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Abstract

US poverty is much higher than poverty in Europe when a relative poverty measure is used. Using an absolute poverty measurement method, the picture looks different: poverty in some European countries is higher**.** This paper estimates poverty rates for all the countries of the (old) EU and the USA applying the official measurement methods of the United States (absolute) and the European Union (relative) to all the countries. The differences in poverty levels, both in time and between the 16 countries are analysed, identifying the various sources for the variance in the figures. Using annual data of the EU and the US from 1994 to 2001, we illustrate how some differences in poverty levels are inherent to the choice for an absolute or a relative approach, while other differences are related to aspects common to both absolute and relative poverty measurement but working out differently depending on the estimation method used. The results of our analysis point out that using a single figure is often misleading.

Keywords: poverty, absolute, relative, United States, European Union

JEL: H53, H55, I3

1. Introduction[1] [2] [3]

The differences in poverty levels between the European Union and the United States are striking: almost one out of four persons in the USA was poor in 2000 against around one out of ten in many European countries. More precisely, in 2000, 23.5 percent of the US population lived below the poverty line if the official EU poverty estimation method is used. Following the same estimation method, poverty levels in 2000 were 13.3 percent in Belgium and 10.4 percent in Sweden. However, when using the official poverty estimation method of the USA, poverty rates for 2000 are 8.7 percent in the USA against 3.6 percent in Belgium and 6.7 percent in Sweden. The "official" poverty estimation method for the EU (further referred to as Laeken methodology and Laeken indicators) is based on a relative poverty concept.[4] The official poverty estimation method for the USA is based on an absolute poverty concept (further referred to as Orshansky method and indicators). The difference between relative and absolute poverty estimates for the same country and the same year are considerable but far from uniform. The differences in the figures quoted above are for example very large for the USA and Belgium but much smaller for Sweden. For the first time in poverty analysis research, this paper estimates poverty levels using both methodologies for the USA and all (old - 15) EU countries and analyses the sources of the differences between the two estimates. The estimates can be made for all the years between 1993 and 2000.

Table 1 provides the estimates according to the 2 methodologies for 1996 and 2000 for the 16 countries under study. It can be seen that across 16 countries the USA shows by far the highest poverty rate when the EU (relative) methodology is used, although the Mediterranean countries (Greece, Spain and Portugal) and Ireland show high figures as well. Using an absolute poverty estimate, as done with the US methodology, the picture becomes very different. Albeit still higher, the USA poverty rates do not show that much difference with most European countries while Greece, Spain and Portugal have figures 4 times higher than the USA. Excluding the Mediterranean countries, differences in poverty levels between countries seem smaller when an absolute poverty concept is used compared to an relative based estimate, but Belgium shows even lower poverty rates than Sweden that in turn does no longer differ that much from the USA. Even though we can not calculate absolute poverty rates for the new EU Member States, there are similarly

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[1] This is work in progress. Please contact Geranda Notten (g.notten@algec.unimaas.nl) before using this document as a reference.

[2] This research benefited from a grant provided by the EuroPanel Users' Network (EPUNet) that financed a research visit to CEPS/INSTEAD (Differdange, Luxembourg) and from a travel grant provided by the Dutch Scientific Organization (NWO) which funded a research visit to the Kennedy School of Government (Cambrige, USA).

[3] We thank our colleagues at CEPS/INSTEAD (Differdange, Luxembourg), Kennedy School of Government (Cambridge, USA), National Poverty Institute (Ann Arbor, USA), Panel Study of Income Dynamics (Ann Arbor, USA) and the participants in the conference on "New Directions in the Study of Inequality" (Princeton, April 2006, USA) who have contributed to the progress of this research. We are especially grateful for the constructive suggestions of Emil Tesliuc, Christopher Jencks, Mary Jo Bane, Erzo Luttmer and Gary Sandefur.

[4] The Laeken indicators are set of commonly agreed indicators which are used to monitor progress on poverty and social inclusion in the European Union and its member states. The Laeken indicators complement, but do not replace the poverty indicators used by each member state.

large differences in relative poverty for these countries. For instance, relative poverty in Lithuania is 17 percent but only 8 percent in the Czech Republic, the lowest poverty rate in the whole European Union![5] Moreover, differences between absolute and relative poverty rates not only influence poverty levels but also affect the poverty developments over time: since 1995 absolute poverty in Ireland declined with 9.5 percentage points to 10.6 percent in 2000 while relative poverty increased with 2.3 percentage points to 21.4 percent over the same period. How can these differences between absolute and relative poverty rates be explained? This question will be addressed in the next sections.

Table 1: Poverty incidence (in % of individuals, in 1996 and 2000)

	Laeken (relative) poverty		Orshansky (absolute) poverty	
	1996	2000	1996	2000
Belgium	14.2	13.3	6.1	3.6
Denmark	9.3	10.8	3.2	3.4
Germany	12.1	11.1	7.0	5.1
Greece	21.5	20.5	28.1	26.1
Spain	20.3	18.8	29.8	19.1
France	14.9	15.4	8.8	6.5
Ireland	19.1	21.4	20.1	10.6
Italy	19.5	19.3	23.0	16.7
Luxembourg	11.4	12.5	0.7	0.6
Netherlands	10.5	11.3	6.1	6.6
Austria	13.0	11.9	5.8	4.8
Portugal	21.6	20.1	38.1	32.2
Finland	8.3	11.4	4.5	4.9
Sweden	8.9	10.4	7.1	5.7
United Kingdom	17.8	17.1	11.4	9.3
United States	21.7	23.5	8.5	8.7

Source: Own calculations ECHP and CNEF-PSID

Focussing on (differences in) official poverty estimates makes a lot of sense, for these statistics are used by governments to evaluate and/or adjust social and economic policies. Politicians and interest groups quote them to argue their case and the publication of the results receives considerable media coverage every year. The official USA poverty measurement methodology was developed by Molly Orshansky in the 1960s and is based on an absolute concept of poverty. Albeit regularly criticized and by times hotly debated, the Census Bureau still uses this method for its annual poverty assessments.[6] At the start of this millennium, the Member States of the EU agreed to use a common set of poverty and social exclusion indicators also called the 'Laeken' indicators. The subset of these indicators that is concerned with financial poverty in EU Member States uses a relative concept of poverty.

[5] These poverty statistics have been retrieved from the website of Eurostat, http://epp.eurostat.ec.europa.eu/portal/page?_pageid=1996,45323734&_dad=portal&_schema=PORTAL&screen=welcomeref&open=/C/C5/C53&language=en&product=Yearlies_new_population&root=Yearlies_new_population&scrollto=1068 (accessed March 2007).

[6] We do not argue that the official poverty methodology currently used in the US is the best option. The US method could be improved in many ways. For a comprehensive overview on its problems and how the methodology could be improved see Citro and Michael (1995) *"Measuring Poverty: a New Approach"*.

Given the importance of these official poverty statistics for policymaking and advocacy groups, it is important to be able to explain the differences between absolute and relative poverty rates. Are they the result of conceptual and methodological differences in the measurement of absolute and relative poverty or do they simply reflect differences in social and economic policy regimes? In this paper we focus on the technical reasons that account for the differences between relative and absolute poverty rates and their impact on poverty levels and poverty trends. This exercise enhances our understanding of how poverty statistics are influenced by, often hidden and forgotten methodological and technical decisions. Our analysis shows how some poverty differences are inherent to choosing either an absolute or a relative approach to poverty while other differences are related to more general aspects of poverty measurement. In short, we explain and illustrate how differences in inequality and changes in inequality over time affect absolute and relative poverty levels and poverty trends. Additionally, we investigate the impact of Purchasing Power Parity rates (PPP) and year to year updating methods of poverty lines on poverty. Finally, even though equivalence scales are used in every poverty approach, we show that equivalence scales have a different impact on absolute and relative poverty rates and explain how this result comes about.

Section 2 defines the poverty concepts and notations used and section 3 further explains the Laeken and Orshansky poverty indicators, discusses the data used as well as the main variables used in the poverty comparisons. Section 4 analyzes the differences between relative and absolute poverty rates for the 16 countries under study and estimates the impact of various measurement choices on poverty incidence; section 5 concludes.

2. Poverty measurement: concepts and definitions

There exists an extensive literature that elaborates at length on the wide range of issues involved in making poverty comparisons (see for instance Ravallion (1992) or Duclos and Araar (2006)). Although we certainly discuss some of the arguments in this literature it is beyond the scope of this paper to give a comprehensive review. We shortly introduce the general concepts and notation used in the analysis.

Key concepts involved in any poverty analysis are the welfare indicator, poverty line, unit of observation, unit of analysis, equivalence scales and poverty measure. The welfare indicator is a measure for the dimension of well being (or deprivation) under study. In this study, we use disposable (after tax) income as a welfare indicator.[7] The poverty line represents the threshold value of the welfare indicator which in turn determines the poverty status. When income is below the poverty line, the unit of analysis is considered 'poor'. With income poverty, the level at which information is collected (unit of

[7] Thus, disposable income is used as an indicator for the economic well being of their citizens. Income, by far, is the most important source for financing consumption in developed economies. Nevertheless, measuring income has a number of drawbacks. One drawback of this indicator is that it labels households that are financing current consumption from assets (such as savings or loans) as 'poor', while their stock of assets may be more than sufficient to finance an acceptable level of economic well-being. Similarly, it can also label households that are financing large debt repayments from current income as 'non poor'.

observation) differs from the level at which poverty is calculated (unit of analysis). Information on income is collected at a household level while poverty is typically calculated counting individuals. This is because income and the items on which income is spent are generally shared at a household level and thus contribute to the level of well being of all household members. Equivalence scales are then used to adjust for differences in household size and composition because these differences *ceteris paribus* also generate differences in well being. Equivalence scales can adjust for differences in food requirements between age and gender groups. They can also take into account that larger households typically have lower expenditures *per member* because they share resources (i.e. house, car) or because they can buy larger quantities of food for a lower unit price. Equivalence scales may be used to correct the welfare indicator to an adult equivalent level, or they adjust the poverty line to fit the characteristics of the household. Finally, a poverty measure aggregates the poverty result from the unit of analysis to the population. A widely used group of poverty measures is the Foster Greer Thorbecke (FGT) class of decomposable poverty measures which reflect the percentage of poor individuals as well as the depth and severity of poverty experienced (Foster *et al*, 1984). In this study we mainly use the percentage of poor individuals, also called headcount or poverty incidence.

Summarizing the above discussion more formally, we can denote adult equivalent income with y and let F(y) represent cumulative distribution function which gives the probability of observing someone with an income less than y.

$$F(y) = \int_0^y f(y)dy \qquad (1)$$

where f(y) is the probability of observing income with a value of y. The poverty line (z) can take the values $0 < z < y_{max}$, where y_{max} is the highest income value. The headcount index can be described as:

$$H = F(z) = \int_0^z f(y)dy \qquad (2)$$

The poverty line can be determined with respect to some objective benchmark such as the cost to fulfil basic needs (food, shelter, clothing etc.). It can also be set in relation to the typical living standard in a society. As commonly denoted in the poverty literature, we call the first an 'absolute' method while we label the latter as 'relative'. Authors such as Boyle (1999) and Ravallion (1992) have argued that this terminology is misleading: the term absolute poverty suggests that the approach taken is objective and positive but every application of this concept involves some normative judgement about insufficiency and/or benchmarking with society. Therefore, "an absolute poverty line is best thought of as one which is fixed in terms of living standards and fixed over the entire domain of poverty comparison; a relative poverty line, by contrast, varies over that domain and is higher the higher the average standard of living" (Ravallion, 1994, p.30). In formal notation, an absolute poverty line is determined by:

$$z_a = f(x) \qquad (3)$$

where f(x) represents the value of attaining some benchmark x. A relative poverty line is determined by a fraction (k) of some moment (m) of the income distribution f(y), usually the median:

$$z_r = k^*[m \mid f(y)] \qquad (4)$$

where $0 < k < 1$.

