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THE DISTRIBUTION OF INCOME
AND RELATIVE INCOME POVERTY
IN THE EUROPEAN COMMUNITY
HOUSEHOLD PANEL

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1. Introduction

In this paper, as part of the Panel TSER Project, we examine the distribution of disposable income among households in each of the countries participating in the European Community Household Panel (ECHP), and the extent of relative income poverty in those countries. In future papers we will be analysing non-monetary indicators of deprivation, the relationship between income and deprivation, and changes from one wave to another in both income and deprivation. This paper provides the initial foundation for that broader programme on longitudinal income and social exclusion, by presenting a detailed picture of income distribution and relative income poverty in Wave 1.

Section 2 outlines the methods used to describe the distribution of income and measure relative income poverty. Section 3 looks first at the distribution of unadjusted disposable income among households in Wave 1 of the ECHP. It then describes the distribution of equivalised income, taking account of differences in household size and composition, among persons. Section 4 assesses these results in the context of other recent cross-country comparative studies of income inequality. In Section 5 we analyse the extent of relative income poverty in Wave 1 of the ECHP. Section 6 compares these results with other recent cross-country poverty studies. Finally, Section 7 summarises the main findings.

2 Measuring Income Inequality and Poverty

A range of methodological issues has to be addressed in measuring the distribution of income and the extent of income poverty. Here our aim is not to provide a comprehensive treatment of these issues, but rather to note the key ones and state clearly the approaches followed here which underlie the results presented. (For in-depth discussion on the measurement of income inequality see for example Atkinson, Rainwater and Smeeding 1995, Chapter 2, Cowell 1995, Jenkins 1991; on the measurement of income poverty see Atkinson 1987, Callan and Nolan 1992, Hagenaars, de Vos and Zaidi 1994).

The income concept employed throughout this paper is household disposable income, (that is after cash transfers have been received and income tax and social insurance contributions paid), as constructed by Eurostat. The ECHP survey contains a great deal of detail on income accruing to household members from different sources. This covers and distinguishes:

   income from employment,

   income from self-employment,

   occupational pensions,

   rental income,

   interest and dividends,

   cash transfers from the state by type, and

   regular cash transfers from other households.

Generally information is obtained on receipts from each individual adult and aggregated to arrive at the total for the household, though in certain cases (e.g. rental income) information on the household total was sought on the household questionnaire. For some sources, notably self-employment, rental and investment income, information about both gross and net receipt is not always obtained, but information about the tax and social insurance in operation in the country in question estimates can be made of net from gross or vice versa. The nature of the data obtained for certain countries raises particular problems in this respect, notably for France where self-employment income is only available on a gross basis. The constructed household income variable incorporates an adjustment for unit missing records, where one or more of those eligible for interview did not respond, and so offers the most comprehensive picture of net household income. We use throughout the version of the ECHP data released for general use in the form of the User Data Base (UDB).

The time period adopted in measuring income is an important issue. Some survey datasets commonly used in measuring income inequality and poverty - such as the UK Family Expenditure Survey - employ a relatively short accounting period of a week or month for most income sources, whereas others focus on annual income. In the ECHP, an annual accounting period is adopted, covering income received in the calendar year prior to the date of interview. In focusing on Wave 1, with the interviewing carried out in 1994 the reference period was 1993.

While the ultimate source of concern is the welfare of the individual, the income accruing to each individual is not a satisfactory measure of their command

over resources because income is generally shared among individuals in a given family or broader household. Here, the income recipient unit employed is the household. This is defined in the ECHP as comprising "either one person living alone or a group of persons, not necessarily related, living at the same address with common housekeeping - i.e. sharing a meal on most days or sharing a living or sitting room" (Eurostat Doc PAN 16, 1994, p. 2). One of the advantages of the ECHP is that it provides a greater degree of harmonisation across countries in the definition of what constitutes a household than a compilation of national survey datasets, though some differences in the precise way this is implemented are to be expected. The extent to which income is actually shared within the household so as to equalise living standards is an empirical question which has received some attention (see for example Lundberg, Pollak and Wales 1997, Cantillon and Nolan 1998). Here, however, we follow conventional practice in assuming that all members of a particular household share a common standard of living.

Since a given income will provide a different living standard to the individuals in a large versus a small household, or adults rather than children, income has to be adjusted for differences in household size and composition. Equivalence scales are intended to make such an adjustment, with actual household income being divided by the number of equivalent adults in the household to produce equivalent or equivalised income. A very wide range of scales is employed within and across countries, and there is no consensus as to which set of scales or methodologies for estimating them is most satisfactory or appropriate. (Studies such as Buhman *et al* (1988) and Coulter, Cowell and Jenkins (1992) have looked at the extent to which the equivalence scale employed can affect the measured income distribution.)

