Using Non-Monetary Deprivation Indicators to Analyse Poverty and Social Exclusion in Rich Countries: Lessons from Europe?

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1. Introduction

Most research on poverty in rich countries still relies primarily on household income to capture living standards and distinguish those in poverty, and this is also true of poverty measurement and monitoring for policy-making purposes. As the other contributions to this conference bring out, there has been increasing awareness of the need to improve the measurement of income, to broaden the measure of financial resources, and to capture the dynamics of income over time, and significant progress has been made in research, statistical practice and data availability in those areas. At the same time, there has been a good deal of interest in exploring how non-income information can also be used to improve the measurement and understanding of poverty in rich countries. Such information may relate to consumption; to wealth and assets; to how people regard and report on their own situation; or to the types of non-monetary indicators of living standards and material deprivation on which this chapter focuses.

Such non-monetary indicators are increasingly used in individual European countries as well as at European Union level in measuring poverty and exclusion.[1] One may see this as reflecting some distinct but inter-related concerns about relying solely on income. The first is that the concrete realities of the experience of poverty can be brought out starkly by specific measures of deprivation, illustrating what poverty/low income actually means. The second is that low income may in fact be unreliable as an indicator of poverty, failing in practice to identify those experiencing deprivation and exclusion. Finally, focusing simply on income may miss an important part of the picture, namely the multidimensional nature of poverty and social exclusion.

[1] Various measures of material hardship have also employed in studying poverty in the USA, e.g. Mayer and Jencks (1988, 1993) and Mayer (1997), and studies exploring how they might best be used there include Bauman (1998, 1999, 2003), Short (2003) and Ouellette,et al (2004); our focus here is on the European experience and the lessons to be drawn from it.

A very valuable and comprehensive review of measures of material deprivation in OECD countries is available in an OECD Working Paper (Boarini and Mira d'Ercole, 2006). This chapter aims more briefly to bring out the rationales behind their increasing use, and how they are generally employed in research and monitoring poverty. We look at some key patterns revealed by deprivation indicators, notably how they relate to one another and to income, and then discuss how these findings can be interpreted and their implications for how such indicators can best be used to capture poverty and multidimensionality. Finally, we highlight some important conclusions and challenges in the further development and use of such measures.

2. Why Should Non-Monetary Deprivation Indicators be Used to Study Poverty and Social Exclusion?

Most research on poverty in Europe takes as point of departure the definition that people are in poverty when "their resources are so seriously below those commanded by the average individual or family that they are, in effect, excluded from ordinary living patterns, customs and activities" – the influential formulation by the sociologist Peter Townsend (1979, p. 31). Such a definition has also been adopted whole-heartedly by politicians and policy-makers in a European Union context.[2] So poverty from this starting-point has two core elements: it is about inability to participate, and this inability to participate is attributable to inadequate resources.[3] Most quantitative research then employs income to distinguish the poor, with a great deal of research and debate on how best to establish an income cut-off. In parallel, though, relying purely on income for this purpose has also been questioned. This was first of all from the perspective that low income could be used to identify the poor, but did not tell us all we needed to know about what it was like to be poor, and how people arrived in and coped with that situation. This

[2] The EC Council adopted the following definition in the mid-1980s:

"The poor shall be taken to mean persons, families and groups of persons whose resources (material, cultural and social) are so limited as to exclude them from the minimum acceptable way of life in the Member State in which they live".
This now firmly underpins the EU Social Inclusion process, although the way in which it is actually applied in that process is still evolving as we shall see later in this paper.

is exemplified by Townsend's (1979), pioneering work on the use of non-monetary indicators of deprivation in the context of poverty measurement, He used these indicators both to derive and validate an income poverty threshold, and to bring out graphically what it meant to be poor in Britain at the time in terms of deprivation of everyday items and activities widely regarded as essential.

As these deprivation indicators started to become more widely available, they were used to underpin a more radical critique of reliance on income: that low income fails in practice to identify those who are unable to participate in their societies due to lack of resources. This argument was put forward most emphatically by Ringen (1987, 1988), who asserted that income was both an indirect and unreliable measure of the underlying concept of poverty. In a similar vein, Mack and Lansley (1985) used deprivation indicators directly to identify those experiencing exclusion in Britain, and a number of subsequent British studies (Gordon et al 2000, Pantazis et al, 2006) have done so with a more extensive set of indicators. By contrast, studies for Ireland (Callan, Nolan and Whelan, 1993, Nolan and Whelan, 1996), identified the "consistently poor" – those both on low income and reporting deprivation in terms of specific "basic" items – as meeting both elements of the underlying concept, inability to participate and inadequate financial resources. A similar approach has been applied in some other countries (for example Forster, 2005), and the UK has announced its intention of using a combined measure of low income and material deprivation in monitoring progress towards its target of eradicating child poverty by 2020 (DWP, 2003). Other studies have looked at those reporting not only low income and deprivation but also a subjectively bad financial situation – what Bradshaw and Finch (2003) term "core poverty". Non-monetary indicators of deprivation have by now been used in various ways in measuring poverty in many European countries, for example Muffels and Dirven (1998) with Dutch data, Hallerod (1996) for Sweden, Kangas and Ritakallio (1998) for Finland, Bohnke and Delhey (1999) for Germany, and Tsakloglou and Panopoulou (1998) for Greece.

[3] This is echoed in the definition put forward by an influential expert panel in the USA as insufficient resources for basic living needs, defined appropriately for the United States today (Citro and Michael, 1995).

Rather than (or as well as) the more accurate identification of the poor, a further argument for the use of non-monetary indicators is that they can help to capture the multidimensionality of poverty and social exclusion. It has long been said that poverty is "not just about money", and the widespread adoption of the terminology of social exclusion/inclusion in Europe reflects *inter alia* the concern that focusing simply on income misses an important part of the picture. Social exclusion may involve not only poverty as low income/financial resources, but also educational disadvantage, poor health and access to health services inadequate housing, and exclusion in the labour market. Reflecting such concerns, a multi-dimensional approach to capturing exclusion is being adopted in many of the EU member states and other developed countries (as well as in measuring progress in alleviating poverty in developing countries, notably by the Millennium Development Goals). This can reflect the view that conceptually social exclusion is distinct from and broader than poverty, or that the underlying notion of poverty that evokes social concern is itself (and always has been) intrinsically multi-dimensional and about "more than money" (see for example Nolan and Whelan, 2007, Burchardt, Le Grand. and Piachaud, 2002.) In either case, a variety of non-monetary indicators come into play in seeking to capture such multidimensionality.

So, in sum, the case for using non-monetary indicators is that they can bring out what it means to be poor, help to do a better job than income on its own in identifying the poor, and also directly capture the multifaceted nature of poverty and exclusion. We now proceed to describe the types of indicators that are most commonly used, and then look at their relationship with low income.

3. Non-Monetary Deprivation Indicators

If one accepts that measuring material deprivation is of value, how does one go about it? The way this has developed has been rather *ad hoc*, with different countries learning from

each other while having their own preoccupations.[4] Scandinavian countries were to the forefront, in particular Sweden with its Level of Living Surveys. Townsend's pioneering British work was also influential. He developed a set of 60 indicators designed to capture what was conceived as 11 different types or aspects of deprivation. Subsequent national studies have sought to expand the set of items used and aspects covered, sometimes drawing on the results of in-depth qualitative research on people's everyday consumption and activities and what they regarded as important. Comparative studies, on the other hand, often have to rely on a limited set of items, and also face problems of ensuring the relevance and comparability of those items from one country to another. Here we will refer to relevant national studies, but in seeking to illustrate the types of indicator commonly employed and bring out some important issues in how they are framed and interpreted, we focus primarily on the European cross-country perspective.

