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The Evolution of Poverty in the European Union: Concepts, Measurement and Data

Koen Decancq, Tim Goedemé, Karel Van den Bosch & Josefine Vanhille

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ABSTRACT

This paper considers the measurement of poverty in the European Union (EU). Starting from a definition of poverty that is suitable for the European context, a flexible measurement framework is proposed based on the Foster-Greer-Thorbecke class of poverty measures. Three key issues need to be addressed in the measurement of poverty. First, one has to determine the appropriate metric of individual well-being. Second, a cut-off value or threshold needs to be established under which persons are considered to be poor. Third, it is necessary to outline an aggregation procedure to attain a poverty figure for society as a whole. In what follows, we discuss the different answers that are implicit in the poverty measures applied in this book* and the EU's social strategy. The EU Statistics on Income and Living Conditions (EU-SILC) are introduced as the main data source for poverty analysis in the EU. Finally, an illustration is provided of how the different conceptual choices in the measurement of poverty affect the empirical findings regarding the evolution of poverty between 2005 and 2009. It turns out that the selection of individual well-being metric and the choice between a county-specific and a pan-European poverty line strongly affect observed patterns of poverty in the EU.

* Cantillon, B. and Vandenbroucke, F. (eds.), *For Better For Worse, For Richer For Poorer. Labour market participation, social redistribution and income poverty in the EU*. Oxford: Oxford University Press (forthcoming).

1 INTRODUCTION

Eradicating poverty is arguably one of the greatest challenges facing mankind. In 2010, the European Commission identified as its fifth Europe 2020 target a 20-million decrease in the number of persons in or at risk of poverty and social exclusion within the next ten years. In order for such a quantitative target to make sense, a clear measure is required of poverty and social exclusion. Indeed, even if it is true that we tend to recognize extreme poverty when confronted with it, the abundance of definitions and measures of poverty in the specialized literature suggests that it is not so easy to pour such intuitions into an operational poverty measure. Yet, as the old motto goes: 'to measure is to know'. So before proceeding with the rest of this book, it is important to consider in greater detail not just the concept of poverty applied in the European Union (EU), but also how it is measured and on the basis of which data.

In fact, there is a long list of on-going conceptual discussions on the definition and measurement of poverty. What exactly do we mean by poverty? Is it a one-dimensional or a multidimensional phenomenon? Should the focus be on the severity of poverty or on the extent to which it manifests itself in different life domains? Where should the poverty line be drawn? Should it follow changes in the prevailing living standard? Should a single poverty line be applied across the EU or are country-specific lines preferable? Should one merely count the number of poor or also consider how the depth of poverty varies across the poor population?

The answers to such (complex) questions reflect our value judgements on the notion of poverty. Different people may disagree on how poverty is most appropriately defined and measured. Poverty has many faces, and hence different perspectives on poverty may lead to different empirical conclusions. In this paper, we identify some of the (implicit) value judgements underlying the various poverty measures applied in this book and the EU's social strategy. Further, we show how different initial choices ultimately lead to different empirical findings.

The measurement of poverty hinges heavily on the availability and quality of appropriate data. For this reason, this paper briefly reviews some of the methodological features of the main data source for measuring poverty in Europe, namely the EU Statistics on Income and Living Conditions (EU-SILC), and what they imply for the measurement of poverty.

This paper begins with a discussion of a poverty definition that is widely used in European policy circles. In the third section, this notion is translated into a suitable measurement framework based on the familiar Foster, Greer and Thorbecke (FGT) class of poverty measures. Three key issues pertaining to the measurement of poverty are discussed: the metric of well-being, the choice of the poverty line and the sensitivity to the distribution among the poor. The section concludes with a reflection on whether there is room for agnosticism on these issues, taking into account partial poverty orderings and robustness. Section four shows how the key poverty measures used in this book and in the EU's social strategy reflect specific answers to the conceptual questions posed. Subsequently, in section five, EU-SILC is introduced as a dataset for the measurement of poverty. Section six considers the empirical relevance of the three central questions identified in section three using EU-SILC data from 2005 and 2009. An overview of conclusions is presented in section seven.

2 DEFINING POVERTY

Given the focus in this paper on poverty in the European Union, let us first consider the poverty definition proposed by the Council of the European Communities (1975):

> 'Persons beset by poverty: individuals or families whose resources are so small as to exclude them from the minimum acceptable way of life of the member state in which they live'.

Many approaches to the measurement of poverty tie in with the above definition and similar definitions have been proposed by other authors, including Townsend (1979). The proposed definition of poverty has three notable features. First, it refers to a lack of resources, suggesting that poverty is a situation that is forced upon people, rather than being a matter of free choice. The list of relevant resources can be defined restrictively or more broadly, so as to include not only cash and other incomes, wealth and services, but also human resources, such as health and education, and social capital. Second, the notion of a minimum acceptable way of life can likewise be understood in a narrow sense or more broadly, in terms of, for example, Sen's notion of basic 'functionings' or 'capabilities'. Functionings are the doings and beings of individuals, such as being healthy, having a good job, being safe, having a decent standard of living, being able to appear in public without shame and so on. The capabilities are the set of potential functionings that a person can obtain (Sen, A., 1983, 1985a). Further, the definition implies that what is regarded as the minimum acceptable way of life can vary from one country to another, and that the level of resources needed to achieve that way of life can change as societies become wealthier or poorer (see Goedemé and Rottiers (2011) for a recent discussion).[1] Finally, it should be noted that the above definition aims at identifying the poor at the individual level. In order to determine poverty at the societal level, which ultimately is the aim of this paper, individual poverty needs to be aggregated to an overall poverty figure.

In the Europe 2020 target, as well as the current European discourse, poverty is often linked to the notion of 'social exclusion'. Social exclusion is a broader, more encompassing and arguably vaguer concept than poverty. The European Commission (2004: 10) defines social exclusion as 'A process whereby certain individuals are pushed to the edge of society and are prevented from participating fully by virtue of their poverty, or lack of basic competencies and lifelong learning opportunities, or as a result of discrimination. This distances them from job, income and education opportunities as well as social and community networks and activities. They have little access to power and decision-making bodies and thus often feeling powerless and unable to take control over the decisions that affect their day to day lives.' The wide scope and vagueness of the notion social exclusion means that it can encompass many different concerns and fit into divergent, even conflicting, political agendas. At the same time, though, these characteristics undermine its analytical usefulness (Atkinson et al., 2002: 3; Daly, 2010). Hence, the focus in the present paper is on the notion of poverty.

Furthermore, in the European discourse since the 2001 Laeken summit, the notion of poverty has received the epitheton 'at risk of'. This prefix may seem to suggest an underlying probabilistic analysis of a person's likelihood of becoming poor (as is customary in the literature on vulnerability; see Ligon and Schechter (2003)). This is not the case however. The prefix is in fact motivated by the current (political) disagreement on how the complex and multidimensional concept of poverty should be translated into a single indicator (see also Daly, 2010, who argues that the term 'at risk of poverty' actually destabilizes the very meaning of poverty). Some of the relevant points of disagreement are discussed in the next section. Suffice it to say at the moment that the phrase 'at risk of poverty' will be reserved for the official headline poverty indicator (see textbox 1 for a precise definition). The next section concludes with an explicit treatment of the room for agnosticism and disagreement in relation to poverty as a concept.

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[1] Traditionally, this issue is referred to as the 'relativity' of poverty. There have been heated discussions in the literature whether poverty is indeed relative. See, for instance the exchange between Amartya Sen and Peter Townsend in *Oxford Economic Papers* in 1985 (Sen, A., 1983, 1985b; Townsend, 1985).

TEXTBOX 1: THE AT-RISK-OF-POVERTY INDICATOR

Being at-risk-of-poverty means living in a household with an equivalized net disposable household income below 60% of the national median equivalized net disposable household income. The net disposable household income is equal to the sum of the income of all household members net of taxes. More precisely, it includes cash or near-cash employee income, company cars, cash profits or losses from self-employment (including royalties), social benefits, income from rental of a property or land, regular inter-household cash transfers received, interests, dividends, profit from capital investments in unincorporated business; minus regular taxes on wealth, regular inter-household cash transfer paid, and tax on income and social insurance contributions.

Total net disposable household income is equivalized using the modified OECD equivalence scale. This scale attaches a weight of 1 to the first adult, a weight of 0.5 to all other household members aged 14 and over, and a weight of 0.3 to household members under the age of 14. The equivalized household income is obtained by dividing total household income by the sum of the individual equivalence weights. All household members are attributed the same equivalized household income. In other words, it is assumed that the living standard of all household members is the same.

Subsequently, the median equivalent net disposable household income is estimated at the individual level for each Member State. Persons with an equivalent net disposable household income below 60 per cent of the median are considered to be at risk of poverty.

In all countries except Ireland and the United Kingdom, the income reference period is equal to the calendar year preceding the survey year, which means that information on the composition of the household (and the equivalence scale) does not always correspond to the income information. In Ireland, the income reference period consists of the twelve months preceding the interview, whereas in the United Kingdom current income is multiplied by 52 or 12 (depending on whether it is provided as a weekly or a monthly amount). More information on this and other EU-SILC-based indicators can be found in Atkinson et al. (2002), Marlier et al. (2007) and on the Eurostat website*.

*http://epp.eurostat.ec.europa.eu/portal/page/portal/income_social_inclusion_living_conditions/introduction

3 MEASURING POVERTY

Once an appropriate definition of poverty has been formulated, the next step is to translate this definition into a computable poverty measure. In practice, a wide variety of such poverty measures is used. Some are remarkably simple, others are quite complex. In this paper, we use a framework for the measurement of poverty that incorporates most of the commonly used approaches in the literature.[2]

3.1 A FRAMEWORK FOR THE MEASUREMENT OF POVERTY

[2] See Foster (1984), Seidl (1988) and Zheng (1997) for more comprehensive surveys on the measurement of poverty.

Let $X=(x_1, \dots , x_i, \dots , x_n)$ be a vector containing an indicator of well-being x_i for each of the n individuals in a society. A poverty measure attributes to each vector X a number reflecting the magnitude of poverty in that society. In this paper, we make use of the popular class of poverty measures introduced by Foster et al. (1984). These measures have the following mathematical structure:

$$P_\alpha(X) = \frac{1}{n}\sum_{i=1}^{n} \max\left\{\left(\frac{z - x_i}{z}\right), 0\right\}^\alpha ,$$

where z is the poverty line and α is a parameter capturing the 'sensitivity to the distribution among the poor'. The expression $\left(\frac{z - x_i}{z}\right)$ measures the individual normalized poverty gap, which is the distance between the well-being of person i and the poverty line z, normalized by the poverty line itself. To obtain a measure of overall poverty in the society, these normalized poverty gaps of all poor individuals are taken to the power α and then averaged. This class of poverty measures has some attractive properties, such as *additive decomposability* (Foster, J. et al., 1984, 2010).[3]

In the remainder of this section, the focus is on the three main building blocks of the above formula, i.e. x_i , z and α. Each of these building blocks captures a fundamental question about the measurement of poverty. While these questions may be distinct, their answers are related. First, x_i is an indicator of individual well-being. In order to be able to say anything sensible about the measurement of poverty in a society, one first needs to ask the question: 'Poverty of what?' In other words, poverty needs to be measured in an appropriate *metric* of well-being. Such a metric of well-being may be one-dimensional or multidimensional. Second, a poverty line z needs to be fixed so that a group of individuals is identified as poor. This is the *identification* step. Various methods exist to distinguish the poor from the non-poor. As will become apparent, the selection of an appropriate poverty line in the context of the EU poses some additional challenges. Third, the magnitude of poverty among the individuals of a society should be *aggregated* to an overall poverty figure for that society. The parameter α plays an important role in this final aggregation step and gives expression to the sensitivity of the measure to the distribution among the poor. Moreover, it allows one to focus straightforwardly on various aspects of poverty, such as its incidence, depth and severity.

An aspect that is not covered by the proposed class of poverty measure is poverty's persistence over time. In this paper, however, the focus is on the measurement of poverty based on cross-sectional data, hence intertemporal aspects are beyond its scope.

3.2 SELECTING A METRIC OF WELL-BEING

First, an appropriate metric of well-being for measuring poverty needs to be selected. In this respect, one can distinguish between one-dimensional approaches (where the relevant information on individual well-being consists in a single indicator) and approaches that are multidimensional (where

[3] An additive decomposable poverty measure increases when *ceteris paribus* the poverty in a subgroup of the population increases (the larger the population share, the larger the impact). This is a desirable property for a measure of European poverty. Indeed, it is preferable that a European poverty measure should increase with an increase in poverty in any Member State. However, additive decomposability comes at a price: additive decomposable measures are blind for some of the social aspects of poverty, such as considerations about the rank of an individual in the society (see Bosmans (2011) for an overview on an alternative class of rank-dependent poverty measures).

individual well-being is expressed by means of a vector rather than a single indicator). Let us first consider the one-dimensional approaches.

