Using Non-Monetary Deprivation Indicators to Analyze Poverty and Social Exclusion: Lessons from Europe?

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Abstract

Non-monetary indicators of deprivation are now widely used in studying poverty in Europe. While measuring financial resources remains central, having reliable information about material deprivation adds to the ability to capture poverty and social exclusion. Non-monetary indicators can help improve the identification of those experiencing poverty and understand how it comes about. They are most productively used when multidimensionality is explicitly taken into account, both in framing the question and in empirical application. While serious methodological and measurement issues remain to be addressed, material deprivation indicators allow for new insights in making poverty comparisons across countries and analyzing changes over time. © 2010 by the Association for Public Policy Analysis and Management.

NON-MONETARY DEPRIVATION INDICATORS

Research and monitoring of poverty in rich countries rely primarily on household income to capture living standards and distinguish the poor. Significant efforts have been made to broaden the measure of financial resources and capture the dynamics of income over time. At the same time, there is increasing interest in using non-monetary information to improve the measurement and understanding of poverty. Such non-monetary indicators are increasingly used in individual European countries as well as at European Union (EU) level, with the suite of indicators employed to monitor the EU's social inclusion process recently expanded to include a summary deprivation measure (see Atkinson et al., 2002; Marlier et al., 2009).[1] One may see this as reflecting some distinct but interrelated concerns about relying solely on income. This paper focuses first on the rationales underpinning the use of measures of material deprivation and the variety of ways they are employed in research and monitoring poverty. We look at some key patterns revealed by deprivation indicators available across the countries of the EU, notably how they relate to one another and to income, and then discuss how these findings can be interpreted and their implications for capturing poverty and multidimensionality. Finally, we highlight

[1] Various measures of material hardship have also employed in studying poverty in the U.S., for example, Mayer and Jencks (1989, 1993) and Mayer (1997). Studies exploring how the various measures might best be used in the U.S. include Bauman (1998, 1999, 2003); however, our focus in this paper is on the European experience and the lessons to be drawn from it.

Journal of Policy Analysis and Management, Vol. 29, No. 2, 305–325 (2010)

Published by Wiley Periodicals, Inc. Published online in Wiley InterScience
(www.interscience.wiley.com)
DOI: 10.1002/pam.20493

some important conclusions and challenges in the further development and use of such measures.

USING NON-MONETARY DEPRIVATION INDICATORS TO STUDY POVERTY AND SOCIAL EXCLUSION

Most research on poverty in European countries takes as a point of departure 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). In a European Union context, the European Council adopted a similar definition in the mid-1980s that refers to "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" (EEC, 1985, p. 24). This now firmly underpins the EU social inclusion process.

From this starting point, poverty has two core elements: It is about an inability to participate, and that is attributable to inadequate resources.[2] Most quantitative research employs income to distinguish the poor, with a great deal of research and debate on how best to establish a poverty threshold. In parallel, though, relying purely on income for this purpose has also been questioned. This came 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 is exemplified by Townsend's pioneering use of non-monetary indicators: Starting from the conceptualization of poverty outlined above, he employed indicators to both derive and validate an income poverty threshold and to bring out in concrete form what it meant to be poor in Britain in terms of deprivation of everyday items and activities widely regarded as essential.

While Townsend's derivation of an income poverty threshold was hotly debated, deprivation indicators started to become more widely available, and they were used to underpin a more radical critique of reliance on income: 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 (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, Gordon, & Levitas, 2006) have done so with a more extensive set of indicators. By contrast, studies in Ireland (Callan, Nolan, & Whelan, 1993; Nolan & Whelan, 1996) identified the "consistently poor"—those both having 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 other countries (e.g., Förster, 2005), and the U.K. 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. Bradshaw and Finch (2003) have looked at those reporting not only low income and deprivation but also a subjectively bad financial situation—what they 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, Halleröd (1995) for Sweden,

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

Kangas and Ritakallio (1998) for Finland, Bohnke and Delhey (1999) for Germany, and Tsakloglou and Panopoulou (1998) for Greece.[3]

As well as a 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 and inclusion in Europe reflects, among other things, the concern that focusing simply on income misses an important part of the picture. Social exclusion may involve not only poverty as low income and financial resources, but also educational disadvantage, poor health and access to health services, inadequate housing, and exclusion from the labor market. Reflecting such concerns, a multidimensional 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 adopted by 189 nations at the UN Millennium Summit in 2000). This corresponds with the view that social exclusion is distinct from and broader than poverty or the underlying notion of poverty that evokes social concern is (and always has been) intrinsically multidimensional and about "more than money" (see, for example, Nolan & Whelan, 2007; Burchardt, Le Grand, & Piachaud, 2002).[4] In either case, a variety of non-monetary indicators come into play in seeking to capture such multidimensionality.

