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# Calibrating a cross-European poverty line

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## Non-technical summary

The European Commission and social researchers have been debating how poverty should be defined and measured in a Union where there are substantial variations in income between countries, as well as within countries. The standard procedure is entirely relative – households are defined as poor if their equivalent income is below 60 per cent of the median of the country where they live. But people might also compare their living standards with those prevalent in other countries; if so, relative poverty might be defined in relation to a benchmark which balanced within-country and between-country considerations.

EU-SILC data for 22 member states is used to analyse the relationship between social exclusion and resources, using both a within-country and a between-country perspective. If absolute living standards were the primary determinant of exclusion, then we would expect a continuous relationship between resources and exclusion across all countries, with the country's local average level of resources playing no effect. But if relative living standards were the primary determinant, we would expect a steady relationship between resources and exclusion within each country, but each country's average level of resources would be a pivot point for relativities. (These expected relationships are illustrated in Figures 1 and 2.)

The empirical analysis shows that for an entirely objective measure of household deprivation (ie the lack of goods, services and activities) there is a continuous relationship with income across countries consistent with an absolute interpretation of living standards. For an entirely subjective measure of deprivation (difficulty making ends meet; lack of money to pay unexpected expenses), the relationship with income varies between countries in a pattern which is partly explained by a relative (within-country) interpretation of living standards, but also partly by an absolute (between-country) interpretation.

If patterns of financial stress are accepted as the key indicator of social exclusion, a household's income in relation to the national average of its country of residence accounts for about one third of the distribution of poverty, but its income in relation to the EU average accounts for about two-thirds. The analysis suggests that Europe-wide comparisons are more important to the perception of poverty than the convention of national relative poverty lines would have led us to expect. Even *relative* poverty is more prevalent in the new low-income (eastern) member states than in the old high-income (western) member states. But this is as much a political as an empirical issue.

# Calibrating a cross-European poverty line

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**Abstract**

How should relative poverty be defined and measured in a European Union where there are substantial variations in income between countries, as well as within countries? This paper uses objective and subjective deprivation indicators to assess the appropriate balance between national and Europe-wide relativities in explaining social exclusion. The analysis suggests that Europe-wide comparisons are more important to the perception of poverty than the convention of national relative poverty lines would have led us to expect. Even relative poverty is more prevalent in the new low-income (eastern) countries than in the old high-income (western) countries. But this is as much a political as an empirical issue.

**Key words:** Europe, poverty, social exclusion, deprivation indicators, EU SILC
**JEL**: I32, D31

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## 1. Issues

The European Union has a long record of concern about poverty among its member states, as expressed for example in the Council's pronouncements in Laeken (2001) and Lisbon (2007). The targets for *Europe 2020* include "at least 20 million fewer people in or at risk of poverty and social exclusion". So two key questions are: how many people are in poor households? and which countries do they live in?

The EU's formal definition of poverty, dating back to 1984, is often quoted:

> *The poor shall be taken to mean persons . . . . whose resources . . . . are so limited as to exclude them from the minimum way of life of member states in which they live.*

This definition is unequivocal in defining poverty as 'relative' – in comparison with 'the minimum way of life' rather than with some absolute subsistence level. It strongly suggests that the benchmark against which resources should be compared should be national. And in fact regular EU-produced statistics since then have used within-country relativities: the operational definition of poverty has been a household equivalent income below 60 per cent of the median of the country concerned. This means that poor countries (defined in terms of their national average income) do not necessarily have a large number of poor people (defined in relation to their national average).

The European Commission and social researchers have, though, questioned whether a common poverty line should (or should not) be applied across the whole Union, defined in relation to the median income of the Union as a whole (Atkinson 1998, Berthoud 2004, Delhey and Kohler 2006, Fahey 2007, Marlier and others 2007, Kangas and Ritakallio 2007, Whelan and Maître 2009a, 2009b). The issue was fairly important before the recent enlargement of the Union, when the range of median equivalent incomes (between Luxembourg and Portugal) was about 3:1. It has been thrown into sharper focus by the accession in 2004 and 2007 of the former socialist countries of eastern Europe, all of them with standards of living lower than Portugal, and establishing a ratio (between Luxembourg and Romania) of 10:1.

The arguments about the geographical units used to define poverty lines are fully analysed by Fahey (2007) and Whelan and Maître (2009a, b) – the former favouring an EU-wide

approach, the latter nationally-based relative poverty lines. Whelan and Maître contrast "weak" and "strong" versions of the argument for an EU-wide standard.

- The "weak" version is based on the hypothesis that the people of Romania and the people of Luxembourg (and all the countries in between) may be aware of each others' living standards, and may feel prosperous or poor (privileged or deprived) in relation to their position on a common ladder. If they do not have this common perception, and actually tend to compare themselves with their neighbours in their own countries, the "weak" argument for a common poverty line fails.

  The "weak" version of the debate is an essentially empirical question – what, in fact, is the reference group against which families compare themselves in considering whether they feel included in, or excluded from, the minimum way of life of their community?

- The "strong" version is based on the proposition that the European Union is a political entity (equivalent to other large and diverse countries such as the USA, Russia, India or China) and that people all over the Union do (or their leaders should) perceive their position in relation to the standards prevailing across the continent.

  The "strong" version of the debate is much more of a political question – regardless of personal perceptions, should the Union's institutions (and its member states when contributing to Union policy) be more concerned about variations between countries, or about variations within countries?

The analysis in this paper addresses the empirical issues around the "weak" version of the question.

The founding fathers of the concept of relative deprivation tended to the view that the reference groups against which people compared themselves were rather narrowly bounded. Runciman (1966) argued that envy or pride were expressed in relation to social groups immediately above or below the subject in an imagined hierarchy, so that, for example, manual workers compared themselves with their supervisors, the supervisors compared themselves with office workers, office workers compared themselves with managers and so

on. The gap between poor and rich was too wide for the poor to be able to see right across it. Meanwhile Townsend (1979) was arguing for a concept of relative poverty in which the reference group was incomes prevailing in *this* country at *this* time, without regard for the obviously much lower absolute living standards prevailing in other continents or in previous centuries. Actually, these concepts were by no means as original as they have sometimes been represented – Adam Smith famously explained why the lack of shoes would be a marker of poverty in 18th century England (where almost everyone wore shoes), but not in France (where hardly anyone wore them) (quoted in Kangas and Ritakallio 2007).

If reference groups are narrowly bounded, a potential issue is how small the geographical unit is, whose norms provide the benchmark against which relative deprivation and poverty are measured (Berthoud 2004). If the country, why not the region? If the region, why not the city? If the city, why not the neighbourhood?

An alternative view is that people all over Europe are aware of, and implicitly compare themselves with, the living standards prevalent across the Union. Or, it might be argued, people in the poorer countries of southern and eastern Europe are aware of, and implicitly compare themselves with, the high living standards prevalent in western Europe – or even in the USA. The almost-universal availability of television might have tended to expand the horizons across which people perceived their own situation.

The concept of *relative* poverty is central to the analysis of social policy, both within countries and across the EU. But the question "relative to what?" (Kangas and Ritakallio 2007) has not yet been fully answered. This paper uses a Europe-wide data-set to ask what level of household income is associated with a subjective perception of poverty, in countries with varying average living standards. It addresses the empirical question associated with the "weak" argument for a common EU benchmark (see above). There is some commentary at the end on the "strong" argument, but it should be clear that the latter is a political issue, perhaps affected by, but certainly not determined by, the empirical analysis.

Given the forcefully-presented arguments for and against a common EU-wide poverty benchmark (Fahey 2007, Whelan and Maître 2009a b), this paper does not expect to settle the question. Its two main contributions to the debate are:

- A theoretical analysis of what the cross-country relationships between income and social exclusion would look like, if either nationally-defined or an EU-wide poverty line were appropriate. The actual findings of the analysis can be compared with these alternative expectations to assess the relative merits of the opposing arguments.
- An empirical analysis, allowing for the possibility that reference groups may be partly framed by within-country comparisons, and partly by between-country comparisons (Atkinson 1998), rather than entirely one or entirely the other. The glass may be both half-full and half-empty.

