

Lietz, Christine; Sutherland, Holly

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## Social indicators and other income statistics using EUROMOD: An assessment of the 2001 baseline and changes 1998 - 2001

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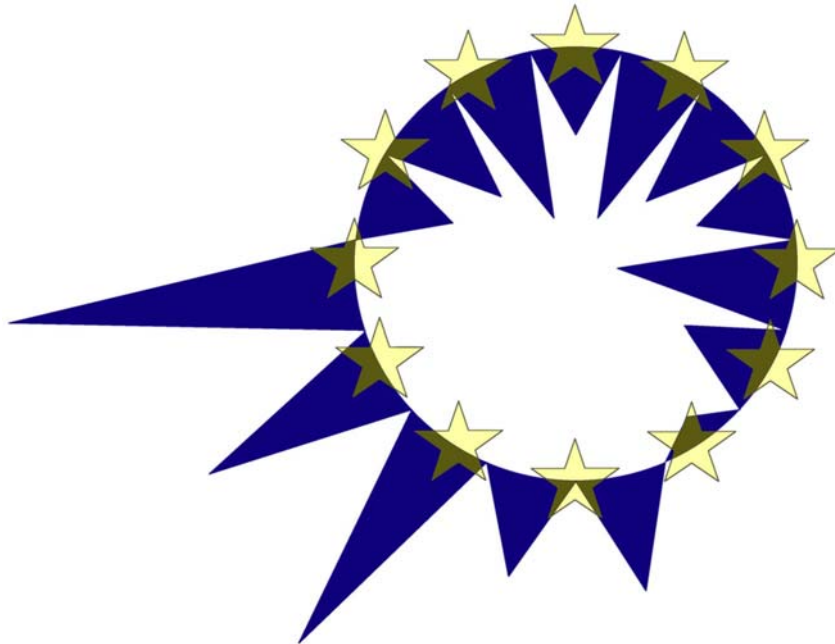
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# EUROMOD

## WORKING PAPER SERIES



EUROMOD Working Paper No. EM6/05

**SOCIAL INDICATORS AND OTHER  
INCOME STATISTICS USING  
EUROMOD: AN ASSESSMENT OF THE  
2001 BASELINE AND CHANGES 1998-2001**

Christine Lietz and Holly Sutherland

March 2005

# Social Indicators and other Income Statistics using EUROMOD: an assessment of the 2001 baseline and changes 1998-2001<sup>1</sup>

Christine Lietz and Holly Sutherland

*Department of Applied Economics, University of Cambridge  
Institute for Social and Economic Research, University of Essex*

March 2005

## Abstract

This paper reports an exercise to validate EUROMOD output for 2001 by comparing income statistics calculated from the baseline micro-output with comparable statistics from the European Community Household Panel (ECHP). It focuses particularly on some of the income-based common “Laeken” social indicators. It also compares EUROMOD estimates of changes in these indicators between 1998 and 2001 with similar estimates based on ECHP. The values of many of the indicators – and changes to the indicators – calculated using EUROMOD are close to those shown by the ECHP. Where there are discrepancies these can usually be explained by known differences in the methods or underlying data. Users of EUROMOD should be aware of remaining unavoidable sources of non-comparability across countries, as well as the nature of the simulation process. Nevertheless they can be confident that the baseline provides a good starting point for the analysis of the effects of policy changes on indicators.

*JEL:* C81, D31, I32

*Keywords:* European Union; Microsimulation; Poverty statistics; Income inequality

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EUROMOD relies on micro-data from 12 different sources for fifteen countries. These are the European Community Household Panel (ECHP) User Data Base made available by Eurostat; the Austrian version of the ECHP made available by the Interdisciplinary Centre for Comparative Research in the Social Sciences; the Panel Survey on Belgian Households (PSBH) made available by the University of Liège and the University of Antwerp; the Income Distribution Survey made available by Statistics Finland; the Enquête sur les Budgets Familiaux (EBF) made available by INSEE; the public use version of the German Socio Economic Panel Study (GSOEP) made available by the German Institute for Economic Research (DIW), Berlin; the Living in Ireland Survey made available by the Economic and Social Research Institute; the Survey of Household Income and Wealth (SHIW95) made available by the Bank of Italy; the Socio-Economic Panel for Luxembourg (PSELL-2) made available by CEPS/INSTEAD; the Socio-Economic Panel Survey (SEP) made available by Statistics Netherlands through the mediation of the Netherlands Organisation for Scientific Research - Scientific Statistical Agency; the Income Distribution Survey made available by Statistics Sweden; and the Family Expenditure Survey (FES), made available by the UK Office for National Statistics (ONS) through the Data Archive. Material from the FES is Crown Copyright and is used by permission. Neither the ONS nor the Data Archive bear any responsibility for the analysis or interpretation of the data reported here. An equivalent disclaimer applies for all other data sources and their respective providers cited in this acknowledgement.

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## **Social Indicators and other Income Statistics using EUROMOD: an assessment of the 2001 baseline and changes 1998-2001**

EUROMOD is a tax-benefit model for the European Union. See Immervoll et al. (1999) and Sutherland (2000) for general descriptions. Tax-benefit models calculate disposable income for each household in a representative set of micro-data. The calculation of household disposable income is made up of elements of gross income taken (or imputed) from the survey data combined with elements of income – taxes and benefits - that are simulated by the model. The calculations are performed once for the baseline system and population, and again for each alternative scenario. The first round effect of the simulated change is the arithmetic difference in the “before” and “after” calculations. EUROMOD can be used to explore the direct effects of policy and other changes on indicators of income poverty and inequality (Sutherland, 2002).<sup>2</sup> The purpose of this paper is to compare EUROMOD baseline output statistics on incomes, inequality and poverty with other sources of corresponding information. It builds on work reported in a companion paper (Mantovani and Sutherland, 2003) which focussed on the baseline for 1998. In this paper we carry out some similar comparisons for 2001 and examine whether the EUROMOD estimates of changes between 1998 and 2001 correspond to those shown by other statistics.

The main aims of this exercise are (a) to provide background information about the quality and comparability of EUROMOD baseline results, to aid the interpretation of results from applications of the model and (b) to highlight aspects of the model that may require further development in order to improve quality and comparability.

There are four main parts to this paper. The first summarises the likely reasons for differences between EUROMOD results and other estimates (greater detail being provided in Mantovani and Sutherland (2003)). The second part compares EUROMOD estimates for 2001 with the most recent statistics to be published by Eurostat, based on 2000 incomes. These data, collected in 2001, are from the final wave of the European Community Household Panel (ECHP) so represent the best source for comparison across EU15 until data from the EU-SILC becomes available. The third part considers changes since 1998. This is done in terms of how EUROMOD-estimated indicators confirm or conflict with ECHP evidence. In the fourth section EUROMOD estimates for EU15 as a whole are compared with those of Eurostat. Both sources merge national income distributions using purchasing power parity adjustments for GDP to rank incomes according to their “real” level. The effect of using this commonly-made adjustment is compared with alternatives and the issues and problems are discussed.

Finally, we draw some conclusions about the quality of EUROMOD results, consider the factors that must be borne in mind when carrying out simulations of changes (i.e. using results that depart from the baseline), and identify further work to be done.