In sum, non-monetary indicators are now being used in a variety of ways in European countries and at EU level in the belief 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 directly capture the multifaceted nature of poverty and exclusion. There is no consensus about how best to employ them, and the underlying rationale(s) may often be implicit rather than explicit, but the volume of research employing material deprivation indicators and the interest in it in policy circles is certainly growing. We now proceed to illustrate the types of indicators that are commonly used, concentrating on those employed in comparative European research and monitoring.

NON-MONETARY DEPRIVATION INDICATORS AND INDICES

If one accepts that measuring material deprivation is of value, how does one go about it? As already noted, the way this has developed has been rather *ad hoc*, with different countries learning from each other while having their own preoccupations.[5] Comparative studies 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, 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 on the European cross-country perspective. We do so using the European Community Household Panel Survey (ECHP) organized by Eurostat and carried out in most of the (then) EU member states from the mid-1990s to 2001 (see

[3] Boarini and Mira d'Ercole (2006) provide a review of the literature on material deprivation in OECD countries, as does OECD (2009).

[4] Swedish welfare research has employed such a multidimensional approach since the 1960s, using individuals' command over resources in terms of family and social relations, material living conditions (income and wealth), health, education, working conditions, political life, leisure time activities, and housing conditions to capture their "level of living."

[5] The focus here, as in the literature being discussed, is on measures obtained at the 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.

Eurostat, 1996) and data now being collected under the EU Statistics on Income and Living Conditions (EU-SILC) framework, which replaced the ECHP (see Eurostat, 2007). Each of these data sources has problems. The ECHP, being a panel survey following respondents over time, inevitably has attrition from one year to the next, and this varies across types of household and across countries; furthermore, differential weighting and imputation procedures may also affect comparability (see, for example, Peracchi, 2002). EU-SILC, unlike the ECHP, is not a harmonized survey across all the countries, but rather a mechanism for obtaining pre-specified variables from each country, with scope for variation in how they choose to collect it; this may also give rise to problems of reliability and comparability (see, for example, Hauser, 2008, on the German EU-SILC). Nonetheless, these sources allow for analysis to be carried out across a wide range of countries with data that is much closer to being comparable than would usually be the case, and serve to illustrate the key points on which we are focusing here in relation to measures of material deprivation and their use.

The deprivation indicators included in the ECHP drew on previous national studies and cover a wide range of areas, from food and clothing to durables, social activities, and problems with housing.[6] The aim was to capture situations where the person was going without the item due to lack of financial resources, rather than because of other constraints or because they did not want it. In some cases the survey asked, "Indicate whether or not your household possesses [the item]. If you do not have [item], please indicate whether you a) would like to have it but cannot afford it, or b) do not have it for other reasons, e.g. you don't want or need it." This was the format adopted for

- A car
- A color television
- A VCR
- A microwave
- A dishwasher
- A telephone

For some other items, the format was, "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?"

- Keep your home adequately warm
- Pay for a week's annual holiday away from home
- Replace any worn-out furniture
- Buy new, rather than secondhand, clothes
- Eat meat, chicken, or fish every second day, if you wanted to
- Have friends or family for a drink or a meal at least once a month

For some other items, the question simply asked, "Does this dwelling have the following amenities?"

- A bath or shower
- An indoor flushing toilet
- Hot running water

[6] In all, the ECHP contained data on about 40 variables that could potentially serve as non-monetary indicators of deprivation (see, for example, Eurostat, 2000). These include some purely subjective indicators—such as how difficult it is to make ends meet—which we employ below.

Finally, in relation to various problems the question was, "Do you have any of the following problems with your accommodation?"

- Shortage of space
- Noise from neighbors or outside
- Too dark, not enough light
- Lack of adequate heating facilities
- Leaky roof
- Damp walls, floors, foundations etc.
- Rot in window frames or floors
- Vandalism or crime in the area
- Pollution, grime, or other environmental problems caused by traffic or industry

The individual non-monetary indicators are of significant interest in themselves—knowing, for example, how many and which types of household are unable to heat their house or buy new clothes—but more 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 is to assign a value of 1 for each item where the household reports enforced deprivation and 0 where it does not, and aggregate those scores into a summary index. To illustrate, Table 1 shows mean deprivation scores on such a summary index using the 24 items listed above for the 14 EU members that participated in the ECHP in 1996.[7] 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. There is a strong relationship between average income per head in purchasing power parity (PPP) terms—also shown in the table—and the average deprivation level, but there are some differences in the rankings these produce. For example, Denmark has similar mean income but lower deprivation scores than Belgium, France, or Germany. Greece and Portugal have the lowest average income levels of the EU-15, but the gap between them and the other "old" member states in terms of deprivation level is very much greater.