We do so first using data from the European Community Household Panel Survey (ECHP) organised by Eurostat and carried out in most of the (then) EU member states from the mid-1990s to 2001 (see Eurostat, 1996 for technical details). Table 1 shows 24 items included in the ECHP that have been widely used as measures of material deprivation in comparative European research.[5] We see that they cover a wide range of areas – from durables such as a TV or a washing machine, to social activities such as having friends in, to food and clothing, and problems with housing such as damp, leaks or rot.

Table 1: Selection of items included in the European Community Household Panel Survey used as indicators of material deprivation

Replacing any worn-out furniture
A weeks annual holiday away from home
Buying new, not second hand clothes
Having friends or family for a meal once a month
Keeping home adequately warm

[4] Our focus here, as in the literature being discussed, is on measures obtained at micro-level for individuals and households, which can be related to their other characteristics - rather than to aggregate-level stand-alone indicators for the country as a whole.

[5] The ECHP contained data on about 40 variables that could potentially serve as non-monetary indicators of deprivation (see for example Dirven *et al* in Eurostat, 2000), but here we concentrate on the ones most widely used for that purpose.

Meat, chicken or fish every second day
In arrears on rent, utilities and HP
Microwave Oven
Dish washer
Video Recorder
Car
Colour TV
Bath or shower
Indoor flushing toilet
Hot running water
Damp walls, floors, foundations etc.
Rot in window frames or floors
Leaking roof
Noise from neighbours or outside
Pollution, grime or other environmental problems caused by traffic or industry
Shortage of space
Too dark/Not enough light
Vandalism or crime in the area.

The ECHP was discontinued after 2001 and core data for the EU on poverty and social exclusion is now being collected under the EU Statistics on Income and Living Conditions (EU-SILC) framework. This includes a more limited but still substantial set of non-monetary indicators, and here we employ 17 shown in Table 2, mostly comprising a sub-set of those in the ECHP, to highlight some important patterns and issues. (A special module being included in EU-SILC in 2009 is investigating a broader set of indicators to inform the selection of items for inclusion in the future.)

Table 2*: Selection of items included in EU-SILC used as indicators of material deprivation*

Afford to pay unexpected required expenses
Weeks holiday away from home.
Meals with meat, chicken, fish (or vegetarian)
Can afford a PC?
Arrears relating to mortgage payments, rent, utility bills, hire purchase
Inability to keep home adequately warm
Respondent for household can afford to have a car
Bath or shower in dwelling
Indoor toilet
Can afford a telephone
Can afford a colour TV?
Can afford a washing machine?

Pollution, grime or other environmental problems in the area caused by traffic or industry
Noise from neighbours or noise from the street
Crime, violence or vandalism in the area
Rooms too dark, light problems
Leaking roof, damp walls/ceilings/floors/foundations, rot in doors, window frames

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If such items are to be used as indicators of deprivation in measuring poverty, it is important that insofar as possible they capture situations where the person is doing or going without due to lack of financial resources, rather than because of other constraints or because they do not actually want the item or activity in question. This is generally addressed in one of two ways. The first is to select and frame items in such a way that it seems likely most people will do without only if they really have to (e.g. adequate heating, hot water). The second, pioneered by Mack and Lansley (1985) and widely copied subsequently, is to ask the respondent explicitly whether they are doing without an item because they cannot afford it.[6] These subjective evaluations of affordability do seem to help in capturing resource constraints (see for example the analysis in Mack and Lansley, 1985, and Nolan and Whelan, 1996), but the issue of choice versus constraint remains an important one, to which we return in the context of the observed relationship between deprivation and income. It is also worth noting that some purely subjective indicators – such as levels of satisfaction with one's life, income, family life, housing or job, or how difficult it seems to make ends meet – can also be included alongside "objective" measures. First, though, we look at summary deprivation measures and the underlying structuring of deprivation in terms of the way the indicators relate to one another.

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6 In some instances, the respondent is first asked if they possess or avail of the item, and if they said they did not then a follow-up question probes whether this was due to inability to afford the item. In others, absence and affordability elements are incorporated into one question, for example: "There are some things many people cannot afford even if they would like them. Can I just check whether your household can afford these if you want them?".

4. Summary Deprivation Measures and Dimensions of Deprivation

While the individual non-monetary indicators available are of interest in themselves – knowing for example how many people, and which types of household, are unable to heat their house or are in arrears on their rent or utility bills – most often the aim is to combine them into some overall measure of deprivation, or sets of measures capturing different aspects or dimensions. The simplest approach to using the 24 items listed in Table 1, for example, would to assign each item a value of 1 where the household reports enforced deprivation and zero where it does not, and simply aggregating those scores into a summary index of deprivation. To illustrate the sort of results this produces, Table 3 shows mean deprivation scores for each of the EU members which participated in the ECHP for 1996.[7]

[7] Not all these countries participated in 1994 and 1995, so this represents the first observation for the maximum number of countries.

Table 3: *Household mean deprivation scores on a 24 items deprivation index by country, ECHP 1996*

	Mean deprivation score
Germany	2.14
Denmark	1.62
The Netherlands	1.96
Belgium	2.26
Luxembourg	1.54
France	2.64
United Kingdom	2.56
Ireland	2.42
Italy	3.42
Greece	6.76
Spain	4.29
Portugal	6.68
Austria	2.25
Finland	2.96
Total	3.37

We see that the mean deprivation score ranges from 2 or below for countries like Denmark, the Netherlands and Luxembourg up to nearly 7 for Portugal and Greece. While there is a strong relationship between average income per head (especially in PPP terms) and the average deprivation level, there are some differences in the rankings these produce.

It is then particularly interesting to look at similar results from EU-SILC, since this covers the enlarged EU with a much wider span in terms of average income per capita. Using the more limited set of 17 indicators available to again construct a straightforward summary deprivation index, Table 4 shows that there is indeed now considerably more variation in mean deprivation. The range within the "old" EU 15 is now from about 11/2 in the case of Denmark, the Netherlands and Luxembourg up to 21/2 or 23/4 in Greece and Portugal, but in Latvia and Lithuania it reaches 4-43/4.

Table 4: *Household mean deprivation scores on a 17 items deprivation index by country, EU-SILC 2006*

	mean deprivation score
AT	1.43
BE	1.82
CY	2.90
CZ	2.23
DE	1.94
DK	1.31
EE	2.95
ES	1.89
FI	1.55
FR	1.78
GR	2.50
HU	3.20
IE	1.63
IS	1.21
IT	2.02
LT	3.95
LU	1.14
LV	4.70
NL	1.51
NO	0.96
PL	3.72
PT	2.77
SE	0.97
SI	2.10
SK	2.90
UK	1.65
Total	2.04

So non-monetary indicators, used in this fairly straightforward way, allow for a comparison of the extent of deprivation across countries that gives a very different picture to the "at risk of poverty" rates based on relative income poverty lines that are widely used in comparative poverty research in Europe and form a central component of the set of common indicators adopted to monitor progress in the EU's Social Inclusion Strategy (see Atkinson *et al*, 2002, Marlier *et al*, 2007).

