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Article

Incidence and intensity of smoothed income poverty in European countries

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Summary The purpose of this paper is to obtain, by combining two longitudinal perspectives, a more detailed national picture of poverty in the member states of the European Union, using the first four waves (1994–7) of the European Community Household Panel (ECHP). In addition to this detailed consideration is given to the time dimension, poverty incidence, poverty gap and poverty intensity. Overall, the ranking across countries and dimensions is relatively robust. Denmark and Portugal differ from the rest of the countries in each dimension. Other exceptions include France and Ireland, where poverty intensity is considerably lower than in the other welfare regimes. The results in terms of the different subgroups of poor individuals, namely transitory, intermittently and persistently poor, emphasize the importance of a more differentiated perspective on poverty, in particular concerning the relationship between social and demographic characteristics and individuals' long-term income situation.

Key words ECHP, panel data, poverty, smoothed income

Résumé L'objectif de cet article est d'obtenir en combinant deux perspectives longitudinales une meilleure image nationale de la pauvreté dans les Etats membres de l'Union européenne en utilisant les quatre premières enquêtes du 'European Community Household Panel' (ECHP), 1994–1997, en plus de cette prise en compte détaillée dans la dimension temporelle, l'incidence de la pauvreté, l'écart de pauvreté et l'intensité de pauvreté sont mesurées. Dans l'ensemble, le classement parmi les pays et les dimensions est relativement robuste. Le Danemark et le Portugal diffèrent des autres pays pour chaque dimension. Les autres exceptions comprennent la France et l'Irlande où l'intensité de la pauvreté est considérablement inférieure que dans les autres Etats providence. Les résultats en terme de différents sous-groupes de personnes, pauvres de manière transitoire, intermittente et persistante, soulignent l'importance d'une perspective plus différenciée de la pauvreté en particulier concernant la relation entre les caractéristiques sociales et démographiques d'une part, et d'autre part, la situation financière à long terme des individus.

Introduction

In the social sciences the current income and the headcount ratio (poverty incidence) are normally used to analyse poverty. Although the limitations and weaknesses of this static approach are well known (e.g. Andress, 1998; Myles and Picot, 2000), alternative approaches and alternative poverty measures are still relatively rarely discussed and applied. Moreover, cross-national comparison on the basis of this classical poverty measure yields 'an approximate poverty snapshot for each country' (Meyer and Linden, 2000) because neither the depth of poverty nor individuals' long-term income situation is taken into account. How-

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ever, in particular within a welfare regime, similarities and differences across countries are not visible as such, and cannot be subjected to further analysis.

The purpose of this paper is to obtain through a combination of two longitudinal perspectives a more detailed picture of poverty, as well as a more distinctive classification of the poor in the member states of the European Union using the first four waves (1994–7) of the European Community Household Panel (ECHP). To consider a person's individual income mobility over time and the consequences of the poverty gap for the individual, measuring both the individual level (smoothed income) and the aggregated level (measuring poverty), we apply not only the classical headcount ratio, but also the poverty intensity measured by Foster et al. (1984) (*FGT* measure). Thus, the paper does not focus on a sensitivity analysis conducted in terms of the consequences of different poverty lines or equivalence scales as it is often understood. It is, rather, a cross-national sensitivity analysis on the basis of measuring poverty incidence, the poverty gap and poverty intensity in terms of different longitudinal perspectives.

Since the introduction of panel data allows longitudinal poverty analyses, the classical measure of income poverty has sometimes been supplemented either by the N-Times-Poor (NIP) approach or by the smoothed income poverty approach (SIP), but seldom by a combination of both (as Hill and Jenkins [2001] have done, for instance, for the UK). The latter were mainly interested in an additive decomposition of overall poverty (or total poverty) into a chronological and a transitory component (see e.g. Rodgers and Rodgers, 1993; Hill and Jenkins, 2001), but not directly in a more distinctive classification of the poor.

However, the NTP approach stems from the 'life-course perspective on poverty' or from 'dynamic poverty research' (Leisering and Leibfried, 1999). This method counts the 'snapshots' of cross-sectional poverty within a given time period in order to reclassify the poor population as persistently poor, temporarily poor or non-persistently poor (e.g. Bane and Ellwood, 1986; Buhr and Leibfried, 1995; Leisering and Leibfried, 1999; Whelan et al., 2002). Accordingly, the persistently poor are those individuals who were poor in all years of the time period under observation, while the temporarily poor experience non-poverty years, as well as poverty years. One weakness of the NTP approach is that it determines the poverty status of a person only in relation to cross-sectional incomes. Therefore it is based on the same assumption as 'static' classical poverty research, where income cannot be smoothed inter-temporally. In addition, this approach pays 'no attention to how far the households fall below the poverty line, and therefore gives no indication of how costly it would be to alleviate the observed poverty' (Myles, 1995: 91). Moreover, minor income changes have a major impact on the number and duration of spells of poverty. Even if income intervals around the poverty line are chosen, this aspect cannot be resolved conclusively.[1]

The second and less common approach, namely the smoothed income approach (SIP), uses individual average income over the whole period. This approach partitions the population into chronically poor (poor on smoothed income) and non-poor.[2] Thus, and in contrast to the NTP approach, the SIP approach starts by assuming that everyone is able to smooth income perfectly over time and without incurring costs. However, this is a rather strong, idealistic assumption, and requires – like the NTP approach – a time-span for each person that takes his/her whole life into account. Since this is not possible with the majority of microdata, the question of the appropriate length of the time-span, as well as the costs,[3] remains empirically unresolved, and is mostly driven by the availability of data or by the preferences of the analysts.[4] Both approaches are therefore based on left and right censored data.

