

25 November 2019

Economic Commission for Europe

Conference of European Statisticians

Expert meeting on measuring poverty and inequality: SDGs 1 and 10

Geneva, Switzerland

5–6 December 2019

Item E of the provisional agenda

Subjective poverty

Subjective Income Poverty and Equivalence Scales in Eastern vs Western European countries

Note by the Institute of Sociology of the Czech Academy of Sciences, Czech Republic* and the Bureau of Labor Statistics, United States**

Summary

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Subjective Income Poverty and Equivalence Scales in Eastern vs Western European countries

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Abstract:

This study estimates Subjective Poverty Lines, based on the intersection approach, and implicit subjective equivalence scales for countries in Europe. The subjective poverty thresholds are derived from the Minimum Income Question included in the EU–Statistics on Income and Living Conditions (2017) data. Implicit subjective equivalence scales differ across the countries with a rough division of Eastern and Western Europe, with lower economies of scale resulting for Eastern European countries. When the estimated country-specific subjective equivalence scales are applied to derive the official at-risk-of-poverty (AROP) rather than the OECD-modified scale, the ranking of countries change only moderately. However, subjective poverty (SP) rates based on the derived subjective thresholds change the ranking of European countries markedly compared to the ranking of the official AROP rate. The SP rates show a much clearer pattern of the East-West division of Europe than do the AROP rates. These results suggest that country-specific economies of scale should be considered in studies of economic well-being, particular those focused on income poverty.

Keywords: Europe; equivalence scale, subjective poverty.

JEL codes: I32, P46.

Acknowledgement: The work of Martina Mysíková, Tomáš Želinský, and Kamila Fialová was supported by the Czech Science Foundation under Grant no. 18-07036S “Methodology and reality of poverty: Czech Republic in the European context”. The EU-SILC datasets were made available on the basis of contract no. 265/14 between the European Commission, Eurostat, and the Institute of Sociology of the Czech Academy of Sciences.

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1. Introduction

The construction of the poverty line, and ranking of countries by poverty rates, depends heavily on the equivalence scale used to obtain the “equivalised” household income. That is also the case of the European environment where the at risk-of-poverty rate is derived as a share of people whose equivalised household disposable income falls below 60% of median equivalised income. The equivalising of income is based on the so called OECD-modified scale, which has been widely used since the late 1990s, a modified version of the original OECD (Oxford) scale developed in the 1980s. The modified scale gives a weight of 1 to the first adult, 0.5 to each additional adult, and 0.3 to each child.

In creating the OECD-modified scale, the authors recommended to devote an attention to the cross-country comparisons and argued that the principal issue whether to use a single equivalence scale for all countries or single methodology to estimate equivalence scales, possibly differing across countries, should be resolved (Hagenaars et al., 1994, p. 194). It is hence realised that economies of scale can be strongly country-specific, depending on the national structure of living costs, consumption of durable and non-durable goods, and goods with different economies of scale in general. This has been shown in previous research across countries and when based on different sets of consumption goods and services (among many, see Buhmann et al., 1988, Hagenaars et al., 1994, Goedemé et al., 2017).

The OECD(-modified) equivalence scale was established before the Eastern European countries joined the European Union. As far as we can find, it was based on the available research regarding equivalence scales derived from various methods using data from Western European countries and other market oriented OECD countries (see Hagenaars et al., 1994). Scales were those implicit in

programs, derived from behavioural models using expenditure data, or based on subjective methods (Buhmann et al., 1988; Citro and Michael, 1995).

Probably the most famous behavioural method for estimating equivalence scales is based on Engel (1895), with food expenditures serving as the basis of the equivalence scales. Engel-based approaches based on food expenditures tend to result in equivalence scales with lower economies of scale than when more expansive bundles of goods and services are considered (see Daley et al., 2014; Phipps and Garner 1994).¹ Whether the OECD-modified equivalence scale, which appears to be based on these types of studies using data from Western or more market oriented economies, is applicable to the countries of Eastern Europe is questionable.

After joining the EU, the former socialist Eastern European block adopted the OECD-modified equivalence scale. Thus, the remarkable differences in the structure of household consumption expenditure that inevitably existed in the Eastern European countries were ignored. This study is motivated by the assumption that economies of scale from living together may differ in Eastern European (EE) and Western European (WE) countries because of the different consumption structures in the two regions.²

According to analyses of European Union Household Budget Survey (EU-HBS) data, the highest shares of consumption expenditure are represented by housing and food in both in EE and WE (Mysíková and Želinský, 2019). While the share of housing expenditure – with relatively high economies of scale – tends to be only slightly lower in the EE region than in the WE region, the

¹ Another behavioural approach, the Rothbarth method, was used by Lazear and Michael (1988) to derive equivalence scales based on assumption regarding the allocation of income for collective expenditures, and private expenditures for adults and children.

² Bishop et al. (2014), based on the minimum income question and the intersection approach for countries in Western Europe, noted that countries with well-developed welfare states show greater economies of scale than those with less well-developed welfare states, represented by three Southern European countries. Hence, the differences might be apparent also within the Western European region.

shares of food – with relatively low economies of scale – are on average substantially higher in EE than in WE. Housing represented less than 30 percent of consumption expenditures without significant difference between the regions, while food represented 29 percent in EE and 13 percent in WE in 2005. The same structural difference was preserved in 2015: 33 percent was spent on housing in both the regions, while 23 percent in EE and 14 percent in WE on food.³ Thus, it follows that economies of scale, considering a full basket of goods and services, would be lower in EE countries than in WE countries in general. Therefore, we assume that the official income poverty indicator – the at-risk-of-poverty rate – commonly applied for European comparisons could provide biased results. Ultimately, the choice of an equivalence scale can substantially influence cross-country comparisons, the ranking of countries in both poverty and inequality ladders, and the demographic composition of the poor.

In much of the existing literature, the equivalence scales have usually been estimated based on consumption/expenditure data (for example, see Muellbauer, 1980; Merz et al., 1994; Lazear and Michael, 1998; Phipps and Garner, 1994; Daley et al., 2014). However, there is a growing body of literature which uses data on subjective perceptions of economic well-being to derive equivalence scales. Examples include the use of income evaluation and/or minimum income questions (Bishop et al., 2014; Carbonnier, 2019; De Vos and Garner, 1991; Flik and Van Praag, 1991; Garner and De Vos, 1995; Hagenaars et al., 1994; Kapteyn et al., 1988; Martin, 2017), minimum spending question (Garner and Short, 2003 and 2004), income satisfaction (Bütikofer and Gerfin, 2009), or personal evaluations of material well-being (Dang et al., forthcoming).

³ Within EE, the food expenditure share was the highest in RO, BG, and LT throughout the period 2005-2015, while within the WE region, the shares were the highest in Southern European countries (Mysíková and Želinský, 2019).

In this study, we adopt the minimum income approach. Our choice is primarily based on the potential of the available data. In particular, we use the internationally harmonised and comparable survey Statistics on Income and Living Conditions (EU-SILC) which has been regularly published since 2005, and at the same time, each annual wave contains the Minimum Income Question (MIQ). We apply a model-based method to define the subjective poverty line (SPL), intersecting responses to the MIQ with reported actual income, controlling for other household demographic and economic characteristics. Using these estimated thresholds, equivalence scales specific for each country are derived. Subjective-based scales are then compared with the officially used (country-uniform) OECD-modified scale; this is accomplished by combining the marginal income needed for adults and children into two parameters, like is done for the OECD-modified scale. Poverty rates based on the SPL for each country are compared to the officially used at-risk-of-poverty (AROP) rates.

To summarise, the main objective of this study is to develop country-specific (subjective) equivalence scales for European countries based on the minimum required household income. First, our starting point is to estimate subjective income poverty lines for selected EU countries. Using the estimated subjective income poverty lines, we derive implicit subjective equivalence scales for the analysed countries (Section 5.1). We assume that the estimated subjective equivalence scales based on the MIQ differ across countries and we argue that they better reflect the country-specific conditions and consumer preferences. We hypothesise that there is an apparent difference between the Eastern and Western European regions.

