposable income in the bottom three deciles, becoming progressively smaller in the middle and higher-income groups. The opposite is the case for taxes. Seen from this perspective, the tax-and-transfer system appears to have become more progressive over time. Transfers as a share of disposable income increased substantially for lower-income groups in all countries except Belgium and Germany. At the same time, the share of taxes in income increased for the upper deciles, while the increase for the middle-income groups has been smaller and less widespread.<sup>15</sup>

Taken together, these patterns suggest a significant shift in income structure in the bottom three deciles away from market income and towards greater dependence on transfer income. Even though the share of transfers going to the bottom three deciles has declined in a number of countries (Table 2), transfers nonetheless make up an increasing share of total income of these households in all countries except Germany (Table 5). Further evidence (not shown) indicates that this shift has been accompanied by an increase in the share of individuals in the bottom three deciles, who belong to non-working households. Increasing retirement and, in certain countries, higher unemployment combined with a less equal distribution of employment opportunities account for this shift.

The Shorrocks analysis (Table 3) shows that taxes and transfers, taken together, reduced inequality in the latest year in all countries. Transfers, taken alone, reduced inequality in all but four countries (Germany, Italy, Japan and Sweden) but, generally, its impact was small relative to taxes. This result partly reflected the effect of size - taxes are larger than transfers (middle panel) - but also the fact that a larger share of taxes are paid by upper-income groups - *i.e.* that taxes are less equally distributed across households (right-hand panel) than transfers. As noted (Box D), a component does not contribute to inequality in the Shorrocks sense if it is equally shared by all individuals. But even a small Shorrocks contribution from transfers is still consistent with transfers having a proportionately larger impact on the incomes of those at the bottom of the distribution of market income. As is shown in Table 5, transfers have made up a larger share of the (lower) income of these households.

Turning to Table 4 (impact on the change in the Gini coefficient), taxes and transfers taken together reduced inequality in all countries except Sweden and, possibly, Germany, offsetting the effect of growing inequality in market incomes. In a majority of countries, the increasing shares of taxes or transfers taken together explain much of this development with no consistent cross-country pattern in terms of the relative importance of the two components.<sup>16</sup> In certain countries, taxes and transfers taken individually contributed to some widening in inequality on a Shorrocks basis.

Table 5. **Allocation of taxes and transfers by income group: share of disposable income**

Per cent, and changes in percentage points

	As per cent of disposable income of each group					
	Transfers			Taxes		
	3 bottom deciles	4 middle deciles	3 top deciles	3 bottom deciles	4 middle deciles	3 top deciles
Australia, 1993/94	66.4	15.5	2.3	3.1	18.3	32.0
Changes, 1975/76-1993/94	41.1	10.4	0.5	-2.2	11.2	23.2
Belgium, 1995	68.4	39.2	15.4	5.7	29.9	51.6
Changes, 1983-1995	-0.9	3.6	-0.7	-3.9	3.6	2.6
Canada, 1994	60.4	23.2	7.0	4.8	18.7	31.2
Changes, 1975-1994	12.8	11.8	2.9	0.2	5.0	10.4
Denmark, 1994	85.9	32.5	12.5	39.5	52.4	63.0
Changes, 1983-1994	28.1	9.2	2.4	9.8	4.0	10.5
Finland, 1995	54.0	26.4	9.8	18.4	29.8	42.9
Changes, 1986-1995	13.2	7.5	-1.7	0.4	-1.3	-2.9
France, 1990	23.0	6.9	1.4	1.3	4.3	15.8
Changes, 1979-1990	0.4	-2.5	-0.6	-0.8	-0.8	-0.1
Germany, 1994	51.4	22.0	8.6	10.6	26.1	38.0
Changes, 1984-1994	-3.0	2.6	-0.2	-0.7	-0.8	-2.7
Italy, 1993	18.8	11.1	7.9	14.8	16.8	25.4
Changes, 1984-1993	7.3	5.1	2.3	-0.6	-0.1	1.3
Japan, 1994	43.9	33.0	16.4	14.4	25.8	35.9
Changes, 1984-1994	8.6	10.0	5.7	-7.5	-0.4	3.6
Netherlands, 1994	67.1	24.1	10.9	27.2	38.5	47.7
Changes, 1977-1994	24.6	0.6	-2.9	-6.8	-4.8	-6.4
Norway, 1995	53.8	17.1	6.6	16.5	30.3	38.2
Changes, 1986-1995	13.7	2.7	0.5	-1.6	-0.5	3.2
Sweden, 1995	80.4	48.0	26.5	26.2	38.5	50.7
Changes, 1975-1995	20.6	24.2	12.6	12.0	9.1	7.2
United States, 1995	35.6	12.0	5.1	12.2	20.4	34.3
Changes, 1974-1995	5.5	3.8	1.4	3.4	1.8	5.9

Note: This follows the approach in Table 2, but taxes and transfers received by each decile group is presented as the share of average household disposable income in each group. In this case, for the bottom three deciles in Australia, transfers represented 66.4 per cent of average household disposable income of that group and this share increased by 41.1 percentage points over the period.

Source: OECD.

Table 6. **Poverty rates before and after taxes and transfers for five countries**