Here the principal scale employed is what is widely known as the "modified OECD" scale where the first adult in the household is given a value of 1, each adult is attributed a value of 0.5 and each child 0.3. This scale is among those employed in Hagenaars, de Vos and Zaidi (1994). It is also the one used in Eurostat's "Statistics in Focus" summaries "Income Distribution and Poverty in EU12-1993", based on an early version of the data from the first Wave of the ECHP, and "Analysis of income distribution in 13 EU Member States" based on Wave 2. We assess the sensitivity of the key findings by also using the OECD scale - under which each other adult is attributed a value of 0.7 and each child is attributed a value of 0.5 - and the square

root of household size (used in for example Atkinson, Smeeding and Rainwater 1995). As in Hagenaars *et al*, we take adult here to mean age 14 years or over.

A further issue is whether one focuses on the distribution of income or poverty among households, attributing each household equal weight in the analysis, or on the distribution among individuals. As noted by Atkinson, Rainwater and Smeeding, it makes sense to treat each household as a single unit (i.e. to apply household weights) if no adjustment is made to income for household size. When equivalent income is used, person weights seem more appropriate. This is achieved by weighting each household in the analysis by the number of persons it contains.

The distribution of income among households and/or persons may be portrayed and summarised in a number of different ways. Here we present decile shares - the share of total income going to the bottom 10%, the next 10%, ... top 10%. In addition, summary measures of inequality are also employed. These are the Gini coefficient, the Atkinson inequality measure with coefficients (i.e. inequality aversion parameter) of 0.5 and 1.0, and Theil's entropy measure. These commonly used measures are fully described in e.g. Cowell (1995).

In measuring income poverty we also follow conventional practice in recent cross-country studies in relying on relative income poverty lines. This involves deriving income lines as proportions of mean or median income in the country in question. Here, we employ both the mean and the median as measures of central tendency, to allow the sensitivity of the results to this choice to be assessed. The poverty lines adopted are calculated as 40%, 50% and 60% of mean equivalent income, and 50%, 60% and 70% of the median equivalent income, in the country in question.

In measuring poverty given these poverty lines, a number of summary measures are employed. The first is the simple head-count of numbers below the income line as a percentage of the total population. While widely used, the limitations of this measure (as highlighted by Sen, 1976) have been recognised for some time, arising from the fact that it does not take into account how far people fall below the line. We therefore also present results for the poverty gap as a percentage of the mean, and for the weighted poverty gap, i.e. the measure proposed by Foster, Greer and Thorbecke (1984) with a parameter of 2. (A full description of these widely used measures is in Foster *et al*, Hagenaars 1991 or Hagenaars *et al* 1994).

3 The Distribution of Income among Households in Wave 1 of the ECHP

We do not in this paper provide a description of the ECHP dataset in terms of sampling, response rates, weighting procedures etc. since that is available elsewhere, but it is necessary to note at the outset that we had to exclude some households in the dataset from our analysis because they had missing values for total household income. Table 1 shows the number of cases in each country that had to be dropped for this reason. We see that in some countries missing values on total household income is a serious problem, most importantly for Italy where over 300 cases are lost for this reason.

Table 1: *Cases Dropped Due to Missing Income Information, ECHP Countries, Wave 1*

	Total N	Missing Total Income
Germany	4466	64
Denmark	3482	4
Netherlands	5187	67
Belgium	4185	79
Luxembourg	1011	0
France	7344	49
United Kingdom	5779	59
Ireland	4048	28
Italy	7115	313
Greece	5523	47
Spain	7206	64
Portugal	4881	99

While income after adjustment for household size is more satisfactory as a measure of living standards, it is useful to look first at the distribution of income before any such adjustment. This allows one to see for example how the impact of equivalisation varies across countries. Table 2 portrays the distribution in terms of decile shares in unadjusted disposable income among households in each country in Wave 1 of the ECHP, using all the cases for which total household income is not missing. (As noted earlier, it seems appropriate to employ household weights when dealing with unequivalised incomes).

These results show considerable variation across countries in the share of total disposable income going to for example the bottom and the top deciles. The share of the bottom decile ranges from well under 2% in Greece and Portugal up to almost 3% in Denmark. The share going to the top decile, on the other hand, ranges from 23-24%% in Denmark, the Netherlands and Belgium up to 28-30% in the UK, Ireland, Portugal and Greece, and over 30% in Portugal.