However, their use is not confined to such an "absolute" comparison, where doing without or being unable to afford a particular item or activity is in effect taken to

represent the same level of deprivation irrespective of how many other people in the same country are in that situation. If instead one wishes to look at deprivation in relative terms and use the country as the frame of reference, one can weight items by its prevalence in the country – so doing without something that almost everyone in the country has is given much more weight than something many others cannot afford. Alternative, the views of the population about which items or activities represent "necessities", as revealed for example in survey responses, can serve as the basis for differentially weighting different items – so doing without items overwhelmingly nominated as necessities will be given the highest weight. Constructing summary indices with differential weighting in this manner will generally lead to narrow gaps in mean deprivation scores between countries, since in general it involves weighting items more heavily in countries with lower levels of "absolute" deprivation.

The question of weighting items also arises when specific aspects of deprivation, rather than a simple summary index, are being investigated. Research on material deprivation at both national and cross-country levels has shown the value of investigating and incorporating into the analysis the manner in which the available items hang together. Again we can illustrate this with results from the ECHP and EU-SILC. A systematic examination to see whether the available items cluster into distinct groups can be done in various ways, most often via exploratory or confirmatory factor analysis. The results clearly show that, rather than treating all the indicators as if they related to a single underlying dimension of deprivation, a better fit statistically is obtained when a number of different dimensions are distinguished. With the range of items available in the ECHP, a five-factor solution was found to be the best fit, with the following dimensions distinguished:

- Basic life-style deprivation - comprising inability to afford items such as food and clothing, a yearly holiday, replacing worn-out furniture, and avoid arrears.
- Secondary life-style deprivation - comprising inability to afford items such as a car, a phone, a colour television, a video, a microwave and a dishwasher.
- Housing facilities - such as not having a bath or shower, an indoor flushing toilet, and hot and cold running water.

- Housing deterioration – having problems such as a leaking roof, dampness and rotting in window frames and floors.
- Environmental problems – having problems such as noise, pollution, vandalism and inadequate space and light.

Table 5 shows the results of the factor analysis in terms of loadings on these dimensions, estimated across the ECHP sample as a whole. Models allowing the

Table 5*: Confirmatory Factor Analysis Results (Oblique Five-Factor Solution), ECHP 1994*

Item	*Basic*	*Secondary*	*Housing Facilities*	*Housing Deterioration*	*Environment*
Replacing any worn-out furniture	0.733				
A weeks annual holiday away from home	0.733				
Buying new, not second hand clothes	0.652				
Having friends or family for a meal once a month	0.645				
Keeping home adequately warm	0.635				
Meat, chicken or fish every second day	0.512				
In arrears on rent, utilities and HP	0.364				
Microwave Oven		0.696			
Dish washer		0.676			
Video Recorder		0.645			
Car		0.497			
Colour TV		0.367			
Bath or shower			0.853		
Indoor flushing toilet			0.764		
Hot running water			0.729		
Damp home				0.653	
Rot in home				0.570	
Leaking roof				0.578	
Noise from neighbours					0.463
Pollute					0.418
Shortage of space					0.379
Not enough light					0.370
Vandalism					0.322

Parameters to vary from country to country were also tested, which revealed that those constraining the parameters to be the same across countries performs as well as the

unconstrained ones. This can be seen from Table 6, which shows various measures of goodness of fit conventionally used in this context and there is little to choose between them.[8] This is substantively very interesting, since there is no reason to expect *a priori* that deprivation indicators would cluster together in the same way in different countries. It is also clearly very convenient analytically, since it means that one can employ the same dimensions for each country in making cross-country comparisons. Other studies analysing the ECHP, for Eurostat for example, have arrived at a similar structure. (For some purposes a measure combining the first two dimensions has also been found useful, which work for Eurostat has employed under the label "economic strain".)

Table 6*: Confirmatory Factor Analysis for Constrained and Unconstrained 5 Factor Oblique Solutions: Goodness of Fit Measures, ECHP 1994*

	Root Mean Squared Error of Approximation	*Adjusted Goodness of Fit Index,*	*Normal Fit Index*	*Parsimonious Goodness of Fit Index*	*Comparative Fit Index*
5 Factors Constrained	0.050	0.944	0.893	0.762	0.894
5 factors Unconstrained	0.013	0.934	0.875	0.764	0.885

The set of indicators available from EU-SILC is more limited than in the ECHP, as we have seen, and appears to allow only three dimensions to be distinguished as follows[9]:

- *Consumption deprivation* – items relating to food, heat, a holiday, a car or a PC, and avoiding arrears on rent or utilities.
- *Household facilities* – such as bath or shower and indoor toilet, a telephone, a colour TV and a washing machine.
- *Neighbourhood environment* - noise, pollution, crime and violence.

Results from the confirmatory factor analysis underpinning this in terms of factor loadings are shown in Table 7.

[8] The estimated model allowing the parameters to vary from country to country was not preferred to the one constraining the parameters to be the same across countries.

[9] The results of factor analysis supporting this conclusion are shown in Appendix Table 2, and similar results from EU-SILC 2005 are described in detail in Whelan, Nolan and Maitre, (2008).

Table 7: *Results of Confirmatory Factor Analysis for EU-SILC 2006 Deprivation Items*

	Consumption	Housing Facilities	Neighbourhood Environment
Weeks holiday away from home	0.889		
Afford to pay unexpected required expenses	0.824		
Meals with meat, chicken, fish (or vegetarian)	0.786		
Respondent for household can afford to have a car	0.711		
Inability to keep home adequately warm	0.68		
Afford a PC?	0.702		
Arrears on mortgage payments, rent, utility bills, hire purchase	0.565		
Bath or shower in dwelling		0.981	
Indoor toilet		0.969	
Can afford a telephone		0.84	
Can afford a washing machine?		0.786	
Can afford a colour TV?		0.757	
Noise from neighbours or street			0.797
Pollution, grime or other environmental problems in area			0.817
Crime, violence or vandalism in the area			0.56

This serves to highlight the obvious but important point with respect to material deprivation that the analysis that can be carried out is constrained by the number of items available. In a comparative context, the constraint is even more binding since items must not only be available across different countries on a common basis (in measurement terms), they should also be substantively comparable.[10] A variety of national studies have investigated dimensionality using similar statistical methods (see for example Saunders

[10] For example, not being able to afford heating would represent a rather different level of material hardship in Sweden compared with Greece or Spain simply because of the climate.

and Adelman, 2006; ??); depending on the range of items available, such studies may be able to distinguish more sub-dimensions. However both national and comparative studies bring out that the value of deprivation indicators in analysing poverty and exclusion is enhanced if one takes into account the way items cluster into distinct dimensions.