However, through the combination of both approaches (column 'COP' in Figure 1) one

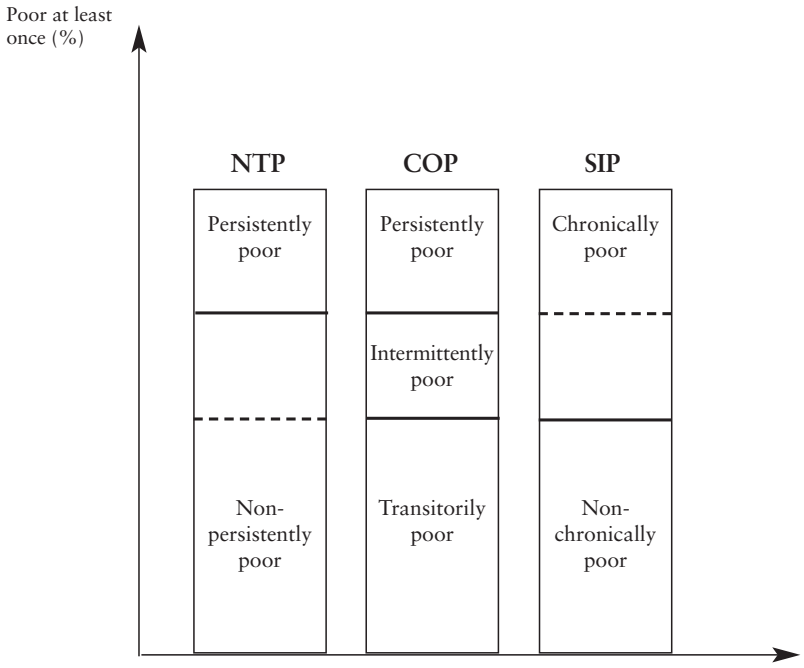

Figure 1 Different longitudinal perspectives on poverty

obtains a reclassification of the poor into more homogenous subpopulations, namely persons who are transitorily, intermittently and persistently poor.

In line with the analysis by Hill and Jenkins (2001), Figure 1 shows that the definition of transitory poor only includes persons for whom we observe cross-sectional poverty in at least one year (NTP approach), but who are not poor according to the SIP approach. This group has selective poverty experiences, but its members' long-term income situation does not suggest chronic poverty. Similar to the transitorily poor, the intermittently poor also experience non-poverty years. However, in contrast to the transitorily poor, the years spent in poverty have a greater impact on the long-term income situation than the non-poverty years. For that reason, we decline the classification of the NTP approach, as well as that of the SIP approach, in both of which only one characteristic of the income situation is considered. The last category of our reclasification represents the persistently poor. They are poor in all the years observed, and as such their long-term income situation is greatly affected by chronic poverty.

As a result of this combination one can use a more distinctive differentiation than is obtained solely with the SIP approach, and there is the possibility to use more sophisticated measures than those available with the NTP approach. Following this, the individual income mobility over time, the current income situations and an enhanced measurement of poverty can be taken into account.

Finally, the comparison of both longitudinal perspectives on poverty emphasizes not only the difficulty encountered in using the different terms, but also the impact of the particular terms used on the portrayal of poverty one obtains. Since empirical portrayals of poverty – e.g. National Plan against Poverty and Social Exclusion (NAP) or EU-SILC, the European Statistics on Income and Living Conditions – become more and more the basis of policies for combating poverty, the question arises of whether the terminology of poverty also determines the strategies used in combating it.

The main questions addressed in the analyses are:

- How great are poverty incidence and poverty intensity in the states of the European Union, measured in terms of smoothed income in contrast to cross-sectional incomes?
- How large are the proportions of transitorily, intermittently and persistently poor within the population in each country observed in the period 1994–7?
- Are there differences in the income situations of the intermittently and persistently poor in European countries, and how wide is this gap?