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<sup>2</sup> For a full discussion of the characteristics of these indicators see Atkinson et al. (2002)

## 1 Making comparisons

The EUROMOD “baseline” for 2001 is the micro-level distribution of household incomes that is output from EUROMOD for the 2001 policy year. It makes use of simulated values for taxes and benefits combined with information taken from the original data on market incomes and household characteristics. In comparisons with ECHP statistics the definition of Household Disposable Income (HDI) that is used is the same as (or as close as possible to) that used by Eurostat. In calculating summary statistics incomes are equivalised using the modified OECD scale,<sup>3</sup> and households are weighted by their size, unless otherwise stated.

There are, however, a number of reasons why we might expect EUROMOD estimates to differ from the statistics with which we compare them. These are considered in some detail in Mantovani and Sutherland (2003). Here we simply list those which have particular relevance to comparisons with the statistics provided by Eurostat based on the 2001 ECHP (Dennis and Guio, 2004).

### *Source of data*

EUROMOD is based on ECHP in five countries and on cross-sections from related national panels in a further five countries. The remaining five countries use data from entirely different sources. See Annex 1 for details of currently used EUROMOD datasets for the 2001 baseline. On the other hand, Eurostat statistics, labelled “ECHP” throughout are actually based on ECHP data for only 13 out of 15 countries. In the case of Denmark the Law Model Database is used (whereas Denmark is one of the countries for which EUROMOD does make use of ECHP) and in the case of Sweden the Income Distribution Survey (HEK) is used, the same source as EUROMOD.

### *Point in time*

The EUROMOD baseline refers to mid-2001 prices and incomes. The output statistics are derived from input data that were collected in different years for different countries (the earliest being 1993 incomes for France and the most recent 2001 incomes for Finland and Sweden. With the exception of these two countries the income data have been updated from the data year to 2001 using a range of appropriate indexes. But this process can only be approximate. Furthermore, the composition of the samples has not been adjusted in any way for demographic or labour market changes.<sup>4</sup> These may have been considerable over the period 1993-2001. Thus while 2001 would be the most appropriate comparison data year, it must be recognised that compositional changes may to some extent contribute to differences between the estimates.

In addition, the ECHP estimates refer to one year earlier than we would wish. They measure the effect of 2000 policies on 2000 incomes whereas EUROMOD measures the effect of 2001 policies on simulated estimates of 2001 incomes. To the extent that policy changes were

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<sup>3</sup> This assumes single person=1; additional people aged 14+ = 0.5; additional people aged under 14 = 0.3.

<sup>4</sup> One exception is the case of Ireland, where weights adjust to the 2001 population.

introduced in 2001 affecting incomes this one-year discrepancy introduces a further source of difference.<sup>5</sup>

#### *Unit of income aggregation*

All the ECHP and EUROMOD statistics refer to incomes of whole households, where the definition of household is similar if not identical in all cases: people living together in one dwelling and sharing some domestic arrangements. In the case of Sweden the EUROMOD database used with 2001 policies now takes advantage of the Swedish Statistical Office's recent development of data organised around the standard European household definition.<sup>6</sup>

#### *Simulation*

EUROMOD calculates tax liabilities and benefit entitlements. For many reasons we would not expect recorded amounts to be the same as simulated amounts. There are two particularly important issues:

1. The treatment of taxes is very different. ECHP simply collects post-tax income variables (in most cases). In EUROMOD we impute gross incomes - using a variety of methods - and then simulate taxes based on these imputations. In some cases there might be a few inconsistencies between the process adopted to impute gross incomes and the programming of the tax-benefit system. In most cases both procedures are to some extent approximate.
2. Modelling benefit take-up and tax evasion (as well as some legitimate tax reliefs) is difficult. Generally speaking, EUROMOD will over-estimate both benefits and taxes because of lack of information that allows us to mimic exactly the processes of benefit claiming and tax declaration. For this reason in some countries for some uses of EUROMOD we tie social assistance entitlement to recorded receipt in the data. The results shown in the tables do not do this, unless explicitly mentioned.

#### *Reference time period*

Irish and UK EUROMOD results are effectively measured over a shorter time period than in other countries, or in ECHP statistics. We would expect this to cause larger measured inequality in these two countries, although the direction of the effect on the poverty rate (the proportion with incomes below 60% of the median) is not clear.

#### *Sampling error*

Finally, it is worth emphasising that even accounting for the factors discussed above, we should not expect EUROMOD results to be identical to those from other sources. There is no certain benchmark against which to make comparisons; no platinum bar against which to calibrate our scales. As well as the reasons for difference that are set out above, all the

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<sup>5</sup> For example, significant increases in the generosity of social assistance for the elderly were introduced in the UK in April 2001. These particularly affected incomes in the region of the 60% median cut-off. We might therefore expect risk of poverty estimates for UK elderly to be lower in EUROMOD than in the ECHP for 2001 for the UK.

<sup>6</sup> The traditional Swedish unit of analysis is the narrow family unit: single people or couples and any children aged under 18. This is used in the EUROMOD database for the 1998 baseline. Older children or other people living within the same household are treated as separate units in the analysis. The use of the narrower unit will result in higher poverty rates for some groups, particularly those more likely to be financially dependent on other household members, such as the young and the old. This is important to remember in interpreting the comparisons for Sweden for 1998 and 2001 later in this paper.

statistics that we cite below are subject to sampling error to some degree. If we had drawn a different ECHP sample then the comparisons would look different. To provide a rough guide to the size of this effect, the 95% confidence interval around the official UK estimates of the proportion of the population with incomes below 60% of the median in 2001/2 is (17+/-0.5)% (Department for Work and Pensions, 2003; Table 2.4). However, this figure is based on a dataset which is four times the size of the Family Expenditure Survey (the basis of the EUROMOD estimates for the UK) which is itself one of the larger samples in the EUROMOD database (Sutherland, 2001; Table 3.2). Thus a very conservative estimate for the confidence interval around most of the poverty estimates reported here would be +/- 1 percentage point, and this would be larger for sub-groups. The magnitude of differences between poverty rate estimates from EUROMOD and other sources should be compared with the +/- 2 percentage points that might arise when comparing rates calculated from any two samples of typical size from the same population.

## **2 Comparisons of EUROMOD social indicator estimates with Eurostat statistics**

### *The headline indicator*

The first panel of Table 1 shows the headline social indicator: the population headcount of people living in households with equivalised disposable incomes below 60% of the national medians. In most countries the difference in the statistic from the two sources is no more than one percentage point. In two countries (Italy and Portugal) the EUROMOD estimate is higher than the estimate taken directly from ECHP, but the difference is only 2 percentage points. In Italy the explanation may be due to differences between the two entirely different data samples. In three other countries (Belgium, Luxembourg and Austria) the EUROMOD estimate is lower: by 2 percentage points in each case.

### *Other social indicators*

Table 1 also shows comparisons for:

- The proportions of populations living in households with less than 40%, 50% and 70% of median incomes;
- The median poverty gap;
- Two measures of income inequality: the Gini coefficient and the quantile share ratio.