Having identified distinct clusters, items may be combined into scales of deprivation in different ways - for example using factor scores as weights. However, simpler scales summing the number of items on which the household is deprived have the benefit of transparency. Standard statistical tests of reliability for these scales can provide reassurance about the extent to which the individual items are tapping the same underlying phenomenon.[11]

5. Deprivation and Low Income

The relationship between deprivation measures and household income is clearly of central importance in thinking about how the deprivation measures are best interpreted and used. It makes sense, in looking at this relationship, to use the income measures that are conventionally employed in analysing poverty. So the income recipient unit is the household[12] and household income is adjusted to take differences in size and composition into account by equivalisation. The equivalence scale chosen can obviously affect the results: again it makes sense to focus primarily on the one now most commonly used in European comparative poverty measurement – somewhat misleadingly termed the "modified OECD scale" - where the first adult in the household is attributed a value of 1, each additional adult is given a value of 0.5 and each child a value of 0.3. The accounting period for income could also make a difference to the strength of the relationship: the ECHP and EU-SILC, for example, concentrate mostly on income received in the previous

[11] Standard statistical tests for the EU-SILC results suggest that the first two dimensions are reasonably reliable but suggest that for the environmental dimension some additional items may be required to improve reliability (Whelan, Nolan and Maitre, 2008).

[8] This is defined in the ECHP as comprising "either one person living alone or a group of persons, not necessarily related, living at the same address with common housekeeping-i.e. sharing a meal on most days or sharing a living or sitting room".

calendar year (not the twelve months prior to the date of interview, much less last week or month).

Choices on how to use the available non-monetary indicators to capture and summarise deprivation will also make a difference to the observed relationship with income. To illustrate, we construct a summary deprivation index constructed using the 24 items in the ECHP listed in Table 1, where Table 8 shows how the average score varies with income decile by country. Table 9 then shows the corresponding results for the wider set of countries included in EU-SILC with a summary index constructed using the 17 items it contains. We see in each case that mean deprivation levels generally decline as one moves up the distribution, but even towards the top some deprivation is being reported; substantial differences between the richer and poorer countries persist right across the distribution.

Table 8: *Household Mean deprivation on a 24-item summary deprivation index by income decile across countries, ECHP 1996*

	Bottom	2	3	4	5	6	7	8	9	Top
Germany	4.4	3.7	2.8	2.4	1.9	1.6	1.5	1.1	1.2	0.9
Denmark	2.5	1.9	2.0	1.9	1.7	1.8	1.3	1.2	0.9	0.9
Netherlands	3.9	3.6	2.3	2.0	1.8	1.6	1.3	1.1	1.0	1.0
Belgium	4.0	3.6	2.9	2.5	2.1	1.7	1.6	1.3	1.5	1.2
Luxembourg	3.4	2.4	1.6	1.4	1.4	1.3	1.0	0.7	1.0	1.0
France	5.0	4.2	3.7	2.9	2.6	2.2	1.9	1.6	1.3	1.1
UK	4.2	4.1	3.7	3.4	2.4	2.1	1.7	1.6	1.3	1.1
Ireland	4.7	4.0	3.7	3.2	2.5	1.6	1.7	1.1	0.9	0.8
Italy	5.9	4.9	4.7	3.6	3.3	3.0	2.8	2.2	2.0	1.6
Greece	9.0	8.6	7.8	7.6	7.2	6.6	6.2	5.6	5.0	3.9
Spain	6.8	5.9	5.4	5.1	4.8	4.0	3.5	3.2	2.5	1.7
Portugal	9.9	9.2	8.7	8.3	7.2	6.7	5.8	4.9	3.7	2.4
Austria	3.7	3.5	2.7	2.4	2.1	1.9	1.9	1.5	1.5	1.3
Finland	5.0	3.6	3.6	3.5	3.2	2.8	2.5	2.1	1.9	1.4
Total	5.5	4.9	4.3	3.9	3.4	3.0	2.7	2.3	2.0	1.5

Table 9: *Household Mean deprivation on a 24 items deprivation index by deciles across countries, EU-SILC 2006*

	Bottom	2	3	4	5	6	7	8	9	Top
AT	2.8	2.3	1.8	1.5	1.3	1.1	1.1	0.9	0.9	0.7
BE	3.5	3.1	2.4	1.9	1.8	1.5	1.2	1.1	1.0	0.9
CY	4.3	4.1	3.6	3.4	3.0	3.0	2.6	2.1	1.6	1.3
CZ	4.7	3.2	2.8	2.3	2.1	2.0	1.6	1.4	1.2	0.9
DE	3.4	3.0	2.4	1.9	1.8	1.6	1.6	1.5	1.3	1.1
DK	2.6	1.9	1.6	1.7	1.5	1.0	0.9	0.8	0.7	0.5
EE	5.0	4.4	4.0	3.5	3.2	2.9	2.4	1.9	1.5	1.0
ES	2.8	2.5	2.4	2.3	2.0	1.9	1.5	1.5	1.2	1.0
FI	3.0	2.8	2.1	1.8	1.4	1.2	1.1	0.9	0.8	0.6
FR	3.2	2.8	2.4	2.1	1.9	1.6	1.2	1.0	0.9	0.7
GR	4.0	3.6	3.4	3.0	2.7	2.6	2.2	1.5	1.2	0.8
HU	5.6	4.6	4.0	3.6	3.3	2.9	2.6	2.2	1.8	1.4
IE	3.1	2.5	2.2	1.9	1.8	1.4	1.1	0.8	0.8	0.7
IS	2.0	1.7	1.6	1.5	1.2	1.3	1.0	0.9	0.6	0.5
IT	3.6	3.0	2.5	2.1	2.0	1.7	1.6	1.4	1.2	1.1
LT	7.2	5.5	5.1	4.3	4.1	3.9	2.9	2.9	2.1	1.5
LU	2.4	1.8	1.5	1.1	1.0	0.9	1.0	0.6	0.6	0.6
LV	7.4	6.2	5.8	5.5	5.1	4.6	4.0	3.5	2.8	2.1
NL	2.5	2.6	1.9	1.8	1.4	1.3	1.1	0.9	0.9	0.8
NO	1.7	1.5	1.4	1.1	0.9	0.8	0.8	0.7	0.6	0.4
PL	6.1	5.2	4.9	4.4	3.9	3.6	3.1	2.6	2.1	1.4
PT	4.3	3.8	3.5	3.4	2.9	2.8	2.4	1.9	1.5	1.1
SE	1.6	1.6	1.5	1.2	0.9	0.9	0.7	0.6	0.6	0.4
SI	3.7	3.1	2.6	2.4	2.0	1.9	1.7	1.5	1.2	0.9
SK	4.4	3.6	3.3	3.4	3.1	2.8	2.7	2.2	2.0	1.5
UK	2.5	2.4	2.0	1.9	1.7	1.5	1.4	1.2	1.1	0.9
Total	3.5	3.0	2.6	2.3	2.1	1.8	1.6	1.4	1.2	1.0

For the reasons already discussed, simply aggregating items into a single index regardless of their inter-relationships may not be the most satisfactory or revealing way to employ them. It is then also important to examine the relationship between summary indices for different dimensions relate to income. Distinguishing the types of dimensions described earlier, various (comparative and national) studies have found that the relationship with income is consistently stronger for some dimensions than others. When the five dimensions detailed in Section 4 are employed using ECHP data, for example, one finds that basic and secondary deprivation are a good deal more strongly correlated with income than housing conditions and facilities, with the local environmental dimension having the lowest correlation. This is the case across all the countries included, but it is

also noteworthy that the relationship between basic deprivation and income is a good deal stronger in the less affluent countries compared with those with higher average income per head. There is also some consistency in pattern when countries are categorised in terms of welfare "regime": those with the highest levels of income and more generous welfare state arrangements tend to display the weakest degree of association between current income and relative deprivation. But even at its highest, selecting the types of indicators/aspects of deprivation that are most strongly associated with income and the countries where this is most pronounced, the correlation between income and deprivation does not exceed -0.5.