Absolute and relative poverty lines thus reflect conceptually distinct approaches to determining insufficient levels of well being; an absolute poverty line identifies those people who have insufficient resources to satisfy basic or main needs while a relative poverty line identifies those that have much less than what is considered typical or normal in a given society.

3. Methodology and data

The USA and EU have developed distinctive approaches to poverty measurement. The task of applying both approaches on each country / group of countries while ensuring comparability of the results is not an easy or a trivial one. In turn, we discuss the Laeken and Orshansky poverty measurement methods, the data and main variables used in the poverty comparisons.[8]

3.1 Laeken and Orshansky poverty measurement methods

The official poverty methodology (Orshansky) used in the United States is based on an absolute concept of poverty while the European method (Laeken) uses a relative poverty concept.

The US poverty line was developed in the 1960s by Molly Orshansky, an economist working for the Social Security Administration. The Orshansky poverty line incorporated both food and non-food components. Firstly, Orshansky used the lowest food plan from the Agriculture Department, which measured the costs of food for families under economic stress, to develop a food poverty line. Subsequently, the poverty line was multiplied by the reciprocal of the average share of food expenditures in total income. Although there have been some minor changes in the methodology over time, the poverty line currently used is essentially the same as those developed in the 1960s. In fact, the Orshansky poverty line is a set of poverty lines; depending on the family size and the age of household members, one of the 48 poverty lines applies.[9] Every year, the poverty lines are updated for inflation using the consumer price index for urban consumers, which is the same for the whole USA. The official poverty rates are annually estimated by the Bureau of Census using the March Supplement of the Current Population Survey (CPS).

[8] We have also documented these issues more in detail in an appendix that can be obtained from Geranda Notten (g.notten@algec.unimaas.nl).

[9] The poverty lines do not differ by state or region in the USA. The thresholds are available for each year on the website of the Bureau of Census on www.census.gov/hhes/www/poverty/threshld.

The poverty status of a family is obtained by comparing its gross annual income to the poverty line of that family type.

During the Nice summit in 2001, the EU Member States decided to combat poverty and social exclusion by means of the open method of coordination. This method "involves fixing guidelines for the Union, establishing quantitative and qualitative indicators to be applied in each member state, and periodic monitoring" (Atkinson *et al*, 2002, p. 5). The design and implementation of policies to fight poverty and social exclusion, however, remains predominantly the responsibility of the Member States. To monitor progress in these areas, a set of common statistical indicators was developed. Named after the Laeken European Council who endorsed the indicators in 2001, these 'Laeken indicators' cover four dimensions of social inclusion; financial poverty, employment, health and education. We use the subset of the Laeken indicators that is concerned with financial poverty. The Laeken poverty line is a relative poverty line that is set at 60% of national median disposable income. Household income is adjusted for the demographic composition of the household using the modified OECD equivalence scales.[10]

3.2 Data

For the European Union we use the European Community Household Panel (ECHP). The ECHP is a survey on household income and living conditions carried out in 8 waves from 1994 until 2001 and includes the so-called EU-15 countries.[11] The data provide cross-section and longitudinal information on household and individual level on topics such as income, education, housing, health and social relations. Comparability of the ECHP data is achieved through common survey structure and procedures, common standards on sampling requirements and where possible on data processing and statistical analysis as well as the use of a 'blue-print' questionnaire used as point of departure for the national surveys. The European statistics office (Eurostat) also uses the ECHP to calculate the Laeken poverty indicators.

For the United States, we use data from the Panel Study of Income Dynamics (PSID) from 1994-2001. The PSID is a nationally representative longitudinal survey containing information on individual and family level on economic and demographic topics. Started as an annual survey in 1968, the PSID became a biennial survey since 1997. The PSID is available in two formats; the original PSID and the so-called Cross-National Equivalent Files (CNEF) which contains equivalently defined variables for the panel surveys of four countries (Germany, United Kingdom, Canada and United States). We use the CNEF because the main variables in the PSID are harmonized with two datasets that are also the basis for the ECHP, which facilitates the construction of comparable welfare indicators.

3.3 Making the comparison – definition and construction key variables

[10] The modified OECD equivalence scale gives a weight of 1 to the first adult in the household, a weight of 0.5 to other members aged over 14 years and a weight of 0.3 for children under age 14.
[11] Included are: Austria (1995-2001), Belgium, Denmark, Finland (1996-2001), France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Sweden (1997-2001) and United Kingdom.

The main challenge lies in the construction of comparable welfare indicators and poverty thresholds. Both the EU and USA use income as welfare indicator for the poverty analyses. However, in the US *gross income* is used while the EU uses *disposable income*. We prefer to use disposable income because disposable income better reflects the funds that a household can spend on consumption. The advantage of using the CNEF-PSID is that these data also include imputed variables indicating the tax burden of households and thus provide an indicator for disposable income in the USA.[12] Furthermore, both datasets contain a range of variables indicating the annual value of various income sources such as wages and salary, earnings from self employment, capital, private transfers and social protection benefits. Our indicator of total net disposable income includes income from these sources. Capital gains (or losses) and in kind benefits are not included, with one exception. For the USA we included the value of food stamps because these in kind transfers can be considered as 'near money' as they are issued in the form of an electronic debit card that can be used to purchase food items in a range of supermarkets. Moreover, the food stamp program is one of the main programs that targets poor households in the USA; not including the value of these benefits would ignore this important poverty reduction effort in the poverty estimates.

The income variables in the ECHP are constructed using the same (or similar) methodology for all Member States. There are, however, two aspects that may affect our cross-national poverty comparisons. Firstly, the use of register data for Sweden, Finland and Denmark may yield higher poverty rates than survey-based poverty estimates.[13] Secondly, the simulated tax burden in the CNEF-PSID also incorporates the higher deductions for low income families with children (Earned Income Tax Credit (EITC). The simulated tax burden assumes a 100 percent EITC take up rate but not all eligible households actually receive the EITC.[14] This assumption may therefore underestimate USA poverty rates.

While both survey data have been collected from 1994-2001, the income variables reflect household income in the year *previous* to the survey (thus, from 1993-2000). The information on the household size and composition, which is also used for the determination of the poverty rate, is based on the survey year. We decided that the calculated poverty rates reflect the period 1993-2000.

We obtained the US poverty thresholds from the Bureau of Census and converted the 1993 dollar thresholds to the Member States' currencies using 1993 Purchasing Power

[12] Federal and state income tax burdens have been imputed using the NBER TAXSIM model and PSID data while payroll taxes have been estimated using the tax rates reported by the Social Security Bulletin (Lillard *et al*, Codebook for the Cross-National Equivalent File 1980-2005).

[13] ECHP data from Sweden, Denmark and Finland are based on statistical registers drawn from administrative records. Comparison of Finnish household survey data with the Finnish ECHP data based on statistical registers shows considerable higher income levels for the lowest two income deciles using survey data. As the other ECHP countries use survey data this affects cross-country rankings of poverty levels (Rendtel *et al*, 2004).

[14] To claim the EITC a special tax form has to be completed and submitted. According to a study of the Internal Revenue Service on participation in the EITC program for the tax year 1996, up to 18% of the of the eligible individuals did not file a tax return (IRS, 2002).

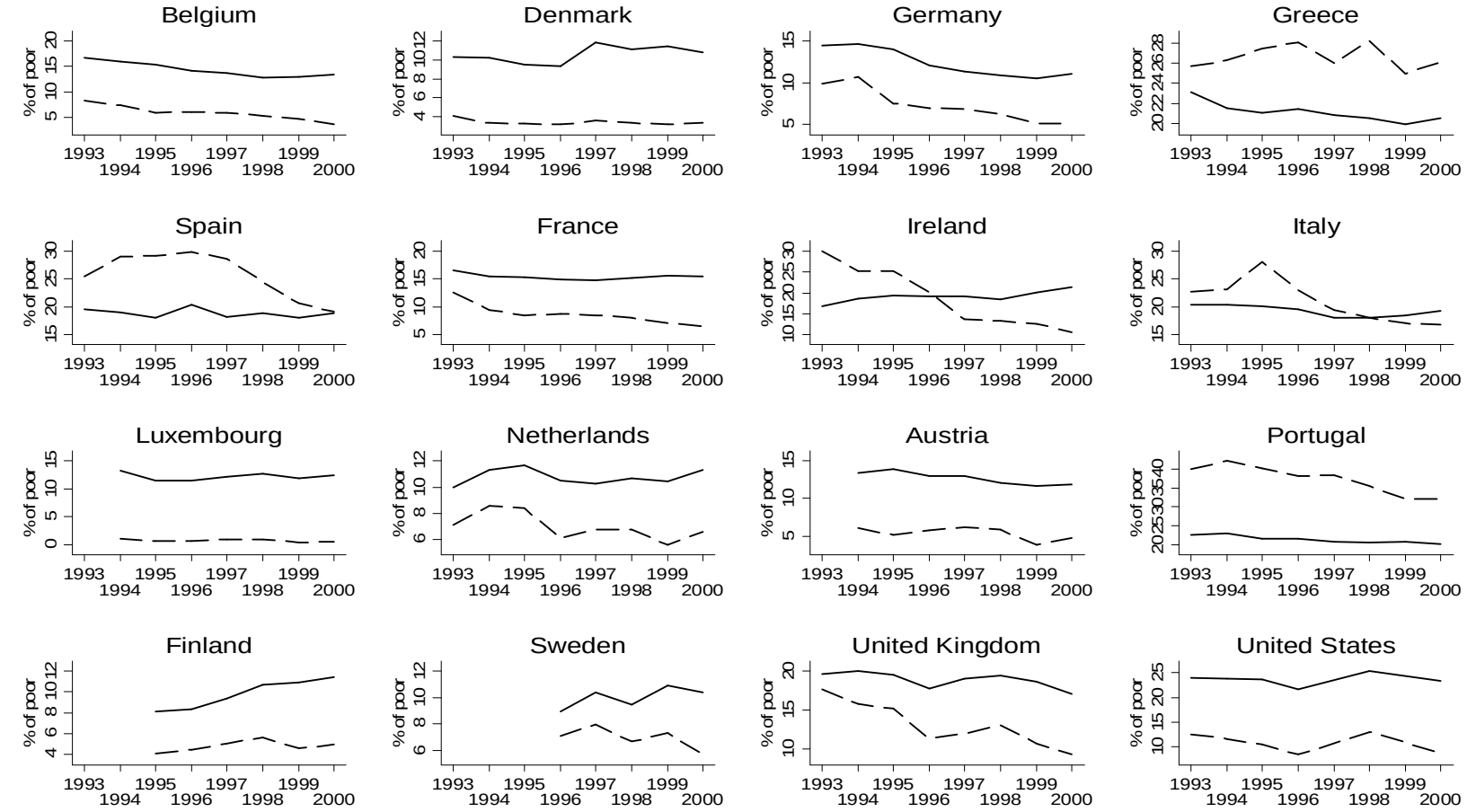
Parity (PPP) indices. After the conversion of the US thresholds to national purchasing power values, we updated the thresholds to other years using national consumer price indices. The Laeken poverty lines depend on the income distribution and are thus based on the income variable in both datasets. Furthermore, we constructed a variable indicating the household level weight of the modified OECD-equivalence scales and a variable indicating which of the 48 Orshansky poverty lines should be applied to the household. Tables A1-A3 in the appendix summarize the number of households and individuals as well as the mean (annual) per capita and adult equivalent income levels by country and survey round.