It is then particularly interesting to look at similar results from EU-SILC, since this covers the enlarged EU (plus Iceland and Norway), with a much wider span across countries in terms of average income per capita. EU-SILC at present includes a more limited but still substantial set of non-monetary indicators, mostly drawn from the ECHP.[8] Table 1 also shows mean levels on a summary deprivation index constructed using 17 indicators. We see that there is indeed now considerably more variation in mean deprivation levels. The range within the "old" EU-15 is now from 1.3 to 1.5 in the case of Denmark, the Netherlands, and Luxembourg up to 2.5 to 2.8 in Greece and Portugal, but in Latvia it reaches 4.7. Again, this partly reflects differences in average income, but the gap in deprivation levels between, for example, Latvia and Lithuania, is wider than that in average income.

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 from the "at risk of poverty" rates based on relative income poverty lines that are widely used in comparative poverty research in Europe. These are also shown in Table 1 for comparison, using the 60 percent of median income threshold. We see

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

[8] The basis on which these were selected is not entirely clear, but they include items in the ECHP that were widely employed in comparative studies. 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 1. Mean deprivation scores and relative income poverty, ECHP 1996 and EU-SILC 2006.

	Mean Deprivation Score		Relative Income Poverty %		Mean Equivalized Income (PPP)	
	24 Items Index 1996	17 Items Index 2006	1996	2006	1996	2006
Austria	2.25	1.43	14	12	14,178	19,269
Belgium	2.26	1.82	15	15	14,384	17,962
Cyprus		2.90		16		18,840
Czech Republic		2.23		10		10,142
Germany	2.14	1.94	14	13	14,675	16,470
Denmark	1.62	1.31	10	12	14,220	17,156
Estonia		2.95		18		7,753
Spain	4.29	1.89	18	20	9,191	14,518
Finland	2.96	1.55	8	13	11,337	16,667
France	2.64	1.78	15	13	13,388	17,309
Greece	6.76	2.50	21	21	8,300	13,919
Hungary		3.20		12		7,975
Ireland	2.42	1.63	19	18	11,695	18,915
Iceland		1.21		10		21,169
Italy	3.42	2.02	20	20	10,490	15,937
Lithuania		3.95		20		6,419
Luxembourg	1.54	1.14	11	14	22,337	30,498
Latvia		4.70		23		6,576
Netherlands	1.96	1.51	12	10	12,910	18,812
Norway		0.96		11		22,357
Poland		3.72		19		6,817
Portugal	6.68	2.77	21	18	7,798	11,156
Sweden		0.97		12		15,893
Slovenia		2.10		12		13,735
Slovakia		2.90		11		7,686
UK	2.56	1.65	18	19	13,659	20,343
EU average	2.89	2.04	16.0	16.0	10,873	15,540

that some countries with low relative income poverty rates have quite high mean deprivation levels (for example, Hungary, Slovenia, and Slovakia), and others have high relative income poverty rates but much lower mean deprivation levels (such as Ireland and the U.K.). These "at risk of poverty" rates 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), but, as discussed below, it has recently been decided that these can be usefully complemented by measures of material deprivation. They also add to what we learn from comparisons of average income levels across countries: It is the combination of differences in average income levels and how those are distributed within countries that underpins variations in deprivation.

The use of non-monetary deprivation indicators is not confined to such an "absolute" comparison, where doing without or being unable to afford a particular item or activity is 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 their 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. Alternatively, 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. Whether differential weighting of items in this way is appropriate depends on the question being asked—whether the focus is on "absolute" differences in living standards versus relative deprivation within countries.

Another important issue is whether the available indicators are employed in the form of simple summary indices of the type shown in Table 1 or used to distinguish and analyze different aspects or dimensions of deprivation. Both national and comparative studies have investigated how different items relate to each other and cluster into dimensions, most often via exploratory or confirmatory factor analysis. The results generally show that a better fit statistically is obtained when a number of different dimensions are distinguished rather than treating all the indicators as if they related to a single underlying dimension of deprivation. Once again, we can illustrate this with results from the ECHP and EU-SILC. Factor analysis suggests that with the items available in the ECHP a five-factor solution provides the best fit statistically, distinguishing the following dimensions:

- Basic life-style deprivation—comprising inability to afford items such as food and clothing, a yearly holiday, replace worn-out furniture, and avoid arrears.
- Secondary life-style deprivation—comprising inability to afford items such as a car, a phone, a color television, a videocassette recorder, 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 2 shows the factor loadings on these dimensions from confirmatory factor analysis, estimated across the ECHP sample as a whole, with individual items generally loading strongly onto a specific dimension.