Table 2 : Decile Shares in disposable Income among households Wave1 (UDB) ECHP

Decile					Share in Unequivalised Income							
	Germany	Denmark	Netherlands	Belgium	Luxembourg	France	UK	Ireland	Italy	Greece	Spain	Portugal
1	2.3	2.9	2.5	2.4	2.5	2.2	2.0	2.2	2.1	1.4	2.3	1.5
2	4.0	4.4	4.2	4.0	4.2	4.0	3.3	3.2	3.9	3.1	3.6	2.7
3	5.4	5.5	5.5	5.1	5.3	5.2	4.4	4.5	5.3	4.5	4.9	3.9
4	6.6	6.6	6.9	6.3	6.5	6.5	5.6	5.8	6.4	6.0	6.2	5.4
5	7.9	8.0	8.4	7.7	7.7	7.8	7.2	7.3	7.8	7.5	7.5	7.0
6	9.4	9.6	9.8	9.2	8.9	9.1	9.0	8.8	9.1	9.0	8.8	8.6
7	11.1	11.5	11.4	11.2	10.6	10.7	10.9	10.7	11.0	10.9	10.5	10.3
8	13.1	13.3	13.1	13.4	12.6	12.8	13.1	13.0	13.2	13.3	12.8	12.8
9	15.9	15.5	15.5	16.3	15.4	15.9	16.5	16.2	16.4	16.6	16.3	17.3
10	24.5	22.9	22.6	24.3	26.3	25.8	28.0	28.3	24.9	27.8	27.1	30.6
total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Summary inequality measures for the distribution of unequivalised household income in Wave 1 are presented in Table 3. Ranked by the Gini measure, Denmark and the Netherlands have the most equal distribution and Portugal and Greece have the least equal. Of the rest, Germany, Belgium and Luxembourg are towards the relatively equally distributed end of the spectrum, the UK and Ireland are towards the relatively unequal end, and France, Italy and Spain are approximately in the middle. Turning to the other summary inequality measures, the Theil index and the Atkinson measure with parameter 0.5 or 1.0 show a broadly similar picture to the Gini, though with some variation in the rankings. Based on income before adjustment for household size these cannot be taken to reflect the distribution of command over resources, living standards or welfare, but they provide a point of departure from which the impact of equivalisation itself on different countries can be assessed.

Table 3 : *Summary Inequality Measures for Distribution of Disposable Income among Households, Wave 1 (UDB) ECHP*

	Gini	Rank	Atk 0.5	Rank	Atk 1	Rank	Theil	Rank
Germany	34.3	3	9.7	3	19.4	4	19.7	3
Denmark	32.0	2	8.5	1	16.3	1	17.8	2
Netherlands	31.8	1	8.5	2	17.7	2	17.0	1
Belgium	34.8	4	9.9	4	20.0	5	20.1	4
Luxembourg	35.0	5	10.0	5	19.0	3	21.3	6
France	35.5	7	10.6	7	20.2	6	22.0	7
UK	39.5	10	12.7	10	24.4	10	26.8	9
Ireland	39.3	9	12.6	9	23.5	9	27.0	10
Italy	35.4	6	10.3	6	20.7	7	20.9	5
Greece	40.1	11	13.6	11	26.7	11	28.2	11
Spain	37.3	8	11.3	8	21.6	8	23.8	8
Portugal	43.4	12	15.5	12	29.5	12	32.4	12

We now adjust household incomes to take differences in size and composition into account. We employ the modified OECD scale as our central scale, but assess the overall sensitivity of the results using the OECD and square root of household size scales. We also move from the distribution among households to that among persons, each individual being attributed the equivalised disposable income of the household of which they are a member.

Table 4 shows decile shares in equivalised disposable income among persons in the revised Wave 1 ECHP, using the modified OECD equivalence scale. The share of the bottom decile is now higher in all countries than was the case for unadjusted income, ranging from about 2% in Greece and Portugal up to over 4% in Denmark.

The share going to the top decile, on the other hand, is now consistently lower than for unadjusted income, ranging from 20% in Denmark up to 26% in the UK and Ireland and 29% in Portugal.

Table 4 : Decile Shares in Equivalised Disposable Income among persons Wave1 (UDB) ECHP
Share in Equivalised Income

Decile	Germany	Denmark	Netherlands	Belgium	Luxembourg	France	UK	Ireland	Italy	Greece	Spain	Portugal
1	2.6	4.4	3.7	3.0	3.3	3.1	2.7	3.3	2.3	2.1	2.6	1.9
2	5.0	6.3	5.7	5.2	4.8	5.0	4.3	4.5	4.6	4.0	4.5	3.7
3	6.4	7.3	6.6	6.4	6.2	6.0	5.4	5.3	5.8	5.4	5.6	5.0
4	7.5	8.2	7.4	7.5	6.9	7.0	6.5	6.2	7.0	6.7	6.7	6.3
5	8.5	8.9	8.3	8.6	7.9	8.1	7.7	7.4	8.2	7.9	7.7	7.4
6	9.6	9.7	9.4	9.8	9.0	9.2	9.0	8.7	9.5	9.2	9.0	8.6
7	10.8	10.5	10.6	10.9	10.3	10.5	10.5	10.4	11.0	10.8	10.4	10.0
8	12.3	11.6	12.3	12.4	12.2	12.1	12.5	12.4	12.9	12.7	12.5	12.1
9	14.8	13.3	14.5	14.5	15.2	14.8	15.2	15.5	15.3	15.3	15.6	15.8
10	22.4	19.8	21.7	21.9	24.4	24.3	26.3	26.4	23.5	26.1	25.5	29.3
total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Equivalence scale: modified OECD, 1, 0.5, 0.3.

Summary inequality measures for income equivalised using the modified OECD scale are shown in Table 5. The rankings in terms of the Gini measure are generally similar to those for unadjusted income, although Denmark rather than the Netherlands now has the most equal distribution. Portugal and Greece now have the least equal distributions, followed by the UK and Ireland.

