

# What can be learned from deprivation indicators in Europe

2009 edition

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## What can be learned from deprivation indicators in Europe?

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### 1. Introduction

The need to extend the EU portfolio of commonly agreed social indicators to material deprivation measures is widely recognised at the national and EU levels, esp. since the recent enlargements of the Union. If purely income-based indicators of poverty and inequality are essential, they are nevertheless not sufficient to satisfactorily reflect the diversity of living conditions in the 27 EU countries.

Monetary poverty focuses on the current level of income available for the household. It is however not easy to measure income accurately, especially for some groups of the population for example, the self-employed or for people working in the grey economy. Income and resources, whilst clearly linked are not the same thing: other individual resources matter in addition to income (e.g. assets/debts, previous labour positions, non-cash transfers...)<sup>2</sup>. Material deprivation measures, rather than a snapshot measure of income, can therefore be used as a proxy for permanent income and offer additional information on the long term financial situation (Willits, 2006).

Furthermore, measures based on income are “input” based methods (also called ‘indirect approach’)<sup>3</sup>, these inputs being used to achieve a certain level of wellbeing. Measures focusing on “outcomes” (also called ‘direct approach’) concentrate on the actual standard of living of people and not on the means available to achieve a certain level of well being<sup>4</sup> (Halleröd (1995); Sen (2000)). The final conditions of individuals can indeed differ between people with identical resources, depending on needs, health conditions, social networks or other personal constraints and abilities<sup>5</sup>.

While recognising the limits of the monetary approach, we do not argue that deprivation measures provide a better approach, we emphasise the interest in comparing different complementary measures to deepen our understanding of poverty.

Based on EU-SILC 2006, this paper aims to compare the poverty picture that can be drawn on the basis on the relative monetary approach, with an alternative view based on material deprivation, defined as the *enforced lack* of a combination of items depicting material living conditions, such as housing conditions, possession of durables and capacity to afford basic requirements.

It is also worth highlighting that the proposed indicators are not indices of social exclusion that take account of all the dimensions of the phenomenon (i.e., access to the labour market, health, education, social participation, etc). They are more intended to offer multidimensional

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<sup>1</sup> I am grateful to Daniel Defays (IWEPS), Eric Marlier and Alessio Fusco (CEPS/INSTEAD), Michela Nardo (JRC), as well as the members of the Eurostat Task force on deprivation for helpful comments and suggestions. Usual reserves apply.

<sup>2</sup> See for example Nolan B, Whelan C.T. (1996), Whelan et al. (2001), Nolan and Whelan (2007).

<sup>3</sup> Ringen (1988).

<sup>4</sup> Boarini, R. and M. Mira d'Ercole (2006).

<sup>5</sup> See for example Halleröd et al. (2006), Nolan and Whelan (2007).

information on *material* living conditions that make it more comparable with other poverty measures. By doing so, we use deprivation measures to apprehend two core elements of the poverty definition in western countries: (a) the inability to participate in the reference society, (b) due to a lack of resources (Nolan and Whelan, 2007).

The paper discusses methodological issues raised by the construction of material deprivation indicators (selection of items, multidimensionality, aggregation and weighting).

The development and use of material deprivation indicators was discussed by the Indicators Sub-Group of the Social Protection Committee (ISG), during the last years, with a view to further refining and consolidating the original list of common indicators. At its October 2006 meeting, the ISG validated the general approach and welcomed the Commission's proposal to set up a task force gathering both members of the "Income and Living Conditions Statistics working group" of Eurostat and some ISG members. One of the goals of this task force was to propose indicators for material deprivation and housing, based on the items currently available in EU-SILC. At the end of 2007, the task force also proposed an additional selection of deprivation items<sup>6</sup> that will be tested in the SILC 2009 module on material deprivation and will constitute a basis to further extend the deprivation measures in the future.

This paper was presented at the January 2009 meeting of the Task Force on material deprivation and at the February 2009 meeting of the ISG, where the indicators proposed in this document (see section 5) were adopted.

## 2. The selection of items

Much of the literature on deprivation stems from the early work of Townsend (1979), who focused on people who were incapable of "living a decent life", because they lacked necessities and activities at least widely encouraged or approved in the society to which they belong. These are therefore excluded from ordinary living patterns. Townsend identified a list of items (covering diet, clothing, shelter, environment, family activities...) and built a scale of deprivation. The deprivation scale was used to derive an income poverty threshold. Subsequent contributions preferred to directly use deprivation measures to identify the "poor", eventually in complement to monetary measures, but not to identify a threshold in the monetary space.

Mack and Lansley (1985) also proposed an alternative methodology for the selection of items, by collecting views of people about which items are considered as "socially perceived necessities", i.e. a consensual definition of deprivation. Furthermore, contrarily to Townsend who simply regarded the lack of a necessity as implying deprivation, they also developed the concept of "enforced lack" and proposed a more adequate format of survey questions to discriminate between preferences and constraints of people.

In EU-SILC, questions on durable goods rely on this Mack and Lansley's format and enable distinguishing between lack of items (due to choice) and enforced lack of items (people would like to possess the items but cannot afford them). Only this latter group was considered as reflecting "deprivation", in order to exclude lifestyle preferences from the concept of deprivation. In doing so, we focus on items whose absence is attributed to limited resources rather than differences in taste and constraints such as ill health, location etc (see among others Nolan and Whelan (2007)).

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<sup>6</sup> Based on the results of a Eurobarometer survey (see TNS, 2007).

It must however be kept in mind that individuals' expectations as to their material well-being tend to increase with income and to decrease with long term poverty (the so-called “adaptive preferences”) and as a consequence poor people may report that they do not want things which are impossible for them to obtain. Furthermore, some people may feel ashamed to admit not being able to afford buying certain items. Therefore, it cannot be excluded that psychological phenomena or measurement issues introduce ‘noise’ in the measure of enforced lack of items. However, when possible, restricting our analysis to the enforced lack of items appeared crucial in focusing on material deprivation.

These questions are also related to the more general question of choices and preferences. How can we assert that we measure differences in deprivation rather than differences in tastes and preferences?<sup>7</sup> It cannot be excluded that people might choose as priority a pattern of consumption not considered essential by the analysis and can not afford the list of items retained. An unavoidable limitation of deprivation score is that the closer an individual’s preferences correspond to the list of items collected and chosen in the index, the less likely that person will appear to be deprived (Halleröd, 1995). We will come back to this in section 2.5.

The list of proposed items, available in the EU-SILC questionnaire is the following:

- The household could not afford:
  - to face unexpected expenses
  - one week annual holiday away from home
  - to pay for arrears (mortgage or rent, utility bills or hire purchase instalments)
  - a meal with meat, chicken or fish every second day
  - to keep home adequately warm
- The household could not afford (if wanted to):
  - to have a washing machine
  - to have a colour TV
  - to have a telephone
  - to have a personal car
- The dwelling suffers from:
  - leaking roof / damp walls/floors/foundations or rot in window frames
  - accommodation too dark
  - no bath or shower
  - no indoor flushing toilet for sole use of the household
  - Lack of space (defined as an insufficient number of rooms compared to the number of persons)

To be chosen as a ‘lifestyle deprivation’ item, an item should ideally meet the following requirements<sup>8</sup>:

- (1) it reflects the lack of an ordinary living pattern common to a majority or large part of the population in the European Union and most of its Member States;
- (2) it allows international comparisons (i.e., it should have the same information value in the various countries, and not relate specifically to a ‘national’ context);
- (3) it allows comparisons over time

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<sup>7</sup> See also the fundamental critic of Townsend approach by Piachaud (Fusco (2007)).

<sup>8</sup> These criteria are a revised version of those proposed in Eurostat (2002).



(4) it is responsive to changes in the standard of living of people.

Obviously, the availability and quality of the data is another important constraint that needs to be taken into account.

### 2.1 Items socially recognised as necessities

The first criterion relates to the importance of selecting items socially recognised as necessities.

The current choice of items available in EU-SILC is based on experts' knowledge, not on social perceptions about which items are considered essential by the majority of the population, i.e. a consensus control. As a first step, in the absence of such information, frequency controls on existing data that informed us about the degree of penetration of the items in a country were taken as an indication of social values<sup>9</sup>. Secondly, in order to assess the current list of items available in EU-SILC and test whether other items better fit to reflect living patterns which are customary or at least widely encouraged in EU Member States, additional information was collected in 2007 through an EU wide Eurobarometer survey on the perception of poverty and exclusion (see annex 1 for a description of the survey). This survey permitted to confirm that the list of items currently available in the EU-SILC questionnaire and used in the deprivation measures is mainly socially validated. Almost all the items are considered absolutely necessary or necessary to have a decent standard of living, by at least 50% of the population in the EU27 (see table 1).

**Table 1: proportion of people considering absolutely necessary and necessary the items, EU27**

EU27	Arrears <sup>10</sup>	Holidays	Home warm	Meat,	Unexp. Exp.	TV	TEL (mob) <sup>11</sup>	Car	Washing machine	Not too dark	No leaking roof etc.	Bath	Toilets
Absolutely necessary	63%	18%	63%	43%	35%	26%	19%	23%	54%	43%	69%	64%	69%
Abs. nec and nec.	95%	49%	97%	81%	78%	65%	51%	56%	90%	87%	97%	94%	96%

Source: *Eurobarometer special n° 279, Wave 67.1*, computation by Dickes et al. (2008)<sup>12</sup>.

The introduction of the enforced lack of a *computer* in the list of selected items was also proposed by the Task Force on deprivation (Eurostat, January 2009), but not retained, as the cumulated percentage of people considering this items as absolutely necessary or necessary was close to 30%, at the EU level. Furthermore, there appear to be large variations between age groups in the valuation of the computer (see the criterion explained in section 2.5).

The results of the Eurobarometer were also used to select a number of additional deprivation items that will be introduced in the SILC module 2009, in order to complement the current available information (see the introduction).

### 2.2 Spatial comparability at the EU level

The second criterion relating to comparability between countries requires choosing items capturing the same aspect of deprivation in all countries. It can be applied more or less

<sup>9</sup> See Guio (2005, 2006).

<sup>10</sup> Average of three questions: avoid arrears in rent/mortgage, utility bills and loans.

<sup>11</sup> The percentage of people considering as absolutely necessary (or necessary) the fixed phone are respectively 20% (abs. necessary) and 53% (abs. necessary or necessary).

<sup>12</sup> In the computation of Dickes et alii (2008), each country, whether small or large, receives the same importance in the EU-27 averages; these averages are thus not computed on the basis of population weighted national results contrary to standard practice. For calculating the EU-27 averages, national samples have been reweighted so as to achieve a sample size of 1000 for each country.

stringently. It could be argued that comparison of deprivation between countries does not require that each item has the same social value in each country and that different items can be chosen in each country, as far as the information value contained globally in the basket of retained items measures the same thing, as is done in temporal consumer price indices<sup>13</sup>. However, the use of a harmonised database with a limited set of variables prevents the feasibility of this approach and it was preferred to use a common basket of items. Data from the Eurobarometer (2007) permitted to study national differences in the consensus survey. As far as items are valued differently in different countries, according to these data, national weighting schemes will be introduced in section 4.

### *2.3 Evolution over time*

The question of the temporal adequacy of the choices of the items is an essential one and is linked to the fourth criterion. It is important to keep in mind that deprivation is a relative measure and that the list of items need to be assessed regularly in order to ensure that they continue to properly reflect consumption patterns, instead the evolution of tastes, patterns of ownership, technological advances and relative costs.