Second, we then produce and compare: (1) poverty rates following the AROP method but using the implicit subjective equivalence scales and the official at-risk-of-poverty rates based on OECD-modified scale (Section 5.2); and (2) subjective income poverty rates with the official ones (Section

5.3). We hypothesise that the overall ranking of European countries reflecting the SPL method will result in a more apparent East-West division of the EU. As the main contribution of our study has an empirical value, we intend to employ a simple approach that leads to a compromise in terms of similarity, simplicity, transparency, and comparability of the estimated equivalence scales with the OECD-modified one.

2. Literature overview: Subjective poverty lines and equivalence scales

In general, the subjective approach explicitly recognises that poverty lines are inherently subjective judgments people make about what constitutes a socially acceptable minimum standard of living in a particular society (Ravallion, 1992). The best known methods to estimating subjective poverty lines are generally based on comparing the actual income to the subjective perception of household's situation (Hagenaars and de Vos, 1988). The seminal study by Goedhart et al. (1977) introduces two approaches to estimation of subjective poverty lines: the subjective poverty line based on survey responses on a minimum income question; and the Leyden poverty line, called after its place of origination, which is based on the so-called income evaluation question. Kapteyn et al. (1988) further elaborated these two approaches and pointed out several methodological issues. Taking into account availability of European data, in this study we focus on the MIQ, asking the respondents to declare income which they consider to be minimal to make ends meet. Goedhart et al. (1977) showed on Dutch data from the 1970s that the welfare level associated with respondent's minimum income is dependent on her/his actual income. It follows that *“richer people are more demanding with respect to their minimum income than are poor people, not only in money terms but also in welfare terms”* (pp. 513–514). The subjective minimum household income needed is dependent not only on the actual income, but inevitably also on the household size.

De Vos and Garner (1991; and Garner and De Vos, 1995) utilize the MIQ to compute poverty thresholds and compare the U.S. and Dutch data from the 1980s. They allow the SPL to differentiate not only according to household size but also various household characteristics. They apply the intersection method introduced by Goedhart et al. (1977) and found out that, for both countries, the subjective poverty thresholds lie in the range of 60 to 75 percent of the *mean* incomes in most family size groups. Compared with the currently applied definition of objective income poverty – 60% of *median* equivalised household income – the Dutch subjective poverty line would be higher. This indicates that the share of population identified as subjectively poor will be higher than the officially considered share. Garner and Short (2003, 2004) estimated subjective poverty thresholds using MIQ, with data collected for the U.S. As previously researchers have found, the implicit economies of scale from their estimation of subjective poverty thresholds were greater than those in the OECD-modified scale.

Saunders et al. (1994) follow the same seminal study by Goedhart et al. (1977) to derive the SPL using the MIQ in Australia and Sweden, but with additional restrictions. First, these researchers only included the number of adults and children in their estimation; they did not include any control variables in the models. Second, as robustness checks, they ran the same exercise while excluding respondents who indicated making ends meet “very easily”, and consequently, by excluding these respondents plus those in categories “easily” and “fairly easily” (the question was answered on a 6-point scale). The reason for excluding respondents with no difficulties making ends meet is based on the belief that these respondents might have provided uninformed responses to the MIQ and, thus, bias the main estimates. However, the results were not sensitive to exclusion of these categories.

Saunders et al. (1994) summarized that the overall subjective poverty rate in Australia (21.5%) was substantially higher than in Sweden (13.4%). The objective income poverty rate with a poverty line defined there as 50 percent of median equivalised household income using the OECD equivalence scale was markedly lower (8.9% in Australia and 6.3% in Sweden). This again indicates that the subjective poverty lines could be higher than the officially applied income poverty lines. Further, their results based on SPL approach identified the weights of adults as 0.14 in Australia and 0.25 in Sweden and the weights of the first child as 0.06 in Australia and 0.16 in Sweden. This strongly contrasts with the OECD scale with weights of 0.7 and 0.5 for adults and children, respectively. These results suggest that the estimated subjective equivalence scale will indicate lower weights as compared to both the OECD and OECD-modified scales.

García-Carro and Sánchez-Sellero (2019) also applied a modified SPL approach – sometimes referred to as CSP (Centre for Social Policy) or Deeleck poverty line approach – where the SPL is established only for a sub-population which make ends meet with some difficulty. The logic is similar as the one applied by Saunders et al. (1994): only respondents whose income is close to the poverty line can credibly assess the level of minimum required income. They obtained very similar poverty lines for one- up to five-member households when comparing SPL and Deeleck approach on Spanish EU-SILC data.

Similarly to the above mentioned studies, García-Carro and Sánchez-Sellero (2019) found the subjective poverty rate about 40 percent (about 35% based on the modified Deeleck approach) with the official income poverty rate being roughly 20 percent in Spain. Therefore, we expect the subjective poverty rate to be higher than the official income poverty rate in most analysed European countries.

Bishop et al. (2014) provide an analysis similar to our study regarding the subjective equivalence scales. Based on pooled EU-SILC data for 2004-2007, they include 15 Euro-Zone-countries (thus excluding most EE countries) and apply MIQ and the intersection method. As opposed to our study, they limit the sample to six most common household types (e.g., excluding single-parent families) and do not control for any additional household characteristics. Their study was further extended by Kalbarczyk-Steclik et al. (2017) who, employing the same sample and control variables restrictions, analysed 23 European countries, including EE countries, for a longer period (2005-2012). They showed that economies of scale were lower in EE than in WE, when pooled data for the two regions were used. Moreover, while the subjective equivalence scale was stable in WE, the estimated values were declining in the EE.

Based on both Saunders et al.'s (1994) and García-Carro and Sánchez-Sellero's (2019) results showing that the estimations on the total sample are valid, we provide estimates based on the whole sample, thus not excluding any observations. However, unlike Bishop et al. (2014) and Kalbarczyk-Steclik et al. (2017), we control for relevant demographic and economic characteristics in our estimations.

3. Data and variables

In this study we follow the stream of literature employing control variables in the regression model used for estimating the SPL (e.g., De Vos and Garner 1991), whereas the originally proposed approach used only household size in addition to actual income as the right-hand-side variables (Goedhart et al., 1977; Saunders et al. 1994, Bishop et al., 2014). The logic behind this approach is that people's living conditions are not assessed solely based on income, as they are also supposed to consider their costs and expenditures in their responses (Večerník and Mysíková 2016). Even households with the same income and structure can require different income as a minimum

necessary one. For these reasons, besides actual income and household structure, we control for other household demographic and economic variables.

The analyses presented in this study are based on the EU-SILC 2017⁴ household survey which has been conducted annually since 2005. It is collected by national statistical offices and harmonized by Eurostat, compulsorily for all EU members. The survey collects data at the household as well as individual level; respondents older than 15 years are surveyed. The analyses performed in this study are based on household level data but also utilise several individual characteristics. Households with non-positive or missing actual or subjective minimum income were excluded (about 5%). The data sample ranges from 3,800 households in Luxembourg to 22,500 households in Greece. As we focus on the distinction between Eastern and Western Europe, where by Eastern Europe we mean the post-communist EU member countries, we include EU countries except Cyprus and Malta, as these do not conform our definition of “Eastern Europe”. Western European countries are defined as the “old EU member” states. List of abbreviations of included countries indicating the East-West division is stated at the end.

The dependent variable in our regression models is the MIQ framed as: *“In your opinion, what is the very lowest net monthly income that your household would have to have in order to make ends meet, that is to pay its usual necessary expenses? Please answer in relation to the present circumstances of your household, and what you consider to be usual necessary expenses (to make ends meet).”*⁵ The minimum income thus represents monthly net income and is transformed into its natural logarithm form.

⁴ EU-SILC – Cross 2017 Version September 2018 is applied.

⁵ EU-SILC variable HS130. Respondents state all income variables in the survey in their national currency and Eurostat transforms it into EUR.