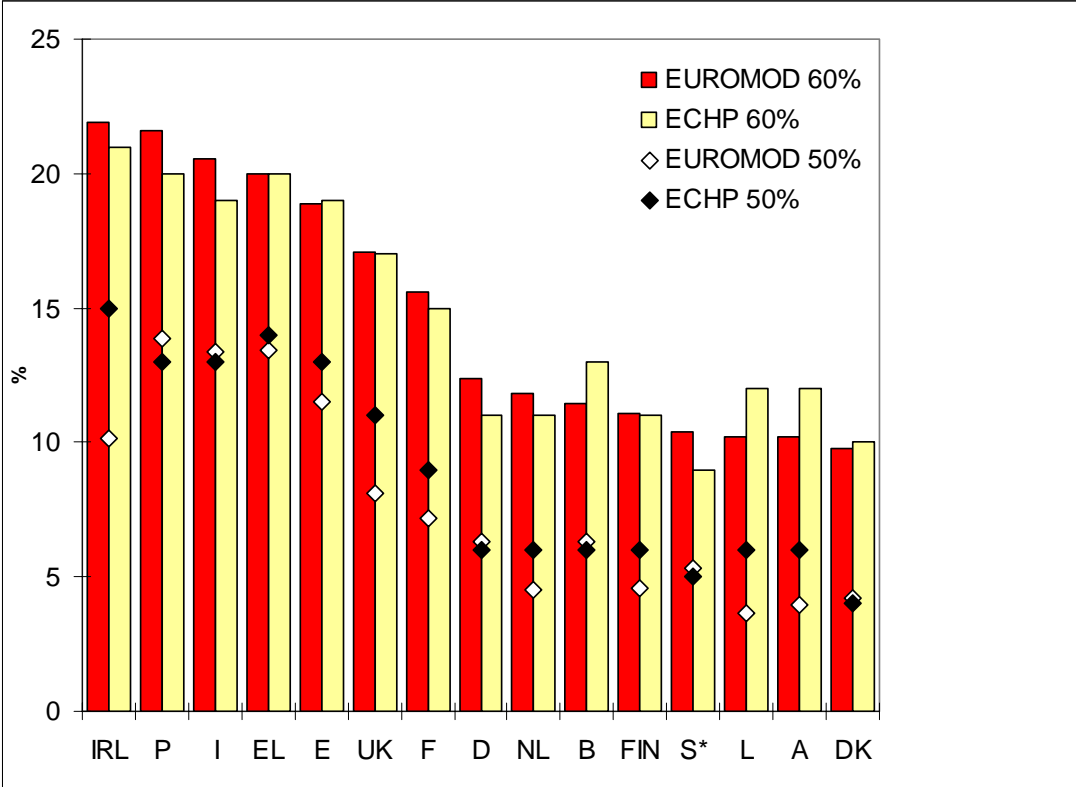
Using a threshold at low proportions of the median (40% and 50%) generally results in EUROMOD estimating lower risk of poverty rates than Eurostat. The exceptions only differ by one percentage point. EUROMOD provides consistently lower estimates than ECHP at these low levels of income for Ireland and also for the UK, in spite of the estimates at 60% being close. The most likely explanation is that the ECHP data capture non-take-up of means-tested benefits whereas the current version of EUROMOD assumes full take-up. Nearly everyone is in principle entitled to some form of minimum income in these two countries, meaning that the numbers simulated to have very low incomes (below the minimum level) are small. In reality however, take-up is a problem and this is reflected in differences at low levels of poverty threshold. The problem is less obvious at the 60% or 70% level because (under the assumptions, equivalence scale, etc. used here) means-tested benefit levels are not sufficient



to lift many above the 60% median poverty threshold. Entitled people are poor whether or not they are recipients.

The comparisons of relative poverty rates using 60% (bars) and 50% (dots) of the median are summarised in Figure 1, where countries are ranked according to their EUROMOD poverty rate using 60% of the median.

**Figure 1: Proportions of populations with incomes below 60% and 50% of the median: comparisons between ECHP (2000 incomes) and EUROMOD (2001 incomes)**



Even using a higher income threshold (70%) the rates stay fairly close in most countries, or consistent with discrepancies observed using the 60% threshold. Differences become apparent in the Netherlands (where the EUROMOD estimate is 3 percentage points higher than that from ECHP).

The poverty gap tends to be smaller in EUROMOD than using ECHP in countries where EUROMOD shows lower values of risk of poverty using the 40% and 50% thresholds. This consistent picture is shown for Ireland, Luxembourg and the UK. EUROMOD also estimates a smaller gap, relative to ECHP, in the Netherlands and Austria. On the other hand the EUROMOD estimate for Greece, Portugal and especially Belgium is larger.

**Table 1: Social indicators using the 2001 EUROMOD baseline, compared with ECHP 2000 incomes**

	B	DK	D	EL	E	F	IRL	I	L	NL	A	P	FIN	S*	UK
<b>All with household disposable income &lt; 60% of the median</b>															
EUROMOD 2001	11	10	12	20	19	16	22	21	10	12	10	22	11	10	17
ECHP 2000 incomes	13	10	11	20	19	15	21	19	12	11	12	20	11	9	17
<i>Difference</i>	-2	0	1	0	0	1	1	2	-2	1	-2	2	0	1	0
<b>All with household disposable income &lt; 40% of the median</b>															
EUROMOD 2001	3	2	3	9	6	2	2	8	0	2	2	5	1	3	2
ECHP 2000 incomes	2	2	3	8	7	4	5	8	3	4	3	6	2	2	5
<i>Difference</i>	1	0	0	1	-1	-2	-3	0	-3	-2	-1	-1	-1	1	-3
<b>All with household disposable income &lt; 50% of the median</b>															
EUROMOD 2001	6	4	6	13	11	7	10	13	4	4	4	14	5	5	8
ECHP 2000 incomes	6	4	6	14	13	9	15	13	6	6	6	13	6	5	11
<i>Difference</i>	0	0	0	-1	-2	-2	-5	0	-2	-2	-2	1	-1	0	-3
<b>All with household disposable income &lt; 70% of the median</b>															
EUROMOD 2001	18	18	21	27	26	24	30	29	18	22	18	29	20	18	27
ECHP 2000 incomes	21	19	19	28	27	23	29	27	21	19	19	28	20	17	26
<i>Difference</i>	-3	-1	2	-1	-1	1	1	2	-3	3	-1	1	0	1	1
<b>Relative median at-risk-of-poverty gap</b>															
EUROMOD 2001	20	11	17	29	24	15	16	25	11	12	12	23	14	17	16
ECHP 2000 incomes	15	13	19	28	24	19	24	28	17	20	19	22	17	17	23
<i>Difference</i>	5	-2	-2	1	0	-4	-8	-3	-6	-8	-7	1	-3	0	-7
<b>Gini coefficient</b>															
EUROMOD 2001	25	23	25	33	31	29	32	35	24	25	23	36	27	24	31
ECHP 2000 incomes	28	22	25	33	33	27	29	29	27	26	24	37	24	24	31
<i>Difference</i>	-3	1	0	0	-2	2	3	6	-3	-1	-1	-1	3	0	0
<b>Quintile share ratio</b>															
EUROMOD 2001	2.9	2.3	3.3	5.3	4.7	4.7	4.6	6.3	4.1	3.5	3.2	6.4	2.8	2.6	4.7
ECHP 2000 incomes	4.0	3.0	3.6	5.7	5.5	4.0	4.5	4.8	3.8	3.8	3.5	6.5	3.5	3.4	4.9
<i>Difference</i>	-1.1	-0.7	-0.3	-0.4	-0.8	0.7	0.1	1.5	0.3	-0.3	-0.3	-0.1	-0.7	-0.8	-0.2

1. ECHP data from Dennis and Guio (2004). Estimates for Denmark are from the Law Model Database and for Sweden from the Income Distribution Survey

2. EUROMOD estimates are calculated using EUROMOD version 30A

\* eligibility for social assistance (and housing benefit) based on receipt in data

We would expect income inequality to be somewhat lower using simulated incomes compared with incomes measured in surveys (due to the former not accounting for tax evasion as well as benefit take-up). While this is generally the case for both measures of inequality shown, it is not universally so. In France, Ireland and Italy EUROMOD shows higher inequality using both measures; the Gini is higher by 3 percentage points in Finland.