For example, the eventual inclusion of the computer in the list of items, eventually combined with other durables (to take into account the evolution the use integrated use of the computer, the TV, internet etc.) could be assessed in the future.

### *2.4 Discrimination power of the items*

The fourth criterion relies on the item's ability to discriminate between those with a low standard of living and those with a high standard of living. We considered items as good discriminators of low living standard if the poorest had a higher probability of not being able to obtain the item because of its cost than the richest group. For example, an initial version of the list of items included environmental items (dirtiness, noise, crime...) and further analysis showed that these items were more linked to urban living conditions and were not varying between income groups, these items were therefore dropped from the list. We will explore further the relationship between material deprivation and low income in section 3.3.

### *2.5 Homogeneity of items' perception across subgroups*

An important additional criterion (5) should also be retained<sup>14</sup>. We should expect a relative homogeneity across subgroups of the population in the evaluation of the importance of the chosen items. If there is limited agreement over the list of items considered as social necessities and there are class and ages differences existing in the rating of necessities, this will introduce noise into the measurement of the deprivation, as judgements of importance may impact upon item attainment.

To check this, we used:

- the Eurobarometer data to test whether the probability of participants endorsing how necessary/absolutely necessary they perceive a given item is the same across different subgroups.

At the EU27 level, the evidence suggests that evaluations are broadly comparable between subgroups (especially if we regroup the "absolutely necessary and necessary" modalities). Some

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<sup>13</sup> This approach is for example followed in INSEE (2005).

<sup>14</sup> See also Dickes (1989), Jensen et al. (2002), McKay (2004).

differences appear in the evaluation of the necessity of the car or one week holidays, for example for the elderly (especially women).

At a country level, a work carried out by a French team for the 1<sup>st</sup> meeting of the Task Force on material deprivation in 2007 showed that the impact of the main socio-demographics characteristics available in the survey<sup>15</sup> is moderate, once the specific country effect is accounted for.

- the EU-SILC data (for durables) to check whether the probability of participants *wanting* the item is the same across different sub-groups. People were considered as wanting the item if they *have* the item or if they would like to possess the item but cannot afford it.

The evidence suggests that there is a large homogeneity in the proportion of people wanting durables, whatever their sex, age, household type, citizenship, tenure status, work intensity of their household, for three durables (TV, Tel, Washing machine). However, there are large variations in the proportion of people wanting a car, with the oldest, the jobless, the women, the tenants, the Non-EU, the low educated, the poorest having the lowest propensity to declare desiring a car<sup>16</sup>. This can also be due to underassessment of needs, due to adaptive preferences, i.e. people who declare they do not want things that it is impossible for them to obtain (see above).

## 2.6 The subjective component of surveys responses

Some items available in the surveys are based on subjective information of the respondent. At the EU level, a lot of discussions arose on the use (or not) of such information in a deprivation indicator. On one hand, subjective questions can be culturally influenced and require caution in international comparison; and the aforementioned “adaptive preferences” also need to be kept in mind. On the other hand, social exclusion influences and is influenced by the perceptions of people, not only by external judgement on a person’s situation. The potential criticisms of including subjective items holds true, to a certain extent, for the majority of deprivation items presented in this paper, but the subjective element is probably predominant in some variable like the subjective assessment of the people's own economic situation (as the item related to the ability “to make ends meet”). It was therefore decided not to include this item, but to use it in a subjective poverty measure that can be compared with the deprivation figures.

## 3. Multi-dimensionality of material deprivation measures

Once the list of items is chosen, a detailed presentation of deprivation shares for each single item can be interesting but remains too detailed, making it hard to draw a comprehensive picture of deprivation in each country. To simplify the interpretation of the information available in the list of items and also to highlight any different patterns of deprivation determinants in different countries, it is useful to cluster the items in a limited number of dimensions of lifestyle deprivation. Even if it is recognised that information on deprivation in each individual item constitutes interesting background information, “the essential interest

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<sup>15</sup> The variables are: gender - age - "standard of living" - occupation - town size - household size - number of children in the hh - education level (proxied by the age at end of full-time education). They studied the impact both on each item and on a global deprivation score.

<sup>16</sup> This should be studied in a multivariate model, in order to assess each specific effect of these variables.

here is not so much in individual items per se as in the underlying situation of more generalised deprivation that they can help to capture.<sup>17</sup>

### 3.1 Confirmatory factor analysis

To do so, some technical choices have to be made. We can group items together according to the 'meaning' of their underlying characteristics on the basis of arbitrary criteria (for example all housing items together) or empirically through data analysis. Factor analysis is one technique that can be used to regroup a wide range of variables into a smaller number of dimensions. However, this technique is sometimes criticised (see for example McKay and Collard, 2003) as there is a certain degree of arbitrariness in the choice of items and the number of factors. Furthermore, as it is data driven, different solutions can be obtained from different samples or from the same sample over time. Despite such limitations, factor analysis remains a useful tool for exploring the underlying structure of data, as will be shown below.

In an exploratory factor analysis (EFA), the structure of the latent factor model or the underlying theory is not specified a priori; rather data are used to reveal the structure of the factors. In a confirmatory factor analysis (CFA), on the other hand, the precise structure of the factor model is assumed and tested. The method used to examine this assumption is in the family of structural equation modelling. The use of the model requires testing to determine whether or not the data meets conditions necessary for its valid application. The confirmatory approach is therefore far more powerful than the exploratory one as it allows for hypothesis testing of the factor structure adequacy that is planned to be used in the deprivation domain at the EU-level.

A confirmatory factor analysis was then performed on available 2006 EU-SILC data for the *whole* EU and showed the consistency of the previous dimension structure highlighted on the ECHP and on SILC-2004<sup>18</sup> (six countries).<sup>19</sup>

In this dimension structure, items are grouped into three dimensions, relating to:

- economic strain<sup>20</sup>
- enforced lack of durables<sup>21</sup>
- housing<sup>22</sup>

Note also that factor analysis is usually based on Pearson correlations. However, there may be problems with using the Pearson correlations. If the variables are discreet and dichotomous, important categorisation errors can result (see Dekkers (2008)). Tetrachoric correlations could be better adapted to the binary nature of data used. To evaluate the sensitivity of our results to the correlations used, we followed Dekkers (2008) and used the matrix of tetrachoric correlations as the input for the CFA<sup>23</sup>. Results appeared to be robust<sup>24</sup>. Table A1, in Annex 2, presents the

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<sup>17</sup> Marlier et al. (2007).

<sup>18</sup> See Guio et al. (2006a, 2006b).

<sup>19</sup> For a use of confirmatory factor analysis in deprivation literature, see also Whelan et al. (2001), Eurostat (2002), Dekkers (2008), Jensen et al. (2002).

<sup>20</sup> Regrouping the following items: to face unexpected expenses, one week annual holiday away from home, to pay for arrears (mortgage or rent, utility bills or hire purchase instalments), a meal with meat, chicken or fish every second day, to keep home adequately warm.

<sup>21</sup> Regrouping the enforced lack of a washing machine, a colour TV, a telephone, a personal car.

<sup>22</sup> Regrouping the dwelling problems: leaking roof / damp walls/floors/foundations or rot in window frames; accommodation too dark, No bath or shower, No indoor flushing toilet for sole use of the household.

<sup>23</sup> It has to be noted that estimators will be consistent, although the standard errors as well as the chi-square tests will be inconsistent.

<sup>24</sup> The analysis was conducted using SAS, proc CALIS, (Structural equation modelling, method of unweighted least square).

fit statistics of the CFA, which are reasonably high and confirm that a structure in 3 dimensions can be accepted by the data. Oblique rotation was applied, implying the hypothesis that the dimensions are correlated. Different dimensions of deprivations tend to be positively correlated, as it is reflected by the covariance between dimensions (Table A3, in Annex 2), i.e. being deprived in one dimension is positively correlated with deprivation in other dimensions. It has also to be noted that the fit increases when we focus only on economic strain and durables dimensions (see Table A5) as the housing dimension is quite heterogeneous and should normally be split into different aspects (housing amenities tend to be regrouped together, eventually with some durables; overcrowding represent a separated aspect not correlated with other items; housing quality (darkness and quality of the walls, the roof...) can be regrouped together).

The analysis was performed on the pooled EU data, but also at country level (see table A2 in Annex 2).

Information on the two dimensions: economic strain and durables could also be combined with little loss of information (see Tables A4 and A5 in Annex 2) and gain in simplicity<sup>25</sup>. This solution cannot be rejected by the data analysis and offers the advantage, in an EU context, of presenting only two aggregations, one based on a larger set of commodities and activities whose access is linked to the financial strain encountered by the household, the other depicting the housing conditions (housing comfort and housing facilities).

The information will therefore be aggregated by dimension, economic strain+durables and housing, but the aggregation process will be stopped at the dimension level, as the construction of one single composite multidimensional indicator would lack transparency and homogeneity<sup>26</sup>.

In the rest of the paper, we will focus on this combined strain dimension. The housing dimension is not analysed in details in this paper.

Before proceeding to make use of this scale, it is still useful to document the statistical reliability of this scale, i.e. its internal consistency via, for example, Cronbach alpha coefficient. At EU level, this coefficient is reasonably high for the economic strain dimension (0,69), even when durables are added (0,68). It is however worth highlighting that TV tends to decrease the alpha, as this item is very poorly correlated with the other items. The highest alpha is obtained by using all the economic strain items and the enforced lack of car (0,70). In this set, the inclusion of TV, washing machine or telephone decreases the alpha.

It was also discussed whether the addition of TV or telephone adds a lot to the deprivation index, as in most of the countries less than 1% of people don't have and can't afford such items (see annex 4). Furthermore, as will be seen in section 4, these items have an important impact on the weights structure, in case of prevalence weighting. It was however decided to keep these items in the list, as it was considered as particularly stigmatizing lack (if wanted) in societies where almost all the people who want these items have them.

By country, the majority of countries have alpha values ranging between 0,60 and 0,70, with the exceptions of Poland, Greece, Latvia, Lithuania, Belgium (more than 0,70) and Cyprus, Portugal, Spain, Denmark, Finland, Austria (between 0,55 and 0,60).