It is striking though that even at its highest, selecting the types of indicators/aspects of deprivation that are most strongly associated with income and the countries where this is most pronounced, the correlation between income and deprivation does not exceed -0.5. What then is the extent of overlap between poverty measured in terms of low income and deprivation captured using these types of indicators? Given the variation across dimensions in the strength of the relationship with income, this will clearly depend on which indicators/dimensions are used. It is of particular interest to focus on the dimensions which are most strongly related to income, so we can illustrate this first with figures from the ECHP measuring deprivation in terms of the combined "basic plus secondary" summary index described above. Table 10 first shows income poverty rates using a threshold set at 60% of the country median, the measure most commonly used in comparative European poverty research, and the picture is familiar - with Denmark and the Netherlands having the lowest rate and Greece, Spain and Portugal at the other end of the spectrum. To examine the degree of overlap with deprivation, suppose we distinguish the group in each country that is equal in size to the income poor but is selected instead as having the highest level of deprivation. The table then shows how much these two groups of the same size overlap.

Table 10: *Percentage of Persons Below 60% of Median Income, Equivalised with Modified OECD Scale, ECHP 1994, And Percentage of These Who Are Above Corresponding Deprivation Threshold*

	% Below 60% of Median	% of these Who Are Above Corresponding Deprivation Threshold
Germany	15.9	31.9
Denmark	8.3	17.0
Netherlands	10.3	39.2
Belgium	17.1	33.3
France	15.0	39.3
UK	20.8	47.2
Ireland	17.1	44.3
Italy	18.8	42.2
Greece	22.1	45.7
Spain	20.1	46.1
Portugal	23.6	52.2

The extent of overlap is tends to be high in the countries with relatively low average income and those with high income poverty rates, as one would expect from the correlation patterns described above. It is very low indeed in Denmark, a high-income country with a very low income poverty rate. Treating Denmark as an outlier, the overlap otherwise ranges from about 33% to 50%. So only from one-third to one-half of those identified as poor using the income poverty threshold in a given country would also be distinguished by an equally demanding deprivation threshold as among the most deprived.

This type of finding has been replicated in other studies using the indicators in the ECHP in various ways, and we can show that data from EU-SILC with the indicators available there display a similar pattern. Table 11 shows the percentage of those below the conventional 60% of median income poverty threshold who also have high deprivation scores (of 3 or more) on an index of "consumption deprivation", the one most strongly related to income. We see that this ranges from about 33% to 50%.

Table 11*: Percentage of those below 60% median with consumption deprivation score of 3+, EU-SILC 2006*

	%
Austria	33.3
Belgium	44.8
Cyprus	32.2
Czech Republic	38.7
Germany	33.3
Denmark	34.7
Spain	33.0
Greece	43.2
Estonia	45.2
Finland	40.6
France	38.6
Hungary	41.3
Ireland	47.8
Italy	45.9
Latvia	41.7
Lithuania	46.8
Luxembourg	40.2
Netherlands	27.8
Poland	43.4
Portugal	41.2
Sweden	31.7
Slovakia	32.1
Slovenia	37.3
UK	47.0

The proportion of low-income households not reporting high levels of deprivation is particularly pronounced right at the bottom of the income distribution. Levels of deprivation are often much lower for those in the bottom 2% or 5% than the rest of the bottom decile, for example. However, the mis-match between income and deprivation is by no means confined to such very low-income households: while average derivation levels are often at their highest for the households with incomes between say 40% and 60% of the median, a significant minority of these households still report intermediate or even low levels of deprivation compared with others in the country in question.

While a substantial proportion of the income-poor may not register as highly deprived, it is also the case that a substantial proportion of those reporting high deprivation – compared with others in their country – are often not below conventional relative income poverty thresholds. While many of these are on incomes not far above the poverty thresholds – for example between 60% and 80% of the median - some are well above (as illustrated in Tables 8 and 9). It should be recalled that this is so despite the widespread use of questions about deprivation which seek to focus the respondent's mind on things they have to do without because they cannot afford them.

We go on in the next section to consider the factors that seem to underpin this degree of overlap - and more significantly of non-overlap – between low income and deprivation, before turning to their implications.

6. Understanding the Mismatch

We have seen that the overlap between low income and deprivation is rather more limited than many would have expected, and that this is a consistent finding across many different countries and deprivation measures, reflecting both the substantial proportion of low-income households not showing up as highly deprived and vice versa. To understand why this might come about one must look at the measures of low income and deprivation, and how these relate to living standards and poverty.

As made abundantly clear in other chapters, it is not surprising that current income has serious limitations in capturing poverty. A household's standard of living depends on its command over resources and its needs, and neither would be adequately reflected in current (equivalised) income even if it were measured with perfect accuracy.[13] While disposable cash income is a key element in the resources available to a household, it is by no means the only one. Savings add to the capacity to consume now, and servicing accumulated debt reduces it; past investment in consumer durables influences the extent to which resources must be devoted to such expenditure now; the flow of services from

owner-occupied housing – the imputed rent – is often not included; and non-cash income in the form of goods and services provided directly by the State, notably health care, education and housing, also comprise a major resource for many households. Cash income itself may fluctuate from month to month and year to year, so current income is an imperfect indicator of long-term or "permanent" income which will influence ability to consume. Needs also differ across households in ways that conventional equivalence scales will not capture. These are usually based simply on the number of persons or the number of adults and children in the household, and there is little basis for confidence that they accurately reflect even the impact that has. Furthermore, households also vary in a variety of other ways that affect the demands on their income, notably with respect to health status and disability. Work-related expenses such as transport and child-care may also affect the net income actually available to support living standards and avoidance of deprivation. Finally, geographical variation in prices may mean that the purchasing power of a given income varies across households depending on their location.

Turning to measurement, one first of all cannot be confident that income itself has been measured comprehensively and accurately. Household surveys – on which poverty research generally relies – face (intentional or unintentional) mis-reporting of income. They also find it particularly difficult to adequately capture income from self-employment, from home production, from capital, and from the imputed rent attributable to homeowners. One would be particularly concerned about the reliability of very low incomes observed in surveys - particularly in countries with what are thought to be effective social safety-nets – but other incomes may also be mis-measured to an unknown extent. A good deal of effort has been going into improving the depth and accuracy of measurement of resources and needs to address such issues, as detailed in other papers here, for example by measuring stocks of assets and liabilities as well as income flows, incorporating non-cash benefits into "income", and exploring ways of capturing needs associated with for example disability. There has also been substantial investment in panel surveys to obtain a dynamic rather than static picture of income, so it is particularly

[13] See the discussions in for example Atkinson *et al*, 2002 and Mayer, (1993).

important to consider the relationship between income and deprivation over time that these reveal.

One can first of all use panel data to derive average income over a number of years, and see whether this is much more strongly associated with (current or average) deprivation than current income. Suppose for example we focus on those who are persistently income poor – below the threshold for say each of the last three years. Depending on the threshold and the country, studies of income poverty dynamics have shown that between x and y of those in income poverty in a given year are persistently poor in that sense. One interesting point to note is that the persistence of high levels of deprivation seems to be similar in scale to that of low income - deprivation levels are not much more stable from year to year. When we examined the relationship between the two for ECHP countries, we found that about 45-55% of the persistently income poor were also "persistently deprived". If we add the further proportion of the persistently poor who were recurrently deprived (define) this range rises to 65%-75%. Thus the common situation is of a very substantial, but by no means perfect overlap.