Models allowing the dimensions to differ across countries can also be tested, but perform no better than the common set across countries. This can be seen from Table 3, which presents various measures of goodness of fit conventionally used in this context:

- The Adjusted Goodness of Fit Index is the ratio of the sum of the squared discrepancies to observed variances, with values above 0.9 indicating a good fit.
- The Normal Fit Index indicates the percentage improvement in fit over the baseline independence model.
- The Parsimonious Goodness of Fit Index adjusts for the number of parameters and data points, with lower values than for the other indices being satisfactory.
- The Comparative Fit Index ranges between 0 and 1, with values exceeding 0.90 indicating a good fit.

In each case, the model employing a common set of dimensions across all the countries performs as well as one that is not constrained in this way. This is substantively very interesting, since there is no reason to expect that deprivation indicators would cluster together in the same way in different countries. It is also very convenient analytically, since it means that one can employ the same dimensions for each country in making cross-country comparisons.

Table 2. Confirmatory factor analysis results (five-factor solution), ECHP 1994.

Item	Basic	Secondary	Housing Facilities	Housing Deterioration	Environment
Replacing any worn-out furniture	0.733				
A week's annual holiday away from home	0.733				
Buying new, not secondhand 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, or hire purchase loans	0.364				
Microwave oven		0.696			
Dish washer		0.676			
Video recorder		0.645			
Car		0.497			
Color 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 neighbors					0.463
Pollution					0.418
Shortage of space					0.379
Not enough light					0.370
Vandalism					0.322

Table 3. Confirmatory factor analysis for constrained and unconstrained five-factor solutions: Goodness of fit measures, ECHP 1994.

	Adjusted Goodness of Fit Index	Normal Fit Index	Parsimonious Goodness of Fit Index	Comparative Fit Index
5 factors constrained	0.944	0.893	0.762	0.894
5 factors unconstrained	0.934	0.875	0.764	0.885

The set of indicators available from EU-SILC, being more limited than in the ECHP, appears to allow only three dimensions to be distinguished:[9]

- *Consumption deprivation*—items relating to food, heat, a holiday, a car or a PC, and avoiding arrears on rent or utilities.

[9] See also Guio and Engsted-Maquet (2007).

Table 4. Results of confirmatory factor analysis for deprivation items, EU-SILC 2006.

	Consumption	Housing Facilities	Neighborhood Environment
One-week holiday away from home	0.889		
Afford to pay unexpected required expenses	0.824		
Meals with meat, chicken, or 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, and rent-to-own 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 color TV		0.757	
Noise from neighbors or street			0.797
Pollution, grime, or other environmental problems in area			0.817
Crime, violence, or vandalism in the area			0.56

- *Household facilities*—such as bath or shower and indoor toilet, a telephone, a color TV, and a washing machine.
- *Neighborhood environment*—noise, pollution, crime, and violence.

Details of the confirmatory factor analysis underpinning this in terms of factor loadings are shown in Table 4. A variety of national studies have also investigated dimensionality using similar statistical methods (see, for example, Saunders & Adelman, 2006), and these again bring out that the dimensions distinguished will depend on the range of items available in the data set in question.

Having identified distinct clusters or dimensions of deprivation, one can then combine items into scales or indices for each dimension. The ECHP has been the main source for cross-country comparative analysis of different deprivation dimensions to date (see, for example, Eurostat, 2003; Whelan et al., 2001; Guio, 2005). Standard statistical tests of reliability for the scales provide reassurance about the extent to which the individual items are tapping the same underlying phenomenon.[10] Table 5 shows the mean levels in the ECHP for each participating country on summary indices for each of the five dimensions described above. Interesting variation in the cross-country patterns across the dimensions can be seen, with much more differentiation in the consumption than the neighborhood and environment dimension, for example, and very low mean levels of deprivation in housing facilities except in Greece and Portugal. Various countries are below the EU-15 average for some dimensions and above it for others—the U.K., for example, has an above-average deprivation level for the housing and environmental dimensions, and Italy has above-average basic deprivation but below-average levels for the other dimensions.