Data and methods

The data used in the analyses are extracted from the User Database (UDB) of the European Community Household Panel (ECHP), which has been collected for most countries since 1994 by public institutions under the supervision of the Statistical Office of the European Communities (Eurostat).[5]

The income information of the previous year is used to measure disposable income. It includes income from work (employed and self-employed), private income (rents, income from capital and private transfers to the house-hold), as well as pensions and other social benefits that are directly received. Indirect social transfers (such as the reimbursement of medical expenses), income in kind and imputed rents for owner-occupied housing are excluded (Marlier and Cohen-Solal, 2000: 7). In order to compare households of different structures and sizes, disposable household income is transformed into equivalent income via the widely used 'modified OECD equivalence scale'.[6]

In contrast to the standard approach, in which the measurement of smoothed income is based on average cross-sectional equivalent income, the average cross-sectional relative income position is used in this paper (smoothing the relative income position).

The relative income position can be defined as:

$$y_{it}^{r} = \frac{y_{it}}{\frac{1}{n}\sum_{i=1}^{n} y_{it}} \quad , \qquad (1)$$

where y_{it} represents the income of person i in period t, y_{it}^{r} is the relative income position and n denotes the number of persons observed at time t.

The results of this method differ slightly from the standard approach. In doing so, we assume that the individuals may not reflect only income losses or gains in comparison with the income situation in the previous years (opportunity to save), but also the demands caused by daily needs and services. The latter are determined by the recent average or minimum standard of living. However, an appropriate inclusion of time into the measurement of poverty is not resolved either by the NTP measure, or by the SIP approach (Walker, 1995). Piachaud has concluded that 'the smaller the income and wealth an individual can rely on, the more difficult it is to stretch resources over time and the more pressing are daily needs. Long-term planning horizons are a luxury of the wealthy' (Piachaud, 1992: 81, authors' translation).

For the analysis of the cross-sectional poverty trends from 1994 through 1997, the population covers persons with valid cross-sectional income information, while the longitudinal poverty measurements are based on a balanced panel. This implies that the sample contains only persons with valid income information in all years and who were living in private households during the years 1994 through 1997.

Although the European Commission (Eurostat Task Force, 1998) recommends setting the poverty line at '60% of the median', the poverty line in the analysis is 50 percent of the contemporary country-specific mean. In contrast to the median, the mean is sensitive to high incomes, and thus the poverty line takes possible structural changes in income inequality into account.[7] For an empirical comparison of differences using median or mean-based poverty lines in an international poverty analysis see Blackburn (1998).

The reference point used to calculate persons' relative income position is generally the income distribution of the whole cross-section of the population. The SIP approach calculates the average relative income position over an observed finite time-period (Hill and Jenkins, 2001). The poverty line in the SIP approach is also 50 percent of the mean smoothed relative income position. The smoothed relative income position is defined as:

$$\mathbf{Y}_{iT}^{r} = \frac{\sum_{t=1}^{T} y_{it}^{r}}{T} \quad , \tag{2}$$

where T is the number of time-points and $\mathbf{Y}_{iT}^{r}$ represents the smoothed relative income position of person i during the time-period t_0 through t_T.

The *FGT* measure by Foster et al. (1984), applied in the analysis, belongs to the family of additively decomposable poverty measures, and is defined as:

$$P_{\alpha}(\mathbf{Y}, z) = \frac{1}{n} \sum_{i=1}^{q} \left(\frac{z - \mathbf{Y}}{z} \right)^{\alpha} . \tag{3}$$

In the above equation n describes the number of observed persons, q represents the number of poor persons, $\mathbf{Y}$ denotes the (smoothed) income of the poor individuals and z is the poverty threshold. α is a weighting parameter for the individual normalized poverty gap ($\frac{z-\mathbf{Y}}{z}$). If the parameter α is equal to zero, the extent of the poverty gap plays no role whatever as to the poverty measure. This yields the widely used headcount ratio, or poverty incidence (FGT_0). If α equals one, the sum of the poverty gaps is taken into account and divided by the whole population. This results in an average poverty gap for the whole population (FGT_1). Implementing an α greater than one ($\alpha > 1$) implies that the three axioms (Monotonicity Axiom; Transfer Axiom and Transfers Sensitivity Axiom)[8] are satisfied.

The *FGT* measure with $\alpha > 1$ is often called 'poverty intensity' because it assigns the income of the poorest person the highest weight, and thus specifies the relationship between poverty incidence and the poverty gap. For a more detailed discussion about the *FGT*, as well as alternative measures, see e.g. Sen (1976), Shorrocks (1995), Zheng (1997), Myles and Picot (2000), Kockläuner (2002), Osberg (2002). For the following measurement of poverty intensity (FGT_2), parameter α is assigned a value of two.

Furthermore, another poverty gap (*PG*) and the poverty distance (*PD*) are calculated. While the FGT_1 measure divides the sum of normalized poverty gaps by the number of all persons observed at a specific time-point, the *PG* divides the sum of the individual poverty gaps averaged over time by the number of persons for whom we observe cross-sectional poverty in at least one year, with $0 \leq PG \leq 1$, see (4). The larger an individual's poverty gap, the larger that individual's (negative) distance from the poverty threshold.