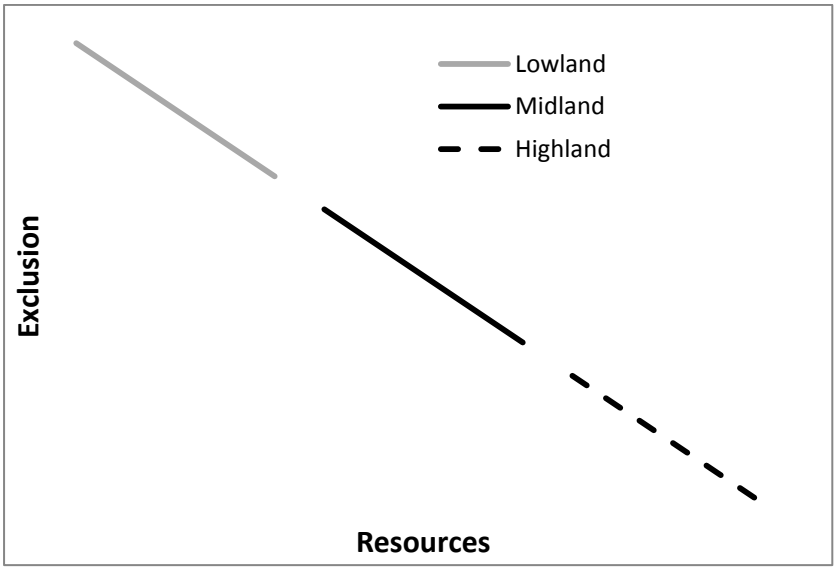
## 2. Analytical framework

So the first stage of the analysis is to ask what the relationship between resources and social exclusion would be, depending on alternative constructions of the ”minimum way of life” within a member state. The plan will be to compare the actual relationships with the expected relationships, in order to evaluate the relative importance of the alternative constructions.

Assume a measure of household resources (which will be approximated by a function of income in the empirical analysis, below). Assume also a measure of social exclusion (which will also be discussed, more problematically, later). The starting point is that the extent or risk of social exclusion will be higher for low-resource households than for high-resource households, within any country. This relationship is represented stylistically as a downward sloping line in Figures 1 and 2. The question is, how will this relationship turn out when compared across countries?

Figure 1 represents the expected relationship if the risk of social exclusion is determined by absolute resources, across all countries. The country with the lowest resources has the highest risk of social exclusion; the country with the highest resources has the lowest risk; the risk for each household is determined by its own resources, regardless of its country of residence. The three countries in the stylised graph are all lined up according to their various resource distributions.

**Figure 1 Expected relationship between social exclusion and resources across countries if absolute resources are the main influence**

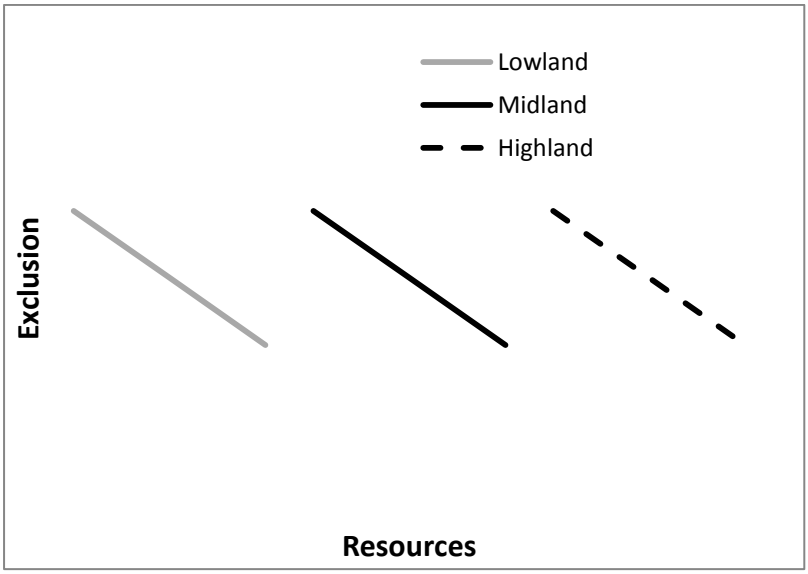



Note: The three stylised countries' distributions of resources have been assumed to be discrete, for clarity of illustration. In practice all countries' distributions overlap.

If the between-country relationship between resources and social exclusion looked like this, that would favour an EU-wide poverty benchmark. Absolute rather than relative resources would be the main determinant of social exclusion. All the households in Lowland would be defined as poor; none of the households in Highland.

Figure 2 represents the expected relationship if the risk of social exclusion was entirely determined by relative resources, within each country. All countries, regardless of their national position in the Europe-wide scale, have similar levels of social exclusion. The risk for each household is determined by its resources in relation to the position of its country of residence. The three countries in the stylised graph are in parallel.

**Figure 2 Expected relationship between social exclusion and resources across countries if relative resources are the main influence**




Note: The three stylised countries' distributions of resources have been assumed to be discrete, for clarity of illustration. In practice all countries' distributions overlap.

If the between-country relationship between resources and social exclusion looked like this, that would favour the retention of nationally-calibrated poverty benchmarks. Relative rather than absolute resources would be the main determinant of social exclusion.

The relationships in Figures 1 and 2 can be represented algebraically as:

$$\text{Exclusion} = \alpha * \text{household resources} + \beta * \text{national average resources} + \text{constant}$$

(where $\alpha$ is expected to be negative and assumed to apply consistently across countries). In the case represented by Figure 1 where social exclusion is related to absolute resources, regardless of national conditions, $\beta$ will be zero – the average resources of the country make no difference to the exclusion experienced by a household with a given level of resources. In the case represented by Figure 2 where social exclusion is related to relative resources, taking account of national conditions, $\beta$ will be numerically equal to $\alpha$, but with a positive sign – that is, high-resource countries will have more social exclusion than their absolute resource levels would have led us to expect.

In the analysis that follows, the relative values of $\alpha$ and $\beta$ are crucial to the interpretation.

The issues raised here are similar to those debated in the literature on the relationship between income and happiness (Easterlin 2001, Stevenson and Wolfer 2008), where within- and between-country relativities are also an important analytical issue. The differences here are that deprivation is a necessary and direct outcome of low income (that's what deprivation means); and it is possible to compare objective and subjective measures of deprivation. 'Happiness' is entirely subjective, and could in principle be negatively related to income.

## 3. Data

The analysis is based on the EU Statistics on Income and Living Conditions, a set of comparable (but not identical) surveys undertaken across all member states of the European Union, plus some other neighbouring countries. The version used was the 2008 longitudinal dataset, which contains multiple observations for panels of households originally contacted in 2005, 2006 or 2007. No results were available for Denmark, France, Germany, Greece or Malta – the omission of Germany and France may be especially serious given the size of those two countries. The income data for Slovakia included some unbelievable outturns; so Slovakia has been left out of the following analysis, for fear of contaminating the results. Norway is included in the data, although not a member of the Union.

The sample analysed has been confined to observations where all eligible adult household members were interviewed in the wave in question. This is intended to minimise the use of imputed income data, given the importance of using accurate income estimates for an analysis of this sort. In five countries (Finland, Netherlands, Norway, Slovenia and Sweden), only one adult member of each household was eligible for interview. They have been included if that member was interviewed.

Households whose income was in the top or bottom 1 per cent of incomes within each country (in any wave) were excluded from the analysis of that wave. This is because of evidence from this and other surveys (eg Berthoud and Bryan 2011) that the highest and lowest incomes are at best temporary and at worst erroneously reported, and give a misleading guide to underlying living standards.

The longitudinal database is constructed as a rolling panel, in which a fresh sample of households was selected each year, and interviewed repeatedly for four years. So the 2008 database contains some households selected in 2005 (now in their fourth year), some selected

in 2006 (now in their third year), and some selected in 2007 (now in their second year). Those selected in 2008 are not included in the data, as they do not yet provide longitudinal data.

The analysis in this paper is cross-sectional, not longitudinal – that is, each household originally interviewed (at wave 1) is characterised as having a single value for income, for deprivation and all other variables, without directly analysing changes in income, deprivation and so on from wave to wave. But the values have been averaged across waves, because of clear evidence (Berthoud and Bryan 2011) that single observations of income, of deprivation and of other household characteristics are unreliable (ie subject to random error) and that much stronger relationships can be identified if measures of *underlying* income, *underlying* deprivation and so on are derived from a sequence of observations across waves. It is these underlying relationships that are the focus of this paper. For these reasons, sample households are included in the analysis only if they provided a complete set of information in at least two waves.

The analysis data-set constructed in this way provides information about a total of 119,851 original households across Europe, ranging from 1,950 in Ireland to 15,228 in Italy. Each observation has been weighted, first, by the number of adults and children in the household, and second by a grossing factor calculated to represent the total population of the country concerned. This means that large countries make more contribution to the findings than small countries, without regard to the sizes of the samples achieved in each country. No attempt was made to compensate for the absence of several countries from the database (see page 7), so that the sample is representative of "Europe with holes", rather than fully representative of "Europe as a whole". This is not crucial for the interpretation of the analysis, which is more concerned with the ratio of within-country variances to between-country variances, than with estimating the values of EU-wide parameters.