The key explanatory variables are the (log of) actual income and household size. The actual total disposable household income includes labour and non-labour income of all household members as well as various social benefits (including pensions) received either at individual or household level, all income is net of taxes and social deductions.⁶ Household size is specified in terms of dummy variables in order to facilitate the process of deriving the equivalence scale. We aim to derive the equivalence scale in the same structure as the OECD-modified equivalence scale which considers a single-adult household as a reference household. Though this might not be ideal (Betti et al., 2017), as households of singles are hardly the most frequent ones, we intend to compromise in terms of similarity, simplicity and comparability of the construction of the equivalised household income.⁷ As noted earlier, in the OECD-modified equivalence scale, the weight of the first adult is 1.0, while the weight by the second and each next adult in a household equals to 0.5, and each child (defined as a person of age 13 or younger) has a weight of 0.3. The actual household income is then divided by the sum of weights of all household members (the equivalised household size) in order to obtain the equivalised income applied in the income poverty rate construction.

One of our goals is to estimate separately the weights of adults and children in order to compare to the OECD-modified scale. The most straightforward way is then to include, first, the number of adult members (aged 16 years or older)⁸ in the model as three dummy variables representing

⁶ EU-SILC variable HY020 – as actual income corresponds to annual income, one twelfth of the reported value is taken into account. EU-SILC is usually conducted second quarter of a year in most countries, and the income reference period corresponds to the previous calendar year, while some questions including MIQ are related to the current situation. We are aware of possible inconsistencies between the current and previous year reference periods. However, the income reference period is considered to provide the best approximation of current income, as suggested by Eurostat (2010), and it is also used in this sense in official statistics.

⁷ The literature includes examples where different type of household, e.g., the modal type, is considered as reference. Among others, Betti et al. (2017) demonstrate on Turkish data that the sensitivity of the poverty measures to equivalence scale could be the higher the more household types deviate from the reference one. According to them, the reference household type then should be the “central” household type. In the pooled EU-SILC 2017 data, one-adult households comprise of 35%, while two-adult households of roughly 45% (regardless the number of children). Childless households (regardless the number of adults) form 75% of households.

⁸ Note that the OECD-modified scale limits the age of children by 13 years, while we limit it by 15 years, for the sake of simplicity. However, as we question the appropriateness of the adoption of the OECD-modified equivalence scale

households that include two adults, three adults, and four and more adults; the reference group consists of households with one adult.⁹ Second, the number of children is translated into two dummy variables representing households with one child and two or more children; the reference group represents households with no children.¹⁰

In addition to the key explanatory variables, we control for numerous household characteristics. In most of the seminal studies on SPL, individual characteristics of the head of the household or the reference person enter the model. We consider the concept of a household head definition unsustainable. Formerly, men used to be automatically regarded as household heads in nuclear families. With the changing female labour market participation and changing gender roles in recent decades, such a definition becomes implausible. Reference persons (persons responding to the household questionnaire) in EU-SILC, on the other hand, tend to be overrepresented by women. We hesitate to define the household head according to economic activity or individual income level either, and, generally, we avoid assigning one household member's characteristics to the whole household and thus constructing an artificial household status (see Večerník and Mysíková, forthcoming, on the discussion of the difficulty to establish a household status). Instead, we define the control variables describing individual characteristics as shares within adult household members.

without a country-specific research, the age limit could be questioned in the same way and we consider the age limit as rather irrelevant in this stage of research.

⁹ In the European 2017 pooled sample, households of 4+ adult members represent 7.7% of households, while households of 5+ adult members of only 1.7%. Similarly, households with 2+ children represent 10.6% of households, while households with 3+ children only 2.2%. The dummy variables were thus constructed in order to obtain sufficiently large groups. We intend to preserve a uniform method for all countries; otherwise, the number of dummies could have been selected according to the national household structures.

¹⁰ An alternative way would be to include dummies for exact types of household, e.g., 1 adult + 1 child; 1 adult + 2 children; 2 adults + 1 child; 2 adults + 2 children, etc., with households of singles as a reference group. This would, however, lead to high number of combinations at the expense of the transparency of deriving the subjective equivalence scales. Nevertheless, we provide the subjective poverty rates following similar approach using partial subjective poverty lines for various household types in Table A.2 in the Appendix.

The originally individual-level variables, which typically influence the individuals' earnings or household level earnings, were transformed to household-level ones as a share of adult household members possessing such a characteristic of total number of adult members. These include: the share of currently working members, females, members with tertiary education (defined by ISCED codes 5-6), and younger members aged 16 to 30.¹¹

Household level control variables also entered the model. These include reference to the type of ownership of the dwelling, size of the flat/house, degree of urbanization of the place of residence, and assessments of the economic situation of households. Type of ownership of the dwelling mirrors the financial demands of a household. We distinguish between a dummy variable for outright owners (plus free accommodation, e.g., for those living at a relative's home for free) and a dummy variable for owners paying a mortgage (the reference group being tenants paying either full market or reduced rate rent). The financial burden of those paying a mortgage and tenants can be similar in some countries while it can differ in others, depending on the conditions of financial and housing markets. The size of the flat/house is measured by the number of rooms per household member. The degree of urbanization is defined in terms of two dummies for densely and medium (with thinly as a reference group) populated areas.¹²

We also use a self-assessed ability to make ends meet,¹³ inspired by the studies by Saunders et al. (1994) and García-Carro and Sánchez-Sellero (2019), who used groups of household with different ability to make ends meet for robustness checks. Five dummy variables were constructed, with

¹¹ The variable for young age is included to capture earnings profile by age. Similarly, the share of older members aged 65 or more could be included (or a share of pensioners/disabled), however, we believe this is captured by the share of working adults.

¹² The categories are derived based on the population size and density of the municipality (Eurostat, 2016).

¹³ EU-SILC variable HS120 stated as "A household may have different sources of income and more than one household member may contribute to it. Thinking of your household's total income, is your household able to make ends meet, namely, to pay for its usual necessary expenses?" with a 6-point scale (1 – with great difficulty, 2 – with difficulty, 3 – with some difficulty, 4 – fairly easily, 5 – easily, 6 – very easily).

“making ends meet very easily” being the reference group. Finally, we included a binary indicator of “severely materially deprived” household,¹⁴ provided by the official EU statistics (see, Decancq et al. 2013 for definitions), to further capture the financial strains of households.

This set of variables describes the housing, material, and working conditions of a household, serving as an overall proxy for the living standard of a household which aims to differentiate basic needs. In general, these characteristics are related to different living costs, habits, aspirations and expectations, as well as different reference groups of individuals and families to whom the respondents might compare their situations. In all models, country household cross-sectional weights are employed. Subsequently, the resulting subjective poverty rates are weighted by individual cross-sectional weights, so that the poverty rates represent shares of subjectively poor individuals, not households, in line with the officially used AROP rate, referred to also as official or objective income poverty hereafter.

The dependent variable, MIQ, is missing for a relatively substantial part of households in some countries: Denmark (roughly 1/6), Croatia (1/8), Netherlands (1/4), Sweden (1/4), and the United Kingdom (1/2). Though we provide the outcomes for these countries, the results have to be interpreted with caution. Further, in some countries, several variables are either completely missing or exhibit a substantial part of missing values. The degree of urbanisation is not available in Germany, Netherlands, and Slovenia, and modified to only two out of three values in Estonia and Latvia. The size of the flat/house is not provided in Germany. Ability to make ends meet is missing at roughly half of observations in the United Kingdom. Regression models (see Table A.1 in the

¹⁴ EU-SILC variable RX060.

Appendix) were run without these control variables in these countries and the difference from other countries has to be kept in mind.

