On the robustness of multidimensional poverty orderings in the EU:
To what extent are cross-country and cross-year comparisons robust to changes in weights?

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Monitoring of poverty trends in the European Union is based on a multidimensional indicator "people at risk of poverty or social exclusion" defined as the sum of persons who are: at-risk-of-poverty and/or severely materially deprived and/or living in households with very low work intensity. The indicator is defined as a simple composite index assigning equal weights to all three dimensions. The arbitrary equal weighting of all dimensions is the most commonly used approach in the empirical applications and is often defended by its simplicity, but at the same time equal weighting is universally considered to be wrong (Chowdhury and Squire, 2006). Several improvements to the "people at risk of poverty or social exclusion" indicator and its sub-indicators have been proposed in the empirical literature, but very little attention has been paid to evaluate the sensitivity of poverty orderings to changes in weights. Robustness checks are usually based on a limited number of weighting vectors, and the analysis of correlation between the initial ranking and rankings for the alternative specifications.

The goal of this paper is to assess the robustness of cross-country and cross-year comparisons in the EU using the official multidimensional poverty framework. The previous research suggests that poverty comparisons are in general sensitive to weights (see e.g. Alkire et al., 2015). Different weighting vectors can hence yield different results, and one is not able to claim robustly whether poverty in country A is higher than in country B, or that poverty in a given country has unambiguously declined or increased.

Our empirical application is based on EU-SILC microdata adopting the counting approach to multidimensional poverty measurement proposed by Alkire and Foster (2011). Two main analyses are performed in the study. First, we check the robustness of cross-country and cross-year comparisons in the EU for all pair-wise comparisons (cross-country as well as cross-year) by testing the necessary, sufficient, and necessary and sufficient dominance conditions (recently proposed in the literature). Secondly, we focus on the pair-wise comparisons for which dominance cannot be assumed. We want to answer the question how far we can go from equal weights while preserving the initial ranks in pair-wise comparisons, i.e. we search for the maximum change in weights that preserves the initial ranks.

We find that approximately 50 per cent of all pair-wise country comparisons are not robust to changes in weights, i.e. it is always possible to find a set of weights for which ranks of countries reverse. Similar results are obtained, when assessing the robustness of poverty comparisons over time. Analysis of the relationship between maximum change in weights (preserving initial ranks) and threshold indicates that the highest probability of preserving ranks is in case of union and intersection approaches. The findings further indicate that rankings of countries are extremely sensitive to change in weights around the official definition of the composite indicator (i.e. weights of all dimensions and threshold equal one third). Our results hence suggest that evaluations of the progress made in alleviating multidimensional poverty in the EU are highly sensitive to the set of weights used to quantify poverty, and that more attention needs to be paid to the checks for sensitivity of poverty comparisons to changes in weights.