Comparison of within-country and between-country relationships is crucial to the following analysis. It is important to caution that between-country relationships cannot be measured with great accuracy, when only 22 countries are available for comparison (Bryan and Jenkins 2012). The conclusions of the paper will depend on establishing broad and systematic differences between countries, rather than on precise estimates

## 4. Key variables

As discussed in section 2, the central objective of this paper is to analyse the relationship – within countries and across countries – between household resources and "social exclusion".

*Resources – equivalent income*

For the empirical analysis, resources have been proxied by household income. This approximation is almost always used, though it is important to bear in mind that other types of resource (capital assets, home production, and the goods and services provided by the state) might make an important contribution to variations in people's material well-being within and between countries.

Household income is defined by EU SILC as the total disposable (after tax) income reported by household members in the calendar year prior to the interview. For the main analysis in Sections 5 and 7, disposable income is divided by the OECD equivalence scale (taking account of the number and ages of household members) to produce an estimate of equivalent income which can be thought of as "income per head". (The further analysis in Section 6 analyses disposable income unadjusted for household size, because measures of household composition are included as covariates in the models.)

Each annual wave of EU SILC records the household's income during the year before the interview, but it reports the household's composition, deprivation indicators and other characteristics at the time of the interview. This discordance between the timing of the measurements has the potential to attenuate the relationships between income and deprivation, but the problem is minimised here by averaging the values of both sets of variables over between two and four waves.

The EU SILC database expresses annual income in terms of Euros, having converted from national currencies using the formal exchange rate. For an analysis of living standards, it is more appropriate to express money income in terms of the cost of living. This was achieved by converting reported incomes in each country back to national currencies using exchange rates, and then to a Euro-equivalent measure using Purchasing Power Parities. The purchasing power standard is based on the Euro, and actual money amounts reported in this paper will be described as Euros, even though this is not strictly accurate labelling.

As expected, the measures of deprivation (see below) are more sensitive to variations in income at the lower than at the upper end of the distribution. The analysis allows for this by using the log of (equivalent) income as the primary predictor in regression equations. But the findings are also illustrated later in the paper in graphs calibrated by actual income, to help readers to get a feel for the conclusions.

*Social exclusion – objective and subjective deprivation indicators*

The distinction between two indicators of social exclusion is crucial to the interpretation of the analysis and to the conclusions of this paper. The first measure is designed as an indicator of *absolute* living standards, which would be determined by household resources, regardless of the country, or the century, in which the observation was recorded. The second measure is designed as an indicator of *relative* living standards, which would be influenced by household resources, but only in the context of the social norms prevailing in a particular country at a particular time. The hypothesis is that the indicator of *absolute* living standards will display the assumed relationship between resources and exclusion illustrated by Figure 1 above. But the indicator of *relative* living standards might display the assumed relationship illustrated by Figure 2

It is proposed to operationalise this distinction between absolute and relative measures of social exclusion, using *objective* and *subjective* indicators of deprivation.

The *objective* measure of deprivation simply records whether households lack certain facilities or activities which are assumed to be widely desirable. These are: a bath or shower[1], a toilet, an annual holiday away from home, meat or fish most days per week, a telephone, a computer, a washing machine and a car.[2] An important principle in the construction of this index was that it should as far as possible exclude all subjective considerations. Thus (unlike most formulations based on similar questions), lack of an item contributed to the score regardless of whether the respondent reported that they could not afford it. It has been shown (Berthoud and others 2006) that the 'cannot afford' criterion is socially constructed and

[1] The Romanian survey records no households who lacked a bath or a toilet. This is unlikely to be true (given the frequent lack of baths and toilets in other low-income east European countries) and it is assumed that Romania did not ask this pair of questions. Romania is excluded from the analysis of objective lack of facilities, but is retained for analysis of subjective financial stress (see below).

[2] Two other items (the absence of leaks in one's home and a colour TV) were rejected from the index, as they were not strongly correlated with the eight included items. A third (ability to keep one's house warm) was rejected because differences between countries would so obviously be sensitive to climatic conditions.

therefore subjective; the correlation between lack of an item and (low) income is sufficient objective evidence that people cannot afford it. By the same token, subjective questions about whether households were experiencing difficulties with housing costs or credit commitments were not included in this index.

The *subjective* measure of deprivation was based on the opposite set of principles. It uses two survey questions: whether the household was finding it difficult to make ends meet on their income, and whether the household was unable to meet unexpected financial expenses.[3]

The objective measure of deprivation will also be labelled "lack of facilities", and as explained, is hypothesised to be an indicator of absolute (low) living standards following the pattern illustrated in Figure 1. The subjective measure will also be labelled "financial stress" and is hypothesised to be an indicator of (low) living standards relative to the social conditions in which the household lives. It is interpreted as the indicator of social inclusion/exclusion relative to either nationally defined or EU wide benchmarks, as suggested in Figures 1 and 2.[4] The argument is that people will feel financial comfort or stress according to how far they see their income as providing, or failing to provide, the living standards that they perceive to be normal in their community. (Note that the measure is a continuous scale, with no judgement being made in advance about what point in the scale represents an exclusion threshold.)

Not everyone will be convinced that this subjective measure of financial stress is the litmus test of relative deprivation across countries. It is proposed as a promising candidate. The remainder of the paper shows what conclusions might be drawn if the assumption is followed through to an analysis within and between countries.

[3] Three other items (arrears on mortgage or rent payments, arrears on utility bills and the financial burden of housing costs, were rejected from the index, as they were not strongly correlated with the two included items, even when analysed within country. These experiences may be strongly affected by national institutional arrangements for setting housing costs and for enforcing payments, as well as by individuals' own situation.
[4] Whelan and Maître (2009a, 2009b) label their index based on lack of facilities "material deprivation", and the one based on difficulty making ends meet "economic stress" (but there are important differences in detail between their indices and the ones used here). Eurostat's analysis of "material deprivation" distinguishes between "economic strain", "durables" and "housing" (Guio 2005). Unhelpfully there is no obvious connection between Eurostat's "economic strain" and Whelan and Maître's "economic stress". Whelan and Maître (2009a) and OECD (Boarini and Mira d'Ercole, 2006) also make the distinction between objective and subjective indicators, again without exactly following the formulation adopted in this paper.

In more detail: each of the contributory variables was initially scored 1 or 0 according to whether the household was or was not deprived on the question concerned. For the question about making ends meet, the initial scores were 1.0, 0.8, 0.6, 0.4, 0.2 and 0.0 according to which of six possible answers the respondent gave, ranging from "with great difficulty" to "very easily". Each contributory question was then standardised to have a mean of 0 and a standard deviation of 1 (Z scores) so that all variables would contribute the same to the level and variance of the overall score.[5] Chronbach's alpha (proposed as a measure of the extent to which the component variables contribute to an underlying construct) was 0.73 for the objective indicator and 0.71 for the subjective indicator if measured across all the countries represented in the survey. If measured separately within countries, alpha ranged from 0.36 to 0.81 for the objective indicator, and 0.61 to 0.75 for the subjective indicator.

After the two indices had been summed across components, they were re-standardised to have a mean of 0 and a standard deviation of 1, so that the analyses of the two indicators could be directly compared with each other.

Both of these indices are abstract statistical indicators. People who score high on either index are assumed to be more deprived than those who score low on the same index, but there is no suggestion that the indices themselves can be used to distinguish between acceptable and unacceptable levels of deprivation. The conclusions of this paper depend on the relationships between income and deprivation identified by the analysis, not directly on the construction of the deprivation variables. What we are looking for is an estimate of the level of income in each country below which the risk of social exclusion (operationalised as subjective financial stress) rises above some level which can convincingly be interpreted as a poverty line.

## 5. The relationships between income, and objective and subjective deprivation across Europe

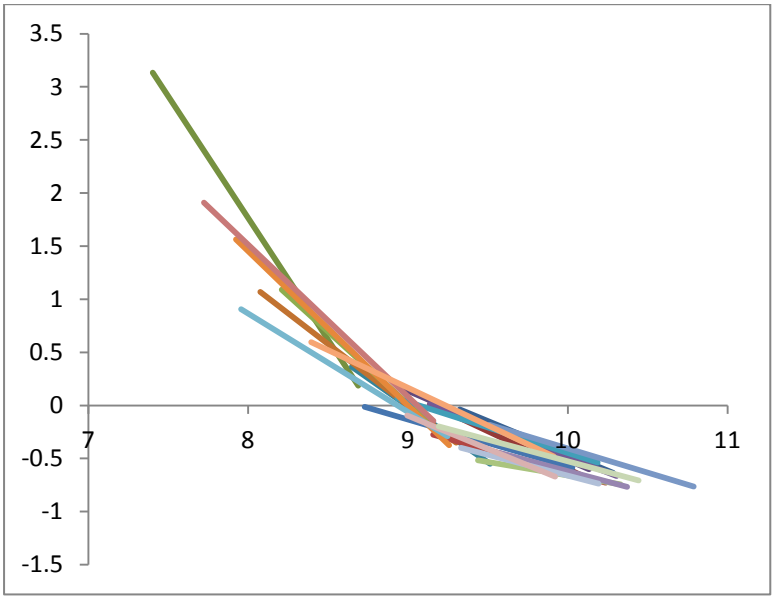
The main analysis of the relationships between income and the two indicators of deprivation is presented in this section at the simplest possible level, using only the three key variables – income, the indicator of objective lack of facilities and the indicator of subjective financial

[5] Many analysts of similar data use "prevalence weighting" to assign greater or lesser importance to the absence of facilities which are more or less common – arguing that the more common a facility, the greater the deprivation associated with its absence. But in practice this procedure assigns much greater overall weight to relatively common facilities (because 50x50=2500, while 99x1=99).

stress. A more complex analysis using a wider range of variables will be presented in the following section, to allow for the possibility that other factors (such as household composition, disability and age) might intervene in the relationship between needs and resources.