Per cent and changes in percentage points

Before taxes and transfers											
By employment status <sup>1</sup>		By age of household head <sup>2</sup>				By family type <sup>3</sup>				Total	
No worker	Workers	Young household	Prime-age household	Older-age household	Retired household	Single adult with children	Single adult, no children	Two adults with children	Two adults, no children		
Canada, 1991	70.8	12.7	27.9	15.5	18.5	57.4	67.4	46.3	15.5	20.4	22.9
Changes, 1975-1991	-14.0	-0.1	12.4	2.8	-0.9	-10.2	0.2	1.4	2.8	-2.9	0.3
France, 1989	80.6	15.4	24.1	20.7	40.1	84.6	53.0	60.6	24.3	40.1	34.5
Changes, 1984/85-1989	1.9	4.2	6.2	2.3	-5.2	-2.8	9.1	0.3	2.1	-0.6	1.6
Germany, 1989	74.5	4.6	14.2	5.2	17.9	70.7	40.5	50.1	4.3	25.4	22.1
Changes, 1978-1989	11.8	1.4	4.5	1.7	0.9	0.9	-1.1	-10.9	-0.2	-7.3	1.9
Sweden, 1992	93.7	14.4	37.9	14.5	21.7	90.7	39.3	57.2	12.3	38.9	33.9
Changes, 1975-1992	4.7	7.5	22.2	7.6	4.1	-8.4	10.4	4.9	7.3	2.3	7.9
United States, 1994	69.5	15.1	31.5	17.4	18.5	58.1	63.3	44.4	18.8	21.9	25.3
Changes, 1974-1994	1.1	4.4	11.9	4.8	1.2	-6.7	-7.6	-5.8	6.4	-0.3	4.5
After taxes and transfers											
By employment status <sup>1</sup>		By age of household head <sup>2</sup>				By family type <sup>3</sup>				Total	
No worker	Workers	Young household	Prime-age household	Older-age household	Retired household	Single adult with children	Single adult, no children	Two adults with children	Two adults, no children		
Canada, 1991	31.3	6.9	20.9	9.7	10.7	5.1	57.7	23.2	8.7	5.3	11.2
Changes, 1975-1991	-24.3	-1.7	8.0	0.1	-3.4	-30.1	2.8	-14.0	-0.3	-5.4	-3.9
France, 1989	22.6	2.3	8.9	6.4	9.3	12.4	29.0	16.3	6.2	7.0	8.2
Changes, 1984-1989	-4.9	0.1	0.4	-1.1	-3.6	-7.0	6.9	-1.9	-1.9	-3.8	-2.1
Germany, 1989	15.0	2.4	9.8	3.8	5.1	7.6	30.4	14.4	2.3	3.2	5.5
Changes, 1978-1989	-3.7	0.7	1.3	1.5	-0.3	-10.3	1.9	-10.6	0.4	-3.3	-1.0
Sweden, 1992	15.1	3.7	18.1	2.8	2.8	6.3	4.9	17.9	2.3	1.2	6.5
Changes, 1975-1992	-4.8	1.4	8.4	0.1	-2.0	-7.1	1.2	-0.4	0.2	-2.4	0.1

Table 6. **Poverty rates before and after taxes and transfers for five countries** (*cont.*)

Per cent and changes in percentage points

	After taxes and transfers										Total
	By employment status <sup>1</sup>		By age of household head <sup>2</sup>				By family type <sup>3</sup>				
	No worker	Workers	Young household	Prime-age household	Older-age household	Retired household	Single adult with children	Single adult, no children	Two adults with children	Two adults, no children	
United States, 1994	40.3	12.4	29.7	15.2	12.4	20.5	57.2	27.9	15.6	9.6	17.7
Changes, 1974-1994	-2.4	3.0	10.6	3.6	0.0	-8.5	-7.4	-7.6	4.7	-0.7	2.4

1. Population in households with a working-age head.

2. Young, prime-age, older-age and retired refer, respectively, to households with heads below 30, between 30 and below 50, between 50 and 65, and above 65 years old.

3. Two-adult households refers to two-or-more adult households.

*Note:* Data drawn from LIS data files and the years do not always correspond to those found in Table 1. Poverty rate by group refers to the number of individuals in a group with equivalent disposable income below 50 per cent of median equivalent disposable income as a per cent of the total number of individuals in that group. Two-adult households refer to individuals living in households with two or more adults. Young, prime-age, older worker and retirement age refer to individuals living in households where the household head is less than 30, between 30 and 50, between 51 and 65 and over 65, respectively.

*Source:* Luxembourg Income Study.

Turning to the impact on poverty, Table 6 (left-hand column) shows poverty rates (head-count ratios) pre- and post-taxes and transfers in the most recent year for which data was available, and the change in these rates over time, for five countries. The data are drawn from the Luxembourg Income Study data files.<sup>17</sup> A comparison of the top and bottom panels indicates that taxes and transfers taken together reduced poverty rates substantially in all countries. Poverty rates before taxes and transfers increased over the period in all countries, particularly in Sweden and the United States. Nonetheless, the increasing role of the tax-and-transfer system slowed the growth in poverty rates after taxes and transfers in all countries, and led to declines in three.

In judging the impact of taxes and transfers on inequality and poverty, it should be noted that developments at the level of market income reflect, in part, interactions between tax-and-transfer policies and household behaviour. For example, increased access to old-age pensions and higher pension benefits over the period may have led to earlier withdrawal from the labour market (Blondal and Scarpetta, 1998), a fall in market incomes of retired households and, thus, increased "poverty" measured before taxes and transfers. Increased take-up of transfer programmes among the working-age population may have had similar effects, particularly in Europe; for example, early retirement and disability schemes have been used in some countries to provide support to the long-term unemployed, who then withdrew from the labour force (MacFarlan and Oxley, 1996). Such factors may partly explain why poverty rates before taxes and transfers are lower in North America than, for example, in France and Sweden.<sup>18</sup>

## **EVALUATING THE IMPACT OF EMPLOYMENT STATUS: AN MLD DECOMPOSITION**

This section provides some further information on the importance of changes in the distribution of employment across households for trends in income distribution. Aggregate changes in inequality can be decomposed into three parts (Box E):

- a) The effect of changing shares of each group in the population. For example, if the share of a group that has a wide distribution of income increases, the degree of overall inequality will also increase. This is referred to as the "structural" effect.
- b) The effect of changing inequality within each group. If the inequality within individual groups increases, aggregate inequality will rise over time, population shares held constant. This is referred to as the "within-group" effect.
- c) Finally, the impact of a widening or narrowing of average incomes of one group relative to another. Thus, if two groups have the same "within-group" distribution,<sup>19</sup> but the difference between the average income of each group widens, then the overall distribution also increases (when the population structure is held constant). This is called the "between-group" effect.

