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Income Distribution in European Countries

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Income Distribution in European Countries[1]

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Introduction

The aim of this paper is to assemble empirical evidence about the personal distribution of income, and the trends in income inequality over time, in the countries of Europe in the 1980s. It encompasses fifteen European countries: the Nordic countries, Switzerland, and all 12 members of the European Community (in 1994) apart from Greece. The United States is included as a point of reference.

Empirical facts are treacherous objects. The subject of income distribution is littered with "facts" that have ceased to hold or which proved on closer examination to be mere statistical artefacts rather than genuine economic regularities (remember Keynes' constancy of the share of labour?). The value of empirical generalisations has more often been found in the theoretical process used to explain them than in the empirical observation itself. It can be argued that the - very substantial - contribution of Kuznets' Presidential Address (1955) lay in his analytical framework rather than in the celebrated Kuznets curve indicating that inequality first rises and then falls as a country develops. This paper starts therefore from a position of modesty as to what can be achieved by a summary of the empirical evidence. Not the least of the reasons for this are the difficulties in making such comparisons, and it is with their limitations that the paper

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[1] This paper draws on a project being carried out as part of the Luxembourg Income Study, of which a fuller account is given in Atkinson, Rainwater and Smeeding (1995). It also makes use of research carried out in conjunction with the Micro-Simulation Unit at the DAE in Cambridge, supported by the ESRC, the Newton Trust, the Department of Social Security and the European Community Human Capital and Mobility Programme. We are grateful to Holly Sutherland for valuable comments.

begins in Section 1.

The second difficulty in writing a paper on empirical facts is that these have many dimensions. Here we have chosen to concentrate on the comparison of income inequality across countries, and across time. Sections 2 and 3 summarise evidence for fourteen of the European countries about the extent of income inequality in the 1980s, drawing largely on data from the Luxembourg Income Study (LIS). (The country not covered in these sections is Denmark.) Do all distributions have broadly the same shape? Can one identify distinct groupings of countries with different degrees of inequality?

Sections 4 and 5 are concerned with the changes over recent years. Is there a world-wide trend towards greater inequality? In addressing this question, use is made not only of the LIS data but also of the findings of individual national studies in different European countries (now including Denmark). These studies, carried out by government statisticians or academic researchers, are not typically designed to be comparable with those in other countries, but are an important complement to the LIS data, providing a point of comparison and typically allowing a longer time series to be examined.

Even within the field delimited above, any compilation of empirical facts is bound to be selective, and there is a high probability that the tables and graphs in this paper fail to answer the particular questions in the reader's mind. It is in fact our belief that this method of dissemination should be supplemented by one which takes advantage of modern micro-technology. We should move to a situation where subsets of variables from full micro datasets are made available in a form where the reader can choose, within limits, the method of presentation. This however requires a change in the rules of official statistical agencies, and for the present we can only apologise for the straitjacket imposed on the micro-data.

Finally, it should be noted that the title refers to income inequality in *European countries*, not to income inequality *in Europe*. It is a challenging project to produce income distribution estimates for Europe as a whole, but that is the subject of another paper.

1 On Entering the Minefield

The comparison of income distributions across countries, or across time, raises many problems. (For discussion of the problems of comparability across countries, see, among others, Lydall (1979), van Ginneken and Park (1984) and Atkinson and Micklewright (1992).) We need to decide what we want to measure and how far we can measure it on a comparable basis.

Inequality of What Among Whom?

In the empirical results, attention is concentrated on the distribution of *disposable money income*, that is income after direct taxes and including transfer payments. Several points should be noted:

a) income rather than consumption is taken as the indicator of resources;

b) the definition of income falls considerably short of a Haig-Simons comprehensive definition, typically excluding much of capital gains, imputed rents, home production, and income in kind;

c) no account is taken of indirect taxes nor of the benefits from public spending (other than cash transfers) such as health care or education or subsidies;

d) the period of assessment is in general annual (although the UK evidence relates to weekly or monthly income).

These points mean that the variable measured may depart from that regarded as ideal. They also mean that the results may not be comparable across countries: for example, one country may help low income families through housing benefits (included in cash income), whereas another provides subsidised housing (not taken into account).

To the question "among whom", the standard answer here is the simplest: the distribution is that among *individuals*. The standard unit of assessment is however taken as the household, in that the incomes of all household members are aggregated and then divided by an equivalence scale to arrive at individual *equivalent income*. The equivalence scale is taken, for simplicity, to be the square root of the household size, so that the income of a household of 4 persons is

divided by 2.0. The choice of the household, rather than a narrower unit such as the spending unit or the family, is open to debate. It assumes a degree of income-sharing within the household which may not take place. Moreover, the choice of unit may affect comparisons across countries on account of differing household structures and/or differences in the form in which data are collected. The same applies to the choice of equivalence scale, and the alternative of taking per capita incomes is considered in Section 2.[2]

Problems in Ensuring Comparability

The problems in ensuring a reasonable degree of comparability may be illustrated by reference to one of the most widely cited international comparisons - that carried out by Sawyer (1976) for the OECD. Table 1 summarises his main findings for the size distribution of post-tax income for 12 OECD countries around 1970. The countries are ranked in order of the Gini coefficient (highest at the top). The countries fall into three main groups, distinguished by the solid horizontal lines in the table (these correspond to differences in the Gini coefficient of more than 2½ percentage points):

- France, Italy, Germany[3] and the United States,
- Spain, Canada and Netherlands,
- United Kingdom, Japan, Australia, Norway and Sweden.

This grouping is rather surprising: it does not correspond to what might be expected in view of the known features of these societies. For this, and other, reasons, the Sawyer study met with lively reactions, notably from the French Government, which published a reply (Bégué, 1976). There are indeed a number of serious problems, some of which are indicated in the

[2] For further discussion of the sensitivity of the results, see Buhmann et al (1988) and Atkinson, Rainwater and Smeeding (1995).

[3] Throughout this paper, "Germany" refers to the former West Germany. For evidence about the distribution of income in East Germany, see Hauser et al (1991) and Hauser (1992).

"Comments" column of Table 1:

a) the data are derived from different types of source. In the majority of cases, the source is a household survey, such as the US Current Population Survey, but in other cases the data are based on tax records (France, Netherlands and Norway) or a synthesis of different sources (Germany). Some indication of the consequences are provided by Sawyer's additional memorandum items for Germany (which replaces the synthetic estimate by one from a household income and expenditure survey) and the UK (which replaces the expenditure survey figure by a synthetic estimate[4]): the Gini coefficients are

	Synthetic estimate	Survey estimate
Germany	*38.3*	31.2
United Kingdom	33.5	*31.8*

Source: Sawyer (1976), Table 6.

To use the italicised figures, as Sawyer did in Table 1, provides a rather misleading picture of the relative income inequality in the two countries.

b) in two cases the data do not cover the whole population (Japan and Australia). The exclusion of part of the population may be expected in both cases to reduce the recorded degree of inequality.

c) Sawyer did not have access to the original micro-data, and had in some cases to make aggregative adjustments, particularly in going from pre-tax income to post-tax income (the countries marked by a * in the Comments column). As described by Sawyer,

"one of these distributions had to be estimated from the other by utilising data on the average amount of tax paid by each income class... inequality tends to be under-estimated since households have not been ranked by the derived income concept" (1976, p 12).

d) The distributions relate to household income, but in the main figures no adjustment is

[4] Usually known as the "Blue Book" estimate, which combines information from the tax records with household survey data and other information.

made for differences in household size.