4. Dissecting the Laeken and Orshansky methodologies: what's in a number?

Using the methodology explained above we have calculated the official EU (Laeken - relative) and US (Orshansky - absolute) poverty rates for each country over time. Figure 1 shows that there are both level and trend differences in official poverty rates and that the experience differs between countries.[15] Ireland shows opposing trends in poverty rates; according to the Orhsansky indicator poverty declines while poverty increases for the Laeken indicator. For Germany, Netherlands, Belgium and the United States both poverty indicators follow the same trend. In most countries, the Laeken poverty rates are higher than the Orshansky poverty rates but this does not hold for Portugal, Greece and Spain. The difference between Orshansky and Laeken poverty rates is larger in countries like the United States and Luxembourg but considerably smaller in the Netherlands, Denmark and Sweden.

[15] Table A4 in the appendix lists the annual poverty rates.

Figure 1: Poverty incidence (in % of individuals over the period 1993-2000)



Notes: To facilitate comparison of Orshansky and Laeken poverty trends within countries, we used different scales on the vertical axes. For the USA there are no observations 1999 and 1997.

Source: Own calculations ECHP and CNEF-PSID

In this section we explain and empirically illustrate the impact of methodological and technical decisions in relative and absolute poverty measurement methods. We focus on three dimensions: differences in poverty levels, poverty trends and poverty risk for particular population groups. Within each of these dimensions we first recognize a number of underlying determinants and then illustrate the effect of each determinant on the official poverty statistics while keeping everything else equal. Firstly, absolute and relative poverty levels are affected by income inequality the conversion of US poverty lines to European price levels. Then, we analyze how absolute and relative poverty trends are influenced by inflation and changes in income inequality. Finally, we show how equivalence weighting affect absolute and relative poverty rates differently.

4.1 Differences in poverty levels

There are two important reasons why the Laeken and Orshansky poverty levels differ within and between countries; differences in inequality (i.e. distributional shape of the welfare indicator) and the use of Purchasing Power Parity (PPP) rates to convert the US poverty lines to country specific thresholds. Differences in income inequality affect the level of relative (Laeken) poverty lines but not of absolute (Orshansky) poverty lines. Differences in cost of living and PPP rates affect the value of the Orshansky poverty lines.

4.1.1 Inequality in welfare

Relative poverty rates depend on the degree of welfare inequality in a society because the threshold is set relative to the living standard of a 'typical' or 'benchmark' resident in that society. It is important to note that by taking a relative approach to poverty, one is not concerned about inequality as such, but about the welfare inequalities between the typical resident and those residents that have fewer resources than this person. Differences in relative poverty rates between countries (or any other group) arise because in some countries there is more dispersion at the lower/left part of the welfare distribution than in other.[16] In the Laeken methodology, the typical resident is the median and the poverty line is set at 60% of the income earned by the median person. When using the Laeken methodology (or any similar approach), higher inequality results in higher relative poverty rates; but only under specific conditions. This becomes clear when we try to state these conditions more formally. Firstly, we shift our focus from the whole income distribution to its left part only.[17] Let $F_m(y)$ represent the cumulative income distribution up till the income of the typical resident, y(m):

[16] Thus, relative poverty methods do not necessarily yield higher poverty rates in a country with more inequality than in a country with less inequality. For instance, country A and B have exactly the same welfare distribution at and below the 'typical' resident, but above the welfare in A is distributed more equally than in country B. Country B has higher inequality than country A but any relative poverty methodology will yield the same poverty rate for country A and B.

[17] We illustrate this argument using the median as the benchmark but we could have used the mean as well. In both cases one focuses on the left/lower part of the distribution; in case of the median one focuses exactly on the lower *half* of the distribution while the mean typically covers a larger part of the distribution (as the mean is more sensitive to outliers in the right part of the distribution).

$$F_m(y) = \int_0^{y(m)} f(y)dy \quad (5)$$

where f(y) is rescaled by y(m) such that $0 \leq y \leq 100$ and y(m)=100.[18] The relative poverty line (z) is determined as a constant fraction of the income of the typical resident (see Equation 4). Now take two countries, whose cumulative income distributions are indicated with $F^A(y)$ and $F^B(y)$. Country A only has higher relative poverty rates than country B when its cumulative income distribution evaluated at the poverty line, z, lies above that of country B.

$$F_m^A(z) > F_m^B(z) \quad (6)$$

In other words, there is more income dispersion below the poverty line in country A than in country B. This is a very specific concept of inequality because country B could have higher relative poverty rates if we use other fractions (k) of the income of the typical resident or if we take another moment to select the typical resident.[19] Relative poverty rates can also contradict with other inequality measures as we will illustrate below in table 2.

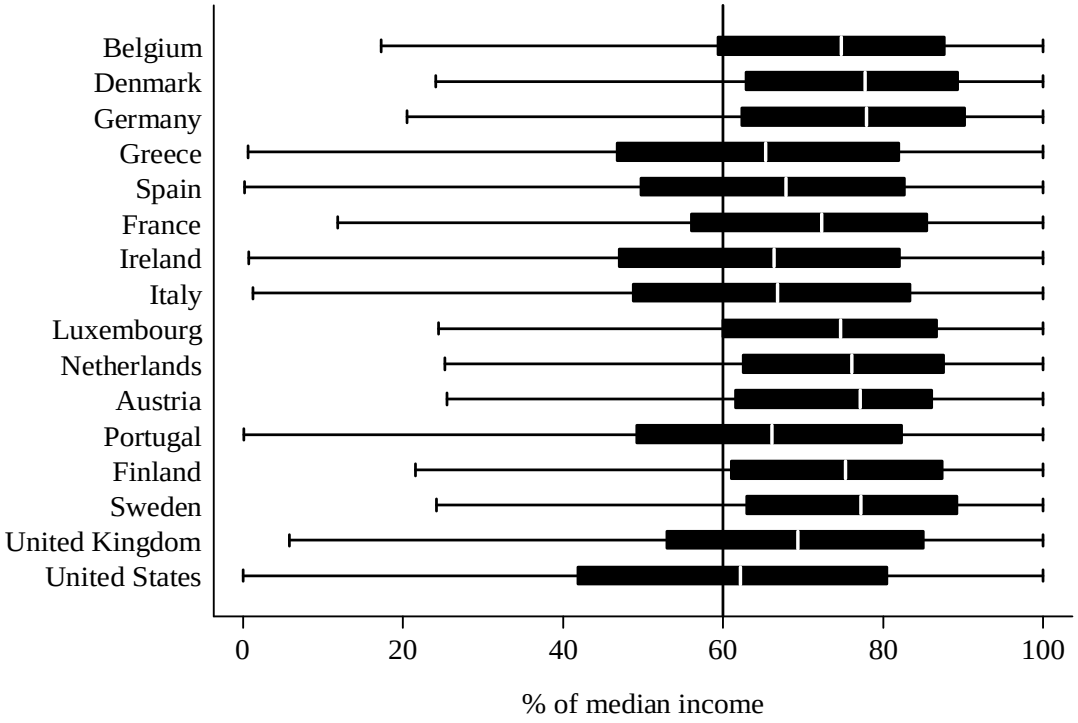
Countries with higher income dispersion below the median have higher relative poverty rates. Moreover, as absolute thresholds do not take distributional characteristics into account, countries with higher income dispersion are more likely to have larger differences between absolute and relative poverty rates.[20] Especially when the absolute threshold is based on some assessment of the minimum amount of resources needed to cover the basic cost of living in a country, large differences between absolute and relative poverty levels can arise.

[18] The rescaling allows us to compare the income distributions of different countries only taking the dispersion of these income distributions into account.

[19] Only when $F_m^A(y) > F_m^B(y)$ for all incomes below y(m), country A always has higher relative poverty rates then country B.

[20] Additionally, in countries with a high dispersion of incomes around the poverty line, poverty rates are very sensitive to the locus of the poverty line; a slight change in the level of the poverty line can have a large impact on the poverty rates (i.e. the poverty elasticity is high).

Figure 2: Dispersion of income below median (2000)



Source: Own calculations ECHP and CNEF-PSID

We now illustrate the income dispersion within the US and the EU Member States in a number of ways and examine to what extent they are consistent with poverty outcomes. Countries with higher income dispersion below the median have higher relative poverty rates. Moreover, as absolute thresholds do not take distributional characteristics into account, countries with higher income dispersion are more likely to have larger differences between absolute and relative poverty rates. Especially when the absolute threshold is based on some assessment of the minimum amount of resources needed to cover the basic cost of living in a country, large differences between absolute and relative poverty levels can arise.

Figure 2 shows boxplots for each country using the 2000 income distribution.[21] The boxplots are drawn using only the observations *in the lower half* of the income distribution. We have rescaled income by setting median income in each country to 100, such that the horizontal axis is the same for all countries. The wider the box, the larger is the income dispersion below the median. The vertical line in the figure at 60% indicates the locus of the Laeken threshold. All observations falling below this line are in relative poverty.[22] We can see that countries with higher dispersion below the median also have higher relative poverty rates (United States, United Kingdom, Ireland, Portugal, Italy, Greece, and Spain). The position of the box also matters, if the box of the United States would lie more to the right relative poverty rates would be lower than in the current situation. This underlines the argument that relative poverty methods use a specific concept of inequality; it is the degree of income dispersion below the median and around the poverty line that ultimately determines the poverty rate.

Table 2 : Indicators of income dispersion and poverty rates (2000)

	y(m) (in Euro)	**Gini of** $F(y)$	**Gini of** $F_m(y)$	$z_r/y(m)$	$z_a/y(m)$	H_r	H_a
Belgium	15,493	0.280	0.144	0.60	0.51	13.3	3.6
Denmark	20,620	0.216	0.139	0.60	0.50	10.8	3.4
Germany	15,760	0.253	0.142	0.60	0.54	11.1	5.1
Greece	7,119	0.328	0.200	0.60	0.80	20.5	26.1
Spain	9,034	0.327	0.191	0.60	0.70	18.8	19.1
France	14,914	0.270	0.160	0.60	0.54	15.4	6.5
Ireland	14,271	0.288	0.182	0.60	0.51	21.4	10.6
Italy	10,401	0.294	0.201	0.60	0.66	19.3	16.7
Luxembourg	23,114	0.265	0.136	0.60	0.36	12.5	0.6
Netherlands	13,820	0.261	0.150	0.60	0.57	11.3	6.6
Austria	15,292	0.242	0.145	0.60	0.52	11.9	4.8
Portugal	5,983	0.369	0.187	0.60	0.91	20.1	32.2
Finland	14,866	0.244	0.142	0.60	0.53	11.4	4.9
Sweden	16,353	0.242	0.142	0.60	0.54	10.4	5.7
United Kingdom	17,724	0.306	0.179	0.60	0.52	17.1	9.3
United States	24,785	0.394	0.228	0.60	0.39	23.5	8.8

Notes: y(m) adult equivalent median income, F(y) total income distribution, $F_m(y)$income distribution below median, z_r relative poverty line, z_a absolute poverty line H_r (relative (Laeken) poverty rate), H_a (absolute (Orshansky) poverty rate). z_a reflects the single working age adult US poverty line.
Source: Own calculations ECHP and CNEF-PSID

Table 2 relates the absolute (Orshansky) and relative (Laeken) poverty rates to a number of other indicators of dispersion. The second column displays the national median income

[21] Boxplots are a means to graphically summarize a number of key characteristics of a distribution. The box includes all observations within the 25th and 75th percentile and the vertical line within the box indicates the 50th percentile (i.e. the median). The larger the spread of a distribution, the wider the box is. The lines outside the box are called 'whiskers', the end of the whisker does not necessarily indicate the lowest or highest observation. Outliers are located outside the whiskers.