4. Methodology

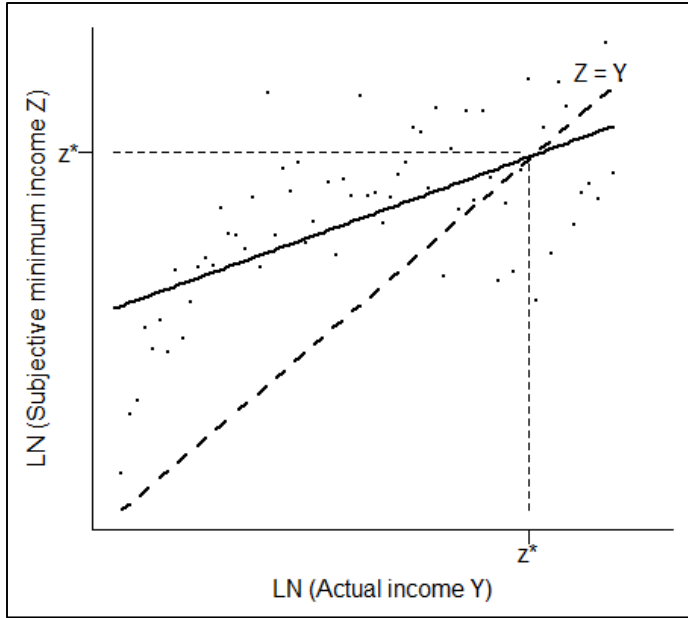
The methodology applied in this study consists of two key steps. First, identifying the subjective poverty lines using the intersection method, and second, deriving the subjective equivalence scales from the estimated subjective poverty lines.

4.1 The Intersection method

In this study, the SPL estimations are based on survey responses to the MIQ. The minimum income is estimated as a function of actual income. Its intersection with the line representing the equality of minimum and actual incomes (i.e., the 45-degree line in Figure 1) determines the subjective poverty line. The intersection in the SPL approach assumes that only respondents with income equal to their subjective minimum income have a realistic idea of the minimum income level. Richer respondents tend to overestimate their minimum necessary income while poorer respondents tend to do the opposite; and, therefore, the minimum income is increasing with actual income. *“Respondent’s perception of the poverty line is distorted by the fact that his [her] actual income is not equal to his [her] minimum income level”* (Goedhart et al. 1977, p. 514). This misperception does not happen only at the intersection, the income level defining the poverty line. As Goedhart et al. (1977) argue, it is yet not possible to include only those whose actual income accounts just for what they necessarily need. It is not a priori known which respondents have an income equal to the poverty line and, thus, all respondents’ answers are needed to obtain the estimated function.

Figure 1 depicts the intersection in double logarithmic form (see also Goedhart et al., 1977, p. 513, also see de Vos and Garner 1991, p. 269, for a figure not in log form). The vertical axis represents the subjective minimum income (Z) and the horizontal axis the actual income (Y), while subjective minimum income typically rises with actual income. The intersection (Z^*), where $Z = Y$, determines income which can be regarded as the subjective poverty line. The SPL divides the population into two parts: (1) poor: whose actual household income is lower than the poverty line, and (2) non-poor: whose actual household income is higher than the poverty line.

Figure 1 Intersection method – double logarithmic form



Following Goedhart et al. (1977), the subjective poverty line is thus calculated as the income level at which $Z = Y = Z^*$ given the function:

$$\ln(Z) = \alpha + \beta \ln(Y), \quad (1)$$

which yields

$$\ln(Z^*) = \frac{\alpha}{1-\beta}. \quad (2)$$

We estimate a single SPL (as well as SPLs for households of various number of adult and child members) running the OLS regression model. The additional explanatory variables enter the right-hand-side of Equation (1):

$$\ln(Z) = \alpha + \beta \ln(Y) + \sum_{i=1}^3 \gamma_i A_i + \sum_{j=1}^2 \delta_j C_j + \sum_{l=1}^n \theta_l X_l, \quad (3)$$

where A stands for three (i) dummy variables for the number of adults, C stands for two (j) dummy variables for the number of children, and X represents the n number of control variables. α , β , γ , δ , and θ represents the corresponding regression coefficients.

Consequently, the estimate of the SPL is given by an extension of Equation (2):

$$\ln(Z^*) = \frac{\alpha + \sum_{i=1}^3 \gamma_i A_i + \sum_{j=1}^2 \delta_j C_j + \sum_{l=1}^n \theta_l X_l}{1 - \beta}. \quad (4)$$

Thresholds across the EU countries differ based not only the intersection points, but also differences in characteristics across the countries. To derive SPLs for various household types for each country (applied for deriving SES presented in Section 5.1), the relevant household size variables are kept at the required values, with the rest of explanatory variables at their means; actual income does not enter equations (2) or (4).¹⁵ For instance, SPL for one-adult household is derived with values of the three dummies for adults set to zero, and the two dummies for children (and other explanatory variables) to their country means. The SPLs for adults are thus valid regardless the number of children in a household, or in other terms, for average number of children.

To estimate the “total” single SPL for each country (applied in Section 5.3), even the household size (and other explanatory) variables are kept at their country means. As noted earlier, household

¹⁵ See Garner and Short (2004) for a discussion of whether to set the other characteristics to country means or to allow them to vary through the production of household-specific subjective thresholds (see pp. 331-332 and Table 8).

size enters the estimation in terms of dummy variables for adult and child household members; the averages for each thus reflect the national household structure.

4.2 Equivalence scale

Subjective equivalence scales (SES) are derived from the SPLs for various household types. For comparability with the OECD-modified scale, a uniform weights W^A and W^C for adults and children, respectively, can be derived from the SPLs.

As a first step, the partial weights, w , for adults and children are derived separately as the relative change in the adult and child specific SPLs when an additional person is added as noted in equations (5) and (6) below. The weights are defined as an additional income needed to meet one's needs (or marginal costs in alternative terminology), relative to the minimum income needed of the reference group (SPL_0).

$$w_i^A = \frac{SPL_i^A - SPL_{i-1}^A}{SPL_0^A}, \quad (5)$$

$$w_j^C = \frac{SPL_j^C - SPL_{j-1}^C}{SPL_0^C}, \quad (6)$$

where A and C denote adults and children, respectively, and i stands for the additional adults, and j for the additional child (as in Equation (3)).

As a second step, we derive a weighted average of the partial weights w according to the shares of households with two-, three-, and four-and-more-adults, and one child and two or more children in each country.

This approach can be formalised by the following equations:

$$W^A = \sum_{i=1}^3 w_i^A s_i^A, \quad (7)$$

$$W^C = \sum_{j=1}^2 w_j^C s_j^C, \quad (8)$$

where W stands for the final, weighted average marginal income needed, which we intend to contrast with the weights assigned by the OECD-modified equivalence scale. s represents the share of the corresponding households with the differing numbers of adults, and households with the differing number of children in a population. Moreover, it holds that $\sum_{k=1}^m s_k = 1$, where m is the number of additional adults or children considered (i.e., number of dummy variables used for adults or children).

Table 1 demonstrates this approach on the example of the Czech Republic, a country with the lowest objective income poverty rate in the EU. Compared to one-adult household, a household of two adults requires by 30 percent higher minimum income (w^A for the second adult).¹⁶ Third adult member represents an additional need of 19 percent higher minimum income (w^A for the third adult), and similarly the fourth and next adult members require additional 21 percent (w^A for fourth and next adults). The higher weight of fourth and next adults than that of the third adult is given by the fact that the first group consists of up to 7 adults; however, 4-adult households represent 5.9 percent of households, while more-adult households only 1.2 percent of households in the Czech Republic. As the final weight W is weighted by the household structure in a country, we consider the upward bias relatively negligible. The weights for children are similarly derived; for example, with the addition of a child to a childless household, an additional 10 percent higher minimum income is needed (w^C for first child).

¹⁶ Regardless the number of children.

Table 1 Monthly Subjective poverty lines (in Euros) and derived equivalence scale for the Czech Republic

Adults	SPL^A	Weight of additional adult (w^A)	Structure of households (s^A)	Children	SPL^C	Weight of additional child (w^C)	Structure of households (s^C)
1 adult	561			Childless	677		
2 adults	729	0.299	0.692	1 child	745	0.101	0.548
3 adults	836	0.191	0.206	2+children	810	0.097	0.452
4+ adults	951	0.206	0.101				
Weight (W^A)		0.267	$\Sigma = 1.0$	Weight (W^C)		0.099	$\Sigma = 1.0$

Source: EU-SILC 2017. Authors' computations.

Notes: SPL is estimated by OLS regression, see Section 3 for control variables.