Approach Adopted Here

The approach adopted here does not overcome all of the problems of making comparisons across countries and across time, but reduces them significantly. Although the data are still drawn from different types of source (Table 2 lists the countries covered and the origin of the data used in Sections 2-4), the great majority are now drawn from household income surveys, or their equivalent, and no use is made of synthetic data. (Synthetic data may well give a more accurate picture of the distribution; they are not however typically available as micro-data.) The main qualification concerns the French data, which come from tax records.

The major advantage compared to the situation in 1976 when Sawyer made his study is the availability of micro-data. The aim of the Luxembourg Income Study has been to assemble in one place a database containing survey data from many countries and to place them as far as possible on a consistent basis.[5] Access to the micro-data means that it is possible to produce results on the same basis starting from individual household records. It is therefore possible to make any desired adjustment for household size (eliminating problem (d) above). Aggregate adjustments, such as those from pre-tax to post-tax income (problem (c)), are not necessary, although in some cases imputations are necessary at the household level. The data all cover, at least in principle, the whole population (avoiding problem (b)).

The aim of the LIS project is to increase the degree of cross-national comparability, but it is important to emphasise that *complete* cross-national comparability is not attainable.

[5] The Luxembourg Income Study (LIS) project began in 1983 under the joint sponsorship of the government of Luxembourg and the Centre for Population, Poverty, and Policy Studies (CEPS) in Walferdange. It is now funded on a continuing basis by CEPS/INSTEAD and by the science foundations of its member countries. The main objective of the LIS project has been to create a database containing social and economic data collected in household surveys from different countries. The database currently contains information for some 25 countries for one or more years. Extensive documentation concerning technical aspects of the survey data, and the social institutions of income provision in member countries is being made available to users.

Comparability is a matter of degree, and all that one can hope for is to reach an acceptably high level. Moreover, comparability does not imply accuracy. A critic may say that it reduces all data sets to the lowest common denominator. There may remain serious shortcomings in the extent to which we can measure economic advantage and disadvantage. These qualifications must be borne in mind when reading this paper. We have some idea as to where the mines are located, but we have to tread very carefully.

2 Incomes in European Countries in the 1980s: The Shape of the Distribution

This section looks at the shape of the distribution of disposable income in fourteen European countries and the United States. In the majority of cases, the results refer to the period 1984-1987, but some relate to the start of the 1980s (Portugal, Spain and Switzerland). Comparisons across countries may be sensitive not just to the data comparability but also to the form of presentation. We begin by considering disposable income per equivalent adult, using an "intermediate" equivalence scale of household size to the power of a half, and by looking at percentiles of the median.

Percentiles of the Distribution

The first method of presentation (Table 3) expresses the percentiles of the distribution as percentages of the median, denoted by P_i. For example, the tenth percentile (bottom decile), P_{10}, in the UK is around a half (51.1 percent) of the median, and the ninetieth percentile (top decile), P_{90}, is nearly double (194.1 percent) the median. The ratio of the top to bottom decile, referred to as the *decile ratio*, is shown in the final column; and in the case of the UK is approaching 4.

The overall picture in the fourteen European countries are shown in the left hand column of Figure 1, where the countries are ranked according to the value of the decile ratio. From this we can see that there is a group of countries with higher ratios, in excess of 4, including Italy, Portugal, Spain and Ireland. Switzerland and France are quite close to the UK, but there are

distinctly lower ratios in Benelux, Germany and the Nordic countries. The decile ratios appear to be inversely related to latitude, if Ireland is included with Southern Europe. It is interesting to note that the decile ratio in the United States, included in Table 3 as a memorandum item, is close to 6, and this is the largest value recorded here. It is in fact off the scale in Figure 1.

Before looking at what lies behind these decile ratios, we should consider their sensitivity to the method of calculation. This issue is examined in Atkinson, Rainwater and Smeeding (1995) and here reference is only made to the results shown in the right hand part of Figure 1, which are intended to test the sensitivity to the method used to calculate equivalent income. It shows the ranking according to the decile ratio of per capita income (Portugal and Spain excluded). Although standard practice in Eastern Europe (see Atkinson and Micklewright, 1992), per capita distributions are rarely presented in OECD countries.[6] For all countries, except Norway, the decile ratio is increased, but the difference varies quite a lot across countries. The decile ratio in Sweden increases from 2.72 to 2.95, whereas that in the Netherlands increases from 2.85 to 3.46, taking it out of the "less unequal" group. France, Switzerland and the UK are now more in line with Italy. While the broad picture is not greatly changed by the use of different equivalence scales, both the level of measured inequality and the position of individual countries *can* be materially affected.

Shape of the Distribution

The high value of the decile ratio in the US is due in large part to the low value of the bottom decile relative to the median. This is brought out in Figure 2, which shows the countries ranked according to the bottom decile. (We have reverted to the square root equivalence scale.) In the US, the bottom decile is only slightly over a third of the median, compared with values of around 46-49 percent in the next group of countries. The bottom decile is in excess of 55 percent in Belgium, Finland, France, Luxembourg, Norway, Sweden, and Germany. In the estimates for

[6] Sawyer discusses the per capita distribution, but his table (1976, Table 7) is a mixture of pre-tax and post-tax data.

the Netherlands, the bottom decile is over 60 percent of the median.

At the upper end of the distribution, the United States is less obviously different. Figure 3 shows the top decile relative to the median. The US cannot be distinguished from Southern Europe and Ireland. Comparing Figures 2 and 3, we can see that higher inequality in one country at one point in the distribution does not necessarily imply higher inequality elsewhere, as it would for example in the case of the two-parameter lognormal distribution. The relative positions of Ireland and the US are one instance. Sweden performs less well with respect to the bottom decile than Netherlands and Luxembourg, but better at the top.

The shape of the distribution is shown more generally in Figure 4 for France, Sweden and the US. This shows the (logarithm) of the income level corresponding to different percentiles. The diagram is like Pen's parade of incomes, except that the heights have been adjusted so that the median person in each country passes through at eye level (0 on the scale) and that the differences are shown in relative rather than absolute terms.

The parade starts with the bottom decile. As we know, incomes at this point are a lot lower in the US. The height rises more steeply to reach the median, but beyond that point increases at almost the same rate. France and Sweden start at the same level as each other, but the heights rise more quickly towards the median in Sweden. After the median, they rise more slowly in Sweden, and France is closer to the US. It may be seen that incomes in Sweden are more centred on the median than in the other two countries. If we take a band from 80% of the median to 125%, as indicated in Figure 4, then only around a quarter (27.8 percent) of the US population are found in this central range. In France, the proportion is around a third (35.9 percent), whereas in Sweden it is approaching one half (46.4 percent). This is an interesting difference between the income distributions in the different countries. From the results of Atkinson, Rainwater and Smeeding (1995), it may be seen that the middle income class is also large in Belgium, Germany, Luxembourg and Norway. The middle income class is small in Ireland, Italy and the UK, in addition to the US.

3 Income Inequality in European Countries in the 1980s

A more common form of presentation of income distribution statistics is in terms of shares of total income, which are the ingredients for the conventional Lorenz curve. Table 4 shows the cumulative shares by decile groups, where S_{10} denotes the share of the bottom 10 percent, S_{20} denotes the share of the bottom 20 percent, etc. The countries are listed in order of the share of the bottom decile group, S_{10}, which ranges from some 2½ percent in the UK to 4½ percent in Finland. The ranking is not identical to that according to the bottom decile, P_{10}, since the share depends on the shape of the distribution in the bottom decile group, as well as on the mean, rather than the median. It may be noted that the UK and Switzerland tend to move down relative to their ranking according to P_{10} (see Figure 2).