**Box E. The decomposition of the Mean Log Deviation index**

The log form of the MLD permits a useful decomposition of the aggregate MLD index, using a modification of the methodology found in Zyblock (1996). The mean log deviation is:

$$MLD = \frac{1}{n} \sum_i \ln \left( \frac{\bar{Y}}{Y_i} \right), \tag{1}$$

where  $\bar{Y}$  is average equivalent disposable income;  $Y_i$  is the income of the  $i^{th}$  individual; and  $n$  is the number of individuals.

When considering sub-groups of the population, this indicator is additively decomposable according to the formula:

$$MLD^t = \sum_g w_g^t \cdot MLD_g^t + \sum_g w_g^t \cdot \ln \left( \frac{\bar{Y}}{Y_g} \right) \tag{2}$$

where  $w_g$  is the share of group  $g$  in the population.

The first term on the right-hand side is the weighted sum of the MLD of each group ( $MLD_g^t$ ) - i.e. the “within-group” component. The MLD of each group indicates the distribution of income within specific groups; their sum, weighted with the share of each group in the population, shows the importance of the inequality within all groups of the population for total inequality.

The second term is the “between-group component” - calculated as deviation of the income of the group ( $Y_g$ ) relative to population mean income ( $\bar{Y}$ ) - indicates how much the total MLD is affected by differences in relative mean income between groups. This corresponds to the inverse of the relative income of each group described above.

To decompose changes of the MLD index over time (for any breakdown by population group), take the first difference of equation [2]:

$$\begin{aligned} \Delta MLD &= MLD^t - MLD^0 \\ &= \underbrace{\sum_g \bar{w}_g \Delta MLD_g}_{1} + \underbrace{\sum_g \bar{w}_g \Delta \left( \ln \frac{\bar{Y}_0}{Y_g} \right)}_{2} \\ &\quad + \underbrace{\sum_g \overline{MLD}_g \cdot \Delta w_g + \sum_g \left( \ln \frac{\bar{Y}}{Y_g} \right) \Delta w_g + \sum_g \bar{w}_g \Delta \left( \ln \frac{\bar{Y}}{Y_0} \right)}_{3} \end{aligned} \tag{3}$$

(continued on next page)

(continued)

where  $w_g$  is the share of group  $g$  in the population,

$\bar{Y}_g$  is the mean income of group  $g$ ,

$\bar{Y}_0 = \sum_g w_g^0 Y_g^t$  is mean income holding the population structure constant, and

$\bar{Y} = \sum_g w_g^t Y_g^t$  is current mean income.

The bar over a term refers to the average over the period considered. The first term on the right-hand side is the impact of “pure” changes of inequality within each group, keeping the structure of the population constant; the second term is the impact of changes in inequality between groups when the population structure is held constant; and the third term is the structural component - *i.e.* the effect of the changes in the population structure keeping constant the within-group and between-group components.

The MLD index is used to isolate these effects as it can be decomposed precisely into these three components (Box E). It should be noted that the MLD is more sensitive to changes at the bottom of the distribution. However, this is probably consistent with the greater concern attached to these groups by policy makers.

Changes in the structure of the population according to the employment status of households is an important factor underlying changes in income distribution (Table 7). The left-hand panel considers individuals living in households with a working-age head (referred to below as the “working-age” population). For this group, the breakdown of the population by the employment status of the household indicates an increase in the share of individuals living in households with no worker. The principal counterpart of this development has been a fall in the share of individuals living in one-earner households. The share of households with two earners increased in all countries except Finland, Germany, Norway and Sweden.

The results presented in Table 8 give some indication of the importance of changes in employment status for income distribution. The table shows the changes in the MLD index over the period as the population is extended progressively from households with workers (Panel A) to include, first, non-working households (Panel B) and, then, retired households (Panel C) (Table 8).<sup>20</sup> For example, in Australia the MLD index increases by 0.3 for workers but by 1.3 after non-working households are included and 1.1 with the inclusion of the retired. Since the focus here is on the impact of non-working households, the difference when moving from Panel A to Panel B is highlighted in Panel D.

Table 7. **Population structure by employment status and household type**

Per cent, and changes in percentage points

	Working-age population			Total population						
	By employment status			By employment status			By age of head			
	Two workers	One worker	No worker	Two workers	One worker	No worker	Young head	Prime-age head	Older working-age head	Retirement-age head
Australia, 1993/94	55.6	30.8	13.6	49.3	28.7	22.0	13.3	53.7	19.9	13.1
Changes, 1975/76-1993/94	2.0	-9.6	7.6	-0.3	-10.3	10.6	-5.3	0.9	0.8	3.6
Belgium, 1995	..	..	..	..	..	..	..	..	..	..
Changes, 1983-1995	..	..	..	..	..	..	..	..	..	..
Denmark, 1994	62.4	27.9	9.7	52.4	24.6	23.0	16.7	48.1	19.0	16.2
Changes, 1983-1994	0.2	-0.9	0.7	-0.3	-1.1	1.4	-1.3	0.0	0.6	0.6
Finland, 1995	72.3	20.8	6.9	62.1	19.1	18.7	13.2	53.8	18.2	14.7
Changes, 1986-1995	-2.5	-1.6	4.1	-4.3	-1.8	5.9	-4.8	0.5	1.4	2.7
France, 1990	44.2	46.8	9.0	37.8	41.1	21.1	10.5	52.7	22.1	14.7
Changes, 1979-1990	7.4	-10.2	2.8	6.2	-9.2	3.0	-1.1	2.5	-1.3	-0.1
Germany, 1994	39.6	48.9	11.5	32.7	41.2	26.1	9.8	45.7	25.1	19.4
Changes, 1984-1994	-3.0	1.4	1.5	-3.6	-0.2	3.8	0.4	-1.6	-1.2	2.4
Italy, 1993	44.8	45.2	10.0	38.4	40.8	20.7	4.5	46.5	31.3	17.6
Changes, 1984-1993	0.2	-4.8	4.6	-1.6	-5.6	7.1	0.2	-1.1	-2.8	3.6
Japan, 1994	56.5	41.4	2.1	51.7	38.9	9.4	5.0	52.5	30.3	12.2
Changes, 1984-1994	1.4	-1.8	0.4	-1.8	-2.9	4.6	-1.2	-7.2	3.7	4.7
Netherlands, 1994	48.1	37.2	14.7	41.2	33.1	25.6	11.5	52.9	20.6	14.9
Changes, 1977-1994	7.0	-14.8	7.8	4.7	-13.9	9.3	-1.0	3.4	-3.4	1.1
Norway, 1995	53.9	34.7	11.4	46.1	30.7	23.1	14.8	53.1	17.2	14.8
Changes, 1986-1995	-2.3	-2.4	4.7	-2.8	-2.7	5.3	-0.4	1.4	-1.6	0.4
Sweden, 1995	54.7	37.3	8.1	45.1	31.9	23.0	17.8	46.0	18.6	17.6
Changes, 1975-1995	-4.6	1.4	3.2	-4.0	0.9	3.1	-2.1	3.9	-2.2	0.4
United States, 1995	63.6	30.2	6.2	56.8	29.4	13.9	13.4	53.4	18.9	14.2
Changes, 1974-1995	5.9	-7.0	1.2	4.0	-7.1	3.1	-3.9	6.0	-4.0	1.9