#### *Breakdowns by gender and age*

While differences in headline indicator estimates may be small, this may conceal differences in estimates for sub-populations that cancel each other out: proportions of sub-populations by age and gender below 60% of the median are shown in Tables 2 and 3. The countries where the two estimates of the headline indicator are close - within  $\pm 0.5$  percentage points - are Denmark, Greece, Spain, Finland and UK and, among these, comparisons of poverty rates by age and gender remain generally close for Denmark, Greece and Spain (within  $\pm 2$  percentage points difference). Differences emerge for Finland and UK.

The data used by EUROMOD for **Finland** are more detailed and are more likely to be accurate than the ECHP. Comparisons of EUROMOD results with national data and with the Finnish national model are reassuring. See Viitamäki (2004) for more information.

One of the main discrepancies in the **UK** statistics is in the 16-24 age group where poverty rates are higher in EUROMOD than in the ECHP. The use of the previous year's annual income for current students in the ECHP statistics, as against current income in the EUROMOD database is a likely contribution to the explanation for this. For most of the population two other factors seem to balance out: (i) take-up has the effect of increasing measured poverty in ECHP compared with EUROMOD and (ii) the use of annual income (in ECHP) which we would expect to result in *lower* inequality (and hence relative poverty) compared with income measured over a shorter reference period (as in the UK EUROMOD database). The specific effect on students – increasing their income in ECHP relative to EUROMOD – results in the noticeable age group discrepancy. Children and the elderly show higher estimates in ECHP than EUROMOD. One contributory factor explaining this is that policy reforms introduced in 2001 have the effect of raising the pension and benefit incomes of these groups. These would not be captured in the 2000 incomes measured using ECHP.

In addition, for **Ireland** there is a large discrepancy in the 16-24 age group which is to some extent balanced by another in the opposite direction among the elderly. The EUROMOD estimate for the younger age group is 8 percentage points higher than that of Eurostat. The poverty rate for older people in EUROMOD is much lower (31%) than that of Eurostat (44%). The discrepancy is particularly large for women (18 percentage points). The explanation for this lies in the concentration of pensioners on the same level of pension incomes near the poverty line. In some sources and on some definitions the large group of pensioners counts as poor; in other cases, with a slightly lower line, they are above it and do not count as poor.

**Table 2: The 2001 EUROMOD baseline, compared with ECHP 2000 incomes: proportions below 60% median, by gender and age (1)**

	B	DK	D	EL	E	F	IRL	I	L	NL	A	P	FIN	S*	UK
<b>All</b> with household disposable income < 60% of the median															
EUROMOD 2001	11	10	12	20	19	16	22	21	10	12	10	22	11	10	17
ECHP 2000 incomes	13	10	11	20	19	15	21	19	12	11	12	20	11	9	17
<i>Difference</i>	-2	0	1	0	0	1	1	2	-2	1	-2	2	0	1	0
<b>Women</b> with household disposable income < 60% of the median															
EUROMOD 2001	13	10	15	21	20	16	23	22	10	13	12	22	12	11	18
ECHP 2000 incomes	15	12	12	22	20	16	23	20	13	11	14	20	14	11	19
<i>Difference</i>	-2	-2	3	-1	0	0	0	2	-3	2	-2	2	-2	0	-1
<b>Men</b> with household disposable income < 60% of the median															
EUROMOD 2001	10	9	10	19	18	15	21	19	10	11	8	21	10	10	16
ECHP 2000 incomes	12	9	10	19	17	15	20	19	12	12	9	20	9	10	15
<i>Difference</i>	-2	0	0	0	1	0	1	0	-2	-1	-1	1	1	0	1
<b>Age 0-15</b> with household disposable income < 60% of the median															
EUROMOD 2001	9	6	15	17	25	19	26	26	15	13	11	29	10	9	21
ECHP 2000 incomes	12	7	14	18	26	18	26	25	18	16	13	27	6	7	24
<i>Difference</i>	-3	-1	1	-1	-1	1	0	1	-3	-3	-2	2	4	2	-3
<b>Age 16-24</b> with household disposable income < 60% of the median															
EUROMOD 2001	11	19	18	22	20	21	20	26	14	22	8	19	18	23	24
ECHP 2000 incomes	12	21	16	19	20	21	12	25	20	22	11	18	23	18	20
<i>Difference</i>	-1	-2	2	3	0	0	8	1	-6	0	-3	1	-5	5	4
<b>Age 25-49</b> with household disposable income < 60% of the median															
EUROMOD 2001	7	6	9	14	15	13	17	19	9	8	7	16	9	9	13
ECHP 2000 incomes	10	7	9	14	15	12	17	18	11	10	8	15	7	7	12
<i>Difference</i>	-3	-1	0	0	0	1	0	1	-2	-2	-1	1	2	2	1
<b>Age 50-64</b> with household disposable income < 60% of the median															
EUROMOD 2001	13	6	10	22	17	12	21	17	8	12	9	16	8	5	14
ECHP 2000 incomes	12	5	10	21	17	13	16	16	9	7	9	16	9	5	11
<i>Difference</i>	1	1	0	1	0	-1	5	1	-1	5	0	0	-1	0	3
<b>Age 65+</b> with household disposable income < 60% of the median															
EUROMOD 2001	27	24	16	31	23	16	31	19	7	13	19	33	17	13	21
ECHP 2000 incomes	26	24	12	33	22	19	44	17	7	4	24	30	23	16	24
<i>Difference</i>	1	0	4	-2	1	-3	-13	2	0	9	-5	3	-6	-3	-3

1. ECHP data from Dennis and Guio (2004). Estimates for Denmark are from the Law Model Database and for Sweden from the Income Distribution Survey.

2. EUROMOD estimates are calculated using EUROMOD version 30A

\* eligibility for social assistance (and housing benefit) based on receipt in data

**Table 3: The 2001 EUROMOD baseline, compared with ECHP 2000 incomes: proportions below 60% median, by gender and age (2)**

	B	DK	D	EL	E	F	IRL	I	L	NL	A	P	FIN	S*	UK
<b>Men aged 16-24</b>															
EUROMOD 2001	10	18	15	21	19	20	18	26	16	23	6	20	17	22	22
ECHP 2000 incomes	11	18	17	18	19	21	10	25	22	24	7	21	19	16	18
<i>Difference</i>	-1	0	-2	3	0	-1	8	1	-6	-1	-1	-1	-2	6	4
<b>Women aged 16-24</b>															
EUROMOD 2001	13	21	20	23	21	22	22	26	12	21	10	18	19	25	25
ECHP 2000 incomes	12	24	15	21	21	21	15	25	17	21	14	15	28	20	21
<i>Difference</i>	1	-3	5	2	0	1	7	1	-5	0	-4	3	-9	5	4
<b>Men aged 25-49</b>															
EUROMOD 2001	5	6	7	14	14	12	16	17	9	7	6	16	9	10	12
ECHP 2000 incomes	8	7	7	14	14	11	17	17	10	10	7	15	8	8	10
<i>Difference</i>	-3	-1	0	0	0	1	-1	0	-1	-3	-1	1	1	2	2
<b>Women aged 25-49</b>															
EUROMOD 2001	8	6	11	15	16	14	18	20	10	9	8	17	8	9	14
ECHP 2000 incomes	11	7	11	15	16	13	18	19	11	10	9	15	7	7	14
<i>Difference</i>	-3	-1	0	0	0	1	0	1	-1	-1	-1	2	1	2	0
<b>Men aged 50-64</b>															
EUROMOD 2001	12	5	9	20	16	12	20	18	7	11	8	16	9	6	14
ECHP 2000 incomes	10	5	10	19	15	12	18	15	9	6	8	15	7	5	10
<i>Difference</i>	2	0	-1	1	1	0	2	3	-2	5	0	1	2	1	4
<b>Women aged 50-64</b>															
EUROMOD 2001	14	7	11	24	18	12	22	17	9	14	9	17	8	5	14
ECHP 2000 incomes	13	5	9	22	18	13	14	16	10	7	11	16	10	5	12
<i>Difference</i>	1	2	2	2	0	-1	8	1	-1	7	-2	1	-2	0	2
<b>Men aged 65+</b>															
EUROMOD 2001	27	23	9	32	20	13	28	14	5	12	14	30	9	9	18
ECHP 2000 incomes	24	23	9	30	20	17	35	16	7	5	14	28	12	10	19
<i>Difference</i>	3	0	0	2	0	-4	-7	-2	-2	7	0	2	-3	-1	-1
<b>Women aged 65+</b>															
EUROMOD 2001	27	24	20	31	25	18	33	22	8	14	22	35	22	15	22
ECHP 2000 incomes	26	25	14	35	24	21	51	19	8	3	30	31	31	20	28
<i>Difference</i>	1	-1	6	-4	1	-3	-18	3	0	11	-8	4	-9	-5	-6