3.2.1 One-Dimensional Approaches

Most empirical poverty estimations use either income or expenditure to assess an individual's poverty status. The question of what is the most appropriate one-dimensional metric has been the subject of extensive discussion in the literature. Given the emphasis in the definition of poverty on the lack of *resources*, income seems a natural choice. Yet, as income-based measures often neglect assets and savings, many consider it counter-intuitive to identify as poor an individual who is temporarily income-poor but able to maintain a high level of consumption. Indeed, through saving and borrowing, an individual may be able to smooth consumption over time, so that current total expenditure may be a better proxy than current income for their real (life-cycle) economic resources and therefore also a more suitable way of assessing an individual's poverty status (Slesnick, 1993; Chaudhuri and Ravallion, 1994; Deaton, 1997). The extent to which individuals actually smooth their consumption is an empirical matter. After a review of research on the topic, Deaton (1992: 218) concludes: 'there is much less evidence for low-frequency smoothing, with consumers using assets or loans to smooth their consumption in the face of long-term or life-cycle fluctuations in income.' This suggests that, in practice, results obtained through income-based poverty measures may not be misleading, provided that the reference period for income is not unduly short.

Pragmatically, there are some additional considerations to take into account when choosing between income or consumption as a one-dimensional metric of well-being. Consumption or expenditures are more commonly used to assess an individual's poverty status in developing countries, since income is often harder to measure in such contexts (Ravallion, 2010: 2). However, in large-scale surveys in developed countries, income data are more easy to collect than expenditure data. Also EU-SILC, the standard data-set for poverty analysis in the EU (see section five), provides only income data, so that almost all recent comparative poverty analyses for the EU are based on such information.

When opting for income as the metric of well-being, a number of additional specifications need to be made in relation to the relevant time span, the exact income concept, the intra-household distribution, and any correction for differences in household needs. In what follows, these aspects are discussed consecutively.

The Expert Group on Household Income Statistics, also known as The Canberra group (2001), has made some recommendations for internationally and inter-temporally harmonized and comparable statistics on household income. First, it recommends a reference period for household income of one year. A sufficiently long reference period reduces the impact of short-term fluctuations, but it also poses higher demands on survey respondents.[4] Moreover, the longer the reference period, the less effective is retrospective questioning (Debels and Vandecasteele, 2008).

Second, the Canberra group recommends a definition of the concept of disposable income as summarized in Table 1 (see also section six). One may want to go a step further by including in-kind income components, especially social transfers through health care and education. The question of

[4] A number of studies assess the effects of opting for monthly or annual income reference periods, with mixed evidence. Böheim and Jenkins (2006) find little effect of the income reference period on accuracy, while the monthly measure outperforms the yearly income concept according to Cantillon et al. (2003).

how disposable income can be extended beyond its cash components is discussed at length in, for instance, Verbist and Matsaganis (forthcoming).

TABLE 1: RECOMMENDED DEFINITION OF DISPOSABLE HOUSEHOLD INCOME

	Employee cash and near-cash income (wages, salaries, bonuses...) including the cash value of 'fringe benefits' (goods and services provided to the employee as part of employment)
+	Income from self-employment (profits/losses from unincorporated business, royalties)
+	Net value of home production (for barter or consumption)
+	Imputed rent for owner-occupied dwellings
+	Net income from rentals
+	Property income (interest and dividends received less costs paid)
+	Current transfers received: Social insurance benefits from employers or government schemes Universal or means-tested social assistance benefits Pensions received from individual private plans Regular inter-household cash transfers received or support received from non-profit institutions
=	TOTAL INCOME
-	Current transfers paid: Employers' social insurance contributions Employees' social insurance contributions Taxes on income Regular taxes on wealth Regular inter-household cash transfers paid (e.g. to other households or charities)
=	DISPOSABLE INCOME

Source: adapted from Table 2.1 in The Canberra Group (2001: 18).

Although the measurement framework is formulated at individual level, data limitations often force poverty researchers to measure poverty at household level. Typically, only the overall income or expenditure level for the household is observed, without further information on the intra-household distribution of resources. Therefore, one often proceeds on the basis of the assumption of equal sharing or full income pooling within the household. This approximation is obviously problematic in contexts where household resources are not shared equally and may lead to considerable underestimations of poverty among certain vulnerable groups, such as children (see for instance Burton et al. (2007); Dunbar et al. (2012)).

Finally, one may want to correct for differences in household needs when measuring poverty. To obtain a comparable measure of income across divergent households, equivalence scales are applied to disposable income, aligning the income concept and the needs associated with its use. Equivalence scales are most widely used to adjust for household composition: the needs of a

household grow with the number of household members, but arguably not proportionally.[5] Needs for space, electricity and other shared goods have substantial economies of scale. To correct for such economies, household income and expenditure are divided by an equivalence scale, leading to so-called equivalized incomes. Much has been written on what are the most appropriate equivalence scales (see for instance Buhmann et al. (1988); Coulter et al. (1992a, 1992b); de Vos and Zaidi (1997)). Moreover, economies of scale are likely to vary across the income distribution, time and place. However, it is standard practice in empirical poverty research to use the so-called modified OECD scale, which assigns a value of 1 to the household head, 0.5 to each additional adult member and 0.3 to each child.

3.2.2 MULTIDIMENSIONAL APPROACHES

One may want to go even further and also correct for other factors differentiating between households beyond their monetary resources and size. Furthermore, resources in other domains of life (such as health) are not freely exchangeable for monetary resources, or the resulting prices might not be appropriate for poverty analysis. If one wishes to take such additional information into account, individual well-being can no longer be described by a one-dimensional indicator. Inevitably, the measurement of poverty becomes multidimensional. In their report for the Commission on the Measurement of Economic Performance and Social Progress, Stiglitz, Sen and Fitoussi (2009: 14) assert that, 'to define what well-being means, a multidimensional definition has to be used', while Narayan (2000) shows on the basis of a large-scale survey that the global poor likewise perceive well-being and poverty as multidimensional notions.

In a multidimensional approach, individual well-being x_i is described by a vector of outcomes rather than by a single indicator. Let us assume that there are m dimensions of well-being, so that $x_i = \left[x_i^1,...,x_i^j,...,x_i^m\right]$ where x_i^j gives the outcome of person i in dimension j. The formula of the FGT, however, needs to be modified in order for it to capture this multidimensionality. Broadly speaking, two options present themselves.

First, one can apply the one-dimensional FGT to each of the m dimensions separately. This is a dimension-by-dimension approach leading to a dashboard or portfolio of m poverty indicators (one for each dimension). An example of such a portfolio of indicators is the set of common indicators for social inclusion agreed at the 2001 Laeken summit (see section 4 of this paper and Atkinson et al. (2002); Marlier et al. (2007) and Daly (2010) for more details). A portfolio has the advantage of covering a complex and multidimensional reality while offering the possibility to focus on each of the indicators in detail. Under the assumption that the outcomes in the different dimensions of well-being cannot be compared or if the aim of the analysis is to evaluate the impact of specific policies, a dashboard approach would seem appropriate (see Ravallion (2011) for a defence). However, such a dimension-by-dimension approach by definition excludes information on the correlation structure between the different indicators. The concern of whether or not the same persons fall below the poverty line in the various dimensions is a key motivation for adopting a multidimensional approach in the first place. Pogge (2002: 11) writes: 'Consider institutional schemes under which half the population are poor and half have no access to higher education. We may plausibly judge such an order to be more unjust when the two groups coincide than when they are disjoint (so that no one bears both hardships)' (see Decancq (2009) and Ferreira and Lugo (2012) for similar arguments).

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[5] When in-kind incomes are included in the income concept, the principle of equivalence scales should also be applied to this dimension, in order to correct for differing needs in, for example, health care and education, see for instance Verbist and Matsaganis (forthcoming).

In order to be able to take due account of the correlation between the indicators, an alternative approach is required that begins with the construction of a well-being index for each individual.[6] These individual well-being indices can subsequently be used as x_i variable in a FGT formula (see, for instance, Alkire and Foster (2011)). The question then becomes how to select an appropriate index of individual well-being that aggregates the various outcomes. Designing such an index echoes the eternal philosophical debate on the Aristotelian question regarding the nature of the 'good life' (see also Rawls (1971: 80)). In practice, one has to make three interdependent choices in the construction of a well-being index (Decancq et al., 2009; Decancq and Lugo, 2013). The first choice concerns the *transformation* of the outcomes in the various dimensions. Especially if the outcomes involve different measurement units, they need to be transformed or standardized, to allow reasonable comparison and aggregation. The second question relates to the relative *weight* given to the different outcomes. These weights play a crucial role in determining the trade-offs implied by the well-being index. If one dimension is assigned a greater weight, for example, then a higher outcome is required in the other dimensions to compensate for a loss in the former. For reasons of agnosticism or simplicity, the weights are often set equally in empirical analyses.[7] The complex question of which dimensions to select in a multidimensional analysis is a particular case of the weighting problem. Indeed, not selecting a certain dimension is equivalent to attributing it a weight of zero. Finally, an *aggregation* procedure needs to be agreed for aggregating the different standardized and weighted outcomes into a single index. Typically, the method chosen is an additive averaging procedure, which presupposes perfect substitutability between the dimensions, but alternatives with more restricted substitutability are conceivable, for example through multiplicative averaging (as in the new version of the HDI, UNDP 2010).[8]

A rather crude but empirically attractive example of a multidimensional poverty approach is the so-called *counting approach* (see, for instance, Atkinson, 2003; Alkire and Foster, 2011). In a counting approach, the outcomes in each dimension are collapsed to a binary scale (taking either the value 0 or 1). These binary values are then (equally) weighted and added, so that a well-being index is obtained that boils down to counting the number of dimensions in which the binary scale takes the value 1. Recent theoretical work on the counting approach has rediscovered and given substance to the old practice in the sociological literature of counting the number of deprived dimensions as a measure of the *width* of poverty (Mack and Lansley, 1985; Vranken, 2002). An example of this approach is the European indicator of material deprivation (e.g. Guio, 2005b, 2009) described in detail in textbox 2.

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6 Such an approach is implicit in the multidimensional analyses by Tsui (2002), Bourguignon and Chakravarty (2003), Maasoumi and Lugo (2008), Alkire and Foster (2011) and the references therein. Thorbecke (2008) provides a survey .

7 Decancq and Lugo (2013) survey various approaches to selecting an appropriate weighting scheme, classifying them as either data-driven, normative or hybrid. Decancq et al. (2011) present an empirical application based on Flemish data where equal weighting receives little support in a simulated voting procedure on alternative weighting schemes among affected individuals.

8 The outcomes in a multidimensional poverty analysis are typically measures of functionings such as indices of living standards, health and level of education. However, one can apply the same multidimensional toolbox to measure chronic poverty if the outcomes are well-being levels in various points in time (Foster, J., 2009).

TEXTBOX 2: SEVERE MATERIAL DEPRIVATION

Severe material deprivation is measured by an index of nine items relating to financial stress and the enforced lack of a list of durables (see the table below). All persons living in a household which, at the moment of the interview, is deprived on at least four out of nine items are considered to be severely materially deprived. The list of items and the threshold are the same across all EU Member States. This indicator is currently under revision and will contain an updated and extended list of items by 2015. Guio (2009) provides extensive background information on the current indicator and Guio et al. (2012) present an extensive analysis in preparation of the new indicator of material deprivation.

TABLE 2: ITEMS OF THE MATERIAL DEPRIVATION INDICATOR

Item	The household…
1	has been in arrears on mortgage, rent payments, utility bills, hire purchase installments or other loan payments over the last 12 months
2	does not have the capacity to afford paying for one week annual holiday away from home
3	does not have the capacity to afford a meal with meat, chicken, fish or vegetarian equivalent every second day
4	does not have the capacity to face unexpected financial expenses equal to the at-risk-of-poverty threshold (monthly average) estimated on the basis of EU-SILC of two years ago
5	cannot afford to keep the home adequately warm
6	does not have a telephone because it cannot afford it
7	does not have a colour TV because it cannot afford it
8	does not have a washing machine because it cannot afford it
9	does not have a car because it cannot afford it

3.3 FIXING THE POVERTY LINE

Given a particular metric of well-being, the poverty line identifies those who are to be considered as poor. Where to draw the poverty line is a matter of value judgements and, taking into account the poverty definition applied, should reflect society's views on what are acceptable and unacceptable levels of well-being.

3.3.1 Different Methods for Fixing the Poverty Line

There are a number of methods to determine the poverty line.[9] This subsection outlines those methods and considers their merits in respect of constructing an EU poverty measure (see Deleeck et al. (1992: 3-5) and Atkinson et al. (2002: 83-98) for more extensive discussions).

Administrative or statutory lines. These poverty lines are equal to the minimum income support offered under the prevailing social security or social assistance system. In some countries, the resulting thresholds might have a prima-facie legitimacy, based upon the assumption that they reflect a political consensus (or at least a majority view) on the minimum level of income acceptable in a particular society. However, the question of whether a guaranteed minimum income suffices to keep persons out of poverty cannot be answered if a statutory poverty line is applied. It is moreover difficult to argue that such country-specific thresholds can be used for cross-country comparisons, particularly in view of the practical complication that some countries do not even have a minimum guaranteed income (e.g. Van Mechelen et al., 2011). Although this approach has been used extensively in the United Kingdom (cf. Morris and Preston, 1986 and references therein) and occasionally in cross-national studies (e.g. Gustafsson and Lindblom, 1993), it has fallen in disuse for the reasons mentioned above.