[10] Standard statistical tests suggest that the first two dimensions in EU-SILC are reasonably reliable but the environmental dimension may require some additional items (Whelan, Nolan, & Maître, 2008).

Table 5. Mean deprivation scores by dimension of deprivation across countries, ECHP 1996.

	Basic Life-Style Deprivation (7 items)	Secondary Life-Style Deprivation (5 items)	Housing Facilities (3 items)	Housing Deterioration (3 items)	Environmental Problems (5 items)
Austria	0.95	0.35	0.11	0.16	0.70
Belgium	0.85	0.24	0.10	0.25	0.81
Denmark	0.55	0.34	0.04	0.16	0.53
Germany	0.72	0.51	0.06	0.13	0.73
Spain	1.97	0.81	0.05	0.38	1.09
Finland	1.58	0.36	0.09	0.09	0.86
France	1.12	0.33	0.09	0.29	0.83
Greece	3.82	0.96	0.78	0.39	0.81
Ireland	1.01	0.56	0.13	0.22	0.52
Italy	1.71	0.38	0.07	0.16	1.10
Luxembourg	0.55	0.20	0.05	0.16	0.60
Netherlands	0.63	0.22	0.02	0.24	0.85
Portugal	2.79	1.46	0.45	0.84	1.13
UK	1.06	0.28	0.01	0.26	0.95
EU	1.24	0.48	0.09	0.24	0.88

Table 6 shows the corresponding figures for the three dimensions distinguished in EU-SILC across all the countries it covers. There is once again a striking contrast between the consumption dimension, which ranges from a mean level of 0.7 in Denmark up to 2.8 in Latvia, and the neighborhood and environment dimension, where there is much less variation across countries. With the expansion of the EU to include countries with a much wider range in terms of average income per head, relying entirely on relative poverty measures benchmarked against each country's median income has come to be seen as more problematic, and that is one reason the indicators employed to monitor the EU's social inclusion process have recently been expanded to include a summary deprivation measure employing items relating to consumption and housing facilities (see Marlier et al., 2009). It is also intended to develop a deprivation measure focused on housing to capture the specifics of that form of hardship in this suite of indicators.

Such cross-country comparisons are illuminating and add to what can be learned from income-based poverty measures and mean income comparisons (see Table 1),[11] but the indicators also serve other valuable purposes. In-depth analysis focusing on the factors associated with different types of deprivation and how these vary across countries has the potential to uncover important features of the causal processes underpinning them. For example, deprivation in current consumption has been found to be strongly linked to income, whereas poor housing facilities, housing deterioration, and neighborhood environmental problems display a very weak relationship even with persistent low income (see, for example, Layte et al., 2001; Whelan, Layte, & Maître, 2003). Factors such as age, household composition, urban or rural location, and tenure status have been found to play an important role in predicting housing and neighborhood-related dimensions, and this is clearly critical in thinking about how policy in those domains needs to respond.[12]

[11] In a similar vein, Boarini and Mira d'Ercole (2006) present a range of comparative data for different OECD countries on the percentage of households unable to satisfy, for example, "basic needs" and basic leisure activities, lacking various consumer durables, and in poor housing conditions.

[12] 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.

Table 6. Mean deprivation scores by dimension of deprivation across countries, EU-SILC 2006.

	Consumption (7 items)	Housing Facilities (5 items)	Neighborhood Environment (3 items)
Austria	0.8	0.0	0.4
Belgium	0.9	0.1	0.6
Cyprus	1.7	0.1	0.7
Czech Republic	1.4	0.1	0.5
Germany	1.1	0.0	0.7
Denmark	0.7	0.0	0.4
Estonia	1.5	0.5	0.6
Spain	1.0	0.0	0.6
Finland	0.9	0.1	0.5
France	1.0	0.1	0.5
Greece	1.6	0.1	0.5
Hungary	2.2	0.2	0.4
Ireland	1.0	0.0	0.4
Iceland	0.8	0.0	0.2
Italy	1.1	0.0	0.6
Lithuania	2.5	0.7	0.4
Luxembourg	0.4	0.0	0.5
Latvia	2.8	0.6	0.8
Netherlands	0.6	0.0	0.6
Norway	0.6	0.0	0.3
Poland	2.5	0.3	0.4
Portugal	1.6	0.2	0.6
Sweden	0.5	0.0	0.3
Slovenia	1.2	0.1	0.5
Slovakia	2.2	0.1	0.5
UK	0.8	0.0	0.6
EU	1.2	0.1	0.6

Looking at how the different dimensions of deprivation relate to one another, the extent to which the same people are affected is a valuable complement to examining them individually. The correlation between dimensions is often quite low—for the "consumption" and "household facilities" dimensions in EU-SILC described earlier, for 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 together are often quite modest. If we look at the five dimensions distinguished in the ECHP, for example, Figure 1 provides an illustration, categorizing 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 percent, and in most cases it is substantially lower. The "cumulatively deprived" are clearly of particular interest from a policy perspective, having distinctive needs and in all likelihood requiring specially designed forms of intervention.