1. ECHP data from Dennis and Guio (2004). Estimates for Denmark are from the Law Model Database and for Sweden from the Income Distribution Survey.

2. EUROMOD estimates are calculated using EUROMOD version 30A

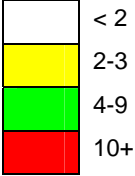
\* eligibility for social assistance (and housing benefit) based on receipt in data

Figure 2 summarises the main differences in a selection of poverty headcount indicators from the two sets of statistics, classifying difference in terms of ranges of the absolute percentage point difference.

**Figure 2: Percentage point differences in estimates of the poverty headcount indicator (<60% of the median): comparisons between ECHP (2000) and EUROMOD (2001)**

	B	DK	D	EL	E	F	IRL	I	L	NL	A	P	FIN	S	UK
All	2-3	< 2	< 2	< 2	< 2	< 2	< 2	2-3	2-3	< 2	2-3	2-3	< 2	< 2	< 2
Males	2-3	< 2	< 2	< 2	< 2	< 2	< 2	< 2	2-3	< 2	< 2	< 2	< 2	< 2	< 2
Females	2-3	2-3	2-3	< 2	< 2	< 2	< 2	< 2	2-3	2-3	2-3	2-3	2-3	< 2	< 2
Age 0-15	2-3	< 2	< 2	< 2	< 2	< 2	< 2	< 2	2-3	2-3	2-3	2-3	4-9	2-3	2-3
Age 16-24	< 2	2-3	2-3	2-3	< 2	< 2	4-9	< 2	4-9	< 2	2-3	< 2	4-9	4-9	2-3
Age 65+	< 2	< 2	4-9	2-3	< 2	2-3	10+	2-3	< 2	4-9	4-9	2-3	4-9	2-3	2-3

Range of difference in poverty rate



**To summarise**, the following main points can be made:

1. Large and consistent differences across indicators seem to be confined to countries where the data source used by EUROMOD is entirely distinct from the ECHP although the opposite is not necessarily so: the results for the UK are generally quite close, in spite of the use of distinct and different datasets. In cases where EUROMOD uses versions of the ECHP as the database (Austria, Denmark, Greece, Spain and Portugal), results are close.
2. Measures sensitive to very low incomes may differ in countries where benefits subject to non-take-up are prevalent. The simulation method currently assumes full take-up and hence under-estimates the numbers on low incomes. This is apparent for Ireland and the UK, and may also apply in other cases.
3. Poverty headcounts may be particularly sensitive to concentrations of people near the poverty line, hence causing in large differences in headcount due to small differences in data or method: this is known to be the case for pensioners in Ireland but may help explain other differences between statistics based on EUROMOD and ECHP.

*The impact of transfers*

Table 4 shows the risk of poverty rate using the same 60% median cut-off calculated as in Table 1 but without the addition of transfers to household income. This indicates the impact of transfers on risk of poverty rates. Leaving aside the issues that arise in interpreting such statistics (incomes in a world without transfers would not be the same as incomes in a world with transfers; in some countries equivalent re-distribution is achieved through tax concessions or benefits in kind) these measures provide an excellent point of comparison for EUROMOD results with survey estimates.

**Table 4: The 2001 EUROMOD baseline, compared with ECHP 2000 incomes: proportions below 60% median before and after cash transfers**

	B	DK	D	EL	E	F	IRL	I	L	NL	A	P	FIN	S*	UK
	<b>Before transfers °</b>														
EUROMOD 2001	37	40	40	39	37	44	39	43	40	30	39	38	42	43	39
ECHP 2000 incomes	38	36	39	39	37	40	36	42	40	36	38	37	30	34	40
<i>Difference</i>	-1	4	1	0	0	4	3	1	0	-6	1	1	12	9	-1
	<b>Including transfers °°</b>														
EUROMOD 2001	11	10	12	20	19	16	22	21	10	12	10	22	11	10	17
ECHP 2000 incomes	13	10	11	20	19	15	21	19	12	11	12	20	11	9	17
<i>Difference</i>	-2	0	1	0	0	1	1	2	-2	1	-2	2	0	1	0
	<b>Reduction in risk of poverty rate due to transfers</b>														
EUROMOD 2001	26	30	27	19	18	29	17	23	30	18	29	16	31	33	21
ECHP 2000 incomes	25	26	28	19	18	25	15	23	28	25	26	17	19	25	23
<i>Difference</i>	1	4	-1	0	0	4	2	0	2	-7	3	-1	12	8	-2

1. ECHP data from Dennis and Guio (2004). Estimates for Denmark are from the Law Model Database and for Sweden from the Income Distribution Survey.

2. EUROMOD estimates are calculated using EUROMOD version 30A

° standard disposable income minus all benefits including public pensions; at-risk-of-poverty threshold is computed on the basis of the distribution including all transfers

°° standard disposable income

\* eligibility for social assistance (and housing benefit) based on receipt in data

Measuring the effect of transfers is one of the main uses of EUROMOD. The Eurostat estimates in Dennis and Guio (2004) show the effect of pensions separately from other transfers, on the basis that the primary role of pensions can be argued to be redistribution across the lifecycle rather than inter-personal transfer. EUROMOD can make a similar distinction, but it is difficult to reproduce the same definition of pensions. For this reason, the comparison in Table 4 focuses on the effect of all transfers. However, in interpreting even these comparisons it should be noted that the definition of cash social transfers as a whole may differ to some extent. Indeed, the discrepancy in the poverty rate before transfers for Sweden, the Netherlands and Finland is so large that this suggests that the definitions are likely to be non-comparable.

Estimates are close for the countries where the ECHP is in use in both sources (Greece, Spain, Portugal and Austria) and also in Belgium, Germany and Luxembourg where the data are from an associated source. They are also close in Italy and the UK, in spite of differences in data source. Differences are larger in Denmark, France and Ireland.

Comparing the size of the poverty reduction effect compounds the effect of the pre-transfer differences and the smaller differences in post-transfer poverty rates. Clearly more work would be needed in ensuring comparability of pre-transfer and transfer income definitions before strong conclusions could be drawn for all countries.