[22] The relative poverty rate can also be approximately read from the figure. Take for instance Luxembourg. For this country the 60% of median income line coincides with the 25th percentile of the income distribution thus implying a poverty rate of 12.5%.

expressed in Euro's, using average annual exchange rate in 2000. The third and fourth column show the Gini indices calculated for the whole distribution and for the lower half of the distribution. Countries with a higher Gini for the whole distribution also have a higher Gini for the lower part of the distribution. Empirically, countries that score high on this inequality measure also have higher relative poverty rates. Nevertheless, rankings between countries may differ according to the inequality indicator used. The Dutch Gini is lower than that of Luxembourg, but the Gini taking only the lower half of the distribution is higher in the Netherlands. Moreover, even though inequality below the median is higher in the Netherlands, the Dutch relative poverty rate is lower than that of Luxembourg. A similar observation can be made for Portugal and Spain.

The other columns show the ratio of both poverty lines over median income as well as the headcount poverty rates. Clearly, differences between the income levels at which the absolute and relative poverty lines are set also affects the discrepancy between absolute and relative poverty rates. The extremely large difference between absolute and relative poverty rates in the United States can be explained by the high dispersion of incomes below the median and by the different position of the thresholds; the absolute threshold is much lower than the relative threshold.

4.1.2 Cost of living

The countries which we use in our poverty analysis have different currencies and different price levels. International poverty comparisons are only possible when the absolute poverty threshold reflects (about) the same living standard in each country. Thus, an income equal to the poverty line in Italy should allow a household to purchase the same goods and services as the poverty line income in the United States. To obtain the absolute poverty lines for the European Members States we converted the official 1993 US thresholds using the 1993 Purchasing Power Parity (PPP) rates provided by the OECD. For the other years, we updated the national thresholds the using the Consumer Price Index (CPI) of each country.[23] We discuss the appropriateness of using PPP rates and we show the impact on poverty of using a different benchmark year.

The PPP indices have been developed to accurately compare macroeconomic indicators such as GDP while controlling for differences in price levels and exchange rates between countries. In practise, the PPP indices are used for various purposes, including international poverty comparisons (Smeeding, 2000 and Schreyer *et al*, 2002).[24] The well known dollar-a-day poverty estimates of the World Bank are obtained using the same methodology. The main problem with the PPP rates is that they may not reflect the costs of buying those goods and services that are consumed at income levels around the

[23] An alternative would be to construct for each country (including the US) a minimum goods basket along the same principles but taking into account local consumption habits. Such an effort, although evidently useful, was well beyond the scope and funding resources of this research project. Following the recommendations of a National Academy of Sciences panel (Citro *et al*, 1995), the US Census Bureau (2005) has constructed such a threshold and performed a poverty analysis. Following a very similar methodology, Soede (2006) has constructed a similar poverty line for the Netherlands.

[24] See Gottschalk *et al* (2000) and Castles (1996) for a discussion on the use of PPP rates and micro-based data comparisons of well-being.

poverty thresholds. One problem is that PPP rates are based on the prices of a goods basket that not only includes consumer products. A second issue is that average income people may consume other goods than those with a (below) poverty line income. Moreover, the relative quantities of goods consumed also vary by income; low income individuals or households spend more resources on basic costs of living (food, shelter) while expenditures on luxury goods, leisure activities are higher as income is higher. The International Comparison Program (ICP) of the World Bank is currently developing so-called Poverty-relevant PPPs (PPPP) which specifically take into account the costs and quantities of goods and services consumed by people living on the threshold level.[25] Unfortunately, the PPPPs are not yet available, so we can only explore differences in the poverty impact using PPP rates. Given our current poverty estimates, we find it difficult to believe that in 1993 about 40% of the Portuguese had an income that was insufficient to cover the basic cost of living. We expect to find lower absolute poverty rates for countries such as Portugal, Greece, Italy and Spain if we could apply the newly developed PPPP rates.

Irrespective of the conversion rate used, poverty estimates are sensitive to the choice of the benchmark year. The PPP rate (q) is defined as the number of currency units required to purchase the amount of goods and services equivalent to what can be bought with one unit of the currency of the base country. For the OECD PPP rates, the US is the base country.[26] The poverty line (z) of country A at time t is obtained by multiplying the US thresholds with the PPP rate (q) at time t:

$$z_{At} = z_{US\,t} * q_t \qquad (7)$$

Then, for any other year the poverty lines of country A are updated for the cost of living using consumer inflation rates (π):

$$z_{At+1} = z_{At} * (1 + \pi_t) \qquad (8)$$

Year to year PPP rates change when the relative cost of living changes between countries (i.e. the inflation rates differ) or when there are changes in the exchange rate. If the costs of living in country A rise with respect to the cost of living in the United States, the PPP rate will increase (and the poverty line in country A as well). Even when inflation rates are constant, changes in the exchange rate influence the PPP rate and thereby the level of the poverty line.

The choice for a particular PPP benchmark year thereby influences the poverty estimates. From 1993 to 2000, there were considerable changes in the PPP rates of countries such as Greece, Spain, Ireland, Italy and Portugal. Take for instance Greece, whose dollar PPP

[25] These PPPPs will be made available in 2007 (ICP Newsletter, volume 3, number 3, October 2006, available on www.worldbank.org).

[26] If there is only one good in the basket, the PPP rate would be calculated as follows: $q_t = P_A * E / P_{US}$, where P_A is the price of this good in country A, P_{US} the price in the United States and E is the dollar exchange rate.

rate increased from 0.494 in 1993 to 0.685 in 2000 (and increase of 38%).[27] Figure 3 shows how absolute poverty in Greece changes by taking different benchmark years for PPP rates. The solid line shows the Orshansky poverty trends using the1993 PPP rates. The dashed line illustrates the Greek poverty rates if we would convert the US thresholds to Greek living standards *every year*. The impact of choosing a certain base year for PPP conversion on poverty levels is reflected by the vertical distance between the lines.[28] Thus, if we would have used the 2000 PPP rates, the absolute poverty rate in 2000 would be 30% as compared to 26%. Choosing a different base year thus has a level effect on the absolute poverty rate but does not affect the poverty trend.[29] The PPP changes for the other countries were considerably smaller and have therefore a much smaller impact on the level of poverty. Concluding, there is a certain arbitrariness involved in the choice for a benchmark year, although it makes sense not to choose for an 'unusual' year in terms of exchange rate or inflation levels.[30]

Figure 3: Impact of PPP benchmark year on absolute (Orshansky) poverty in Greece

[27] Expressed in ECU/Euro.

[28] The difference in poverty levels in Figure 3 may not only arise because of exchange rate trends. It may also be the result of inflation differences between consumer goods (π) and the goods basket used for constructing PPP rates.

[29] Converting the thresholds every year using the yearly PPP rates is not a good alternative, particularly if one is interested in studying changes in absolute poverty over time. This is because changes in the exchange rate could then affect the poverty trend.

[30] Most of the EU-15 countries were member of the European Monetary System (EMS) during the observed period and we thus involved in a joint effort to curb volatility of exchange rates. We preferred not to use the late nineties or 2000 because in these years the EMS was replaced by the European Monetary Union (EMU) which introduced a common currency for most of the Member States. Speculations on the success of these policy changes affected the exchange rates between those countries adopting the Euro and those not (United Kingdom, Sweden, Denmark) as well as those with the most important reserve currency in the world, the US Dollar. Furthermore, we chose 1993 simply because it was the first year in our data.

Source: Own calculations ECHP and CNEF-PSID

4.2 Differences in poverty trends

Orshansky poverty trends are explained by changes in the price level vis-à-vis changes in income while Laeken poverty trends are explained by distributional income changes. We study the impact of these mechanisms on Laeken and Orshansky poverty trends by analyzing the impact of changes in the year to year poverty lines on poverty rates (i.e. the updating mechanism) separately from distributional income changes (i.e. changes in inequality).

4.2.1 Method for updating the poverty lines

As shown in equation 8, the US thresholds are updated annually with the change in the consumer price index. This implies that the percentage change in this absolute threshold is equal to the inflation rate.

$$\%\Delta z_a = \pi \qquad (9)$$

The updating mechanism of the Laeken threshold is more implicit because the Laeken poverty line is determined by the yearly median income level. Thus, the Laeken threshold is updated every year with the percentage change in median income.

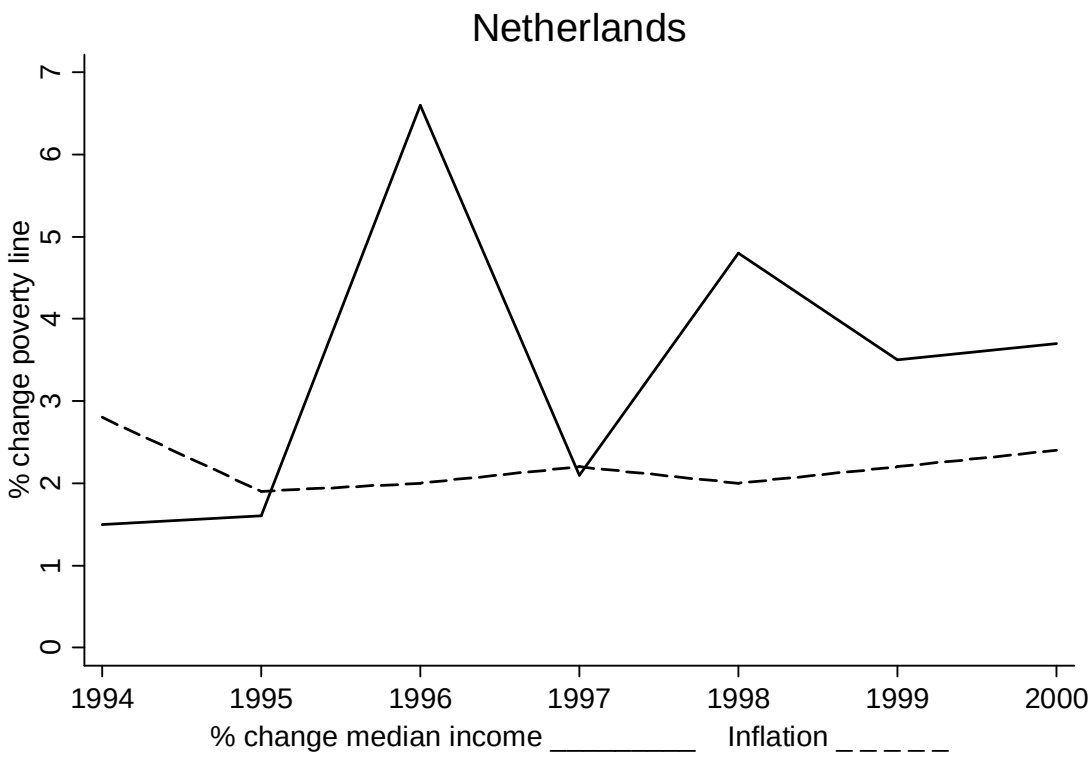
$$\%\Delta z_r = \%\Delta y_m \qquad (10)$$

In the countries we study here, low and stable inflation is an explicit monetary policy target and the monetary authorities are rather successful in achieving this target. As a result, price changes are less volatile than changes in economic growth (and income) over the business cycle. This implies that the updating mechanism used in the Laeken indicator functions as an *in-built stabilizer* on the poverty rates. In good times, the threshold is increased by the increase in median income but in bad times, the threshold could even decline (or increase by less than the inflation rate, a decline in real terms). The picture below illustrates with which growth rates the Orshansky and Laeken poverty lines are updated for the Netherlands.

Figure 4 illustrates the effects of both updating methods on poverty trends for all countries. To isolate the effect of the updating mechanism we start from the relative poverty threshold in 1993 and update this threshold using both methods.[31] Subsequently, we calculate the poverty rate according to each updating mechanism. The updating methods influence the poverty trends in all countries; over time we can see a divergence in poverty trends with higher poverty rates when the change in median income as used as an updating mechanism. Divergence in trends is largest for countries that experienced high economic growth. This happens when median income levels also benefit from real economic growth; then the poverty line is not only adjusted for inflation but it is also adjusted for real income changes in society. Ireland is the extreme case in this respect, because the poverty trends are not just diverging but even move into the opposite direction. Also, the poverty trends with the Laeken updating mechanism appear more stable than the trends using inflation updating. This observation empirically supports the hypothesis that the Laeken updating mechanism has a stabilizing effect on the poverty rates.

