

# Multidimensional poverty in Europe: measuring the ‘leaving no one behind’ principle

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**Abstract.** In this paper we present a fuzzy multidimensional approach for the measurement of the ‘leaving no one behind’ principle underlying the Sustainable Development Goals (SDGs) in European countries. In particular, we consider a two-step procedure. First, we compute the degree to which an individual is ‘left behind’ in each specific dimension. We then propose alternatives to measure the extent to which an individual is ‘left behind’ in a multidimensional setting. We illustrate our proposal taking as a reference the ‘at risk of poverty or social exclusion’ (AROPE) framework (dimensions, indicators and union criteria). The results highlight that although the average ‘left behind’ (LB) level and AROPE are largely consistent across European countries, our fuzzy measure provides valuable additional information, both in individual and aggregate terms, on persons who are further away from those better positioned and how far they are.

Keywords: Fuzzy sets, multidimensional poverty, AROPE, ‘left behind’

## 1 Introduction

In 2015, world leaders adopted 17 Global Goals known as the Sustainable Development Goals (SDGs; see [21]), which have the potential to end poverty, reduce inequality and tackle climate change in 15 years, among other challenges. One of the pillars of the 2030 Agenda for Sustainable Development and the SDGs, and one which represents a critical improvement over the Millennium Development Goals (MDGs), is the pledge to ‘leave no one behind’. In committing to the realization of the 2030 Agenda for Sustainable Development, Member States recognized that the dignity of the individual is fundamental and that the Agenda’s goals and targets should be met for all nations and people and for all segments of society. Furthermore, they endeavored to reach first those who are furthest behind.

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