Finally, and crucially, information on material deprivation may help us to more reliably identify those who are experiencing poverty than income alone, as we elaborate in the next section.

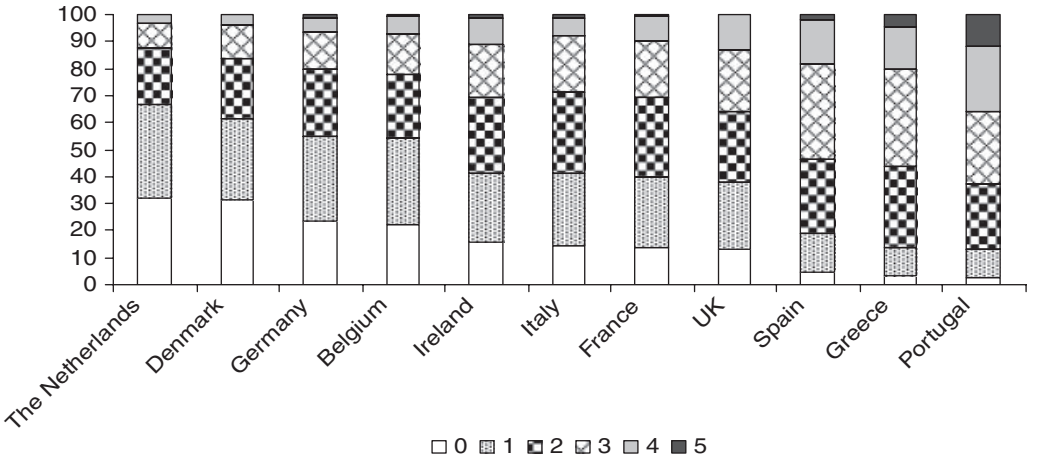

Figure 1. Percentage of persons lacking at least one item for five deprivation dimensions, ECHP 1994.

DEPRIVATION AND LOW INCOME

The relationship between deprivation measures and household income is clearly of central importance in thinking about how non-monetary indicators are best interpreted and used. To look at this relationship, we use the income measure employed in the "at risk of poverty" indicators in the EU's suite of social inclusion indicators presented in Table 1 above. The income recipient unit is the household,[13] and household income is adjusted to take differences in size and composition into account by dividing by an equivalence scale, assigning the first adult in the household a value of 1, each additional adult a value of 0.5 and each child a value of 0.3 (the so-called "modified OECD" scale). The accounting period for income is the previous calendar year. When different dimensions of deprivation are distinguished, the relationship with income is consistently stronger for some dimensions than others; with ECHP data and the five dimensions described earlier, for example, 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 (see Whelan, Layte, & Maître, 2003). The relationship between basic deprivation and income is also stronger in the less affluent countries than in those with higher average income per head. There is also some consistency in pattern when countries are categorized 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 and 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

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

Table 7. Percentage of those below 60 percent 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

clearly depend on which indicators and dimensions are used. It is of particular interest to focus on the dimensions that are most strongly related to income, so Table 7, using EU-SILC data, shows the percentage of those below the 60 percent 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 28 percent to 50 percent. The mismatch between income and deprivation is by no means confined to households with little or no income, although it is particularly pronounced for them: A significant proportion of households with incomes between 40 percent and 60 percent of the median report do not report high levels of deprivation (compared with others in the country in question). Conversely, a substantial proportion of those reporting high deprivation are not below conventional relative income poverty thresholds (though many of these are on incomes not far above the poverty threshold, for example, between 60 percent and 80 percent of the median). It should be recalled that this is so despite the widespread use of questions about deprivation that seek to focus the respondent's mind on things they have to do without because they cannot afford them. Panel surveys allow the relationship between income and deprivation over time to be studied, and analysis of data from the ECHP shows that over a three-year window about 45 to 55 percent of the persistently income-poor had (relatively) high deprivation levels in each year, and about another one-fifth of the persistently income-poor had high levels in some but not all the years. Mean levels of income and deprivation over a number of years are more highly correlated than in a cross-section (Whelan & Maître, 2008; Berthoud, Bryan, & Bardasi, 2004).