[31] For Austria, Finland and Sweden we start with the year in which their first survey was held.

Figure 4: Change in poverty lines due to different updating mechanisms



Source: Own calculations ECHP and CNEF-PSID

4.2.2 Changes in inequality

The previous section discussed that relative poverty lines are adjusted over time, in line with economic development. Another key factor in explaining poverty trends is distributional change (i.e. changes in inequality). Typically, the costs and benefits of economic development are not equally distributed across the (income) distribution. Income changes at the lower end of the income distribution also affect relative and absolute poverty trends. The intuition is as follows. Relative poverty rates do not change when all incomes grow at the same rate. This is because the relative poverty line and everyone's income is updated with the same percentage growth rate. If the income of the poorer percentiles of the population grows less than that of the median; relative poverty rates are likely to increase. When the income of low income groups increases in real terms, absolute poverty declines.

We use growth incidence curves (GIC) to further illustrate this argument. A GIC shows the growth of income at each percentile of the distribution. Using the cumulative income distribution (CDF) specified in equation 1 and following Ravallion and Chen (2003, p. 94), inverting the CDF at the p^{th} quantile gives the income of that quantile:

$$y_t(p) = F_t^{-1}(p) = L_t^{'}(p)\mu_t \qquad (y_t^{'}(p) > 0) \tag{11}$$

where $L_t(p)$ is the Lorenz curve (with slope $L_t^{'}(p)\mu_t$ and the mean μ_t). The Lorenz curve shows the income share of total income owned by the bottom percent of the population (when incomes are ranked from low to high). The growth rate in income of the p[th] quantile is:

$$g_t(p) = [y_t(p) / y_{t-1}(p)] - 1 \tag{12}$$

Letting p vary from zero to one, $g_t(p)$ indicates the growth incidence curve. It follows from equation 11 that:

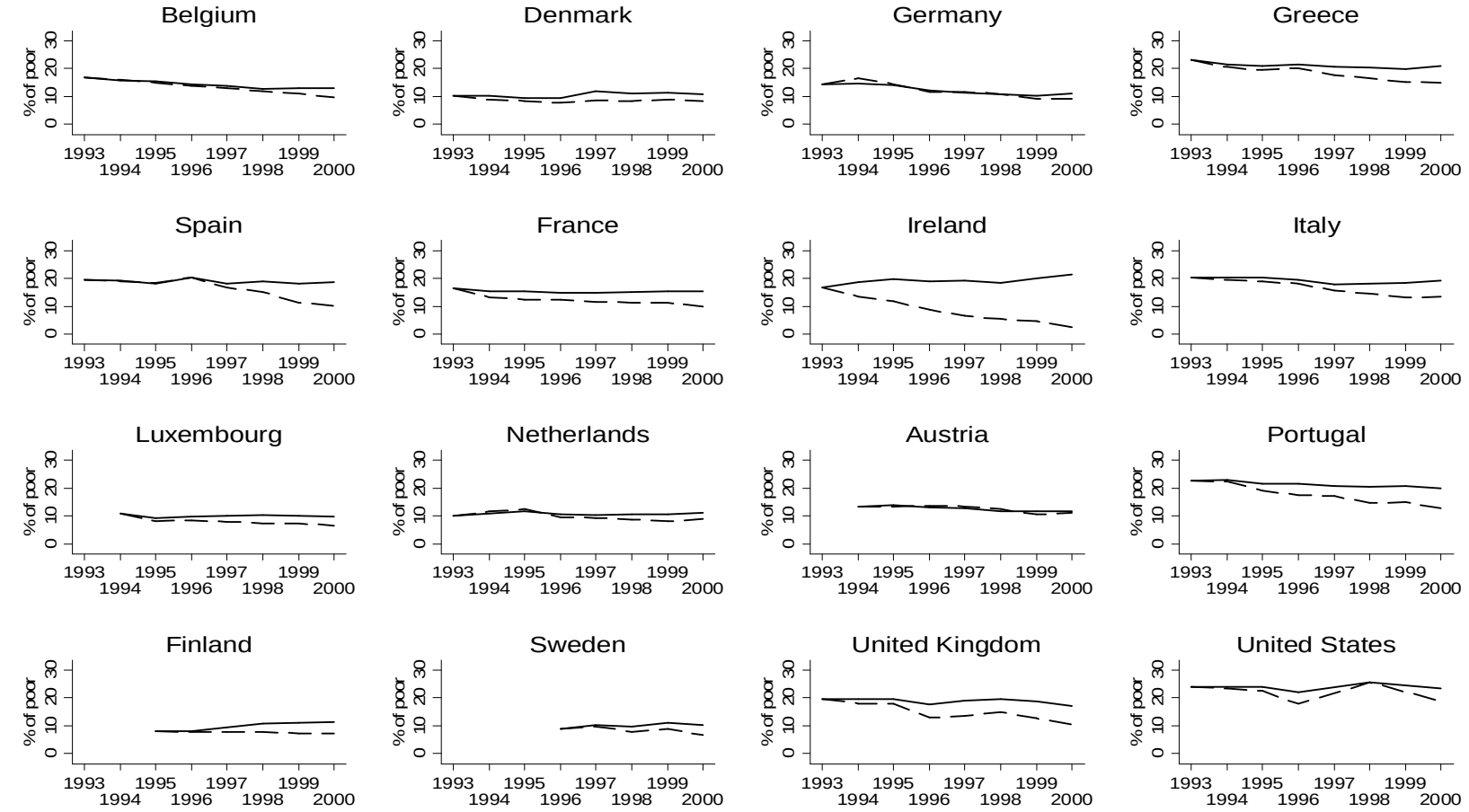
$$g_t(p) = \frac{L_t^{'}(p)}{L_{t-1}^{'}(p)}(\gamma_t + 1) - 1 \tag{13}$$

where $\gamma_t = (\mu_t / \mu_{t-1}) - 1$ is the growth rate of average income (μ). Thus, if there are no changes in inequality (i.e. the Lorenz curve stays the same), the GIC will be a flat line at the average income growth rate. If $g_t(p)$ is a decreasing function for all p, then inequality is reduced over time (and vice versa).

A GIC explains the growth patterns of the *aggregate distribution*. It does not necessarily reflect the experienced income growth of the individuals or households making up that distribution because they can also move *within the income distribution;* individuals lose a job, get promotion, retire and thereby change their position in the income ranking. Being poor (or not) is a status which applies to individuals and not to p[th] quantiles. Nevertheless, GIC's are a useful tool to explain poverty trends because trends in aggregate poverty measures can, to a large extent, be explained by changes in the income distribution.

For simplicity, imagine a world with no distributional mobility (individuals do not switch ranks in the income distribution) or, equivalently, there is mobility, but each move in ranks is compensated by an exact countervailing move. The absolute poverty is only adjusted for inflation. In such a situation, changes in absolute poverty can entirely be explained by the real income changes of the percentiles around the poverty line. Everything else equal, absolute poverty increases (decreases) when the real income growth rates of those percentiles just above (under) the poverty line are negative (positive). For relative poverty rates the argument changes because the poverty line is determined endogenously by the income distribution. In the case of the Laeken approach, relative poverty rates can be explained by a combination of the real income changes of the percentiles around the poverty line and those of the median (50[th] percentile). Relative poverty increases (decreases) when the real growth rate at the median is higher (lower) than the growth rates of the percentiles above (below) the poverty line.

Figure 5: The impact of updating mechanisms on poverty incidence



Notes: For the USA there are no observations 1999 and 1997.
Source: Own calculations ECHP and CNEF-PSID

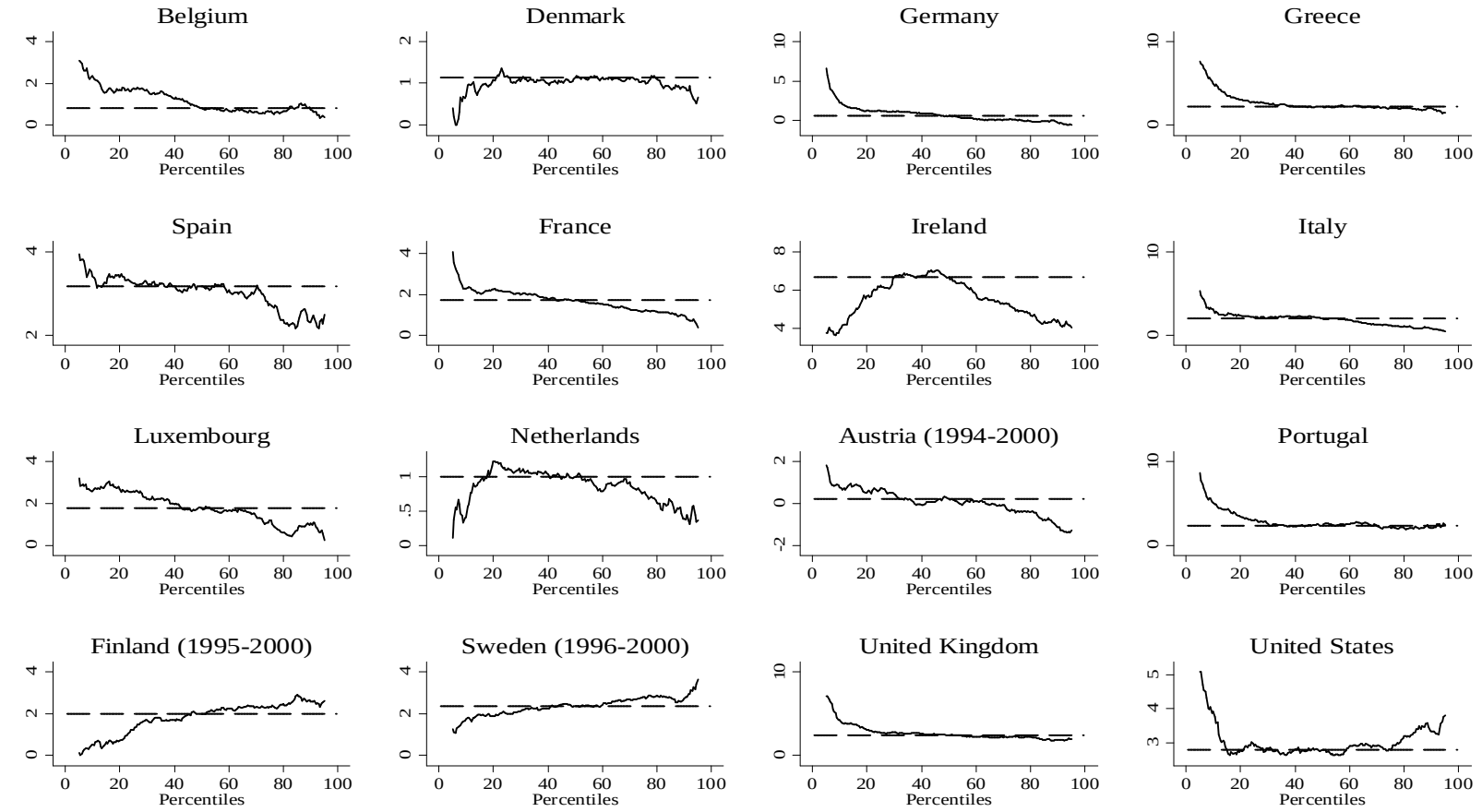
The GICs for each country using the 1993 and 2000 income distributions are displayed in Figure 6 and express average annual real growth rates. For most countries, the growth rates are averaged over 8 years. The curve shows the GIC and the horizontal line reflects the average annual growth rate of median income.[32] If all incomes grow at the same rate, the GIC is flat and there are no changes in inequality. Note that the GICs are drawn comparing the 1993 and 2000 income distributions; they do not necessarily reflect inequality changes occurring between intermediate years.