Statistical lines. Under the statistical method, the poverty line is defined as a function of the underlying distribution, often a certain percentage of median or mean household equivalized income. This is the method most commonly applied in cross-national research on income poverty in the developed world, most likely because it requires no information other than micro-data on household income. Statistical lines can differ in their reliance on the mean or the median, and in the setting of the particular percentage. As far as the EU poverty indicators are concerned, the median is preferred to the mean, because it is less sensitive to outliers and extreme observations, unaffected by top-bottom coding, and less sensitive to sampling error (Atkinson et al., 2002: 94). The percentage is largely arbitrarily chosen, but 40, 50 and 60 % seem the most commonly applied thresholds. The EU headline at-risk-of-poverty indicator uses 60 % of the median equivalized disposable income as a poverty line (see textbox 1 for more details).

Subjective lines. Subjective poverty lines are based on the responses of survey participants to questions such as: 'What is the minimum income with which your household could make ends meet?' While the answers to this question correlate quite strongly with income, methods have been designed to derive an estimate of the poverty line that is unbiased by this correlation (Goedhart et al., 1977; Hagenaars, 1985; Deleeck et al., 1992). Unfortunately, the resulting poverty lines vary from country to country, according to patterns that are not only difficult to explain but also unstable over time. One problem is that results are sensitive to small changes in the wording or placement of the survey questions (Van den Bosch, 2001, provides a review). This is presumably why subjective poverty lines have fallen into disuse in the course of the past decade (Vrooman, 2009).

Budget standards. Budget standards have been used in pioneering poverty studies by Rowntree (Rowntree, 2000 [1901]) and others. A budget standard is a specific basket of goods and services which, when priced, can represent a particular standard of living for a reference household in particular circumstances and with particular characteristics (Bradshaw, 1993). In principle, the method is simple: first one draws up a list of goods and services that are deemed indispensable; then one estimates the lifespans of the goods and corresponding prices; and finally one adds up the

[9] For more detailed information, see the surveys by Callan and Nolan (1991), Ravallion (1994), Van den Bosch (2001) and Vrooman (2009).

resulting amounts. In practice, however, this is of course 'a ghastly chore' (Bradshaw, 1993: 236). A variety of sources of information is used in the selection of items, including other budgets, expert opinion, actual spending patterns, public opinion, and value judgements.

Budget standards have been put forward recently in various European countries (see Storms et al. (2011) for a review). To date, no attempt has however been made to define budget standards that allow comparison between countries (although Storms et al. (2011) do formulate a proposal in this respect). As budget standards are specific to the characteristics and circumstances of the reference households, it is not self-evident to use budget standards as a poverty line for sample survey data. However, budget standards are useful for validating poverty lines derived from other methods, in particular the statistical method. For Belgium, a budget standard for 2008 turned out to be surprisingly close to 60 % of median household equivalized income (Storms and Van den Bosch, 2009). It would be interesting to repeat such an exercise for other countries, in particular for the newly acceded EU Member States with lower average incomes (Goedemé and Rottiers, 2011).

Finally, the use of a multidimensional metric of well-being requires either to set a dimension-specific poverty line (for a dimension-by-dimension approach) or to select a cut-off value of the obtained well-being indices that distinguishes poor from non-poor persons. In the counting approach, one typically selects a number of deprived dimensions as poverty line. For the severe material deprivation index, this cut-off is 4 dimensions (see textbox 2 for more details, and Nolan and Whelan (2011a) for a critical appraisal of this choice).

3.3.2 Fixing a Poverty Line for the European Union

Unlike in the case of the official US measure of poverty (Orshansky, 1965, 1969; Blank, 2008), most poverty analyses for the EU define the poverty line in relative and in national terms, taking 50 % or 60 % of the country-specific median income as a poverty line (i.e. a statistical approach). [10] Over time, such poverty lines fluctuate as the median changes. As explained above, though, this choice is just one of several alternatives, and it should therefore be open to public scrutiny and debate (Atkinson et al., 2002; Kangas and Ritakallio, 2007). In what follows, three particularities are discussed of the standard practice in the EU of choosing a *floating*, *relative* and *country-specific* poverty line, as opposed to the American approach of setting a *fixed*, *absolute* and *pan-US* poverty line (see also Besharov and Couch, 2012).

Floating. A poverty line that is allowed to fluctuate in real terms is called a floating poverty line. A poverty line that, on the contrary, is kept constant in real terms is a fixed poverty line anchored at a point in time, or an anchored poverty line for short. An anchored poverty line is only adjusted over time for changes in the price level. Some circumspection is in place when interpreting poverty figures obtained with a floating poverty line. After all, with a floating poverty line, it is conceivable that a decrease in the well-being of all poor persons is cancelled out by a simultaneous lowering of the poverty line, which may in itself lead to a declining poverty figure.[11] On the other

[10] See, among others, Zaidi and de Vos (2001); Atkinson et al. (2002); European Commission (2002, 2007, 2009); Marlier et al. (2007); OECD (2008) ; Bäckman (2009); European Commission, 2009. Notten and de Neubourg (2011) provide a comparison of the two approaches for the US and 15 EU Member States.

[11] This was the case, for example, in Finland during the early 1990s: the economic crisis led to a decrease in the floating poverty line and hence poverty supposedly decreased notwithstanding the decline in living standard at the bottom end of the income distribution (cf. Halleröd and Heikkilä, 1999; Ministry of Social Affairs and Health, 1999). In a number of countries, most notably Estonia and Latvia, a similar mechanism seems to have been at play during the current economic crisis (Eurostat on line database, last accessed 20 Dec. 2011).

hand, anchored poverty lines may fail to capture possible changes in the perception of the minimum acceptable living standard in a given society, since they are fixed at construction.

Relative. A poverty line expressed as a percentage of the median varies when the income distribution changes (hence it is not anchored and is floating by definition). Such poverty lines are commonly referred to as relative poverty lines, for obvious reasons. Alternatively, a poverty line may also be conceived as a physiological minimum for human survival, which typically does not vary with a changing income distribution. Such absolute poverty lines may fluctuate, though, with price evolutions of the items necessary to attain the physiological minimum. Ravallion (2010) characterizes poverty lines that are defined as a percentage of the median as 'strongly relative', which at once implies an important drawback: a strongly relative poverty line would ultimately approximate to zero in a situation where an entire population becomes extremely poor. Zheng (1997) hints at a potentially counter-intuitive anti-poverty policy that aims at simply deleting some of the non-poor incomes around the median. Atkinson and Bourguignon (2001) therefore propose a 'weakly relative' poverty line somewhere in between the two extremes of an absolute and strongly relative poverty line. In this approach, an absolute poverty line is applied up to a certain threshold and a strongly relative one is used above that threshold. This notion has been further generalized by Ravallion and Chen (2011).[12]

Country-specific. Three different arguments have been put forward in favour of an EU-wide rather than a country-specific poverty line (see Goedemé and Rottiers (2011: 78-79); and Nolan and Whelan, (2011b: 207-210), as discussed below.

First, poverty figures on the basis of country-specific poverty lines may be adequate for distinguishing poor groups within single Member States, but they sketch only a partial picture of the variation in living conditions and poverty across the EU: the purchasing power of the poor in the less affluent Member States is generally lower than the purchasing power of the poor in the richer EU Member States (see for example Lelkes et al., 2009: 23). On this basis, some authors have argued that these poverty figures are not fully comparable cross-nationally and lead to an underestimation of poverty in the less wealthy Member States (see for example Guio, 2005a, 2005b; Beblavy and Mizsei, 2006; Juhász, 2006: 100-101).

Second, it has been contended that the group of persons with whom living standards are compared, i.e. the reference group, is of crucial importance for the measurement of poverty (or social stratification in general) and that reference groups have to a large extent Europeanized (Förster et al., 2004; Delhey and Kohler, 2006; Fahey, 2007; Whelan and Maître, 2009).[13]

A third argument for a Europeanized poverty line comes from Brandolini (2007) and Fahey (2007), who contend that, even if reference groups were not strongly Europeanized, the national at-risk-of-poverty rate would still miss an important aspect of the heterogeneity and social cohesion in the EU as well as the social dimension of European unification. Therefore, poverty should also be calculated using an EU-wide poverty line (see also Marlier et al., 2007: 153-155).[14]

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[12] Recent questionnaire surveys eliciting perception of poverty have shown relativist concerns to be widespread among respondents, particularly in coexistence with absolutist concerns (Corazzini et al., 2011).

[13] Goedemé and Rottiers (2011), stress however that a distinction should be made between reference groups used for evaluating one's own living standard (i.e. privately-oriented reference groups), and reference groups used for defining what should be the minimum acceptable living standard for society at large (i.e. publicly-oriented reference groups). Even if the latter seem more relevant, the existing literature focusses on the former privately-oriented references groups. The Europeanization of the publicly-oriented reference groups is still an open question for further research.

[14] A poverty index based on an EU-wide poverty line satisfies the property of *subgroup anonymity*. This means that moving a person between subgroups (i.e. countries) with no change of well-being does not affect overall poverty (Ravallion, 2008). Again, whether or not this is an attractive property for a poverty measure is a matter of debate.

3.4 AGGREGATION BEYOND THE HEADCOUNT

When an appropriate metric of well-being and a poverty line separating the poor from the non-poor have been selected, aggregation is required to arrive at a single measure of the extent of poverty in a society as a whole.

The headcount poverty measure *H* is an obvious candidate for this aggregation. It is simply the percentage of poor persons in a given society.[15] The *headcount* can be obtained by setting *α=0* in the definition of P_α (so that P_0=H). As an indicator, it is easy to interpret and communicate, and by far the most popular measure of overall poverty, but it is obviously a crude index (Watts, 1969; Sen, A., 1976). It also has some unattractive properties, especially when used as a policy target. Consider the example of a policymaker who aims at maximally reducing poverty with a limited anti-poverty budget. How should he or she best spend the available funds? Well, if the extent of poverty is expressed in terms of a headcount, then it makes sense for him to focus on the better-off poor, as this offers the best chance of lifting a maximum number of individuals out of poverty (Bourguignon, François and Fields, 1990). Furthermore, an unchanged headcount of people below the poverty line may conceal a sharp rise in the extent of shortfall from the poverty line.

A natural alternative is to use the income gap ratio I, which is the average normalized amount by which poor incomes fall below the poverty line.[16] One easily checks that setting *α=1* in the definition of P_α, leads to the overall (normalized) income shortfall divided by the total population (hence $P_1=HI$). Let us return to the example of the policymaker intending to reduce poverty with a limited anti-poverty budget. Using P_1 as a poverty target, clearly it does not matter which poor the policy measures are aimed at, as overall poverty will decrease with the same amount. Conversely, a policymaker may wish to spend the available anti-poverty budget on the poorest of the poor. Bourguignon and Fields (1990) show that such a policy is optimal whenever a poverty measure P_α with *α>1* is used as a target. This is the case, for example, when α equals 2 such that the poverty gaps are weighted by the poverty gaps themselves (Foster, J. et al., 1984, 2010). When α goes to infinity, only the poorest person matters for the measurement of poverty (reflecting a Rawlsian perspective).

In general, the parameter *α* may be interpreted as the extent of 'poverty aversion'. The larger *α*, the greater the impact of the condition of the poorest of the poor on the overall measurement of poverty. Alternatively, α may be interpreted as 'the elasticity of individual poverty with respect to the normalized poverty gap', so that a one-per cent increase in the individual poverty gap results in an α-per cent increase poverty level of the individual (Foster, J. et al., 2010). One of the practical advantages of the Foster-Greer-Thorbecke class of poverty measures P_α is that the same class of measures allows the researcher to switch easily to the most appropriate perspective given the problem at hand. One can focus on the *incidence* or *prevalence* of poverty by setting *α=0*, on its *depth* by setting *α=1*, or on its *severity* by *α=2*. By now, this terminology has become the standard in the studies of international institutions such as the World Bank, so that P_α has assumed a prominent role as a class of poverty measures (Ravallion, 1994).[17]

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15 The headcount (and all other measures belonging to P_α) is a so-called *replication invariant* poverty measure. Cloning all persons in a society (poor and non-poor) would not affect the extent of poverty in that society. This property allows a meaningful comparison of poverty across societies with different population sizes. Yet, alternatives have been proposed, focusing on the number of poor persons in the society rather than the percentage (Subramanian, 2002).

16 *I* is defined here in terms of *incomes*. It is obvious that the definition can be applied irrespective the chosen metric of well-being.

17 An alternative graphical representation of the incidence, intensity and inequality dimensions of aggregate poverty is provided by the so-called Three I's of Poverty (TIP) curve (Jenkins and Lambert, 1997).

3.5 ROBUSTNESS AND PARTIAL POVERTY ORDERINGS

As demonstrated above, in order to be able to select the most appropriate poverty measure from the extensive toolbox available, at least three (difficult) questions need to be answered. What is the appropriate metric of well-being? Where to draw the poverty line? And how to aggregate poverty figures to society level? The answers to these questions depend to a large extent on value judgements regarding the notion of poverty itself. Hence, it is unlikely that unanimity could ever be reached on these issues. Furthermore, even when value judgements are shared, additional problems can arise due to a lack of accurate data. As mentioned before, the fact that the epithet 'at-risk-of' has been added to the headline poverty measures in the EU may be seen to reflect these difficulties.

