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The Sensitivity of Income Poverty Rates to Equivalence Scale in European Countries

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Although poverty has multidimensional nature and various multidimensional poverty measures reflecting different dimensions of poverty emerge, the income poverty rate still serves as the primary poverty indicator and is well identified and established not only by academics but also by politicians, media and the public. It is either used as a unidimensional measure of poverty itself, or as one of the dimensions of various multidimensional poverty indices. In this study, we focus on one of the first steps in estimating income poverty rates – on the construction of the equivalence scale and its impact on the income poverty rate.

In general, these income poverty rates are based on equivalised income. As there is no agreement on the optimal approach to the construction of equivalence scales, the actual choice is somewhat arbitrary. For instance, Eurostat adopted the "modified" OECD scale in the 1990s, though the cross-country comparability of income poverty rates based on a uniform equivalence scale had been questioned even by the research of that time. The comparability concerns are related to the fact that economies of scale can be strongly country-specific, and depend on the national structure of living costs, consumption of durable and non-durable goods, and goods with different economies of scale in general. The applied scale then affects the income poverty thresholds, the resulting rates, and inevitably the structure of the poor population. Ultimately, we argue that the methodology of its construction should be revised after more than two decades to achieve a robust tracking of the monetary poverty rate.

The questions regarding the appropriateness of a uniform scale have been raised again when the formerly socialist Eastern European countries joined the EU in 2004 and onwards. The OECD-modified scale was tailored to Western European countries' consumption structure, and thus we should expect that it reflects the economies of scale of this group of countries. As the consumption structure in Eastern European countries differs, it may not be appropriately reflected by the scale. We believe that one of the requirements of a right equivalence scale is a low sensitivity of the income poverty rate to the relative weights of adult and child household members assigned by the scale. If the income poverty rate changes substantially in response to a moderate change in the equivalence scale, the explanatory power of the income poverty rate is deficient and cannot be reliably used to inform social policy. Hence, the first aim of this study is

to assess the sensitivity of income poverty rates to the relative weights of adult and child household members.

Our methodological approach is based on assessing the sensitivity of income poverty rate to relative weights of adults/children, with the weights ranging between [0; 1]. As a starting point, we derive the rates for all combinations of adult and children weights to obtain a grid of complete distribution of the income poverty rate. The construction of our sensitivity measure is then based on the idea of average slopes of the resulting surface. However, when it comes to practical applications, one can argue that extremely low or high values of weights are not reasonable. Therefore, we also check the sensitivity using a limited range of weights.

Although the level of sensitivity of the overall income poverty rate can be low in some countries, the structure of poverty across sub-populations can still vary depending on the scale applied. Knowledge of the distribution of income poverty rates across different sub-populations may have important implications for social policies. For instance, empirical evidence suggests that the income poverty of pensioners is highly sensitive to the relative weight of adults assigned by the scale, needless to mention the sensitivity of child income poverty to the children weight. Thus, the second aim of this study is to assess the sensitivity of poverty structures to the equivalence scale.

Next, the third goal of this study is to identify clusters of countries with similar patterns in terms of the sensitivity of poverty rates to equivalence scales. Intuitively, we expect that the groups of countries identified will roughly reflect the East-West division of Europe. Ultimately, our last goal is to utilise the time-series microdata (EU-SILC 2005-2018) for analysing the robustness of income poverty rates to equivalence scales over time in individual European countries. Once the income poverty rate is highly sensitive to the scale, its identified long-term trend can be misleading. We conclude by conjecturing that countries with a high degree of sensitivity should consider establishing their own country-specific equivalence scales.