Table 5 : *Summary Inequality Measures for Distribution of Equivalised (Modified OECD) Disposable Income among Persons, Wave 1 (UDB) ECHP*

	Gini	Rank	Atk 0.5	Rank	Atk 1	Rank	Theil	Rank
Germany	29.3	4	7.3	4	14.6	4	14.9	4
Denmark	22.2	1	4.5	1	7.9	1	10.2	1
Netherlands	27.0	2	6.2	2	12.2	2	12.7	2
Belgium	28.2	3	6.8	3	13.2	3	13.9	3
Luxembourg	31.1	6	8.0	5	15.0	5	17.1	5
France	30.9	5	8.1	6	15.4	6	17.4	6
UK	34.6	10	9.9	10	18.6	10	21.2	10
Ireland	34.1	9	9.5	9	18.0	8	21.0	9
Italy	32.1	7	8.8	7	17.4	7	17.7	7
Greece	35.3	11	10.6	11	20.3	11	22.4	11
Spain	33.8	8	9.5	8	18.4	9	19.8	8
Portugal	38.8	12	12.5	12	23.8	12	26.4	12

To allow the sensitivity of the results to the choice of equivalence scale to be seen, we recalculated the decile shares and summary inequality measures for both the OECD and square root equivalence scales. Table 6 summarises the overall pattern by simply reporting the Gini inequality measure for each country with each of the three equivalence scales. We see that the equivalence scale employed does make a difference to the level of the Gini coefficient in some countries. However, while some pairwise rankings of countries by inequality level are different, the overall pattern in terms of country groupings is not affected by the choice across these three scales.

4. The ECHP Income Distribution Estimates in Context

Having presented figures for the income distribution in the ECHP, it is useful to compare them briefly with results from other cross-country comparative exercises using different data sources. First, though, it may be helpful to compare them with other figures produced from the ECHP, by Eurostat. In "Income Distribution and Poverty in EU12 - 1993", in the Statistics in Focus series (1997 no. 6), decile shares in equivalised income using the modified OECD scale, together with Gini coefficients, were presented based on an early version of the data from Wave 1.

Table 6: *Gini Coefficient for Equivalised Disposable Income Among Persons in ECHP Wave 1, Alternative Equivalence Scales*

	Modified OECD Scale	OECD Scale	Square Root scale
	Gini	Gini	Gini
Germany	29	30	29
Denmark	22	23	23
Netherlands	27	28	27
Belgium	28	29	29
Luxembourg	31	32	31
France	31	32	31
UK	35	35	35
Ireland	34	35	34
Italy	32	33	32
Greece	35	36	35
Spain	34	34	34
Portugal	39	39	39

Concentrating on the Gini coefficients for convenience, these are compared with our estimates from Wave 1 in Table 7. We see some substantial differences between the figures produced here and the early Eurostat summary release. For example, the Gini coefficient for the Netherlands is 34 compared with 27 here, and that for Italy is 37 compared with 32 here.

The same income definition and equivalence scale are used in that summary report and this study. However, the weighting procedure differs: the results in the summary report appear to be household-weighted, whereas here we have employed person weights in analysing equivalised income, for the reasons described in Section 2. The Wave 1 data have also been revised, in some cases substantially, since the summary report was produced. These factors appear to be the main sources of the observed differences.

More recently, income distribution results have also been published in summary form by Eurostat based on Wave 2 of the ECHP, once again in the Statistics in Focus series and using the modified OECD scale (but now with person-weighting). The Gini coefficients from this publication, together with the estimates we derived from Wave 1 and corresponding figures we have also produced from Wave 2, are shown in Table 8. We see that comparing Wave 1 and Wave 2 estimates produced in this study, they are generally very close. The only cases where the Gini has changed by more than 1 are France, the UK and Portugal. Comparing our estimated Gini

coefficients for wave 2 with those published in Statistics in Focus, there are some differences which may be primarily attributable to on-going data revisions.

Table 7: *Gini Coefficient for Equivalised Disposable Income Among Persons, Modified OECD Scale, Wave 1 of the ECHP*

	Statistics in Focus	This Study
	Gini	
Germany	?	29
Denmark	25	22
Netherlands	34	27
Belgium	31	28
Luxembourg	32	31
France	33	31
UK	37	35
Ireland	34	34
Italy	37	32
Greece	38	35
Spain	35	34
Portugal	42	39

Table 8: *Gini Coefficient for Equivalised Disposable Income Among Persons in ECHP Wave 1 and Wave 2, Modified OECD Scale*

	Wave 1, this study	Wave 2, this study	Wave 2, Statistics in Focus
	Gini	Gini	Gini
Germany	29	29	?
Denmark	22	23	23
Netherlands	27	27	25
Belgium	28	29	30
Luxembourg	31	31	30
France	31	29	29
UK	35	33	34
Ireland	34	35	36
Italy	32	31	31
Greece	35	34	35
Spain	34	33	34
Portugal	39	37	37