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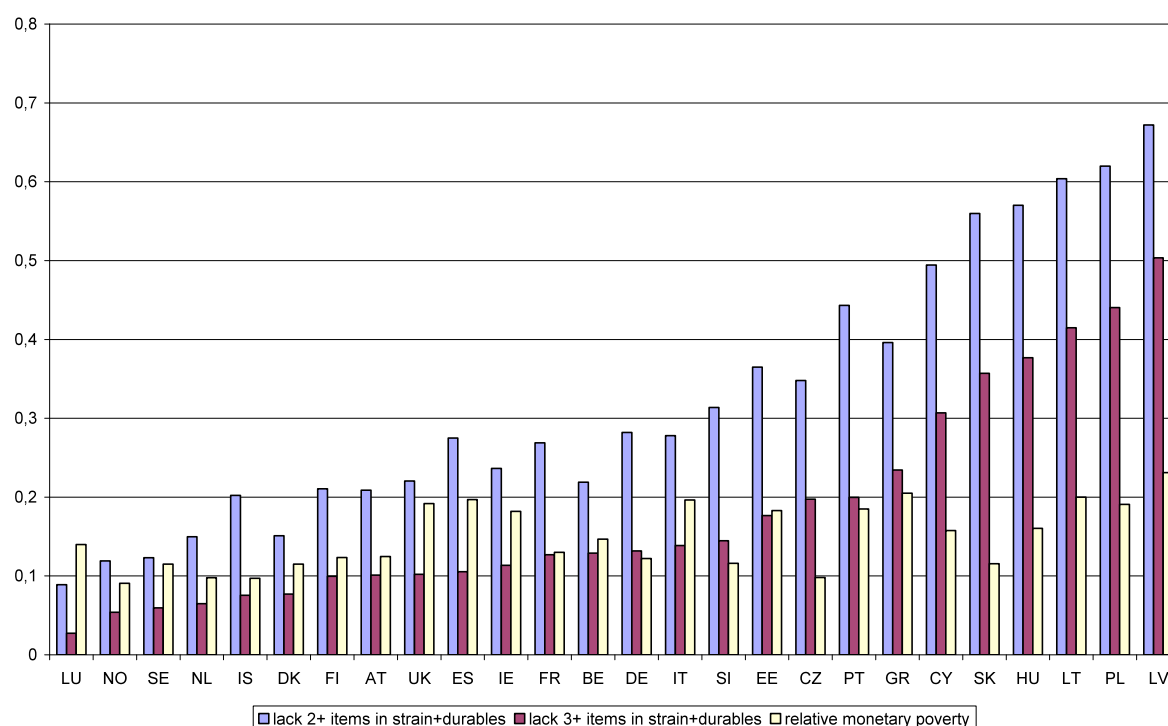
<sup>25</sup> As proposed in Marlier et al. (2007).

<sup>26</sup> Callan et al. (1996) argued that the aggregation processes into a single measure lead to substantial loss of information, as different aspects of deprivation are occulted (see also Nolan and Whelan (2007)).

### 3.2. Presentation of deprivation figures on economic strain and lack of durables, at country level

In order to illustrate analyses that can be performed on the basis of deprivation indicators, Figure 2 compares the proportion of people deprived in the combined strain/durables dimension, with the monetary poverty risk, by country. Each person receives a summary score of the number of items his/her household lack because they cannot afford them. The threshold used for each dimension is set at two or more/or three or more enforced lack (out of 9 items) in the combined economic strain and durables dimension. It is worth insisting on the fact that this indicator focuses on the accumulation of deprivations at the individual level. Contrarily to an average index computed at the national level, deprivation of some people can't be compensated by absence of deprivation of other people in the country (see the table below on pros and cons of each deprivation presentation).

**Figure 1: At-risk-of-poverty rate and measures of deprivation in economic strain and durables (at least 2+ items (or 3+) lacks), EU-25(except MT) + NO + IS , 2006**



Source: Eurostat, EU-SILC 2006. Countries are ranked according to the deprivation rate (3+ lacks out of 9).

These figures provide a simple illustration of how material deprivation measures can reflect differences in living conditions between countries. Notably, the highest deprivation rates can be found in the new Member States, including those with low at-risk-of-poverty rates, associated with narrower income distribution. In the least deprived countries (LU, NO, SE, NL, IS, DK, FI, AT, UK, ES, IE, IT), the deprivation rate (threshold fixed at “at least 3 lacks”) is lower than the poverty risk rate and conversely, the most deprived countries (CZ, PT, GR, CY, SK, HU, LT, PL, LV) face deprivation higher than their poverty risk levels (one fifth to a half of the population in these countries face deprivation, defined in the more exigent way (3+ enforced lacks)). This would mean that measuring poverty and social



exclusion through material deprivation indicators based on a common set of items independently of their distribution across the population (contrarily to a relative measure of monetary poverty) shows a much greater diversity of national situations in the EU than would be inferred on the basis of the poverty risk indicator. The deprivation measure (3+ lacks) ranges indeed between 3% and 50%, although the poverty rate ranges between 10% and 23%.

In figure 1, figures are obtained by transforming each deprivation index (which has discrete values between 0 and 9) into a binary variable (deprived/not deprived, by using a threshold of 2+ or 3+). We could also use the full information and present the averages of individual indexes (See table 2). This illustrates the mean degree of deprivation in the country, i.e. the mean number of items lacked out of a total of 9. In Latvia, Poland, Lithuania, Hungary, Slovakia, people lacks on average 2 items in the economic strain and durables list, although in most of the old Member states, this number is inferior to one (except in Greece and Portugal).

**Table 2: At-risk-of-poverty rate (%), and mean index of deprivation (in economic strain and durables), EU-25(except MT) + NO + IS , 2006**

	LU	SE	NO	NL	DK	UK	FI	AT	IS	BE	IE	ES	FR	DE	IT	SI	CZ	EE	GR	PT	CY	SK	HU	LT	PL	LV	
Mean number of items lacked	0,3	0,5	0,5	0,5	0,6	0,7	0,7	0,7	0,7	0,8	0,8	0,9	0,9	0,9	1,0	1,0	1,1	1,3	1,3	1,4	1,5	1,6	1,9	2,1	2,3	2,3	2,6
Monetary poverty rate	14%	12%	9%	10%	12%	19%	12%	12%	10%	15%	18%	20%	13%	12%	20%	12%	10%	18%	21%	18%	16%	12%	16%	20%	19%	23%	

Source: Eurostat, EU-SILC 2006. Countries are ranked according to the mean deprivation rate.

Note also (see Table 3) that the ranking order of countries is not greatly influenced by the choice of the two alternative deprivation thresholds (2+ or 3+ enforced lacks), except for Belgium and Spain. The ranking order of the mean index is also comparable (except for IS and UK). Table 3 illustrates also ranking differences between deprivation and monetary and subjective poverty (defined as the proportion of people having (great) difficulties to make ends meet). This last one is however closer to the deprivation measures than the relative monetary poverty.

**Table 3: countries ranking order by deprivation and monetary measures, 2006**

Rank	LU	NO	SE	NL	DK	IS	AT	FI	BE	UK	IE	FR	ES	IT	DE	SI	CZ	EE	GR	PT	CY	SK	HU	LT	PL	LV
Deprivation (2+)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
Deprivation (3+)	1	2	3	4	6	5	8	7	13	9	11	12	10	15	14	16	18	17	20	19	21	22	23	24	25	26
Mean deprivation index	1	3	2	4	5	9	8	7	10	6	11	13	12	15	14	16	17	18	19	20	21	22	23	24	25	26
Monetary poverty	13	1	6	3	5	2	11	10	14	21	17	12	23	22	9	8	4	18	25	19	15	7	16	24	20	26
Subjective poverty	1	2	6	9	5	7	3	4	12	8	14	11	18	20	15	13	17	10	26	21	25	19	22	16	24	23

Source: Eurostat, EU-SILC 2006. Countries are ranked according to the deprivation (2+)

The next table summarises the pros and cons of the deprivation rate and the mean index.

<i>Deprivation rate</i>	<i>Mean index</i>
+ The deprivation rate takes into account the accumulation of lacked items at the individual level.	- The mean index is not influenced by accumulation of deprivation at the individual level. Example: 3 people with one lack have the same impact on the mean index as one person with 3 lacks and 2 persons non-deprived.
- Discrete information (9 levels index) is transformed into a binary index (0=non-deprived; 1=deprived). For people above the threshold, the severity of deprivation is not taken into account. For people below the threshold, the number of items lacked doesn't count.	+ Full set of information is used.
- Arbitrary choice of the threshold	+ No threshold
Interpretation: "the percentage of people suffering from at least x items." More transparent and easy to communicate.	Interpretation: "the average number of lacked items in the list"

In the case of the deprivation rate, the choice between a threshold of 2+ or 3+ enforced lacks is arbitrary and can be influenced by different considerations. We would argue in favour of a threshold of 3+ as it focuses on more severe deprivation<sup>27</sup>, it limits the impact of eventual measurement errors and misclassification and from a communicational point of view, it is closer at the EU level to the value of the EU poverty rate.

It should be added that the choice of this threshold, although arbitrary, is linked to the weighting question, as the higher the threshold, the higher is the weight given to the least frequently lacked items.

### 3.3. Risk factors and overlap with poverty

This type of information can be presented by the usual breakdowns (age, sex, household type, activity status, work intensity...), and compared with the poverty rate or some subjective poverty rate.

It can therefore be evaluated whether deprivation, subjective poverty and monetary relative poverty offer a similar diagnostic on the relative position of specific subgroups. For example, Table 4 presents the children relative risk for different measures (the relative risk is defined as the ratio between the risk for children group and the risk for the total population). On this basis, it can be advanced that the different approaches may offer a different diagnostic on children relative risk, depending on the country. In some Member States, children face higher deprivation relative risk than monetary relative risk (BE, CY, DE, DK, FI, NO, UK). In other countries, children face higher relative risk according to the poverty criterion than to the deprivation one (CZ, GR, HU, LT, LV, PL, SK).

<sup>27</sup> Furthermore, tests by quintile showed that people lacking 3+ items are less present in higher quintiles than people lacking 2+ items.



**Table 4: Relative children risk, by country and different measures, EU-25 (except MT) + NO + IS, 2006**

Relative children of children	Depr 2+	Depr 3+	Poverty	Subj pov
AT	1,19	1,21	1,17	1,17
BE	1,23	1,34	1,04	1,14
CY	0,98	0,98	0,73	1,08
CZ	1,11	1,19	1,67	1,21
DE	1,25	1,24	0,96	0,76
DK	1,06	1,19	0,83	1,37
EE	1,00	1,05	1,10	1,09
ES	1,05	1,25	1,22	1,09
FI	1,11	1,06	0,78	1,26
FR	1,13	1,17	1,05	1,21
GR	0,91	0,92	1,10	0,97
HU	1,06	1,12	1,56	1,12
IE	1,24	1,40	1,22	1,26
IS	1,13	1,24	1,22	1,13
IT	1,08	1,14	1,25	1,13
LT	0,97	0,94	1,26	1,02
LU	1,25	1,39	1,41	1,52
LV	0,97	0,95	1,12	1,00
NL	1,15	1,33	1,36	1,24
NO	1,16	1,05	0,93	1,15
PL	1,00	1,01	1,38	1,02
PT	0,94	1,01	1,12	1,01
SE	1,20	1,36	1,17	1,37
SI	0,89	0,86	0,98	0,99
SK	1,00	1,03	1,46	0,97
UK	1,41	1,50	1,22	1,42

Source: Eurostat, EU-SILC 2006. The relative risk for children is defined as the ratio between the risk for children group (0-17) and the risk for the total population.

We find that, among those below the poverty threshold, the percentage of deprived (3+ lacks) ranges from less than 20% (LU, NO, SE, IS) to more than 70% (LV, LT, PL, HU). Among those above the poverty threshold, this percentage reaches less than 10% in most “old” Member States (except GR and PT), but reaches more than 30% in SK, LV, LT, PL, HU, and SK.