*Note:* Shares in the total population of individuals living in households with the defined characteristics except the left-hand panel, which refers to individuals living in households with a head of working age. Two-adult households refer to individuals living in households with two or more adults. Young, prime-age, older worker and retirement age refer to individuals living in households where the household head is less than 30, between 30 and 50, between 51 and 65 and over 65, respectively. Two-worker households refer to two or more workers and two-adult households refer to two-or-more-adult households.

*Source:* OECD.

Table 8. **The impact of employment status on changes in inequality: MLD decomposition**

	MLD change												First difference			
	Workers <sup>1</sup> (panel A)				Workers and non-workers (panel B)				Total population (panel C)				Panel D = panel B-panel A			
	Total [1]	Within [2]	Between [3]	Structural [4]	Total [5]	Within [6]	Between [7]	Structural [8]	Total [9]	Within [10]	Between [11]	Structural [12]	Total [5]-[1]	Within [6]-[2]	Between [7]-[3]	Structural [8]-[4]
Australia, 1975/76-1984	0.3	0.9	-0.3	-0.3	1.3	0.6	-0.9	1.6	1.1	0.2	-1.0	1.9	1.1	-0.3	-0.6	1.9
Belgium, 1983-1995	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Canada, 1985-1994	0.2	0.2	-0.1	0.0	0.6	0.0	0.2	0.5	0.4	0.1	0.2	0.1	0.5	-0.2	0.3	0.5
Denmark, 1983-1994	-0.4	-0.2	-0.1	-0.1	-0.9	-0.8	-0.2	0.1	-1.5	-1.1	-0.6	0.2	-0.5	-0.6	-0.1	0.1
Finland, 1986-1995	0.9	1.1	-0.1	0.0	1.4	1.0	0.1	0.3	1.0	0.8	0.1	0.0	0.5	-0.1	0.2	0.4
France, 1979-1990	-0.1	0.4	0.0	-0.5	-0.1	0.2	0.0	-0.2	-0.5	-0.2	-0.2	-0.2	0.0	-0.2	0.0	0.2
Germany, 1984-1994	1.2	0.9	0.4	0.0	2.3	1.1	1.1	0.1	1.6	1.0	0.4	0.2	1.1	0.2	0.7	0.1
Italy, 1984-1993	4.1	2.9	1.2	0.0	5.3	3.1	1.3	0.8	4.5	3.2	0.7	0.6	1.1	0.2	0.0	0.8
Japan, 1984-1994	1.0	0.7	0.3	0.1	1.1	0.7	0.2	0.2	1.5	0.7	-0.1	0.9	0.0	0.0	-0.1	0.1
Netherlands, 1985-1994	1.1	1.4	0.0	-0.3	2.6	1.4	1.1	0.2	2.5	1.5	1.0	0.0	1.5	0.0	1.0	0.5
Norway, 1986-1995	0.9	0.9	0.0	0.0	3.2	1.7	-0.3	1.7	2.9	2.4	-0.2	0.7	2.3	0.9	-0.3	1.8
Sweden, 1983-1995	2.6	1.7	0.8	0.1	1.5	-0.1	0.0	1.6	0.6	0.9	-0.8	0.5	-1.1	-1.8	-0.8	1.6
United States, 1985-1995	3.1	3.2	0.3	-0.4	4.2	3.7	0.2	0.3	3.7	3.7	-0.6	0.6	1.0	0.5	-0.1	0.7

1. Workers are broken down into two groups: one-earner and two-earner households. The "within" effect indicates changes in inequalities within each group, the "between" effect measures inequalities between these groups when the structure is held constant. The "structural" effect captures the inequality component due to population shifts among these groups. For instance, a positive structural effect indicates rising inequality due to the combination of increasing weights with: a) high "within group" inequality; or b) high "between group" inequality.

Source: OECD.

The change in the MLD for households with at least one worker was positive in all countries except for Denmark and France and was very large in Italy, Sweden and the United States (Panel A). Part of this increase may reflect widening wage-rate distributions where they occurred.<sup>21</sup> However, employment effects have also been important in explaining the changes in the distribution of disposable income: as can be seen, the addition of non-workers to the working-age population leads to a further increase in the MLD over the period for all countries except Denmark and Sweden (Panel D, first column). In contrast, the change in the MLD is smaller when the retired households are included (compare column 9 with column 5) indicating that this group tended to offset the widening among the households with a working-age head.

Further evidence of the importance of employment effects is indicated by the breakdown of the change in inequality into the “between-group”, “within-group” and “structural” effects described above.<sup>22</sup>

- For working households (Panel A) (which include both single-earner and two-or-more-earner households), the main source of the change in inequality has been widening inequality within both one- and two-worker households (“within-group” effect), although a widening in average incomes between the two groups has also played a role, particularly in Italy and Sweden (“between-group” effect). There is no evidence that the increase in the share of two-earner households (“structural” effect) has led to a widening in the distribution of income as measured by the MLD.
- The decline in inequality (in all countries except Japan) when the retired are added in appears to be driven by the “between-group” effect, suggesting rising mean incomes of the retired as pension schemes matured.
- The “structural” effect arising from the rising share of non-working households is positive in all countries (last column in Panel D) and is generally more important than the “within” and “between-group” effects.