Moving on to the results of cross-country comparisons of income inequality using other sources, the most useful point of comparison may be the comprehensive study of income inequality carried out by Atkinson, Rainwater and Smeeding (1995) for the OECD. This was based primarily on data from the Luxembourg Income Study database, with the date of the surveys on which the study focused being between 1984-1988. In addition they were able to include results for Portugal and Spain, not in the LIS, produced on a comparable basis from national sources. The income concept,

recipient unit and accounting period employed was similar to that used in the ECHP, the main focus being on disposable household income measured over a year without including for example imputed rent. (Unlike the ECHP, the datasets in LIS come from national surveys which are not harmonised at source: areas where data for particular countries departed from the desired measure of income or the household unit are discussed in Atkinson, Rainwater and Smeeding, Section 1.2).

Atkinson, Rainwater and Smeeding present results on the distribution of income for nine out of the eleven countries covered in this study - they did not have data for Denmark or Greece - using the square root equivalence scale and person weighting. Table 9 compares these with the figures presented from the ECHP Wave 1 with the square root equivalence scale. There are major differences for some countries between the two sets of results. As summarised in the Gini coefficient, the level of inequality in the ECHP was a good deal higher than in the Atkinson *et al* results for Germany, Belgium, Luxembourg, the UK, Spain and Portugal. For the Netherlands, France, Ireland and Italy the ECHP estimates are similar to those in Atkinson, Rainwater and Smeeding.

It is known from national studies that the level of income inequality did indeed rise between the mid-1980s and the mid-1990s in some EU countries, notably the UK. On this basis the increase in the UK Gini appears broadly consistent with external evidence (see for example Goodman, Johnson and Webb 1997[1]). Some increase in inequality in Belgium up to 1992 is suggested by national sources (see Cantillon *et al* 1994), but not as great as the gap between the Atkinson, Rainwater and Smeeding and ECHP figures.[2] It would however be surprising if the level of inequality had increased in Luxembourg and Portugal by as much as this comparison suggests, particularly when the Atkinson, Smeeding and Rainwater results for Portugal refer to 1989/90. As we have seen, the Gini for Portugal in Wave 2 of the ECHP is lower, but still well above the figure given by Atkinson, Rainwater and Smeeding. Further investigation and comparison of the ECHP with national sources, for these countries in particular, seems a priority.

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[1] The latter cannot be compared directly with either ARS or the ECHP results because a different equivalence scale is used.

[2] Cantillon et al (1994) show the Gini coefficient increasing from 0.225 in 1985 to 0.237 in 1992, using a different equivalence scale.

Table 9: *Gini Coefficient, Equivalised Income among Persons, Square Root Scale, Wave 1 ECHP and Atkinson, Rainwater and Smeeding Study*

		Gini
Germany	ECHP	29
	ARS (1984)	25
Netherlands	ECHP	27
	ARS (1987)	27
Belgium	ECHP	29
	ARS (1988)	24
Luxembourg	ECHP	31
	ARS (1985)	24
France	ECHP	31
	ARS (1984)	30
UK	ECHP	35
	ARS (1986)	30
Ireland	ECHP	34
	ARS (1987)	33
Italy	ECHP	32
	ARS (1986)	31
Spain	ECHP	34
	ARS (1990/91)	31
Portugal	ECHP	39
	ARS (1989/90)	31

Equivalence scale: square root of household size.
Source: Atkinson, Rainwater and Smeeding 1995 Tables 4.3 and 4.4 except for
Spain, from Table 5.21 and Portugal Table 5.20.

5. Relative Income Poverty in Wave 1 of the ECHP

We now turn from the distribution of income to income poverty. The methodological issues in measuring income poverty have already been discussed in some detail in Section 2. To reiterate the main features of the approach adopted here, we are using country-specific relative income poverty lines, so the standard being used is "ordinary living standards" in the country in question rather than in the EU as a whole. We use both the mean and the median so the sensitivity of the results to the choice of measure of central tendency can be assessed. Rather than concentrating on a single proportion of the benchmark, we look at 40%, 50% and 60% of the mean, the proportions widely used in previous cross-country comparisons. In the case of the median this range would be less informative because 40% of the median is very low indeed for some countries and of little interest, so with the median 50%, 60% and 70% are employed. Household income is equivalised in the manner already described, household equivalised income is attributed to each person in the household, and persons rather than households are counted in calculating the mean/median and the

numbers below the income poverty lines. The poverty measures employed are the head count, the poverty gap (as a percentage of the mean) and the weighted poverty gap (as a percentage of the mean).

Table 10 shows the percentage of persons in each of the countries in Wave 1 of the ECHP below 40%, 50% and 60% of mean equivalised income using the modified OECD equivalence scale. The poverty rate on this basis ranges from only 3% in Denmark with the 40% line up to 33% in Portugal below the 60% line. Focusing on the 50% line, the range is from 6% in Denmark to 25% in Portugal. With all three lines, Denmark and the Netherlands have the lowest low poverty rates. Portugal has the highest rates with all three lines and is equal to Ireland with the 60% line. The UK, Spain and Greece also have relatively high rates.