Rather than to look for unequivocal answers to the three aforementioned questions, one can look for ranges of reasonable answers and empirical indications of the evolution of poverty that are robust for all choices within the selected range (as we do in the sixth section of this paper). The following (hypothetical) example clarifies this approach. Four co-authors may disagree on where exactly to set the poverty line, yet agree that it should be set somewhere between 40% and 70% of median disposable income. To resolve their dispute, they might decide to adopt an agnostic perspective and compute poverty for any poverty line within this range. However, agnosticism comes at a price. Consider the unfortunate case where poverty has increased for all poverty lines up to 64% of median disposable income, but decreased for all higher poverty lines.[18] Without narrowing the range of relevant poverty lines (say, to 57%-63%), the four co-authors will not be able to unambiguously ascertain whether poverty has increased or decreased.

To allow for such disagreements, partial poverty orderings may be applied. Partial poverty orderings require unanimous poverty rankings for a class of poverty measures or a range of poverty lines (see Zheng, 2000, for a survey). As illustrated above, they cannot order any pair of societies, but where they can, they provide strong results (see also Sen (2009) on the usefulness of partial orderings in welfare economics in general).[19]

Furthermore, one may want to remain agnostic on the metric of well-being. In several EU Member States, a consistent poverty approach has been introduced whereby individuals are said to be consistently poor only if they are both income-poor *and* poor according to the material deprivation index (Förster, 2005; Nolan and Whelan, 2011b).[20] The four co-authors, who furthermore disagree on the most appropriate metric of well-being, will agree that consistently poor persons should be considered to be poor. They will also agree that a person who is non-poor according to both criteria is not poor. They may well disagree, however, on the status of individuals who are poor according to one criteria but not the other.

The consistent poverty approach requires that both conditions are fulfilled (hence it is a so-called 'intersection' approach to multidimensional poverty, see Duclos et al. (2006)). In contrast, the Europe 2020 procedure reflects a 'union' approach, where a person is considered poor or socially excluded if he is poor or socially excluded according to at least one of the three criteria (i.e. being

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18 This situation is quite inconvenient for the co-authors, in particular if a policymaker expects them to come up with an unequivocal answer regarding the evolution of poverty.

19 In a series of papers, Foster and Shorrocks (1991, 1988) uncover a powerful link between a unanimous agreement between the class of P_α's for a given α and any poverty line and stochastic dominance of the $\alpha+1$'th order. Furthermore, Atkinson (1987) shows that reaching unanimous agreement for all additive separable poverty measures (which is a much wider class than the FGTs) for all poverty lines is equivalent to second-order stochastic dominance. See Duclos et al. (2006) for a generalization to the multidimensional case.

20 Berthoud and Bryan (2011) study the relationship between households' incomes and deprivation scores over time using longitudinal data for the UK.

income poor, materially deprived, and/or belonging to a jobless household). The Europe 2020 poverty indicators and their relation to other poverty measures used in this book are the topic of the next section.

4 POVERTY MEASUREMENT IN THE EUROPEAN UNION: AN OVERVIEW

The object of this section is to show how the set of indicators of poverty and social exclusion used in the EU's social strategy fit into the poverty measurement framework discussed in the previous section. For an in-depth discussion of the EU's involvement in the struggle against poverty, see Marlier et al. (2007) and Frazer et al. (2010).

4.1 THE EUROPEAN SOCIAL STRATEGY AND POVERTY MEASUREMENT

Though the EU has shown an interest in the living standards of its citizens from its inception, work on poverty indicators was given a boost at the Lisbon European Council of March 2000, where the Member States established the Social Inclusion Process with the aim of making decisive inroads into eradicating poverty by 2010. A novel method of governance, known as the Open Method of Coordination (OMC), was introduced which involves common objectives to be achieved by national policies. In assessing Member States' progress towards the common objectives, comparable and robust indicators were deemed of key importance. A first set of eighteen such indicators on poverty and social exclusion was adopted at the Laeken European Council in December 2001 (hence the often-used term 'Laeken indicators'). It is effectively a portfolio of indicators designed in accordance with a number of methodological principles, as formulated by Atkinson et al. (2002). Important considerations were the comparability between Member States and the balance and transparency of the total portfolio. In subsequent years, the portfolio was further extended to include a broad range of indicators covering various aspects of social protection and social inclusion. The EU-SILC data were created specifically as an information source for compiling comparable indicators on social cohesion.[21] In June 2010, the European Council went one step further and defined a specific target in its Europe 2020 strategy: '20 million less [sic] people should be at risk of poverty and exclusion according to three indicators (at-risk-of poverty; material deprivation; jobless household), leaving Member States free to set their national targets on the basis of the most appropriate indicators, taking into account their national circumstances and priorities' (European Council, 2010: 12).

Let us take a closer look at some key measures of poverty and social exclusion as they stood in 2009 (European Commission, 2009). In line with the framework defined above, for each measure a metric of well-being[22], a poverty line and a method of aggregation are specified. As Table 3 shows, the metric of well-being varies substantially. Many measures are defined in terms of disadvantage and, in some cases (e.g. duration of unemployment), it is not straightforward to define a corresponding metric of well-being. While the choice of indicators is constrained by data availability, it is possible to identify the domains that are regarded as important in respect of poverty and social exclusion: income, material living standard, education, employment and medical care. No attempt is made to create a composite or multidimensional index of poverty or social exclusion summarizing all indicators. Marlier et al. (2007: 182-185) state that this is to encourage countries to pursue balanced

[21] For a more detailed treatment of the EU-SILC data-set, see section five.

[22] Most indicators are in fact defined in terms of disadvantage. Where possible, the corresponding metric of well-being is specified; where not, this is indicated by the word 'reverse' in brackets.

policies aimed at improving their performances in all domains, rather than to concentrate on an opaque overall score (see also Atkinson, 2010, for a discussion). Interestingly, the aggregation method used is nearly always a headcount (FGT with α set at 0), despite the drawbacks of this measure. Presumably the easy interpretability of a headcount overrides other concerns. As an indicator of the poverty gap, the median normalized poverty gap is used. This measure does not belong to the class of FGT poverty measures and is not additively decomposable, but it has the advantage of being more robust to outliers.

TABLE 3: KEY MEASURES OF POVERTY: METRIC OF WELL-BEING, POVERTY LINE AND AGGREGATION

Measure	Metric of well-being (x_i)	Poverty line (z)	Aggregation
At-risk-of poverty rate (AROP)	Equivalized disposable household income	60% of median household income	FGT (α= 0)
Relative median at-risk-of-poverty risk gap	Equivalized disposable household income	60% of median household income	Median poverty gap
Early school leavers	Educational level	Having only lower secondary education or less	FGT (α= 0)
Long-term unemployment rate	Duration of unemployment (reverse)	≥ 12 months	FGT (α= 0)
People living in jobless households	Share of eligible persons with paid job in households	= 0	FGT (α= 0)
Self-reported unmet need for medical care	Receiving medical care when needed (binary)	n.a.	FGT (α= 0)
At-risk-of-poverty rate anchored at a fixed moment in time	Equivalized disposable household income	60% of median household income in 2005	FGT (α= 0)
In-work at-risk-of-poverty rate	Equivalized disposable household income	60% of median household income	FGT (α= 0)
Persistent at-risk-of-poverty rate	Equivalized disposable household income	60% of median income in 2005 in current year and two of the three preceding years	FGT (α= 0)
Employment gap of immigrants	Employment (binary)	n.a.	FGT (α= 0), difference between immigrants and non-immigrants
Material deprivation rate	Number of items lacking (i.e. not able to afford if not possessed) out of 9	≥ 3	FGT (α= 0)

5 DATA FOR POVERTY MEASUREMENT IN THE EUROPEAN UNION

There are various cross-national comparative surveys providing data for studying poverty and social exclusion in the EU, such as the Survey of Health, Ageing and Retirement in Europe (SHARE), the European Quality of Life Surveys (EQLS) and the European Social Survey (ESS).[23] However, these surveys either cover only part of the population (SHARE), or they have a small sample size (EQLS), or they contain only limited information on income and living conditions (ESS). Consequently, after its launch in 2004, EU-SILC quickly became the EU reference source for micro-data on income and living conditions. Many indicators designed to monitor poverty and social exclusion in the EU are based on EU-SILC (e.g. European Commission, 2006; Marlier et al., 2007).

This section assesses EU-SILC as a data-set for measuring poverty in the European Union and, for reasons explained below, the German SOEP data-set as complementary data source for Germany.

5.1 EU STATISTICS ON INCOME AND LIVING CONDITIONS (EU-SILC)

The reference population of EU-SILC consists of private households residing in the participating countries at the moment of selection.[24] Currently thirty-one countries are included in the EU-SILC data-set, namely all EU Member States plus the four non-EU members Iceland, Norway, Switzerland and Turkey. However, some countries are not represented for all years in the User Database (UDB).

In 2004 EU-SILC replaced the European Community Household Panel (ECHP) as the common European source for data on income and social inclusion. ECHP ran as a long-term panel structure in fourteen European Member States over the eight-year period from 1994 to 2001. The persistence of quality problems, such as low response rates, steady attrition rates, incomplete geographical coverage and poor timeliness, led to its termination in 2001. To accommodate these quality problems, EU-SILC pays additional attention to the sample design, internationally-harmonized income definitions, and EU-wide coverage (Clemenceau and Museux, 2007).

Common guidelines for EU-SILC assure output harmonization of the survey results (see for example Eurostat, 2010b). Within these guidelines, national statistics offices have a certain degree of discretion to implement the guidelines according to the national conditions. While basic rules on definitions, time reference, minimum effective sample sizes, etc. are legally binding, considerable differences remain between participating countries in terms of sample design, data collection and post-collection processing (e.g. Eurostat, 2011), with varying impact on the comparability of the results. These aspects are discussed consecutively.

Sample design. With respect to sample design, the common guidelines prescribe a nationally representative probability sample of the population residing in private households within the country. The guidelines on sample design have been implemented differently in the various countries. In some, the sample consists of a simple random selection of households, individuals, or dwellings/addresses. In others, a more complicated procedure is followed, which in the first stage involves the random selection of clusters (communities or census areas, for example) from which

[23] For more information, see respectively http://share-project.org; http://www.eurofound.europa.eu/surveys/eqls/ and http://www.europeansocialsurvey.org/.

[24] It should be noted that people residing in institutions are excluded. This may cause some bias, especially when studying poverty among elderly (Peeters et al., 2011).

households are subsequently drawn in the second or third stage (see the annex in Goedemé (2010) for more details).[25]

Data collection. Generally, data are collected by means of face-to-face personal interviews. At the same time, the survey design is sufficiently flexible to allow the use of (previously existing) national sources. In a number of countries, the national statistics office opted for reasons of reliability to base many income variables on administrative data rather than on survey data, as this approach avoids the issue of respondents' accuracy in reporting detailed retrospective information. Recently, Lohmann's (2011) research on the relationship between employment, earnings and poverty has shown that this difference in data collection method may substantially affect estimates based on EU-SILC.

Post-collection processing. Unit non-response rates for EU-SILC vary substantially between countries, ranging from 5 per cent in Romania to 45 per cent in Denmark (Eurostat, 2010a). The high non-response rates in several countries may compromise data representativeness and thus comparability between countries. Correcting for the resulting potential biases then becomes especially important. Countries have however employed different models to deal with the problem of unit and item non-response, involving respectively reweighting and imputation (Verma and Betti, 2010; Wolff et al., 2010), which adds to the complexity of inter-country comparison. Furthermore, countries also vary substantially in terms of the manner in which negative and extreme values are treated (Verma and Betti, 2010). In view of this problem, top-bottom coding may be used to mitigate its impact on comparability (see also Section 6). Unfortunately, the variables concerning response status of households and individuals are not available to researchers. This rules out the possibility of testing for patterns of non-response across the population.

5.2 GERMAN SOCIO-ECONOMIC PANEL (G-SOEP)

For Germany, notable problems arose from the fact that until 2007, at least part of the sample was selected by quota sampling instead of representative probability sampling, preventing the computation of probability sample weights and compromising representativeness, particularly of certain (smaller) population groups (Hauser, 2008; Frick, J. and Krell, 2011). In the context of the present book, whenever applicable and possible, use is made of the German Socio-Economic Panel (G-SOEP) as a second data-set to test the sensitivity of the empirical results.

The G-SOEP is an on-going household panel survey, conducted annually since 1984 and representing the resident population of Germany with, as of 2006, a total of eight subsamples (Wagner et al., 2007). The G-SOEP data used in this book are constructed in such a way that they correspond as closely as possible to Eurostat's recommendations for the EU-SILC data, in order to ensure international comparability in terms of structure (a representative cross-sectional data-set for each survey year), the population covered (private households), weighting factors (post-stratified household inverse probability weights), accounting period (previous calendar year), and content of the common variables analysed (in particular total disposable income). Having said that, it was impossible to account for all differences between the two surveys with a potential impact on comparability, e.g. with regard to post-collection processing (different methods are employed to deal

[25] Additionally, EU-SILC has an important panel component, in the form of a four-year rotational panel design. This means that, every year, a quarter of the sample is replaced with a new representative sample of households. In other words, every household can participate for a maximum of four consecutive years. Exceptions to this Eurostat recommendation are France and Norway, where the panel duration is nine, respectively eight, years, and Luxembourg, where a pure panel is supplemented annually with a new, additional sample (Wolff et al., 2010: 41).

with extreme values, negative incomes, partial unit non-response, item non-response, …) and variable coverage (the G-SOEP data-set contains no comparable indicators on material deprivation, for instance).