Consider first the relationship between (log equivalent) household income and the objective measure of lack of facilities. The analysis consistently shows a linear relationship with log income (as reported formally in Table 1 below). The analytical task is to test alternative formulations of this relationship, to illustrate the variations within and between countries. Figure 3 is based on 21 separate regressions – calculations of the relationship between log income and deprivation — for each of the countries analysed.[6] For each country we predict the typical lack of facilities reported at the 10$^{th}$ percentile, and at the 90$^{th}$ percentile, of that country's income distribution. The straight line linking these two predictions automatically runs through the other points in the country's distribution, including the median. The graph in Figure 3 plots the levels and the slopes of objective deprivation (Y axis) against the log of absolute equivalent income (X axis).

***Figure 3. Country by country relationships between objective lack of facilities and log equivalent income***




Note: X-axis plots the log of equivalent income; Y-axis plots the 'objective' indicator of lack of facilities. The graph shows the level of objective deprivation predicted by within-country regression equations, from the 10$^{th}$ to the 90$^{th}$ percentiles of the country's income distribution

[6] Remember that Romania is excluded from analysis of objective deprivation because it did not provide data on all the components of the index.

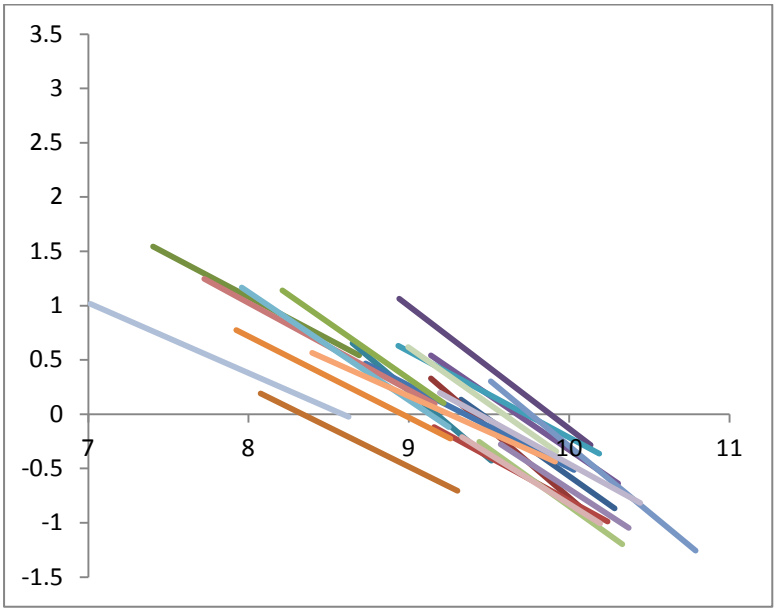
Two points about Figure 3 are immediately clear. The downward slope of the income/facilities relationship is very similar in all countries. And the countries are strung out between each other in a pattern which closely matches the within-country slopes. One could summarise this by suggesting that one slope – within countries and across countries — provides a single summary of the relationship between income and objective deprivation, right across Europe. To predict any household's lack of facilities, you would need to know their absolute income, but knowing what country they lived in would not add much further information. (The main exception is that objective deprivation is rather less sensitive to household income in countries with the highest levels of income. This may be explained by the fact that households in the rich countries have such low levels of objective deprivation that their income makes little difference.)

The observed relationship between income and objective deprivation illustrated in Figure3 is very similar to the theoretical relationship proposed in Figure 1. This is exactly what would have been predicted from the theory – objective measures of deprivation are closely, and universally, related to absolute measures of income.

Figure 4 is equivalent to Figure 3, this time illustrating the relation between log equivalent income and subjective financial stress, within and between countries.

Two points stand out from Figure 4, in comparison with Figure 3. As before, the relationship between income and subjective deprivation is very similar – with parallel slopes – in all countries. But in contrast, the countries' plots are rather more spread out from left to right – next to each other, rather than strung out in a continuous sequence. This implies that subjective deprivation is more sensitive to relative income (the difference between each household's income and the national average of their country).

***Figure 4. Country by country relationships between log equivalent income and subjective financial stress***




Note: X-axis plots the log of equivalent income; Y-axis plots the 'subjective' indicator of financial stress. The graph shows the level of subjective deprivation predicted by within-country regression equations, from the 10$^{th}$ to the 90$^{th}$ percentiles of the country's income distribution

The pattern in Figure 4 is more similar to the theoretical prediction of relative deprivation illustrated in Figure 2. Thus it approximates what would have been predicted from the theory – subjective perceptions of deprivation are based on relative measures of income. But it is important to recognise that the observed pattern in Figure 4 combines elements of the predictions in both Figure 1 and Figure 2: some spread between left and right, but also some consistency from top left to bottom right.

Table 1 provides more formal and more precise estimates of these relationships, for objective deprivation.

- The first column reports a simple regression equation in which (log equivalent) income predicts objective lack of facilities, taking no account of the country in which the household was living.
- The second column records the relationship between countries' average levels of (log equivalent) income and of deprivation. Slopes are very similar. The country-level analysis seems to provide a less good fit, because most of the variance in both income and in deprivation is observed within, not between, countries.
- The third column records the relationships if both household income and national average income are taken into account at the same time. The combined analysis

suggests that a household's own (absolute) income has much the strongest influence on objective lack of facilities, though households in countries with high average incomes are a bit less deprived than might otherwise have been expected.

***Table 1 OLS regression equations linking objective lack of facilities with equivalent income***

| | Household income only | | National average income only | | Both household and national average | |
|---|---|---|---|---|---|---|
| | Coeff | t | Coeff | t | Coeff | t |
| Log *household* equivalent income (α) | -0.73 | -73 | | | -0.63 | -6.9 |
| Log *national average* equivalent income (β) | | | -0.83 | -6.9 | $-0.19^{ns}$ | -1.4 |
| Constant | 6.65 | 7.0 | 7.65 | 6.7 | 7.56 | 6.2 |
| $R^2$ | 37% | | 23% | | 37% | |
| Number of observations | 113,686 | | 113,686 | | 113,686 | |

Note: t is the ratio of the coefficient to its standard error. The coefficient is conventionally regarded as statistically significant if t is greater than 2. Calculations of robust standard errors allow for the obvious within-country correlation of the national average income by treating 'country' as a cluster

The key point for interpretation is that the coefficient for national average income in the third column (referred to as β in the theoretical equation) is much smaller than, and has the same sign as, the coefficient for household income (α). These characteristics are consistent with the Figure 1 hypothesis, and confirm that absolute income is the main determinant of objective lack of facilities

Table 2 presents similarly-calculated results for analysis of the subjective indicator of financial stress.

- Using household income as the sole predictor (first column) shows that financial stress is also less common at higher than at lower levels of income. But the slope of the relationship with household income (coeff), and the fit of the equation ($R^2$) is rather less for the subjective (Table 2) than for the objective measure of deprivation (Table 1).

- Levels of financial stress are rather lower in countries with high average incomes. This on its own supports the absolute interpretation of the relationship between income and subjective deprivation. But the between-country relationship is flatter and weaker than it was for objective deprivation, and flatter and weaker than the link (in the first column) with household income. These findings at least partly support the relative interpretation.