The corresponding results with the same equivalence scale but using 50%, 60% and 70% of the median are shown in Table 11. Very much the same configuration of countries is seen, with Denmark and the Netherlands having relatively low poverty rates at all three lines, and Greece and Portugal having relatively high rates with all three. Poverty rates with half the median are of course lower than with half the mean, but even using the former the poverty rate exceeds 15% in Greece and Portugal.

Table 10 : *Percentage of Persons below Mean-based Relative Income Poverty Lines, Modified OECD scale, Wave 1 (UDB) ECHP*

	% of persons below proportion of mean		
	40%	*50%*	*60%*
Germany	9.9	15.2	21.4
Denmark	2.9	6.0	12.2
Netherlands	4.7	8.8	19.1
Belgium	7.3	13.3	21.5
Luxembourg	6.5	15.4	25.9
France	7.7	14.9	24.5
UK	12.3	21.3	30.8
Ireland	7.7	21.6	32.9
Italy	11.2	17.7	26.2
Greece	14.8	21.8	29.3
Spain	11.0	19.8	29.1
Portugal	17.1	25.2	32.9

Table 11: *Percentage of Persons below Median-based Relative Income Poverty Lines, Modified OECD scale, Wave 1 (UDB) ECHP*

| | % of persons below proportion of median | | |
	50%	*60%*	*70%*
Germany	13.2	17.4	24.0
Denmark	4.5	9.1	16.8
Netherlands	6.2	10.7	20.7
Belgium	10.9	17.4	25.4
Luxembourg	7.4	15.6	25.0
France	9.5	16.3	24.6
UK	13.9	21.3	29.5
Ireland	8.0	19.7	28.4
Italy	13.4	20.1	27.0
Greece	16.3	22.8	29.0
Spain	12.3	19.8	27.4
Portugal	17.1	23.4	29.4

We now look at whether alternative equivalence scales make any difference to the levels of poverty across countries. Table 12 shows poverty rates at 50% of the mean with the three equivalence scales. Compared with the modified OECD scale, the poverty rates produced by the other scales are generally similar, though choice of scale makes some difference to certain countries. For example, Denmark has a higher poverty rate with the square root scale than the other two, while those for the Netherlands, France, Luxembourg and Italy are higher with the OECD scale.

Table 12: *Percentage of Persons below 50% of Mean Relative Income Poverty Line, Alternative Equivalence Scales, Wave 1 (UDB) ECHP*

| | % of persons below 50% mean with scale | | |
	Modified OECD	*OECD*	*Square root*
Germany	15.2	15.3	15.5
Denmark	6.0	5.3	7.2
Netherlands	8.8	10.5	9.2
Belgium	13.3	13.5	14.2
Luxembourg	15.4	16.6	14.8
France	14.9	16.2	14.6
UK	21.3	21.8	22.2
Ireland	21.6	21.3	21.5
Italy	17.7	19.0	17.1
Greece	21.8	22.2	21.6
Spain	19.8	20.2	20.3
Portugal	25.2	25.0	25.4

A poverty headcount alone has limitations as an aggregate measure of poverty, and it is useful to supplement it with measures taking the depth and distribution of income poverty into account. We therefore present the poverty gap and weighted

poverty gap measures described above. Table 13 shows the poverty gap and weighted poverty gap measures, with poverty lines set at 40%, 50% and 60% of the mean in each country. We see that the ranking of countries in terms of these measures is broadly consistent with that by poverty rates. Denmark has by far the lowest levels of any country for both the poverty gap and weighted poverty gaps across all three poverty lines, and Portugal has the highest. There are some interesting divergences, however. We saw that Ireland, for example, had a very high poverty rate with the 60% poverty line, but we now see that the weighted poverty gap for Ireland at that line is relatively low – much lower than Italy, for example, which had a lower poverty rate. This reflects the fact that Ireland has a much smaller proportion on very low incomes, as we see from both its low poverty rate and low poverty gap with the 40% line.

6. Poverty Rates in the ECHP in Context

These results can usefully be compared first with the poverty rates calculated from Wave 1 of the ECHP itself and published in *Statistics in Focus* No. 6, 1997. These are based on the poverty line of 50% of the mean, and the modified OECD equivalence scale, although the mean appears to have been calculated using household weights rather than the person weights employed here. Poverty rates for households and persons rounded to the nearest whole number are given in *Statistics in Focus*, and Table 14 compares the latter with those for the 50% line from Table 10 above. This shows that in most cases the two are close, within one percentage point, but for Germany, the Netherlands and Italy there are more substantial differences with the poverty rate now considerably higher for Germany but lower for the other two countries.