The share of the bottom decile group gives the initial ranking of the Lorenz curves, but the Lorenz curves may subsequently cross. The decile shares are used in Table 5 to test whether or not the Lorenz curves cross. A + or (+) in the table indicates that the Lorenz curve for the country shown in the left hand column remains everywhere above that for the country shown on the horizontal axis; and a ? indicates that the Lorenz curves cross. Treating any difference as significant, there are in fact a high proportion of situations where a Lorenz comparison can be made. Of the 91 possible pair-wise comparisons of the 14 European countries, there are 70 cases where one Lorenz curve dominates the other. If, to make approximate allowance for the errors surrounding the estimates, cases are excluded where the differences for all decile shares are less than 1 percentage point (those cases marked (+) in Table 5)[7], then there are 67 cases of Lorenz dominance. In over 70 percent of cases we have an unambiguous ranking.

The partial ordering resulting from the Lorenz comparisons (taking only those cases where the difference is 1 percentage point or larger) are summarised in Figure 5 in terms of a

[7] It would clearly be possible to calculate the sampling errors associated with the Lorenz curve, and require that one curve be significantly different from another at a specified level of confidence. However, this focuses on sampling error to the exclusion of other, non-sampling, error, which may be quantitatively more important.

Hasse diagram. The countries towards the top of the diagram have the lower levels of inequality, and where a line can be traced downwards from country A to country B this implies that the Lorenz curve for country A is superior to that of country B. Finland dominates all countries, followed by Benelux and Norway and Sweden. There appears to be a clear grouping of mainland Northern Europe at the top. In the middle are France, Italy, the UK and Portugal, which cannot be ranked one against the other. The Lorenz curves for Italy and Portugal are close; those for France, and even more the UK, start off lower and end up higher.

Summary Measures of Inequality

Where the Lorenz curves cross, the use of a summary measure of inequality yields a complete ranking, although different measures may generate different such rankings. In Table 6 are shown the Gini coefficients and equally distributed equivalent (Atkinson) measures with inequality aversion parameters 0.5 and 1.0.

The results for the Gini coefficients suggest a ranking of countries which is rather different from that of Sawyer, who found a higher value for the Gini coefficient in West Germany than in the US, and for whom Netherlands and Spain were virtually indistinguishable. The Spearman rank correlation coefficient for the nine countries common to both lists (including the US) is 0.5.

The results with the Atkinson indices are broadly similar. Cases where European countries move up the ranking compared with the Gini coefficient are shown in italics in Table 6. With an inequality aversion parameter of 1.0, Luxembourg moves up to second place and Sweden drops to fifth, below Germany; Italy moves ahead of France and the UK.

4 Recent Trends in Income Distribution: Evidence from the LIS Dataset

There is considerable interest in how the distribution of income has been changing over

time, particularly over the 1980s.[8] For eight of the fourteen European countries discussed in the previous section we have comparable information for two dates: Belgium, Finland, France, Netherlands, Norway, Portugal, Sweden, and the United Kingdom. These cover a range of countries, both with regard to their intrinsic features and with regard to what we have seen about the degree of income inequality. However, the two data points are not the same in each country, and the results need to be interpreted with care in view of the differing macro-economic climate at different dates and in different countries.

Percentiles of the Distribution

The changes in the percentiles are shown in Table 7. In considering the changes over time, little significance can be attached to small changes, such as the fall in the bottom decile in Belgium from 59.3 percent of the median to 58.5 percent. On the other hand, more significance can be attached to the rise in the top decile in the UK from 179.7 percent to 194.1 percent.

The decile ratio increased in Finland, Netherlands, Norway, Sweden, the UK, and (slightly) in Belgium. It remained unchanged in France and fell modestly in Portugal. In broad terms, this summarises the picture that emerges throughout this section. The majority of countries covered here show a rise in inequality, but this is not universal and the extent of the increase differs. There is diversity of experience across countries. Moreover, the pattern of change has distinctive features. Even among those countries where inequality increased, we find differences. If, for instance, we look at the top decile relative to the median, then we find little change in the Netherlands and Sweden, where it is the decline in the relative position of the bottom groups that is responsible for the rise in the decile ratio. In contrast, the rise in the decile ratio in the UK over this period is the product of the rise in the relative position of the top decile. In the US, both the top decile rose and the bottom decile fell.

[8] Recent reviews of the evidence about trends in income inequality in different countries include Bourguignon and Morrisson (1992), Gottschalk (1993), Green, Henley and Tsakalotos (1992), and Gardiner (1993).

In the US, the changes between 1979 and 1986 were associated with a contraction of the central income group: the proportion between 80% and 125% of the median fell from 31.1 percent to 27.8 percent. There were increases in the size of both the lower and the upper income groups. Over a similar period (1981-1987) the percentage in the central group fell also in Sweden, from 49.3 percent to 46.4 percent, but the increase was almost entirely in the lower group. In contrast, in France the proportion in the central group did not change between 1979 and 1984.

Lorenz Curves

The changes in the Lorenz curves are shown in Table 8 for the eight European countries and the US. In France, the Lorenz curves cross, but they are virtually identical in the two years, the maximum difference in the cumulative decile shares being 0.3 percentage points. In Portugal the Lorenz curve moves upwards, the maximum difference over 10 years being 0.8 percentage points. For the remaining six European countries, and the US, the Lorenz curve moves downwards, to varying degrees.

In both Netherlands and Norway the share of the bottom 50 percent fell on average by 0.1 percentage point per year (in Belgium the fall was smaller), whereas the average rate of fall was larger in Finland, and was 0.2 percentage points or higher in Sweden, the UK and the US. As far as changes over time are concerned, the US does not appear to be an outlier. In the US, the total difference over the 7 year period in the cumulative decile shares is at least 1 percentage point from the third decile upwards, whereas in Sweden (over a 6 year period) this is true from the second decile and in the UK for all decile shares. The maximum difference in the Lorenz curve in the US is 2.7 percentage points, which is the same as in the UK.

A similar picture is shown by the summary measures of inequality. The rise in the Gini coefficient is 3.2 percentage points in the US and 3.4 percentage points in the UK (Atkinson, Rainwater and Smeeding, 1995, Table 4.8). By historical standards this is a noteworthy increase.

The rise in Sweden is 2.1 percentage points, and that in Norway around half this amount. In France the Gini coefficient remained virtually unchanged between 1979 and 1984; in Portugal there was a modest decline over the 1980s. Again there is diversity of experience: the upward trend in income inequality is exhibited to differing degrees in different countries, and is not to be found in some countries.

5 Recent Trends in Income Distribution: Evidence from National Studies

In this section, we set the earlier results in the context of national studies of income inequality and extend the coverage to include Denmark. In reviewing the evidence available from other studies, we do not attempt a comprehensive survey of all published material. Rather, our purpose is to build a bridge between the LIS dataset, with its emphasis on raising the degree of comparability of the data employed, and the much more disparate national studies, which for understandable reasons have employed a wide variety of sources and definitions. Since we are concerned to compare the LIS dataset with other approaches, we do not refer to other studies which are based on the LIS dataset, such as Smeeding, O'Higgins and Rainwater (1990).

