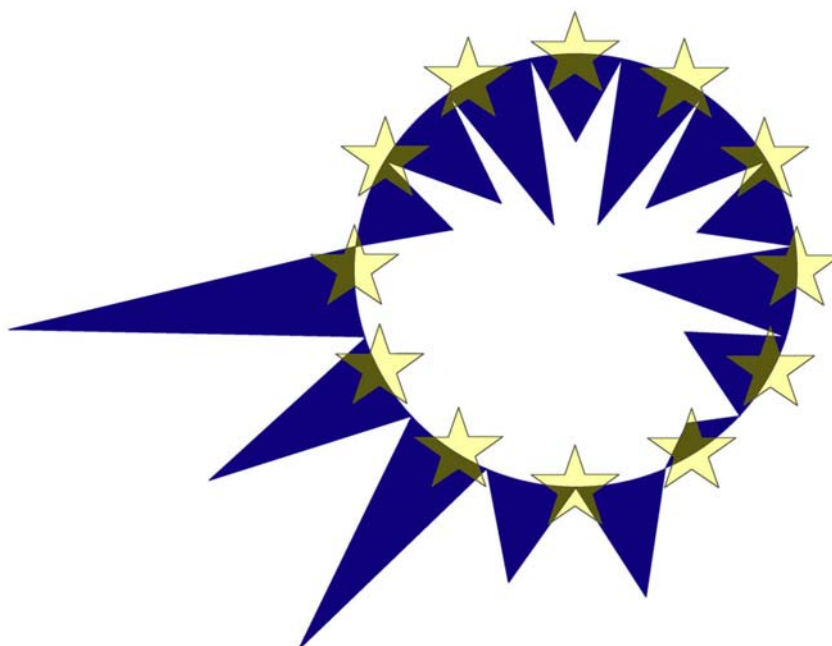


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**SOCIAL INDICATORS AND OTHER INCOME
STATISTICS USING THE EUROMOD
BASELINE: A COMPARISON WITH EUROSTAT
AND NATIONAL STATISTICS**

Daniela Mantovani and Holly Sutherland

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Social Indicators and other Income Statistics using the EUROMOD Baseline: a Comparison with Eurostat and National Statistics¹

Daniela Mantovani and Holly Sutherland

University of Cambridge

Abstract

This paper reports an exercise to validate EUROMOD output for 1998 by comparing income statistics calculated from the baseline micro-output with comparable statistics from other sources, including the European Community Household Panel. The main potential reasons for discrepancies are identified. While there are some specific national issues that arise, there are two main general points to consider in interpreting EUROMOD estimates of social indicators across EU member States: (a) the method of updating microdata to 1998 and (b) the non take-up of means-tested benefits. A further conclusion is that comparisons of the type made in this paper are rarely definitive. The findings presented here should be treated as indicative of the reliability of the EUROMOD baseline as a starting point for policy simulations.

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 the EUROMOD Baseline: a Comparison with Eurostat and National Statistics

Daniela Mantovani and Holly Sutherland

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 (1998) 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).² The purpose of this paper is to compare EUROMOD baseline output statistics with other sources of corresponding information. This is a vital component part of EUROMOD becoming a well-used and trusted tool for the analysis of policy and its impact on financial poverty and income inequality.

The exercise consists of reproducing with EUROMOD a set of indicators that are available from - and comparable with - other national or international sources. It is designed mainly to identify and clarify EUROMOD characteristics in relation to other sources of income data and to explore comparability among countries. It should be thought of as an exercise of reconciliation, rather than one which treats the external estimates as the “right” figures for EUROMOD to try and match.

There are four parts to this paper. The first sets out the types of comparisons that are made and explains the likely reasons for the differences between EUROMOD results and other estimates. The second part takes a European overview and compares EUROMOD estimates for 1998 with the most recent statistics to be published from the European Community Household Panel (ECHP), based on 1998 incomes. In addition to the information this supplies about the quality of each set of national results it also provides a cross-country overview that can tell us something about comparability of the national results. The third part considers each country individually, makes use of a range of national sources of income data and discusses some nationally-specific issues. Finally, we draw some conclusions about the quality of EUROMOD results, consider the factors that must be borne in mind when carrying out policy simulations (i.e. using results that depart from the baseline), and identify further work to be done.

1. Making comparisons

The EUROMOD “baseline” for 1998 is the micro-level distribution of household incomes that is output from EUROMOD for the 1998 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

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

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,³ and households are weighted by their size, unless otherwise stated.

In comparisons with other statistics EUROMOD's flexibility allows us to reproduce national practice in terms of income definition, weighting and equivalence scale. Where this has not been possible, the fact is noted.

There are, however, a number of reasons why we might expect EUROMOD estimates to differ from the statistics with which we compare them.

Point in time

The EUROMOD baseline refers to mid-1998 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 1998 incomes for Austria and Luxembourg). With the exception of these latter two countries the income data have been updated from the data year to 1998 using a range of appropriate indexes (earnings indexes for earnings, and so on). 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. These may have been considerable over the period 1993-1998. Thus while 1998 is the most appropriate comparison data year, it must be recognised that compositional changes may to some extent contribute to differences between the estimates.

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. Only in the case of Austria does the EUROMOD database make use of the 1998 wave of ECHP, the source for the comparisons used in section 2. See Appendix 1 for details of currently used EUROMOD datasets.⁴

Section 2 considers the specific issues involved when comparing EUROMOD results based on twelve different sources of microdata with estimates from ECHP. Here we list the ways in which differences between the EUROMOD source and the sources of the comparison statistics might be expected to affect any comparison.

The micro-data underlying EUROMOD might be **the same source** as that used for the comparison statistic. This is the situation for Austria in section 2⁵ and for some of the national comparisons in section 3. Rather than using the recorded taxes and benefits to calculate disposable income, EUROMOD *calculates* the taxes and benefits from the recorded (or imputed) gross incomes. In these cases the only explanation for discrepancies in results is this

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

⁴ There are ambiguities over what constitutes a "different" source. For example, the ECHP for Sweden is not based on a special-purpose panel survey but is instead derived from the Swedish Income Distribution Survey, the same data source as used by EUROMOD. However, the adjustments made to harmonise these data with the ECHP for other countries are likely to be such that we can consider the datasets "different".

⁵ Eurostat use the User DataBase (UDB) for their statistics and EUROMOD uses the Austrian version of the ECHP. Thus the sources are not strictly the same.

process of simulation of taxes and benefits. This is a very useful type of comparison because it highlights the differences made by simulation. It cannot be used to assess the representativeness or precision of results in relation to the actual effect on the population.

The comparison might be made for the same source of data but using waves from **different points in time**. In four countries (Denmark, Greece, Portugal and Spain) EUROMOD uses an older wave of ECHP than that used for comparison in section 2. Thus differences are due to the simulation process and the updating process. There may also be some difference due to ECHP sample attrition.

The comparison might use **sources that are similar** in terms of design, sample, and so on. In the countries that use national panel data linked to ECHP (Belgium, Germany, Ireland, Luxembourg, Netherlands) the ways in which the national panels diverge will be an additional source of difference.

The data sources might be **entirely different**. In these cases any differences in results will be due to the factors described above plus the fact that the design, samples and method of data collection may lead to a whole range of differences in the underlying database including non-response and under-reporting patterns; the questions about income and circumstances may capture different aspects; data processing and imputation may correct for different problems. In these cases the two data sources will effectively provide different pictures of the same population. Without information about the quality of both sets of data we cannot say which is preferable. Even with general quality indicators (such as response and attrition rates; sample size; imputation rates and so on) this information may not be sufficient to judge the performance of the data as an input into a tax-benefit model. Some factors are irrelevant (such as the quality of benefit information, which the model ignores and simulates instead) and others become important (such as availability of variables critical to tax-benefit calculations; and representativeness of the data in terms of key groups in the population).

More generally, in comparing social indicator statistics from different sources explanations for differences may lie in differential response rates or coverage rates. While the main known effects of differential non-response may be corrected by re-weighting, this typically does not – and often cannot - take account of all relevant dimensions in social indicator calculations or, especially, in tax-benefit calculations.⁶

Unit of income aggregation

With one exception 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 does not enable this definition to be used. The traditional Swedish unit of analysis is the narrow family unit: single people or couples and any children aged under 18. Older children or other people living within the same household are treated as separate units in the analysis. In some Swedish income distribution statistics – not those reported here - children who are still dependent and living with their parents, but are aged over 18, are omitted from the analysis altogether. Clearly, inclusion of these units is likely to

⁶ For more discussion see Atkinson et al. (1988) and Sutherland (1991).

increase poverty rates in the 18-25 age group since many of them will be students on low or zero income. More generally, 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. The effect on the overall relative poverty rate cannot be anticipated *a priori*, but it is likely that inequality will be higher when using the narrower unit.⁷

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.

National comparisons in section 3 include the use of national tax-benefit model estimates where these are available to us. This type of comparison allows us - in principle at least - to hold constant the effects of simulating taxes and benefits. In some of the comparisons the same underlying data and policy year are used. In these cases we would expect results to be identical unless assumptions made in the simulation process are different in the two models. In practice this is often the case, which is indeed the justification for the need for a Europe-wide model (Callan and Sutherland, 1997). Where possible the assumptions are aligned, making use of the flexibility of EUROMOD. However in some cases national models choose to simulate a different set of policies and it may then be necessary for the national model to be adjusted, as well as EUROMOD, for the simulations to be made comparable.

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. The national comparisons for both countries use comparable reference time periods.

A further issue is the use of the previous year's income information along with current information about household composition in the calculation of equivalised income. Some "mismatch" may occur since typically compositional changes are not matched by

⁷ Future EUROMOD databases will be able to take advantage of the Swedish Statistical Office's recent development of data organised around the standard European household definition.

corresponding changes in equivalised income. This problem is common to the ECHP and many of the EUROMOD datasets but in the case of Ireland and the UK does not apply to the EUROMOD results or the national statistics (the equivalence scale should correctly match current income in all cases). Comparisons for these countries with the ECHP are not comparable in this respect.

To summarise, the following types of comparison are informative about the quality of EUROMOD baseline results:

- A Comparisons with statistics drawn from the identical data source
- B Comparisons with statistics drawn from 1998 data of the same type, where EUROMOD is based on an earlier year
- C Comparisons with statistics drawn from data of the same type, not for 1998
- D Comparisons with statistics drawn from a different type of source, for 1998
- E Comparisons with statistics drawn from a different type of source, and not for 1998
- F Comparisons with 1998 national simulation model results using the same underlying data
- G Comparisons with 1998 national simulation model results using different underlying data
- H Comparisons with national simulation model results not for 1998

Practical considerations

In practice only some of these comparisons are possible – because of limitations in available data - and this is reflected in the contents of sections 2 and 3 below. Comparisons that are made in the remainder of this paper by type and by country are shown in Figure 1.

Figure 1: Types of comparison, by country

	B	DK	D	EL	E	F	IRL	I	L	NL	A	P	FIN	S	UK
A									X		X				
B		X	X	X	X			X				X	X	X	X
C													X		
D	X		X	X		X	X	X	X	X			X	X	X
E	X	X				X				X		X			X
F					X		X								X
G		X													
H						X							X		

More generally, it is clear that in making these comparisons we often do so without full information about the nature of the estimates that are used as sources of independent information. The main issues of principle to consider in understanding why estimates may differ are outlined above. However, it is usually the case that the sources we draw on are in the form of published statistics or research results, rather than statistics that we have derived ourselves from raw micro-data. It has become standard to document the choice of equivalence scale but there remain many choices and assumptions that are not usually documented. The precise definition of the income measure, the unit of aggregation and the reference time period for each income component is an example that is particularly relevant to the current exercise. Thus in many instances we cannot be certain that our comparisons are strictly of like-with-like.

Furthermore, statistical indicators and the methodology underlying them can be revised. This has recently been the case with the ECHP statistics, as discussed in the next section. It is also the case with EUROMOD results. The EUROMOD model is continuously being revised and developed. In order to minimise confusion over constant revisions, an agreed “baseline” is published from time to time. The baseline statistics used in most of this paper come from, or are consistent with, the exercise reported in Feres et al. (2002). However, there are exceptions where more recent versions of EUROMOD have been used, or where the underlying “baseline” assumptions have been altered. Where this is the case, it is noted.