The growth patterns of the countries are very different in terms of growth levels as well as in the way income growth is distributed over the population. In many countries, the lower end of the income distribution benefited most from economic growth, but this is not the case in Denmark, Finland, Sweden, the Netherlands and Ireland where the opposite pattern occurs. To see how poverty trends can be explained by these growth patterns, we need to focus on those income percentiles around the poverty rates and the median percentile (the latter only for Laeken poverty). The case of Ireland clearly illustrates these effects. In the period from 1993 to 2000, Ireland experienced rapid economic growth. Every percentile benefited from this growth; percentile income growth rates are mostly at or above 4% per annum. As the Orshansky threshold did not change in real terms, absolute poverty rates in Ireland have decreased. In 1993, 30% of the Irish had an income below the Orshansky threshold and in 2000 poverty rates were below 11% (table A4 in the appendix). However, the GIC from Ireland shows that the middle income groups benefited much more than other groups; median income growth was above 6%. The relative poverty threshold thus also increased by more than 6% per annum while the growth rates around the poverty line percentiles (16-21) were about 5%. Relative poverty thus increased from 17% in 1993 to 21% in 2000 in Ireland.

For most of the countries, the GIC patterns explain the poverty trends rather well. Although at low poverty rates and/or low growth rates it is more difficult to graphically see the effects. Note that there are contrasting experiences among the faster growing countries (Greece, Spain, Portugal, and Ireland)). In Greece, Spain and Portugal the lower 20 percentiles had higher growth rates than the median income percentile while Ireland experienced the opposite.

[32] To enhance comparability between countries, we excluded the lowest and highest 5 percentiles because they had a too large effect on the scaling of the vertical axis. For the same purpose, we allowed the vertical axis to differ by country.

Figure 6: Growth incidence curves (expressed in real annual growth rates, based on using survey data from 1993 and 2000)



Notes: To facilitate comparison of Orshansky and Laeken poverty trends within countries, we used different scales on the vertical axes and excluded the 5% lowest and highest observations.
Source: Own calculations ECHP and CNEF-PSID

4.3 Equivalence scales and the impact on absolute and relative poverty rates

Equivalence scales adjust for the economies of scale that larger households have as compared to a single person household. They also adjust for differences in cost of living for different age and/or gender groups. Cross national poverty comparisons typically apply the same equivalence scales to every country even though it is likely that such costs differ between countries. The Laeken and Orshanky methods also use different equivalence scales. We explore how these weighting schemes differ and how they impact the Laeken and Orshansky poverty estimates.

The modified OECD equivalence scales used in the Laeken indicator assign a weight to each household member. The first adult receives a weight of 1 and subsequent adults get a weight of 0.5. Children under age 14, each obtain a weight of 0.3. A household consisting of two parents and two children thus receives a weight of 2.1. Adult equivalent income is obtained by dividing household's income by 2.1. All individuals in the household are poor when the adult equivalent income lies below the adult equivalent poverty line. The Orshansky equivalence scales are derived from the 48 poverty lines; which poverty line is applied depends on the number and age of the household members. Household members under the age of 18 are counted as children. For the single and two person households a further distinction is made with respect to the age of the head of the household. If the head is older than 65, the household has a lower threshold. We calculated these implied Orshansky equivalence scales by taking the single adult household poverty line as a benchmark.[33]

Table 3: Total household weight using various equivalence weighing schemes

Household types	Individual	Modified OECD scales (Laeken)	Implied Orshansky scales	Household
Single adult	1	1	1	1
Single elderly	1	1	0.92	1
Adult couple	2	1.5	1.29	1
Elderly couple	2	1.5	1.16	1
Single parent, one child	2	1.3	1.32	1
Single parent, two children	3	1.6	1.55	1
Parents one child	3	1.8	1.55	1
Parents two children	4	2.1	1.95	1
Parents three children	5	2.4	2.29	1

Table 3 compares the total household weights for a number of household types using the OECD and Orshansky weighting schemes. We have also included two extreme scales; the individual scheme which gives a weight of 1 to every individual and the household scheme which gives a weight of 1 to each household, irrespective of its composition. Single elderly households get a weight of 1 for all schemes except the Orshansky scheme, which attributes a weight of 0.92. Thus, single elderly 'need' only 92% of the income required for a single adult. Compared to the household and individual weighting schemes the OECD and Orshansky scales are rather similar. For most household types the

[33] For example, the poverty line of a single adult is $1,000 and $2,000 for a household consisting of two adults and two children. The (implied) equivalence weight of the latter household is $2,000/$1,000=2.

Orshansky scales have a lower value than the OECD scales, which implies that the Orshansky scales assume lower cost to reach the same level of economic well being.[34] In contrast to the OECD scales, the Orshansky scales often give a slightly higher weight to children than to additional adults. For instance, single parents with one child receive an Orshansky weight of 1.32 and an OECD weight of 1.3. For an adult couple household the OECD weight is 1.5 while the Orshansky weight is 1.29. Even though the differences between the Laeken and Orshansky equivalence scales are not so large, they can have a considerable impact on overall poverty rates as well as on poverty rates for certain groups in society. The impact is especially large when differences in equivalence scales apply to large parts of the population.

Equivalence scales also affect the Laeken and Orshansky poverty rates differently. To see this, the adult equivalent income (y) of household i, is obtained by dividing household income by its equivalence scale E_i. Then, for most households the OECD equivalence scale is larger than the Orshansky equivalence scale, resulting in a lower equivalent adult income. Using the same absolute (equivalent adult) poverty line, it can easily be seen that absolute poverty rates using the Orshansky weights are higher than with the OECD scales. If, for most households, $E_{OECD} > E_{orshansky}$, then $y_{OECD} < y_{orshansky}$ and for a given z_a then $H_{OECD} > H_{orshansky}$.

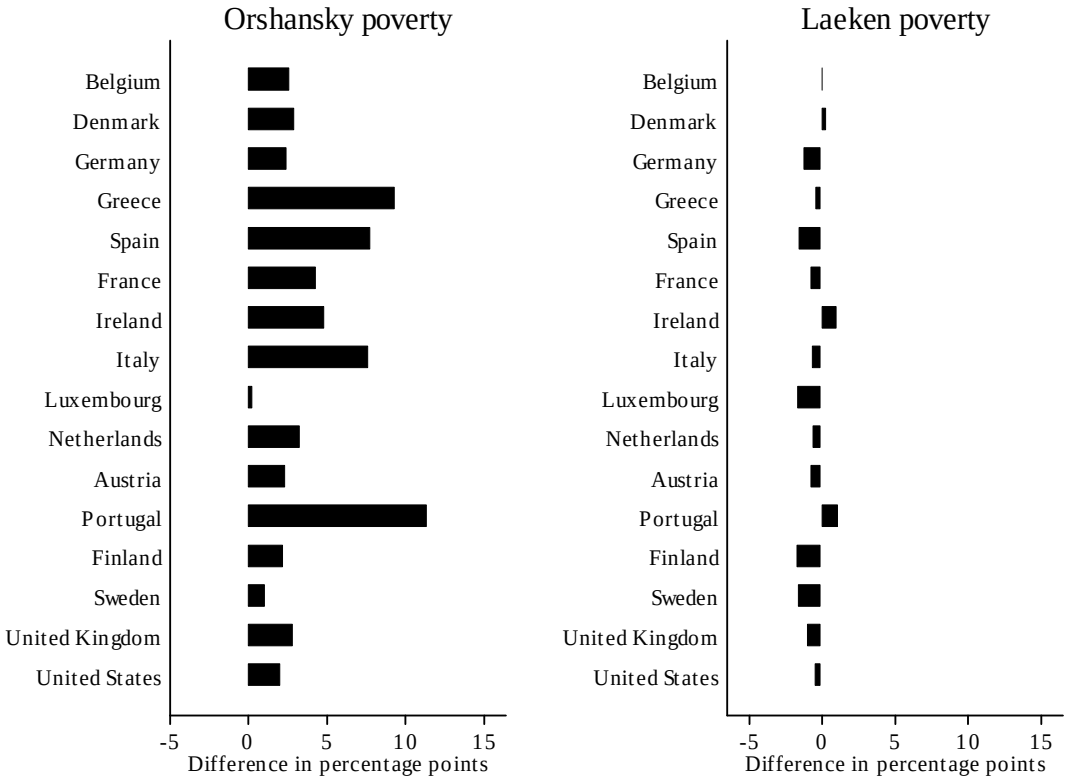
Knowing the weighting schemes is not sufficient to predict how equivalence schemes affect the relative poverty rates. This is because the equivalence scales not only weigh income differently, but they also determine the *locus of the relative poverty line* as median income (y_m) is also affected by the weights. The net effect on poverty depends on the demographic composition of the population (the relative size of the three generations and how they are spread over household types) and the income of these households. If, for most households, $E_{OECD} > E_{orshansky}$, then $y_{OECD} < y_{orshansky}$ and $z_{r(OECD)} < z_{r(orshansky)}$ (because $y_{m(OECD)} < y_{m(orshansky)}$). As lower equivalent adult income tends to increase poverty rates while a lower poverty line decreases poverty rates, the net impact on relative poverty is not clear.

We have calculated the 2000 Laeken and Orshansky poverty rates using the modified OECD equivalence scales and the implied Orshansky weights. Figure 7 shows the impact of both weighting schemes on the overall poverty rates by illustrating the percentage point difference for each poverty indicator (poverty rate using OECD equivalence scale minus poverty rate using implied Orshansky scale). As expected, Orshansky poverty rates are higher when using the modified OECD scales. For example, in Ireland Orshansky poverty rates are 5 percentage points higher if we would apply OECD equivalence scales. The differences in Laeken poverty rates are much smaller and are positive in some countries while negative in others. In general, relative poverty rates are less sensitive to the use of different equivalence scales. The magnitude of these differences varies by country and may thus affect international poverty rankings. The 2000 Orshansky poverty

[34] For some more atypical households, notably households with many children and relatively few adults, the Orshansky scales indicate a higher cost than the modified OECD scales.

rate is 5.7% in Sweden and 5.1% in Germany. When Orshansky poverty rates are computed using the modified OECD scheme, poverty is now 6.8% in Sweden and 7.7% in Germany (Germany is now ranked above Sweden).