So even when one extends the income measurement period the mis-match with deprivation is still substantial. Why is this? One contributory factor is clearly mis-measurement in both income and deprivation. It has been shown that failure to take this into account in a panel context leads to underestimation of the persistence of both income poverty and severe deprivation, and of the extent to which such persistence is influenced by socio-economic variables reflecting long-term command over resources (Breen and Mosio, 2004 and Whelan and Maitre, 2006). Measurement issues almost certainly contribute to the finding that short-term changes over time in deprivation (at the individual/household level) are very weakly related to corresponding variation in income. In contrast, mean deprivation over a period is highly correlated with income averaged over a number of years (Whelan and Maitre, 2008; Berthoud *et al*, 2004). While it may be difficult to link short-term deprivation dynamics to specific events or influences, there is ample evidence that both income and deprivation are strongly influenced by factors affecting the longer term accumulation and erosion of resources (including labour market

experience, education and social class). Having controlled for persistent low income, individual and household characteristics such as education, labour market experience and social class, marital status and household structure are significant in explaining deprivation levels (Whelan *et al* 2002). The evidence also shows that there are significant differences in the determinants of persistent income poverty versus persistent deprivation (e.g. Berthoud *et al*, 2004; Whelan, Layte, and Maître, 2004).

Some households, even if genuinely on low income for several years, may be able to avoid severe deprivation – for example by drawing on assets, borrowing, and receiving support from extended family. Furthermore, some people may be exceptionally good managers of their limited resources, and succeed in maintaining essentials even where most people on that income could not. However, another point to note is that some persistently low income households may report little or no *enforced* deprivation but still be doing without. As described earlier, some deprivation measures in common use go beyond whether the person lacks the item or the activity to incorporate a subjective evaluation as to whether they are doing without due to inability to afford. While they may be helpful in trying to capture the impact of financial constraints rather than preferences, there is cause for concern that such responses may be influenced by adaptation to economic circumstances, rather than just tastes (McKay, 2004; Dominy and Kempson, 2006; Halleröd, 2006). There are structured differences across age groups or urban-rural location in the extent to which particular items are seen as necessities. - older people may place less value on having a holiday, or urban dwellers on having a car. Where the deprivation measures are constructed that way, one may also have particular concerns about certain types of household becoming habituated to doing without, or having different expectations from the majority (Halleröd, 2006). Where the formulation of the questions allow, it is therefore useful to look both at what people report as enforced deprivation and what they simply lack.

What, conversely, of the households with incomes above the poverty line who are reporting deprivation? This is not difficult to understand when they are close to poverty line – a few extra euro or pounds over the poverty threshold might not have a dramatic

impact on living standards. Those in top half of the income distribution for some time and still reporting substantial deprivation, on the other hand, may be particularly poor managers of their income, they may have got heavily into debt, or they may have rather different priorities in allocating their spending to the norm. Deprivation conceptually relates to being denied the opportunity to have or do something; the difficulty is in empirically inferring a constrained opportunity set from what people do not have or do, as opposed to differences in preferences/tastes. (This probably accounts for the reluctance of many economists to place much weight on non-monetary deprivation indicators.) As we will argue below, this means that using deprivation indicators to measure poverty, one may wish to exclude high-income households reporting that they cannot afford things that many lower income-households have.

It is reasonable to conclude, then, on the basis of both comparative and national studies, that measured income and material deprivation each contain valuable information about the situation of households, reflecting their resources and needs and how these have evolved, with income not an adequate substitute for deprivation or vice versa. This conclusion is underpinned when one looks at how income and deprivation levels relate to people's overall subjective evaluations of their own situation.[14] A widely-used measure of self-assessed economic strain, included in the ECHP and EU-SILC, is based on the following question: "Thinking now of your household's total income, from all sources and from all household members, would you say that your household is able to make ends meet?, with respondents offered responses ranging from "with great difficulty" to "very easily". Levels of self-assessed economic strain are generally found to be considerably higher for those above the deprivation threshold than for those in income poverty.[15] Having panel data on income over time helps to explain differences in economic strain, but deprivation levels remain significant determinants (Whelan *et al* 2004).

[14] See Van den Bosch (2001) for an in-depth discussion of subjective assessments of income adequacy.
[15] See for example Whelan *et al,* (2001).

In interpreting this evidence it is also useful to look at how income and deprivation levels relate to people's subjective evaluations of their own situation.[16] A widely-used measure of self-assessed economic strain, included in the ECHP and EU-SILC, is based on the following question: "Thinking now of your household's total income, from all sources and from all household members, would you say that your household is able to make ends meet?, with respondents offered responses ranging from "with great difficulty" to "very easily". Table 12 compares the percentage reporting great or some difficulty among those below the 60% relative income line with those above the deprivation threshold that distinguishes the same proportion of the sample (Whelan *et al* 2001). In every country levels of self-assessed economic strain are considerably higher for those above the deprivation threshold than for those in income poverty.

Table 12: *Percentage Experiencing Economic Strain Among Those Falling Below the 60% Median Income Line and Above the Corresponding Deprivation Threshold*

	Below 60% Income Line	Above Corresponding Deprivation Threshold
Germany	16.4	32.3
Denmark	22.5	55.4
Netherlands	40.8	65.5
Belgium	28.0	47.1
France	42.3	61.0
UK	43.1	61.8
Ireland	53.8	69.6
Italy	44.5	59.6
Greece	78.1	91.5
Spain	62.3	74.5
Portugal	57.0	71.5

7. The Implications for Using Deprivation Indicators in Measuring Poverty and Exclusion

We now focus on the implications of the findings from the now substantial range of European studies using deprivation indicators for how best to employ them in measuring and monitoring poverty and exclusion and in improving our understanding of those

[16] See Van den Bosch 2001 for an in-depth discussion of subjective assessments of income adequacy.

phenomena. In considering this, we distinguish their use to measure and understanding deprivation, to identify the poor, and to capture the multidimensionality of poverty and exclusion and the extent and nature of multiple deprivation.

a/ Measuring and Understanding Different Types of Deprivation

The most obvious uses for indicators designed to capture deprivation is in investigating the causal processes producing deprivation, and in comparing deprivation levels over time or across countries. While a summary deprivation index encompassing different types of deprivation has its uses, it seems more informative to distinguish different dimensions where possible and make comparisons on that basis. The ECHP has been the main source for cross-country comparative analysis of this type (see for example Eurostat, 2003, 2005, Whelan *et al*, 2001, 2006, Guio, 2005), and the European Quality of Life Survey (EQLS) organised by the European Foundation for the Improvement of Living and Working Conditions also provides some useful data covering a wider span of countries. Table 13 shows, for example, mean scores on deprivation indices for each of the five dimensions distinguished in the ECHP, for participating countries in 1996. EU-SILC now represents the primary source for such comparative analysis in Europe with a much wider set of countries, so we use data for 2006 to compare mean deprivation scores by country for the enlarged EU in Table 14 for the three dimensions distinguished in that source as described earlier. In each case, interesting variation in the cross-country patterns across the dimensions can be seen – with much more differentiation in the consumption than the environment dimension, for example, and generally very low mean levels of deprivation in housing facilities.