Finally, it is worth emphasising that 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 statistics that we cite below are subject to sampling error to some degree. If we had drawn a different ECHP sample then the comparisons in section 2 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. Europe-wide comparisons with ECHP

The most recent statistics from ECHP are available for 1999, reporting 1998 incomes. They have been published in Dennis and Guio (2003) with some additional material available on the Eurostat web site.⁸ These are not only the latest statistics corresponding to the income year of EUROMOD outputs, they have also undergone substantial revision in method since the statistics for 1997 incomes were published (see Dennis and Guio, 2003).⁹

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 statistic is within one percentage point from the two sources.

⁸ <http://europa.eu.int/comm/eurostat/Public/datashop/print-product/EN?catalogue=Eurostat&product=1-structur-N&mode=download#Cosociale>

⁹ The EUROMOD databases that use ECHP UDB waves earlier than 1999 (1998 incomes) do not incorporate the recent methodological changes.

Table 1: Social indicators using the 1998 EUROMOD baseline, compared with ECHP 1998 incomes

	B	DK	D	EL	E	F	IRL	I	L	NL	A	P	FIN	S	UK
All with household disposable income < 60% of the median															
EUROMOD 1998	15	11	10	20	18	12	18	20	12	10	11	22	9	8	20
ECHP 1998 incomes	13	11	11	21	19	15	18	18	13	11	12	21	11	9	19
<i>Difference</i>	2	0	-1	-1	-1	-3	0	2	-1	-1	-1	1	-2	-1	1
All with household disposable income < 40% of the median															
EUROMOD 1998	3	2	2	11	7	1	1	7	1	2	2	8	1	4	2
ECHP 1998 incomes	3	2	3	9	7	4	4	7	2	3	4	7	2	3	7
<i>Difference</i>	0	0	-1	2	0	-3	-3	0	-1	-1	-2	1	-1	1	-5
All with household disposable income < 50% of the median															
EUROMOD 1998	7	4	5	15	11	5	9	13	4	4	4	15	3	6	10
ECHP 1998 incomes	7	6	6	14	13	8	11	12	6	6	6	13	5	5	11
<i>Difference</i>	0	-2	-1	1	-2	-3	-2	1	-2	-2	-2	2	-2	1	-1
All with household disposable income < 70% of the median															
EUROMOD 1998	23	20	18	27	26	22	30	28	21	21	19	29	18	14	29
ECHP 1998 incomes	22	18	17	28	26	24	28	26	22	18	20	28	19	17	27
<i>Difference</i>	1	2	1	-1	0	-2	2	2	-1	3	-1	1	-1	-3	2
Relative median at-risk-of-poverty gap															
EUROMOD 1998	14	11	17	36	24	13	17	24	11	11	12	24	10	35	16
ECHP 1998 incomes	18	18	20	28	27	18	21	27	15	19	18	23	16	19	22
<i>Difference</i>	-4	-7	-3	8	-3	-5	-4	-3	-4	-8	-6	1	-6	16	-6
Gini coefficient															
EUROMOD 1998	25	24	25	33	32	28	33	34	26	25	24	36	23	26	31
ECHP 1998 incomes	29	23	25	34	33	29	32	30	27	26	26	36	25	23	32
<i>Difference</i>	-4	1	0	-1	-1	-1	1	4	-1	-1	-2	0	-2	3	-1
Quintile share ratio															
EUROMOD 1998	3.2	2.4	3.4	5.9	5.8	4.2	4.8	6.0	4.2	3.4	3.4	5.8	2.3	2.8	5.0
ECHP 1998 incomes	4.2	3.2	3.6	6.2	5.7	4.4	4.9	4.9	3.9	3.7	3.7	6.4	3.4	3.2	5.2
<i>Difference</i>	-1.0	-0.8	-0.2	-0.3	0.1	-0.2	-0.1	1.1	0.3	-0.3	-0.3	-0.6	-1.1	-0.4	-0.2

ECHP data from Dennis and Guio (2003). Estimates for Spain and the UK are due for revision.

EUROMOD baseline results from Feres et al. (2002) using EUROMOD output dated 29/11/02 except for Sweden, which were produced on 25/4/03 and 27/6/03.

In two countries (Belgium and Italy) the EUROMOD estimate is higher than the estimate taken 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.¹⁰ In two countries (France and Finland) the EUROMOD estimate is lower: by 3 percentage points in the case of France and by 2 points in Finland. The explanation for the French difference may again be due to the fact that entirely different samples are being compared.

Other social indicators

Generally, the similarities for this headline statistic are reassuring. However, these may be coincidental: the Swedish estimates are close but we know that a different unit of income aggregation is in use in the two sources; estimates for Ireland and the UK are close but we know that a different reference time period is used. There may be differences in statistics that capture other characteristics of the income distributions. 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.

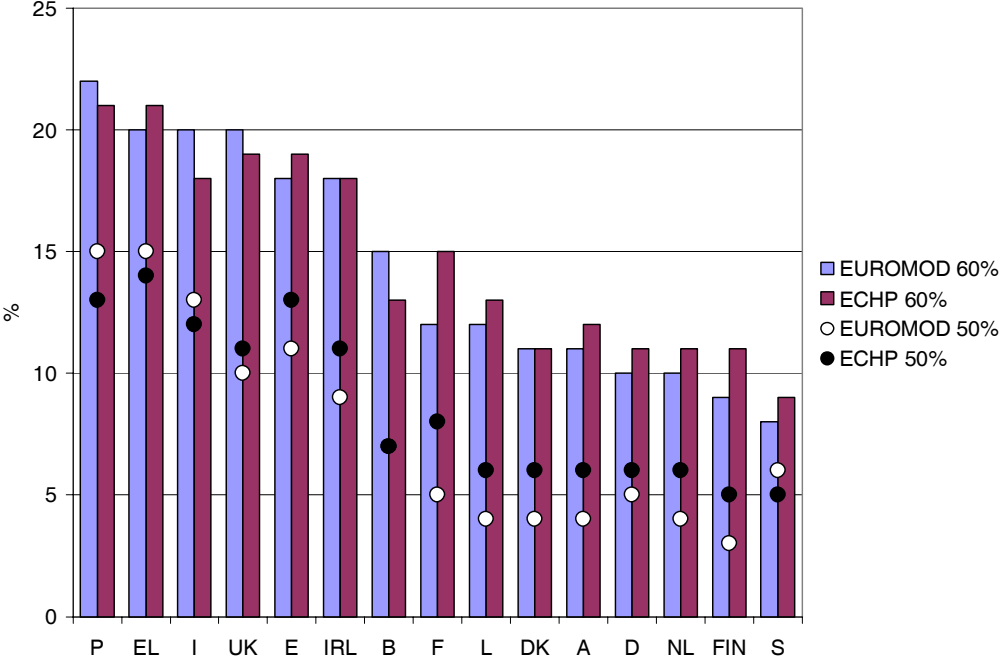
In France the same, consistent, difference of 3 percentage points is observed at both the 40% and 50% cut-offs. But generally differences become apparent in more countries when lower income cut-offs are considered. Relatively large differences emerge for Ireland (at both 40% and 50%) and also for the UK (40% only). EUROMOD provides lower estimates than ECHP at these low levels of income. 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% 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 2, where countries are ranked according to their EUROMOD poverty rate using 60% of the median.

Even using a higher income threshold (70%) the rates stay fairly close in most countries although differences become apparent in the Netherlands (where the EUROMOD estimate is 3 percentage points higher than that from ECHP) and Sweden (where it is 3 percentage points lower). In France, the difference narrows from 3 to 2 percentage points.

¹⁰ Appendix 2 shows the ratio of the poverty lines (using 60% of the median) in EUROMOD compared with the ECHP. Interestingly, Italy has the largest ratio (1.13) which would contribute to a higher observed poverty rate in EUROMOD. But Belgium has the lowest ratio (0.85) which suggests that low incomes in EUROMOD must be much lower than those in the ECHP.

Figure 2: Proportions of populations with incomes below 60% and 50% of the median: comparisons between ECHP and EUROMOD, 1998 incomes



The poverty gap is much smaller in EUROMOD than using ECHP for most countries. This is consistent with an over-estimation of means-tested benefits although it is perhaps surprising to see the difference generally across so many countries. The two exceptions are Greece and Sweden where the EUROMOD poverty gap is much higher.

The two measures of income inequality show generally similar patterns of difference and similarity to each other. The Gini coefficients are within one percentage point for all but 5 countries. In Italy and Sweden the Gini using EUROMOD is higher (by 4 and 3 percentage points respectively); in Belgium it is lower by 4 percentage points and in Austria and Finland it is lower by 2 percentage points. The Swedish difference can be explained by a difference in the unit of income aggregation. The EUROMOD estimates use the narrow family as the unit, whereas the ECHP uses the wider household. The Gini coefficient is larger using the narrower unit (26% compared with 23%), a result which is very similar to the Swedish national comparison using a common dataset for 1999. See section 3.14.

Interestingly, given the results for relative poverty rates for France, the Gini coefficients are close (28% using EUROMOD and 29% from ECHP). Some of the same countries exhibit large differences (in the same directions as the Gini) in the estimates of the quintile share ratio. The EUROMOD estimate for Italy is higher and the Belgian and Finnish estimates are lower, than those taken from ECHP.

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 2a and 2b.

Table 2a: The 1998 EUROMOD baseline, compared with ECHP 1998 incomes: proportions below 60% median, by gender and by age group

	B	DK	D	EL	E	F	IRL	I	L	NL	A	P	FIN	S	UK
All with household disposable income < 60% of the median															
EUROMOD 1998	15	11	10	20	18	12	18	20	12	10	11	22	9	8	20
ECHP 1998 incomes	13	11	11	21	19	15	18	18	13	11	12	21	11	9	19
<i>Difference</i>	2	0	-1	-1	-1	-3	0	2	-1	-1	-1	1	-2	-1	1
Women with household disposable income < 60% of the median															
EUROMOD 1998	16	12	11	21	18	12	19	21	12	10	13	24	10	8	21
ECHP 1998 incomes	14	13	12	21	19	16	20	18	13	11	14	22	13	10	21
<i>Difference</i>	2	-1	-1	0	-1	-4	-1	3	-1	-1	-1	2	-3	-2	0
Men with household disposable income < 60% of the median															
EUROMOD 1998	15	10	8	19	18	11	17	19	12	10	9	20	9	8	19
ECHP 1998 incomes	11	9	10	20	18	15	17	18	12	10	10	19	9	9	18
<i>Difference</i>	4	1	-2	-1	0	-4	0	1	0	0	-1	1	0	-1	1
Age 0-15 with household disposable income < 60% of the median															
EUROMOD 1998	15	6	8	16	21	13	26	25	17	12	13	23	4	5	30
ECHP 1998 incomes	12	6	13	17	25	17	21	22	19	14	14	26	7	10	29
<i>Difference</i>	3	0	-5	-1	-4	-4	5	3	-2	-2	-1	-3	-3	-5	1
Age 16-24 with household disposable income < 60% of the median															
EUROMOD 1998	17	19	12	21	22	18	15	25	16	21	10	18	17	31	19
ECHP 1998 incomes	16	20	15	21	23	21	17	25	19	20	8	17	23	20	25
<i>Difference</i>	1	-1	-3	0	-1	-3	-2	0	-3	1	2	1	-6	11	-6
Age 25-49 with household disposable income < 60% of the median															
EUROMOD 1998	12	6	8	14	16	10	15	18	11	8	8	16	7	7	16
ECHP 1998 incomes	10	5	9	15	17	12	14	17	12	9	9	16	8	9	15
<i>Difference</i>	2	1	-1	-1	-1	-2	1	1	-1	-1	-1	0	-1	-2	1
Age 50-64 with household disposable income < 60% of the median															
EUROMOD 1998	17	8	11	23	17	10	14	17	7	9	10	23	8	3	14
ECHP 1998 incomes	10	7	10	21	17	12	15	16	8	7	9	16	8	5	11
<i>Difference</i>	7	1	1	2	0	-2	-1	1	-1	2	1	7	0	-2	3
Age 65+ with household disposable income < 60% of the median															
EUROMOD 1998	21	28	14	34	17	12	17	18	9	7	17	39	18	6	23
ECHP 1998 incomes	22	31	11	33	16	19	34	14	8	7	24	33	17	8	21
<i>Difference</i>	-1	-3	3	1	1	-7	-17	4	1	0	-7	6	1	-2	2

ECHP data are from the Eurostat web site 11/3/03; results for Spain and UK are due for revision

EUROMOD baseline results are from Feres et al. (2002) using EUROMOD output dated 29/11/02 except for Sweden, which were produced on 25/4/03 and 27/6/03.