6 AN ILLUSTRATION: POVERTY TRENDS IN THE EUROPEAN UNION BETWEEN 2005 AND 2009

The aim of the analysis presented in this final section is to illustrate the empirical impact of alternative choices with regard to the measurement of poverty (in terms of metric of well-being, poverty line and sensitivity to the distribution among the poor) on the observed evolution of poverty in the EU between 2005 and 2009. We deviate from other chapters in this book in two important ways. First of all, our focus is on the entire population, including elderly persons. Second, we evaluate the evolution between EU-SILC 2005 and EU-SILC 2009, instead of EU-SILC 2008. We do so, because for most countries this results in a comparison of two independent samples. Since EU-SILC has a 4-year rotational panel design in most countries, it is important to take the covariance between samples into account when comparing EU-SILC samples that differ less than 5 years. As we have no access to the necessary sample design variables for calculating the covariance (Goedemé, 2012), we opted for comparing EU-SILC 2009 and EU-SILC 2005 to be sure that we are able to distinguish between statistically significant and non-significant changes. A first estimation of standard error of year-to-year changes for several central EU-SILC indicators can be found in Berger et al. (2012).

The initial focus is on poverty in the EU as a whole (excluding Bulgaria, Malta and Romania from the set); subsequently, attention is paid to individual EU Member States. For more elaborated discussions of European poverty trends and what drives them, the reader is referred to the other chapters in this book as well as to Ward et al. (2009), Aktinson and Marlier (2010), and Notten and de Neubourg (2011).

6.1 POVERTY IN THE EUROPEAN UNION

Use is made of the two most commonly applied *metrics of well-being*, namely equivalized household disposable income (using the modified OECD equivalence scales) and a counting measure based on an index of nine deprivation items (listed in textbox 2). [26] The disposable income concept used in the analyses corresponds to the income concept employed in official Eurostat statistics. This diverges slightly from that proposed in the Canberra Group recommendations outlined in Section 3.2.1. First, it does not take account of imputed rent for owner-occupied dwellings and the value of home production.[27] Finally, the extent to which fringe benefits are recorded in the EU-SILC data varies between countries. Additionally, disposable incomes are – in contrast to standard Eurostat practice – top-bottom coded.[28] This procedure reduces the effect of the different treatment of negative

[26] For the income-based indicators, income generally refers the previous calendar year, whereas most of the deprivation items refer to the situation in the survey year. In some countries, the impact of the financial crisis was already noticeable in 2009: there were increases in the number of deprived households in Ireland, Lithuania, Estonia, Latvia, and – albeit less strongly – Spain, Greece and Hungary (Eurostat online database, last accessed on 25 November 2011).

[27] The impact of imputed rent on poverty and inequality estimates has been studied by, among others, Frick and Grabka (2003), and Sauli and Törmälehto (2010). The measurement and impact of including production for own consumption is discussed in Paats and Tiit (2010). Brandolini et al. (2010) employ an even wider income concept: they focus on the total net worth, which takes account of as many assets and debts as possible.

[28] We use LIS top-bottom coding, i.e. top-coding income at 10 times the median of non-equivalized income and bottom-coding income at 1 per cent of equivalized mean income. Our sensitivity analysis has shown that top-bottom coding

incomes across the EU (see Verma and Betti (2010), for further details). In order to take due account of relative price differences between countries and differences in exchange rates, income in national currencies is divided by Eurostat's purchasing power parities for final household consumption. (see Van Mechelen et al. (2011: 36-37) and OECD (2006)).

For the poverty measures based on disposable income, an exploration is made of a range of country-specific *poverty lines* around the standard choice of 60% of the country-specific median disposable income (40-70% of the country-specific median) and a range of EU-wide poverty lines (40-70% of the European median). A sensitivity analysis is performed for the threshold for material deprivation on a scale from 7 to 1 (i.e. a person is considered to be deprived if deprived on at least seven items, on at least six items, and so on).

For each case, the three most commonly used *FGT indices* are considered, i.e. $\alpha = 0; 1$ and 2. This yields nine alternative comparisons, as shown in Table 4, together with the main finding on poverty trends between 2005 and 2009. Since EU-SILC is based on a sample, 95 % confidence intervals are estimated and reported in the graphs included in the annex. Maximum account is taken of the sample design and weighting schemes (see Goedemé (2013) for a full discussion and illustration).[29]

Proceeding row-by-row, first a comparison is made of the results for the three FGT measures for the metrics of well-being based on disposable income combined with a country-specific poverty line. Each graph in the annex consists of three panels showing the 95% confidence intervals for the FGT(0), FGT(1) and FGT(2) for both years. These figures are so-called 'poverty incidence curves' as introduced by Ravallion and Bidani (1994). The horizontal axis represents alternative choices for the poverty line, whereas the FGT value can be read from the vertical axis.

(and the exact procedure applied) does not strongly affect the qualitative results presented in this paper. However, especially for FGT(2) the effect on point estimates and estimated standard errors is non-negligible (figures available from the authors, see also Van Kerm (2007)).

[29] For the estimation of the 95 per cent confidence intervals of the difference between the two years, it is assumed that the 2005 and 2009 samples are independent, which is true for most countries. This assumption simplifies the estimation of standard errors of the difference. It should be kept in mind that partially overlapping confidence intervals of two estimates do not necessarily imply that the difference is not statistically significant at the given confidence level (e.g. Schenker and Gentleman, 2001; Wolfe and Hanley, 2002; Afshartous and Preston, 2010; Cumming, 2009). Standard errors and confidence intervals have been estimated with the DASP module for Stata (Araar and Duclos, 2007) as well as standard Stata estimation commands.

TABLE 4: THE EVOLUTION OF POVERTY IN THE EU, AN OVERVIEW (EU-SILC 2005-2009)

Metric of well-being	Poverty line	FGT(0)	FGT(1)	FGT(2)
Equivalized household disposable Income	40-70% of country-specific median income	Figure 1a =	Figure 1b =	Figure 1c =
	40-70% of EU median income	Figure 2a ↓	Figure 2b ↓	Figure 2c ↓
Deprivation index	1-7	Figure 3a ↓	Figure 3b ↓	Figure 3c ↓

Note: In the case of the last two rows, for all examined poverty lines, changes between 2005 and 2009 are significantly different from zero with more than 99.99% confidence . In the case of the first row, no single change is found to be statistically significant with at least 85% confidence (two-sided test).

Source: EU-SILC UDB 2005, 2009; authors' calculations.

In the first row of Table 4 we adhere to the official at-risk-of-poverty indicator, which measures country-specific poverty by a headcount using a poverty line defined as a percentage of the country-specific median income and measures European poverty by the population weighted average. As can be seen from the top panel of Figure 1, no substantial changes are found between 2005 and 2009.[30] About 16% of the individuals are poor, which amounts to nearly 80 million people, roughly equivalent to the population of Germany. About 5% of the EU population is to be considered poor with a poverty line at 40% of the median. For reasons explained above, we did the same exercise replacing the German EU-SILC data with G-SOEP data. To some extent, the poverty standstill observed between 2005 and 2008 is driven by German data. If G-SOEP data are included in the analysis, a slight but significant decrease of about half a percentage point is observed for all levels of the poverty line in the case of FGT(0), and even smaller decreases are observed for higher levels of the poverty line in the case of FGT(1) and FGT(2).

The picture is very different if one analyses income poverty with an EU-wide poverty line, corresponding to the second row of Table 4, as shown in Figure 2. Poverty is then found to have substantially declined between 2005 and 2009, and this is especially so at lower levels of the poverty line for the headcount FGT(0), whereas this evolution is more obvious at higher levels of the poverty threshold in the case of the squared poverty gap ratio FGT(2). For the poverty line set at 60 % of the EU-wide median income, the headcount dropped from 23 % of European citizens in 2005 to around 21 % in 2009 (a decrease by about 10 million persons in poverty, roughly the population of Belgium).

Similarly, if one takes a perspective based on material deprivation (the third row of Table 4), the poverty headcount dropped from over 17 % to around 15 % of EU citizens using at least three items as a threshold (see Figure 3 in the annex). Also in the case of FGT(1) and FGT(2) substantial

[30] Given the existing doubts about the quality of the German EU-SILC data (especially during the first years of EU-SILC (Frick, J. and Krell, 2011; Goedemé, 2013), the analyses were run with and without Germany. To some extent, the poverty standstill is driven by German data. Excluding Germany from the analysis, poverty declines significantly: at 60 per cent of national median income, the total percentage of EU citizens at risk of poverty drops by just under a percentage point (from almost 17 to just over 16 per cent). Even though, in percentage points, this change may seem rather small, it amounts to approximately 3.2 million fewer Europeans in poverty. Similar qualifications hold for the (squared) normalized poverty gap ratio.

decreases in material deprivation can be observed. As can be seen from the figure, only a very small proportion of the EU population is estimated to be deprived on seven or more items.

6.2 POVERTY IN THE INDIVIDUAL MEMBER STATES

Even though the observed changes for the EU as a whole are remarkable, they mask even larger fluctuations within individual Member States. For this reason, a detailed look is taken at the EU Member States for the FGT(0) measure (which corresponds to the measurement choices summarized in the first column of Table 4). Figure 4 represents the country-specific evolution of the poverty headcount between 2005 and 2009 for respectively the official at-risk-of-poverty indicator, the income poverty indicator with an EU-wide poverty line, and the indicator of material deprivation. The poverty line corresponds to respectively 60 % of country-specific median income, 60 % of the EU-wide median income (German EU-SILC data) and at least three out of nine items. As it turns out, the type of indicator (income poverty versus deprivation) and the kind of poverty line applied (country-specific or EU-wide) makes an even bigger difference than was the case in Figure 2, Figure 2 and Figure 3.

Let us again begin with the official poverty measure with poverty lines defined as a percentage of country-specific median income (Figure 4a). The difference between the country with the lowest headcount (9 % in the Czech Republic) and that with the highest (26 % in Latvia) is relatively small. Changes seem to follow no specific pattern. Percentage-point changes in the at-risk-of-poverty rate are substantial in Latvia (+6), Sweden (+4), Poland (-4) and Ireland (-4). Smaller changes are observed in Finland (+2), the Czech Republic (-2) and Slovakia (-2). In the other countries, changes are not statistically significant at the 95 per cent confidence level. The increase observed with German EU-SILC data, is not corroborated when using the G-SOEP data.

Again, the picture changes though if one applies an EU-wide poverty line (Figure 4b), which results in a larger cross-national variation in the poverty headcount. In the poorest EU Member States, it exceeds levels of 50 %, which is much higher than the headcount in the richest Member States (under 10 %). In just four years, the poverty headcount decreased by between 10 and 30 percentage points in the poorest Eastern European EU Member States, who joined the EU in 2004, with Hungary being an important exception. By contrast, in the richest Member States, the poverty headcount did not decline by much; in some cases, it actually increased slightly. As can be seen from Figure 4c, results obtained with an EU-wide poverty line are similar to those relating to the indicator of material deprivation, which also uses a single poverty line for all EU Member States, though the observed differences between countries are somewhat smaller.

Finally, the question arises whether the three indicators point in the same direction for all the individual countries. In a quarter of the Member States under consideration, this is indeed found to be the case. For instance, in the Czech Republic, Slovakia and Poland, all three indicators consistently point to a significant decrease in the poverty headcount. In seven countries, there is agreement only for the two indicators with an EU-wide poverty threshold. Remarkably, only in Latvia substantial decreases in financial poverty with an EU-wide threshold and decreases in deprivation are combined with considerable increases of the at-risk-of-poverty indicator. Finally, it is noteworthy to mention that in Ireland, substantial increases in material deprivation are accompanied by substantial decreases in the income-based indicators.

These contradicting trends may be attributable to the fact that the deprivation indicator more readily captures the impact of the economic crisis than income does, as the latter concerns the income for the year preceding the moment of the interview.

In sum, for our analysis of the evolution of EU poverty it is clear that the choice of the metric of well-being, the place of the poverty line and the degree of sensitivity to the distribution among the poorest are not merely theoretical concerns, but that they also matter empirically.[31] In particular, the findings show that the chosen metric of well-being and the setting of the poverty line (country-specific or EU-wide) lead to substantially different conclusions.

7 CONCLUSION

The focus in this paper is on the measurement of poverty in the European Union. The starting-point is a widely accepted definition of poverty in the EU context. The class of FGT poverty measures offers a powerful and flexible toolbox for measuring poverty. Three decisions need to be taken in order to be able to measure poverty. These relate to the determination of the most appropriate metric of well-being x_i, the setting of the poverty line z, and the sensitivity to the distribution among the poor α. All three decisions involve value judgements with regard to the notion of poverty, implying that some disagreement between individuals is inevitable.

The famous at-risk-of-poverty measure reflects a particular answer to the three aforementioned questions. Although the official at-risk-of-poverty measure is easy to interpret and communicate, it should be used with care. As a policy target, the at-risk-of-poverty measure provides incentives to focus on the richest among the poor. Moreover, poverty measured by at-risk-of-poverty can decrease in a situation where a deterioration in living standards specifically affects the median of the distribution. Rather than to rely on a single poverty indicator, one should apply a broad portfolio of poverty measures including robustness and sensitivity checks (Atkinson et al., 2002).