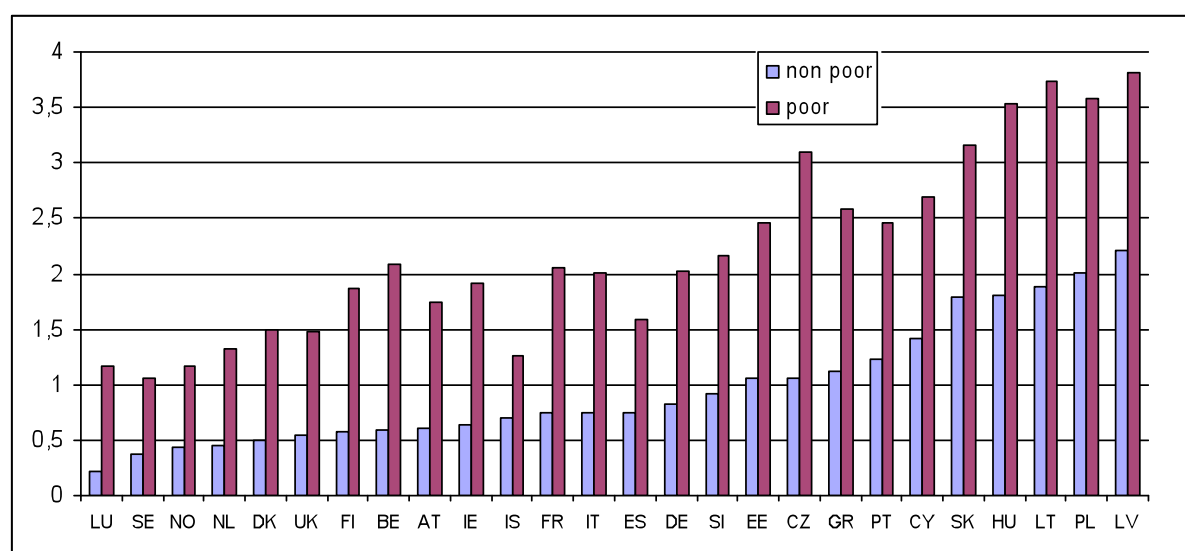
Among those in deprivation (3+ lacks), the poverty rate varies between 30% and 50% in the majority of Member States, with no clear pattern between “old” and “new” Member states. The same absence of pattern holds true for the poverty rate of the non-deprived that reaches around 10% (from 5% in CZ to 17% in SE).

All these figures confirm that deprivation and poverty are not concentrated on the same subpopulations and that the relationship between income poverty and deprivation is weaker than could be expected (Mack and Lansley (1985), Hallerod (1996), Nolan, Whelan (1996), Whelan et al. (2001), Guio (2005, 2006)).

Material deprivation measures may be used to complement or in combination with income. Some countries compute consistent poverty measures, i.e. by focusing on people facing deprivation and relative income poverty (intersection approach). This could help to exclude

from the “poor” population those people for whom there are deprivation/income mis-measurements, people receiving low income but avoiding deprivation or people facing deprivation but receiving income above the threshold. However, in the enlarged Union, the figures show that the deprivation level is far from being similar between countries, with even the ‘poorest’ in ‘rich’ countries facing a lower deprivation level than the ‘richest’ in ‘poor’ countries (for example the poor in SE lack on average 1,1 items (out off 9), although the NON-poor in LV lack on average 2,2 items, see the Figure 2 below). Therefore, restricting the use of a deprivation measure by combining it with a monetary relative criterion risks hiding the diversity of social and economic development levels among EU25 Countries. It seems therefore preferable, at this stage, to present the monetary and non-monetary measures separately, with a breakdown of deprivation figures by poverty status.

**Figure 2: Mean number of lacked items (out off 9), according to the poverty status, EU-25 (except MT) + NO + IS , 2006**



#### 4. Simple and weighted indices of deprivation: does each deprivation item have the same importance?

##### 3.1. Prevalence or consensus weighting?

The above figures result from a simple count of the items of deprivation over the population. The main advantage of this approach is to make the interpretation of the results simpler. However, this method relies on the implicit assumption that each item receives the same weight in all countries. It has also to be kept in mind that choosing the items in the list is also a kind of crude weighting (giving 1 to each item retained, and 0 to those not in the list).

The issue of weighting (or not) can receive a different answer depending on whether we only focus on basic needs or on a larger set of items. It can be easily argued that access to some items has the same normative value, whatever the country, if these items are considered essential. For such items, the unweighted approach could be preferable. It could be argued, for example, that (most of) the items in the housing dimension are in this case<sup>28</sup>. For the economic strain and durables dimension, this can be questioned, which is why the use of different weights could be considered.

<sup>28</sup> As suggested for instance by Marlier et alii (2007).

This weighting approach can be formalised as follows: in each dimension, the deprivation score ( $u_j$ ) for each individual ( $j$ ) in the sample equals the sum over the items ( $X_{ij}$ ) weighted with  $w_i$ ,  $h_i$  being the initial weight (see below).

### Formula 1:

$$u_j = \sum_{i=1}^I w_i X_{ij}$$

$$\text{where } w_i = \frac{h_i}{\sum_{i=1}^I h_i}$$

$$\text{and } \sum_{i=1}^I w_i = 1$$

These weights could be established on the basis of social views on what is more desirable or even necessary, i.e. goods considered as necessary by a larger proportion of the population should receive greater weights, in comparison to the other items in the dimension (see Mack and Lansley (1985), Halleröd (1995)). To do so, we can use the Eurobarometer data.

An alternative method for constructing weights is to weight each item by a function of the proportion of persons who do possess the item<sup>29</sup> (prevalence weighting). The idea is that the higher the proportion of people who have the item, the more likely a person not able to afford the item (but wanting it) will feel deprived.

We will compare the results of these two alternative weighting methods. To summarise:  $h_i$  in formula 1 would either be:

- The proportion of people considering the item  $i$  as “absolutely necessary or necessary” in the Eurobarometer.
- Or the proportion of people having the item  $i$  over the whole population, in the EU-SILC survey.

Weights are normalized to one (see formula 1). This means that the weight of each item  $i$  depends on  $h_i$ , but also on the sum of  $h_i$ , i.e. the proportion of people “having”/“considering absolutely necessary” the other items in the dimension. For example, two countries with very different penetration rates ( $h_i$ ) might have the same set of weights (prevalence weighting), if substitution rates between items are identical (see the example in footnote<sup>30</sup>).

This means that weights have to be considered as a measure of relative importance of the item in the deprivation index, relatively to the other items in the dimension. Each ratio of weights can be seen as a “substitution rate” between these two items<sup>31</sup>, i.e. the coefficient by which a deprivation of one item can be compensated by the non-deprivation of another item.

Like for the indicator of relative monetary poverty, one important question is related to the choice of the reference population. We can make the hypothesis that, in evaluating their

<sup>29</sup> See for a similar approach: Desai and Shah (1988), Tsakloglou and Papadopoulos (2001); Whelan et al. (2002); D’Ambrosio, Gradin (2003); Muffels, Fouarge (2004); Förster (2005); Willits (2006).

<sup>30</sup> Country A: 90% of car possession, 10% of TV possession.  $W_{car} = 90/100=0,9$ ;  $W_{tv}=10/100=0,1$ ; Country B: 45% of car possession, 5% of TV possession.  $W_{car} = 45/50=0,9$ ;  $W_{tv}=5/50=0,1$ ;

<sup>31</sup> In the standard weighted arithmetic mean (formula 1), see Munda and Nardo (2005) and Decancq K and Lugo M-A (2008).

material situation, respondents are influenced mostly by their perceptions of how they are doing compared to others in their own country, even if it might be argued that, in the European Union, comparisons would extend beyond national border lines<sup>32</sup>. That is the reason why nationally-defined weights and EU-defined weights will be tested.

The following table summarises the alternatives to construct the weights.

	Nationally defined	EU defined
Prevalence weighting (EU-SILC)	Set 1	Set 2
Consensus weighting (Eurobarometer)	Set 3	Set 4

Table 5 presents the value of the different set of weights, by country and for the EU.

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<sup>32</sup> Whelan C, Layte R, Maitre B, Nolan B (2001).

**Table 5: Weight of each item, prevalence and consensus weighting, country and EU level**

	Arrears	Holidays	Home warm	Meat, ..	Unexp. Exp.	TV	TEL	Car	Washing machine
<b>UNWEIGHTED</b>	0,111	0,111	0,111	0,111	0,111	0,111	0,111	0,111	0,111
<b>Weights based on prevalence rate (people who have the item)</b>									
AT	0,119	0,092	0,119	0,112	0,091	0,121	0,123	0,104	0,120
BE	0,115	0,093	0,106	0,119	0,098	0,122	0,124	0,106	0,117
CY	0,107	0,063	0,091	0,128	0,078	0,137	0,136	0,126	0,134
CZ	0,122	0,085	0,121	0,112	0,079	0,131	0,127	0,093	0,130
DE	0,118	0,093	0,120	0,113	0,075	0,122	0,126	0,109	0,123
DK	0,117	0,112	0,112	0,121	0,094	0,120	0,123	0,097	0,104
EE	0,125	0,052	0,132	0,124	0,099	0,133	0,131	0,080	0,124
ES	0,118	0,078	0,115	0,121	0,088	0,125	0,124	0,107	0,124
FI	0,112	0,101	0,121	0,120	0,086	0,118	0,123	0,103	0,117
FR	0,114	0,086	0,118	0,119	0,084	0,123	0,123	0,110	0,122
GR	0,094	0,067	0,118	0,123	0,093	0,133	0,133	0,109	0,130
HU	0,125	0,051	0,128	0,109	0,071	0,148	0,143	0,085	0,140
IE	0,114	0,096	0,120	0,121	0,077	0,123	0,123	0,104	0,121
IS	0,106	0,105	0,108	0,118	0,084	0,120	0,122	0,116	0,121
IT	0,111	0,078	0,115	0,120	0,092	0,124	0,122	0,112	0,125
LT	0,132	0,051	0,112	0,118	0,066	0,150	0,144	0,092	0,135
LU	0,114	0,105	0,116	0,115	0,095	0,116	0,116	0,108	0,114
LV	0,137	0,049	0,121	0,110	0,050	0,158	0,153	0,082	0,139
NL	0,114	0,102	0,117	0,117	0,092	0,117	0,120	0,102	0,118
NO	0,108	0,111	0,118	0,116	0,089	0,117	0,119	0,105	0,117
PL	0,119	0,050	0,110	0,110	0,066	0,151	0,147	0,095	0,151
PT	0,127	0,054	0,081	0,130	0,113	0,134	0,125	0,107	0,128
SE	0,110	0,102	0,116	0,115	0,103	0,115	0,119	0,102	0,119
SI	0,110	0,088	0,124	0,114	0,072	0,125	0,127	0,115	0,126
SK	0,130	0,061	0,131	0,091	0,074	0,143	0,140	0,087	0,142
UK	0,115	0,095	0,117	0,118	0,088	0,122	0,123	0,103	0,120
EU	0,116	0,084	0,116	0,117	0,085	0,126	0,126	0,105	0,125
<b>Weights based on consensus rate (people considering the item as absolutely necessary or necessary)</b>									
AT	0,165	0,056	0,167	0,121	0,132	0,084	0,056	0,062	0,157
BE	0,160	0,063	0,166	0,145	0,130	0,069	0,051	0,079	0,137
CY	0,124	0,090	0,123	0,087	0,118	0,116	0,093	0,124	0,124
CZ	0,158	0,060	0,158	0,098	0,111	0,100	0,085	0,073	0,158
DE	0,169	0,048	0,181	0,116	0,126	0,092	0,037	0,066	0,164
DK	0,176	0,057	0,184	0,148	0,121	0,080	0,072	0,051	0,112
EE	0,131	0,086	0,132	0,118	0,115	0,107	0,106	0,082	0,124
ES	0,146	0,066	0,145	0,142	0,127	0,078	0,064	0,087	0,145
FI	0,157	0,061	0,159	0,140	0,111	0,076	0,095	0,063	0,138
FR	0,149	0,083	0,154	0,131	0,113	0,075	0,041	0,116	0,137
GR	0,125	0,103	0,128	0,106	0,119	0,110	0,078	0,109	0,123
HU	0,140	0,092	0,142	0,105	0,116	0,121	0,083	0,060	0,139
IE	0,144	0,074	0,146	0,138	0,124	0,079	0,074	0,089	0,131
IT	0,149	0,055	0,150	0,128	0,131	0,083	0,067	0,103	0,136
LT	0,137	0,066	0,138	0,117	0,119	0,121	0,093	0,081	0,127
LU	0,147	0,067	0,153	0,113	0,105	0,091	0,072	0,103	0,149
LV	0,134	0,082	0,136	0,119	0,118	0,111	0,106	0,071	0,122
NL	0,175	0,067	0,194	0,153	0,125	0,049	0,029	0,039	0,170
PL	0,139	0,081	0,143	0,129	0,121	0,107	0,071	0,069	0,140
PT	0,129	0,081	0,127	0,130	0,112	0,115	0,089	0,089	0,127
SE	0,171	0,083	0,170	0,128	0,097	0,081	0,060	0,073	0,136
SI	0,142	0,080	0,147	0,104	0,102	0,097	0,073	0,110	0,146
SK	0,127	0,079	0,133	0,106	0,119	0,113	0,098	0,090	0,133
UK	0,169	0,072	0,175	0,136	0,134	0,067	0,042	0,056	0,150
EU	0,144	0,074	0,146	0,122	0,118	0,098	0,077	0,085	0,136