### **THE RELATIVE POSITION OF INDIVIDUAL GROUPS AND THE IMPACT OF THE TAX-AND-TRANSFER SYSTEM<sup>23</sup>**

Changes in the position of individual groups relative to developments in the population as a whole - and the degree to which these changes reflect the operation of the tax-and-transfer system - are described in two ways. A first approach (Table 6) compares poverty rates for different groups in the population before and after taxes and transfers, broken down by employment status, age of the household head and family type.<sup>24</sup> However, information is limited to a subset of only five countries.

The second approach looks at average income of the same groups relative to the population average. Table 9 (first line) shows the per cent ratio of average

Table 9. **Relative income by household type: household disposable income**

Per cent ratio, and changes in percentage points

	Working-age population			Total population							
	By employment status			By age of head				By family type			
	Two workers	One worker	No worker	Young head	Prime-age head	Older working-age head	Retirement-age head	Single adult with children	Single adult, no children	Two adults with children	Two adults, no children
Australia, 1993/94	121.3	79.9	45.4	101.1	101.4	110.9	68.2	58.5	78.6	95.7	119.8
Changes 1975/76-1993/94	-2.2	2.4	3.4	-4.4	1.4	3.1	-5.7	-8.0	-0.6	0.4	-0.1
Belgium, 1995	..	..	..	..	..	..	..	73.7	74.2	115.3	107.8
Changes 1983-1995	..	..	..	..	..	..	..	..	..	..	..
Canada, 1990	110.9	81.9	47.0	87.7	101.5	111.9	87.3	54.6	79.8	94.3	112.5
Changes 1985-1990	-0.1	0.9	-2.9	-1.8	0.4	0.5	-0.4	1.7	-0.4	0.3	-0.2
Denmark, 1994	111.9	84.8	67.0	89.6	105.9	117.3	73.4	61.9	71.1	104.4	110.9
Changes 1983-1994	-0.8	1.2	1.9	-10.9	-1.5	10.7	4.7	-2.7	0.3	-2.2	3.5
Finland, 1995	106.7	82.7	58.4	80.3	106.8	114.5	78.1	77.9	71.5	103.1	108.6
Changes 1986-1995	-0.5	2.0	-3.8	-7.6	0.3	6.4	1.1	1.2	-0.5	0.7	-1.0
Germany, 1994	122.3	89.3	55.9	78.5	100.9	113.0	89.3	58.9	85.0	97.4	110.3
Changes 1984-1994	3.6	-1.2	-9.5	-1.9	-1.5	0.6	4.3	2.7	2.7	-0.9	0.0
Italy, 1993	131.2	77.4	51.0	92.1	98.1	109.9	84.7	54.1	71.1	93.6	112.7
Changes 1984-1993	6.3	-5.5	-1.3	-4.8	1.5	-2.7	2.9	-4.6	-4.3	0.3	0.1
Japan, 1994	110.0	88.7	62.7	75.9	94.2	120.7	93.1	57.4	82.4	94.2	121.5
Changes 1984-1994	3.8	-5.0	5.3	-6.0	-0.9	3.6	-0.8	-1.2	-5.0	-0.5	2.6
Netherlands, 1994	119.3	89.7	62.0	85.2	100.8	114.0	87.5	58.6	80.0	95.0	118.1
Changes 1977-1994	1.7	0.1	-10.9	-5.9	5.0	-2.2	-8.9	-3.5	-10.4	0.8	1.3
Norway, 1995	115.4	85.7	49.4	78.0	107.3	117.3	73.7	69.9	69.3	103.8	111.5
Changes 1986-1995	-0.1	-0.2	2.4	-11.5	0.6	4.6	4.0	1.1	-2.7	0.0	1.0
Sweden, 1995	115.1	80.8	58.2	73.3	104.2	125.8	89.3	73.9	74.5	103.7	121.7
Changes 1975-1995	3.0	-6.3	9.9	-15.8	-5.3	12.2	16.5	-11.6	-1.3	-2.7	8.0
United States, 1995	116.7	82.2	39.6	75.0	101.5	120.0	91.9	49.9	88.4	94.9	122.4
Changes 1974-1995	3.1	-5.0	1.3	-9.5	0.9	1.8	6.4	5.6	7.0	-0.9	-0.9

Note: Relative income by household type is the ratio of its average household disposable income to the average for the entire population. For definitions of household types see Table 7. Thus, for Australia, relative average income of no-worker households among the working-age population was 45.4 per cent of total average income. This ratio increased by 3.4 percentage points over the period.

Source: OECD.

income of each group relative to the population average in the most recent year. Changes in this indicator (Table 9, second line) indicate which groups have improved their situation over time relative to developments in the whole population.<sup>25</sup> The impact of the tax-and-transfer system for each group is measured (Table 10, first line) by the difference, for each group, between the relative income at the level of disposable income and at the level of market income (*e.g.* before taxes and transfers). Positive values indicate that taxes and transfers have improved the relative position of a given group. Positive changes in this indicator (Table 10, second line) indicate that the effect of taxes and transfers on the relative income of a group became more important over time. In the event, the two approaches (based on poverty and on relative income) point to a broadly similar picture, and the analysis below focuses on relative income.

The breakdown by employment status of households (*e.g.* the presence and number of household members with work) shows the largest cross-group differences in average income. Individuals in households with no workers and a working-age head (third column of Table 9) have, in general, very low relative income. They also appear to have benefited the most from the operation of the tax-and-transfer system, as highlighted by the large increase in their relative income when shifting from a pre- to post-tax-and-transfer basis (Table 10). However, this positive effect has tended to become more important over time in only about half of the countries. By contrast, households with a single earner appear, on balance, to have benefited modestly from the tax-and-transfer system, although this has tended to improve over time in almost all countries. Not surprisingly, taxes and transfers have tended to lower the (high) relative income of households with two or more workers, and this effect has strengthened over time.