In an inverse to the poverty gap, for the intermittently poor a (positive) 'poverty distance' can be calculated, defined as the relative distance from the poverty threshold, where $0 \leq PD \leq \infty$ and also averaged over time, see (5). The poverty distance is standardized by the mean which implies that a person reaches the mean income once the poverty distance for this person is equal to 1 (100 percent). Since the poverty line in the analysis is 50 percent of the mean, the person has double the income which was defined as the poverty line. However, the larger such a poverty distance measure, the larger the individual's positive distance from the poverty threshold. The poverty gap, as well as the poverty distance, are formally defined as:

$$PG = \frac{1}{\sum_{i=1}^{n} q_i} \sum_{i=1}^{n} q_i \omega_i^T \tag{4}$$

$$PD = \frac{1}{\sum_{i=1}^{n} q_i} \sum_{i=1}^{n} q_i \gamma_i^T \tag{5}$$

$$\omega_i^T = \frac{1}{\sum_{t=1}^{T} I(y_{it} < z_t)} \sum_{t=1}^{T} I(y_{it} < z_t) \frac{z_t - y_{it}}{z_t}$$

$$\gamma_i^T = \frac{1}{\sum_{t=1}^{T} q_i I(y_{it} \geq z_t)} \sum_{t=1}^{T} q_i I(y_{it} \geq z_t) \frac{y_{it} - z_t}{z_t}$$

$$q_i = I\left[\left(\sum_{t=1}^{T} I\left(y_{it} \geq z_t\right)\right) < T\right]$$

where z_t is the poverty line in period t, y_{it} describes the income of person i in period t and T is the number of time-points measured. $I(.)$ is the indicator function, defined as:

$$I(\theta) = \begin{cases} 1 & \text{if } \theta \text{ is true,} \\ 0 & \text{else.} \end{cases}$$

A cross-national comparison of poverty

Cross-sectional poverty trends

In most of the European countries included, no clear poverty trend emerged between 1994 and 1997 (see Table 1). A rise in poverty incidence since 1994 could be observed for the UK and the Netherlands. In contrast, poverty incidence declined in the same period in Germany, Austria and Spain. The ranking of poverty incidence among the countries analysed is relatively robust over the years. Not surprisingly, Denmark and Finland, the representatives of the socio-democratic welfare states, have the lowest rates of poverty incidence, with about 5 percent or 6 percent, while the Mediterranean countries and the liberal welfare states have the highest poverty incidence (at least 17 percent). The representatives of the corporatist-conservative welfare regime (Germany, France, Belgium, the Netherlands and Austria) occupy the middle positions.

The pictures across the countries offer a clearer poverty profile when the poverty intensity measure is added. While the former represents the classical poverty measure, the latter explains the relation between poverty incidence and the poverty gap in each country. Thus, the UK has the largest poverty intensity among all countries in 1997 due to a rise in poverty incidence and income inequality (see section on 'Poverty Gap' below) since 1994. Although the Republic of Ireland has a similarly high poverty incidence (UK about 18 percent, Republic of Ireland 20 percent), the poverty intensity in this country is one of the lowest by far. Furthermore, combining two poverty measures in this manner shows that the Mediterranean countries, despite differences in poverty incidence (e.g. Italy 17 percent, Portugal 24 percent), generally present a homogenous profile. The reverse can be observed for the corporatist-conservative countries, the poverty intensity levels differing in this group from 1.14 up to 2.59 in 1997. Together with the case of the Republic of Ireland, they provide examples of how a specific poverty incidence need not inevitably imply a specific poverty profile.

Smoothed income poverty

The use of the smoothed income extends the national poverty pictures by the time dimension of poverty experiences. Not surprisingly, the ranking of countries concerning poverty incidence, poverty gap and poverty intensity does not change.[9] Countries with low (high) cross-sectional poverty incidence also have a high (low) smoothed income poverty incidence (see Table 2).

The TIP curve (Jenkins and Lambert, 1997) paints a revealing picture of smoothed income poverty in the states of the European Union. By depicting the cumulated poverty gaps of the poor as a curve, it is possible to illustrate poverty incidence, poverty intensity and the inequality of individual poverty gaps separately for each country (see Figure 2). Poverty incidence is represented by the non-horizontal line which crosses the x-axis. The magnitude of poverty intensity is indicated by the highest