The Gini coefficients in Table 9 are drawn from national studies of income inequality which are not designed for purposes of international comparison, and they are not necessarily based on the same types of sources, the same concepts of income or the same methods of calculation. For example, the US series, unlike those for other countries shown, relates to the distribution of gross income (before taxes) and is not adjusted for household size. We have chosen series which give a reasonable span of years and which are themselves intended to be consistent over time. They therefore may serve to give an indication of the relative *trends* in different countries, but it should be stressed that one can draw no conclusions from these figures about the *relative* degree of inequality in different countries. (The main respects in which the series differ from those in earlier sections of the paper are identified in the notes to Table 9.) In view of the differences in definitions, sources, and timing, we would not necessarily expect the results from the national studies to show the same level of inequality as we found in earlier

sections. Nor need the trends be the same, in that the differences may have a different impact at different dates. The trends in the national studies are however of particular interest in view of the fact that the estimates typically cover a longer time period and include more observations.

We saw in Section 4 that in the first half of the 1980s there was a marked rise in income inequality in Sweden and the UK. This rise is the more striking in that it came after a period in which inequality fell: there was a reversal of the previous trend. The U-shaped pattern - the inverse of that predicted by the Kuznets hypothesis - is illustrated in Figure 6. As may be seen, the pattern in the Netherlands, Norway and Denmark has some similarity, although in Denmark it is only the last year (1987) in which there is any indication of an upturn in inequality. But in other countries, such as those shown in Figure 7, the pattern is less clearly U-shaped. In Finland and France, it appears to be a case of the trend towards reduced inequality having come to a stop; in Germany there is no marked trend; in Ireland and Italy the downward trend continued, in the latter case with a cyclical component.

The pattern across countries does not therefore appear to be a uniform one. While it is possible that the countries in Figure 7 are lagging behind the UK and Sweden, and that the 1990s will see a rise in income inequality more generally, this has yet to be demonstrated. Moreover, among the countries where inequality is rising, the rate of increase differs, with the UK standing out for the sharpness of the rise in recorded income inequality in the second-half of the 1980s.

It may be noted that there is no apparent relation between the trend over the 1980s and the overall level of inequality. Inequality has increased both in the United States, with a high level even before the increase, and in Sweden, where inequality has historically been relatively low. Inequality has fallen in Italy, but risen in the UK, both occupying intermediate positions in the mid-1980s.

Concluding Comments

This review of evidence for different European countries is only partial, but it suggests

two broad conclusions.

First, certain groupings may be made. The Scandinavian countries, Benelux and West Germany have apparently distinctly less inequality in disposable equivalent income; Southern Europe and Ireland have distinctly higher inequality, with France and, to some degree, the UK and Italy, occupying an intermediate position. The ranking of countries is rather different from that of the earlier study by Sawyer and more suggestive of explanatory hypotheses - such as the differing form and extent of social protection, and the role of redistributive income taxation.

Secondly, we can no longer assume that all European countries are comfortably on the downward part of the Kuznets curve, with inequality falling over time. Continuing progression towards *reduced* inequality was in the 1980s the exception rather than the rule. In a number, but not all, of the countries studied, inequality increased. We suspect that Kuznets himself would scarcely have been taken aback by the finding that the inverse-U shape no longer applies, since he referred frequently to the balancing of conflicting effects. Changes in the distribution of income are the outcome of several forces operating in different directions. As the balance of these forces varies, we may expect the resulting trend in inequality to change direction. In the same way, alternative explanations have differing importance at different dates.

Table 1 International Comparison by Sawyer (1976)

Country	Year	Gini %	Comments
France	1970	41.4	* Based on tax records
Italy	1969	39.8	
Germany	1973	38.3	Synthesis of different sources
United States	1972	38.1	*
Spain	1973-4	35.5	
Canada	1969	35.4	
Netherlands	1967	35.4	Based on tax records Relates to tax unit rather than household
UK	1973	31.8	*
Japan	1969	31.6	* Excludes agricultural, forestry workers and fishermen.
Australia	1966-7	31.2	Only households in urban areas
Norway	1970	30.7	Based on tax records
Sweden	1972	30.2	

Note: * Estimated by applying average tax rates to pre-tax data

Source: Sawyer (1976), Tables 4 and 6.

Table 2 Sources of data used here

Country (abbreviation)	Years	Source
Belgium (BE)	1985, 1988	Household panel study
Finland (FI)	1987, 1990	Household income survey
France (FR)	1979, 1984	Income tax records
Germany (GE)	1984	Socio-economic panel survey
Ireland (IR)	1987	Household income survey
Italy (IT)	1986	Household income survey
Luxembourg (LU)	1985	Household panel study
Netherlands (NL)	1983, 1987	Household survey of the use of public services
Norway (NO)	1979, 1986	Household income and wealth survey
Portugal (PO)	1980/1, 1989/90	Household income and expenditure survey
Spain (SP)	1980/1	Household income and expenditure survey
Sweden (SW)	1981, 1987	Household income survey
Switzerland (CH)	1982	Household income and wealth survey
UK	1979, 1986	Household income and expenditure survey
US	1979, 1986	Household income survey

Table 3 Income distribution in 1980s: percentiles of median and decile ratio

	P_{10}	P_{25}	P_{75}	P_{90}	P_{95}	P_{90}/P_{10}
Belgium 1988	58.5	74.5	128.8	163.2	190.8	2.79
Finland 1987	58.9	76.5	125.5	152.7	173.6	2.59
France 1984	55.4	72.1	139.7	192.8	233.5	3.48
Germany 1984	56.9	75.0	132.7	170.8	201.7	3.00
Ireland 1987	49.5	66.7	150.9	209.2	252.2	4.23
Italy 1986	48.9	68.8	145.0	197.9	233.8	4.05
Luxembourg 1985	58.5	75.1	132.7	184.0	228.1	3.15
Netherlands 1987	61.5	75.7	135.0	175.0	206.4	2.85
Norway 1986	55.3	76.0	128.7	162.2	187.3	2.93
Portugal 1980/1	47.4	69.2	143.5	203.2	252.7	4.29
Spain 1980/1	46.3	68.1	143.4	203.0	248.1	4.38
Sweden 1987	55.6	75.6	125.1	151.5	170.4	2.72
Switzerland 1982	53.9	73.6	134.3	185.1	244.6	3.43
UK 1986	51.1	67.6	144.6	194.1	232.1	3.79
Memorandum item:						
US 1986	34.7	61.7	149.6	206.1	247.3	5.94

Notes: (a) the results are for the distribution among persons of household disposable income adjusted by an equivalence scale equal to (household size)$^{0.5}$.

(b) The results for Portugal and Spain are not produced from the LIS dataset and are less comparable with those for other countries.

Sources: Portugal: supplied by C Rodrigues (see Rodrigues, 1993).
Spain: supplied by M Mercader (see Mercader, 1993).
All other from Atkinson, Rainwater and Smeeding (1995), Table 4.1.