Table 2b: The 1998 EUROMOD baseline, compared with ECHP 1998 incomes: proportions below 60% median, by gender and age groups

	B	DK	D	EL	E	F	IRL	I	L	NL	A	P	FIN	S	UK
Male aged 16-24 with household disposable income < 60% of the median															
EUROMOD 1998	17	18	10	20	23	18	12	24	19	22	8	16	16	31	18
ECHP 1998 incomes	16	15	15	20	24	21	15	25	23	19	8	15	17	18	25
<i>Difference</i>	1	3	-5	0	-1	-3	-3	-1	-4	3	0	1	-1	13	-7
Female aged 16-24 with household disposable income < 60% of the median															
EUROMOD 1998	17	21	14	22	21	17	17	25	14	19	12	20	18	31	21
ECHP 1998 incomes	16	26	15	22	22	21	19	25	16	21	8	19	28	23	26
<i>Difference</i>	1	-5	-1	0	-1	-4	-2	0	-2	-2	4	1	-10	8	-5
Male aged 25-49 with household disposable income < 60% of the median															
EUROMOD 1998	12	6	8	13	15	9	13	16	10	7	7	15	9	7	15
ECHP 1998 incomes	8	5	9	15	15	11	13	16	11	8	8	15	8	9	13
<i>Difference</i>	4	1	-1	-2	0	-2	0	0	-1	-1	-1	0	1	-2	2
Female aged 25-49 with household disposable income < 60% of the median															
EUROMOD 1998	13	6	8	15	17	10	16	20	11	8	9	16	5	6	17
ECHP 1998 incomes	12	6	10	15	18	12	15	18	12	10	10	16	8	8	17
<i>Difference</i>	1	0	-2	0	-1	-2	1	2	-1	-2	-1	0	-3	-2	0
Male aged 50-64 with household disposable income < 60% of the median															
EUROMOD 1998	18	6	9	20	17	10	15	17	6	8	9	21	8	4	14
ECHP 1998 incomes	10	7	8	18	17	12	16	17	5	6	8	15	8	5	10
<i>Difference</i>	8	-1	1	2	0	-2	-1	0	1	2	1	6	0	-1	4
Female aged 50-64 with household disposable income < 60% of the median															
EUROMOD 1998	15	11	12	26	18	11	14	16	8	10	10	24	8	3	13
ECHP 1998 incomes	11	6	11	23	17	12	14	16	10	7	10	16	7	5	12
<i>Difference</i>	4	5	1	3	1	-1	0	0	-2	3	0	8	1	-2	1
Male aged 65+ with household disposable income < 60% of the median															
EUROMOD 1998	21	30	9	34	18	10	11	13	7	7	12	38	12	5	20
ECHP 1998 incomes	20	26	9	34	16	16	26	12	6	7	15	30	9	6	17
<i>Difference</i>	1	4	0	0	2	-6	-15	1	1	0	-3	8	3	-1	3
Female aged 65+ with household disposable income < 60% of the median															
EUROMOD 1998	21	27	16	34	16	13	21	21	10	6	21	40	22	7	25
ECHP 1998 incomes	22	35	13	33	16	21	41	16	10	7	29	36	23	10	25
<i>Difference</i>	-1	-8	3	1	0	-8	-20	5	0	-1	-8	4	-1	-3	0

ECHP data are from the Eurostat web site 11/3/03; results for Spain and UK are due for revision

EUROMOD baseline results are from Feres et al. (2002) using EUROMOD output dated 29/11/02 except for Sweden, which were produced on 25/4/03.

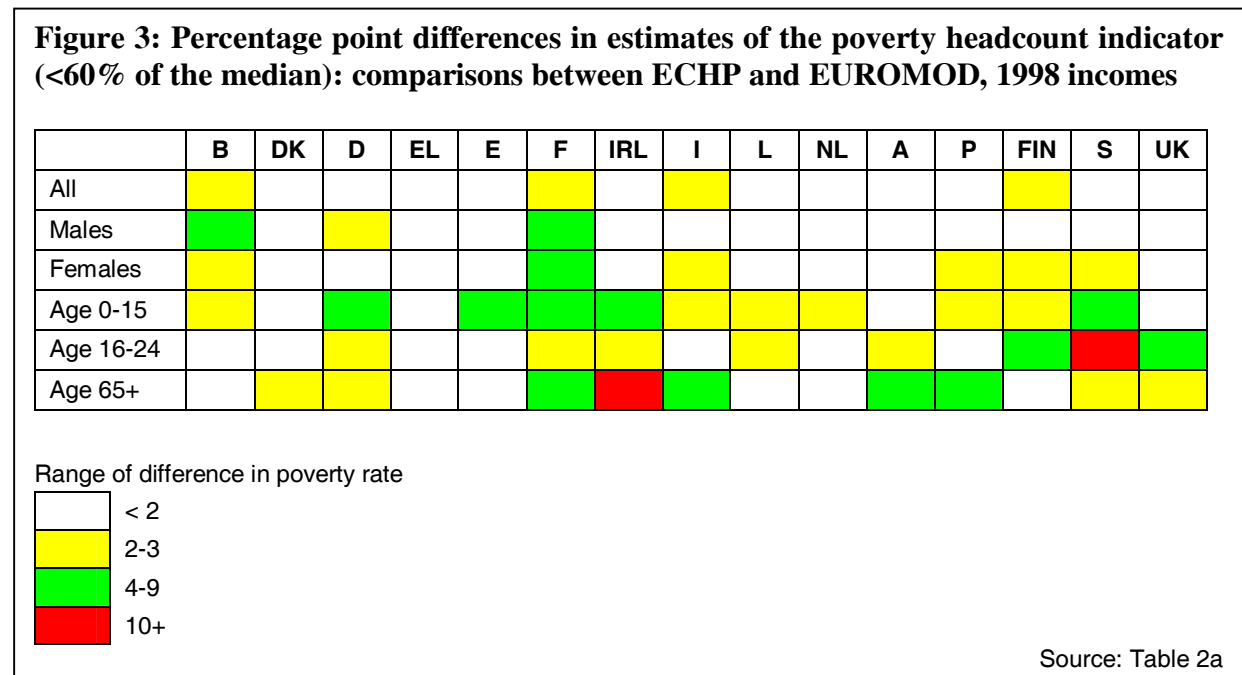
In this context the differences for each gender are useful in two ways. First, they provide some indication of the robustness of the whole-population estimates and of the differences between them using the two sources. For example, the differences between the French estimates for men and women separately are similar to those for the population as a whole (the EUROMOD estimates are consistently smaller). Generally the patterns are similar, to within one percentage point, but this is not always the case. The second way in which the gender breakdowns are useful is in using them to provide clues as to where to look for reasons behind the population level differences. For example, one could explore the income components received by single men and women to understand the reasons for the difference in gender-specific poverty rates. In the case of Italy, the higher estimate from EUROMOD could be due particularly to a higher estimate of poverty among women. The reverse is the case in Finland: the lower estimate from EUROMOD could be due to a particularly low estimate for women.

We can draw out further points in relation to the age breakdowns:

- While comparisons are good for most demographic categories for **Spain**, the poverty rate for children is substantially (4 percentage points) lower using EUROMOD than that using the ECHP directly. The explanation is not the non-take-up of benefits in this case. The ECHP is known to under-report child benefits (both in terms of number of recipients and aggregate expenditure) and the EUROMOD estimates for these amounts are much closer to national administrative statistics (Levy et al, 2001).
- For **Ireland** there is a similar difference in child poverty rate, but in the opposite direction (the EUROMOD estimate is 5 percentage points higher) – in spite of the overall poverty rate being the same. In addition, the poverty rate for older people in EUROMOD is only half that estimated from ECHP. The discrepancy is particularly large for women (20 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. See section 3.7 for another example and more discussion of this phenomenon.
- **Swedish** estimates from ECHP are much higher for children (5 percentage points) and much lower for people aged 16-24 (11 percentage points) than in EUROMOD. The explanation lies in the different unit of income aggregation that is used in the two sets of statistics. The EUROMOD estimates for Sweden use the non-standard narrow family as the unit, treating people aged 18+ as their own unit. Many of these young people will in fact be dependent on their parents but will appear in the statistics with low income. Once they are included in the same unit as their parents (as in the ECHP) they effectively lower the equivalent income of some households that contain younger brothers or sisters, pulling more children below the poverty line.
- The main discrepancy in the **UK** statistics is in the 16-24 age group where poverty rates are higher in the ECHP than in EUROMOD. The use of the previous year's annual income for students in the ECHP statistics, as against current income in the EUROMOD

database is a likely contribution to the explanation for this. Generally, we would expect the use of annual income (in ECHP) to result in lower inequality than the use of income measured over a shorter reference period (as in the UK EUROMOD database). We would expect the ECHP relative poverty estimates to be lower. But non-take-up and the treatment of student incomes are influences that operate in the opposite direction: to increase measured poverty in ECHP compared with EUROMOD.

Figure 3 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.



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. This is particularly clear in France and Italy although it is not necessarily the case: 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 tend to be 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. However, take-up is not always the reason for ECHP poverty rates to be lower than those of EUROMOD. In the case of Spain, the quality of the ECHP data on child benefits is known to be poor: simulations of benefit receipt in EUROMOD produce results that are closer to administrative statistics. Similar explanations may apply elsewhere.

4. The unit of income aggregation is an important issue; but differences in this are an explanatory factor only for Sweden. Similarly, differences in the reference time period (in Ireland and UK) may explain differences in relative poverty rates in the two sources.
5. 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.

It is interesting to note that the differences between EUROMOD and ECHP estimates are generally much smaller than they have been in earlier comparisons. For example, in comparing the proportions of the populations with household income below 60% of the median using EUROMOD (1998) with 1996 and 1997 incomes from the ECHP (as available in May 2002) we found that the difference was at least 2 percentage points in 6 out of 14 countries. Table 1 shows just 4 out of 15 cases where this is so. While it is not possible to say whether the later data or the revised methodology is responsible, this does serve to demonstrate that comparisons are difficult to make definitively. Thus the comparisons reported here should be treated as indicative only. This applies also to the comparisons with national statistics in the following section.

3. National comparisons with national statistics and national tax-benefit model estimates

In the following sub-sections the 15 national sets of EUROMOD indicators are compared with national sources of comparable statistics. The countries are considered in the same order as they appear in Tables 1 and 2. Unless otherwise stated, the variable being analysed is Household Disposable Income (HDI) for 1998 using the same definition as in section 2, equivalised using the modified OECD scale. Some of the material in this section is drawn from EUROMOD Country Reports, where more information may be found.¹¹

3.1 *Belgium*

Table 3.1a shows comparisons of EUROMOD poverty rate statistics with comparable estimates using a different data source – the Socio-Economic Panel (SEP) data for 1997 collected by the Centre for Social Policy at the University of Antwerp (a “type E” comparison). The poverty rate estimates are close using the two sources across all the various assumptions about poverty line, equivalence scale and counting unit. The individual headcounts are mainly lower using EUROMOD but are higher with the higher poverty lines (60% of mean and median) using the modified OECD equivalence scale. Results counting households (which use the same poverty line as the individual headcounts) are also close and generally lower using EUROMOD, with the exception of the proportion below the 60% mean line.

The EUROMOD estimates in Table 3.1a are slightly different to those in Table 1; a more recent version of the model was used.¹² Results are fairly similar using the two sources:

¹¹ <http://www.econ.cam.ac.uk/dae/mu/emodcty.htm>

¹² The Belgian results in this section were run in July 2003.