Table 1 Cross-sectional poverty trends in years 1994–7

Year	*DK*	*FIN*	*D*	*FR*	*B*	*NL*	*AUS*	*UK*	*IRL*	*I*	*SP*	*GR*	*P*
Incidence FGT_0 in %													
1994	6.6	–	14.4	15.4	16.4	8.6	–	17.7	19.4	17.4	19.8	22.7	24.3
1995	5.5	–	14.8	14.0	18.5	9.5	10.5	17.2	20.3	17.4	19.0	21.2	24.9
1996	4.9	5.2	14.0	14.4	16.3	11.1	10.6	18.5	20.7	16.5	18.7	19.8	23.6
1997	5.5	5.4	12.2	14.9	14.6	10.7	10.1	19.6	20.0	16.5	18.8	21.8	25.3
Gap FGT_1*10													
1994	1.5	–	6.0	4.7	4.7	2.9	–	5.9	3.9	6.9	6.5	8.9	9.3
1995	1.2	–	5.9	3.7	5.4	4.0	3.2	5.4	4.2	6.1	6.1	7.4	8.7
1996	1.3	1.0	4.5	3.2	4.8	4.3	2.8	7.2	3.9	6.0	7.0	6.7	7.8
1997	1.1	1.3	3.5	3.7	4.5	4.1	2.5	8.4	3.8	6.6	6.7	7.5	7.9
Intensity FGT_2 *100													
1994	0.68	–	3.92	2.58	2.44	1.72	–	3.05	1.64	4.30	3.53	5.07	5.36
1995	0.49	–	3.68	1.77	2.93	2.61	1.72	2.74	1.63	3.77	3.27	3.80	4.66
1996	0.57	0.42	2.58	1.34	2.58	2.81	1.40	4.77	1.33	3.60	4.20	3.45	4.19
1997	0.43	0.61	1.84	1.65	2.23	2.59	1.14	5.77	1.26	4.16	3.71	3.84	4.00

Notes: Net equivalent disposable household income position, modified OECD equivalence scale, poverty line: 50% of contemporary mean.

Source: UDB ECHP 2001: Wave 1 (1994) – Wave 4 (1997), weighted.

point of the curve (y-axis). 'The inequality dimension of poverty is summarized by the degree of concavity of the non-horizontal section of the TIP curve' (Jenkins and Lambert, 1997: 319). The lower the poverty gap of the poorest person in a country and the lower the inequality among the poor, the flatter the curve of the cumulative poverty gaps. Because incomes of the non-poor are not significant, and these individuals have a poverty gap of zero, each curve finishes parallel to the x-axis.

Smoothed income poverty is a minor phenomenon in Denmark, while in Portugal it is highest among the Mediterranean countries and among all other countries included in the analysis. In this respect, both countries differ from all other countries in each of the three dimensions of smoothed income poverty (incidence, gap and intensity). From the perspective of welfare-regime typology, it is apparent that the poverty profiles of the liberal and Mediterranean welfare regimes are different once poverty intensity is taken into account. The Mediterranean countries have the largest inequality of poverty gaps, and therefore also the greatest poverty intensity in the European Union. However, the TIP curves of the

Table 2 Smoothed income poverty in the time-period 1994–7; balanced panel

	DK	*D*	*FR*	*B*	*NL*	*UK*	*IRL*	*I*	*SP*	*GR*	*P*
Incidence: (FGT_0 in %)	2.4	8.2	13.8	13.1	6.1	13.5	17.1	12.4	14.8	17.5	21.6
Gap: (FGT_1 * 10)	0.2	2.0	2.2	3.1	1.0	2.8	2.3	3.2	3.6	4.6	6.7
Intensity: (FGT_2 * 100)	0.04	0.91	0.55	1.28	0.38	1.03	0.48	1.38	1.43	1.77	3.11

Notes: Smoothed net equivalent disposable household income position, modified OECD equivalence scale, poverty line: 50% of mean of smoothed relative income position.

Source: UDB ECHP 2001: Wave 1 (1994) – Wave 4 (1997), balanced panel, weighted.