Hence, as opposed to the OECD-modified scale where the economies of scale are assumed to be uniform (the weight of 0.5) for all additional adults, the marginal minimum income needed declines with adult household members and the weight for additional person diminishes. In the specific case of the Czech Republic, this holds for adult weights only, while the weights of children seem to be constant.

The resulting single weight W^A of second and next adults is 0.267. The same exercise for children yields a weight W^C of 0.099. As expected, the subjective equivalence scale provides higher economies of scale (weights of 0.267 and 0.099) than the OECD-modified scale (0.5 and 0.3).

5. Results

The estimated SPLs for various household types allows for deriving the subjective equivalence scales, which are assumed to exhibit lower economies of scale for Eastern European than for the Western European region. The subjective poverty lines are expected to be higher than the officially used objective income poverty lines, generally, in all countries, and so are the subjective income poverty rates compared to the objective ones. This section provides the results confirming our assumptions and hypotheses. The SPLs are based on OLS regression models; the full-model results are stated in Table A.1 in Appendix.

5.1 Subjective equivalence scales

As expected, the SES generally provides higher economies of scale than the OECD-modified scale, with few exceptions. Table 2 shows the derived partial and final uniform weights for the 26 European countries. The weights for the second adult range from 0.17 in the Netherlands to 0.60 in Bulgaria; however, about half are in the range of 0.30 to 0.45. For the third adult, it ranges between 0.05 to 0.46.¹⁷ Bishop et al. (2014), for a pooled sample of Euro Zone countries in 2004-2007, reported the weight of the second adult at 0.34, with the third adult coming in at 0.18 and the fourth at 0.21. Similarly, Kalbarczyk-Steclik et al. (2017), for 2005-2012, estimated the weight of second, third, and fourth adults as 0.32, 0.21, and 0.24, respectively, in WE, and 0.49, 0.44, and 0.30 in EE, respectively. Garner and Short (2003), presenting results by the number of persons rather than by the number of adults and children separately, found similar results, with the addition of a second person resulting in a weight of 0.32 and a third person in a weight of 0.22.

The constructed final uniform weight of adults, to be applied in the same way as the OECD-modified equivalence scale, is higher than the OECD-modified 0.5 weight only in Estonia (0.55), Latvia (0.52), and Bulgaria (0.51). The lowest weights are seen in Romania (0.12), Netherlands (0.15), and Italy (0.19). Except Romania, which is the exception located at the tail of low adult weights, the ranking of countries roughly correspond to the East-West division: the weights for adults are mostly higher and economies of scale lower in Eastern than in Western Europe (see also the simple averages in Table 2).

¹⁷ Note that the weight for the last added group of adults/children is negative in RO/DK. Though similar cases are known from the existing empirics (e.g., for third adult in NL in Bishop et al., 2014), these countries should be more cautious when deriving implications of these results.

Table 2 Subjective equivalence scales: weights for adults and children

	Weight of				Weight of		
	2nd adult	3rd adult	4th and next adults	Adults - uniform	1st child	2nd and next children	Children - uniform
Eastern Europe							
BG	0.598	0.357	0.447	0.513	0.159	0.139	0.151
CZ	0.299	0.191	0.206	0.267	0.101	0.097	0.099
EE	0.590	0.455	0.425	0.546	0.196	0.045	0.128
HR	0.447	0.327	0.241	0.370	0.148	0.133	0.140
HU	0.370	0.258	0.301	0.336	0.098	0.139	0.115
LT	0.412	0.371	0.426	0.404	0.172	0.063	0.129
LV	0.586	0.344	0.436	0.515	0.192	0.124	0.166
PL	0.431	0.235	0.278	0.348	0.045	0.106	0.071
RO	0.219	0.049	-0.057	0.119	0.124	0.086	0.108
SI	0.428	0.261	0.269	0.366	0.048	0.062	0.055
SK	0.362	0.303	0.340	0.341	0.138	0.097	0.120
<i>Simple average</i>				<i>0.375</i>			<i>0.117</i>
Western Europe							
AT	0.387	0.153	0.205	0.319	0.065	0.096	0.079
BE	0.364	0.141	0.247	0.311	0.142	0.083	0.111
DE	0.344	0.147	0.154	0.303	0.116	0.141	0.127
DK	0.389	0.309	0.209	0.372	0.125	-0.026	0.044
EL	0.357	0.259	0.233	0.315	0.087	0.073	0.080
ES	0.254	0.126	0.186	0.216	0.098	0.055	0.080
FI	0.203	0.182	0.252	0.203	0.157	0.100	0.127
FR	0.388	0.160	0.207	0.339	0.028	0.043	0.036
IE	0.284	0.130	0.163	0.238	0.134	0.016	0.071
IT	0.223	0.163	0.179	0.202	0.083	0.101	0.091
LU	0.304	0.085	0.320	0.265	0.078	0.082	0.080
NL	0.167	0.112	0.047	0.151	0.081	0.057	0.067
PT	0.306	0.163	0.189	0.256	0.086	0.148	0.108
SE	0.201	0.234	0.118	0.201	0.031	0.123	0.083
UK	0.321	0.027	0.104	0.255	0.158	0.015	0.085
<i>Simple average</i>				<i>0.263</i>			<i>0.085</i>

Source: EU-SILC 2017. Authors' computations.

Regarding the child uniform weight, its maximum (in LV) barely reaches a half of the OECD-modified weight (0.3). It is the highest in Latvia (0.17), Bulgaria (0.15), and Croatia (0.14), while the lowest in France (0.04), Denmark (0.04), and Slovenia (0.06). Again, with some exceptions (SI

and PL, for instance), Eastern European countries reflect lower economies of scale as represented by higher weights of children compared to those for the Western European countries. Our results for child weights are less comparable with the findings of Bishop et al. (2014) and Kalbarczyk-Steclik et al. (2017), as their studies are based on two-adult households with child(ren) only (i.e., single-parent and three-and-more-adult households with children are excluded from the sample).

As our results confirm, economies of scale, in fact, differ across countries and for households with differing numbers of adults or children. These results confirm our assertion that the OECD-modified equivalence scale should not have been simply adopted by the Eastern European countries without any specific research. Though it is obvious that the subjective weights are typically lower than the OECD-modified ones, we hesitate to conclude which ones are the more “correct” based on our analysis. However, even our doubts about the today appropriateness of the OECD-modified scale for the Western European countries remain.

5.2 Income poverty rates based on subjective equivalence scales

Next, we compare the original AROP rate with an AROP rate were the country-specific subjective equivalence scales used instead of the (country-uniform) OECD-modified scale (and keeping the rest of the steps of AROP rate construction unchanged).¹⁸ Figure 2 displays the same information twice, making the difference in country ranking more visual.