Sources: Eurostat, EU-SILC 2006. Eurobarometer special n° 279, Wave 67.1, EU average (computed by Dicks et al. (2008), see Table 1).

Compared to the unweighted approach:

- In the prevalence weighting, the weights are higher for the most possessed items (TV, Phone, Car and Washing machine) and lower for items for which the lack is more prevalent (holidays and unexpected expenses). In some new Member States (HU, LT, PL, SK), the weights of the most possessed durables (TV, phone, washing machine) attains the highest level, compared to other countries, mainly due to higher deprivation level in other items (like holidays) that therefore receive lower weights (even, compared to other EU countries), suggesting a contrasted hierarchy of items in these new Member States.
- In the consensual approach, at the EU level, weights are higher for the deprivation in arrears, home warm, meat, washing machine, as these items were considered as important to have a decent life by more people. The weights are lower for the other durables (TV, phone, car) and for holidays. At country level, this general picture still holds true, but the value of the weights can vary a lot between countries, in function of particular national valuation of items. The relative value of the car, for example, shows large variations between countries: the highest in Cyprus, France, Slovenia and Greece and far lower in Holland, Denmark, Austria, UK, Hungary, or Poland.
- The hypothesis underlying the prevalence approach implies that the most possessed items receive a higher weight, although the judgement on social importance of items determines the weights in the consensual approach. This also means that items for which the deprivation rate is higher (the capacity to face unexpected expenses for example), comparatively to other items (like TV or phone), have lower weights in the prevalence weighting. This can be seen as a drawback of the prevalence method, as this type of deprivation is minimised (whatever the “social” importance of avoiding it). An additional argument against prevalence weighting is linked to the sensibility to eventual measurement errors. Furthermore, consensual weighting is more understandable and easier to communicate.
- The practical implications of weighting depend on the homogeneity of the different items in the set. The closer the prevalence/appreciation rates of the different items in the dimension, the more equal the weights will be (therefore equivalent to the unweighted approach). In the case of items not necessarily relating to the same form of deprivation and possessed/assessed very differently in the population or not very correlated, the weights will differ significantly and weighting the items will have an impact, compared to the unweighted index<sup>33</sup>. The higher the Chronbach’s alpha of the indicator (0,69 in our case, see section 3.1), the less useful are also the weights. The introduction of new items in the EU-SILC module should normally increase the reliability of the indicator and decrease the need of weighting<sup>34</sup>.

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<sup>33</sup> See also Boarini and Mira d’Ercole (2006) and Brandolini A. (2008) for a similar argument.

<sup>34</sup> As the square root of the Chronbach’s Alpha can be interpreted as the correlation between the current deprivation index and the theoretically perfect deprivation index made up of the infinite numbers of possible deprivation items. We owe this point to Professor David Gordon (Bristol, UK), as a member of the Eurostat task force.

- In the prevalence weighting, the weights could be (or not<sup>35</sup>) adjusted each year to take into account changing levels of ownership, as the database used provides annual data. The use of the consensus weighting implies however to choose an anchored set of weights to a baseline (the Eurobarometer data is only available for 2007). This is defensible from a practical point of view: weights can remain stable, making it easier to interpret the temporal evolution of the weighted indexes. However, it is important to keep in mind that regular assessment will be useful in order to evaluate the evolution of the social value of items in all Member States.

### 3.2. Eventual additional tests – heterogeneous set of weights according to several socio-economic characteristics and different functional forms

So far, we postulated that there was enough consensus in the definition of necessities and enough homogeneity in people's opinion or behaviour to allow the computation of a set of weights, unique at national (or European level), irrespective of differences in demographic or social position. Halleröd (1995) chose to use different set of weights, to take into account difference in preferences for different subgroups<sup>36</sup>. The Eurobarometer results however show that the impact of the main socio-demographics characteristics available in the survey is moderate. The country has the largest impact, followed by a subjective assessment of the "standard of living" as measured by how far is the household actual income from what the respondent think is the needed to make ends meet (when the respondent considers that its household actual income is far below what he/she thinks is needed in his personal case, he considers on average more items as (absolutely) necessary). But it must be kept in mind that this variable cannot be thought as describing the actual household standard of living but more its subjective assessment. Finally, age and education have a lower but significant impact. It might be worth testing the impact of the use of a heterogeneous set of weights according to several socio-economic characteristics.

Different functions of weights could also be tested. We chose the simplest and transparent linear function of the proportion of 'have' (see formula 1), but sensitivity analysis could be performed by using alternatives functions: the weighting structure which still varies positively with the proportion of "haves" as desired, but which gives higher weights to items with higher proportions of 'have' and introduces higher variability between items.

Some of the alternative functions are illustrated in Figure 3<sup>37</sup>. The function used in this paper is linear (first chart), i.e. it gives the same importance to any variation of the proportion of "have"/ "have not"<sup>38</sup>. The minimal weight (0) is reached when everybody is deprived and the weight attains one (non-normalised), the maximum (when nobody is deprived).

The logarithmic function illustrated in the second chart is not defined when nobody is deprived and gives an increasing importance to proportion of haves the closest to one (the lack of TV and telephone for example). The linear inverse function (1/(% have not)), is not defined when nobody is deprived, gives excessive importance to items possessed by a large

<sup>35</sup> See the UK deprivation indicator used to monitor child poverty (Willits (2006)).

<sup>36</sup> See also Halleröd et al. (2006). Cappellari and Jenkins (2004) used a multivariate probit model to take into account of the heterogeneity of the deprivation measures between different populations.

<sup>37</sup> See Filippone et al. (2001) for similar illustrations.

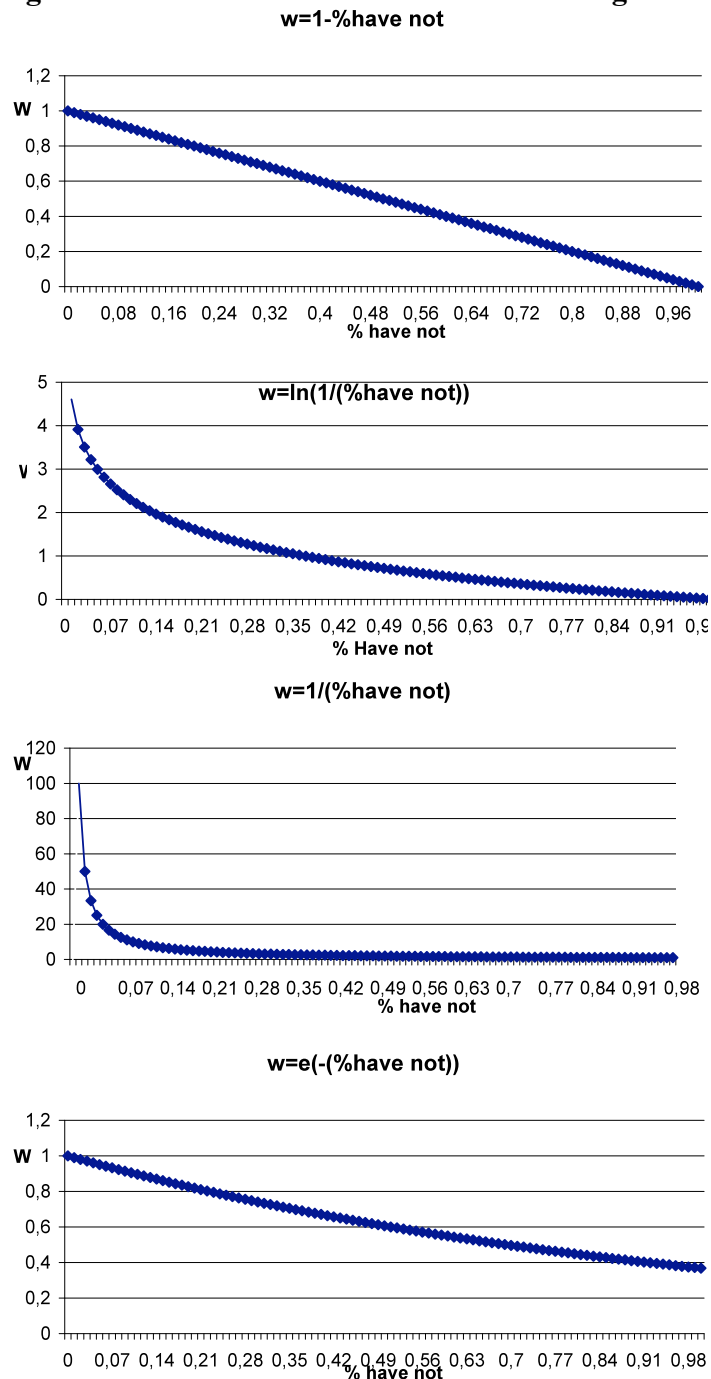
<sup>38</sup> We illustrate the weights in function of the proportion of "have not" to make easier the understanding of the charts. Please note that the proportion of the "have not", i.e. one minus the proportion of "have", is not equivalent to the proportion of people deprived for durables (the differences being the proportion of people not having the item because they do not desire it).



part of the population and do not make any difference for proportions of “have not” greater comprised between 20% and 100%.

The exponential function ranges from 0,368 to 1, and is quite flat, i.e. gives little importance to small differences in proportions of “haves”.

**Figure 3: different functional form of the weights**



Other authors (See Betti, Verma (1998), Eurostat (2002) or Freguja and Siciliani (2006) propose a more sophisticated method and weight each item by mixing:

- the item’s power to discriminate among individuals, its dispersion in the population, i.e. the coefficient of variation of each deprivation item. For proportion, the



coefficient of variation is the square root of the ratio of proportion of “have” and the proportion of “have not”.

- the correlation with the other items in the dimension (the effect of item correlated with others is reduced).

This last alternative is however less transparent.