Figure 7: Difference between Laeken and Orshansky poverty rates due to different equivalence schemes (in percentage points)

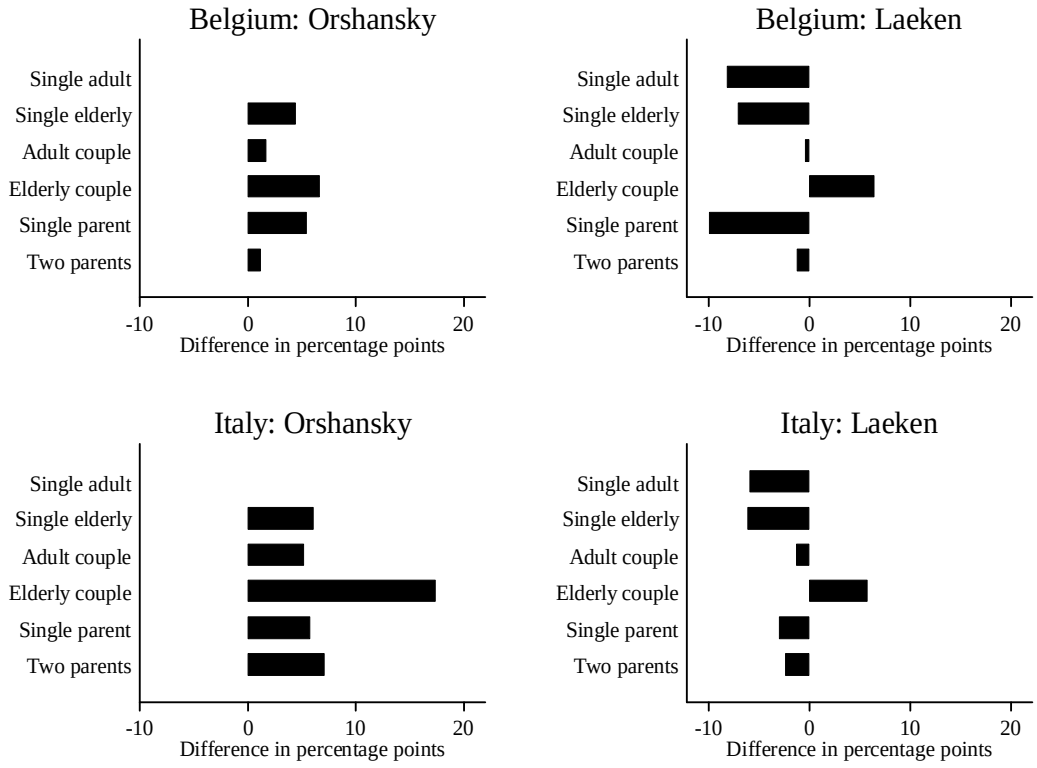


Notes: The bars reflect the difference in poverty rate using OECD equivalence scale minus the poverty rate using implied Orshansky scale.
Source: Own calculations ECHP and CNEF-PSID

We also illustrate the impact of the Orshansky and OECD weighting schemes for six household types: single adult, single elderly, adult couple, elderly couple, single adult with child(ren) and two adults with child(ren) (**Error! Not a valid bookmark self-reference.**). As the number of observations for single parents is very low in some countries, the results for this group should be interpreted with caution. Generally, Orshansky poverty risk increases for most household types when modified OECD weights are applied (excluding single adult households as they have the same weight). Austria is the only country where single parents (of one or more children) have a lower poverty rate using the Orshansky scales. The larger the population share of a particular household type, the larger its effect on Orshansky poverty rates. **Error! Not a valid bookmark self-reference.** further shows that the small overall Laeken poverty differences mask considerable changes in relative poverty risk for different household types. The poverty differences are negative for some household types and positive for other types but the direction of the effect is common between countries. Poverty rates

among elderly couples are larger in all countries when using OECD equivalence scales while poverty rates among single adults, single elderly and single parents are lower. The differences for adult couples and parents with children are only small. Thus, equivalence scales affect the relative poverty risks of groups in society; using a different equivalence scale alters the poverty risk of one group relative to the other. Knowing the equivalence weighting schemes, it is easy to assert the direction of change in absolute poverty risk for a certain population group or household type but the magnitude of the effect is determined by the population shares of the group. If children receive a higher weight, child poverty increases. Using a relative approach to poverty, the direction of change in poverty risk for specific groups depends not only on the equivalence weights but also on the composition of the population.

Figure 8: Difference between Laeken and Orshansky poverty rates due to different equivalence schemes (by household type, in percentage points)



Notes: The bars reflect the difference in poverty rate using OECD equivalence scale minus the poverty rate using implied Orshansky scale.
Source: Own calculations ECHP and CNEF-PSID

5. Conclusion

US poverty is much higher than poverty in Europe when a relative poverty measure is used. Using an absolute poverty measurement method, the picture looks different: poverty in some European countries is higher**.** Over time, both poverty indicators may develop in a parallel, converging or diverging fashion. In this paper we applied the

official poverty measurement methods of the United States and the European Union to both regions in order to explain underlying reasons for these differences in relative and absolute poverty. We used within and between country perspectives to explain differences in poverty levels and trends and showed the impact of each of these aspects on poverty levels and poverty trends while keeping other explanatory factors constant. Poverty figures reflect the net outcome of a complex set of factors. On the one hand they incorporate (changes in) the welfare dimensions they are meant to capture (minimum living standard, income inequality, economic development). On the other hand, technical aspects such as equivalence scales and PPP rates also have considerable influence on poverty rates.

As absolute poverty concepts are based on a minimum acceptable living standard while relative poverty concepts are distribution dependent (but in a very specific way), thus resulting differences between poverty levels and trends across countries are explained by the interplay of distributional and non-distributional factors. The degree of income dispersion at and below median income influences relative poverty rates but also resulting differences with absolute poverty levels. Countries with more income dispersion have higher relative poverty levels and are more likely to display a wider gap between absolute and relative poverty rates. However, over time, this gap between absolute and relative poverty levels declines, remains constant or increases. We showed that poverty trends are affected firstly by changes in the year to year poverty lines (i.e. the updating mechanism) and secondly by distributional income changes (i.e. changes in inequality). While absolute poverty lines are updated with the rate of inflation, the Laeken relative poverty line changes with the percentage growth rate of median income. The final impact on both poverty indicators, however, depends on the degree of real income change at the lower end of the income distribution; real income increases are sufficient to reduce absolute poverty while more than proportional income increases at the lower end are required to reduce relative poverty. Although relative and absolute poverty indicators each evaluate the outcome of economic development by focusing on its impact on low income levels, their perspective on what constitutes progress in welfare is different; the absolute indicator evaluates real progress while the relative indicator only detects progress when it is more than proportionally shared.

The above suggests that it makes sense to use both absolute and relative poverty indicators. Absolute poverty analyses provide insights into the parts of the population that do not attain the minimal living standard. Relative poverty analyses inform about the group of people whose living standard is low compared to that of the society they live in. Relative and absolute approaches thus each portray different poverty dimensions; monitoring one dimension does not provide information on developments in the other dimension. Ignoring one dimension may lead to developments in society that at some point may conflict with societies' preferences.

Even though most countries in the developed and developing world report (semi) official poverty statistics on a regular basis, only few countries actually report both absolute and relative poverty statistics. In fact, it is not easy to find comparable absolute and relative poverty data (the poverty research based on the Luxembourg Income Study (LIS) data

being a noteworthy exception). Unfortunately, it seems that a 'battle of the rates' takes place only when deciding about which official poverty indicator to choose (EU) or to discuss the deficiencies of the current indicator (US and EU). In the USA, a national academy of sciences panel proposed an improved absolute poverty indicator (Citro *et al*, 1995) but relative poverty indicators do not seem to play any role of significance. Even though in the USA inequality may generally be perceived as less problematic than in Europe, does that mean that any level of inequality acceptable or that the situation of those having considerably less than the rest should not be monitored? Differences between absolute and relative poverty indicators are extremely large in the US; what are the implications for a society if about one quarter of its population is has much less than its middle person? And why does the EU only use a relative approach while differences in living standards between Member States are large and have further increased with current expansions of the European Union? How should we interpret the fact that the Czech Republic has the lowest Laeken poverty rate within the EU? If the Laeken indicators would be complemented with an absolute poverty indicator reflecting the cost of achieving a minimum living standard in each member state (including costs such as food, rent, clothing, health and education), the impact of the reforms resulting from the European integration process could also be evaluated from this perspective. The new Member States are still in the process of restructuring their economies and it is expected that there will be strong economic growth; all reasons for expecting divergence between absolute and relative poverty levels and trends in these countries.

Literature

Alesina, A. and E.L. Glaeser (2004), *Fighting Poverty in the US and Europe; a World of Difference*, Oxford University Press, Oxford.

Atkinson, T., B. Cantillon, E. Marlier and B. Nolan (2002), *Social Indicators; The EU and Social Inclusion*, Oxford University Press, Oxford.

Butrica, B.A. and R.V. Burkhauser (1997), *Estimating Federal Income Tax Burdens for Panel Study of Income Dynamics (PSID) Using the National Bureau of Economic Research TAXSIM Model*, Maxwell Center for Demography and Economics of Aging, Syracuse University, New York, 13244-1020.

Burkhauser, R.V., B.A. Butrica, M.C. Daly and D.R. Lillard (December 2000), *The Cross-National Equivalent File: A Product of Cross-National Research*, Soziale Sicherung in Einer Dynamischen Gesellschaft (Social Insurance in a Dynamic Society), Irene Becker, Notburga Ott, and Gabriele Rolf (Eds.), Festschrift fuer Richard Hauser zum 65. Geburtstag (Papers in Honour of the 65th Birthday of Richard Hauser).

Castles, I. (1996), *Review of the OECD-Eurostat PPP Program*, STD/PPP(97)5, Economic Studies Branch, Paris, France, OECD.

Citro, C. and R. Michael (1995), Measuring Poverty: a New Approach, Panel on Poverty and Family Assistance, Committee on National Statistics, National Research Council. Washington, D.C.: National Academy Press.

Duclos (2006) J. and A. Araar, *Poverty and Equity; Measurement, Policy and Estimation with DAD*, Springer, New York.

Euro Panel Users Network (July 2004), ECHP user Guide, Institute for Social and Economic Research, University of Essex, available online on http://epunet.essex.ac.uk/ECHP_USER_GUIDE_06-07-2004b.pdf (retrieved August 2005).

Eurostat (2003), Construction of weights in the ECHP, DOC. PAN 165/2003-06, available online on http://forum.europa.eu.int/Public/irc/dsis/echpanel/library?l=/user_db&vm=detailed&sb=Title (retrieved August 2005).

Eurostat (2003), ECHP UBD Description of Variables, DOC. PAN 166/2003-12, available online on http://forum.europa.eu.int/Public/irc/dsis/echpanel/library?l=/user_db&v m=detailed&sb=Title (retrieved August 2005).

Eurostat (2002), Imputation of Income in the ECHP, DOC. PAN 164/2002-12, available online on http://forum.europa.eu.int/Public/irc/dsis/echpanel/library?l=/user_db&vm=detailed&sb=Title (retrieved August 2005).

Eurostat (2003), 'Laeken' Indicators; Detailed Calculation Methodology, Working Group Statistics on Income, Poverty and Social Exclusion, DOC. E2/ISPE/2003, available online on http://forum.europa.eu.int/Members/irc/dsis/soipase/home (retrieved August 2005).

Feenberg, D. and E. Coutts (1993), *An Introduction to the TAXSIM Model*, Journal of Policy Analysis and Management, 12(1), pp. 189-194.

Fischer, G.M. (1992), The Development of the Orshansky Poverty Thresholds and Their Subsequent History as the Official U.S. Poverty Measure, partially revised 1997, available online on http://www.census.gov/hhes/www/povmeas/papers/orshansky.html (retrieved August 2005).

Förster, M. and M.M. d'Ercole (2005), Selection of Figures: Income Distribution and Poverty in OECD Countries in the Second Half of the 1990s, OECD Social, Employment and Migration, Working Paper, 22, available online on www.oecd.org/els/workingpapers (retrieved August 2005).

Foster, J., Greer, J. and E. Thorbecke (1984), A Class of Decomposable Poverty Measures, *Econometrica*, 52, pp.761-65.

Gottschalk, P. and T. Smeeding (2000), Cross-National Comparisons of Earnings and Income Inequality, *Journal of Economic Literature*, 35(2), pp.633-687.

Gouskova, E. and R. Schoeni (2002), Comparing Estimates of Family Income in the Panel Study of Income Dynamics and the March Current Population Survey, 1968-1999, Institute for Social Research, University of Michigan.

Hulme, D., and A. Shepherd (2003), Conceptualizing Chronic Poverty, *World Development*, 31(1), pp. 403-423.

Internal Revenue Service (2002), *Participation in the Earned Income Tax Credit Program for Tax Year 1996*, performed by SBSE Research, Research Project 12.26, Greensboro (NC), available online on http://www.taxpolicycenter.org/taxfacts/papers/irs_eitc.pdf.

Lillard, D.R., M. Grabka and S. Freidin, Codebook for the Cross-National Equivalent File 1980-2005 BHPS – GSOEP – HILDA – PSID – SLID, part 1 and 2, Cornell University and DIW Berlin, available online on http://www.human.cornell.edu/che/PAM/Research/Centers-Programs/German-Panel/cnef.cfm.