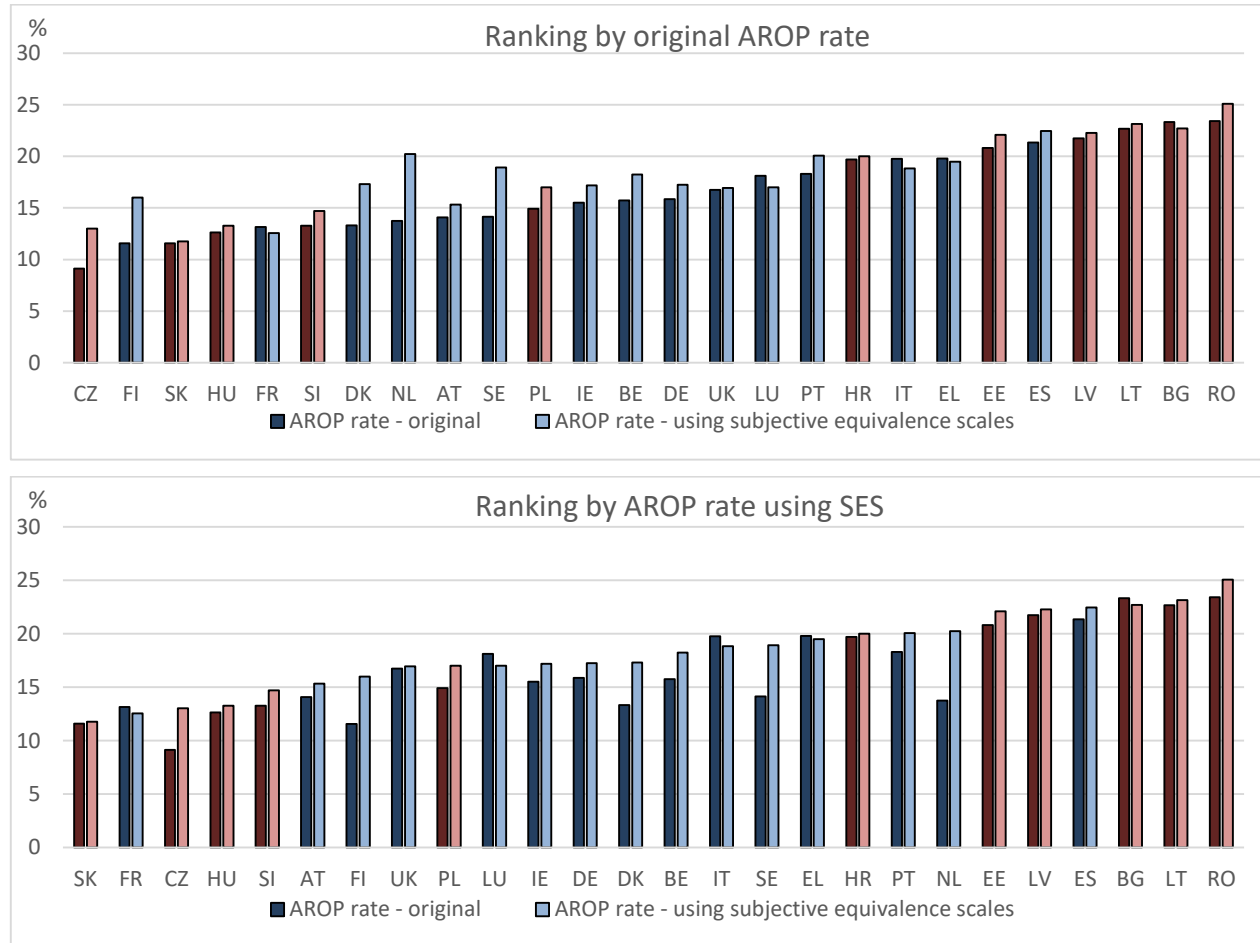
The change of the ranking is only moderate. Both the lower and upper tails of both rankings are occupied basically by the same countries, though their order changed at least partly.¹⁹ The most substantial shift can be seen in Netherlands, which jumped from 8th to 20th position. In the opposite

¹⁸ Note that the equivalised income of each household changes, and so the national median equivalised income.

¹⁹ Similarly, Bishop et al. (2014) concluded that using subjective weights for poverty rates did not alter the rankings of Euro Zone countries. However, as opposed to our study, they applied fixed exogenously determined poverty lines. With estimated economies of scale higher than the OECD-modified one, their poverty rates inevitably results to lower values.

direction, Luxembourg (and UK) changed the position most considerably, from 16th to 10th (from 15th to 8th).²⁰

Figure 2 Objective income poverty rates using OECD-modified and subjective equivalence scales



Source: EU-SILC 2017. Authors' computations.

Notes: AROP – at-risk-of poverty; SES – subjective equivalence scale. Share of individuals in population. EE countries in red, WE countries in blue.

Nevertheless, even moderate changes in the ranking indicate a sensitivity of the AROP rate to the equivalence scale used. Needless to say that more substantial changes might be revealed once we took a closer look at the demographic structure of the AROP (De Vos and Zaidi, 1997; Bishop et

²⁰ Note that the results for UK should be considered with caution due to a high share of missing values.

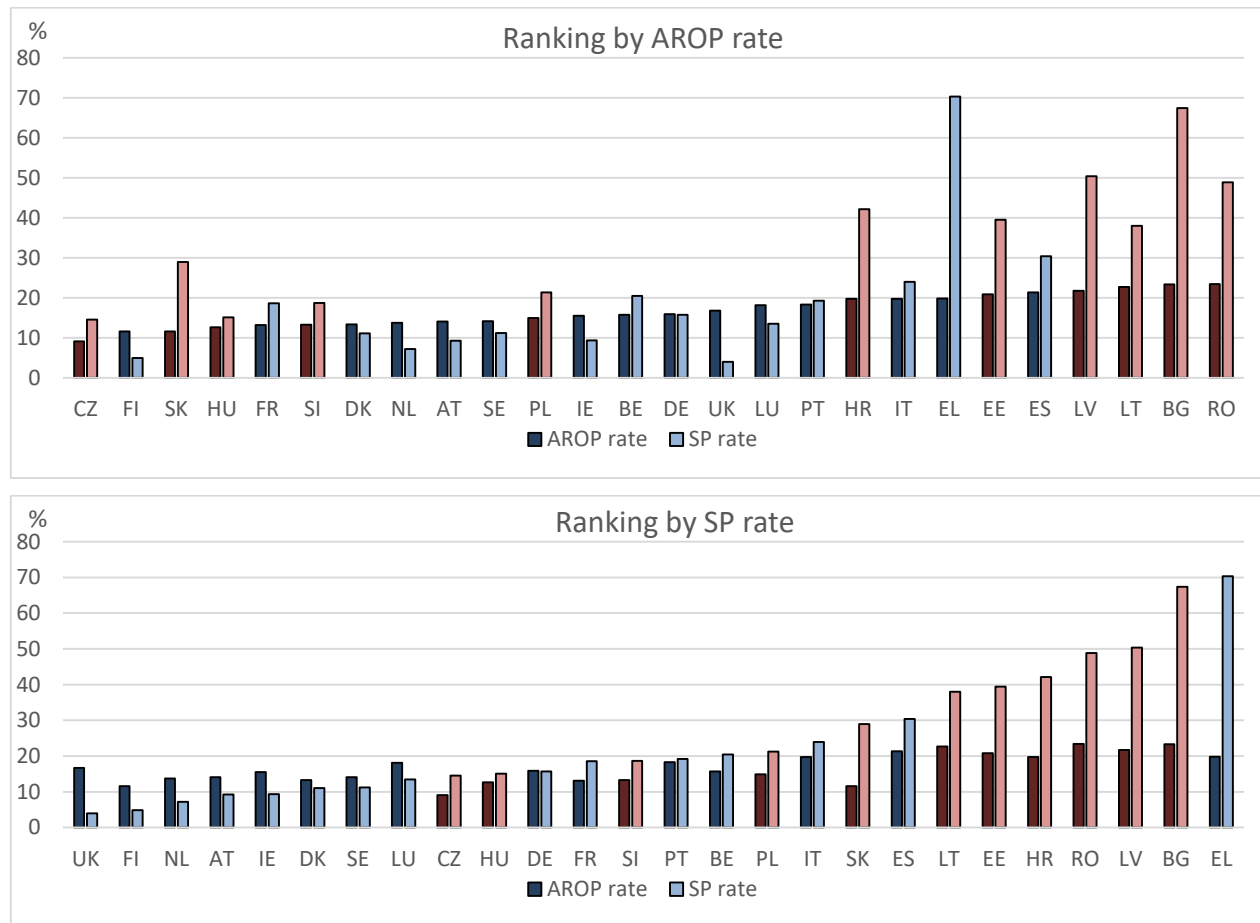
al., 2017). Moreover, some countries are more sensitive than others to the equivalence scale. For instance, in Netherlands, the AROP using SES increases by 6.5 percentage points, while in Luxembourg, it decreases by 1.1 percentage point. As stated by Mysíková and Želinský (2019) both these countries belong to those whose AROP rate is relatively sensitive to both adult and child weights, however, in different directions.

5.3 Subjective and objective income poverty rates

Once we apply the intersection method to derive the single or total SPLs (presented in Appendix in Table A.2), we can depict the differences between the SP and AROP rates. Though the top and bottom panels of Figure 3 bear the very same information, we depict the countries ranked by AROP and SP rates, respectively, on purpose to highlight the different rankings. Here, the change of the ranking is much more dramatic as when we compared the AROP rates using OECD-modified scale and SES (see Figure 2). While the rates are similar in some countries (e.g., DE and PT), the differences are extreme in others, given the very high SP rates (especially in EL and several Eastern European countries, e.g., BG, LV, RO, HR, EE).