The ECHP results based on the modified OECD scale can be compared with poverty rates for the late 1980s produced in the detailed study for Eurostat carried out by Hagenaars, de Vos and Zaidi (1994). While that study paid most attention to expenditure-based poverty lines and rates, it compared these to corresponding results based on income. Table 15 compares the poverty rates from that study for persons on an income basis, using poverty lines derived as proportions of the mean and with the modified OECD scale, with the results from Wave 1 of the ECHP we presented in Table 10. (One methodological difference does remain: it appears that Hagenaars *et al* calculated the mean across households, and then counted persons in poor households, whereas here the mean has been calculated across persons).

17

Table 13: *Poverty Gap and Weighted Poverty Gap Measures, Equivalised (Modified OECD) Income, Mean-based Poverty Lines, Wave 1 ECHP*

	Poverty Gap (% of Mean)			Weighted Poverty Gap (% of Mean)		
	40%	50%	60%	40%	50%	60%
Germany	0.0336	0.0524	0.0736	0.0161	0.0258	0.0372
Denmark	0.0070	0.0138	0.0263	0.0028	0.0055	0.0099
Netherlands	0.0174	0.0271	0.0449	0.0100	0.0143	0.0207
Belgium	0.0266	0.0418	0.0635	0.0136	0.0209	0.0305
Luxembourg	0.0194	0.0367	0.0644	0.0088	0.0154	0.0260
France	0.0242	0.0416	0.0673	0.0123	0.0196	0.0301
UK	0.0340	0.0611	0.0944	0.0156	0.0270	0.0425
Ireland	0.0169	0.0430	0.0808	0.0079	0.0153	0.0296
Italy	0.0427	0.0630	0.0894	0.0235	0.0340	0.0469
Greece	0.0530	0.0787	0.1083	0.0261	0.0405	0.0568
Spain	0.0352	0.0587	0.0893	0.0176	0.0280	0.0421
Portugal	0.0611	0.0909	0.1240	0.0319	0.0478	0.0662

Table 14: *Comparison between Poverty Rates in Wave 1 ECHP in "Statistics in Focus" and Here, 50% of Mean (Modified OECD Scale)*

	% below 50% of Mean (Modified OECD Scale)	
	Here	"Statistics in Focus"
Germany	15	11
Denmark	6	6
Netherlands	9	13
Belgium	13	13
Luxembourg	15	15
France	15	14
UK	21	22
Ireland	22	21
Italy	18	20
Greece	22	22
Spain	20	20
Portugal	25	26

Source: "Statistics in Focus "1997 no. 6, Figure 2, and Table 10 above.

The comparison reveals that for some countries the poverty rates produced here from the ECHP are higher, sometimes substantially higher, than those for the late-1980s in Hagenaars *et al*. The exception is Denmark, where poverty headcounts in the ECHP are lower. The gap between the ECHP poverty rates and those in Hagenaars *et al* is particularly wide for Luxembourg, Ireland, Spain and Portugal. The surveys employed by Hagenaars *et al* refer to 1987, 1988 or 1989, whereas the Wave 1 results are for 1993. This highlights once again the need to examine on a country-by-country basis the evolution of poverty and income inequality from the late 1980s

Table 15: *Comparison between Poverty Rates (modified OECD scale) in Wave 1 ECHP and in Hagenaars, de Vos and Zaidi (1994)*

	40%		50%		60%	
	HVZ	*here*	*HVZ*	*here*	*HVZ*	*Here*
Germany		9.9		15.2		21.4
Denmark (1987)	3.3	2.9	8.8	6.0	17.6	12.2
Netherlands (1988)	2.2	7.3	7.1	8.8	18.1	19.1
Luxembourg (1987)	1.9	6.5	5.7	15.4	14.9	25.9
France (1989)	7.1	7.7	14.4	14.9	23.4	24.5
United Kingdom (1988)	8.8	12.3	19	21.3	28.1	30.8
Ireland (1987)	6.7	7.7	16.9	21.6	27.6	32.9
Italy (1988)	5.6	11.2	13	17.7	23.7	26.2
Greece (1988)	10.2	14.8	17.3	21.8	26.7	29.3
Spain (1988)	7	11.0	13.7	19.8	22.3	29.1
Portugal (1989)	8.8	17.1	17.2	25.2	26.8	32.9

Note: Dates refers to year of survey employed in Hagenaars, de Vos and Zaidi study. Income-based poverty rates for Belgium were not presented in that study.

Source: Hagenaars, de Vos and Zaidi (1994), Table A4.4 for country in question, and Table 10 above.

It is also valuable in this context to compare relative income poverty rates in Wave 1 and Wave 2 of the ECHP. Table 16 shows poverty rates at 50% of the mean, with the modified OECD scale, in the two waves. It also once again shows poverty rates for Wave 2 recently published in the *Statistics in Focus* series. We see from this table that relative income poverty rates are generally rather stable between the two waves. The largest movements are in Belgium and Greece, where a change of 2 percentage points is shown. The poverty rates presented here from Wave 2 are not identical to those published in Statistics in Focus, but they are in all cases within 1 percentage point at the exception of Ireland and Spain with two percentage points and the UK with three percentage points.