#### *Using a fixed risk of poverty threshold*

Table 5 shows the rate of risk of poverty in terms of a threshold set at a fixed point in time. In this case the ECHP threshold for each country is fixed in terms of 60% of median using the 1998 ECHP, with the value of the threshold updated for inflation between 1998 and 2001 (see Dennis and Guio, 2004). The EUROMOD estimate uses the 60% median threshold calculated using the 1998 baseline. This is then also updated for inflation to 2001 using the same inflation factor as Eurostat.<sup>7</sup> In most countries the two estimates are quite close. The exceptions are Ireland, the Netherlands and the UK where EUROMOD estimates are 3 percentage points lower than those from the ECHP, and Italy where the EUROMOD estimate is 3 percentage points higher. In the case of Italy this is just one percentage point more than the discrepancy in the poverty rates using the contemporary median as the poverty line. In the other three cases the headline indicator is rather close in the two sources (see Table 1) and if anything larger using EUROMOD than the ECHP. This suggests that ECHP and EUROMOD are not capturing the same growth in median incomes in the three year period. This may be because the actual periods being compared are slightly different or for other reasons. This discussion of the use of EUROMOD to explore changes over time is developed further in the next section.

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<sup>7</sup> Note that the same inflation factor is applied to 1997-2000 incomes from ECHP and 1998-2001 incomes from EUROMOD.



**Table 5: The 2001 EUROMOD baseline, compared with ECHP 2000 incomes: risk of poverty anchored at a point in time (t-3)**

	B	DK	D	EL	E	F	IRL	I	L	NL	A	P	FIN	S*	UK
	<b>%of population below 60% of median in (t-3)</b>														
EUROMOD 2001	12	8	8	17	11	12	10	18	9	7	10	17	8	7	10
ECHP 2000 incomes	11	9	9	17	12	13	13	15	10	10	10	16	9	6	13
<i>Difference</i>	1	-1	-1	0	-1	-1	-3	3	-1	-3	0	1	-1	1	-3
<i>EUROMOD threshold 1998 (Euro)</i>	8,768	10,233	8,523	3,717	4,325	8,588	6,375	6,280	12,861	8,204	8,988	3,157	8,088	8,312	8,044
<i>Updating factor applied to threshold</i>	1.064	1.072	1.040	1.090	1.088	1.042	1.122	1.067	1.073	1.097	1.048	1.096	1.070	1.046	1.034
<i>2001 threshold anchored in 1998</i>	9,333	10,966	8,865	4,051	4,705	8,950	7,152	6,703	13,803	9,003	9,420	3,460	8,656	8,691	8,316

1. ECHP data from Dennis and Guio (2004). Estimates for Denmark are from the Law Model Database and for Sweden from the Income Distribution Survey.

2. EUROMOD estimates are calculated using EUROMOD version 30A

\* eligibility for social assistance (and housing benefit) based on receipt in data

### 3 Changes 1998-2001

First of all we provide a summary of the extent to which the pattern of similarities and differences between EUROMOD and Eurostat estimates are the same for 2001 as they were for 1998. This is followed by a comparison of the direction and size of change in some selected indicators using the two sources.

#### *Comparisons for 1998 and 2001: do they tell the same story?*

We can compare the results for the 2001 comparisons reported in the previous section with those for 1998 reported in Mantovani and Sutherland (2003). The fact that the ECHP income data refer to one year earlier (2000) in the 2001 comparison may lead us to expect the estimates diverge a little more for the 2001 baseline than for the 1998 baseline. In fact, they are of a similar order in general and the following specific points can be noted:

1. The main difference in the EUROMOD estimates, in terms of how comparisons are made, is that the **Swedish** estimates use the same household definition as the rest of the EU15 countries, and the same household as used in the Eurostat statistics (which are in fact, derived from the same source as the EUROMOD database). This is reflected in much closer results for Sweden in the 2001 comparisons.
2. The discrepancy in child poverty rates in **Spain** observed for 1998 (Mantovani and Sutherland, 2003) no longer applies in the 2001 comparison. The most likely explanation is that ECHP information on benefits for children has been improved.

#### *Comparison of changes 1998-2001 using EUROMOD and Eurostat statistics*

Changes in the value of income-based social indicators calculated using ECHP data are made use of in monitoring changes in social inclusion. Changes in indicators using EUROMOD can be used in the same way, although it should first be made clear exactly what elements of income are changing. One type of calculation is analogous to those provided by ECHP and involves not only the policy rules changing between the two points in time (say 1998 and 2001), but also the population characteristics and the distribution of pre- tax and transfer income following those in the population, as captured by the survey data. The second type of calculation focuses only on the effect of policy changes, keeping the population characteristics (and hence the underlying database) constant. (The value of original incomes in the database is adjusted to reflect average actual changes over the period, by source.) This type of calculation focuses attention on the changes in the indicators that may be directly attributed to changes in policy. We should not expect changes in the value of indicators calculated on this basis to match the change in value calculated from two waves of ECHP data. Policy changes are one component of changes in income. Other components, and their interactions with policy parameters, would need to be accounted for if the full change between periods of time is to be captured.

Table 6 shows changes for two groups of countries. The EUROMOD estimates in the first group of eight are calculated using two different databases, a later one for the 2001 estimates than the 1998 estimates.<sup>8</sup>

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<sup>8</sup> For the datasets used for the 1998 baseline, see Annex 1.

**Table 6: Change in selected social indicators using EUROMOD (1998-2001) and Eurostat statistics (1998-2000 incomes)**

	Two different EUROMOD databases								Common EUROMOD database						
	D	E	L	NL	P	FIN	S	UK	B	DK	EL	F	IRL	I	A
<b>% with household disposable income &lt; 60% of the median</b>															
EUROMOD 1998	10	18	12	10	22	9	6	20	11	10	20	13	21	21	11
EUROMOD 2001	12	19	10	12	22	11	10	17	11	10	20	16	22	21	10
Change	1	1	-1	2	0	2	4	-3	0	-1	0	3	1	0	0
ECHP 1998 incomes	11	19	13	11	21	11	9	19	13	11	21	15	18	18	12
ECHP 2000 incomes	11	19	12	11	20	11	9	17	13	10	20	15	21	19	12
Change (ECHP)	0	0	-1	0	-1	0	0	-2	0	-1	-1	0	3	1	0
<i>Difference in change</i>	1	1	0	2	1	2	4	-1	0	0	1	3	-2	-1	0
<b>% with household disposable income &lt; 50% of the median</b>															
EUROMOD 1998	6	12	4	4	14	3	4	10	6	4	14	6	11	13	4
EUROMOD 2001	7	11	4	5	15	5	5	8	6	4	13	7	10	13	4
Change(EUROMOD)	0	0	0	1	1	1	1	-2	0	0	-1	2	-1	0	0
ECHP 1998 incomes	6	13	6	6	13	5	5	11	7	6	14	8	11	12	6
ECHP 2000 incomes	6	13	6	6	13	6	5	11	6	4	14	9	15	13	6
Change (ECHP)	0	0	0	0	0	1	0	0	-1	-2	0	1	4	1	0
<i>Difference in change</i>	0	0	0	1	1	0	1	-2	1	2	-1	1	-5	-1	0
<b>Gini coefficient</b>															
EUROMOD 1998	25	33	26	25	36	25	27	31	25	23	34	29	32	35	23
EUROMOD 2001	29	31	24	25	36	27	24	31	25	23	33	29	32	35	23
Change	4	-2	-2	0	1	2	3	0	0	0	-1	0	-1	0	0
ECHP 1998 incomes	25	33	27	26	36	25	23	32	29	23	34	29	32	30	26
ECHP 2000 incomes	25	33	27	26	37	24	24	31	28	22	33	27	29	29	24
Change (ECHP)	0	0	0	0	1	-1	1	-1	-1	-1	-1	-2	-3	-1	-2
<i>Difference in change</i>	4	-2	-2	0	0	3	2	1	1	1	0	2	2	1	2
<b>Quintile share ratio</b>															
EUROMOD 1998	3.4	5.9	4.2	3.4	5.6	2.5	2.7	4.9	2.9	2.4	5.6	4.4	4.3	6.5	3.4
EUROMOD 2001	3.0	4.7	4.1	3.5	6.4	2.8	2.6	4.7	2.9	2.3	5.3	4.7	4.6	6.3	3.2
Change(EUROMOD)	-0.4	-1.3	-0.1	0.1	0.8	0.2	0.1	-0.2	0.0	0.1	-0.3	0.2	0.3	-0.2	-0.2
ECHP 1998 incomes	3.6	5.7	3.9	3.7	6.4	3.4	3.2	5.2	4.2	3.2	6.2	4.4	4.9	4.9	3.7
ECHP 2000 incomes	3.6	5.5	3.8	3.8	6.5	3.5	3.4	4.9	4.0	3.0	5.7	4.0	4.5	4.8	3.5
Change (ECHP)	0	-0.2	-0.1	0.1	0.1	0.1	0.2	-0.3	-0.2	-0.2	-0.5	-0.4	-0.4	-0.1	-0.2
<i>Difference in change</i>	-0.4	-1.1	0	0	0.7	0.1	-0.1	0.1	0.2	0.2	0.2	0.6	0.7	-0.1	0