In all Eastern European countries, the SP rate is uniformly higher than the AROP rate. In the Western European countries, the opposite mostly holds, with the exceptions of France, Belgium, Portugal, Italy, Greece, and Spain; there is also an apparent deviation of the Southern European countries from the rest of the WE region. While the AROP-rate ladder is occupied by Eastern European countries at both tails, the SP-rate ranking reveals a much clearer East-West division with more EE countries to the right. Also, there appears to be an Eastern-plus-Southern versus Western division. As we hypothesised, the SP rates result in a more apparent division of European regions.

Figure 3 Subjective and objective income poverty rates



Source: EU-SILC 2017. Authors' computations.

Notes: AROP – at-risk-of poverty; SP – subjective poverty. Share of individuals in population. EE countries in red, WE countries in blue.

6. Conclusion

Income poverty rate is a measure highly dependent on various steps in its construction. First of all, it is the equivalence scale used to equalise total income of households of different sizes to comparable units. This study questions the currently officially used OECD-modified equivalence scale, which was derived prior to Eastern European countries joined the EU as the sole scale for cross-national comparisons. The justification for using a single scale is to provide uniformity across European countries. Focusing on the difference between the Eastern – post-communist countries

experiencing the economic transition three decades ago – and Western European countries (“old EU member” states), we argue that the uniformity of this equivalence scale may not be appropriate. Primarily we base our assumption on the different consumption expenditure structures of the two European regions, leading to different economies of scale. Housing and food accounts for more substantial shares of consumption expenditures, with extremely opposite economies of scale. In countries in which housing accounts for relatively less of the needs to be met by the family and with food accounting for relatively more, economies of scale are expected to be less. While shares spent on housing are similar in the two regions, relative expenditures on food are considerably higher in the Eastern region (Mysíková and Želinský, 2019), thus, potentially leading to lower economies of scale there.

We confirm our assumption based on the estimations of subjective poverty lines, derived subjective equivalence scales, and comparisons of objective and subjective income poverty rates. First, we recommend that for cross-national comparisons country-specific equivalence scales should be considered along with the officially applied OECD-modified scale. We demonstrate this by showing that the subjective equivalence scales differ in the rough division of Eastern and Western Europe. Moreover, we can confirm that Eastern European countries generally exhibit lower economies of scale than Western European countries when subjectively assessed minimum income needed by households is considered, ultimately this result being in accordance with the statistics on consumption expenditures structure.

Second, we compared the official at-risk-of-poverty (AROP) rates with AROP rates where the subjective equivalence scales derived by this analysis used instead of the OECD-modified scale, while all other steps in the construction of the AROP rate were kept the same in this simulation. The change of country rankings is not so dramatic in this case as the lower and upper tails remain

to be occupied by basically the same countries. Nevertheless, the changes in AROP rates range from one percentage point higher the original than the simulated AROP to almost seven percentage points higher the simulated than the original one. This study leaves the analysis of countries' sensitivity of the AROP rate to equivalence scales in a more technical way for additional analysis (already at the stage of elaboration by the authors).

Finally, using estimated subjective poverty lines to directly derive subjective poverty (SP) results in rates that considerably changes the ranking of European countries when compared to the official AROP rate. While the latter shows rather a “random” order of countries regardless of any regional, economical, or even historical or cultural reasoning, the ranking of countries according to the first shows much clearer patterns. Though we admit that our hypothesis of an apparent East-West division of the European Union according to SP rate has to be slightly modified – not so surprisingly to an Eastern-plus-Southern versus Western division – we can confirm it.

We hesitate to conclude this study by evaluating whether the subjective equivalence scales are “better” than the OECD-modified scale or whether the subjective income poverty rates reflect “better” the situation of households than the objective ones, but we do not hesitate to conclude that country-specific equivalence scales would be more appropriate not only for country-specific purposes, for instance in terms of social policies inspirations, but also for cross-country comparisons.

Country abbreviations

Eastern Europe (EE):				Western Europe (WE):			
BG	Bulgaria	RO	Romania	AT	Austria	IE	Ireland
CZ	Czech Republic	SI	Slovenia	BE	Belgium	IT	Italy
EE	Estonia	SK	Slovakia	DE	Germany	LU	Luxembourg
HR	Croatia			DK	Denmark	NL	Netherlands
HU	Hungary			EL	Greece	PT	Portugal
LT	Lithuania			ES	Spain	SE	Sweden
LV	Latvia			FI	Finland	UK	United Kingdom
PL	Poland			FR	France		

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Appendix

Table A.1 Regression model results

	AT	BE	BG	CZ	DE	DK	EE	EL	ES	FI	FR	HR	HU
Actual income ln(Y)	0.20**	0.31**	0.16**	0.25**	0.31**	0.24**	0.21**	0.17**	0.13**	0.33**	0.40**	0.23**	0.15**
2 adults	0.26**	0.22**	0.39**	0.20**	0.20**	0.25**	0.37**	0.25**	0.20**	0.12**	0.20**	0.28**	0.27**
3 adults	0.35**	0.28**	0.56**	0.30**	0.27**	0.40**	0.57**	0.40**	0.28**	0.22**	0.26**	0.44**	0.41**
4+ adults	0.45**	0.39**	0.74**	0.40**	0.34**	0.49**	0.72**	0.51**	0.39**	0.33**	0.34**	0.54**	0.56**
1 child	0.05**	0.09**	0.12**	0.07**	0.08**	0.09**	0.14**	0.07**	0.08**	0.10**	0.02	0.11**	0.08**
2+ children	0.12**	0.14**	0.22**	0.14**	0.16**	0.07*	0.17**	0.12**	0.12**	0.15**	0.04*	0.19**	0.18**
Working - share	0.14**	0.03*	0.30**	0.14**	0.07**	0.20**	0.31**	0.09**	0.12**	0.12**	0.09**	0.17**	0.09**
Female - share	-0.02	0.01	-0.08**	-0.07**	0.03**	-0.04	-0.11**	-0.04**	-0.05**	0.04*	-0.01	-0.04*	0.00
Tertiary education - share	0.07**	0.11**	0.05**	0.04**	0.10**	0.14**	0.14**	0.14**	0.15**	0.10**	0.10**	0.16**	0.09**
Young 16-30 - share	-0.12**	-0.07**	0.06*	-0.04*	-0.14**	-0.28**	0.01	-0.06**	-0.03	-0.11**	-0.12**	0.00	-0.02
Owners	-0.12**	-0.00	-0.05	-0.05**	-0.03**	-0.03	-0.01	0.01	-0.05**	-0.15**	-0.00	-0.05	-0.03
Mortgage	0.02	0.08**	0.04	0.05**	0.13**	0.10**	0.09**	0.10**	0.06**	0.03	0.09**	0.00	0.05*
Rooms	0.05**	0.01**	0.03**	0.04**	---	0.04**	0.01**	0.06**	0.03**	0.03**	0.04**	0.02**	0.04**
Dense area	0.09**	0.02	0.12**	0.11**	---	0.07**	---	0.09**	0.07**	0.10**	0.10**	0.16**	0.08**
Medium area	0.07**	-0.04**	0.08**	-0.00	---	0.03	---	0.07**	0.04**	0.04*	0.05**	0.11**	0.02
Great difficulty to MEM	0.11**	0.25**	0.07	0.13**	0.13**	0.24**	0.23**	-0.04	0.14*	0.28**	0.19**	0.18*	-0.02
Difficulty to MEM	0.06*	0.23**	0.09	0.16**	0.14**	0.22**	0.23**	-0.07	0.14*	0.29**	0.16**	0.19*	0.04
Some difficulty to MEM	0.10**	0.20**	0.08	0.12**	0.17**	0.17**	0.20**	-0.06	0.16**	0.22**	0.08*	0.14	0.06
Fairly easily MEM	0.06**	0.11**	0.07	0.06	0.05**	0.10**	0.08	-0.09	0.12*	0.12**	-0.01	-0.00	0.03
Easily MEM	-0.02	0.02	-0.02	-0.00	0.02	0.06**	-0.02	-0.08	0.10	0.06**	-0.05	0.00	0.01
Material deprivation	0.02	0.00	-0.01	-0.01	-0.06**	-0.05	0.04	-0.03**	-0.05*	-0.03	-0.01	-0.06**	-0.05**
Constant	5.38**	4.84**	4.94**	4.48**	4.78**	5.16**	4.95**	5.66**	5.84**	4.29**	4.03**	4.64**	4.65**
Observations	5,958	5,717	7,339	8,698	12,843	4,780	6,119	22,467	13,620	9,536	10,523	6,694	8,040
R-squared	0.51	0.55	0.68	0.53	0.55	0.50	0.61	0.52	0.37	0.48	0.58	0.60	0.45
F	222.8	257.8	504.9	420.2	526.2	165.1	350.6	697.7	205.5	283.5	336.5	346.7	192.7
p	0	0	0	0	0	0	0	0	0	0	0	0	0

Table A.1 Regression model results (cont.)