The breakdown by age of the household head points to a normal life-cycle pattern, with relative income rising during working life and then declining as the household head moves into retirement (Table 9, middle panel). This pattern has tended to become more marked over the period. Households with a head of retirement age benefited the most from the tax-and-transfer system among all age groups, and this further improved over time in all countries except Finland<sup>26</sup> and the Netherlands (Table 10, middle panel).<sup>27</sup> Individuals in households with a young head experienced a generalised decline in their relative income over the period considered (Table 9), despite a larger positive contribution of taxes and transfers (Table 10). Finally, the tax-and-transfer system tended to reduce the relatively high income of households with a prime age and an older working-age head, and this effect has also tended to strengthen over time.<sup>28</sup>

When looking at family types (*i.e.* the presence of children and the number of adults in the household), households with a single adult, with or without children, tend to have lower disposable income than those with two adults, and those with a

Table 10. **Difference in relative income by household type, pre- and post-taxes and transfers**

Per cent ratio, and changes in percentage points

	Working-age population			Total population							
	By employment status			By age of head				By family type			
	Two workers	One worker	No worker	Young head	Prime-age head	Older working-age head	Retirement-age head	Single adult with children	Single adult, no children	Two adults with children	Two adults, no children
Australia, 1993/94	-7.9	4.7	38.7	-0.3	-5.4	-1.4	33.6	29.3	13.5	-2.7	1.3
Change 1975/76-1993/94	-5.3	5.2	12.2	2.1	-0.9	-3.2	7.6	14.5	1.5	0.1	-2.0
Belgium, 1995	..	..	..	..	..	..	..	1.2	12.2	-20.8	18.6
Change 1983-1995	..	..	..	..	..	..	..	..	..	..	..
Canada, 1990	-4.0	4.1	30.2	-2.1	-9.3	-5.8	37.7	15.3	12.3	-6.8	1.6
Change 1985-1990	-0.9	1.4	4.5	1.0	-1.2	-0.4	3.4	2.6	3.1	-1.2	0.0
Denmark, 1994	-11.3	9.6	47.4	2.1	-10.3	-5.2	35.5	18.5	20.0	-9.1	2.3
Change 1983-1994	-5.9	5.6	22.6	-1.2	-2.3	1.9	6.3	7.9	4.5	-1.4	-0.8
Finland, 1995	-2.9	5.9	29.8	14.0	-2.9	-13.3	10.4	20.7	5.5	0.4	-5.0
Change 1986-1995	1.2	-2.8	-10.9	13.0	6.7	-12.6	-31.6	9.5	-6.7	6.7	-8.4
Germany, 1994	-7.8	0.8	29.1	-13.7	-16.1	-7.5	63.9	11.1	18.5	-10.1	4.9
Change 1984-1994	2.0	0.9	-13.0	-0.3	1.8	-3.6	0.9	3.7	-3.1	1.2	-0.5
Italy, 1993	-9.6	3.4	48.8	-12.7	-18.9	4.8	56.5	5.2	38.8	-16.6	19.2
Change 1984-1993	-3.8	3.6	-2.1	0.5	-6.4	5.0	9.5	8.0	10.9	-6.4	7.8
Japan, 1994	-1.3	0.2	38.8	-2.2	-3.4	-3.0	39.9	3.1	15.2	-3.7	7.1
Change 1984-1994	-1.1	1.3	4.5	-1.6	-0.8	-2.4	16.6	-2.0	10.8	-1.7	2.6
Netherlands, 1994	-8.4	1.6	38.7	-3.3	-8.1	-4.8	40.3	29.4	19.1	-4.0	1.7
Change 1977-1994	-2.4	2.7	-6.0	5.5	-1.1	2.3	-5.0	-2.3	-10.4	2.2	-1.8
Norway, 1995	-7.8	5.8	33.7	2.5	-8.5	-9.1	39.6	17.0	11.2	-7.6	4.2
Change 1986-1995	-0.7	1.2	-0.7	5.0	-1.3	-1.1	0.6	-0.6	-2.1	-1.2	2.8
Sweden, 1995	-11.3	10.9	56.7	0.3	-18.4	-22.9	72.4	23.9	14.0	-15.3	8.1
Change 1975-1995	-4.7	6.4	10.0	2.5	-6.5	-6.3	20.6	-5.6	1.8	-4.1	6.3
United States, 1995	-4.7	3.8	26.4	0.9	-6.8	-5.4	35.0	11.1	11.1	-3.8	3.1
Change 1974-1995	-1.5	2.4	-0.7	3.0	-1.7	-0.4	3.1	-1.8	-0.7	0.0	0.4

*Note:* Values in the first line of the table are the differences between relative income calculated on a pre- and post-taxes basis for each household group. Pre-tax relative income is calculated as average pre-tax-and-transfer income of a particular group taken as a per cent ratio of average pre-tax-and-transfer income of the entire population. Relative post-tax-and-transfer income is calculated as in Table 9. The second line shows the change in this difference over the period expressed as percentage points. For Australia, no-worker households at the end of the period increased by 38.7 percentage points relative to average income as a result of the tax and transfer system. Over the period, the difference shown in the first line improved by 12.2 percentage points. For definitions of household type, see Table 7.

*Source:* OECD.