Table 4 Income distribution in European countries 1980s: cumulative decile shares of total income %

	S10	S20	S30	S40	S50	S60	S70	S80	S90
FI	4.5	10.8	18.1	26.4	35.6	45.6	56.6	68.6	82.2
LU	4.3	10.2	17.1	24.8	33.5	43.1	53.9	66.0	80.4
BE	4.2	10.2	17.1	25.0	33.8	43.5	54.3	66.4	80.3
NL	4.1	10.1	16.9	24.5	33.0	42.5	53.2	65.3	79.4
GE	4.0	9.8	16.6	24.2	32.9	42.5	53.2	65.3	79.4
NO	3.9	9.8	16.9	24.9	33.9	43.7	54.6	66.7	80.6
SW	3.3	9.5	16.9	25.3	34.6	44.8	55.9	68.2	81.9
IT	3.1	8.0	13.9	20.7	28.7	38.0	48.7	61.2	76.2
PO	3.1	7.8	13.8	20.1	28.7	37.9	48.3	60.6	75.8
FR	3.0	8.3	14.6	21.8	29.9	39.1	49.5	61.6	76.3
IR	2.9	7.4	13.0	19.6	27.3	36.5	47.1	59.6	75.1
CH	2.8	8.0	14.1	21.0	29.0	37.8	47.7	58.9	72.5
SP	2.8	7.4	13.2	20.1	28.2	37.5	47.9	60.2	75.5
UK	2.5	7.5	13.5	20.5	28.7	38.2	49.1	61.8	77.1
IR	2.5	7.1	12.6	19.3	27.1	36.3	47.0	59.6	75.1
US	1.9	5.7	11.2	18.0	26.2	35.7	46.9	60.2	76.3

Note: the results are for the distribution among persons of household disposable income adjusted by an equivalence scale equal to (household size)$^{0.5}$.

Sources: Portugal and Spain: see Table 3.
All other from Atkinson, Rainwater and Smeeding (1995), Table 4.3.

Table 5 Lorenz comparisons (based on decile points)

	LU	BE	NL	GE	NO	SW	IT	PO	FR	CH	SP	UK	IR	US
FI	+	+	+	+	+	+	+	+	+	+	+	+	+	+
LU		?	+	+	?	?	+	+	+	+	+	+	+	+
BE			+	+	?	?	+	+	+	+	+	+	+	+
NL				(+)	?	?	+	+	+	+	+	+	+	+
GE					?	?	+	+	+	+	+	+	+	+
NO						?	+	+	+	+	+	+	+	+
SW							+	+	+	+	+	+	+	+
IT								(+)	?	?	+	?	+	?
PO									?	?	(+)	?	+	?
FR										+	+	?	+	+
CH											?	?	?	?
SP												?	+	?
UK													+	+
IR														?

Source: calculated from Table 4.

Table 6 Summary measures of inequality

Country	Year	Gini	Atkinson Parameter	Measure
			0.5	1.0
Finland	1987	20.7	3.6	7.5
Sweden	1987	22.0	4.6	10.3
Norway	1986	23.4	4.6	*9.5*
Belgium	1988	23.5	4.9	10.3
Luxembourg	1985	23.8	*4.6*	*9.2*
Germany	1984	25.0	5.2	10.1
Netherlands	1987	26.8	n/a	n/a
France	1984	29.6	7.7	16.0
UK	1986	30.4	8.2	18.1
Italy	1986	31.0	*8.0*	*15.3*
Switzerland	1982	32.3	9.9	18.4
Ireland	1987	33.0	*9.3*	18.8
United States	1986	34.1	9.9	21.2

Source: see Table 4.

Note: In these calculations the data have been bottom-coded with the lowest value set at 1 per cent of mean disposable income.

Table 7 Trend over time in income distribution: percentiles of median

			P_{10}	P_{25}	P_{75}	P_{90}	P_{95}	P_{90}/P_{10}
Belgium		1985	59.3	74.7	128.7	162.5	187.2	2.74
		1988	58.5	74.5	128.8	163.2	190.8	2.79
Finland	1987		58.9	76.5	125.5	152.7	173.6	2.59
		1990	57.0	76.4	126.2	156.2	178.5	2.74
France	1979		53.6	72.5	138.4	186.5	232.3	3.48
		1984	55.4	72.1	139.7	192.8	233.5	3.48
Netherlands	1983		64.8	77.2	135.5	176.1	208.1	2.72
		1987	61.5	75.7	135.0	175.0	206.4	2.85
Norway		1979	57.0	76.7	126.6	158.1	181.9	2.77
		1986	55.3	76.0	128.7	162.2	187.3	2.93
Portugal		1980	47.4	69.2	143.5	203.2	252.7	4.29
		1990	48.6	69.0	143.2	202.4	248.5	4.16
Sweden		1981	61.5	79.2	124.4	150.9	167.0	2.45
		1987	55.6	75.6	125.1	151.5	170.4	2.72
United Kingdom		1979	50.9	70.4	138.5	179.7	208.9	3.53
		1986	51.1	67.6	144.6	194.1	232.1	3.79
United States	1979		38.1	64.5	141.8	187.6	221.9	4.93
		1986	34.7	61.7	149.6	206.1	247.3	5.94

Note: the results are for the distribution among persons of household disposable income adjusted by an equivalence scale equal to (household size)$^{0.5}$.

Sources: Portugal: see Table 3.
All other from Atkinson, Rainwater and Smeeding (1995), Table 4.5.

Table 8 Trend over time in income distribution: cumulative decile shares of total income %

	S10	S20	S30	S40	S50	S60	S70	S80	S90
FI									
87	4.5	10.8	18.1	26.4	35.6	45.6	56.6	68.6	82.2
90	4.3	10.5	17.7	26.0	35.1	45.1	56.0	68.1	81.8
BE									
85	4.2	10.3	17.3	25.1	34.0	43.9	54.8	66.9	80.9
88	4.2	10.2	17.1	25.0	33.8	43.5	54.3	66.4	80.3
NL									
83	4.4	10.6	17.4	25.0	33.4	42.8	53.3	65.3	79.4
87	4.1	10.1	16.9	24.5	33.0	42.5	53.2	65.3	79.4
NO									
79	4.1	10.2	17.4	25.6	34.6	44.4	55.2	67.2	80.9
86	3.9	9.8	16.9	24.9	33.9	43.7	54.6	66.7	80.6
SW									
81	4.0	10.6	18.3	26.7	36.0	46.1	57.2	69.2	82.9
87	3.3	9.5	16.9	25.3	34.6	44.8	55.9	68.2	81.9
PO									
80/1	3.1	7.8	13.8	20.1	28.7	37.9	48.3	60.6	75.8
90/1	3.4	8.0	13.9	20.9	28.9	38.1	48.5	60.8	75.8
FR									
79	3.1	8.4	14.6	21.9	30.0	39.2	49.7	61.6	76.0
84	3.0	8.3	14.6	21.8	29.9	39.1	49.5	61.6	76.3
UK									
79	3.5	8.7	15.1	22.6	31.1	40.8	51.8	64.4	79.2
86	2.5	7.5	13.5	20.5	28.7	38.2	49.1	61.8	77.1
US									
79	2.1	6.4	12.4	19.7	28.4	38.3	49.6	62.7	78.3
86	1.9	5.7	11.2	18.0	26.2	35.7	46.9	60.2	76.3

Note: the results are for the distribution among persons of household disposable income adjusted by an equivalence scale equal to (household size)$^{0.5}$.

Sources: Portugal: see Table 3.
All other from Atkinson, Rainwater and Smeeding (1995), Table 4.7.