***Table 2 OLS regression equations linking subjective financial stress with equivalent income.***

| | Household income only | | National average income only | | Both household and national average | |
|---|---|---|---|---|---|---|
| | Coeff | t | Coeff | T | Coeff | t |
| Log *household* equivalent income (α) | -0.67 | -7.3 | | | -0.84 | -22.6 |
| Log *national average* equivalent income (β) | | | -0.57 | -4.7 | 0.27 | 2.8 |
| Constant | 6.27 | 7.1 | 5.3 | 4.7 | 5.24 | 4.8 |
| $R^2$ | 34% | | 14% | | 35% | |
| Number of observations | 119,829 | | 119,829 | | 119,829 | |

See note to Table 1

- If household income and national average income are both taken into account in the same analysis (third column of Table 2) it turns out that the slope of the within-country coefficient between household income and subjective deprivation (Table 2) is just as steep as it was for objective deprivation (Table 1). But the between-country relationship reverses – for households with any given absolute income, prosperous countries now have higher, not lower, levels of financial stress. The fact that the coefficient predicting the effect of country-level income (β) is significant and positive, while the coefficient predicting the effect of household income (α) remains strongly negative, is consistent with the idea that social exclusion depends on relative, rather than absolute, income. But the positive coefficient for the national average income is much smaller than the negative coefficient for households' individual income.

The implication is that people are influenced by their knowledge of both their country's national average, and also the Europe-wide average, when assessing the "minimum way of life" against which to report their subjective perception of financial stress.

## 6. Taking account of potential variations in households' needs and perceptions

Households' ability to convert income into a good standard of living (the absence of deprivation) depends, at least in part, on variations in their needs. Most obviously, a large household may require more income than a small household to maintain the same living standard. It is also possible that different social groups are more or less likely to report deprivation than a strict calculation of needs and resources would lead us to expect.

The previous section analysed the within- and between-country relationships between household income and deprivation using the very simple conventional assumption about variations in households' needs embodied in the OECD equivalence scale. This section reviews the findings in the light of more detailed information about households which might help to explain why one is (or says that it is) more deprived than another, even though they both have the same income. Three aspects of the household are considered: household structure, disability and age. The aim on this occasion is not so much to measure and comment on the influence of these three sets of characteristics (though these are potentially interesting issues which should be investigated in more detail on another occasion) but simply to check that the household-level and country-level relationships between income and the two types of deprivation remain true, after taking account of this more detailed information about household characteristics.

Table 3 presents the results of regression models in which households' levels of objective and subjective deprivation are analysed in terms of a series of household characteristics, in addition to income. The measure of income used this time is households' disposable income (and its national average) unadjusted for family size, because the latter is dealt with in the analysis:

***Table 3 OLS regression equations linking income with objective and subjective deprivation, taking account of household stricture, age and disability.***

| | Objective lack of facilities | | Subjective financial stress | |
|---|---|---|---|---|
| | Coeff | t | Coeff | t |
| Household representative [a] has a partner | -0.13 | -3.8 | 0.03[ns] | 0.7 |
| Number of other adults (excl hh rep and partner) in household | 0.08 | 3.2 | 0.20 | 14.8 |
| Number of children (<16) in household | 0.24[ns] | 0.9 | 1.50 | 4.1 |
| Disabled adult in household[b] | 0.10 | 4.1 | 0.23 | 11.8 |
| Age of household representative (divided by ten) | 0.15[ns] | 1.0 | 0.63 | 2.2 |
| Age/10 squared | 0.05[ns] | -1.8 | -0.13 | -2.5 |
| Age/10 cubed | 0.005 | 2.7 | 0.007 | 2.3 |
| Log household disposable income (α) | -0.56 | -5.6 | -0.76 | -20.1 |
| Log national average disposable income (β) | -0.30 | -2.0 | 0.25 | 2.4 |
| Constant | 8.36 | 6.3 | 4.18 | 3.4 |
| $R^2$ | 46% | | 37% | |
| Number of observations | 113,598 | | 119,741 | |

See note to Table 1

[a] "Household representative" is the person who answered the household-level questions in the survey interview, including the deprivation questions.

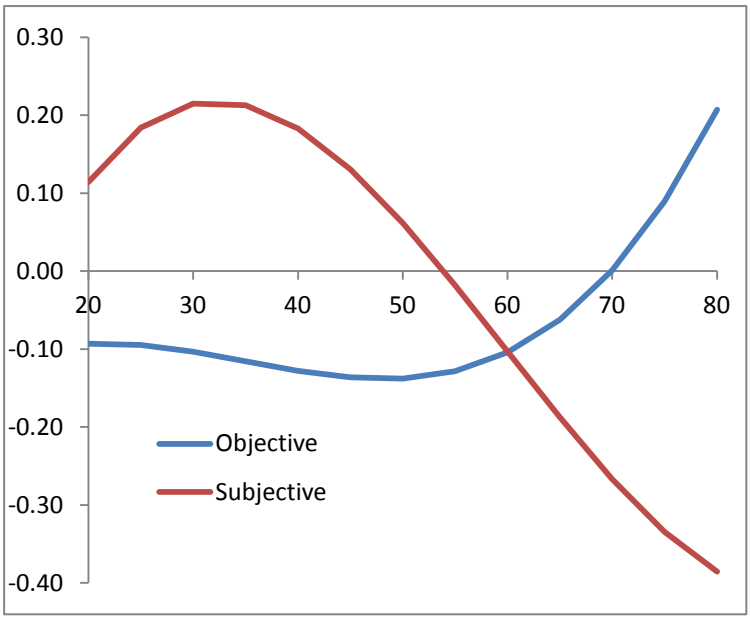
[b] Each adult in the household scored 1 if s/he reported limitations in activities that people usually do, because of health problems, for at least the last 6 months; and scored 2 is s/he was strongly limited. Household level disability was defined as the highest score (2 or 1) of any adult in the household

- Couples are less deprived in terms of objective lack of facilities than single people. This is at first sight a surprising result (and contradicts the extra weight for couples built into equivalence scales), but the same finding has been reported many times in the past (eg Berthoud and Ford 1996, Berthoud and Bryan 2011). A potential explanation is that a couple can make much more efficient use than a single person of facilities (like a toilet or a washing machine) of which only one is required per

household. But couples report about the same level of subjective financial stress as single people with the same income.

- Other adults (beside the householder and partner) increase the level of objective deprivation slightly, and the level of subjective deprivation substantially, after controlling for income.
- Children make little difference to objective deprivation, but they increase subjective deprivation, for a household with a given income.
- Disabled people often have expenditure requirements that add to household needs, and this has been shown to affect levels of deprivation experienced by them and their families on a given income (Zaidi and Burchardt 2005, 2009). EU SILC households containing a disabled adult lacked more facilities, and experienced substantially higher levels of financial stress, than others on the same income.
- Levels of deprivation vary by age, even after taking account of the generally lower levels of income received by older people (Berthoud and others 2006). The coefficients for age, age-squared and age-cubed look rather similar for both objective and subjective measures (ie they are successively +, - and +) but if the patterns are plotted the outcomes are quite different. Figure 5 shows that older people are much

***Figure 5 Variations in objective and subjective deprivation indicators by age, controlling for household and national income, and other characteristics***




Note: The graph plots the predicted value at each age for households with average income and average other characteristics.

*more* likely to lack facilities than younger people with the same income and other characteristics, but they are much *less* likely to report financial stress. The striking divergence between the two measures helps to emphasise the distinction between the objective and subjective approaches. It also suggests that estimates of the living standards of older people are highly sensitive to the balance between objective and subjective considerations in the indicator chosen.

But the real interest in Table 3 is in the relationship between deprivation and income, comparing especially the within-country effects (α) and between-country effects (β) (taking account of other characteristics). Table 4 repeats the income coefficients from Tables 1, 2 and 3 to support comparison between them.

For objective lack of facilities, both the simple analysis by equivalent income, and the more complex analysis controlling for other characteristics, show that:

- Objective deprivation is strongly associated with low household income (large negative α).
- Households in countries with low average incomes lack even more facilities than can be explained by their own income, though the effect is slight (small negative β).

But for subjective financial stress:

- Subjective deprivation is strongly associated with low household income (large negative α).
- Households in countries with low average incomes are *less* likely to report subjective deprivation than households with similar incomes in countries with high average incomes (significant positive β).
- But the positive country effect (β) is smaller than the negative household effect (α). Both the simple analysis by equivalent income and the more complex analysis controlling for other characteristics suggest that the counter effect of the national average income is rather less than a third of the main effect of household income.