Table 11. **Relative incomes and differences pre- and post-taxes and transfers: children**

Per cent, and changes in percentage points

Total population	Relative income position after taxes and transfers			Indicator of gains and losses due to taxes and transfers		
	Age of individuals	Single-earner households with children		Age of individuals	Single-earner households with children	
	Age 0-17	Single parent	Two parents	Age 0-17	Single parent	Two parents
Australia, 1993/94	84.8	72.9	74.8	0.6	14.2	-0.8
Changes, 1975/76-1993/94	-4.7	-10.1	0.5	2.1	7.2	1.9
Belgium, 1995	104.9	74.4	97.5	..	..	..
Changes, 1983-1995	..	..	..	..	..	..
Canada, 1990	90.5	63.4	68.5	-12.8	5.1	2.1
Changes, 1985-1990	-9.9	-1.0	-4.1	-13.2	-5.0	-2.1
Denmark, 1994	96.7	66.6	90.5	-14.6	7.3	12.2
Changes, 1983-1994	-2.9	-2.7	4.2	-9.3	3.2	10.8
Finland, 1995	100.4	84.3	81.3	-10.1	14.0	25.4
Changes, 1986-1995	2.3	6.2	2.9	-5.9	6.1	14.8
Germany, 1994	96.7	74.8	88.9	-12.8	2.7	-5.7
Changes, 1984-1994	-2.9	5.0	1.0	-8.1	10.1	1.7
Italy, 1993	89.3	68.4	70.5	-16.7	-10.2	-10.3
Changes, 1984-1993	-0.9	1.8	-6.4	-5.8	-3.1	-2.8
Japan, 1995	88.2	53.2	83.7	-8.4	0.8	-7.1
Changes, 1983-1995	-3.7	-10.9	-6.1	-6.1	-3.3	-4.1
Netherlands, 1995	88.9	74.7	84.2	-10.8	-0.4	-5.4
Changes, 1983-1995	-1.1	-3.7	-1.4	-6.1	-2.5	0.6
Norway, 1995	97.4	81.9	85.2	-16.4	6.1	4.8
Changes, 1983-1995	0.9	-0.5	0.4	-12.7	-1.5	4.5
Sweden, 1995	97.9	78.5	82.1	-30.5	19.1	21.5
Changes, 1983-1995	-3.9	-9.5	-4.9	-21.9	-8.2	24.7
United States, 1995	83.7	59.5	73.4	-8.4	5.1	-0.8
Changes, 1983-1995	-2.1	5.7	-12.2	-7.0	-1.4	1.4

Note: For explanations, see Table 9 for the left-hand panel and Table 10 for the right-hand panel.

Source: OECD.

single adult and children have the lowest relative income of all groups. These patterns reflect a combination of factors: *i*) a higher number of workers in households with two or more adults; *ii*) larger size of households with children; and *iii*) the fact that more lone parents do not work when compared to other groups. In general, the tax-and-transfer system benefits single-adult households the most and two-adult households with children the least, mirroring differences in relative income (Table 10, right-hand panel).

Table 11 provides additional insight on the situation of children, in terms of both relative income (left-hand panel) and the importance of the tax-and-transfer system (right-hand panel). Children (defined as individuals below the age of 18) enjoyed - in the most recent year available - below-average income in all countries except Belgium and Finland, and their position tended to deteriorate over time in almost all countries. The tax-and-transfer system has tended to increase, on balance, their relative income, but support appears to have been falling over the past decades in most countries (Table 11, right-hand panel). Single parents without work are obviously the most vulnerable group. But relatively low income was also experienced in some countries by two-adult households with a single earner (Table 11, second column); and in a majority of countries taxes and transfers contributed to a deterioration of the relative position of this group.

## CONCLUSIONS

The results provide some hints as to which factors underlie the increase in inequality at the level of market income. First, while earnings contribute most to inequality in any one year, this income component has not always been the largest contributor to the widening of the distribution of income over the period and, in some cases, earnings did not contribute to the increase in disposable income inequality at all once interaction effects have been taken into account (Shorrocks methodology). Capital and self-employment income has contributed significantly in many countries, sometimes reflecting increased shares. However, measurement problems argue for caution in interpreting these results.

Decompositions which take into account the changing patterns of employment and non-employment across households suggest that disposable income inequality increased among employed households. A number of factors probably played a role, including increased wage-rate differentials and a more unequal distribution of employment across households. The results showed that increasing shares of non-working households within the working-age population contributed to the rise in inequality and this increase may have been substantial in a few countries. In contrast, the increasing share of the retired appears to have contributed to a reduction in inequality.

The results also show that the increased importance of taxes and transfers has been quite successful in offsetting the greater inequality in market income - although feedback effects (*e.g.* earlier retirement as a result of age pensions) certainly explain at least some of the widening in the distribution of market income. There was considerable variation across countries in the relative importance of these two components in explaining the change in inequality over the period. Nonetheless, transfers appear to have been key for helping households at the bottom of the distribution. As the share of non-working households in the total population has increased, incomes of those at the bottom of the distribution have been increasingly made up of income-transfer benefits. In this context, retirement-age households have been particularly favoured and, for a subset of five countries, they have experienced the sharpest falls in poverty of all population groups considered. In contrast children, taken as a group, have tended to lose ground.

An unanswered question is how policy should respond to increased inequality of market income. In this context, it would appear important to consider not only the impact of policy on the "static" distribution (as presented in this study), but also the effects on the income of individual households through time. Households at the bottom of the distribution move up the income ladder as they become employed and, as they improve their earning capacity through better education and skills; conversely, those losing jobs or moving into retirement may see their incomes fall. As noted above, some part of the increase in inequality and poverty has reflected the increasing share of non-working households among the working-age population. Policies aimed at narrowing the "static" distribution of income by increasing transfer payment may - where they are already generous - limit job creation and reduce the incentive to find work, thereby perpetuating low incomes. At the same time, policies which lead to a widening in wage rates for the low paid may raise employment but lead to an increase in the number of "working poor" households. Policies need, therefore, to focus both on increasing employment and on measures to encourage upward earnings mobility through time, possibly supplemented by work-conditional benefits for low-wage households.