Some progress has been made recently in the literature on poverty measurement by the introduction of a more encompassing definition of well-being through the application of multidimensional techniques. More sophisticated approaches have been developed for fixing a poverty line, such as the budget standard method; and increased computational power has resulted in more reliable assessment of the statistical precision of results obtained. However, the quality of a poverty analysis obviously depends crucially on the quality of the underlying data. Further improvements of EU-SILC, such as a broadening of the portfolio of indicators of human well-being (expenditures, objective health characteristics, subjective well-being and life satisfaction), larger sample sizes and more precise information on the sampling procedure can only improve the measurement and our understanding of the nature of European poverty.

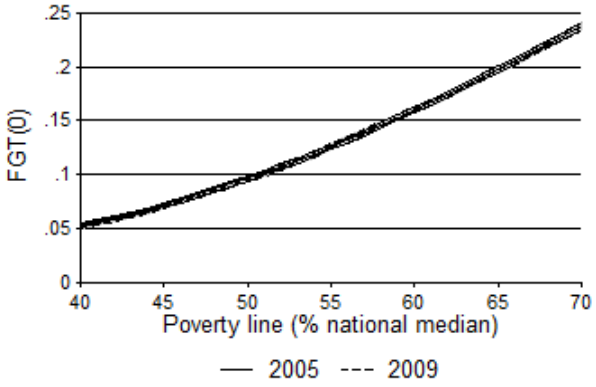
[31] Similar findings have been reached for developing countries, Laderchi et al. (2003) for instance, study the empirical impact of the definition and measurement of poverty in India and Peru.

8 ANNEX

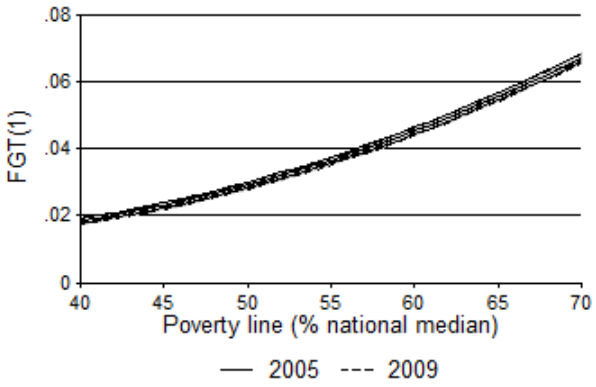
8.1 FIGURES

FIGURE 1: POVERTY TRENDS IN THE EUROPEAN UNION, EU-SILC 2005 – 2009 WITH THE POVERTY THRESHOLD EXPRESSED AS A PERCENTAGE OF THE NATIONAL MEDIAN INCOME

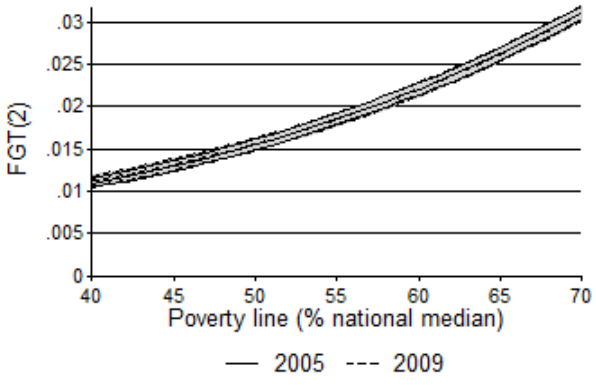
(A)



(B)



(C)

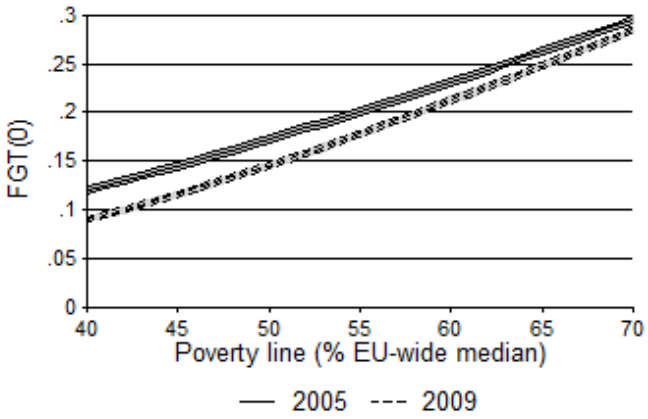


Notes: EU27 minus Bulgaria, Malta and Romania. Area shaded in grey represents 95% confidence intervals. Standard errors take as much as possible account of the sample design (cf. Goedemé, 2013) and the fact that poverty line has been estimated on the basis of the data (Araar and Duclos, 2007).

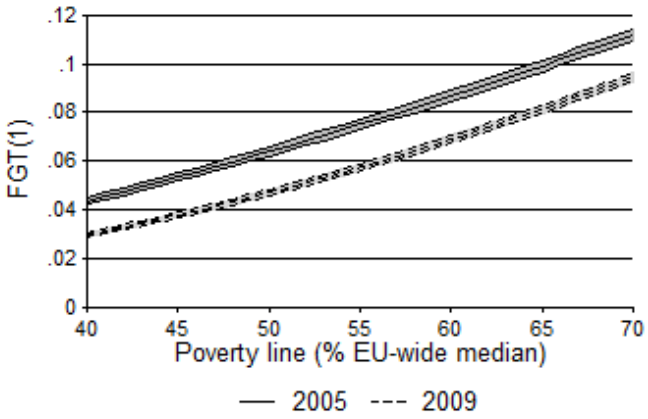
Source: EU-SILC 2005 and 2009 UDB, Eurostat (PPPs), authors' calculations.

FIGURE 2: POVERTY TRENDS IN THE EUROPEAN UNION, EU-SILC 2005 – 2009 WITH THE POVERTY THRESHOLD EXPRESSED AS A PERCENTAGE OF THE EU-WIDE MEDIAN INCOME

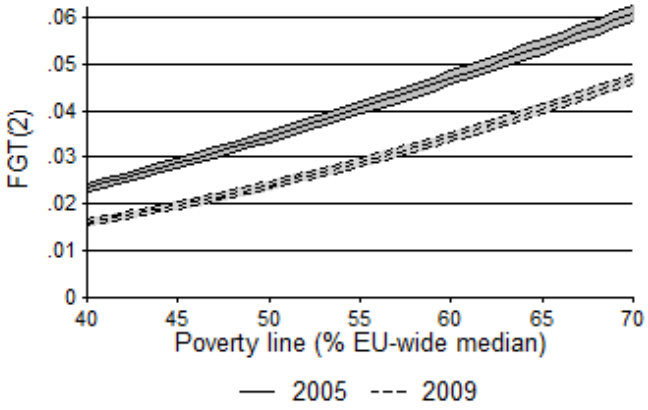
(A)



(B)



(C)

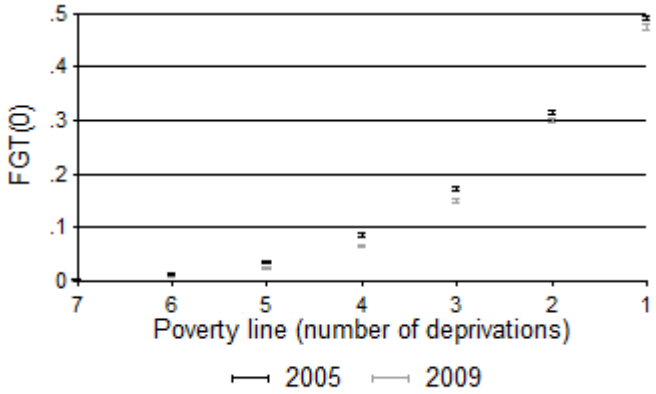


Notes: EU27 minus Bulgaria, Malta and Romania. Area shaded in grey represents 95% confidence intervals. Standard errors take as much as possible account of the sample design (cf. Goedemé, 2013) and the fact that poverty line has been estimated on the basis of the data (Araar and Duclos, 2007).

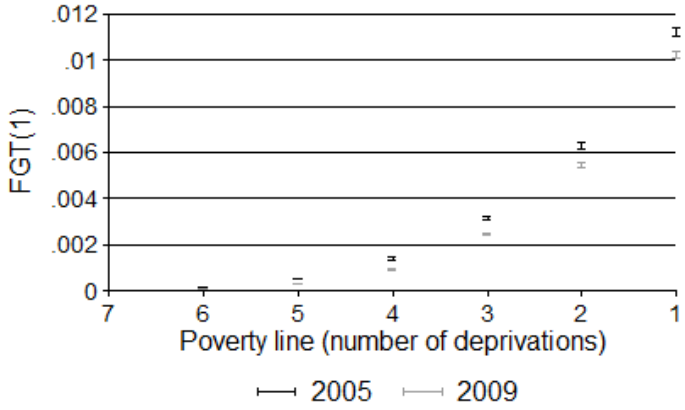
Source: EU-SILC 2005 and 2009 UDB, Eurostat (PPPs), authors' calculations.

FIGURE 3: THE EVOLUTION OF MATERIAL DEPRIVATION IN THE EUROPEAN UNION, EU-SILC 2005 – 2009

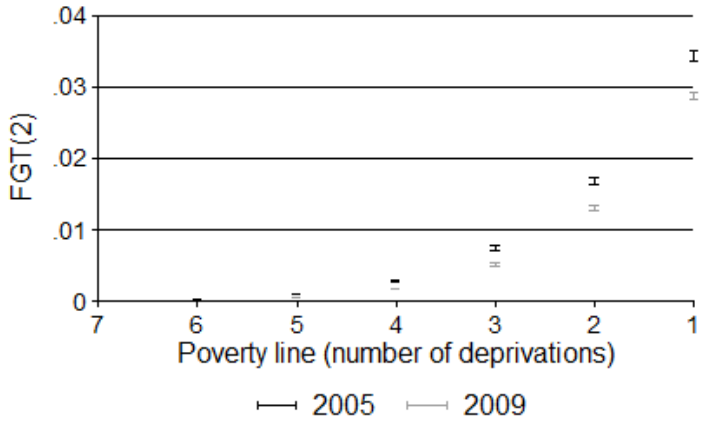
(A)



(B)



(C)

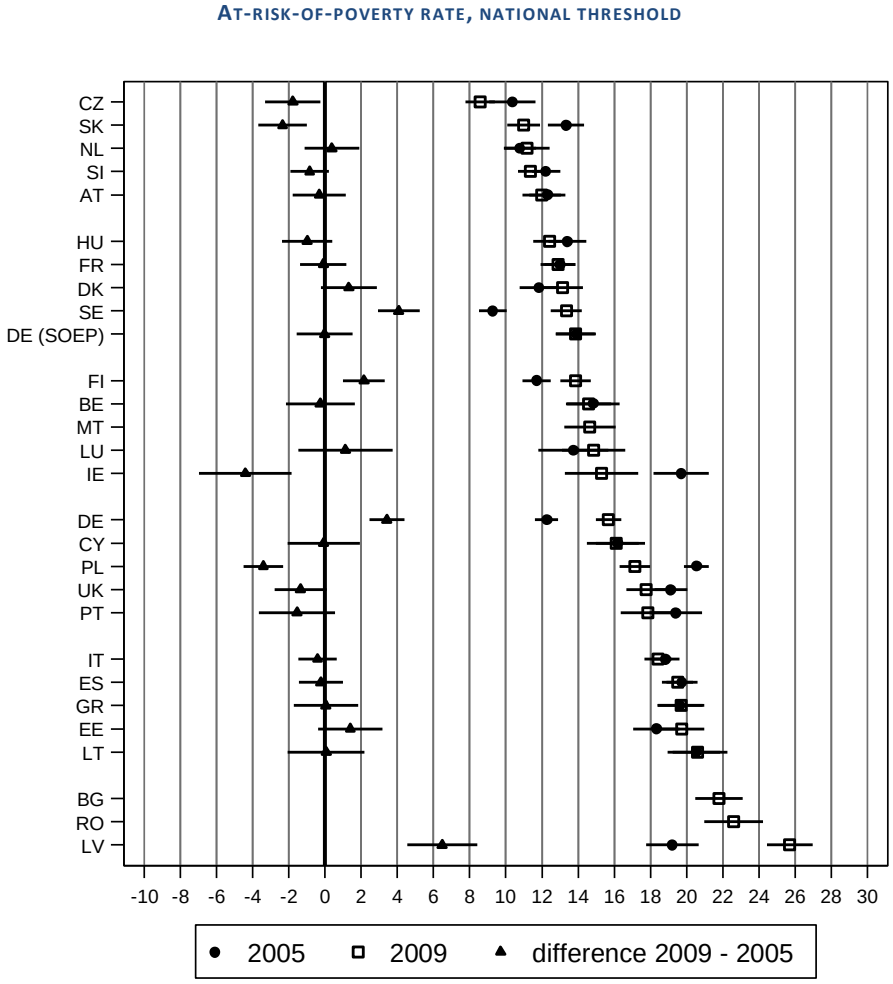


Notes: FGT1 and FGT2 not normalised. EU27 minus Bulgaria, Malta and Romania. 95% confidence intervals, estimated taking account of sample design (cf. Goedemé, 2013).