Table 6 illustrates possible variations in the weighting system, according to different functional forms of the weights illustrated in figure 3, for prevalence weighting and two countries: Belgium and Poland.

**Table 6: illustration weights, different functional forms, Belgium and Poland – prevalence weighting, 2006**

	Arrears	Holidays	Home warm	Meat, ..	Unexpected expenses	TV	TEL	Car	Washing machine
<b>BE</b>									
% have not	6,9%	24,9%	14,5%	4,2%	21,1%	1,6%	0,4%	14,4%	5,7%
<b>Weights, in function of</b>									
1-% have not	0,115	0,093	0,106	0,119	0,098	0,122	0,124	0,106	0,117
ln(1/% have not)	0,106	0,055	0,077	0,126	0,062	0,164	0,220	0,077	0,114
1/% have not	0,037	0,010	0,018	0,061	0,012	0,157	0,642	0,018	0,045
exp (-(% have not))	0,115	0,096	0,106	0,118	0,099	0,121	0,122	0,106	0,116
<b>PL</b>									
% have not	22,4%	67,3%	28,4%	28,4%	57,0%	1,8%	4,3%	38,6%	2,2%
<b>Weights, in function of</b>									
1-% have not	0,119	0,050	0,110	0,110	0,066	0,151	0,147	0,095	0,151
ln(1/% have not)	0,089	0,023	0,075	0,075	0,033	0,237	0,186	0,056	0,227
1/% have not	0,032	0,011	0,025	0,025	0,012	0,387	0,163	0,018	0,326
exp (-(% have not))	0,115	0,073	0,108	0,108	0,081	0,141	0,137	0,097	0,140

Source: Eurostat, EU-SILC 2006.

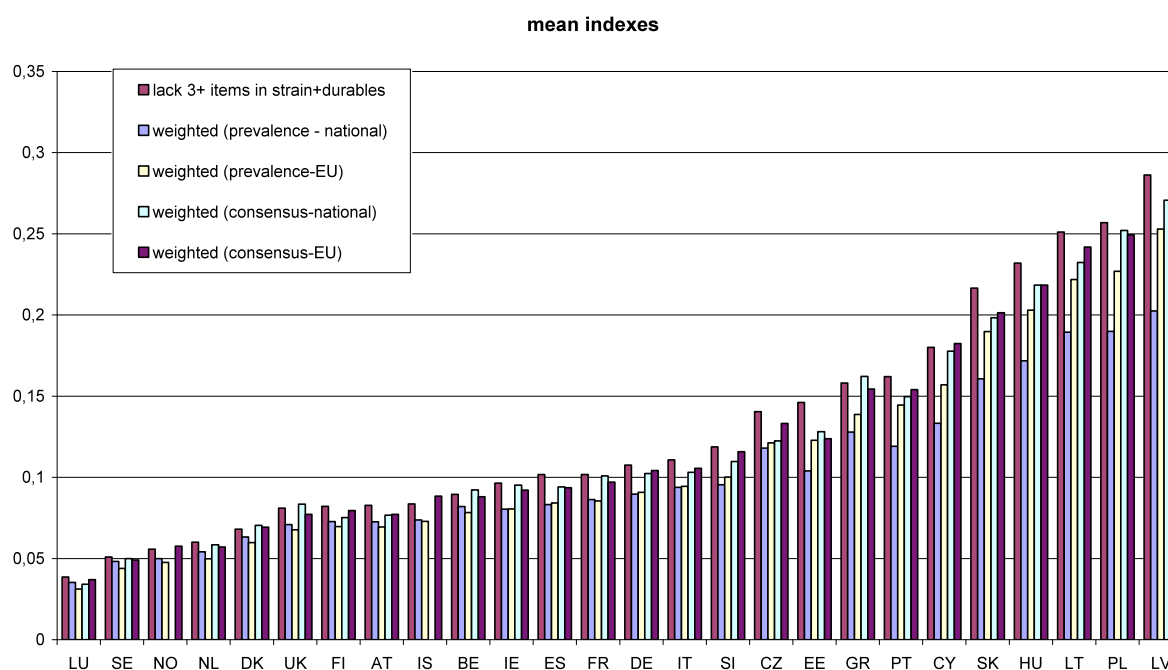
The inverse linear function like to a lesser extent the logarithmic function, gives disproportionate value to items possessed by a proportion of the population close to one (telephone in Belgium, TV and washing machine in Poland) and very low weights to the other items. The approach retained in this paper (1-% have not) is very close to the exponential alternative, although easier to understand and communicate.

We tested the impact of these alternative functional forms on the national mean (weighted) indexes and it appeared that this had an impact not only on the value of the index, but also on the country ranking. Choosing a functional form or another have a normative aspect in this context, as it assumes to give higher weight to some items that will dominate the deprivation index (as the telephone or the TV in the case of prevalence weighting or as ‘keeping the home adequately warm’ in the consensus weighting). It appeared therefore preferable to apply the linear form, as it offer the advantage of a more balanced weighting scheme, recognizing the importance of all the items chosen in the list.

### 3.3. Presentation of weighted results – mean indexes

Figure 4 compares the mean deprivation index, weighted according the four alternative weighting systems, with the unweighted mean index.

**Figure 4: mean deprivation index (economic strain and durables), weighted and unweighted, EU-25(except MT) + NO + IS , 2006**



Source: Eurostat, EU-SILC 2006. Countries are ranked according the unweighted index

In the less deprived countries, the use of weights has little incidence on the mean indexes, (whatever the methodology), as the weights of items are close to equal weighting.

Compared to simple counts, the use of prevalence weights (nationally defined) decreases the national values of the aggregated index, especially for the most deprived countries. This is due to the fact that weights give less importance to the most frequently non possessed items. The highest difference concerns the majority of new Member States, Greece and Portugal, where the importance of the less possessed items (not having a week holiday, not keeping the home adequately warm, the enforced lack of a car) receive a lower weight in the weighted approach (see Annex 4 for a detailed presentation of deprivation by items and by country). The choice between national or EU reference appears as important in the prevalence weighting, for the most deprived countries.

The use of consensus weighting increases the deprivation indexes, compared to the national prevalence weighting approach, as weights do not give less importance to the most frequently deprived items in the country, but on the contrary to items less valued in the Eurobarometer, like durables or holidays.

### 3.3. Presentation of weighted results – which threshold?

If it worth comparing figures presented in Figure 1 with their weighted counterparts, results are however very dependant on methodological options retained in terms of choice of the threshold<sup>39</sup>.

An option could be to choose a relative (national based) threshold, as for the monetary poverty rate. People suffering from at least 300% (for example) of the mean weighted index in the country (the median cannot easily be used as it equals zero in some countries) would be considered “deprived”. The following table shows the proportion of people deprived, i.e. whose deprivation level is higher than 300% (or 320%) of the national mean, for the different weighting schemes (including the unweighted alternative).

**Table 7: weighted deprivation rate, relative nationally defined threshold, 2006**

Country	Relative threshold=300% of national mean					Relative threshold=320% of national mean				
	Unweighted	Prevalence-national- W	Prevalence-EU-W	Consensus-national-W	Consensus-EU-W	Unweighted	Prevalence-national- W	Prevalence-EU-W	Consensus-national-W	Consensus-EU-W
AT	10,1%	10,2%	10,3%	11,0%	11,0%	10,1%	10,1%	10,2%	10,8%	10,6%
BE	12,9%	12,9%	13,0%	13,4%	14,0%	12,9%	12,9%	12,9%	12,8%	11,9%
CY	2,5%	2,6%	2,5%	2,4%	2,3%	0,2%	2,5%	2,5%	0,6%	2,0%
CZ	9,6%	9,7%	9,6%	7,9%	7,9%	4,1%	8,2%	9,6%	7,8%	6,8%
DE	13,2%	13,2%	13,2%	8,9%	11,9%	4,8%	9,0%	6,2%	8,7%	8,7%
DK	15,1%	15,1%	12,9%	10,7%	10,9%	15,1%	13,4%	11,0%	10,7%	10,5%
EE	7,0%	7,0%	7,0%	7,0%	6,7%	2,5%	7,0%	4,7%	5,1%	6,6%
ES	10,6%	10,6%	10,6%	9,2%	9,0%	10,6%	10,6%	10,6%	8,7%	8,9%
FI	10,0%	10,4%	10,3%	12,7%	12,7%	10,0%	10,0%	10,1%	10,9%	12,5%
FR	12,7%	12,7%	12,7%	12,6%	11,7%	12,7%	12,7%	12,7%	11,6%	11,6%
GR	5,2%	7,0%	5,7%	5,2%	7,8%	5,2%	5,5%	5,3%	5,2%	5,2%
HU	1,4%	4,0%	3,9%	3,0%	3,2%	1,4%	3,9%	1,5%	1,5%	1,5%
IE	11,4%	11,4%	11,4%	11,3%	8,7%	11,4%	11,4%	11,4%	8,6%	8,6%
IS	7,6%	7,9%	8,3%		8,2%	7,6%	7,6%	7,6%	0,0%	7,7%
IT	13,9%	10,5%	13,5%	13,2%	12,5%	6,3%	7,4%	7,4%	12,5%	9,1%
LT	2,1%	5,3%	2,1%	2,3%	2,2%	0,6%	2,8%	2,1%	1,6%	1,3%
LU	8,9%	9,8%	9,8%	19,8%	19,6%	8,9%	9,6%	9,8%	9,6%	9,6%
LV	1,0%	2,6%	1,2%	1,0%	1,6%	0,2%	2,4%	1,0%	1,0%	0,7%
NL	15,0%	15,0%	15,0%	13,9%	14,7%	15,0%	15,0%	15,0%	13,9%	14,7%
NO	11,9%	11,9%	11,9%		11,8%	11,9%	11,9%	11,9%	0,0%	11,8%
PL	1,0%	2,0%	1,0%	0,4%	0,9%	0,2%	1,1%	1,0%	0,3%	0,3%
PT	3,7%	7,0%	4,1%	5,0%	4,7%	3,7%	4,6%	3,8%	3,7%	3,8%
SE	12,3%	12,3%	12,3%	15,0%	12,3%	12,3%	12,3%	12,3%	14,6%	12,3%
SI	5,1%	6,0%	5,9%	6,3%	5,6%	5,1%	5,5%	5,2%	5,4%	5,5%
SK	2,1%	3,0%	2,1%	2,1%	2,6%	0,6%	2,1%	2,1%	1,7%	1,5%
UK	10,2%	10,4%	10,4%	11,6%	11,6%	10,2%	10,3%	10,3%	10,1%	11,4%

Source: Eurostat, EU-SILC 2006.

These figures show clearly that adopting a relative threshold in the deprivation space lead to conclusions that hides the deprivation diversity highlighted in Figure 1, whatever the system of weighting. The most deprived countries have the lowest rates, although the less deprived member states have the highest rates. In the most deprived countries, a large part of the population suffers from deprivation and is therefore close to the mean, which is high.

An important drawback of the use of a relative threshold is that it focuses only on the dispersion of deprivation in the country than on the deprivation level attained by the majority of the national population. The “absolute” nature of deprivation measure is indeed occulted.

<sup>39</sup> For Gordon and al. (2000) : “the optimum poverty threshold is set where statistically it maximises the differences between ‘poor’ and ‘not poor’ and minimises the differences between these groups”. The authors use Anova and logistic regressions, or discriminant analysis to identify the right threshold. The underlying question is to know whether income data has to be used to construct or validate the deprivation measure. So far, we decided to treat deprivation and monetary poverty as two different approaches.