EUROMOD produces somewhat higher poverty rates when using a relatively high poverty line (e.g. 60% of the mean) and lower poverty estimates when using a lower poverty line (e.g. 50% of the median)

Table 3.1a: Poverty rates using EUROMOD and the SEP for Belgium

Poverty line:	Households ¹		Individuals	
	SEP 1997	EUROMOD 1998	SEP 1997	EUROMOD 1998
<i>Equivalence scale: modified OECD</i>				
50% mean	11.0	10.0	9.9	9.4
60% mean	18.8	20.2	16.8	18.5
50% median	8.6	6.0	7.9	5.7
60% median	15.1	15.5	13.5	14.5
<i>Equivalence scale: square root of household size</i>				
* 40% median	-	-	3.3	2.0
* 50% median	-	-	8.0	6.2
* 60% median	-	-	14.4	14.3

Source: SEP 1997 calculations by Kristian Orsini using Luxembourg Income Study (LIS) data except those marked * which come from LIS Key Figures, accessed at <http://www.lisproject.org/keyfigures.htm> on 16/6/03.

Note: 1. All statistics are based on poverty lines using mean/median household incomes calculated across individuals.

Table 3.1b shows comparisons of the mean, Gini coefficient and decile points for the income distribution.

Table 3.1b: Income inequality using EUROMOD and the SEP for Belgium

	SEP 1997	EUROMOD 1998	Ratio EUROMOD/SEP
Gini coefficient	0.248	0.247	-
Decile points BEF/month			
1	24402	22422	0.919
2	30543	27351	0.895
3	35377	32157	0.909
4	39961	36180	0.905
5	44876	40520	0.903
6	50196	45460	0.906
7	56054	50625	0.903
8	63798	56543	0.886
9	76095	67074	0.881
Mean (BEF/month)	48440	43829	0.905

Source: SEP 1997 calculations by Kristian Orsini using LIS data.

Note: All statistics are based on equivalised income using the modified OECD scale, calculating over individuals.

The Gini coefficients are very close but in spite of referring to one year earlier, the level of incomes in the SEP data are higher than those from EUROMOD, across the whole distribution. The effect is slightly more marked at the top of the distribution. One plausible explanation for this is that EUROMOD is not able to capture tax avoidance and evasion.

However, the household disposable income variable in the SEP is calculated by deducting taxes from gross incomes, based on a microsimulation of taxes and contributions.¹³ This is a similar procedure to that carried out in EUROMOD.¹⁴ Differences are therefore likely to be due to differences in the underlying data samples, rather than calculation method.

3.2 Denmark

Table 3.2a shows a comparison of the EUROMOD poverty rate with that estimated by the Danish national “Lov Model”, which uses a different dataset, based on register data. (This is a “type G” comparison.) The equivalence scale used is the square root of household size.

Table 3.2a: Individuals below 60% median incomes using simulations for 1998 from EUROMOD and the Danish “Lovmodellen”

	The Danish Ministry of Economic Affairs “Lovmodellen”	EUROMOD
Poverty line DKK/ year, 1998	84400	83812
% of individuals below poverty line	6.9	13.0

Source: Hansen (2001); EUROMOD estimate revised in July 2003

Although the EUROMOD poverty line is somewhat lower than the Danish national estimate the poverty rate is much higher: nearly double. EUROMOD simulation-based estimates using ECHP are similar to those using ECHP directly (Table 1), suggesting that the main source of difference in Table 3.2a is the underlying data. It appears that, relative to the national data, ECHP contains too many people with low measured incomes.

Table 3.2b shows a comparison with a simplified version of the same data on which the Lov Model is based, but for 1997, taken from the Luxembourg Income Study web site. This is a “Type E” comparison. In this case the EUROMOD Gini coefficient is lower.

Table 3.2b: Gini coefficients using EUROMOD and LIS data for Denmark

	Danish register data (LIS) 1997	EUROMOD 1998
Gini co-efficient	0.257	0.243

Source: Luxembourg Income Study (LIS) data from LIS Key Figures, accessed at <http://www.lisproject.org/keyfigures.htm> on 16/6/03.

Note: All statistics are based on equivalised income using the square root of household size, with the individual as the unit of analysis

¹³ See <http://www.lisproject.org/techdoc/be/be97survey.pdf>

¹⁴ See Lumen and Scholtus (2001).

3.3 Germany

Tables 3.3a and 3.3b show comparisons between EUROMOD statistics and the same underlying data source (the GSOEP) but for a later year. (This is a “type B” comparison.) It is worth noting that the 1997 incomes used in EUROMOD are updated to 1998 levels using growth rates derived from year-to-year changes in GSOEP itself, but that the updating factors do not take account of differential growth (e.g. at different points in the earnings distribution.) So the main reasons for differences – apart from the one year of compositional changes and the effects of simulating incomes – will be due to any differential growth in incomes.

The EUROMOD estimates in Tables 3.3a and 3.3b are calculated on a different basis than those in Table 1. In this comparison, instead of assuming that everyone who appears to be entitled to social assistance benefits and housing allowances in fact receives them (the basis for Table 1), these benefits are only simulated for those people who are found to receive them in the GSOEP. The substantial difference in the headline poverty rate (10% and 14%) suggests that this is an important issue in Germany. In these national comparisons, tying entitlement to recorded receipt has the automatic effect of bringing the social indicator estimates from the simulations and the data closer together.

The proportions below both 50% and 60% of the median are the same and the Gini coefficient and decile shares (Table 3.3b) are close. It is clear that while these comparisons are reassuring, as were those for Germany in section 2, comparisons of EUROMOD results using the different take-up assumptions, or of ECHP with GSOEP would be less satisfactory. For example, the ECHP gives a Gini of 25% and the GSOEP, 29%. Not only is the take-up issue important, but also different methodologies applied to the same sample - like the weighting scheme and the follow up for persons who left a household - make a difference. (The German ECHP is based on GSOEP.)

Table 3.3a: Poverty rates using GSOEP and EUROMOD, 1998 incomes

	GSOEP 1998	EUROMOD 1998
% of individuals with income < line		
50% median	9.3	9
60% median	14.4	14
% of individuals with income > line		
150% median	21.0	19
200% median	7.6	7

Source: Grabka M (2001) using SOEP- Socio-economic Panel study – 1999.

Also provided in Table 3.3a are some comparisons of estimates of the proportion of people in households with incomes *above* certain percentages of the median. The match is less good than for low incomes but is still quite close. One possible explanation for the larger number of people at relatively high incomes in the 1999 GSOEP than in EUROMOD using 1998 GSOEP is that higher market incomes may have grown faster than the average. Comparing 1998 and 1999 GSOEP data shows that this is the case for capital income (dividends and interest) as well for labour income, in particular for higher income earners

Table 3.3b: Income distribution using GSOEP and EUROMOD, 1998 incomes

		GSOEP 1998	EUROMOD 1998
Gini coefficient %		28.8	28
Decile shares %	1	2.8	2.7
	2	5.2	5.6
	3	6.4	6.8
	4	7.4	7.7
	5	8.4	8.6
	6	9.5	9.5
	7	10.8	10.8
	8	12.5	12.4
	9	15.1	14.8
	10	21.9	21.3

Source: German Council of Economic Experts (2000: p.264.) using SOEP- Socio-economic Panel study – 1999.

3.4 Greece

Apart from estimates using ECHP data, shown in Table 1, the only other published poverty or inequality estimates for 1998 for Greece are those available in the National Action Plan for Inclusion (NAPIncl) report, based on Household Budget Survey (HBS) data for 1998/9. These are “type D” comparisons.

A comparison of poverty rates using various proportions of the median as poverty line, and of Gini coefficients is shown in Table 3.4a. Most of the statistics from the NAPIncl report use a definition of disposable income which includes both incomes tax paid by the self employed and incomes in kind (such as from consumption of own production and owner occupation). The EUROMOD estimates shown in the table include neither but are otherwise broadly comparable. They show higher poverty rates using each poverty line and slightly more inequality, as measured by the Gini coefficient. A few estimates from the HBS are available without inclusion of incomes in kind (but still including income tax for the self-employed). The headline poverty rate is very close to the EUROMOD estimate (20% compared with 21%) while the Gini coefficient for the poor is much higher in EUROMOD than in the HBS.

Table 3.4a: Poverty rates and Gini coefficients using Greek HBS data and EUROMOD

Poverty line as % of the median	HBS data for Greece (NAPIncl 2001)		EUROMOD
	<i>Including income in kind</i>	<i>Excluding income in kind</i>	<i>Excluding income in kind</i>
40%	6.0	-	10.3
50%	11.2	-	15.2
60%	17.3	20	21.4
70%	25.1	-	28.3
Gini coefficient: all	0.322	-	0.34
Gini coefficient: for the poor	-	0.173	0.23

Source: Household Budget Survey data 1998/9 from Greek National Action Plan for Social Inclusion 2001-3 (translated from Greek). Note that HBS data report “disposable income” including income taxes for the self-employed. Results including incomes in kind are from Appendix Table 1 and results excluding incomes in kind are from Appendix Table 3. **Equivalence scale:** modified OECD, **unit:** individual.

Further comparisons of poverty indicators, using non-comparable income definitions (the HBS estimates include incomes in kind), are shown in Table 3.4b. Here, the relative risk of poverty for selected population groups is shown (national average risk=100).¹⁵ Numbers less than 100 indicate less than average risk; numbers greater than 100 indicate greater than average risk. Estimates are shown for two poverty lines: 40% and 60% of the median. Given that the underlying population poverty rates are different and the income definitions are not comparable it is not surprising that all groups do not have the same relative risk of poverty in the two sources.¹⁶ However, estimates are quite close for all employment status groups except pensioners using the 60% median line, for working age couples without children, and by gender. The main differences appear among single people, particularly those aged under 65. It is quite possible that such differences can be explained by the samples in the two sources having different characteristics. There are also differences for those aged over 65. This is a group that is likely to be farmers and to benefit from income in kind from owner occupation or consumption of own production. This would explain their higher risk of poverty in EUROMOD which does not include these sources of income. Finally, the risk of falling below 40% of the median is almost negligible in EUROMOD for couples with children but over half the average risk using the HBS. At the 60% of median poverty line the relative risks for this group are much the same in the two sources.

Table 3.4b: Relative risk of poverty using HBS data and EUROMOD for Greece

	40% poverty line		60% poverty line	
	HBS	EUROMOD	HBS	EUROMOD
Employment status				
Employed	58	56	68	58
Unemployed	175	127	146	129
Pensioner	160	209	147	176
Other inactive	103	87	104	97
Household type				
Person aged below 64 living alone	82	137	77	114
Person aged over 65 living alone	242	288	159	188
Couple, no children both below 65	90	74	87	79
Couple, no children at least one over 64	190	224	176	226
Couple + 1 child	67	5	55	47
Couple + 2 children	53	7	69	67
Sex				
Men	92	93	98	96
Women	108	107	102	104

Source: Household Budget Survey (HBS) data 1998/9 from Greek National Action Plan for Social Inclusion 2001-3 (translated from Greek). Note that HBS data report “disposable income” including income taxes for the self-employed and including incomes in kind are from Appendix Table 8a. **Equivalence scale:** modified OECD, **unit:** individual.

¹⁵ Some categories, with very small sample sizes in EUROMOD are omitted.

¹⁶ Particularly since it is possible that some of the category definitions are not identical in the two sources.

3.5 *Spain*

Table 3.5a shows some comparisons of poverty measures using EUROMOD with those from EspaSim, the Spanish national model which is based on the same data: a “type F” comparison. All the comparisons in Table 3.5a are very close.