Table 16: *Comparison between Poverty Rates in Wave 1 ECHP with Wave 2 in "Statistics in Focus" and Here, 50% of Mean (Modified OECD Scale)*

	% of persons below 50% of mean equivalised income		
	Wave 1	*Wave 2*	
	Here	*Here*	*"Statistics in Focus"*
Germany	15	14	?
Denmark	6	7	6
Netherlands	9	8	8
Belgium	13	15	16
Luxembourg	15	14	15
France	15	14	14
UK	21	20	23
Ireland	22	23	25
Italy	18	17	17
Greece	22	20	21
Spain	20	19	21
Portugal	25	25	24

7. Conclusions

This paper first analysed the distribution of disposable income by country in Wave 1 of the ECHP, in terms of decile shares and summary inequality measures. Disposable income without any adjustment for household size and composition was first examined. The share of total disposable income going to the bottom decile of households varied from well under 2% in Greece and Portugal up to almost 3% in Denmark. The share going to the top decile ranges from 23-24%% in Denmark, the Netherlands and Belgium up to 28-30% in the UK, Ireland, Portugal and Greece, and over 30% in Portugal. Ranked by the Gini summary measure, Denmark and the Netherlands have the most equal distribution and Portugal and Greece have the least equal. Of the rest, Germany, Belgium and Luxembourg are towards the relatively equally distributed end of the spectrum, the UK and Ireland are towards the relatively unequal end, and France, Italy and Spain are approximately in the middle.

Income adjusted for differences in household composition by the use of equivalence scales comes closer to a satisfactory measure of command over resources and living standards, and is most often employed in cross-country comparisons of income distribution. The main equivalence scale employed in this study is the modified OECD scale. Measuring the distribution among persons of income equivalised with this scale, the share of the bottom decile is now higher in all countries than was the case for unadjusted income, ranging from about 2% in Greece and Portugal up to over 4% in Denmark. The share going to the top decile, on the

other hand, is now consistently lower than for unadjusted income, ranging from 20% in Denmark up to 26% in the UK and Ireland and 29% in Portugal. Summary inequality measures showed a generally similar ranking of countries compared with the corresponding measures for unadjusted income. Generally similar results were found with alternative equivalence scales, namely the OECD and square root scales.

Corresponding results for Gini coefficients from Wave 2 of the ECHP were also presented, and these are generally very close to the figures from Wave 1. The only cases where the Gini has changed by more than 1 are France, the UK and Portugal. Comparing our estimated Gini coefficients for Wave 2 with those published in Statistics in Focus, there are some differences which may be primarily attributable to on-going data revisions.

The results presented here were also compared with those in the study by Atkinson, Rainwater and Smeeding, based mostly on datasets in the Luxembourg Income Study for the mid/late 1980s. As summarised in the Gini coefficient, the level of inequality in the ECHP was a good deal higher for Germany, Belgium, Luxembourg, the UK, Spain and Portugal. For some countries, this could be plausibly explained by an increase in inequality between the date of the survey covered in the Atkinson *et al* study and Wave 1 of the ECHP - this could be the case for the UK, for example. For some other countries, however, notably Germany, Belgium, Luxembourg and Portugal, the difference between the ECHP-based results and those in Atkinson *et al* was such that further investigation is required.

The extent of income poverty vis-à-vis relative income poverty lines in Wave 1 of the ECHP has also been examined in this paper. Country-specific relative income poverty lines were derived as proportions of mean and median equivalised income. These proportions were 40%, 50% and 60% of the mean, and 50%, 60% and 70% of the median. The three alternative equivalence scales were employed as before to allow the sensitivity of the results to be assessed. The position of persons vis-à-vis these lines, and the extent to which they fell below the line, was measured.

With the modified OECD equivalence scale, the percentage of persons below half mean equivalised income ranged from 6% in Denmark up to 25% in Portugal. With all three lines, Denmark and the Netherlands had relatively low poverty rates and Greece and Portugal had relatively high ones. Median-based lines showed a similar configuration of countries. Using the OECD or square root equivalence scale

affected the pairwise ranking of some countries in terms of poverty rates, but not the broad grouping of countries into those with high versus low rates.

Comparisons were made with the results of the comprehensive study of income poverty by Hagenaars, de Vos and Zaidi (1994) based on budget survey data from the late 1980s. Poverty rates in Wave 1 of the ECHP were found to be generally higher, sometimes substantially so, than those from Hagenaars *et al.*, and the divergence was sufficiently great to make in-depth comparison with national sources a priority for future investigation. Comparing Wave 1 and Wave 2 of the ECHP, relative income poverty rates were generally rather stable between the two waves.

As well as headcounts of the numbers falling below income poverty lines, alternative poverty measures taking the depth and distribution of poverty gaps or shortfalls were also presented for each of the equivalence scales. These generally ranked countries in the same broad groupings as the headcount measure, though some interesting divergences were noted. For example, Ireland had relatively high head-count poverty rates, but had relatively low poverty gaps and particularly weighted poverty gaps, ranking further down by those measures than by the headcount.

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