Our idea is that, not the dispersion, but the level of deprivation in the country has to be taken into account, as illustrative of the level of living of people.

The table also illustrates the sensitivity of the results, to the choice of the threshold. Choosing 320% of the national average, instead of 300%, can change (a lot, see for example the case of Luxembourg) the deprivation rate, but not for all weighting schemes, neither for all countries. This drawback is not linked to the definition of the national relative threshold, but is related to the irregularity of the evolution of the weights and the combination of deprivations in each country

To illustrate this, the next table presents the possible values of the individual deprivation index, depending on the combination of items lacked by the person, in the case of two lacks, for the prevalence and consensus weighting, for common EU weights.

**Table 8: possible values of the deprivation index, in the case of two lacks, prevalence and consensus weighting, common EU weights.**

PREVALENCE	holidays	unexp exp	car	home warm	arrears	meat	washing mach	TV	tel
<b>weights</b>	0,084	0,085	0,105	0,116	0,116	0,117	0,125	0,126	0,126
holidays	:	0,169	0,189	0,200	0,200	0,201	0,209	0,210	0,210
unexp exp	0,169	:	0,190	0,200	0,201	0,202	0,210	0,211	0,211
car	0,189	0,190	:	0,221	0,221	0,222	0,230	0,231	0,231
home warm	0,200	0,200	0,221	:	0,232	0,233	0,241	0,242	0,242
arrears	0,200	0,201	0,221	0,232	:	0,233	0,241	0,242	0,242
meat	0,201	0,202	0,222	0,233	0,233	:	0,242	0,243	0,243
washing mach	0,209	0,210	0,230	0,241	0,241	0,242	:	0,251	0,251
TV	0,210	0,211	0,231	0,242	0,242	0,243	0,251	:	0,252
Tel	0,210	0,211	0,231	0,242	0,242	0,243	0,251	0,252	:
CONSENSUS	holidays	unexp exp	car	home warm	arrears	meat	washing mach	TV	tel
<b>weights</b>	0,074	0,118	0,085	0,146	0,144	0,122	0,136	0,098	0,077
holidays	:	0,192	0,159	0,220	0,218	0,196	0,210	0,172	0,151
unexp exp	0,192	:	0,203	0,264	0,262	0,240	0,254	0,216	0,195
car	0,159	0,203	:	0,231	0,229	0,207	0,221	0,183	0,162
home warm	0,220	0,264	0,231	:	0,290	0,268	0,282	0,244	0,223
arrears	0,218	0,262	0,229	0,290	:	0,266	0,280	0,242	0,221
meat	0,196	0,240	0,207	0,268	0,266	:	0,258	0,220	0,199
washing mach	0,210	0,254	0,221	0,282	0,280	0,258	:	0,234	0,213
TV	0,172	0,216	0,183	0,244	0,242	0,220	0,234	:	0,175
Tel	0,151	0,195	0,162	0,223	0,221	0,199	0,213	0,175	:

Source: Eurostat, EU-SILC 2006.

This table can be read as follows: in the case of prevalence weighting, the composite index varies between 0,169 (the combined lack of holidays and capability to face unexpected expenses that have the lowest weights) and 0,252 (the lack of telephone and TV, the highest weights). Choosing a threshold of 0,252 would therefore give the same results as the 3+ threshold in the unweighted approach, as all the “two deprivations” indexes are always inferior to the lowest “three deprivations” index (unexpected expenses, car and holidays: 0,274).

This table illustrates that, in the weighted alternative, choosing a threshold is choosing among the combination of deprivations, excluding others.

In the case of consensus weighting, the composite index varies between 0,151 (the combined lack of holidays and telephone) and 0,290 (not afford keep home adequately warm and arrears). In the case of consensus weighting, the index for the lack of three items (TV, Tel and holidays for example) can be inferior to the index of two more valued lacks (home warm and washing machine, for example). Choosing a threshold of 0,290 would therefore consider deprived those who lacks 3 items, whose weights are at least superior to the two highest

weights. People lacking Car/holidays/Tel or Car/holidays/TV or TV/Tel/Holidays are considered as less deprived than those lacking the two most necessary items (avoid arrears and afford to keep the home warm). This could be defensible from the conceptual point of view: the threshold is fixed at the sum of the two maximal weights (the maximal value of deprivation indexes in the case of two lacks), i. e. we consider as problematic the lack of three items, except if the sum of weights of these three items is inferior to the sum of the two highest weights. In other words, if someone lacks three items, considered as less important than the two most necessary items (avoid arrears and afford to keep the home warm), this person is not considered as deprived.

The threshold could also be fixed in such a way at the national level, at the sum of the two highest weights, nationally defined.

However, from a statistical point of view, the proportion of people lacking the three least valued items is so low that the proportion of people below the 0,290 threshold is the same as the proportion of people lacking at least 3 items in the unweighted alternative.

Another point important to keep in mind before choosing a threshold is that the probability of the different combinations of deprivations depends on the country. Fixing the threshold at a slightly higher level, could change the deprivation rates, for some, but not all of the countries, as illustrated in Annex 5, for a few countries and for one weighting scheme (prevalence, EU defined).

To avoid the arbitrariness of the choice of a threshold in the weighted alternative, the use of mean weighted indexes seems preferable. This index can be computed for the whole population (see Figure 4) or for the deprived population only, like in Table 9 below. These figures give an idea of the *severity* of deprivation, among those considered as deprived. The first two columns illustrate the unweighted number of items lacked by people facing at least three deprivations. The other columns illustrate the weighted number of lacks and take into account the fact that some items are less valued than others in the computation of the mean. The prevalence weighting tends to decrease the mean deprivation indexes, especially in countries where the deprivation is higher, as the more frequently lacked items are less valued. The consensus weighting has a more limited impact.

**Table 9: mean deprivation indexes, among people lacking at least 3 items in the list, unweighted and weighted schemes.**

Country	unweighted	unweighted (normalised)	prevalence weights (National)	prevalence weights (EU)	consensus weights (National)	consensus weights (EU)
AT	3,48	0,39	0,35	0,34	0,37	0,37
BE	3,76	0,42	0,39	0,37	0,44	0,42
CY	3,50	0,39	0,30	0,34	0,39	0,40
CZ	3,79	0,42	0,37	0,38	0,38	0,41
DE	3,51	0,39	0,35	0,35	0,38	0,38
DK	3,59	0,40	0,38	0,36	0,40	0,40
EE	3,61	0,40	0,33	0,35	0,37	0,37
ES	3,45	0,38	0,34	0,34	0,39	0,38
FI	3,48	0,39	0,35	0,34	0,35	0,37
FR	3,57	0,40	0,36	0,35	0,41	0,40
GR	3,81	0,42	0,36	0,38	0,44	0,43
HU	3,96	0,44	0,35	0,40	0,42	0,43
IE	3,66	0,41	0,36	0,36	0,40	0,39
IS	3,36	0,37	0,34	0,33	:	0,39
IT	3,70	0,41	0,37	0,37	0,42	0,42
LT	4,09	0,45	0,36	0,41	0,43	0,45
LU	3,49	0,39	0,37	0,34	0,36	0,38
LV	4,12	0,46	0,34	0,41	0,44	0,45
NL	3,48	0,39	0,36	0,34	0,39	0,38
NO	3,71	0,41	0,39	0,37	:	0,41
PL	4,06	0,45	0,35	0,41	0,45	0,45
PT	3,74	0,42	0,34	0,38	0,40	0,41
SE	3,45	0,38	0,36	0,34	0,39	0,38
SI	3,49	0,39	0,33	0,34	0,37	0,38
SK	3,77	0,42	0,32	0,37	0,39	0,40
UK	3,49	0,39	0,35	0,34	0,41	0,38

Source: Eurostat, EU-SILC 2006.

Note: In the second column, the unweighted mean number of items, initially comprised between 3 and 9 (for the “deprived”) was divided by 9 to be normalised and compared with the weighted figures.

## 5. Indicators

Due to the complexity of the weighting schemes, both in terms of methodology and communication/transparency, the following unweighted indicators were proposed and adopted at the EU level (see Table 10).

1. Primary Indicator: Proportion of people lacking at least 3 items in the list, broken down by sex, age, household type, activity status, work intensity, tenure status and income poverty status;
2. Secondary Indicator : Mean (unweighted) number of items lacked by people deprived (see Table 9, first col.), to take into account the *severity* of the deprivation among the “deprived” people in the different countries;

**Table 10: deprivation rate and mean deprivation indexes (out of 9) among people lacking at least 3 items in the list, 2006**

Country	% of people lacking at least 3 items	Mean number of items among the "deprived"
LU	3%	3,49
NO	5%	3,71
SE	6%	3,45
NL	6%	3,48
IS	8%	3,36
DK	8%	3,59
FI	10%	3,48
AT	10%	3,48
UK	10%	3,49
ES	11%	3,45
IE	11%	3,66
FR	13%	3,57
BE	13%	3,76
DE	13%	3,51
IT	14%	3,70
SI	14%	3,49
EE	18%	3,61
CZ	20%	3,79
PT	20%	3,74
GR	23%	3,81
CY	31%	3,50
SK	36%	3,77
HU	38%	3,96
LT	41%	4,09
PL	44%	4,06
LV	50%	4,12

Source: Eurostat, EU-SILC 2006.

Ideally, the evolution of these two indicators (between 2005 and 2006) should have been presented to evaluate the temporal stability of the figures and guide the choice. However, definitional changes (especially for the item on the capacity to face unexpected expenses) occurred and made difficult this 2005-06 comparison. The 2007 figures will be computed and compared to the 2006 figures, as soon as the 2007 User Data Base is made available.



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## ANNEX 1: The Eurobarometer

The Eurobarometer (Eurobarometer special n° 279 - wave 67.1), carried out between February and March 2007, contains data on the 27 countries of the EU plus Croatia. National samples of adults aged 15+ living in private households were interviewed. The questionnaire on “Poverty and Material Deprivation” is divided into two parts. The first part contains 9 questions on the perception of poverty. The second part includes 10 questions designed to assess which items are considered to be necessary for people to live in an acceptable/decent standard of living in the country where they live. Questions asked in part 2 relate to adult deprivation, child deprivation and homelessness.

At the adult level, 53 items of material and social deprivation are spread among the following 5 domains:

- Financial stress: 6 items
- Poor housing and environment: 14 items
- Enforced lack of durables: 12 items
- Poor quality food and clothing, access to basic services: 13 items
- Exclusion from essential social and leisure activities: 8 items

At the child level, 21 items are included (see table in the main text)

Questions were asked in the following way:

*“In the following questions, we would like to understand better what, in your view, is necessary for people to have what can be considered as an acceptable or decent standard of living in [your country]. For a person to have a decent standard of living in [your country], please tell me how necessary do you think it is to ...”*

The potential answers are the following:

1. absolutely necessary, no one should have to do without;
2. necessary;
3. desirable but not necessary;
4. not at all necessary;
5. don't know.

**ANNEX 2: Confirmatory factor analysis– pooled EU data (+NO, IS)****Table A1: Fit statistics of the CFA, pooled data – 3 factors solution**

Goodness of Fit Index (GFI)	0.9757
GFI Adjusted for Degrees of Freedom (AGFI)	0.9643
Root Mean Square Residual (RMRS)	0.0749
Parsimonious GFI (Mulaik)	0.7756

**GFI, goodness of fit index**, represents the amount of variances and covariances in the sample covariance matrix that are predicted by the model. Theoretically, its maximal value is 1. However, as GFI is affected by the sample size and the number of indicators, its upper bound can be lower than one, even in the case of perfect fit. One rule of thumb is that the GFI for good fitting model should be greater than 0.9.