***Table 4 Summary of relationships between income and deprivation***

| | Objective lack of facilities | | Subjective financial stress | |
|---|---|---|---|---|
| | Equivalent income (Table 1) | Disposable income controlling for characteristics (Table 3) | Equivalent income (Table 2) | Disposable income controlling for characteristics (Table 3) |
| Household income (α) | -0.63 | -0.65 | -0.84 | -0.71 |
| National average income (β) | $-0.19^{ns}$ | -0.30 | 0.27 | 0.25 |
| Ratio (β/α) | | | -32% | -35% |

## 7. Implications for poverty measurement

These are the central findings of this paper. Both analyses confirm that objective deprivation (lacking facilities) is associated with low household income, independently of the country in which the household lives. The pattern is very similar to the theoretical relationship illustrated by Figure 1. It supports the view that objective deprivation can be interpreted as an indicator of absolute poverty. Subjective deprivation is also associated with low household income within any country. The effect is partly offset by a tendency for households in high-income countries to report more financial stress than their income measured in Euros would lead us to expect. The pattern is closer to the theoretical relationship illustrated by Figure 2. It supports the view that subjective deprivation can be interpreted as an indicator of relative poverty. But the fact that the slope of the positive between-country relationship between income and subjective deprivation (β) is only one third as steep as the negative within-country relationship (α) shows that the national average on its own is not an appropriate benchmark for calibrating a relative poverty line.

How should these findings be interpreted for the measurement of poverty? The conventional approach is to define as relatively poor those households with an equivalent income below 60 per cent of each country's median income. That approach, applied to the EU SILC data being analysed here, shows that relative poverty rates range between 4 per cent in the Czech Republic and 20 per cent in Romania. As the rates plotted in Figure 6 (below) indicate, there is something of a tendency for countries with low average incomes to have wider dispersions and therefore higher relative poverty rates (red bars), but the overall conclusion is that, as the

definition would lead us to expect, relative poverty does not vary very much from country to country. The overall average prevalence of relative poverty is 14 per cent.[7]

It is often suggested that an absolute poverty line should also be drawn, at 60 per cent of the median of the EU-wide income. This can easily be done, but because there is quite a wide range of variation between countries, the variance in the overall EU income distribution is substantially wider than the variance within countries, and this leads to an initial absolute poverty rate of 27 per cent. Because this paper is more concerned with the method of combining income distributions than with estimating an overall poverty rate, the absolute definition has been adjusted, so that it defines as poor the 14 per cent of households across Europe with the lowest equivalent incomes – the same proportion as are defined poor on the relative scale.[8] This is designed to enable direct comparisons between the alternative poverty definitions. Of course the absolutely poor are distributed quite differently across Europe, with many western countries reporting less than 1 per cent, and many eastern countries reporting more than 50 per cent, of their households below the EU-wide threshold (see Figure 6, below, black bars).

These are close-to-standard ways of identifying poor households. The key issue for this paper is how analysis of the objective and subjective deprivation indicators can contribute to our understanding of poverty, and especially to the contrast between relative and absolute standards of comparison. One school of thought proposes to use deprivation questions directly in the measurement of poverty, defining the poor as those with high scores on the indicators (Ringen 1988, Pantazis and others 2006). We reject that approach, partly on theoretical grounds (poverty should be defined as lack of resources, not as its consequences) but mainly on empirical grounds (the simple deprivation *indicators* are far too loosely defined to bear the weight of being treated as actual *measures* of a household's position on the ladder). Instead, we use the deprivation indicators to calibrate income-based measures of poverty. The poor are defined as people whose income is so low as to create a high risk of hardship.

[7] The relative poverty rate calculated here will be rather lower than that presented by other analysts of the same data-set, because: a) the top and bottom 1 per cent of each country's income distribution have been rejected as potential outliers, and b) the measure of underlying income averaged across observations in the longitudinal data will have a narrower variance than a measure of a single year's household income.
[8] The 14 per cent of households identified in this way have an income below 38 per cent of the EU-wide median.

The indicator of objective lack of facilities exhibits a relationship with income between and within countries very similar to the pattern hypothesised in Figure 1. Low household income explains objective deprivation in a single relationship across Europe, with no countervailing variation between more and less prosperous countries. The objective indicator confirms the relevance of an absolute poverty measure, calibrated in relation to the EU distribution as a whole. But there is no need to readjust the absolute definition already in use.

The indicator of subjective financial stress exhibits a relationship partly consistent with the pattern hypothesised in Figure 2. Low household income explains subjective deprivation within countries, but this is offset by an opposite relationship between countries. The latter encourages a relative view of poverty within countries. But the offsetting between-country effect is much smaller than the between-household effect, so it is appropriate to argue that subjective financial stress is perceived partly in relation to one's country's situation, and partly in relation to the Europe-wide distribution.

This leads to an option of defining subjective poverty in terms of households whose combination of household and national income places them at highest risk of deprivation. The regression equation presented in Table 2 is used to predict, for each household, what their subjective financial stress in likely to be. That is:

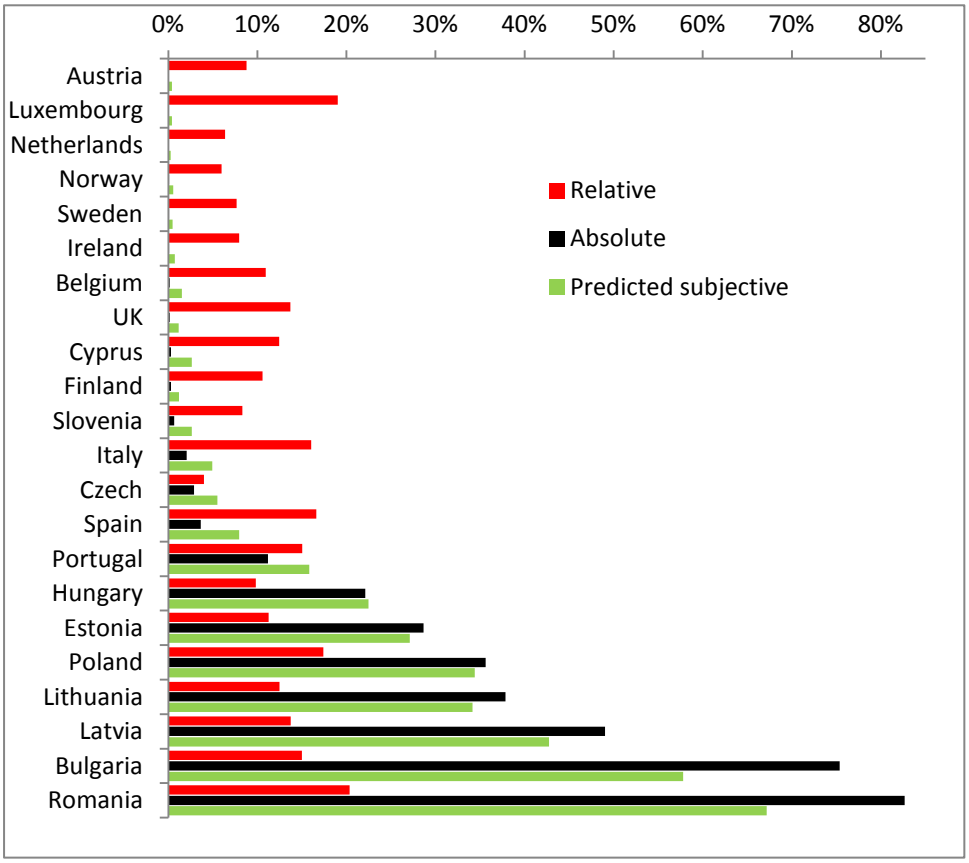
Predicted subjective deprivation = -0.84*hhold income + 0.27*national average income + 5.24

To aid comparison with other poverty measures, the subjective poor are defined as the 14 per cent of households whose incomes give them the highest *predicted* subjective deprivation.

Figure 6 compares the prevalence of poverty on the three measures, across countries.[9] As already reported, conventionally-defined relative poverty varies somewhat, but not greatly, between countries (red bars). Absolute poverty in relation to the EU-wide distribution of income obviously varies hugely between countries (black bars). As expected, the rate of predicted subjective poverty, as estimated from the regression equation, falls between these two extremes (green bars). But, also as expected, the distribution of predicted subjective poverty between countries is closer to the absolute than to the relative distribution.

[9] Appendix Table A1 provides the percentages on which Figure 6 is based.