	IE	IT	LT	LU	LV	NL	PL	PT	RO	SE	SI	SK	UK
Actual income ln(Y)	0.28**	0.08**	0.11**	0.15**	0.25**	0.27**	0.19**	0.31**	0.15**	0.16**	0.21**	0.21**	0.26**
2 adults	0.18**	0.19**	0.31**	0.22**	0.35**	0.11**	0.29**	0.18**	0.17**	0.15**	0.28**	0.24**	0.21**
3 adults	0.25**	0.30**	0.51**	0.28**	0.49**	0.18**	0.41**	0.27**	0.20**	0.30**	0.41**	0.40**	0.22**
4+ adults	0.33**	0.41**	0.70**	0.45**	0.65**	0.21**	0.54**	0.35**	0.16**	0.37**	0.53**	0.55**	0.28**
1 child	0.09**	0.07**	0.14**	0.06*	0.13**	0.06**	0.04**	0.06**	0.10**	0.03	0.04*	0.10**	0.11**
2+ children	0.10**	0.16**	0.19**	0.13**	0.21**	0.09**	0.11**	0.15**	0.16**	0.12**	0.08**	0.17**	0.12**
Working - share	0.11**	0.14**	0.22**	0.02	0.24**	0.02	0.13**	-0.01	0.09**	0.16**	0.19**	0.18**	0.17**
Female - share	0.06*	-0.05**	0.00	-0.01	-0.07**	-0.01	-0.00	-0.06**	-0.01	-0.02	-0.05**	-0.08**	0.02
Tertiary education - share	0.18**	0.11**	0.09**	0.19**	0.10**	0.14**	0.10**	0.24**	0.03	0.09**	0.08**	0.07**	0.17**
Young 16-30 - share	-0.11*	-0.02	0.01	-0.07*	0.08*	-0.14**	-0.06**	-0.00	0.12**	-0.12**	-0.07**	-0.02	-0.00
Owners	-0.01	-0.00	0.03	-0.18**	0.01	-0.05	-0.09**	-0.07**	0.04	-0.12**	0.00	-0.05*	-0.15**
Mortgage	0.17**	0.10**	0.18**	0.11**	0.20**	0.09**	0.10**	0.11**	0.19*	0.01	0.15**	0.04	0.13**
Rooms	0.02*	0.03**	0.02*	0.03**	0.01*	0.02**	0.03**	0.03**	0.03*	0.03**	0.03**	0.03**	0.06**
Dense area	0.07**	0.08**	0.01	0.05	---	---	0.13**	0.11**	0.24**	0.10**	---	0.08**	-0.01
Medium area	0.05	0.04**	0.15**	0.11**	---	---	0.08**	0.06**	0.20**	0.06**	---	0.04*	-0.00
Great difficulty to MEM	0.31**	0.03	-0.23	0.10*	0.42**	0.04	-0.03	0.23**	0.15	0.31**	0.20**	0.22**	0.14**
Difficulty to MEM	0.23**	0.06	-0.13	0.14**	0.43**	0.11**	0.01	0.25**	0.04	0.23**	0.21**	0.21**	0.08
Some difficulty to MEM	0.15*	-0.05	-0.12	0.12**	0.39**	0.10**	0.02	0.20**	0.02	0.22**	0.21**	0.18**	0.10**
Fairly easily MEM	0.11	-0.08	-0.23	0.00	0.27*	0.06**	-0.02	0.12	-0.07	0.12**	0.08	0.16**	0.04
Easily MEM	0.11	-0.07	-0.14	0.02	0.15	0.01	-0.01	0.06	-0.05	0.07**	0.03	0.13*	-0.00
Material deprivation	-0.08	-0.08**	0.00	-0.02	-0.07**	0.03	-0.04*	-0.05*	-0.08*	-0.01	-0.04	-0.10**	-0.07
Constant	4.61**	6.47**	5.46**	6.27**	4.37**	4.92**	4.75**	4.06**	4.72**	5.66**	4.97**	4.80**	4.47**
Observations	4,331	21,967	4,839	3,771	5,733	9,787	12,540	11,929	7,275	4,277	8,801	5,418	6,688
R-squared	0.41	0.30	0.46	0.38	0.62	0.35	0.51	0.41	0.10	0.38	0.48	0.50	0.43
F	92.21	302.4	93.43	68.15	384.4	156.0	368.8	195.5	37.19	134.5	360.6	185.5	149.2
p	0	0	0	0	0	0	0	0	0	0	0	0	0

Source: EU-SILC 2017. Authors' computations.

Notes: * statistically significant at the 5% level, ** statistically significant at the 1% level. MEM – make/ing ends meet.

Table A.2 Subjective poverty rates using total and partial subjective poverty lines

	Total SPL (EUR monthly)	Mean DI (EUR monthly)	SP rate (based on total SPL)	rank	SP rate (based on partial SPLs)	rank	Difference in	
							SP rate	rank
EE:								
BG	801	630	67.4	25	80.7	26	-13.3	-1
CZ	699	1234	14.5	9	13.3	8	1.2	1
EE	1200	1334	39.5	21	52.8	21	-13.4	0
HR	942	997	42.1	22	53.2	22	-11	0
HU	410	757	15.1	10	13.8	9	1.3	1
LT	723	962	38.0	20	45.3	20	-7.3	0
LV	1069	1011	50.4	24	63.9	24	-13.6	0
PL	658	1036	21.3	16	24.4	16	-3.1	0
RO	455	449	48.8	23	53.6	23	-4.7	0
SI	1188	1855	18.7	13	20.0	14	-1.3	-1
SK	937	1155	28.9	18	35.9	19	-7	-1
WE:								
AT	1488	3591	9.3	4	8.1	4	1.2	0
BE	1985	3206	20.5	15	21.9	15	-1.4	0
DE	1570	3004	15.7	11	15.2	11	0.6	0
DK	1766	3889	11.1	6	9.0	7	2	-1
EL	1714	1273	70.3	26	79.3	25	-9	1
ES	1556	2316	30.4	19	33.6	18	-3.2	1
FI	1129	3203	4.9	2	3.0	1	1.9	1
FR	1967	3296	18.6	12	19.1	12	-0.5	0
IE	1595	3955	9.3	5	8.5	6	0.8	-1
IT	1593	2565	23.9	17	26.4	17	-2.5	0
LU	2847	5857	13.5	8	14.0	10	-0.6	-2
NL	1283	3273	7.2	3	5.4	3	1.8	0
PT	781	1535	19.2	14	19.6	13	-0.4	1
SE	1463	3344	11.2	7	8.2	5	2.9	2
UK	952	3390	4.0	1	3.1	2	0.9	-1

Source: EU-SILC 2017.

Notes: DI – household disposable income. “Total SPL” considers a single subjective poverty line for whole population. “Partial SPLs” consider different subjective poverty lines for twelve various household types (combinations of 1 to 4+ adults and 0 to 2+ children). Rank – from lowest to highest rate within 26 European countries.