Table 3.5a: Poverty indicators for Spain using EUROMOD and EspaSim

Poverty rates	EspaSim	EUROMOD
45% of median income	9.1	8.9
54% of median income	14.5	14.3
60% of median income	18.3	18.4
63% of median income	20.6	20.4
75% of median income	29.4	29.4
FGT(1)		
45% of median income	3.4	3.1
54% of median income	4.8	4.5
60% of median income	5.9	5.6
63% of median income	6.6	6.3
75% of median income	9.6	9.3
FGT(2)		
45% of median income	2.0	1.7
54% of median income	2.6	2.3
60% of median income	3.1	2.8
63% of median income	3.4	3.1
75% of median income	4.8	4.5

Source: Levy and Mercader Prats (2001)

These comparisons are testing differences in simulation method and assumptions rather than validating results against independent information. However, EspaSim has already been validated against Spanish national statistics (see Levy et al, 2001).

3.6 *France*

Table 3.6a shows a comparison of average incomes and income shares, by quantile using EUROMOD and the French national model, SYSIFF, which uses the same data as EUROMOD but simulates the 1994 tax-benefit system. (This is a “type H” comparison.) The equivalence scale used is the square root of household size and the ranking unit is the individual. SYSIFF has been separately validated against national statistics for 1994 (see Bargain and Terraz, 2001). Thus the comparison between EUROMOD and SYSIFF is testing differences in simulation method and assumption rather than validating results against fully independent information. Differences between the two sets of model estimates may be due to changes in the tax-benefit system between 1994 and 1998 as well as other factors. The shape of the income distribution, as indicated by the quantile shares is very similar in the two sets of model results. Levels of income are not so close – with EUROMOD disposable incomes being higher than those in SYSIFF (adjusted to 1998 levels). The difference is smallest in the bottom quintile.

Table 3.6a: Mean of annual equivalent household disposable income and shares of income for France using the national model, SYSIFF and EUROMOD

	Average household equivalent income (KFF/year)				Share of total disposable income	
	SYSIFF	SYSIFF	EUROMOD	Ratio:EUROMOD	SYSIFF	EUROMOD
	1994 ^a	1998 ^b	1998	/ SYSIFF	1994 ^a	1998
Quintile 1	46	52	55	1.058	9.9	9.4
Quintile 2	62	70	79	1.129	13.2	13.4
Quintile 3	80	90	101	1.122	17.1	17.2
Quintile 4	102	115	131	1.139	21.8	22.2
Decile 9	139	157	169	1.076	14.8	14.4
Decile 10	217	245	272	1.110	23.2	23.3
Total	94	106	117	1.104	100	100

Source: (a) Bourguignon (1999; table 3) using SYSIFF, the French national microsimulation program (DELTA). (b) 1994 estimates are approximately updated to 1998 levels using the uprating factor applied in EUROMOD to market incomes (12.85%). See Bargain and Terraz (2001) for more details. **Note:** all figures refer to disposable income per adult equivalent, the number of adult equivalents being defined as the square root of the total number of members within the household.

Table 3.6b shows comparisons of EUROMOD poverty rates for France with estimates from two official national sources using different data. (These are “type D and E” comparisons). One source is fiscal data for 1997. These do not include capital incomes that are not subject to income tax. The other source is from a rather different survey (PCV) which shows higher poverty rates, but for which data are available for 1997 to 1999. This allows us to see the extent of volatility in poverty estimates for France year by year. Given this, the EUROMOD estimates are quite close to the estimates from fiscal data and are indeed closer to these than to the estimates from ECHP shown in Table 1. The difference between the headline indicator estimates is just 1 percentage point.

Table 3.6b: Estimates of poverty rates for France using EUROMOD and national statistics

% of households with income < line	Fiscal data ¹	PCV ²			EUROMOD 1998	
	1997	1997	1998	1999	Individual	Household
40% median	2.4	5.8	6.1	5.6	1.4	1.3
50% median	6.9	11.2	11.5	11.1	4.9	5.1
60% median	12.8	17.9	18.9	18.1	11.8	11.8

Source: (1) Fiscal data (*Enquête revenus fiscaux, 1997*) published in “Les travaux de l’observatoire national de la Pauvreté et de l’exclusion sociale” 2001, INSEE-DGI. (2) Enquêtes PCV (Santé logement et endettement des ménages), INSEE. **Note:** in both cases the equivalence scale is the modified OECD scale and the unit is the household.

3.7 Ireland

Tables 3.7a and 3.7b show comparisons of EUROMOD statistics with comparable estimates from SWITCH, the Irish national model belonging to ESRI. It uses the same underlying data as EUROMOD. (These are “type F” comparisons.) Table 3.7a shows the Gini coefficient using an OECD-type scale with slightly different values of the parameters than standard.

Table 3.7a: Gini coefficients for Ireland using EUROMOD and SWITCH

	SWITCH	EUROMOD
Gini co-efficient %	32	32

Source: SWITCH see Callan et al. (2001)

Equivalence scale: OECD type- weights: **1** first adult (ages 14+), **0.66** each other adult, **0.33** each child

The estimates are identical to two significant figures. Table 3.7b compares poverty rates for the population and for sub-groups using the SWITCH equivalence scale in both SWITCH and EUROMOD, and also showing EUROMOD results using the standard modified OECD scale.

Table 3.7b: Poverty rates (% below 60% of the median) using SWITCH and EUROMOD with two different equivalence scales.

	SWITCH (1)	EUROMOD(1)	EUROMOD(2)
All	16	17	18
Male	16	16	17
Female	16	17	19
Age 0-15	24	26	26
Age 16-24	17	16	15
Age 25-49	15	15	15
Age 50-64	14	12	14
Age 65+	2	3	17
Age 16-24 Male	15	14	12
Age 16-24 Female	19	18	17
Age 25-49 Male	13	14	14
Age 25-49 Female	16	16	16
Age 50-64 Male	16	13	15
Age 50-64 Female	13	11	14
Age 65+ Male	3	4	11
Age 65+ Female	2	2	21
ALL	16	17	18

Source: SWITCH: see Callan et al. (2001)

Equivalence scale: (1) OECD type- weights: **1** first adult (ages 14+), **0.66** each other adult, **0.33** each child

(2) Modified OECD scale (1 / 0.5 / 0.3).

The population poverty rates are similar using SWITCH and EUROMOD and a common equivalence scale, and only a little different again using EUROMOD with the modified OECD scale. But examining poverty rates by sub-group shows the importance of choosing an identical equivalence scale when comparing poverty estimates from the same or different sources. The two sets of EUROMOD estimates use slightly different parameter values in the OECD-type equivalence scale. The choice of scale has an effect that is quite striking for poverty rates for people aged 65 and over. The poverty rate is very low for this group (around 2-3 %) using the Irish scale but much closer to the national rate (17-18% according to EUROMOD) if the modified OECD scale is used. This is because the poverty line shifts upward for single person households if the OECD scale is used. Many Irish pensioners live alone and the value of contributory pensions (widowed and old age) are greater than the poverty line using the 1/0.66/0.33 scale but below the poverty line using the 1/0.5/0.3 scale.

More generally, the risk of poverty for Irish pensioners is very sensitive to the exact position of the poverty line in relation to the level of pension incomes. In Tables 2a and 2b poverty rates for people aged 65+ are much higher in the ECHP than from EUROMOD, even when the modified OECD scale is used.

3.8 Italy

Table 3.8a shows comparisons of 1998 EUROMOD baseline output with official national poverty estimates, using the Italian national poverty line. These calculations use the household as the unit of analysis and calculate the poverty line, and incomes in relation to it using a method that is rather different than those typically used internationally, applying the “Carbonaro” scale. The poverty line for each household is calculated by applying an equivalence scale to the value of national per capita income (i.e. the sum of household income divided by the population). Actual, monetary income for the household is then compared with this value and households with income below the poverty level are counted as poor. The “equivalence scale” depends on household size as follows:

Household size Scale value

1	0.60
2	1.00
3	1.33
4	1.63
5	1.90
6	2.14
7+	2.40

The EUROMOD results in Table 3.8a are based on an earlier wave of Bank of Italy data (1995) than the official results (which use 1998 incomes). This is therefore a “type B” comparison.

Table 3.8a: Comparison of EUROMOD poverty rates for Italy with estimates from the Bank of Italy Survey for 1998

		Bank of Italy survey 1998 ^a	EUROMOD 1998
All households		13.7	12.4
Area	North	5.7	4.5
	Centre	7.0	7.6
	South	26.2	30.0
Household size	1 person	10.0	11.4
	2 persons	9.8	7.2
	3 persons	12.4	11.3
	4 persons	16.4	15.9
	5 persons or more	29.8	23.2

^a Rapporto sulle politiche contro la povertà e l'esclusione sociale- commissione d'indagine sulla povertà e l'esclusione sociale (1998) (Report on policies against poverty and social exclusion – Ministry of welfare)

Both sets of results show that poverty is higher in large households and in households in the Southern regions of Italy. Since the two sets of results are based on different waves of the

same data source, differences are due to a combination of (a) actual changes in poverty, (b) other differences between the two surveys and (c) the distribution of simulated incomes being different from the distribution of recorded incomes.

A second type B comparison, using the same data source for 1998 is shown in Table 3.8b. This uses the standard OECD equivalence scale. The table shows the Gini coefficient on this basis; the ratio of the median income in the top decile, to that in the bottom decile, an equivalent statistic for the 9th and 2nd deciles and four poverty statistics using 50% of the mean as the poverty line.

Table 3.8b: Comparison of EUROMOD inequality and poverty statistics for Italy with estimates from the Bank of Italy Survey for 1998

	Bank of Italy survey 1998^a	EUROMOD 1998
Gini coefficient	0.350	0.342
Median D10 / median D1	8.9	7.4
Median D9 / median D2	3.3	3.2
Poverty rate (headcount ratio): %	14.0	17.2
Poverty rate (income gap ratio): %	36.4	30.8
FGT(1)	5.1	6.1
FGT(2)	3.2	3.1

Source: Prometeia, Rapporto di Previsione, Giugno 2000 (Prometeia, Forecasting Report, June 2000).

Data: Bank of Italy Survey of Households Income and Wealth (SHIW) on 1998 incomes

Note: poverty line: 50% mean; equivalence scale: standard OECD; **unit:** household

Results are very close, with EUROMOD results showing slightly less inequality but more poverty than the Bank of Italy data for 1998. The income gap ratio is, however, lower using EUROMOD than using the 1998 survey data.

3.9 Luxembourg

Table 3.9a compares EUROMOD results with corresponding estimates taken directly from the same data for Luxembourg: the PSELL which covers 1998 incomes. Since there is no updating involved, this comparison is a direct indication of the difference made by simulating incomes. For Luxembourg in 1998 this involves not only a check on the simulation of taxes and benefits from original gross income variables (and other characteristics), it involves checking the net-to-gross imputation procedure which also uses EUROMOD (Immervoll and O'Donoghue, 2001; Berger and Borsenberger, 2001). This is a "type A" comparison.

Comparison of the poverty rates and the Gini coefficient shown in Table 3.9a indicate that simulated incomes are somewhat more equal and result in slightly less estimated poverty. This would be consistent with take-up of some benefits being less than the 100% assumed, but may have other explanations.

Table 3.9a: Income distribution and poverty rate comparisons for Luxembourg

	PSELL	EUROMOD	EUROMOD /PSELL
% of households with income < line			
60% median	13	11	-
50% median	6	3	-
% of individuals with income < line			
60% median	13	12	-
50% median	6	4	-
Gini coefficient %	27	26	-
Decile points – households (LUF/month)			
1	41767	42559	1.019
2	50667	50196	0.991
3	58473	57694	0.987
4	66363	65172	0.982
5	73945	72537	0.981
6	83333	81531	0.978
7	94667	91898	0.971
8	110555	106160	0.960
9	137583	129850	0.944

Source: PSELL-Panel Socio-Economique Liewen zu Lëtzebuerg

A comparison of the decile points in Table 3.9a reveals that EUROMOD incomes are consistently somewhat lower throughout the distribution, than those taken from PSELL directly, except at the bottom. Thus the EUROMOD poverty lines (based on the median) are lower and the incomes of those likely to be below the line are higher than in PSELL.

3.10 The Netherlands

Comparisons for the Netherlands are with results from official sources using different datasets. Results are available for 1997 and 1999, rather than the year 1998 which is the reference year for EUROMOD output. Thus the comparisons are “type E” comparisons. Table 3.10a compares the percentages below different proportions of the poverty line (60% of median equivalised disposable income). Results at low levels of income are reasonably close but start to diverge above the poverty line. These figures compare 1998 simulated incomes based on data for 1995 with national statistics for 1997.