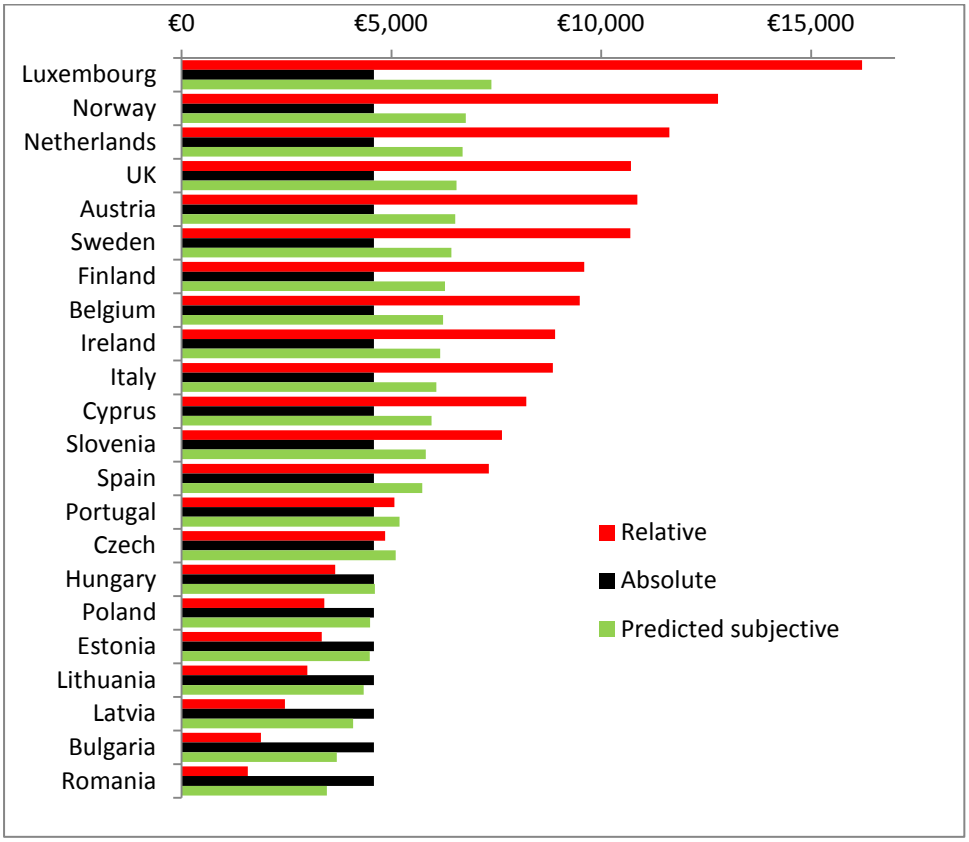
***Figure 6. Relative, absolute and predicted subjective poverty rates, by country***




It is also possible to plot the levels of the income poverty thresholds in each country on which each of these definitions is based. For relative poverty this is simply 60 per cent of the country's median, and varies hugely between countries – from 1,500 Euros in Romania to 17,200 in Luxembourg. For absolute poverty it is the income below which 14 per cent of all households fall, and is obviously the same – 4,600 Euros - in each country. For predicted subjective poverty it is the income below which the households with the highest predicted deprivation scores fall, and varies somewhat – from 3,500 to 7,400 - between countries. These poverty lines are shown in Figure 7. [10]

[10] Appendix Table A2 provides the poverty lines on which Figure 7 is based.

***Figure 7. Relative, absolute and predicted subjective poverty lines, by country***




It would be helpful to generalise the balance of relative and absolute influences on the between-country prevalence of subjective poverty. In an early contribution to this debate, Atkinson (1998) proposed that a cross European poverty line might be based on a combination of national and EU perspectives, and suggested the formula:

$$50\% \text{ of } Y_{EU}^{\theta}.Y_{country}^{(1-\theta)}$$

for calculating a poverty line, in which the Ys were the average incomes of Europe and the household's country of residence, and θ (theta) was a measure of the relative importance of the EU as opposed to national considerations. In the absence of any suggested value for the weight, Atkinson was proposing a way of thinking about the question without offering a solution.[11]

[11] In 1998, relative poverty lines were commonly defined as 50 per cent of the mean. The current convention for defining poverty lines as 60 per cent of the median makes no difference to the argument about the balance between national and EU-wide reference points.

Table 5 shows the estimated relationship between conventional relative poverty lines and the implicit national poverty line based on predicted subjective poverty. It is based on a regression equation in which each of the 22 countries being analysed is counted as an observation (weighted by its population size). Given that the predicted subjective poverty line and the relative poverty line are both derived in part from measures of the national income, it is hardly surprising that there is a very close fit between the two parameters, with an $R^2$ of 99 per cent.

***Table 5 OLS regression equation linking the log of national predicted subjective poverty lines with log of national relative poverty lines***

| | Coeff | t |
|---|---|---|
| Log national relative poverty line | 0.32 | 122 |
| Constant | 5.77 | 246 |
| $R^2$ | 99% | |
| Number of observations | 22 | |

The equation reported in Table 5 can be written as:

$$\text{Log}(L_{S)} = 5.77 + 0.32*\log(L_R)$$

where $L_S$ and $L_R$ are the country's predicted subjective, and relative, poverty lines, respectively. Converting the logs gives:

$$L_S = 321 * L_R^{0.32}$$

Since the absolute (EU wide) poverty line illustrated in Figure 7 is €4,580 (constant across countries), the same equation can be written as:

$$L_S = L_{EU}^{0.68} * L_R^{0.32}$$

Since 0.68 and 0.32 sum to 1.00, this relationship is almost identical to Atkinson's proposed formula, in which θ has an empirical value of 68 per cent.

It needs to be said again that the between-country variances cannot be estimated precisely when there are only 22 observations (Bryan and Jenkins 2012), and when several member states, including Germany and France, are missing from the data-set. It cannot be claimed

that the between-country relativity is exactly 0.68 and the within-country relativity exactly 0.32. But it can be concluded that the one is much larger than the other.

Defining national poverty lines as $L_{EU}^{0.68} * L_R^{0.32}$ naturally produces national poverty estimates which are very close to the predicted subjective estimates (Figure 6 and Table A1). The advantage of using the formula is that its calculation is based directly and solely on income measures, and can be replicated across countries and across years without any need to repeat the analysis of subjective deprivation on each occasion.

The more general conclusion is that if poverty is defined as a level of income so low as to risk subjective financial stress, then broader EU wide relativities are twice as important as narrower national relativities in forming households' frame of reference.

## 8. Conclusions

This is by no means the first contribution to this debate, and it is unlikely to be the last. Many authors (Atkinson 1998, Berthoud 2004, Delhey and Kohler 2006, Fahey 2007, Marlier and others 2007, Kangas and Ritakallio 2007, Whelan and Maître 2009a, 2009b) have discussed the issues at the level of principle, and several of them have analysed household surveys very similar to the data used here, to argue on the one hand for the Europeanisation of the poverty perspective, or on the other hand for the retention of nationally-bounded relativities. No doubt the authors of all these papers still prefer their own approach to the one presented here, but the paper aims simply to make a contribution to the debate, rather than to decide the issue for all time.

At a technical level, the paper has offered two potential improvements to the analysis of income and deprivation. First, it has distinguished as rigorously as possible between objective and subjective considerations in the construction of the two deprivation indicators. In doing so, it has shown how different these considerations are, and how sensitive the conclusions might be to the balance in practice between objective lack of facilities and subjective financial stress – not only in between-country comparisons, but also in within-country comparisons by (for example) age.

The second potential technical improvement is that the paper has used the multiple observations available in the EU SILC panel survey to calculate the average level of income,

and of deprivation (and of other parameters) reported by the members of each selected household over a period of up to four years. The interpretation is that identifying the *underlying* relationship between income and deprivation is more effective statistically, and more meaningful, than short-term analysis based on cross-sectional (single-year) surveys. It is often remarked that the relationship between low income and deprivation is surprisingly weak, and all sorts of hypotheses are built on the differences between the two. Analysis of panel data shows that the underlying relationship is rather strong for micro-analysis of this sort, especially if other influences on needs and resources are taken into account (the $R^2$ for objective deprivation reported in Table 3 was 46 per cent). This suggests that the relationship observed in cross-sectional data is attenuated by either short-term fluctuations, or measurement error (or both).[12]

The paper also offers two theoretical contributions to the debate. First, it starts with a stylised presentation of what the relationship between resources and social exclusion would look like, in each of two extreme hypothetical conditions where exclusion was determined either absolutely (by household resources regardless of the country in which the household lived) or relatively (by household resources in relation to the country, regardless of the position of other countries). These alternative hypothetical conditions are illustrated in Figures 1 and 2, and it is clear that the relationship between the within-country and between-country coefficients (labelled $\alpha$ and $\beta$) of a regression equation determines the balance between national and European considerations.

Social exclusion has been operationalised here in terms of two indicators. As expected, an objective indicator of lack of facilities is strongly related to household income, with no countervailing country effect. Objective deprivation exhibits the hallmarks of absolute poverty illustrated by Figure 1. But a subjective indicator of financial stress is expressed, at least in part, relative to the average income of the country concerned. Subjective deprivation has some of the characteristics of relative poverty illustrated by Figure 2.

The second theoretical contribution is that the analysis allows for a compromise position between the extreme interpretations. Some authors, like Fahey (2007), have observed that

[12] In detail, the panel data show that the underlying relationship between income and deprivation is rather strong, while the dynamic relationship is very weak. The observed cross-sectional relationship is the outcome of the two in combination (Berthoud and Bryan 2011)

between-country effects do not fully explain the cross-national patterns of deprivation, and so have argued for a Europe-wide definition of (absolute) poverty. They are opposed by other authors, like Whelan and Maître (2009), who have observed that between-country effects do have some influence, and so conclude that a within-country definition of (relative) poverty is required.