Table 9 National studies of income distribution: Gini coefficients from 1970

Year	BE	DK	FI	FR	GE	IR	IT
1970				39.8			
1971			27.0				
1972							
1973					25.4	36.7	
1974							
1975				38.4			
1976			21.6				
1977							34.9
1978					25.4		33.4
1979				36.4			33.8
1980						36.0	31.2
1981		22.7	20.6				30.6
1982		22.0					28.7
1983		21.6			25.5/ 25.0		29.2
1984		20.5		37.2			30.1
1985	22.5	20.1	20.0		26.0		
1986		20.0	20.5				30.2
1987		20.9	19.9		25.2	35.2	31.9
1988	23.4		20.4				
1989			20.5				29.7
1990			20.4		26.0		
1991			20.2				29.2
1992	23.7		19.9				

Table 9 continued

Year	NL	NO	SW	UK	US
1970				25.5	39.4
1971				26.2	39.6
1972				26.5	40.1
1973				25.5	39.7
1974				24.7	39.5
1975			21.3	23.8	39.7
1976			20.9	23.7	39.8
1977			20.4	23.4	40.2
1978			20.0	23.5	40.2
1979			19.7	24.8	40.4
1980			19.4	25.3	40.3
1981	28.3		19.1	25.9	40.6
1982		23.4	19.4	25.8	41.2
1983	27.8		19.4	26.4	41.4
1984			20.4	26.6	41.5
1985	28.1		20.5	27.9	41.9
1986		22.6	21.4	28.8	42.5
1987	29.4		20.5	30.2	42.6
1988	29.0		20.4	32.0	42.7
1989	29.6	24.4	21.0	32.4	43.1
1990			21.9 / 23.5	33.7	42.8
1991			24.7	33.7	42.8
1992					43.3

Notes and Sources to Table 9:

Belgium (BE)Cantillon et al (1994), Table 30; equivalent (scale 0.7 for the second adult and 0.5 per child) disposable income with person weights.

Denmark (DK)Hansen (1993), Table 3.4; equivalent disposable income with family weights.

Finland (FI)Uusitalo (1989), Table 5.4 and Uusitalo (1994); equivalent (scale 0.7 to the second adult and 0.5 per child) disposable income with person weights.

France (FR)Canceill and Villeneuve (1990), p 71; household income with no adjustment for household size, and with household weights.

West Germany (GE)Hauser and Becker (1993), Table 7; equivalent (social assistance scale) disposable income with person weights; excludes households with non-German head.

Ireland (IR)Callan and Nolan (1993), Table 4; household disposable income with no adjustment for household size, and with household weights.

Italy (IT)Brandolini and Sestito (1994), Table 2a; equivalent disposable income with household weights.

Netherlands (NL)data supplied by Central Bureau of Statistics, see Atkinson, Rainwater and Smeeding (1995), Chapter 4; household disposable income (deducting from net income interest paid, health care and life assurance premia, wealth tax payments, and alimony paid) with no adjustment for household size, and with household weights.

Norway (NO)Epland (1992), Tabell 4; equivalent (scale of 0.7 for second household member and 0.5 for subsequent members) disposable income with person weights.

Sweden (SW)Gustafsson and Palmer (1993), Annex; equivalent (social assistance scale) disposable income (including an allowance for imputed rent on owner-occupied homes) with person weights.

UKGoodman and Webb (1994), page A2 (BHC); equivalent (HBAI scale) disposable household income with person weights.

USU.S. Department of Commerce (1993), Table B-3, p B-6; household gross income (not including food stamps) unadjusted for household size, and with household weights.

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Figure 1 Decile ratios for European Countries on two different bases

Decile ratio	Equivalised	Per capita
4.9		**IR**
4.8		
4.7		
4.6		
4.5		
4.4		**UK**
4.3	**SP**	**FR IT**
4.2	**PO IR**	**CH**
4.1		
4.0	**IT**	
3.9		
3.8		
3.7	**UK**	
3.6		
3.5		**GE**
3.4	**CH FR**	**NL**
3.3		**LU**
3.2		
3.1	**LU**	
3.0	**GE**	**BE**
2.9	**NO**	**SW NO**
2.8	**NL**	
2.7	**SW BE**	**FI**
2.6		
2.5	**FI**	

Note: 3.0 denotes that the decile ratio lies between 3.00 and 3.09.

Sources: Table 2.3 and Atkinson, Rainwater and Smeeding (1995), Table 4.9.