Table 3.10b provides some more detailed comparisons according to personal and household characteristics, using independent statistics for both 1997 and 1999. In this case it is not possible to reproduce the official income definition exactly as this includes imputed rent. The EUROMOD results approximate this income component by using imputed taxable income from owner occupation. Furthermore, the equivalence scale used for the EUROMOD calculations approximates to the Netherlands’ official scale.

Changes between 1997 and 1999 tend to be smaller than differences between EUROMOD and either estimate. But actual changes over time are clearly a possible component of an explanation of the differences. With some exceptions personal incomes tend to be lower but

household incomes tend to be higher in EUROMOD, compared with the external sources. The table also shows that the EUROMOD database contains a higher proportion of adults with their own income than the data used by the official statistics.

Table 3.10a: Percentages below proportions of the poverty line (60% median): the Netherlands

	IPO 1997	EUROMOD 1998
Households		
< 75% of poverty line	2.8	3.2
< 90% of poverty line	4.9	5.3
< poverty line	8.0	10.7
< 110% of poverty line	12.7	18.1
< 125% of poverty line	21.6	29.1
Persons		
< 75% of poverty line	3.1	2.6
< 90% of poverty line	5.9	5.1
< poverty line	9.1	9.9
< 110% of poverty line	13.7	16.1
< 125% of poverty line	22.2	26.1

Source: IPO'97: CBS/SCP (1999), Het meten van armoede (the measurement of poverty), Statistics Netherlands / Sociaal en Cultureel Planbureau, Voorburg / Den Haag

Table 3.10b: Income statistics for selected groups in the Netherlands

	1997	1999	EUROMOD 1998
% adults (18+) with income	81%	82%	86%
Avg. disp. income ¹ of adults (1000 Euro/year)	12.2	12.6	13.4
Avg. disp. income of adults with income	15.1	15.4	15.5
Avg. disp. income of employees	16.0	16.3	17.7
avg. disp. income of self-employed	21.1	20.9	18.7
avg. disp. income of disabled persons	10.9	10.8	11.1
income inequality adults: Gini	.420	.410	.444
income inequality adults with income: Gini	.316	.315	.346
avg. disp. income ² of households (total)	15.9	16.5	16.1
avg. disp. inc. single persons	13.4	14.1	13.5
avg. disp. inc. single parents	9.6	10.1	9.6
avg. disp. inc couples without children	18.6	19.2	19.3
avg. disp. inc couples with children	15.2	15.9	15.7
avg. disp. inc others without children	20.3	20.8	18.2
avg. disp. inc. others with children	16.1	16.9	15.3
income inequality – households: Gini	.252	.251	.247
% of hh with 'low' income ³	15.1%	13.2%	12.9%
% of hh with 'high' income ³	8.3%	9.7%	7.8%

Amounts expressed in 1998 prices (1000 Euro/year, 1 Euro = 2.20371 NLG)

Source: 1997, 1999: Sociaal en Cultureel Planbureau, "Sociale staat van Nederland 2001", Den Haag, 2001 (www.scp.nl). **Equivalence scale:** Approximates SCP equivalence scale.

¹Does not include rent subsidy and child benefit

²Does not include rent subsidy, deducts mortgage interest payments, includes imputed rent and deducts private health insurance contributions.

³'low' and 'high' incomes defined on the basis of SCP cut-off (less than 9,030 Euro and more than 27,090 Euro per equivalent adult per year)

3.11 Austria

Comparisons for Austria use the Austrian national version of the 1999 ECHP (1998 incomes) which is the dataset on which EUROMOD estimates are based. Thus this is a “type A” comparison. Estimates from the national version of the ECHP are not precisely the same as those shown in Table 1 using the Eurostat UDB version. It is also the case that the EUROMOD estimates are slightly different to those in Table 1: a more recent version of the model was used.¹⁷ Table 3.11a compares Gini coefficients, decile points and poverty rates. Results are generally very close although appear to diverge in the extent of extreme poverty: the Gini for the poor is much lower, and the poverty deficit is lower using EUROMOD. This is probably due to the assumption of 100% take-up of social assistance benefits in EUROMOD. At high incomes the 9th decile is lower in EUROMOD. Generally, these results are consistent with some modest over-estimation of benefits and taxes but may also be due to other factors.

Table 3.11a: Poverty and inequality statistics for Austria using EUROMOD and the Austrian ECHP

	Austrian ECHP 1998	EUROMOD 1998
Gini-coefficient		
Overall population	0.25	0.23
“Poor” population	0.30	0.10
Decile points (equivalised ATS/month)		
1 st	10,105	10,163
2 nd		12,351
3 rd		14,070
4 th		15,463
5 th	17,272	17,181
6 th		18,920
7 th		21,204
8 th		24,099
9 th	30,456	29,072
Poverty line (60% of the median)	10,360	10,309
Below 60% of median %	11.0	10.7
Poverty deficit (bn ATS/year)	15,78	13,01
Poverty line (50% of the median)	8,602	8,591
Below 50% of median %	4.0	3.8
Poverty line (70% of the median)	12,085	12,027
Below 70% of median %	20.0	18.3

Source ECHP: ICCR (2001a), 21, 74, 104, 113; ICCR (2001b) Table 1.2.3. **Note:** monthly figures are annual amounts /12.

Table 3.11b shows comparisons of poverty rates by gender and age group. Most differences are small although some are rather hard to explain – an example is the large difference in poverty rate among females below the age of 20 using the 50% median cut-off. The

¹⁷ The Austrian results in this section were run in April 2003. See Tarcali et al. (2003).

EUROMOD poverty rate (4.5%) is roughly the same as that for males of the same age (4.2%) but the ECHP rate is much higher (7.0% compared with 4.0%).

Table 3.11b: Poverty rates by gender and age for Austria using EUROMOD and the Austrian ECHP (%)

	Austrian ECHP 1998		EUROMOD 1998	
	Men	Women	Men	Women
Age 0-19				
Below 50% of the median	4.0	7.0	4.2	4.5
Below 60% of the median	11.0	13.0	11.1	13.0
Below 70% of the median	25.0	24.0	22.0	22.1
Age 20-60				
Below 50% of the median	4.0	4.0	3.7	3.4
Below 60% of the median	8.0	9.0	6.9	8.6
Below 70% of the median	14.0	18.0	12.2	15.5
Age 61+				
Below 50% of the median	1.0	2.0	2.9	4.1
Below 60% of the median	12.0	21.0	13.1	20.0
Below 70% of the median	22.0	30.0	21.4	29.5

Source ECHP: ICCR (2001a), 79

3.12 Portugal

The comparisons for Portugal shown in Tables 3.12a and 3.12b use a completely different survey from an earlier and a later year. These are “type E” comparisons. The EUROMOD Gini coefficient is the same as that given in the 1994/5 survey (to 2 significant figures) and only one percentage point different to the larger value from the 2000 survey. Information on decile shares shows that EUROMOD incomes are slightly less concentrated at the top of the distribution: consistent with modest over-estimation of taxes paid by high income households.

Table 3.12a: Income distribution statistics for Portugal using EUROMOD and national survey data.

	IOF		EUROMOD
	1994/5	2000	1998
Gini coefficient	0.36	0.37	0.36
Decile shares %			
	1	3.0	2.8
	2	4.2	4.2
	3	5.0	5.3
	4	5.9	6.4
	5	7.2	7.4
	6	8.5	8.6
	7	10.1	10.0
	8	12.2	11.9
	9	15.4	15.3
	10	28.6	28.0

Source: IOF – calculations by Carlos Rodrigues, based in Inquérito aos Orçamentos Familiares 1994/5 and 2000 do INE (monetary income only).

Poverty rates, shown in Table 3.12b, are also quite close, with EUROMOD estimating slightly higher poverty rates than the 2000 survey.

Table 3.12b: Poverty rates for Portugal using EUROMOD and national survey data.

	IOF		EUROMOD
	1994/5	2000	1998
% of households with income < line			
40% of the median	-	7.8	9.2
50% of the median	-	16.2	17.4
60% of the median	-	24.5	25.4
70% of the median	-	32.9	32.5
% of individuals with income < line			
40% of the median	-	6.2	7.6
50% of the median	-	13.5	14.5
60% of the median	20.4	20.5	21.9
70% of the median	-	28.0	29.4

Source: IOF – calculations by Carlos Rodrigues, based in Inquérito aos Orçamentos Familiares 1994/5 and 2000 do INE (monetary income only).

3.13 Finland

Finnish comparisons of Gini coefficients and poverty rates are possible in a number of ways. Estimates are shown in Table 3.13a from two data sources, the Income Distribution Survey (IDS) - as used in EUROMOD - and the Finnish Household Budget Survey (HBS). Information is available from several different studies using the IDS, for three separate years (1997, 1998 and 1999) and also using national model estimates using IDS (but for 1999 using 1999 data instead of 1998 using 1997 data, as in EUROMOD). These correspond to “type B”, “type C”, “type D” and “type H” comparisons.

Table 3.13a: Gini coefficients using EUROMOD and Finnish national sources

Year	1997	1998	1999
Gini coefficient: OECD-type equivalence scale³			
IDS ²	24	25	26
SOMA-model year 1999	-	-	26
HBS ¹	-	24	-
EUROMOD	-	23	-
Gini coefficient: modified OECD equivalence scale			
IDS ¹	23	24	26
EUROMOD	-	23	-

Sources: DATA. Statistics Finland: 1) IDS (Income distribution Survey), 2) HBS (Household budget survey); MODEL: SOMA by Ministry of Social Affairs and Health.

1. Riihelä et al. (2001b).

2. Statistics Finland (2001): Income Distribution Survey 1999. Income and Consumption 2001:16. (available in Finnish).

3. **OECD-type equivalence scale:** 1 single, 0.7 additional adults aged 18+, 0.5 children aged under 18.

Comparisons are made using two equivalence scales. The first uses the same parameters as the standard OECD scale but includes all people aged under 18 as children with the lower weight of 0.5; people aged 18+ are allocated the higher weight of 0.7. The second scale is the modified OECD scale which uses the conventional age of 14 to distinguish between the adult weight (0.5) and the child weight (0.3). The EUROMOD Gini coefficient is slightly lower than other estimates for 1998 (23% compared with 24% or 25%). More detail is provided in Table 3.13b which compares income shares across decile groups and within-decile Gini coefficients. Results are very close with EUROMOD again showing a somewhat more equal distribution with less inequality in the top and – especially - the bottom deciles than shown by the IDS.

Table 3.13b: Income shares and Gini coefficients by deciles for Finland in 1998

Group	Share of income		Gini coefficient	
	IDS	EUROMOD	IDS	EUROMOD
1 decile	4.5	4.9	10.3	6.5
2 decile	6.0	6.1	2.6	2.2
3 decile	6.9	6.9	2.0	1.9
4 decile	7.6	7.7	1.7	1.7
5 decile	8.5	8.5	1.7	1.7
6 decile	9.4	9.4	1.6	1.7
7 decile	10.4	10.5	1.8	1.8
8 decile	11.7	11.7	2.1	2.1
9 decile	13.6	13.6	3.1	2.9
10 decile	21.6	20.6	19.9	17.0
Total	100.0	100	24.5	23.1

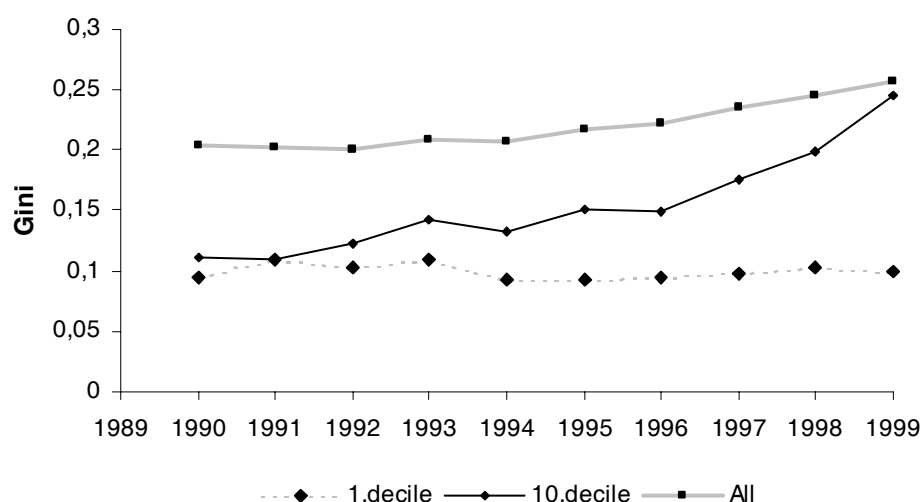
Source: IDS: Income Distribution Survey, 1998

OECD-type equivalence scale: 1 single, 0.7 additional adults aged 18+, 0.5 children aged under 18.