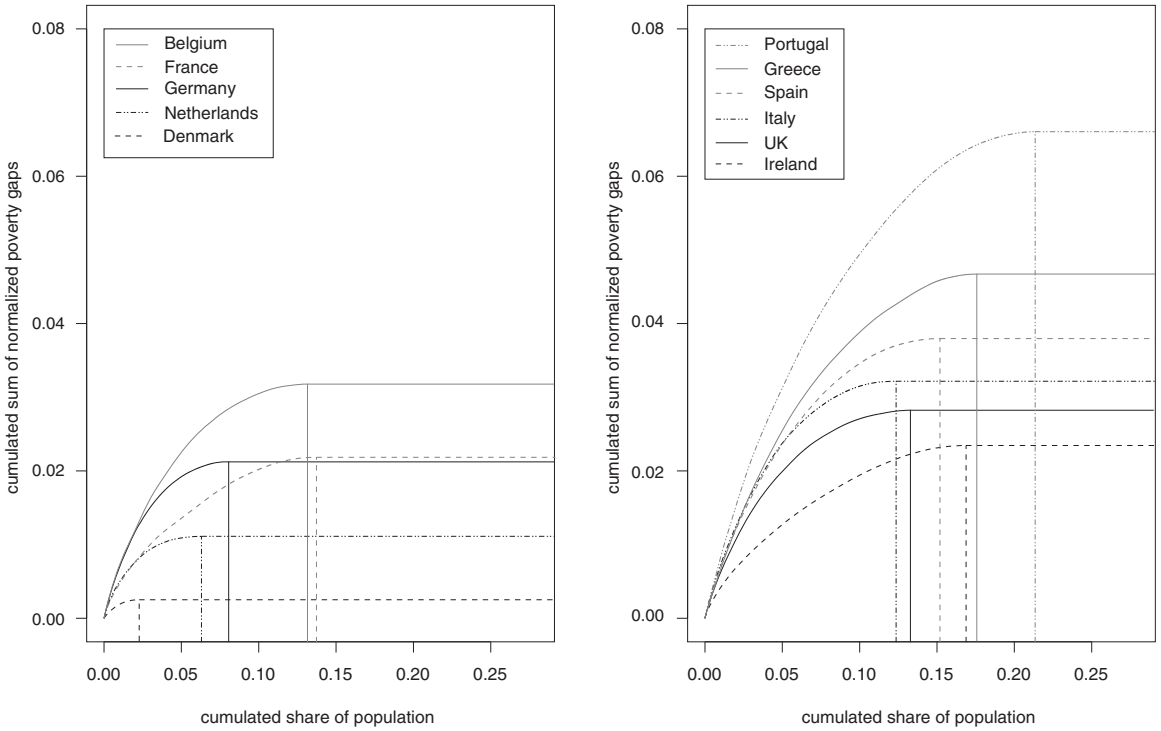

Figure 2 Three I's of the poverty curve for smoothed income

Notes: Smoothed net equivalent disposable household income position, modified OECD equivalence scale, poverty line: 50% of mean of smoothed relative income position.

Source: UDB ECHP 2001: Wave 1 (1994) – Wave 4 (1997), balanced panel, weighted.

Republic of Ireland and France demonstrate how a low poverty gap can influence poverty intensity. However, these results confirm the problem of ignoring the poverty gap in both the headcount ratio and the NTP approach. Thus, it might be expected that the numbers of transitory, intermittently and persistently poor in the European countries would differ according to these poverty profiles.

Transitory, intermittently and persistently poor

Figure 3 shows the empirical incidence of the different subgroups of poor individuals which occur due to the combination of both longitudinal perspectives (NTP and SIP approach). Furthermore, the left bar shows the typical starting point of the NTP approach, namely the incidence of individuals with at least one cross-sectional poverty experience.

According to Figure 3, more than 20 percent of the entire population was poor at least once in all European countries, with the exception of Denmark (12.5 percent). In countries like Belgium, the Republic of Ireland and the Mediterranean countries, the proportion of those who were poor at least once is over 30 percent. However, fewer than 10 percent were persistently poor, except for Portugal (over 10 percent). Not surprisingly, most countries (except Germany, Denmark and the Netherlands) have a relatively low proportion of persistently poor, between 5 percent and 10 percent of the population. The majority of individuals in most countries belong to the transitory poor.

Using an alternative longitudinal approach – the SIP approach – Denmark and Portugal

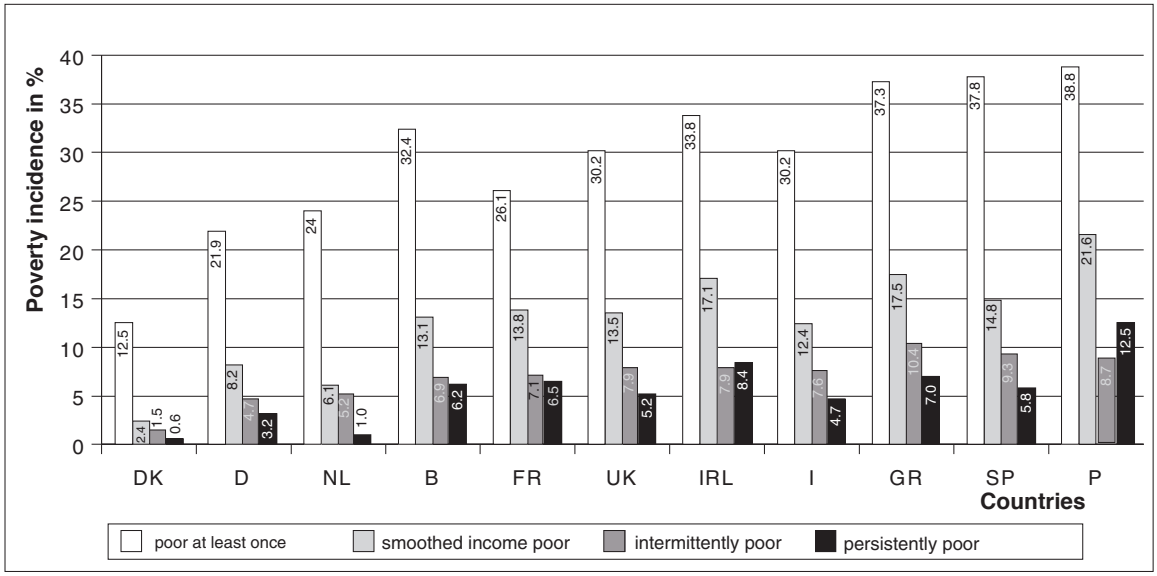

Figure 3 Poor at least once, intermittently, chronically and persistently poor in 1994–7

Notes: Smoothed net equivalent disposable household income position, modified OECD equivalence scale, poverty line: 50% of mean of smoothed relative income position.