1. ECHP data from Dennis and Guio (2003) and Dennis and Guio (2004) 2000 estimates for Denmark are from the Law Model Database and for Sweden from the Income Distribution Survey

2. EUROMOD 2001 estimates are calculated using EUROMOD version 28A

\* eligibility for social assistance (and housing benefit) based on receipt in data; the two Swedish databases use different units of income aggregation

This group of calculations take some account of changing population characteristics 1998-2001. However, in no case except Finland do the two datasets refer to 1998 and 2001 incomes, and typically the data are two or three years out of date. In spite of updating procedures one would not expect an exact match with the ECHP-based estimates of change. (In the case of Finland, the original datasets are in any case different.)

The second set of seven countries use a common database for the 1998 and 2001 estimates. In each case original incomes are updated to the policy year and the policy rules for that year are applied. The effect is an estimate of what would have happened if policy changes were made in an otherwise unchanging world.

Table 6 focuses on just four indicators: proportions of populations below 60% and 50% of the national median income, the Gini coefficient and the quintile share ratio. In many cases the comparisons of the changes in indicators among the countries in the left-hand side of the chart show the movement in the EUROMOD indicator to be similar to that using the ECHP (over a shorter period). Exceptions include Finland, the Netherlands and the UK where the ECHP estimates of poverty rates are stable using 60% median for the first two countries, and using 50% of the median for the UK. EUROMOD indicates that corresponding poverty rates are increasing in Finland and the Netherlands and falling in the UK. In each case the discrepancy in the change is two percentage points, which is not large, especially given the fact that the ECHP estimates in fact cover a two- rather than three-year period. Similar discrepancies occur in Germany for the Gini coefficient and Spain for the quintile share ratio, with EUROMOD estimating an increase in inequality in the former case and a reduction in the latter (ECHP estimates again suggesting stability). Some quite large changes are evident for Sweden but in this case these are driven by the change in EUROMOD unit of analysis between the years.

The comparisons shown on the right-hand side of Table 6 are difficult to interpret since on the one hand the EUROMOD estimates only show the “policy effect”. On the other hand, we have seen that modest discrepancies between EUROMOD and ECHP estimates that are otherwise broadly comparable are to be expected. So it is not possible to interpret with any certainty the discrepancies in this part of the table as *measuring* the policy effect. At the same time it is quite possible that the reduction of one percentage point in the Irish population below 50% of the median that EUROMOD suggests would have occurred due to policy changes alone has been offset by other changes in the population, increasing the overall (ECHP-estimated) poverty rate from 11% to 15%. Indeed if the policy changes had not happened the ECHP overall estimate might have been larger.

#### **4 Social Indicators for EU15**

As well as providing statistics on each of the EU15 countries, EUROMOD can calculate statistics for EU15 as a whole. Table 7 makes some comparisons with Eurostat statistics using some of the same indicators as shown in Tables 1-4 for 2001. Countries are aggregated using population weights and incomes are adjusted for real differences in purchasing power using the PPPs used by Dennis and Guio (2003; 2004). Comparisons are made in terms of the value of the indicator for EU15 and also in terms of its position in the ranking of each indicator, relative to the values for each Member State (with the lowest value ranked as 1).

**Table 7: Income statistics for EU15 in 2000/2001 using population weights and PPP (GDP) adjustment**

	Eurostat		EUROMOD		Difference	
	Indicator value	rank (out of 16)	Indicator value	rank (out of 16)	In value	In rank
% below 60% median	15	9.5	17	10	2	0.5
% below 40% median	5	11	5	12	0	1
% below 50% median	9	9.5	10	11	1	1.5
% below 70% median	23	9.5	25	10	2	0.5
% below 60% median age 0-15	19	11	19	10	0	-1
% below 60% median age 65+	19	6.5	21	9	2	2.5
Relative median at-risk-of-poverty gap	22	10.5	21	12	-1	1.5
Gini coefficient	28	10	30	10	2	0
Quintile share ratio	4.4	10	4.8	13	0.4	3
Reduction in risk of poverty rate due to transfers	24	8	19	6	-5	-2
Risk of poverty anchored at a point in time	12	9	12	13	0	4

"Rank" is position relative to 15 national estimates with lowest value of estimate given rank=1

1. ECHP data from Dennis and Guio (2004) 2000 estimates for Denmark are from the Law Model Database and for Sweden from the Income Distribution Survey
2. EUROMOD 2001 estimates are calculated using EUROMOD version 28A

With two exceptions the EUROMOD indicator shows higher or the same levels of poverty and inequality as the Eurostat indicator. These exceptions are the poverty gap and the reduction in poverty risk due to transfers. In only two cases is the rank using EUROMOD higher than that using ECHP. These are the child poverty rate and the reduction in risk of poverty rate due to transfers. Leaving these exceptions aside, this general property of the EUROMOD EU15 income distribution to show higher poverty and inequality than ECHP is worth exploring further. It is rather at odds with the results for individual countries which suggest, if anything, that EUROMOD underestimates poverty and inequality in relation to the ECHP. The explanation must lie in **between country** differences and the extent to which the two sources correctly capture the different levels of average income across countries. Both sets of statistics use the same adjustment factors to allow for differences in spending power. Any discrepancy must be due the differences in the success of the two sources in measuring income in the same way in all countries. To explore this further would require a reconciliation of the data in the two sources with aggregate information sources such as National Accounts. The issues in principle and practice have been discussed by the Canberra Group (2001). Comparing the aggregates obtained using microsimulation methods with those from survey data and with National Accounts estimates would be a useful exercise but is beyond the scope of this paper.