**AGFI, adjusted goodness of fit index**, is the GFI adjusted for degrees of freedom. A value superior of 0.8 is more often used as a cut-off value to consider the model as good fitting.

**RMSR, root mean square residual**, is the square root of the average of the square of the residuals between the sample and modelised covariance matrix. The less is the fit between the model and the data, the larger the RMSR.

**PGFI, Parsimonious goodness of fit index**, is a modification of the GFI that takes the parsimony of the model into account.

**Table A2: fit statistics of the CFA, countries with the highest and lowest fit**

<b>Lowest FIT</b>	BE	IE	MT	ES
Goodness of Fit Index (GFI)	0,92	0,91	0,87	0,91
GFI Adjusted for Degrees of Freedom (AGFI)	0,88	0,87	0,8	0,87
Root Mean Square Residual (RMRS)	0,14	0,13	0,16	0,12
Parsimonious GFI (Mulaik, 1989)	0,73	0,72	0,69	0,72
<b>Highest FIT</b>	IT	PL	HU	PT
Goodness of Fit Index (GFI)	0,98	0,98	0,99	0,98
GFI Adjusted for Degrees of Freedom (AGFI)	0,97	0,97	0,98	0,97
Root Mean Square Residual (RMRS)	0,06	0,06	0,05	0,07
Parsimonious GFI (Mulaik, 1989)	0,78	0,78	0,78	0,78

**Table A3: Covariance between factors, pooled data**

	Economic strain	Durables	Housing
Economic strain	1	0,82	0,55
Durables	0,82	1	0,74
Housing	0,55	0,74	1

**Table A4: fit statistics of the CFA, pooled data, two or three factors (economic strain and durables regrouped, housing)**

Pooled data	3 factors	2 factors
Goodness of Fit Index (GFI)	0.9757	0.9680
GFI Adjusted for Degrees of Freedom (AGFI)	0.9643	0.9545
Root Mean Square Residual (RMRS)	0.0749	0.0860
Parsimonious GFI (Mulaik, 1989)	0.7756	0.7943

**ANNEX 3: Confirmatory factor analysis, without housing items – pooled EU data (+NO, IS)**

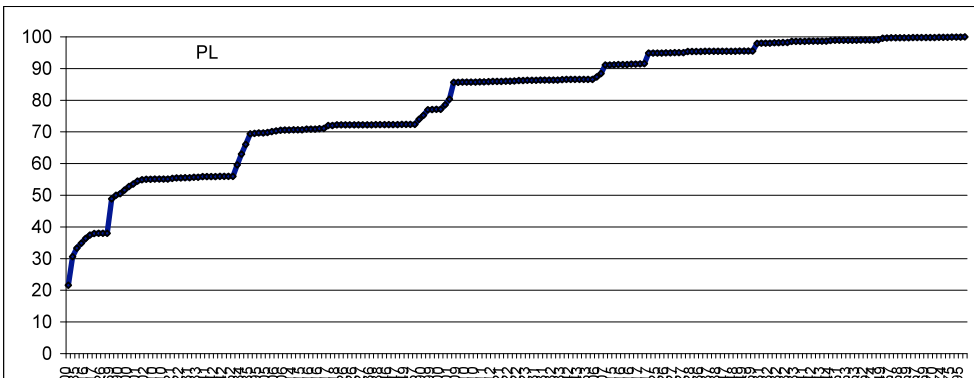
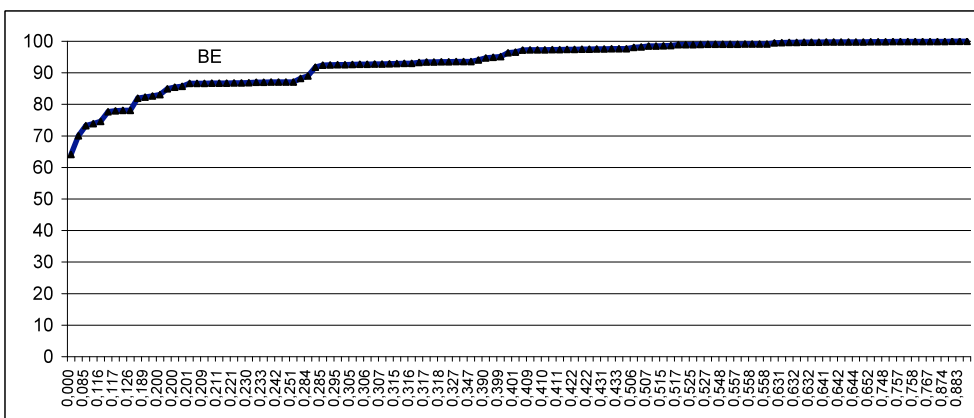
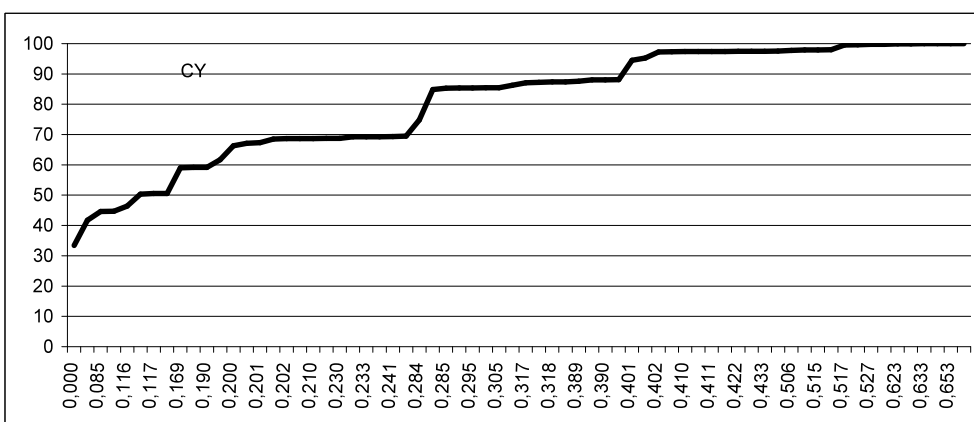
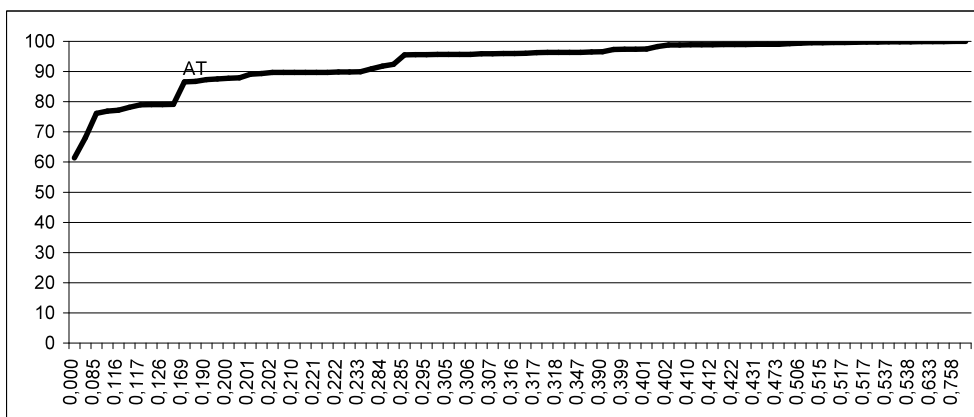
**Table A5: fit statistics of the CFA, pooled data – Economic strain and durables**

	<b><u>Economic strain and durables, separated</u></b>	<b><u>Economic strain and durables, regrouped</u></b>
Goodness of Fit Index (GFI)	0,9959	0,9911
GFI Adjusted for Degrees of Freedom (AGFI)	0,9912	0,9822
Root Mean Square Residual (RMRS)	0,0358	0,0529
Parsimonious GFI	0,6165	0,6607

**Annex 4: deprivation proportion, by items and by country**

	Arrears	Holidays	Home warm	Meat,	Unexp. Exp.	TV	TEL	Car	Washing machine
AT	3,4%	25,7%	3,8%	9,3%	26,5%	0,3%	0,1%	4,8%	0,5%
BE	6,9%	24,9%	14,5%	4,2%	21,1%	0,3%	0,2%	6,8%	1,7%
CY	22,0%	54,0%	33,8%	6,3%	43,1%	0,0%	0,1%	2,0%	0,7%
CZ	8,4%	36,3%	8,9%	16,2%	40,3%	0,3%	1,8%	13,4%	0,6%
DE	6,8%	26,3%	5,3%	10,8%	40,5%	0,6%	0,3%	5,8%	0,5%
DK	5,2%	9,5%	9,3%	1,7%	23,8%	0,5%	0,0%	9,3%	2,0%
EE	7,0%	61,1%	2,3%	8,2%	26,7%	0,5%	1,6%	20,8%	3,3%
ES	6,1%	38,2%	8,1%	3,9%	29,7%	0,1%	0,4%	4,5%	0,5%
FI	9,6%	18,5%	2,4%	2,6%	30,1%	0,8%	0,1%	8,4%	1,4%
FR	9,6%	31,4%	5,9%	5,6%	33,3%	0,3%	0,7%	3,7%	0,9%
GR	29,9%	49,7%	12,0%	7,9%	30,7%	0,4%	0,6%	9,1%	2,1%
HU	16,7%	66,0%	14,9%	27,8%	52,5%	0,7%	3,0%	23,4%	3,7%
IE	8,4%	22,7%	3,8%	2,5%	37,9%	0,3%	0,4%	10,3%	0,6%
IS	12,7%	14,2%	11,0%	3,3%	31,0%	0,3%	0,0%	1,8%	0,9%
IT	12,9%	38,8%	10,1%	5,6%	27,5%	0,3%	1,3%	2,7%	0,4%
LT	14,4%	67,0%	27,6%	23,2%	57,4%	1,7%	4,3%	21,8%	8,6%
LU	2,3%	10,0%	0,6%	1,9%	18,4%	0,0%	0,1%	1,3%	0,2%
LV	15,0%	69,4%	25,2%	31,9%	68,7%	1,6%	3,6%	33,7%	8,6%
NL	4,8%	15,4%	2,2%	2,6%	23,2%	0,1%	0,0%	5,6%	0,1%
NO	9,5%	7,1%	1,4%	2,5%	25,1%	0,3%	0,1%	3,8%	0,3%
PL	22,4%	67,3%	28,4%	28,4%	57,0%	1,0%	2,9%	22,6%	1,2%
PT	6,5%	59,8%	40,0%	3,8%	16,4%	0,6%	4,3%	10,9%	3,5%
SE	7,6%	14,6%	2,5%	3,2%	13,6%	0,4%	0,0%	4,0%	0,0%
SI	13,8%	31,2%	3,0%	10,7%	43,3%	0,7%	0,4%	3,4%	0,4%
SK	10,1%	57,6%	9,7%	36,9%	49,2%	0,8%	2,1%	27,5%	1,0%
UK	6,2%	23,0%	4,7%	4,5%	28,8%	0,1%	0,2%	4,9%	0,5%

### Annex 5: Cumulative distribution of weighted deprivation index, prevalence weighting, common EU weights



European Commission

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