Source: UDB ECHP 2001: Wave 1 (1994) – Wave 4 (1997), balanced panel, weighted.

also present extreme positions among the European countries. The proportion of smoothed income poor in the Portuguese population is by far the highest with over 20 percent. However, most countries have a proportion of smoothed income poor of between 10 percent and 15 percent.

The classification of poor is complete when the smoothed income poor are distinguished between persistently and intermittently poor (using a combination of both longitudinal perspectives). The results show that the proportion of the intermittently poor in the European countries observed is at least as high as the proportion of the persistently poor. Again, Portugal is an exception because the number of the persistently poor exceeds the number of the intermittently poor; the number of the persistently poor in France slightly exceeds the number of the intermittently poor.

The poverty gap and distance from poverty of the persistently and intermittently poor

Given the distribution of the intermittently and persistently poor among the smoothed income poor, a question emerges: Are there differences in the long-term income situation of the intermittently and persistently poor in European countries? For that reason, the poverty gap and poverty distance have been calculated. The empirical results in Table 3 report relatively minor differences in the smoothed income poverty gaps between the countries despite considerable differences in the national proportions of smoothed income or chronically poor.

Since the number of years has an influence on the magnitude of the 'smoothing method', such differences might be expected to become smaller with each additional wave. The relatively narrow poverty gap in Portugal (15.5 percent), given the large proportion of chronically poor (21.6 percent), is notable in this

Table 3 Poverty gap and poverty distance in the time-period 1994–7

	DK	*D*	*FR*	*B*	*NL*	*UK*	*IRL*	*I*	*GR*	*SP*	*P*
Chronically poor in % (intermittently + persistently poor)	2.4	8.2	13.8	13.1	6.1	13.5	17.1	12.4	17.5	14.8	21.6
Intermittently poor in % (share of chronically poor)	69.4	60.2	47.3	53.3	82.2	61.0	49.1	61.3	60.7	63.6	41.9
Persistently poor in % (share of chronically poor)	30.6	39.8	52.7	46.7	17.8	39.0	50.9	38.7	39.3	36.4	58.1
Poverty gap chronically poor in %[a]	–5.6	–12.7	–8.0	–12.0	–8.8	–10.7	–6.9	–13.0	–13.1	–12.4	–15.5
Poverty gap intermittently poor in %[a]	–4.6	–7.0	–5.1	–6.8	–6.6	–5.9	–4.3	–8.3	–8.3	–8.9	–8.2
Poverty gap persistently poor in %[a]	–7.8	–21.2	–10.5	–17.8	–18.7	–18.0	–9.3	–20.4	–20.5	–18.3	–20.7
Poverty distance intermittently poor in %	+23.6	+24.3	+16.4	+22.1	+24.2	+22.3	+17.5	+24.6	+24.4	+25.8	+23.1

Notes: Net equivalent disposable household income position, modified OECD equivalence scale, poverty line: 50% of mean of smoothed relative income position.
[a] See Equation 4.
[b] See Equation 5, poverty line: 50% of contemporary mean.

Source: UDB ECHP 2001: Wave 1 (1994) – Wave 4 (1997), balanced panel, weighted.

context. Portugal differs therefore above all from the other countries due to result of poverty intensity measured by Foster et al. (1984). Second, the poverty gap of the intermittently poor is considerably narrower than the gap of the persistently poor in all countries observed. Since the number of intermittently poor is larger, the impact of this group on the smoothed income poverty gap of the chronically poor (both persistently and intermittently poor) is bigger. In other words, the group of the intermittently poor dominates the smoothed income poverty gap of the chronically poor.

In addition, Table 3 shows the income situation of the intermittently poor during non-poverty years. If the poverty distance is greater than 50 percent, the individuals have on average an income position during non-poverty years which is at least 75 percent of the mean. But this is not true for at least one country, and it emphasizes how close the intermittently poor live to the poverty threshold (Hill and Jenkins, 2001).

Conclusions

This paper combines the N-Times-Poor and the smoothed income approach in order to obtain a comprehensive portrayal of poverty concerning the different dimensions of poverty, namely poverty incidence, poverty gap, poverty intensity and durability of poverty experiences, in the member states of the European Union. In terms of poverty incidence, the ranking of countries does not change when the smoothed income approach is used. But the relative distance between the liberal and Mediterranean welfare states becomes considerably larger, to the disadvantage of the Mediterranean countries, when poverty intensity is added.