Source: EU-SILC 2005 and 2009 UDB, authors' calculations.

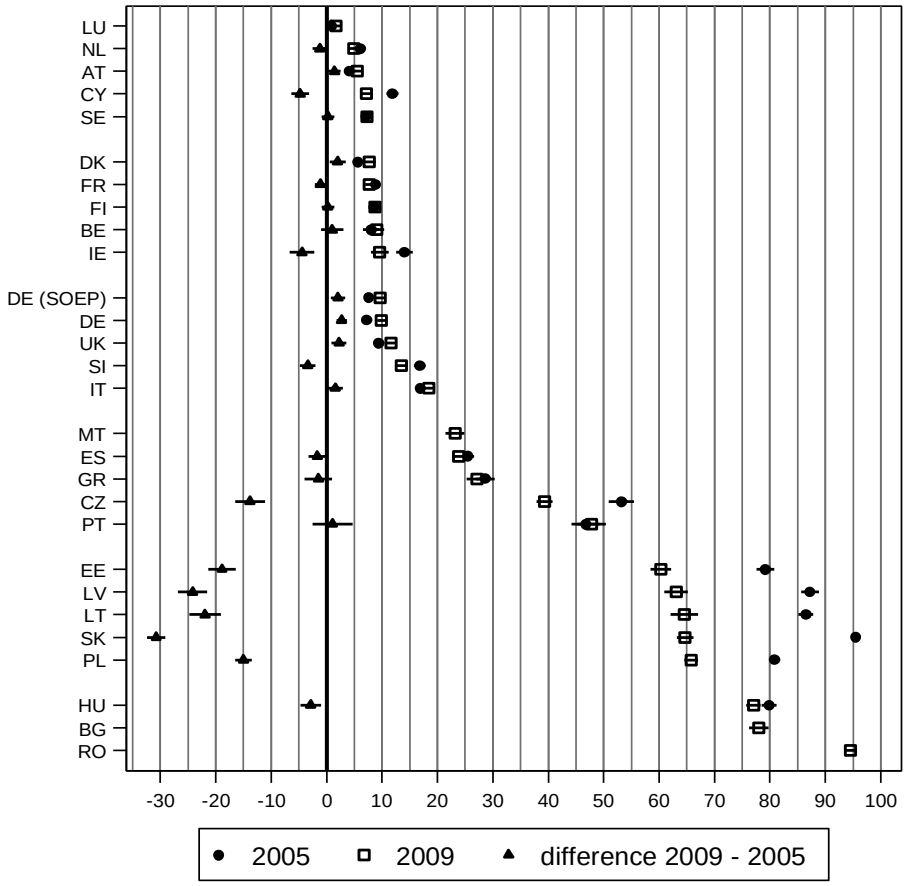
FIGURE 4: FGT0 OF THE AT-RISK-OF-POVERTY INDICATOR WITH THE POVERTY LINE SET AT 60 % OF THE NATIONAL MEDIAN EQUIVALIZED NET DISPOSABLE HOUSEHOLD INCOME (A), OF A SIMILAR INDICATOR WITH THE POVERTY LINE SET AT 60 % THE EU-WIDE MEDIAN EQUIVALIZED NET DISPOSABLE HOUSEHOLD INCOME (B) AND OF THE EU INDICATOR OF MATERIAL DEPRIVATION WITH THE POVERTY LINE SET AT THREE OUT OF NINE DEPRIVATION ITEMS (C), EU-SILC 2005 AND 2009 COMPARED

(A)

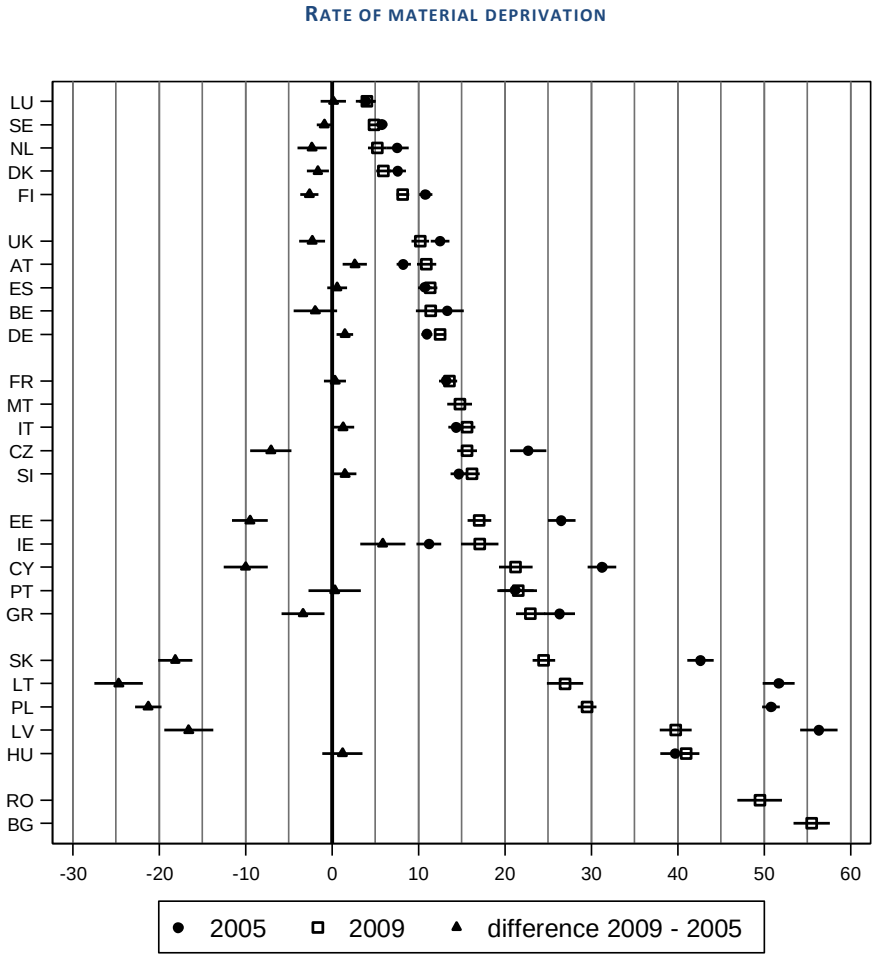


AT-RISK-OF-POVERTY RATE, EU-WIDE THRESHOLD

(B)



(c)



Notes: Countries sorted by EU-SILC 2009 estimates. 95% confidence take as much as possible account of the sample design (cf. Goedemé, 2013) and the fact that the poverty line has been estimated on the basis of the sample (see Araar and Duclos, 2007). Estimates for Bulgaria, Malta and Romania in panel (c) are based on an EU-wide poverty threshold including all EU27 countries. In order to maximise cross-temporary consistency, for the other countries the threshold is estimated excluding the latter three countries. In the case of DE(SOEP), the EU-wide threshold has been estimated including G-SOEP instead of EU-SILC data for Germany.

Source: EU-SILC 2005 and 2009 UDB, G-SOEP, Eurostat (PPPs), authors' calculations.

8.2 THE IMPORTANCE OF TOP-BOTTOM CODING

Extremely low and negative incomes as measured in surveys like EU-SILC pose an important challenge to poverty research. In some cases they point to measurement error, whereas in others the values maybe correct, but may be an invalid indicator of the living standard or the command people have over goods and services. In addition, even if extreme values do not result from measurement error and are a valid indicator of the living standard, while being small in number, they may have a disproportionately large impact on estimated poverty and inequality indices, undermining the reliability of the estimates. Several methods exist for 'cleaning' the data and reducing the impact of extreme observations, such as trimming (i.e. dropping extreme observations from the dataset), winsorizing (i.e. imputing a bottom and a top value for incomes which cross these values), and (semi-

) parametric tail modelling (by which the tails of the income distribution are modelled on the basis of a known distribution, such as the Pareto distribution). Van Kerm (2007) discusses each of these methods in more detail and, on the basis of EU-SILC 2004, has evaluated their impact on a series of inequality and poverty measures. Van Kerm (2007: 14) finds that "Unsurprizingly, besides removing self-employment income recipients, only trimming has a somewhat marked impact on the headcount ratio. The impact remains relatively low anyway, at least for a poverty line set at 60% of the median income [...]". In addition, Van Kerm reports that top-bottom coding has a more important effect on FGT1 estimates. Van Kerm (2007: 17) recognises however, that further research is necessary to evaluate the impact of top-bottom coding on estimated standard errors. In this paper for Oxford University Press, we do not apply Eurostat practice to use the data 'as they are' in the EU-SILC UDB. In contrast, we apply the LIS procedure for top-bottom coding[32], which is a particular form of winsorizing. The following graphs illustrate why we have decided to do so.

The graphs below illustrate the potential impact of top-bottom coding on point estimates and confidence intervals for FGT0, FGT1 and FGT2. For each of these poverty measures, results on the basis of the 'raw' data are compared to those presented in this paper, which rely on the LIS procedure for top-bottom coding. Figure 5 suggests that in the case of FGT0 not only point estimates, but also confidence intervals are *not* strongly affected by top-bottom coding. However, as is illustrated by Figure 6 and Figure 7, top-bottom coding does not only change estimated FGT1 and FGT2 values, but also – particularly in the case of FGT2 – estimated confidence intervals. As far as the analysis of poverty trends in the EU is concerned, using the raw data instead of LIS top-bottom coded data would not change conclusions in the case of FGT0 and FGT1. However, with regard to FGT2 conclusions are very different, namely, in the case of an EU-wide poverty threshold it is not possible on the basis of the raw data to conclude unambiguously that poverty has decreased: only when the poverty line is at least equal to 66 per cent of the EU-wide median, a significant change (with 95% confidence) can be observed. When the poverty line is relative at the national level, similar effects of top-bottom coding can be observed: no effect in the case of FGT0, a small effect in the case of FGT1, and a particularly strong effect on both point estimates and confidence intervals in the case of FGT2.

Given the nature of the FGT poverty measures, the observed patterns should not come as a surprise. First of all, winsorizing does not affect the median income, as it leaves the rank of individuals in relation to their income unaffected, except at the bottom and top of the income distribution. In addition, for the poverty headcount (FGT0), the only thing that matters is whether one has an income below the (unchanged) poverty threshold or not. Usually, the imputed values for extremely low incomes are still below the poverty threshold. As a result, winsorizing does not result in a different estimate for FGT0 or its standard error as compared to using the data before top-bottom coding[33]. This is different in the case of FGT1. In that case, all individual poverty gaps are summed and divided by the total number of inhabitants. When the lowest incomes are winsorized (i.e. replaced with a higher income), the total sum of the individual poverty gaps will be lower as compared to using the raw data, and so will be FGT1. In addition, the variance of incomes below the poverty threshold will be lower, and so will be the variance of FGT1. Given that FGT2 is based on the square of the individual poverty gaps, the effect of winsorizing observed for FGT1 can be observed in a strongly magnified form in the case of FGT2.

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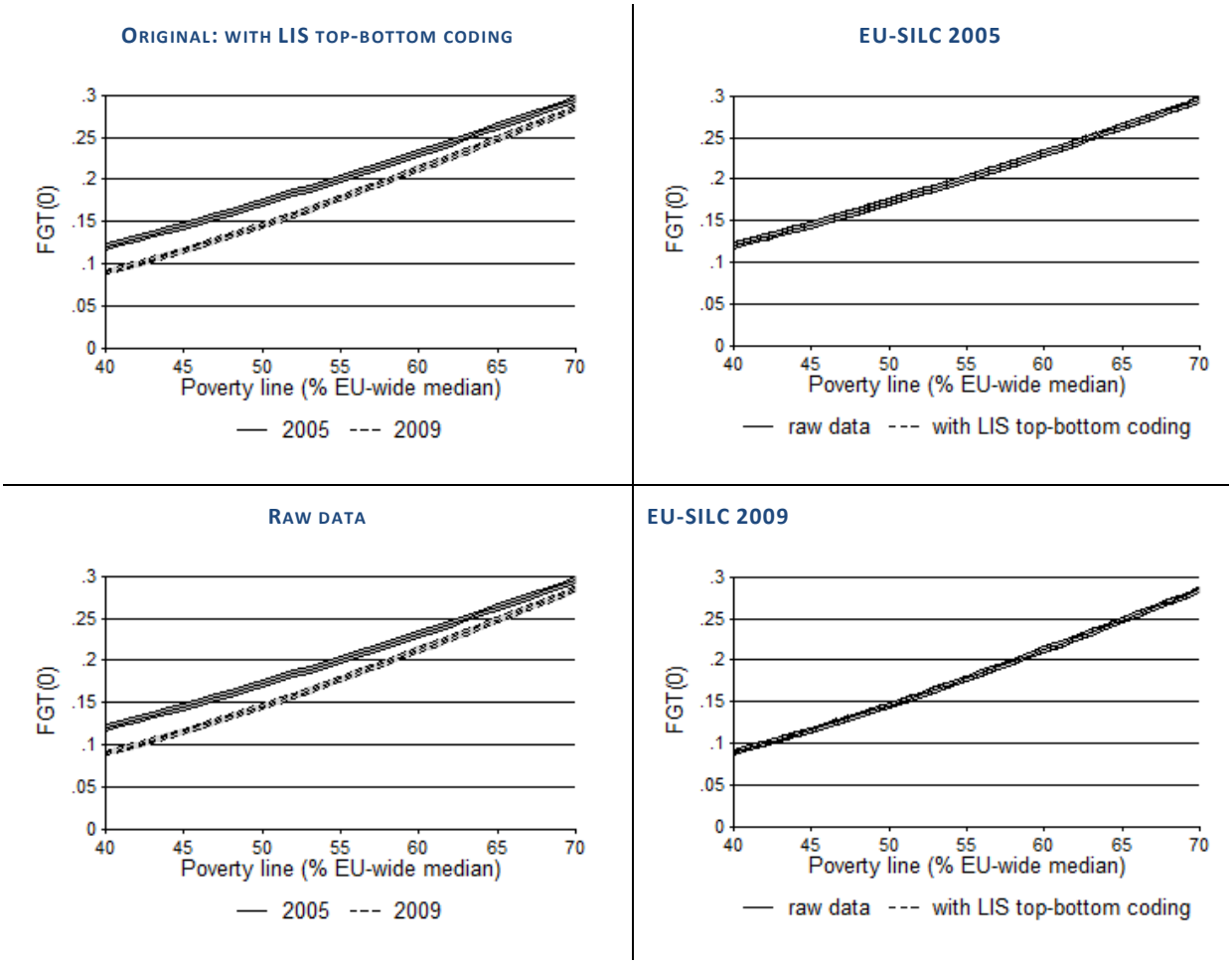
[32] In the case of LIS top-bottom coding, equivalent net disposable household incomes of less than 1 per cent of the mean equivalent net disposable household income are replaced with the latter value. If non-equivalised net disposable household income amounts to more than 10 times the median net disposable household income, it is replaced with the latter value (only in a second step top incomes are equivalised) (http://www.lisdatacenter.org/data-access/key-figures/inequality-and-poverty/, last accessed in February 2012).