Figure 2 Bottom decile as % median

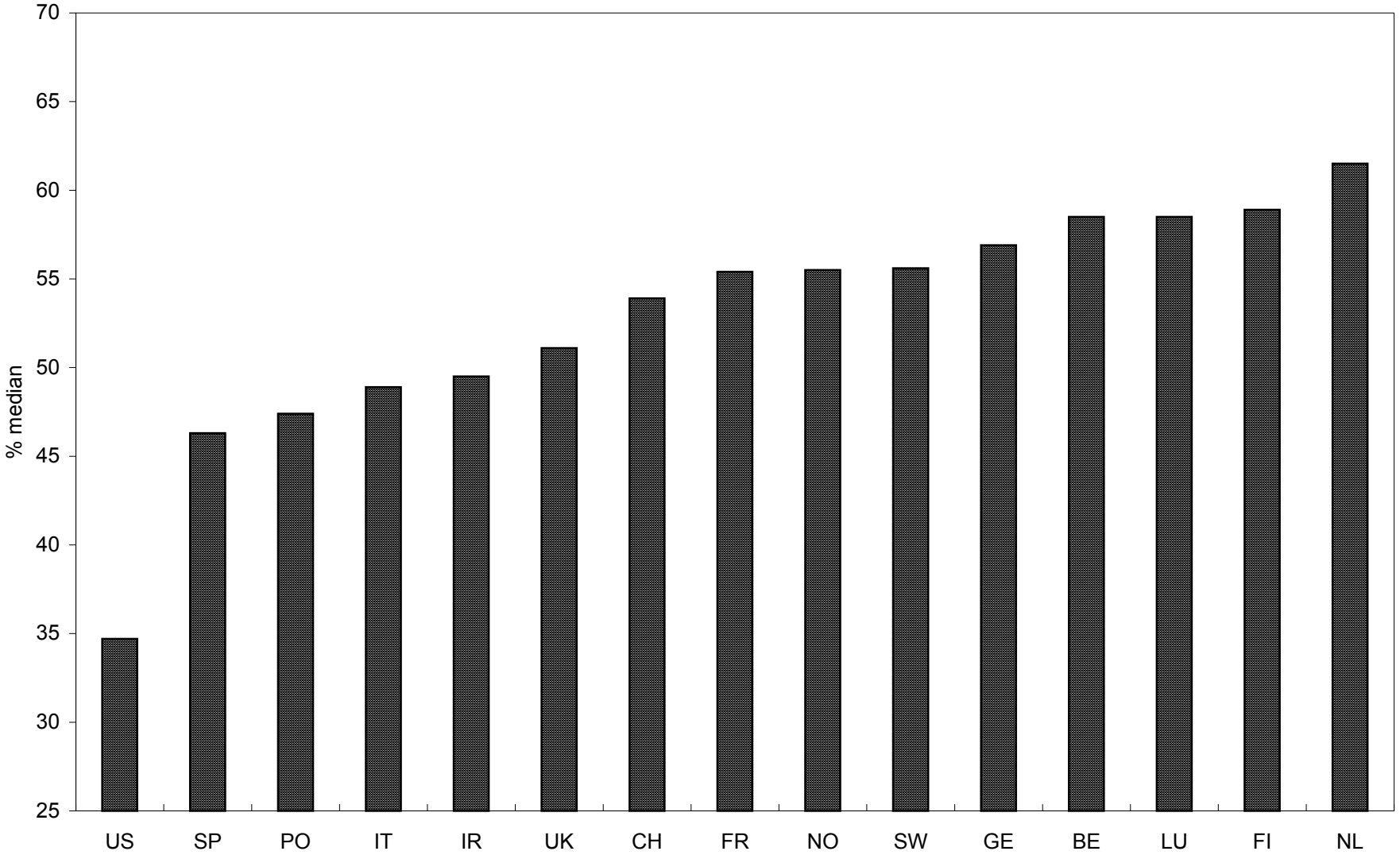

Figure 3 Top decile as % median

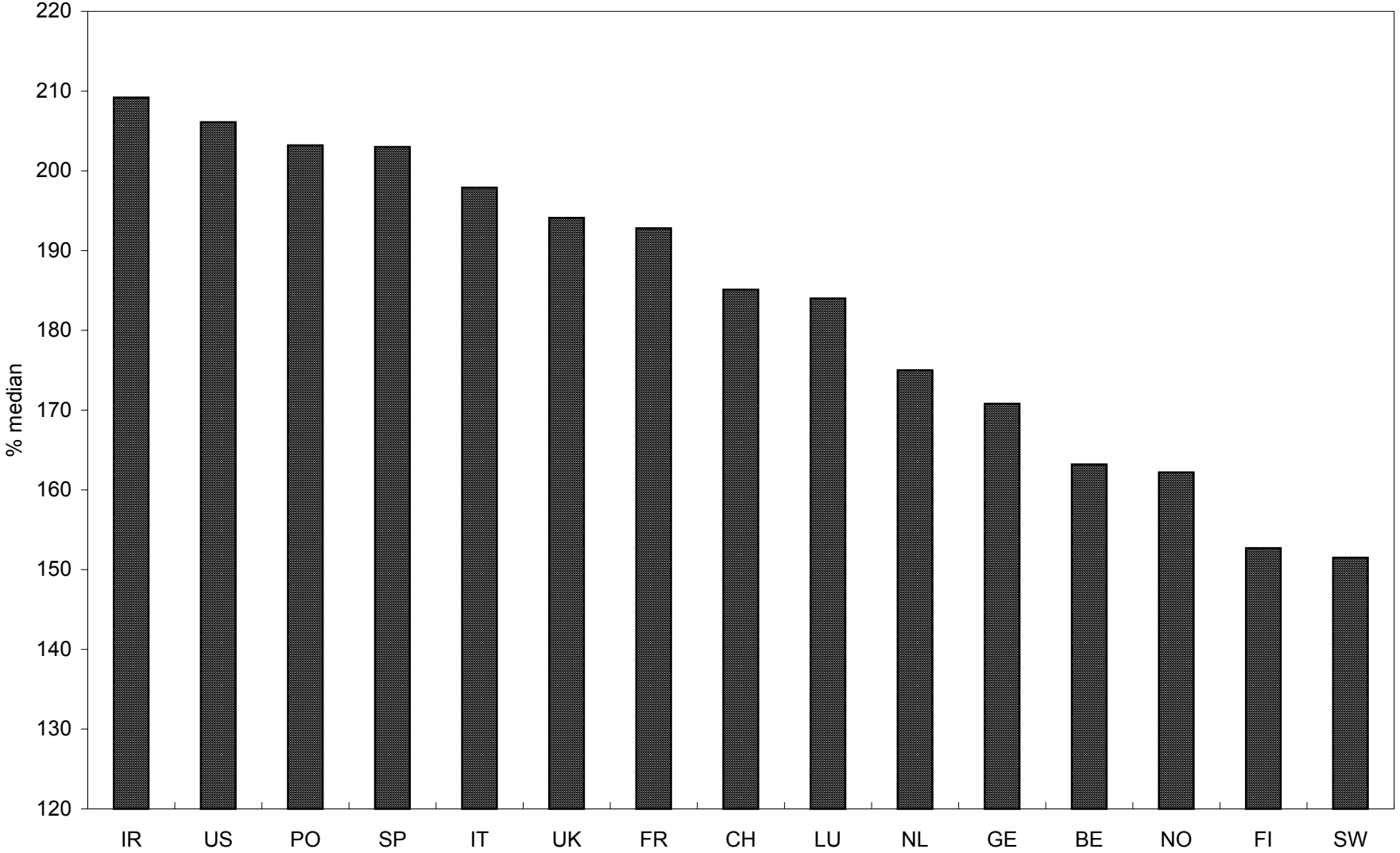

Figure 4 Relative incomes at different percentiles

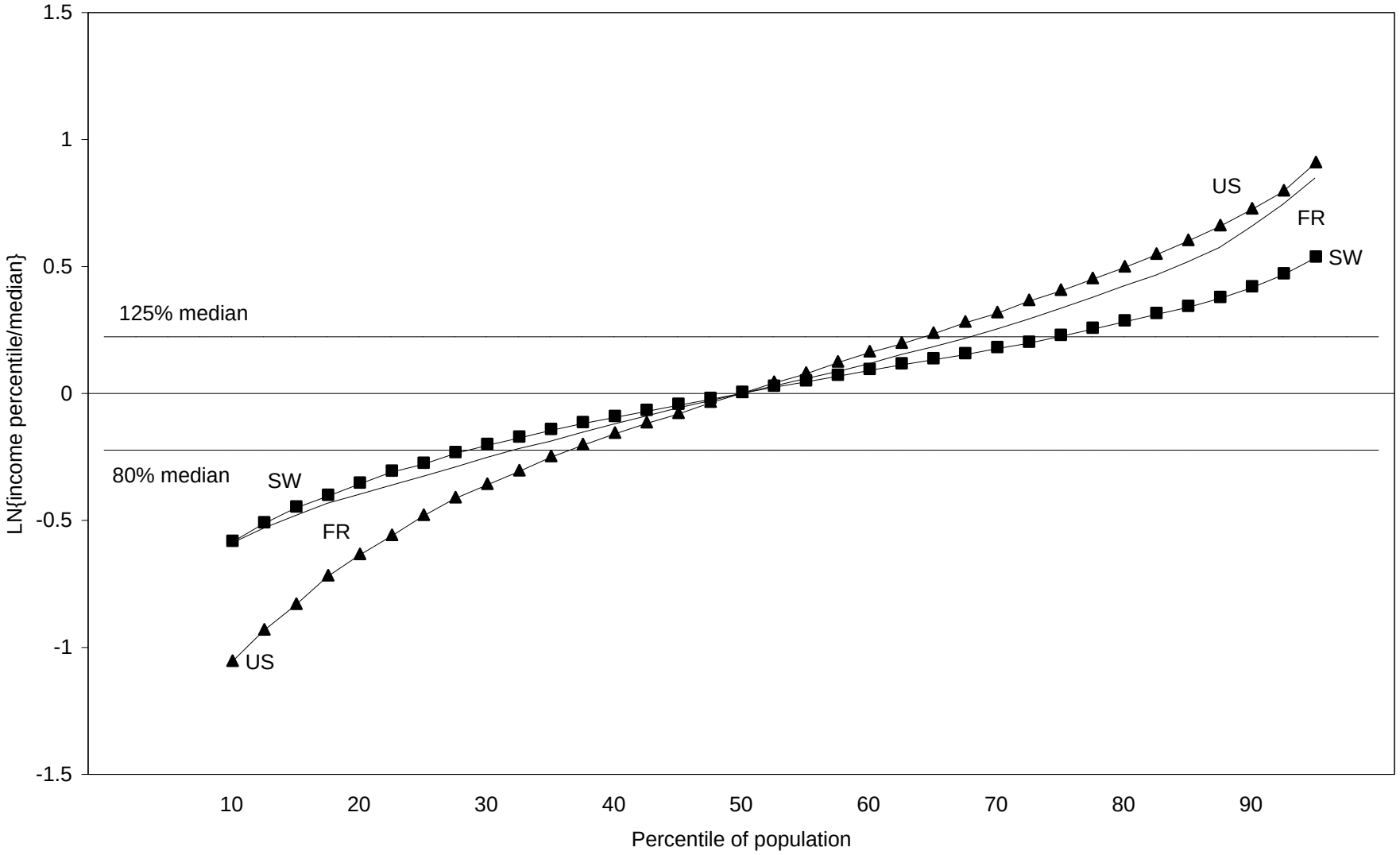

Figure 5. Ranking of countries (Hasse diagram)