Overall, the Mediterranean welfare regimes actually have the largest poverty inequality and the greatest poverty intensity as such in the European Union. The case of the Republic of Ireland emphasizes how inadequate it is to measure poverty by the headcount ratio alone. Ireland has a high poverty incidence, and at

the same time one of the lowest poverty intensities. Denmark and Portugal are both countries which differ from all others in each poverty dimension. While Denmark represents a country in which poverty is a minor phenomenon in terms of intensity and durability of poverty experiences, Portugal has by far the highest poverty intensity and largest proportion of persons with poverty experiences.

Due to the combination of the N-Times-Poor and the smoothed income approach, the smoothed income poor can be differentiated as the intermittently poor and the persistently poor. From an overall longitudinal poverty perspective one obtains another classification of poor, that is, in all countries a large proportion of transitory poor and a smaller proportion of the intermittently and persistently poor. Although the poverty gap of the persistently poor is essentially larger than the poverty gap of the intermittently poor, the latter also live close to the poverty threshold in non-poverty years. While the long-term income situation of the persistently poor is characterized by the 'bad years', the intermittently poor also experience 'good years'. Nevertheless, it is their long-term income situation which is determined by the consequences of the 'bad years' in the observed time-period.

The results confirm that a longitudinal poverty approach must consider both the poverty gap and the income situation in non-poverty years. Moreover, it might be expected that the causes of poverty are different across these three subgroups. In particular from the perspective of policies to combat poverty, the question emerges as to the degree to which the observed cross-national differences among a welfare regime type are affected by specific elements of social policy and social-demographic characteristics (different proportions of single-parent households in the UK and the Republic of Ireland, for instance).

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Notes

1 Devicienti (2002: 320) defined 'exits from poverty (out-of-poverty) as occurring only when post-transition income is more (less) than 110% (90%) of the poverty line'. However, such an interpretation of the interval means that equal income amounts are treated in two different ways. A person with an income of 102% in year t_0, of 89% in t_1 and of 102% again in t_2 (e.g. due to reemployment), is non-poor in t_0, poor in t_1 and still poor in t_2, although income in t_1 is equal to that in t_2. The fact that such an approach (using intervals) recognizes minor income changes at two points of the income distribution merely doubles the disadvantage of a poverty line in this sense.

2 For a more detailed discussion of the smoothed income approach see Watts (1968); Shorrocks (1978); Duncan and Rodgers (1991); Rodgers and Rodgers (1993); Burkhauser et al. (1997); Tsakloglou and Panopoulou (1998); Hill and Jenkins (2001); Krause (2001); Jenkins et al. (2002).

3 For an attempt to incorporate savings and debts into the calculation of a smoothed income see Rodgers and Rodgers (1993).

4 An indication could be the approach proposed by Shorrocks (1978) who compares inequality in m periods with the inequality in the aggregated period and produces an index (R) for measuring mobility. He stressed for the choice of m 'the best procedure is to compute R for $m = 2$ up to the largest value of m that the data allow' (p. 388f), and then plot the results for the Index (R) graphically. The resulting picture shows the (decreasing) impact of each additional time-period for the aggregated period.

5 Data collection is based on a sample of around 170,000 persons in 60,500 households (Mejer and Linden, 2000). The analyses for Germany and the UK are based on the converted versions of the ECHP (Clemenceau and Wirtz, 2001). Data for Luxembourg, Finland and Austria were not available for the time-period 1994–7; data for Sweden will be available in an updated version. For a detailed description of the ECHP

methodology, see Eurostat (1996); on survey attrition and non-response in ECHP data see Perracchi (2002), on a comparative analysis of income data with the Luxembourg Income Study (LIS) see Beblo and Knaus (2001).

6 This scale is used to assign the appropriate weight to each household member in the sample. This scale gives the first adult a weight of 1.0, additional adults (of at least 15 years of age) a weight of 0.5, and children (under 15 years) a weight of 0.3. Concerning the measurement of poverty, De Vos and Zaidi (1997: 332) established a comparison of the 'old' and 'modified OECD equivalence scales' using a subjective equivalence scale: 'The ranking of the Member States in terms of poverty incidence remains largely unaffected by the choice of the equivalence scale.'

7 In the ECHP, UDB outliers are removed during the imputation procedures of income variables (see Eurostat, 2001: 10). Nevertheless, to check the robustness of the results, we also investigated another poverty line (60% of the contemporary median) and the results are unchanged.

8 Foster et al. (1984) stressed that a poverty measure should satisfy the following three axioms invented by Sen (1976): *The Monotonicity Axiom*: other things being equal, a reduction in the income of a poor household must increase the poverty measure; *The Transfer Axiom*: other things being equal, an income transfer from a poor household to a wealthier household must increase the poverty measure; *The Transfer Sensitivity Axiom*: if an income transfer $t > 0$ takes place from a poor household with income y_i to another poor household with income $y_i + d$ ($d > 0$), then the magnitude of an increase in poverty must be smaller for larger y_i. For a survey of poverty measures and poverty axioms see Zheng (1997).

9 A comparison of the cross-sectional poverty in a cross-sectional population versus a balanced panel population has been examined and does not yield different results due to such factors as sample selection.

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