## NOTES

1. Not all results are available for all countries and periods.
2. While there have been a number of international comparisons (see, *inter alia*, Gottschalk and Smeeding, 1997), a common methodology has not been used and the range of countries covered is smaller.
3. For a further discussion of data issues and problems see Burniaux *et al.* (1998).
4. Nonetheless, a comparison of Gini coefficients with those found in Atkinson *et al.* (1995), based on LIS data, shows similar rank orderings across countries.
5. Estimates of the number of homeless suggest that this would not make a substantial difference to the results in terms of the overall distribution, although it might possibly be somewhat more important for measures of poverty (OECD, 1996b).
6. The size of the changes over time for individual components and groups for some countries suggest that there may be inconsistencies in data sets which have not been accounted for.
7. This is referred to as an equivalence scale elasticity of 0.5 (or  $N^{0.5}$ ).
8. To test the sensitivity of the results to this assumption, indicators of distribution and poverty were also calculated using per capita income (*i.e.* household income divided by the number of individuals). In the event, changes in overall income distribution show broadly the same trends over time, though relative rankings of households by characteristic (age, family and employment status) within each country were often different (see Burniaux *et al.*, 1998).
9. Indirect taxes have not been taken into account. There has been some shifting in taxes from direct towards indirect taxes over the period such that the equalising impact of taxes may be overstated See Leibfritz *et al.*, 1997.
10. Thus, the threshold rises in line with median income. See Burniaux *et al.* (1998) for results using a threshold which remains unchanged in real terms through the period. On this basis, poverty would have fallen in all countries except Australia (where real median income fell over the period).
11. Similar results were used found using poverty thresholds set at 40 and 60 per cent of median income. See Burniaux *et al.*, 1998.
12. Additional evidence presented in the fifth section shows that the widening in the shares of earnings may be related to employment patterns and the rise in the number of no-earner households which are concentrated in the bottom deciles.
13. The contributions of each component to the change in the index can differ depending on the index chosen. As shown in Table 1, both the sign and the size of the change can vary depending

on the index chosen. Nonetheless, the results using the other two indices in Table 1 broadly concur with the results presented here. Results using the SCV are shown in Burniaux *et al.* (1998).

14. This is less the case for Denmark, the Netherlands and Sweden, where most transfer payments are taxed as part of income.
15. Taxes also rose sharply for the lower-income group in Denmark and Sweden. This reflected the fact that, as noted, a larger share of transfers is taxable in these two countries and that transfers increased sharply in both.
16. The large positive contribution of taxes in Sweden partly reflects the effect of tax reforms in the early 1990s, that changed the definition of taxable income and widened the tax base.
17. A comparison of the poverty rates from the LIS files and the questionnaire suggests that the country rankings are broadly the same. The main difference in ranking is Germany, where the poverty rate is much lower in the LIS 1989 data than in the GSOEP data for 1994.
18. This may also reflect differences in pension arrangements between Europe and the United States. Private pensions, which are included in market incomes, are more important in the United States. This is likely to reduce the number of non-working households with no market income, leading to a narrower market income distribution and lower poverty rates pre-taxes and transfers.
19. Relative to the mean of each group.
20. To better capture the effects of non-workers, workers and the retired, the population groups have been recomposed in Table 8 into individuals belonging to households with at least one worker (of working age and retirement age) (Panel A), individuals belonging to households with no workers of working age (Panel B) and individuals belonging to households with non-workers of retirement age (the retired) (Panel C).
21. However, it is difficult to assess the impact without further information about the impact of changing patterns of hours worked across households and the correlation between the incomes of workers in multi-earner households.
22. For example, in Australia the structural effect (*i.e.* the effect of changing shares of one and two-earner households) at the level of working households was -0.3 (column 4), but this increased to 1.6 (column 8) when changes in the shares of working and non-working households are allowed for – a difference of 1.9 (Panel D). This compares to rise of 1.0 at the level of total MLD (1.3 in column 5 less 0.3 in column 1).
23. Results for average incomes and poverty rates in this section are particularly sensitive to the equivalence scale used. For example, the use of an equivalence-scale elasticity of 1 (per capita income) would raise average equivalent incomes of population groups with a small size (*e.g.* the retired) relative to those with larger average household size (*e.g.* two-adult households with children).
24. Family type refers to the family status – *i.e.* single or married and with or without children. The income unit remains the household.
25. The population structure has been held constant at the end of the period to control for the impact of changing population structure.
26. The results for Finland may be affected by a shift in the pension system from the public to the private sector.
27. Indeed, the relative position of this group improved over time as they cumulated both higher market incomes relative to the population average and increased benefits from the

tax-and-transfer system: for the five countries, poverty rates for retirement-age households fell even before taxes and transfers (Table 6).

28. For the five countries, the share of the poor who belonged to prime-age households increased over the past two decades and for this group there also appears to have been an increasing number of working poor. This contrasts with the experience of older-worker households which work: poverty rates for this group have declined. This pattern for older-worker households is consistent with increased early retirement or withdrawal from the labour market, particularly among those with lower incomes (Table 6).

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## **STATISTICAL ANNEX**

Table A1. **Inequality indices: market and disposable income**

	Gini			SCV			MLD		
	Market income [1]	Disposable income [2]	Difference due to tax and transfer [2]-[1]	Market income [1]	Disposable income [2]	Difference due to tax and transfer [2]-[1]	Market income [1]	Disposable income [2]	Difference due to tax and transfer [2]-[1]
Australia, 1993/94	46.3	30.6	-15.7	91.3	37.5	-53.8	84.1	17.8	-66.3
Belgium, 1995	54.5	29.9	-24.6	131.4	47.2	-84.1	122.4	26.9	-95.6
Canada, 1994	..	28.4	..	..	30.9	..	..	14.3	..
Denmark, 1994	42.0	21.7	-20.3	67.1	22.9	-44.2	68.8	8.8	-60.0
Finland, 1995	39.2	23.1	-16.1	63.2	24.3	-39.0	..	9.0	..
Germany, 1994	43.6	28.2	-15.4	75.8	32.4	-43.4	96.9	13.5	-83.4
Italy, 1993	51.0	34.5	-16.5	119.0	58.4	-60.6	96.0	24.0	-72.0
Japan, 1994	34.0	26.5	-7.5	53.6	29.6	-24.1	33.5	12.6	-20.9
Netherlands, 1994	42.1	25.3	-16.8	66.6	23.9	-42.7	28.7	11.6	-17.2
Norway, 1995	39.9	25.6	-14.3	34.2	30.5	-3.7	..	13.1	..
Sweden, 1995	48.7	23.0	-25.8	89.4	21.7	-67.7	87.2	11.0	-76.2
United States, 1995	45.5	34.4	-11.1	81.1	44.1	-36.9	..	21.9	..

Source: OECD.