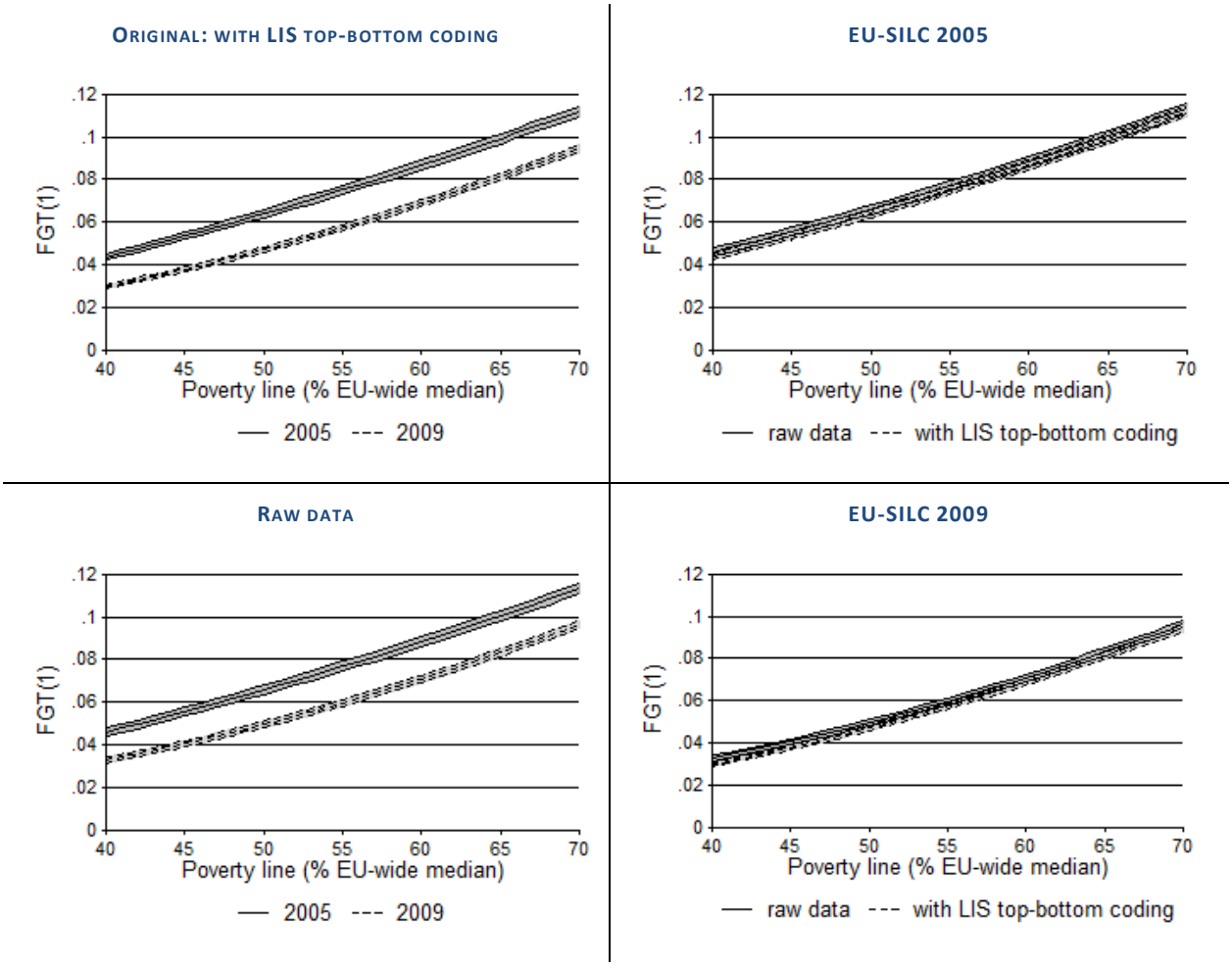
[33] Of course, in the case that the average income is used to define the poverty threshold, winsorizing may both affect the poverty threshold and the poverty headcount (as well as its standard error).

FIGURE 5: THE EVOLUTION OF FGT0 IN THE EU, WITH AN EU-WIDE THRESHOLD, WITH AND WITHOUT LIS TOP-BOTTOM CODING, AGGREGATE OF 24 EU MEMBER STATES, EU-SILC 2005-2009



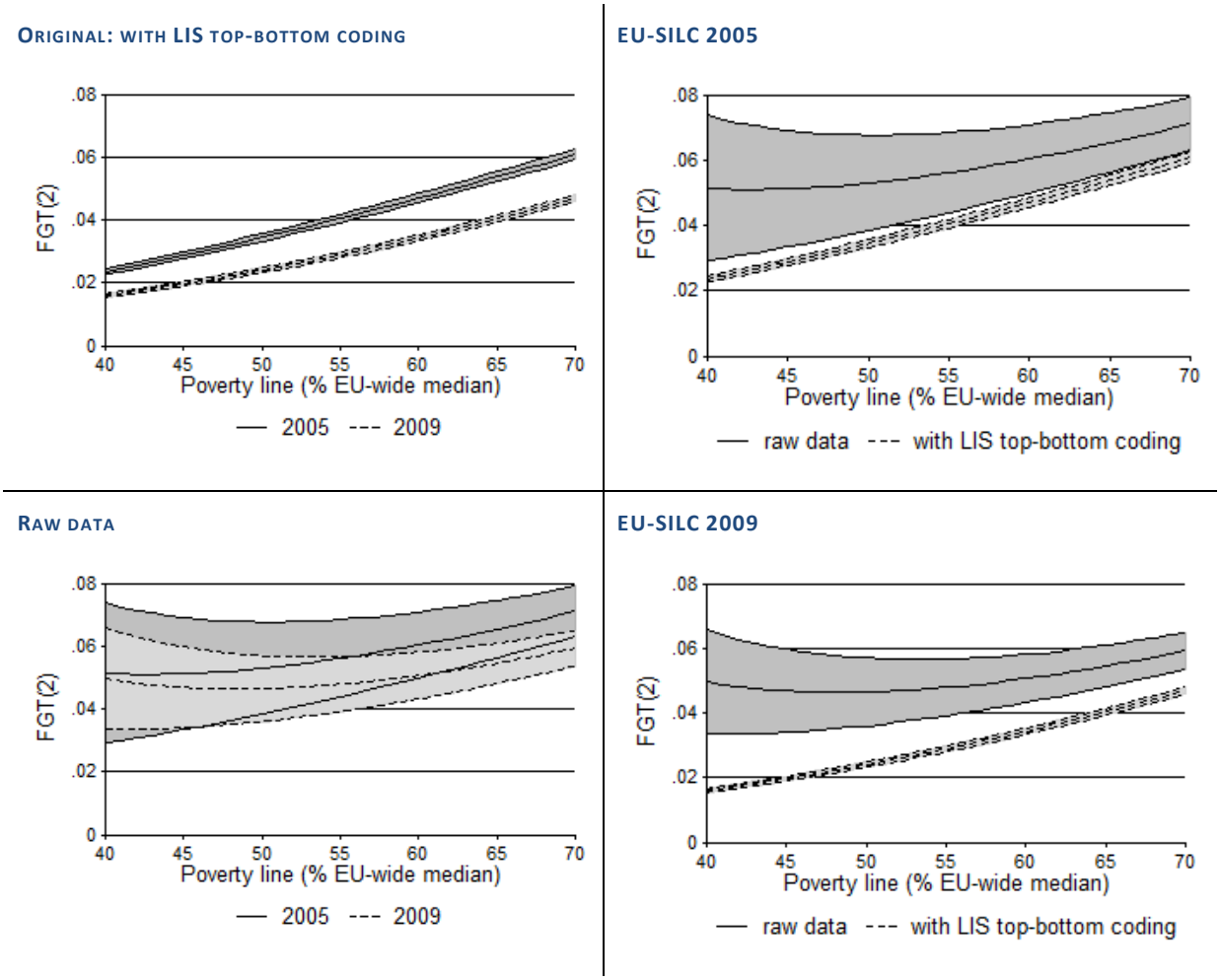
Notes: EU27 minus Bulgaria, Malta and Romania. Area shaded in grey represents 95% confidence intervals. Standard errors take as much as possible account of the sample design (cf. Goedemé, 2013) and the fact that poverty line has been estimated on the basis of the data (Araar and Duclos, 2007). Incomes converted to purchasing power standards on the basis of Eurostat's PPPs for final household consumption (Eurostat online database, last accessed in December 2011).

FIGURE 6: THE EVOLUTION OF FGT1 IN THE EU, WITH AN EU-WIDE THRESHOLD, WITH AND WITHOUT LIS TOP-BOTTOM CODING, AGGREGATE OF 24 EU MEMBER STATES, EU-SILC 2005-2009



Notes: EU27 minus Bulgaria, Malta and Romania. Area shaded in grey represents 95% confidence intervals. Standard errors take as much as possible account of the sample design (cf. Goedemé, 2013) and the fact that poverty line has been estimated on the basis of the data (Araar and Duclos, 2007). Incomes converted to purchasing power standards on the basis of Eurostat's PPPs for final household consumption (Eurostat online database, last accessed in December 2011).

FIGURE 7: THE EVOLUTION OF FGT2 IN THE EU, WITH AN EU-WIDE THRESHOLD, WITH AND WITHOUT LIS TOP-BOTTOM CODING, AGGREGATE OF 24 EU MEMBER STATES, EU-SILC 2005-2009



Notes: EU27 minus Bulgaria, Malta and Romania. Area shaded in grey represents 95% confidence intervals. Standard errors take as much as possible account of the sample design (cf. Goedemé, 2013) and the fact that poverty line has been estimated on the basis of the data (Araar and Duclos, 2007). Incomes converted to purchasing power standards on the basis of Eurostat's PPPs for final household consumption (Eurostat online database, last accessed in December 2011).

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ImProvE: Poverty Reduction in Europe. Social Policy and Innovation

Poverty Reduction in Europe: Social Policy and Innovation (ImPRovE) is an international research project that brings together ten outstanding research institutes and a broad network of researchers in a concerted effort to study poverty, social policy and social innovation in Europe. The ImPRovE project aims to improve the basis for evidence-based policy making in Europe, both in the short and in the long term. In the short term, this is done by carrying out research that is directly relevant for policymakers. At the same time however, ImPRovE invests in improving the long-term capacity for evidence-based policy making by upgrading the available research infrastructure, by combining both applied and fundamental research, and by optimising the information flow of research results to relevant policy makers and the civil society at large.

The two central questions driving the ImPRovE project are:

- How can social cohesion be achieved in Europe?
- How can social innovation complement, reinforce and modify macro-level policies and vice versa?

The project runs from March 2012 till February 2016 and receives EU research support to the amount of Euro 2.7 million under the 7th Framework Programme. The output of ImPRovE will include over 55 research papers, about 16 policy briefs and at least 3 scientific books. The ImPRovE Consortium will organise two international conferences (Spring 2014 and Winter 2015). In addition, ImPRovE will develop a new database of local projects of social innovation in Europe, cross-national comparable reference budgets for 6 countries (Belgium, Finland, Greece, Hungary, Italy and Spain) and will strongly expand the available policy scenarios in the European microsimulation model EUROMOD.

More detailed information is available on the website http://improve-research.eu.

Coordinator:

Prof. dr. Bea Cantillon
Herman Deleeck Centre for Social Policy
University of Antwerp
Sint-Jacobstraat 2
BE-2000 Antwerp
Tel.: +32 3 265 53 98
bea.cantillon@ua.ac.be