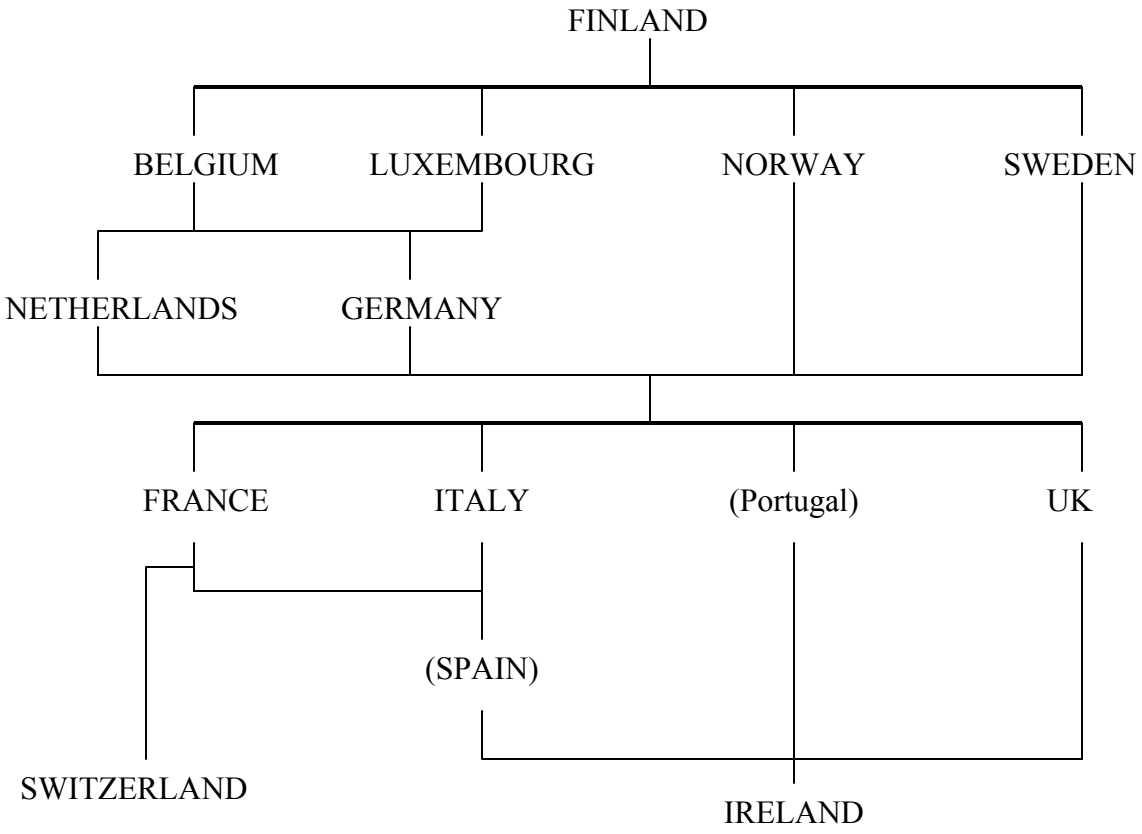

Figure 6 Trends in Inequality I

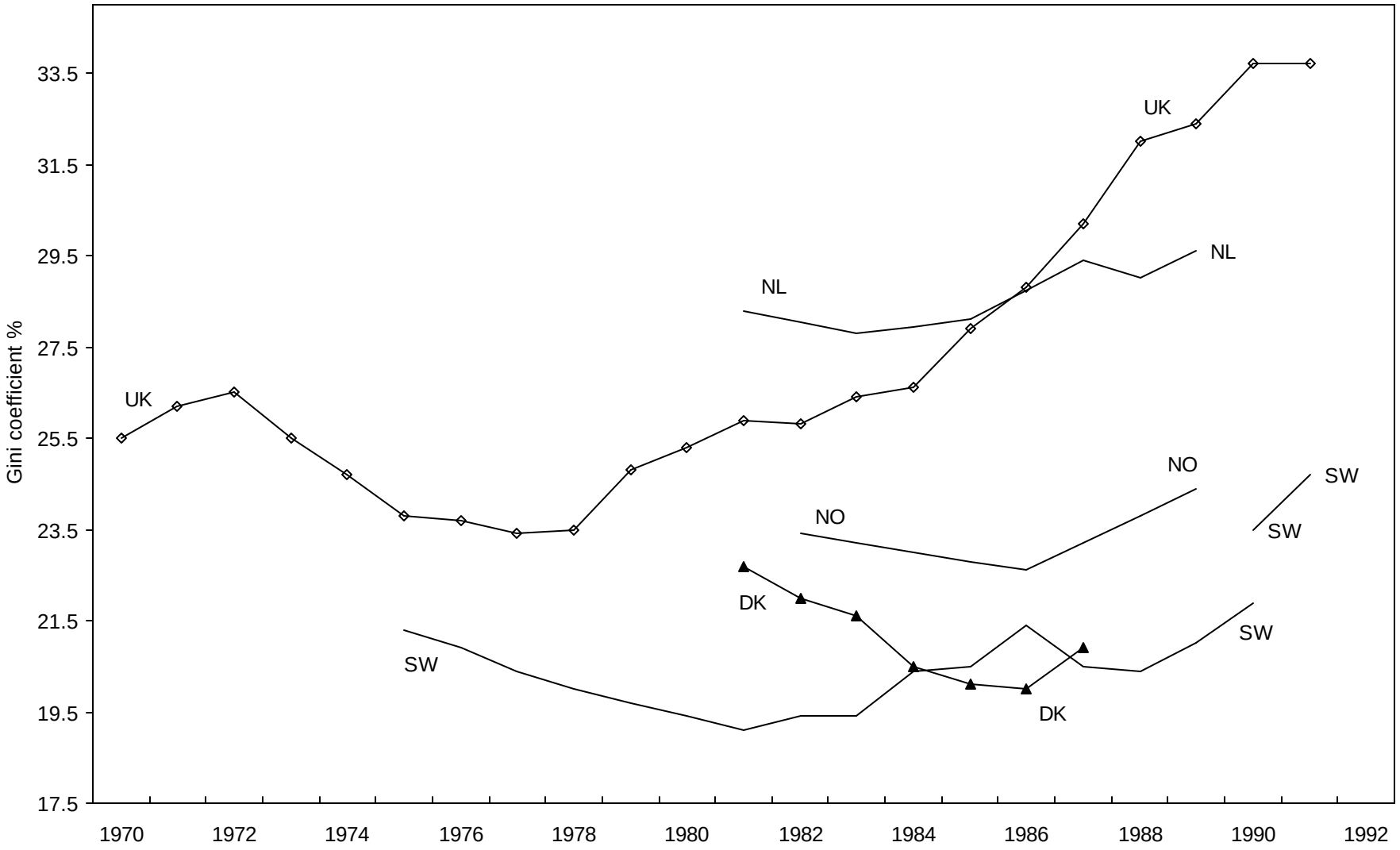

Figure 7 Trends in Inequality II