The factors that seem to underpin this degree of overlap—and more significantly of non-overlap—between low income and deprivation merit careful consideration. A household's standard of living depends on its command over resources and its needs, which would not be adequately reflected in current (equivalized) income even if it were measured with perfect accuracy.[14] Savings add to the capacity to consume, as does past investment in consumer durables, and servicing accumulated debt reduces it. Owner-occupied housing and noncash income in the form of goods and services provided by the state also comprise major resources for many households (see OECD, 2009, Chap. 9). 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 that will influence the ability to consume. The choice of equivalence scale may itself affect which households are below the income threshold (see, for example, Buhmann et al., 1988; Aaberge & Melby, 1998) and thus the overlap with material deprivation. Needs also differ across households in ways that conventional equivalence scales will not capture, notably with respect to health and disability (see Zaidi & Burchardt, 2005). Household surveys also find it particularly difficult to adequately capture income from self-employment, home production, capital, and the imputed rent attributable to homeowners. Mismeasurement in a panel context leads to underestimation of the persistence of both income poverty and severe deprivation (Breen & Mosio, 2004; Whelan & Maitre, 2006); there may also be selective attrition of the deprived (Berthoud, Bryan, & Bardasi, 2004). Nonresponse on survey questions about deprivation does not generally appear to be a major problem, though, unlike income (see, for example, Frick & Grabka, 2007). It may be difficult to link short-term deprivation dynamics to specific events or influences, but there is ample evidence that both income and deprivation are strongly influenced by factors affecting the longer-term accumulation and erosion of resources (including labor market experience, education, and social class). Having controlled for persistent low income, individual and household characteristics such as education, labor market experience, and social class, marital status and household structure are significant in explaining deprivation levels (Whelan, Layte, & Maître, 2002).

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. However, some persistently low-income households may also not be reporting their actual deprivation levels accurately, having become habituated to doing without or having different expectations from the majority (Halleröd, 2006; McKay, 2004; Dominy & Kempson, 2006). Conversely, households in the top half of the income distribution that report substantial deprivation may be particularly poor managers of their income, may have got heavily into debt, or may have different priorities in allocating their spending from the norm. Deprivation conceptually relates to being denied the opportunity to have or do something; the difficulty is in empirically identifying the consequences of a constrained opportunity set, as opposed to differences in preferences and 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 in 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 that measured income and material deprivation each contain valuable information about the situation of households, reflecting their

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

Table 8. Percentage experiencing economic strain among those falling below the 60% median income line and above the corresponding deprivation threshold, ECHP.

	Below 60 Percent 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

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.[15] 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?" 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. Table 8 compares the percentage reporting great or some difficulty among those below the 60 percent relative income line with those above the deprivation threshold that distinguishes the same proportion of the sample in that country—that is, those with the highest deprivation scores rather than the lowest income (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.[16]

THE IMPLICATIONS FOR USING DEPRIVATION INDICATORS IN MEASURING POVERTY AND EXCLUSION

We now focus on the implications of the findings from the substantial range of European studies using deprivation indicators for how best to employ them in measuring, tracking, and understanding poverty and exclusion. The conceptual and measurement problems in relying on income alone to identify the poor suggest that incorporating deprivation into the process could have significant potential. Where income is genuinely low but that is an unusual scenario for the household and it has savings to run down, for example, or where income has been misreported as low, non-monetary indicators might correctly suggest a higher standard of living than income. Where the household benefits from noncash support from the state, this should enable them to attain a higher standard of living, again reflected in lower

[15] See Van den Bosch (2001) for an in-depth discussion of subjective assessments of income adequacy.
[16] Using panel data on income over time helps to explain differences in economic strain, but deprivation levels remain significant determinants (Whelan, Layte, & Maître, 2004).

levels of deprivation. Where a household faces particular needs that act as a drain on income, due to disability, for example, deprivation levels should be higher than for others on the same income.

This does not mean that income can be ignored, focusing 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 those households, it does not seem a reliable basis for concluding that they are poor. 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 doing so 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 in Ireland in the early 1990s to distinguish those "consistently poor"—that is, poor when assessed both by income and by deprivation. This was subsequently adopted as the official measure of poverty for use in the Irish government's National Anti-Poverty Strategy and had a major influence on the groups identified as most vulnerable. The focus on those both with low income and manifesting serious deprivation excluded many of those reporting low income from self-employment and highlighted the relatively disadvantaged situation of families with children in "working poor" households. This had a considerable influence on the development of policy, including the boosting of child income support levels.