O'Boyle, E.J. (1999), Toward an Improved Definition of Poverty, *Review of Social Economy*, 57(3).

Oxley H., T.T. Dang, M. Förster, M. Pellizari (2000), Income Inequalities and Poverty among Children and Households with Children in selected OECD Countries: Trends and Determinants, in K. Vleminckx and T.M. Smeeding (eds), *Child Well-Being, Child Poverty and Child Policy in Modern Nations*, The Policy Press, Bristol.

Ravallion, M. and S. Chen (2003), Measuring Pro-poor Growth, *Economic Letters* 78, pp. 93-99.

Ravallion, M. (1994), Poverty Comparisons, *Fundamentals of Pure and Applied Economics*, 56, Harwood Academic Publishers GmbH.

Rendtel, U., L. Nordberg, M. Jäntti, J. Hanisch and E. Basic (January 2004), Report on Quality of Income Data, the Change from Input Harmonization to Ex-post Harmonization in the National Samples of the European Community Household Panel – Implications on Data Quality (CHINTEX), *Chintex working paper*, 21.

Schreyer, P. and F. Koechlin (2002), Purchasing Power Parities – Measurement Issues, *Statistics Brief*, 3, OECD, Paris.

Soede, A. (August 2006), Naar een Nieuwe Armoedegrens? Basisbestedingen als Maatstaf voor een Tekortschietend Inkomen (Towards a New Poverty Line? Basic Expenditures as a Benchmark for Insufficient Income), Sociaal en Cultureel Planbureau (SCP), The Hague.

Smeeding, T.M. (2005), Poor People in Rich Nations: The United States in a Comparative Perspective, *Luxembourg Income Studies Working Paper*, 419.

Smeeding, T.M., L. Rainwater and G. Burtless (2000), United States Poverty in a Cross-National Context, *Luxembourg Income Studies Working Paper*, 244.

Smeeding, T.M. and K. Ross (1997), Financial Poverty in Developed Countries: The Evidence from LIS, *Luxembourg Income Studies Working Paper*, 155.

Yong-Seong, K. and F. Stafford (2000), The Quality of PSID Income Data in the 1990's and Beyond, available on http://psidonline.isr.umich.edu/Guide/Quality/q_inc_data.html (retrieved March 2006).

US Census Bureau (June 2005), *Alternative Poverty Estimates in the United States: 2003*, US Department of Commerce, Economics and Statistics Administration, Washington DC, http://www.census.gov/prod/2005pubs/p60-227.pdf (accessed April 2007).

Table A1: Number of observations in cross-sections by country and survey year

Survey year	1994		1995		1996		1997		1998		1999		2000		2001	
	# hh	# ind	# hh	# ind	# hh	# ind	# hh	# ind	# hh	# ind	# hh	# ind	# hh	# ind	# hh	# ind
Belgium	3,454	9,077	3,341	8,788	3,189	8,356	3,008	7,862	2,857	7,367	2,684	6,915	2,549	6,510	2,322	5,888
Denmark	3,478	7,687	3,217	7,192	2,950	6,555	2,739	6,190	2,504	5,653	2,376	5,409	2,272	5,212	2,279	5,130
Germany	6,163	16,180	6,293	16,577	6,207	16,174	6,098	15,769	5,891	15,076	5,782	14,689	5,619	14,158	5,474	13,733
Greece	5,480	16,205	5,173	15,186	4,851	14,256	4,543	13,335	4,171	12,205	3,952	11,577	3,893	11,322	3,895	11,208
Spain	7,142	22,837	6,448	20,458	6,128	19,267	5,714	17,916	5,438	16,598	5,291	15,835	5,046	14,780	4,948	14,270
France	7,105	18,198	6,679	17,326	6,554	16,878	6,141	15,672	5,849	14,814	5,593	14,076	5,331	13,335	5,247	13,039
Ireland	4,036	14,558	3,562	12,533	3,164	10,871	2,935	9,931	2,723	8,984	2,372	7,706	1,944	6,266	1,757	5,558
Italy	6,915	21,424	7,004	21,431	7,026	21,235	6,627	19,837	6,478	19,096	6,273	18,410	5,989	17,483	5,525	15,979
Luxembourg	1,010	2,805	2,976	8,190	2,471	6,804	2,651	7,089	2,521	6,644	2,550	6,584	2,373	6,184	2,428	6,306
Netherlands	5,139	12,895	5,035	12,591	5,097	12,662	5,019	12,529	4,922	12,303	4,981	12,435	4,974	12,378	4,824	12,027
Austria	na	na	3,365	9,540	3,280	9,229	3,130	8,707	2,951	8,173	2,809	7,732	2,637	7,161	2,535	6,859
Portugal	4,787	14,500	4,869	14,717	4,807	14,536	4,766	14,354	4,666	13,997	4,645	13,729	4,606	13,431	4,588	13,237
Finland	na	na	na	na	4,138	11,212	4,103	10,885	3,917	9,970	3,818	9,583	3,101	7,549	3,106	7,480
Sweden	na	na	na	na	na	na	5,286	12,584	5,208	12,451	5,165	12,283	5,116	12,104	5,085	12,045
United Kingdom	5,023	12,588	4,981	12,365	4,974	12,463	4,936	12,322	4,928	12,236	4,874	12,049	4,793	11,904	4,702	11,710
United States	6,675	18,424	7,325	20,109	7,510	20,521	5,439	14,893	na	na	5,874	16,081	na	na	5,908	16,129

Source: Own calculations ECHP and CNEF-PSID

Table A2: Per capita income by country and survey year (in Euro)

Survey year	1994	1995	1996	1997	1998	1999	2000	2001
Belgium	10,721	11,020	11,655	11,561	11,538	12,085	12,551	12,885
Denmark	13,026	13,188	13,606	13,881	14,189	14,658	15,107	15,428
Germany	12,005	11,903	12,749	12,925	12,561	12,859	13,506	14,108
Greece	4,094	4,371	4,646	5,009	5,401	5,317	5,766	5,829
Spain	5,320	5,200	5,335	5,635	5,812	6,267	6,762	7,309
France	10,718	10,717	11,039	11,324	11,292	11,564	11,778	12,146
Ireland	6,261	7,010	7,027	7,736	8,864	9,076	9,302	10,461
Italy	6,477	6,711	6,373	6,932	7,516	7,834	8,106	8,342
Luxembourg	16,441	16,993	18,034	18,110	18,270	19,364	20,042	20,870
Netherlands	9,984	10,272	10,962	11,121	11,136	11,722	12,052	12,568
Austria	na	11,982	12,405	12,018	11,815	12,264	12,667	12,760
Portugal	3,481	3,595	3,873	4,083	4,251	4,447	4,728	5,263
Finland	na	na	10,361	10,407	10,625	10,914	11,412	11,972
Sweden	na	na	na	11,772	12,015	11,753	12,321	13,690
United Kingdom	8,225	8,906	8,635	9,516	12,017	12,358	13,801	15,776
United States	13,349	13,637	12,938	14,687	na	16,439	na	24,068

Notes: Nominal amounts, calculated using average annual exchange rates. Referring to income earned in the year previous to the survey.
Source: Own calculations ECHP and CNEF-PSID

Table A3: Adult equivalent income by country and survey year (in Euro)

Survey year	1994	1995	1996	1997	1998	1999	2000	2001
Belgium	14,351	14,817	15,684	15,565	15,595	16,415	17,184	17,640
Denmark	16,630	17,407	18,125	18,602	19,113	19,852	20,536	21,015
Germany	15,418	15,229	16,271	16,483	16,056	16,438	17,240	17,896
Greece	5,821	6,133	6,486	7,013	7,666	7,554	8,116	8,182
Spain	7,753	7,603	7,798	8,195	8,396	9,026	9,738	10,480
France	14,276	14,478	14,923	15,302	15,295	15,733	16,009	16,513
Ireland	8,979	9,966	10,125	11,116	12,811	13,006	13,444	15,136
Italy	8,972	9,203	8,676	9,504	10,368	10,825	11,246	11,587
Luxembourg	21,885	22,207	23,760	23,925	24,167	25,228	26,208	27,463
Netherlands	12,943	13,330	14,206	14,345	14,317	15,014	15,396	16,101
Austria	na	15,994	16,519	15,944	15,615	16,166	16,733	16,789
Portugal	5,181	5,305	5,707	6,058	6,319	6,631	7,037	7,801
Finland	na	na	13,433	13,439	13,768	14,158	14,820	15,526
Sweden	na	na	na	14,807	15,120	14,855	15,594	17,331
United Kingdom	10,843	11,786	11,370	12,559	15,820	16,121	18,012	20,636
United States	17,589	17,900	16,981	19,287	na	21,873	na	31,832

Notes: Nominal amounts, calculated using average annual exchange rates. Referring to income earned in the year previous to the survey.
Source: Own calculations ECHP and CNEF-PSID

Table A4: Poverty incidence (in % of individuals over the period 1993-2000)

	Laeken (relative) poverty								Orshanksy (absolute) poverty							
	1993	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**
Belgium	16.7	15.9	15.3	14.2	13.8	12.8	12.9	13.3	8.4	7.4	6.0	6.1	5.9	5.4	4.8	3.6
Denmark	10.3	10.2	9.5	9.3	11.9	11.1	11.5	10.8	4.1	3.3	3.3	3.2	3.6	3.4	3.2	3.4
Germany	14.4	14.6	14.0	12.1	11.4	10.9	10.5	11.1	9.8	10.7	7.5	7.0	6.8	6.3	5.1	5.1
Greece	23.1	21.5	21.0	21.5	20.8	20.5	19.9	20.5	25.7	26.3	27.5	28.1	26.0	28.2	25.0	26.1
Spain	19.6	19.0	18.0	20.3	18.2	18.8	18.0	18.8	25.4	29.0	29.1	29.8	28.6	24.5	20.6	19.1
France	16.6	15.4	15.2	14.9	14.7	15.2	15.6	15.4	12.6	9.4	8.4	8.8	8.5	8.0	7.1	6.5
Ireland	16.8	18.6	19.5	19.1	19.2	18.5	20.1	21.4	30.1	25.3	25.3	20.1	13.7	13.3	12.6	10.6
Italy	20.4	20.4	20.1	19.5	18.0	18.0	18.4	19.3	22.7	23.2	28.0	23.0	19.4	18.0	17.0	16.7
Luxembourg	na[1]	13.2	11.8	11.4	12.2	12.7	11.9	12.5	na	1.1	0.7	0.7	1.0	1.0	0.4	0.6
Netherlands	10.0	11.3	11.7	10.5	10.3	10.7	10.4	11.3	7.1	8.6	8.4	6.1	6.8	6.8	5.6	6.6
Austria	na	13.4	14.0	13.0	12.9	12.0	11.7	11.9	na	6.1	5.2	5.8	6.2	5.8	3.9	4.8
Portugal	22.5	22.9	21.5	21.6	20.8	20.5	20.8	20.1	40.0	42.2	40.2	38.1	38.4	35.5	32.2	32.2
Finland	na	na	8.1	8.3	9.4	10.7	10.9	11.4	na	na	4.1	4.5	5.1	5.7	4.6	4.9
Sweden	na	na	na	8.9	10.4	9.5	10.9	10.4	na	na	na	7.1	7.9	6.7	7.3	5.7
United Kingdom	19.6	20.0	19.5	17.8	19.0	19.4	18.7	17.1	17.6	15.8	15.2	11.4	12.0	13.1	10.7	9.3
United States	24.0	24.0	23.8	21.7	na	25.4	na	23.5	12.4	11.4	10.6	8.5	na	13.0	na	8.7

Notes: Not available (na).
Source: Own calculations ECHP and CNEF-PSID