Table 13: *Mean deprivation scores by dimension of deprivation across countries, ECHP 1996*

	Basic life-style deprivation	Secondary life-style deprivation	Housing facilities	Housing deterioration	Environmental problems
Germany	0.72	0.51	0.06	0.13	0.73
Denmark	0.55	0.34	0.04	0.16	0.53
Netherlands	0.63	0.22	0.02	0.24	0.85
Belgium	0.85	0.24	0.10	0.25	0.81
Luxembourg	0.55	0.20	0.05	0.16	0.60
France	1.12	0.33	0.09	0.29	0.83
UK	1.06	0.28	0.01	0.26	0.95
Ireland	1.01	0.56	0.13	0.22	0.52

Italy	1.71	0.38	0.07	0.16	1.10
Greece	3.82	0.96	0.78	0.39	0.81
Spain	1.97	0.81	0.05	0.38	1.09
Portugal	2.79	1.46	0.45	0.84	1.13
Austria	0.95	0.35	0.11	0.16	0.70
Finland	1.58	0.36	0.09	0.09	0.86
Total	1.52	0.53	0.16	0.28	0.87

Table 14: *Mean deprivation scores by dimension of deprivation across countries, EU-SILC 2006*

	Consumption	Housing Facilities	Neighbourhood Environment
AT	0.8	0.0	0.4
BE	0.9	0.1	0.6
CY	1.7	0.1	0.7
CZ	1.4	0.1	0.5
DE	1.1	0.0	0.7
DK	0.7	0.0	0.4
EE	1.5	0.5	0.6
ES	1.0	0.0	0.6
FI	0.9	0.1	0.5
FR	1.0	0.1	0.5
GR	1.6	0.1	0.5
HU	2.2	0.2	0.4
IE	1.0	0.0	0.4
IS	0.8	0.0	0.2
IT	1.1	0.0	0.6
LT	2.5	0.7	0.4
LU	0.4	0.0	0.5
LV	2.8	0.6	0.8
NL	0.6	0.0	0.6
NO	0.6	0.0	0.3
PL	2.5	0.3	0.4
PT	1.6	0.2	0.6
SE	0.5	0.0	0.3
SI	1.2	0.1	0.5
SK	2.2	0.1	0.5
UK	0.8	0.0	0.6

In a similar vein, Boarini and Mira d'Ercole present and discuss a range of comparative data for different OECD countries on the percentage of households unable to satisfy "basic needs" and basic leisure activities, lacking various consumer durables, in poor housing conditions etc. Such cross-country comparisons are illuminating in themselves, but in-depth analysis focusing on the factors associated with different types of deprivation and how these vary across countries then has the potential to uncover important features of the causal processes underpinning them. It is worth reiterating in

this context the contrast already noted between those types of deprivation in current consumption that are strongly linked to income, versus poor housing facilities, housing deterioration, and neighbourhood environmental problems where a very weak relationship even with persistent low income has been found across countries in the ECHP (Layte et al, 2001; Whelan *et al* 2003). Factors such as age, household composition, urban/rural location and tenure status have been found to play an important role in predicting housing and neighbourhood-related dimensions, and this is clearly critical in thinking about how policy in those domains needs to respond.[17]

Their value in capturing how deprivation is evolving over time can be illustrated by the Irish experience. Using a consistent set of indicators, levels of "basic" deprivation were seen to decline markedly over the period from the mid-1990s to around 2000 when economic growth reached spectacular heights and incomes grew very rapidly. The Irish data also illustrate some potential difficulties in measurement, in that when EU-SILC replaced the ECHP the level of measured deprivation rose from 2001 to 2003 despite continued economic growth. This appears to reflect two distinct hazards from a measurement perspective. The first arises because the data from 1994 to 2001 is from a panel survey – the Irish element of the ECHP – and selective attrition may mean deprivation is less well represented at the end than the beginning. (Berthoud, 200?, argues that declining deprivation in the BHPS sample was also partly attributable to selective attrition.) This is not a problem particular to deprivation, though, and the important thing is to be aware of this possibility and examine the nature of attrition. The second potential problem is that apparently insignificant changes in the survey instrument – in the way the questions are worded, framed and located in the questionnaire – may also have affected the level of deprivation reported. This is of particular concern, and highlights the need to carefully monitor the precise way deprivation is being measured to ensure that lack of consistency – over time or across countries – in the measurement instrument is not responsible for changes in the figures.

[17] For other national and comparative studies of the characteristics associated with different types of deprivation see for example Tsaklogou and Papadopoulos, 2000; Lollivier and Verger, 1997; Gordon et al, 2000;

b/ Identifying the Poor

If non-monetary indicators can be used to capture deprivation, does this help in measuring poverty? The conceptual and measurement problems in relying on income alone to identify the poor (discussed earlier) suggest that incorporating deprivation into the measurement process could have significant potential. Where income is genuinely low but this is unusual for the household and it has savings to run down, for example, or where income has been mis-reported as low, non-monetary indicators might correctly suggest a higher standard of living than income. Where the household benefits from non-cash support from the state, this should enable them to attain a higher standard of living, again reflected in lower levels of deprivation, ceteris paribus. Where a household faces particular needs which act as a drain on income, due to disability for example, then deprivation levels should be higher than for others on the same income. Where prices are considerably higher in one part of the country than another, lower levels of deprivation in the low-cost regions could be captured by non-monetary indicators.

This does not mean that a convincing case can be made for ignoring income and focused simply on deprivation in measuring poverty. We have seen that some middle- and even high-income households report deprivation with conventional measures. While this seems to be telling us something (which may be quite important) about such households, it does not seem a reliable basis for concluding that they are poor according to the widely-used definition discussed earlier. Given two relevant pieces of information about a household - income and deprivation - each with limitations from both conceptual and measurement perspectives, incorporating both into the measurement process is one way to seek to improve reliability in identifying the poor.

A relatively straightforward way of incorporating deprivation is to focus on those who are both on low (relative) income and experiencing high (relative) levels of deprivation. This approach was developed and applied to Irish data to distinguish those "consistently poor" – that is, poor both when assessed by income and by deprivation - from the late 1980s through the Celtic Tiger boom, and officially adopted as the basis on which the

Irish government's anti-poverty strategy set a global poverty reduction target. It showed a rather different trajectory over that period to poverty measures based on purely relative income thresholds, declining substantially when the latter were stable or even rising despite dramatically declining unemployment (as discussed in for example Layte, Nolan and Whelan, 2006). Such an approach has also be applied in some other countries (notably Austria) and in making comparisons across EU countries (e.g. Forster, 2005). We illustrate the results of such an exercise in Table 15 based on ECHP data, showing for each country the percentage both below the 60% relative income threshold and above a deprivation threshold that cuts off the same proportion of the sample. For the Netherlands, Germany, Belgium and France between 4-7% are "consistently poor" in that sense. For Ireland, Italy, Spain, Greece and the UK it lies between 8-10%, peaking at 12% in Portugal. The rank ordering of countries remains similar to relative income lines, but since the degree of overlap between income and deprivation is greater in countries with higher income poverty rates so the disparities are sharper. This is an approach which has also received some attention in EU circles and may be considered suitable for incorporation into the suite of common indicators at some point in the future. For the present, it remains a valuable approach from a research perspective and in focusing attention on a group within each country that should accorded very high priority for anti-poverty policy.