Such an approach has also been applied in some other countries (notably Austria) and in making comparisons across EU countries (Förster, 2005). Such a comparison is illustrated with ECHP data in Table 9, showing for each country the percentage both below the 60 percent 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 and 7 percent are consistently poor in that sense. For Ireland, Italy, Spain, Greece, and the U.K., it lies between 8 and 10 percent, peaking at 12 percent 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, the disparities are sharper. This is an approach that has also received some attention in EU circles and may be considered for incorporation into the suite of common indicators at some point in the future. It would be a valuable complement to the relative income poverty measures, which currently dominate the suite, and the summary deprivation indicator that has recently been added to them.

The usefulness of non-monetary deprivation indicators in capturing how deprivation is evolving over time can also be illustrated by the Irish experience. The "consistent poverty" measure, officially employed in setting a global poverty reduction target, declined markedly over the period from the mid-1990s, when economic growth reached spectacular heights, incomes grew very rapidly, and unemployment declined dramatically.[17] Poverty measures based on purely relative income thresholds, on the other hand, were stable or even rising over this period (see, for example, Layte et al., 2001).

Finally, using non-monetary indicators to distinguish different dimensions of deprivation opens up two complementary and valuable forms of analysis and monitoring

[17] It is worth noting that in the switch from the ECHP to EU-SILC as applied in Ireland, some changes in the way the questions are worded, framed, and located in the questionnaire may also have affected the level of deprivation reported. This scenario highlights the need to carefully monitor the precise way deprivation is being measured to ensure consistency over time and across countries.

Table 9. Percentage below 60 percent income line and above the deprivation threshold compared with percentage below line, ECHP.

	%	
Germany	4.9	14
Denmark	1.5	10
Netherlands	4.7	12
Belgium	5.6	15
France	6.2	15
UK	8.9	18
Ireland	9.2	19
Italy	9.3	20
Greece	9.4	21
Spain	7.9	18
Portugal	10.0	21
Average	7.1	16.6

already illustrated earlier. First, in-depth analysis focusing on the factors associated with each specific type of deprivation helps tease out the causal processes underlying them and frame the appropriate policy response—which may be very different depending on the nature of the problem. Second, looking at the extent to which the same people are affected by multiple forms of deprivation helps in capturing the multidimensionality of poverty and exclusion and the extent of cumulative disadvantage. 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" (p. 600).[18] Deprivation indicators allow us to see, for example, where absence of basic necessities, poor housing, bad local environment, social isolation, and ill health are found together.[19] Such a range of indicators tap different aspects of a complex underlying phenomenon, and one way of capturing this is by the methodology of latent class analysis (see Whelan & Maître, 2005; Nolan & Whelan, 2007; Dewilde, 2004). An alternative applied by Tomlinson, Walker, and Williams (2008) is structural equations modeling, and Capellari and Jenkins (2007) employ item response theory. Conceptual and measurement issues remain to be addressed in teasing out how best to implement such 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 summarizing and analyzing the range of indicators available and the transparency required to serve the needs of policymakers and inform public debate.

CONCLUSIONS

Non-monetary indicators of deprivation are now widely used in studying poverty in Europe. This reflects both the recognition that income, while central, has serious

[18] Note that a case can be made for a multidimensional approach to *conceptualizing, measuring, understanding*, and *responding* to poverty, but they are not the same case and one does not simply follow from the other (see the discussion in Nolan & Whelan, 2007).
[19] 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.

limitations in identifying the poor and the need to capture the multidimensional aspects of poverty and exclusion. Material deprivation indicators now complement income-based poverty measures in the EU's portfolio of social inclusion indicators and in official monitoring of poverty in a range of countries such as Austria, Ireland, and the U.K. They are being used to capture different dimensions or aspects of deprivation, such as basic everyday necessities, durables, housing, and the local neighborhood, and also to measure who is multiply deprived across these dimensions. This allows for new insights in making comparisons across countries, in tracking changes over time, and in framing policies to respond to the situation and needs of different groups. Serious methodological and measurement issues remain to be addressed, but 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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ACKNOWLEDGMENTS

The authors thank editor Ken Couch, three referees, and participants at the Joint OECD/University of Maryland International Conference, Measuring Poverty, Income Inequality, and Social Exclusion: Lessons from Europe, Paris, March 2009 for their most helpful comments. Funding from the Irish Research Council for the Humanities and Social Sciences is gratefully acknowledged.

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