However, Table 8 does provide comparisons of EUROMOD estimates using different factors for adjusting for cross-country differences in prices. Shown are the social indicator estimates for EU15 together with their rank compared with the 15 individual national estimates. Sensitivity to three adjustments is shown: no adjustment (i.e. use of currency exchange rates for the three non-Euro zone countries); GDP PPPs (as in Table 7) and PPPs calculated on the basis of Household Final Consumption Expenditure (HFCE). The values of the two sets of PP exchange rates are given in Annex 2.

This shows that in some cases the estimate and ranking is very sensitive to the use of a PP adjustment factor. For example the EU15 Gini coefficient moves from being the 13<sup>th</sup> lowest (ie only 3 out of the 15 individual countries have higher inequality measured in this way) to being the 10<sup>th</sup> lowest if incomes are adjusted using the GDP PP adjustment factor. This is not surprising. At the same time Table 8 shows that the EU15 results are not very sensitive to the choice between PPPs calculated for GDP or HFCE.

## 5 Conclusions

Comparisons of EUROMOD estimates with ECHP statistics may be seen as particularly useful because the harmonised definitions and assumptions provide a common framework which can be replicated in EUROMOD. At the same time, ECHP is known to be problematic in specific respects and is not always the main national reference point. So comparisons with other sources are necessary but sometimes involve the introduction of conflicting evidence. It is then difficult to assess the weight we should give to the outcome of such comparisons as against those that appear to be made on a consistent basis (Mantovani and Sutherland, 2003). So, for brevity we have focussed in this summary on ECHP comparisons.

**Table 8: Income statistics for EU15 in 2001 using EUROMOD: sensitivity to adjustment for price differences**

	No adjustment (currency exchange rates)		GDP PPPs		HFCE PPPs	
	Estimate	Rank	Estimate	Rank	Estimate	Rank
% below 60% median	19	11	17	10	17	10
% below 40% median	7	14	5	12	5	13
% below 50% median	12	13	10	11	10	11
% below 70% median	26	11	25	10	25	10
% below 60% median age 0-15	20	11	19	10	19	10
% below 60% median age 65+	22	10	21	9	21	10
Relative median at-risk-of-poverty gap	25	14	21	12	21	12
Gini co-efficient	32	13	30	10	30	10
Quintile share ratio	5.8	14	4.8	13	4.9	13
Reduction in risk of poverty rate due to transfers	19	6	19	6	19	6
Risk of poverty anchored at a point in time	14	13	12	13	12	13

“Rank” is position relative to 15 national estimates with lowest value given rank=1

Estimates of GDP and HFCE from OECD <http://cs4hq.oecd.org/oecd/eng/TableViewer/Wdsview/dispviewp.asp?ReportId=1749&bReportOnly=True>

1. EUROMOD 2001 estimates are calculated using EUROMOD version 28A

However, we can conclude that statistics summarising the EUROMOD baseline are broadly in line with what might be expected from other evidence; and therefore that users of EUROMOD can be confident that the baseline provides a good starting point for policy simulation experiments.

As we have seen, headline indicator statistics may compare well; but this may mask many underlying differences. Only a very laborious exercise could establish with any certainty which explanations are relevant for each discrepancy in the comparison of statistics. Generally a combination of factors is the cause and it is usually not entirely clear that one estimate is “right” and the other “wrong”.

EUROMOD is intended as a tool for measuring the distributional effects and costs of changes to tax and benefit systems. The baseline is only the starting point and it is important that the model can also capture accurately the effects of changes. On the one hand it is possible that defects in the baseline will be netted out when looking at the effects of changes. On the other hand accurate policy simulations depend on variables that do not necessarily contribute directly to the baseline.

The main challenge to validating the policy simulation capacity of EUROMOD is that there are typically no independent sources of information on the distributional effects of policy changes with which to compare. The exception is where we have access to national tax-benefit models. A second problem is that some of the social indicator statistics considered here may be very sensitive to certain types of small change. We have seen this in the case of Ireland where, for example, a small increase in pension income may either have a very large or rather small effect on pensioner poverty, depending on the position of the poverty line in relation to pre-reform pension incomes. EUROMOD Country Reports provide detailed comparisons and discussion where these are possible.<sup>9</sup>

In the absence of national model results from policy simulations with which to compare, the main tools are (a) the comparison of aggregate expenditures and revenue (as well as number of recipients or taxpayers) under the baseline systems and (b) the change in these numbers following actual policy changes. Comparisons of these types have been carried out for some countries and are documented in EUROMOD Country Reports. However, it should be clear that they are not always straightforward and that inherent differences between administrative statistics and survey based simulations need to be taken into account. Key issues include differences in reference time period and the treatment of the non-household and non-resident populations.

Finally we summarise the main tasks for future consideration:

- Reconciliation of simulated household income and its components with National Accounts aggregates.
- Accounting for non-take-up and tax evasion.
- Harmonisation of the reference time period of income data across countries; and identification of relevant reference periods for each component of the tax-benefit system that depends on income.

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<sup>9</sup> See <http://www.econ.cam.ac.uk/dae/mu/emodcty.htm>



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### Annex 1: EUROMOD base datasets used for the 2001 baseline

Country	Base Dataset	Date of collection	Reference time period for incomes
Belgium	Panel Survey on Belgian Households	1999	annual 1998
Denmark	European Community Household Panel	1995	annual 1994
Germany	German Socio-Economic Panel	2001	annual 2000
Greece	European Community Household Panel	1995	annual 1994
Spain	European Community Household Panel	2000	annual 1999
France	Budget de Famille	1994/5	annual 1993/4
Ireland	Living in Ireland Survey	1994	month in 1994
Italy	Survey of Households Income and Wealth	1996	annual 1995
Luxembourg	PSELL-2	2001	annual 2000
Netherlands	Sociaal-economisch panelonderzoek	2000	annual 1999
Austria	Austrian version of European Community Household Panel	1999	annual 1998
Portugal	European Community Household Panel	2001	annual 2000
Finland	Income distribution survey	2001	annual 2001
Sweden	Income distribution survey	2001	annual 2001
UK	Family Expenditure Survey	2000/1	month in 2000/1

### Base Dataset for EUROMOD used for 1998 baseline, where different

Country	Base Dataset	Date of collection	Reference time period for incomes
Belgium	Panel Survey on Belgian Households	1998	annual 1997
Germany	German Socio-Economic Panel	1998	annual 1997
Spain	European Community Household Panel	1996	annual 1995
Luxembourg	PSELL-2	1999	annual 1998
Netherlands	Sociaal-economisch panelonderzoek	1996	annual 1995
Portugal	European Community Household Panel	1996	annual 1995
Finland	Income distribution survey	1998	annual 1998
Sweden	Income distribution survey	1997	annual 1997
UK	Family Expenditure Survey	1995/6	month in 1995/6

## Annex 2 PPP adjustment 2001

	<i>B</i>	<i>DK</i>	<i>D</i>	<i>EL</i>	<i>E</i>	<i>F</i>	<i>IRL</i>	<i>I</i>	<i>L</i>	<i>NL</i>	<i>A</i>	<i>P</i>	<i>FIN</i>	<i>S</i>	<i>UK</i>
<i>GDP PPs in national currency</i>	0.98869	9.18868	1.07365	0.76373	0.82515	0.99000	1.08381	0.90089	1.09689	1.01103	1.01203	0.72394	1.07395	10.27680	0.68631
<i>HFCE PPs in national currency</i>	0.99242	9.40128	1.03308	0.81592	0.82134	1.01779	1.11976	0.92189	0.99371	1.00324	0.99008	0.71969	1.18541	10.45500	0.68600

Source: Stapel, Pasanen and Reinecke (2004).