The national results in Table 3.13a show income inequality increasing in the period 1997-1999. One explanation for lower EUROMOD estimates of inequality is that these use 1997 data. The older data are likely to result in lower estimates, given that income inequality has been rising in Finland over the period. Figure 3.13.1 illustrates this by plotting the Gini coefficient for the top and bottom decile groups over the period 1990-1999. This shows particularly the growth in inequality at the top of the distribution, which has been driving the overall increase. Any increase in inequality of market incomes between 1997 and 1998 is not captured in the EUROMOD updating process applied to 1997 data.

Another plausible explanation for the lower EUROMOD estimates is that simulated incomes tend to produce more equal distributions (see section 1 above). In fact, this does not apply to the estimate of the Gini coefficient from the national model, SOMA, compared with that calculated using data from the same year, 1999 (the coefficients are the same, to two significant figures). However, by international standards the results in Tables 3.13a and 3.13b are close.

Figure 3.13.1 Gini coefficients for the 1st and 10th deciles for Finland in 1990-1999



Source: Economic Council (2002): Labour market Exclusion, Income Distribution and Poverty. Summary of the Working Group Report. Prime Minister Office: Publication 2002/2.

Tables 3.13c and 3.13d show poverty indicators from the Income Distribution Survey for 1998 compared with those from EUROMOD. Again, differences are small and consistent with the inequality results.

Table 3.13c: Poverty rates for Finland using the modified OECD scale, 1998

Poverty rate: % individuals with income < proportions of median	Riihelä et al./IDS) ¹	Statistics Finland (IDS) ²	EUROMOD
40%	2	-	1
50%	4	4	3
60%	9	10	9
70%	19	19	18

Sources: 1) Riihelä et al. (2001a)

2) Statistics Finland (2001): Income Distribution Statistics 1999. Income and Consumption 2001:16. (available in Finnish).

Table 3.13d: Poverty indicators for Finland using a OECD-type equivalence scale, 1998

Poverty line: proportions of median	IDS	EUROMOD
Poverty rate		
40%	1.4	0.3
50%	3.9	2.1
60%	8.9	7.4
FGT (1)		
40%	0.3	0.03
50%	0.7	0.2
60%	1.6	0.8
FGT (2)		
40%	0.2	0
50%	0.3	0.04
60%	0.5	0.2

Source: Riihelä et al. (2001a). 3. **OECD-type equivalence scale:** 1 single, 0.7 additional adults aged 18+, 0.5 children aged under 18.

3.14 Sweden

The comparisons of poverty rates and inequality measures are based on the Swedish Income Distribution Survey (IDS) from 1998. The comparisons are therefore “type B”. The income concept is the standard disposable income in the Swedish survey, except that capital gains are not included in income and taxes paid on capital gains are not deducted to make the definition comparable with that used in EUROMOD. The definition of the household does not correspond to the standard used in most European statistics: it is a narrower family unit with children aged over 18 treated as a separate unit. Other adults not part of the family unit are also treated separately. This tends to result in a higher level of poverty and inequality than if the wider household is used as the unit of income aggregation. For example, the Gini coefficient for family income was 0.265 in 1999 whereas the value for household income was 0.235.¹⁸ In particular, young people make up a large proportion of the people counted as poor on the Swedish definition. In the comparisons shown in Tables 3.14a and 3.14b EUROMOD results replicate the Swedish household definition.

The comparisons of poverty rates in Table 3.14a are shown by age group and by gender. The overall poverty rate is much lower using EUROMOD than the IDS – using the 60% cut-off the rate is nearly 8% in EUROMOD compared with 12% using data from the 1998 survey. Differences are in the same direction but generally less using the lower 50% cut-off.

Table 3.14a: Comparisons of poverty rate statistics by age and gender from the Swedish Income Distribution Survey (IDS) for 1998 and EUROMOD (%)

Poverty line:	50% median		60% median	
	IDS	EUROMOD	IDS	EUROMOD
All	7.7	5.6	11.9	8.2
All aged 0-64	8.0	6.5	11.5	8.6
All aged 65+	6.3	1.7	13.6	6.4
Men	8.1	6.2	11.8	8.5
Women	7.3	5.1	12.0	7.9
Men aged 0-64	8.7	7.0	12.3	9.0
Men aged 65+	5.0	2.0	9.4	5.4
Women aged 0-64	7.3	6.1	10.8	8.1
Women aged 65+	7.4	1.4	16.9	7.2
Men aged 0-74	8.1	6.6	11.5	8.6
Men aged 75+	8.3	1.6	15.3	7.0
Women aged 0-74	6.8	5.5	10.3	7.7
Women aged 75+	11.4	1.9	25.6	9.8

Source: IDS 1998 calculations by Bengt Eklind

Using both poverty lines there are very large discrepancies for the elderly. According to EUROMOD almost no Swedes over the age of 65 are poor using 50% median, and the

¹⁸ Statistics Sweden, “Income Distribution Survey, 1999” (IF21 SM0101). As with the results reported in this paper, capital gains are not included in these calculations. Corresponding Gini coefficients including the effect of capital gains are 0.294 and 0.266.

rates are low using the higher cut-off. The rates taken from the IDS show the elderly to be at a risk of poverty to about the same extent as the population as a whole using the lower cut-off. Elderly women are more at risk of poverty if aged over 75, and using the 60% cut-off their poverty rates are really quite high (26%). In international perspective this is explained by the unit of income aggregation – the elderly are all assumed to rely on their own incomes. Using the European standard household definition (as in the ECHP statistics in Tables 2a and 2b) assumes that they share incomes with any other household members, reducing their risk of poverty (e.g. using 60% median, to 10% for women aged 65+ compared with 17% using IDS statistics).

However, this does not explain why the EUROMOD estimates are so much lower, particularly for the elderly, since these statistics also use the narrow family unit for income aggregation. One factor likely to be relevant is that some of this group in fact fail to take up social assistance benefits. Indeed, the EUROMOD income definition excludes one small benefit – the special housing supplement for pensioners. This is excluded because simulations that do not take account of non-take-up result in 10 times too much benefit, when compared with administrative statistics (0.2bn SEK in 1998). Including the simulated value of the benefit lowers poverty rate among the elderly still further. Other Swedish income-tested benefits that are simulated in EUROMOD – social assistance and the housing supplement for pensioners – are also over-estimated when compared with administrative statistics (by approximately 4 and 2 times, respectively). The importance of the issue depends on the size of these benefits in relation to the rest of the system and incomes generally. While in Sweden income tested benefits are not nearly as important components of the system as, for example, in the UK, 8% of families were in receipt in 1999 (Eklind and Löfbom, 2002). It is likely that, if the non-take-up of these benefits were to be modelled explicitly – as in Swedish national model simulations – rather than assumed to be zero, the EUROMOD poverty rates would move closer to those calculated using IDS data directly.

Table 3.14.b compares three quantile points and the Gini coefficient. The 20th percentile is 7% higher in EUROMOD than the 1998 IDS, whereas the median is only 3% higher – a result that is consistent with the poverty rate comparisons above. The 80th percentile and the Gini coefficient are close, suggesting that the main reason for discrepancy in the poverty rates is the difference in level of low incomes. Again, non-take-up of income-tested benefits would be a plausible explanation.

Table 3.14b: Comparisons of quantile points and the Gini coefficient from the Swedish Income Distribution Survey (IDS) for 1998 and EUROMOD

Quantiles (SEK/year):	IDS	EUROMOD	Ratio EUROMOD:IDS
P20	88,446	94,892	1.073
Median	123,303	126,815	1.028
P80	168,465	171,474	1.018
Gini coefficient	0.25	0.26	-

Source: IDS 1998 calculations by Bengt Eklind

3.15 United Kingdom

Comparisons for the UK use two official sources. The first (“Economic Trends”) uses data from the same source as EUROMOD: the Family Expenditure Survey (FES). Here we compare results for the 1998/9 FES with simulations for 1998 based on data from the 1995/6 FES. This is a “type B” comparison, although the income variable is defined slightly differently.¹⁹

The second comparison is with poverty estimates from a different source – Households Below Average Income (“HBAI”) based on the Family Resources Survey (FRS) also for 1998/9. This is a “type E” comparison. Again, the income definition is slightly different.²⁰ Comparisons of the two surveys from 1995/6 were carried out by Frosztega et al. (2000) using a common income definition. They found that equivalised disposable income was on average £6 a week lower in FRS than FES (Appendix Table 3). However, for some household types FES incomes were on average lower than FRS incomes. Using the same surveys Dayal et al. (2000) found that the income distributions of the two samples are statistically significantly different. Generally FES produces higher poverty estimates than FRS.²¹

A third comparison is with output from the national model, POLIMOD, using the same database and, as far as possible, the same assumptions as EUROMOD. This is a “type F” comparison.

All the comparisons are carried out using the UK-specific equivalence scale, the McClements scale. This is defined as shown in the table below. Also shown are the weights of the modified OECD scale, rebased to be comparable with the McClements scale, which takes the couple (rather than the single person) as the base household.

	McClements (BHC)	Modified OECD
First adult	0.61	0.67
Spouse of first adult	0.39	0.33
Other second adult	0.46	0.33
Third adult	0.42	0.33
Fourth + adults	0.36	0.33
Child aged 0-1	0.09	0.20
Child aged 2-4	0.18	0.20
Child aged 5-7	0.21	0.20
Child aged 8-10	0.23	0.20
Child aged 11-12	0.25	0.20
Child aged 13	0.27	0.20
Child aged 14-15	0.27	0.33
Child aged 16-18	0.36	0.33

¹⁹ The official statistics include the imputed value of rent free accommodation and company cars, and water charges are deducted. The EUROMOD HDI variable does not include imputed incomes in kind and does not deduct utility charges.

²⁰ HBAI incomes include imputed welfare incomes in kind that are “passported” by virtue of receipt of certain income-tested benefits. Examples include free school meals and welfare milk.

²¹ See Sutherland et al. (2003) for more information.

Table 3.15a compares the decile points for the household distribution. The EUROMOD values are all much lower than those taken from the official publication. This may be a reflection of a failure to update 1995/6 income correctly but is much more likely to be explained by differences in the income definition. The statistics from Economic Trends annualise income approximately. EUROMOD is based on incomes from shorter periods (typically the month prior to interview). The official statistics include the imputed value of some incomes in kind.

Table 3.15a: Decile points of the UK household income distribution

Decile points £/year	Economic		Ratio
	Trends 1998/9	EUROMOD 1998	EUROMOD: Ec. Trends
1 st	4437	4338	0.98
2 nd	5820	5174	0.89
3 rd	7355	5975	0.81
4 th	8722	6981	0.80
5 th	10091	8224	0.81
6 th	11764	9734	0.83
7 th	13613	11363	0.83
8 th	16222	13609	0.84
9 th	21226	17714	0.83

Source: "The Effect of taxes and Benefits on Household Income for 1998/99", *Economic Trends* N.557 April 2000. **Equivalence scale:** McClements. **Unit:** Household

Table 3.15b confirms that the FES average is much higher in the Economic Trends estimates than using simulated incomes in EUROMOD and also shows that the FRS-based estimates (HBAI) are also higher than EUROMOD-generated estimates, but less so. The bottom decile point, and to a lesser extent the second decile are closer than the rest in the comparison shown in Table 3.15a. The most likely explanation for this smaller discrepancy is that in EUROMOD low incomes are on average inflated by the assumption of 100% take-up.