A third group, like Atkinson (1998), and Marlier and others (2008), have allowed for the possibility of a definition which combines Europe-wide and national relativities, without having a clear theoretical or empirical basis for deciding on the balance between the two. Within the limits of the assumptions necessary to undertake the analysis, this paper provides an empirical basis for that decision – a poverty line which best reflects the risk of subjective hardship would combine European and national relativities in the ratio of 68:32.

It can be argued that this balance places much more weight on EU-wide considerations than would have been expected from the international consensus about relative poverty which has followed Townsend's (1979) classic study of *Poverty in the United Kingdom*. The poverty line derived indirectly from the subjective indicator of financial stress places households in the western countries of the "old" EU at much lower risk of poverty than the conventional relative poverty line; while households in the eastern countries of the "new" EU are at much higher risk.

The empirical findings do not end the debate. The interpretation depends heavily on Whelan and Maître's distinction between the weak (empirical) and strong (political) versions of the argument for the Europeanisation of poverty analysis. The weak version relies on the assumption that residents of one country are indeed aware, if only in a vague way, of the range of living standards available in other countries, and implicitly compare themselves with those other countries in deciding whether they find it difficult to make ends meet, or have enough money to deal with an unexpected expense. The question can be tested empirically, as in this paper. The boundaries of the EU are not central to the analysis – it would be absurd to suggest that the prevalence of subjective financial stress suddenly fell in western Europe and rose in eastern Europe when the richer and poorer halves of the continent were merged in the mid-2000s.

The strong version of the argument, in contrast, relies on the normative judgement that the leaders of every country, and the leaders of the EU itself, should make themselves aware of range of living standards available across countries within the Union for which they have a shared responsibility. It is a political question, to which the empirical evidence makes an interesting, but not necessarily decisive, contribution. And in this case the composition of the EU is central to the analysis: the perspectives and obligations of the better-off members of the former EU 15 were directly affected by the accession of the poorer new member states.

Because it is a political, rather than an empirical issue, this new analysis does not really change the conclusions drawn from a previous consideration of these issues, at that time confined to the EU15 (Berthoud 2004). The answer to the question of perspective may be an institutional one. Policy makers should adopt a framework appropriate to the scope of their responsibilities:

- When considering their own domestic policies, national governments should apply their own national benchmark.
- EU institutions, and national governments when addressing European issues, could consider the distribution of income across the Union, and measure poverty against a common benchmark.

Between-country inequalities could be seen as a European issue, even if within-country inequalities remained the responsibility of national governments.

**References**


Atkinson, A. (1998) *Poverty in Europe*, Basil Blackwell

Berthoud, R. (2004) *Patterns of Poverty across Europe*, Policy Press

Berthoud, R., Blekesaune, M. and Hancock, R (2006) *Are "poor" pensioners "deprived"?* DWP Research Report 364, Department for Work and Pensions

Berthoud, R. and Bryan, M. (2011) 'Income, deprivation and poverty: a longitudinal analysis', *Journal of Social Policy*, vol. 40, no. 1

Bryan, M and Jenkins, S. (2012), "Regression analysis of cross-national differences using multi-level data: a cautionary note", ISER Working Paper, University of Essex, forthcoming

Boarini, R. and Mira d'Ercole, M. (2006). 'Measures of material deprivation in OECD countries', OECD Working Paper No. 37: OECD

Delhey, J. and Kohler, U. (2006) 'From nationally bounded to pan-European inequalities: on the importance of foreign countries as reference groups' *European Sociological Review*, vol. 22, no. 2

Easterlin, R. (2001), 'Income and happiness: towards a unified theory', *Economic Journal*, vol 111, no. 473

Fahey, T. (2007) 'The case for an EU-wide measure of poverty' *European Sociological Review*, vol. 23 no. 1

Guio, A. (2005) 'Material deprivation in the EU', *Statistics in Focus* 21/2005, Eurostat

Kangas, O. and Ritakallio, V. (2007) 'Relative to what? Cross-national pictures of European poverty measured by regional, national and European standards', *European Societies*, vol. 9, no. 2

Marlier, E., Atkinson, A., Cantillon, B. and Nolan, B. (2007), *The EU and Social Inclusion: facing the challenges*, Policy Press

Pantazis, C., Gordon, D. and Levitas, R. (eds 2006) *Poverty and Social Exclusion in Britain: the millennium survey*, Policy Press

Ringen, S. (1988) 'Direct and indirect measures of poverty', *Journal of Social Policy*, vol 17

Runciman, W. (1966) *Relative Deprivation and Social Justice*, Routledge and Kegan Paul

Stevenson, B. and Wolfer, J. (2008) ‘Economic growth and subjective well-being: reassessing the Easterlin paradox’, *Brookings Papers on Economic Activity*

Townsend, P. (1979) *Poverty in the United Kingdom*, Penguin

Whelan, C. and Maître, B. (2009a) ‘The “Europeanisation” of reference groups: a reconsideration using EU-SILC’, *European Societies*, vol. 11 no. 2

Whelan, C. and Maître, B. (2009b) ‘Europeanization of inequality and European reference groups’, *Journal of European Social Policy*, vol. 19, no. 2

Zaidi, A. and Burchardt, T, (2005) ‘Comparing incomes when needs differ: equivalization for the extra costs of disability in the UK’, *Review of Income and Wealth*, vol. 51 no. 1

## Appendix: Details of national poverty rates and poverty lines, using three approaches

***Table A1 Poverty rates (plotted in Figure 6)***

| | Relative | Absolute | Predicted subjective |
|---|---|---|---|
| Austria | 8.8% | 0.0% | 0.4% |
| Luxembourg | 19.0% | 0.0% | 0.4% |
| Netherlands | 6.4% | 0.1% | 0.3% |
| Norway | 6.0% | 0.1% | 0.6% |
| Sweden | 7.7% | 0.1% | 0.5% |
| Ireland | 8.0% | 0.1% | 0.7% |
| Belgium | 10.9% | 0.2% | 1.5% |
| UK | 13.7% | 0.2% | 1.2% |
| Cyprus | 12.5% | 0.3% | 2.7% |
| Finland | 10.6% | 0.3% | 1.2% |
| Slovenia | 8.3% | 0.7% | 2.6% |
| Italy | 16.0% | 2.1% | 5.0% |
| Czech | 4.0% | 2.9% | 5.5% |
| Spain | 16.6% | 3.7% | 8.0% |
| Portugal | 15.1% | 11.2% | 15.8% |
| Hungary | 9.8% | 22.1% | 22.5% |
| Estonia | 11.3% | 28.7% | 27.1% |
| Poland | 17.4% | 35.6% | 34.4% |
| Lithuania | 12.5% | 37.9% | 34.2% |
| Latvia | 13.7% | 49.0% | 42.7% |
| Bulgaria | 15.0% | 75.4% | 57.8% |
| Romania | 20.4% | 82.7% | 67.2% |

***Table A2. Poverty lines (plotted in Figure 7)***

| | Relative | Absolute | Predicted subjective |
|---|---|---|---|
| Luxembourg | € 16,218 | € 4,580 | € 7,383 |
| Norway | € 12,784 | € 4,580 | € 6,772 |
| Netherlands | € 11,625 | € 4,580 | € 6,693 |
| UK | € 10,711 | € 4,580 | € 6,549 |
| Austria | € 10,862 | € 4,580 | € 6,522 |
| Sweden | € 10,690 | € 4,580 | € 6,427 |
| Finland | € 9,596 | € 4,580 | € 6,273 |
| Belgium | € 9,489 | € 4,580 | € 6,227 |
| Ireland | € 8,899 | € 4,580 | € 6,164 |
| Italy | € 8,850 | € 4,580 | € 6,074 |
| Cyprus | € 8,215 | € 4,580 | € 5,952 |
| Slovenia | € 7,632 | € 4,580 | € 5,821 |
| Spain | € 7,319 | € 4,580 | € 5,734 |
| Portugal | € 5,073 | € 4,580 | € 5,190 |
| Czech | € 4,852 | € 4,580 | € 5,104 |
| Hungary | € 3,657 | € 4,580 | € 4,606 |
| Poland | € 3,400 | € 4,580 | € 4,490 |
| Estonia | € 3,338 | € 4,580 | € 4,485 |
| Lithuania | € 2,998 | € 4,580 | € 4,342 |
| Latvia | € 2,462 | € 4,580 | € 4,089 |
| Bulgaria | € 1,894 | € 4,580 | € 3,699 |
| Romania | € 1,575 | € 4,580 | € 3,461 |