Table 15: *Percentage Below 60% Income Line and Above the Deprivation Threshold*

	%
Germany	5.1
Denmark	1.4
Netherlands	4.0
Belgium	5.7
France	5.9
UK	9.8
Ireland	7.6
Italy	7.9
Greece	10.1
Spain	9.2
Portugal	12.3

c/ Capturing Multidimensionality and Cumulative Disadvantage

Finally, as well as helping in identifying the poor deprivation indicators may be of considerable value in capturing the multidimensionality of poverty and exclusion and the extent of cumulative disadvantage. A multi-dimensional approach, using non-monetary indicators as well as income and distinguishing among different dimensions of deprivation, can deepen our understanding of poverty and social inclusion. As Tomlinson, Walker and Williams (2008) put it, "while it is widely appreciated that poverty is an inherently multi-dimensional concept, this multi-dimensionality has been lost, weakened or distorted when poverty is measured," in the absence of a method by which the holistic nature of poverty can be captured in a way that facilitates measurement over time – and, we might add, across countries.

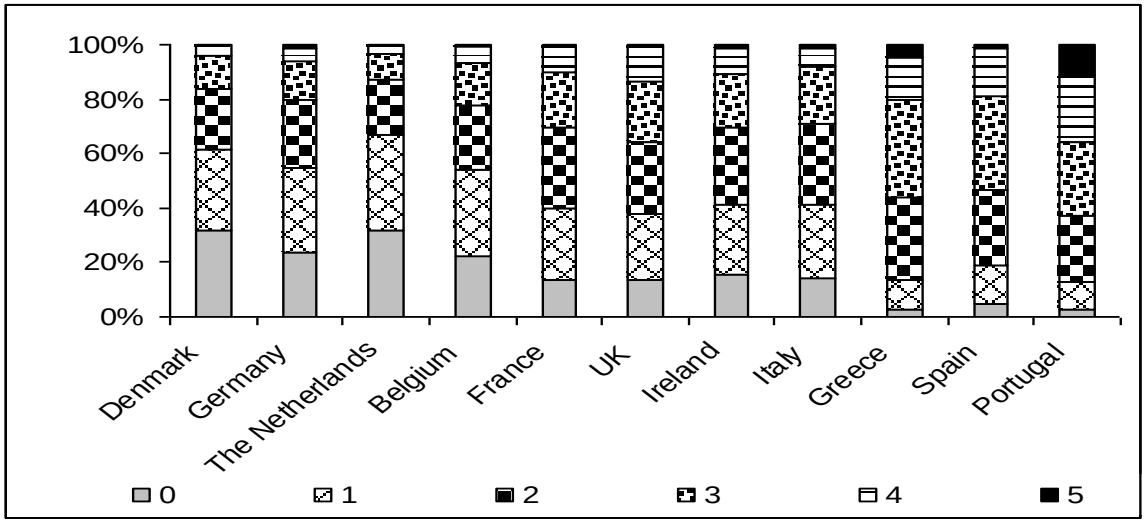
It is important to note, though, that in discussing multidimensionality a clear distinction needs to be maintained between *conceptualising, measuring, understanding* and *responding* to poverty. One can make a case for a multidimensional approach to each of these, but they are not the same case, they have different implications, and one does not simply follow from the other. For example, the fact that poverty may be best thought of as a multidimensional concept does not in itself mean that the poor can only be identified using a multidimensional approach; nor does identifying the poor uni-dimensionally (via income, for example) imply that poverty has to be understood that way or that policies should be directed towards that single dimension (for a fuller discussion see Nolan and Whelan, 2007).

Deprivation indicators allow the relationship between different aspects or types of deprivation at the individual/household level, so that we see for example where absence of basic necessities, poor housing, bad local environment, social isolation and ill-health are found together.[18] The correlation between dimensions is often quite low – for the "consumption" and "household facilities" dimensions in EU-SILC described earlier, for

[18] Such aggregation at the level of the individual is to be distinguished from combining what are already aggregate indicators - such as the unemployment rate, the poverty rate and average life expectancy – to produce summary measures such as the Human Development Index.

example, it is only 0.3. It is not surprising, then, that both national and cross-country studies suggest that the numbers experiencing high levels of deprivation across a number of dimensions are often quite modest. If we look at the five dimensions distinguished in the ECHP, for example, Figure 1 provides an illustration, categorising the sample for each country into those displaying no deprivation versus those deprived on one, two, three, four or all five dimensions. Only in Portugal and Greece does the number reporting deprivation on all five dimensions rise appreciably above zero. Outside Greece, Portugal and Spain the percentage reporting deprivation on four or more dimensions does not exceed 13% and in most cases it is substantially lower.

Figure 1: *Percentage of Persons Lacking at least One Item for Five Deprivation Dimensions*, ECHP 1994



Focusing on the number of dimensions in which a person is deprived – see Vranken (2002) for an example - is referred to by Atkinson (2003) as the "counting approach". Tsui (2002) provides an axiomatic justification for aggregating across different deprivation dimensions into a single cardinal index, and distinguishing the poor as those above some threshold score on that index. Bourguignon and Chakravarty (2004), on the other hand, provide a framework for counting the number of poor in different dimensions and combining that information into a statistic summarising the overall extent of poverty, and how this can be linked to assumed properties of the social welfare function. Atkinson (2003) brings out how the "counting approach" can be seen within the same framework, and also highlights the role of assumptions made regarding the degree of concavity of the social welfare function and the weighting of different attributes or dimensions. A dominance approach - familiar from comparison of income inequality – seeks to identify circumstances under which one can then say that "multidimensional deprivation in Country A is lower than in country B".[19]

Implicit in the notion of multi-dimensional measurement of exclusion is the assumption that there is no one 'true' indicator of the underlying concept. Instead what is measured is a sample of indicators that tap different aspects of a complex phenomenon. There is

[19] See also Brandolini and D'Alessio (1998).

considerable appeal in trying to move beyond rather *ad hoc* approaches to develop a measurement model that enables us to understand the manner in which the indicators are related to the latent concept. One way of doing so is by employing the methodology of latent class analysis (see Moisio, 2004; for applications to comparative European data see Whelan and Maitre, 2005 a & b; Nolan and Whelan, 2007; Dewilde, 2004; see also the discussion in Grusky and Weeden, 2007). An alternative (applied by Tomlinson *et al*, 2008) is via structural equations modelling, while Capellari and Jenkins (2007) employ item response theory. Unresolved conceptual and measurement issues remain to be addressed in teasing out how best to implementing multidimensional measures (Thorbecke, 2007), and this is likely to be a fruitful area for future development. However, there will continue to be a tension between the power of sophisticated methods in summarising and analysing the range of indicators available and the transparency required to serve the needs of policy-makers and inform public debate.

8. Conclusions

Non-monetary indicators of deprivation are now widely used in studying poverty in Europe. Reviewing the experience to date suggests that while measuring financial resources and their evolution remains central, having reliable information about material deprivation adds to the ability to capture poverty and social exclusion. Non-monetary indicators can help in identify those experiencing poverty and in understanding how that comes about. They are most productively used when multidimensionality is explicitly taken into account, both in framing the question and in empirical application. They allow for new insights in making comparisons across countries and in tracking and analysing changes over time. While serious methodological and measurement issues remain to be addressed, much has been learned to date from the development of material deprivation indicators and their use is set to increase in the future.

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