Table 3.15b: Average income in EUROMOD and other UK sources

£/year	Ec. Trends		EUROMOD		Ratio EUROMOD:	
	1998/9	HBAI 1998/9	1998	1998	Ec. Trends	HBAI
	Households	Individuals	Individuals	Households		
Mean (not equivalised)	19230	-	7284	17086	0.89	-
Mean (equivalised)	11042	10356	9757	9994	0.91	0.94
Median (equivalised)	-	8372	8201	8236	-	0.98

Sources: HBAI-Household below Average Income for 1998/99. Department of Social Security. Values are re-based to 1998/9

"The Effect of taxes and Benefits on Household Income for 1998/99", *Economic Trends* N.557 April 2000.

Equivalence scale: McClements.

Table 3.15c compares the within decile group medians for the individual distributions. Although most of the estimates are lower in EUROMOD, this is not the case for the bottom decile. This is consistent with the differences across the distribution shown in Table 3.15a and is likely to be due to the 100% take-up assumption in EUROMOD. The top decile median is

higher in the official statistics at least partly because a correction is made for under-reporting high incomes. This is not done in EUROMOD.

Table 3.15c: Decile group medians and income shares: UK

Decile	HBAI 1998/9		EUROMOD 1998		Ratio EUROMOD: HBAI
	Median £/year	Share %	Median £/year	Share %	Median
1 st	3504	3	3753	4	1.07
2 nd	4744	5	4653	5	0.98
3 rd	5705	6	5499	6	0.96
4 th	6666	6	6417	7	0.96
5 th	7783	8	7625	8	0.98
6 th	9023	9	8886	9	0.98
7 th	10511	10	10329	11	0.98
8 th	12372	12	12103	12	0.98
9 th	15100	15	14653	15	0.97
10 th	22139	27	20750	24	0.94

Sources: HBAI-Household below Average Income for 1998/99. Department of Social Security. Values are re-based to 1998/9. **Equivalence scale:** McClements. **Unit:** Individuals

Table 3.15d compares poverty rates from HBAI with those from EUROMOD, using poverty lines based on the mean and the median and for children as well as the population as a whole.²² Estimates are fairly close, except for some of the comparisons at low levels of income. Lower poverty estimates from EUROMOD are at least partly due to the benefit take-up assumption.

Table 3.15d: Proportions of individuals below percentages of average incomes: estimates for UK using EUROMOD, national statistics and national model results

%	HBAI 1998/9		EUROMOD 1998		POLIMOD 1998/9			
	<i>With benefits in kind</i>		<i>Without benefits in kind</i>		<i>With benefits in kind</i>		<i>Without benefits in kind</i>	
	All	Children	All	Children	All	Children	All	Children
40% mean	9	12	6	9	5	5	5	7
50% mean	19	26	18	26	16	22	16	25
60% mean	30	40	29	40	28	37	28	38
70% mean	40	50	39	50	38	48	38	48
80% mean	49	60	46	58	46	57	46	57
Mean	64	74	61	72	61	73	61	72
50% median	10	12	9	13	7	9	8	11
60% median	18	24	18	27	17	24	18	26
70% median	27	35	28	38	27	36	27	37
80% median	35	45	36	47	36	45	36	46
Median	50	61	50	61	50	61	50	61

Sources: HBAI-Household below Average Income for 1998/99. Department of Social Security. Values are re-based to 1998/9; POLIMOD – see Redmond et al. (1998)

Equivalence scale: McClements. **Unit:** Individual

²² Children are defined in the same way in each set of estimates – as being aged under 16 or under 19 if in full-time non-advanced education and not themselves married.

Table 3.15d also shows poverty estimates based on mean and median incomes from POLIMOD, the UK tax benefit model which uses the same dataset as EUROMOD. The main difference is in the updating factors which adjust 1995/6 market incomes to 1998 levels: EUROMOD uses a simplified set of factors. Two sets of results are shown: one including imputed welfare benefits in kind, as in the HBAI statistics and one without these incomes (as in EUROMOD). The second set of results is closer to those of EUROMOD. They are mainly very close, except at the low levels of income for children where EUROMOD results are generally somewhat higher.

4 Conclusions

We conclude this paper in three ways. First, the main reasons for difference between indicators calculated using the EUROMOD baseline and those taken from other sources are summarised. Secondly, we consider the issues that are relevant when assessing the quality of policy simulation results using the baseline as a starting point. This leads to a final discussion of future work.

4.1 *The EUROMOD baseline*

The comparisons that have been possible to carry out are by no means comprehensive. Many of them are inconclusive because of lack of full information about the national source of statistics. Comparisons with ECHP in section 2 may be seen as the most useful part of the exercise because the harmonised definitions and assumptions provide a very useful 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. In some cases the national statistics that we compare with are known to be not fully comparable (e.g. in France, Greece, the Netherlands and UK). It is difficult to assess the weight we should give to the outcome of these comparisons as against those that appear to be made on a consistent basis. However, with the limitations of the exercise firmly in mind, we can conclude that statistics summarising the EUROMOD baseline are broadly in line with what might be expected from other evidence; and therefore that the baseline provides an adequate starting point for policy simulation experiments.

As we have seen, headline indicator statistics may compare well; but this may mask many underlying differences. The potential explanations for difference in estimates were discussed in section 1. 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”. Moreover, not all types of comparison are possible for all countries.

Some comparisons allow us to focus on particular aspects. At one extreme we can compare EUROMOD results with those for the same policy year from national policy simulation models based on the same data. This does not test the accuracy of EUROMOD estimates in

relation to what actually happens in the country, but generally national model results have already been validated against national statistics and administrative information. This type of comparison is done for Spain, Ireland and the UK. In principle it should be possible to get exactly the same results. In practice discrepancies can be explained by differences in assumption, level of detail or coverage of simulated income components. We have observed instances where these can make dramatic differences.

Another example of a comparison that limits the possible sources of difference is where we can compare simulated 1998 incomes with 1998 incomes drawn directly from the same dataset. This is done for Austria and Luxembourg and highlights differences between simulated incomes and those drawn directly from the database. Tax evasion and benefit non-take-up will give rise to differences, as will any other feature of tax payment or benefit receipt that cannot be fully captured in simulations using the available data.

When the comparison is made with data drawn from a different source then many other factors may introduce discrepancy, in addition to those mentioned above. Such comparisons are more stringent tests of the accuracy of EUROMOD results. However, at the same time, differences in estimates do not necessarily imply that the quality of EUROMOD results is poor. First, there may be deficiencies in the non-EUROMOD data source (as is the case for the ECHP for Spain) which may be known or unknown. Secondly, if data are taken from an earlier period they may not provide a good basis of comparison – actual changes in the characteristics of the population may be driving differences in statistics.

The following list summarises possible explanations for differences in the comparisons made in this paper. Countries where the explanation is known to apply are shown in brackets – but this does not mean that the issue is not relevant elsewhere. Explanations which suggest that particular care should be used in interpreting EUROMOD results are shown in **bold**.

- **Updating of the pre-1998 EUROMOD database does not capture all relevant aspects of actual change** (e.g. demographic change; differential growth in incomes) [Finland, Germany]
- **Non-take-up of means-tested benefits is not captured in EUROMOD** [Germany, Ireland, Austria, UK]
- **Tax evasion is not captured in EUROMOD**
- **Lack of information does not allow some details of the tax-benefit system to be captured by EUROMOD** (e.g. certain tax reliefs and avoidance schemes)
- EUROMOD captures some benefits better than some survey data because of under-reporting [Spain]
- Differences in the underlying datasets (due to different survey design, non-response etc)

- Comparisons are with statistics that have been derived using different methods and assumptions (income definition)

In addition, the comparisons have highlighted areas where the EUROMOD baseline is not fully comparable across countries. The unit of aggregation is different in Sweden and the reference time period is different in Ireland and the UK.

4.2 Policy simulation

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 sources of information on the distributional effects of policy changes with which to compare. The exception is where we have access to national 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 (section 3.7) 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 pre-reform pension incomes.

In the absence of national model results from policy simulations to compare with, 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 the type (a) have been carried out for some countries and are documented in EUROMOD Country Reports (and this paper draws on them to some extent). 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.)

Comparisons of type (b) can be carried out for the period 1998-2001 when the 2001 baseline system is completed in EUROMOD. We would not expect EUROMOD simulations to match the change in administrative totals both because of the reasons described above (although some will be netted out when looking at changes) and because change in population composition is not captured in EUROMOD. For example, an increase in unemployment will increase the amount spent on unemployment benefits but EUROMOD will only capture any change due to policy reforms to the benefit.

4.3 Future work

Here, we list possible components of the second stage of the validation of EUROMOD results.

- Comparisons of income-based social indicator statistics using the 1998 and 2001 baselines, and with external statistics for 2001 where these are available
- Comparisons of outputs from simulations of policy changes, comparing EUROMOD with national models
- Comparisons of aggregate statistics on tax-benefit instruments with national administrative statistics and of changes in these 1998-2001
- Comparisons that take account of future model developments: for example those which attempt to account for non take-up of means-tested benefits.

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Appendix 1: EUROMOD base datasets

Country	Base Dataset for EUROMOD	Date of collection	Reference time period for incomes
Belgium	Panel Survey on Belgian Households (W6)	1997	annual 1996
Denmark	European Community Household Panel (W2)	1995	annual 1994
Germany	German Socio-Economic Panel (W15)	1998	annual 1997
Greece	European Community Household Panel (W2)	1995	annual 1995
Spain	European Community Household Panel (W3)	1996	annual 1995
France	Budget de Famille	1994/5	annual 1993/4
Ireland	Living in Ireland Survey (W1)	1994	month in 1994
Italy	Survey of Households Income and Wealth	1996	annual 1995
Luxembourg	PSELL-2 (W5)	1999	annual 1998
Netherlands	Sociaal-economisch panelonderzoek (W3)	1996	annual 1995
Austria	Austrian version of European Community Household Panel (W5)	1999	annual 1998
Portugal	European Community Household Panel (W3)	1996	annual 1995
Finland	Income distribution survey	1997	annual 1997
Sweden	Income distribution survey	1997	annual 1997
UK	Family Expenditure Survey	1995/6	month in 1995/6

Appendix 2: The value in Euro per year of 60% equivalised median income using the 1998 EUROMOD baseline, compared with ECHP 1998

	B	DK	D	EL	E	F	IRL	I	L	NL	A	P	FIN	S	UK
EUROMOD 1998	7249	10263	8346	4021	4329	8452	5883	6275	12899	8193	8817	3123	7998	8007	7747
ECHP 1998 incomes	8531	11649	8754	3810	4491	8289	6656	5557	12716	7668	8621	3168	8154	8503	8289
Ratio	0.850	0.881	0.953	1.055	0.964	1.020	0.884	1.129	1.014	1.069	1.023	0.986	0.981	0.942	0.935
<i>Euro exchange rate 31 Dec 1998</i>	<i>40.340</i>	<i>7.4587</i>	<i>1.9558</i>	<i>340.75</i>	<i>166.39</i>	<i>6.5596</i>	<i>0.7876</i>	<i>1936.3</i>	<i>40.340</i>	<i>2.2037</i>	<i>13.760</i>	<i>200.48</i>	<i>5.9457</i>	<i>9.5121</i>	<i>0.7032</i>
<i>PPS-Euro conversion factor</i>	<i>0.9852</i>	<i>1.2374</i>	<i>1.0629</i>	<i>0.8016</i>	<i>0.8399</i>	<i>1.0434</i>	<i>0.9903</i>	<i>0.8814</i>	<i>1.0147</i>	<i>0.9505</i>	<i>1.0568</i>	<i>0.7200</i>	<i>1.1782</i>	<i>1.2249</i>	<i>1.0773</i>

ECHP data from Dennis and Guio (2003) converted from PPS to Euro using the factors shown. Results for Spain and UK are due for revision.

EUROMOD baseline results are from Feres et al. (2002) using EUROMOD output dated 29/11/02 except for Sweden, which were produced on 25/4/03.