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## **Book review: Multidimensional Poverty Measurement and Analysis.**

“Multidimensional Poverty Measurement and Analysis” is a formidable piece of work that anyone interested in the quantitative analysis and measurement of poverty should definitely read. The book offers a comprehensive and in-depth review of currently existing ideas, approaches and techniques that will be useful for researchers, students and technical staff in governmental and international development agencies alike. Interestingly, it covers virtually all theoretical and practical aspects any researcher or practitioner must deal with when attempting to implement a multidimensional poverty measure. The clear and highly pedagogical style in which it is written makes the book accessible to a wide readership, even for those who are not particularly acquainted with quantitative methods and techniques.

In a nutshell, the book revolves around the idea that the Alkire and Foster counting methodology (henceforth referred to as ‘AF method’, see Alkire and Foster 2011) is among the best methods that are currently available when attempting to measure multidimensional poverty. To illustrate the point, the book starts examining the foundations of multidimensional poverty measurement (chapter 2) and then discusses the different quantitative techniques introduced in the literature so far (chapter 3). After highlighting the limitations of alternative approaches, the book proceeds with a thorough description of the AF method and other counting methodologies (chapters 4 and 5). The last five chapters of the manuscript cover many of the aspects typically encountered in practice when attempting to design and implement multidimensional poverty indices. In this respect, the emphasis given to the normative choices involved in measurement design (chapter 6) and to the analysis of robustness (chapter 8) are laudable and highly necessary. The growing availability of internationally comparable datasets (discussed in chapter 7) increasingly facilitates the possibility of constructing multidimensional poverty indices, which in many occasions might be poorly designed and/or lacking adequate justification. As these chapters make clear, the technical decisions involved in their construction have non-trivial implications on results, so it is crucial not to make them in an automated way. The 9<sup>th</sup> and 10<sup>th</sup> chapters tap over a wide range of practical issues including the inequality among the poor, the decompositions of poverty indices, poverty over time and regression models including AF measures. Regrettably, these chapters (particularly the last one) lack the exhaustiveness characterizing the previous chapters of the book, passing on tiptoe over several topics that are hugely relevant in empirical analysis and which can be extended in several directions.

There is much to praise in the AF method and there are several factors that have contributed to its widespread acceptance and implementation – indeed, it is nowadays the state-of-the-art methodology currently employed by researchers, policy-makers and institutions around the world to identify the poor in multidimensional settings<sup>1</sup>. These

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<sup>1</sup> To illustrate: the AF method is currently being implemented by the governments of Bhutan, Brazil, Chile, China, Colombia, El Salvador, Malaysia, Mexico or the Philippines to complement their income poverty measures, with many other countries to follow soon, and the United Nations Development

factors include (i) its flexibility to accommodate many reasonable alternatives lying between the – admittedly extreme – ‘union’ and ‘intersection’ perspectives, (ii) the possibility of incorporating the ordinal data that commonly arise in multidimensional settings and (iii) its plasticity in adapting to alternative contexts where different variables are available. Noticeably, in its effort to promote its preferred method the book reviewed here does not attempt to discuss some of the limitations which, like any other measurement methodology, the AF approach has. Knowing what are the shortcomings of any measurement methodology is perhaps one of the best ways of taking the most advantage of it without stretching beyond its possibilities, so in the remainder of the review I will briefly outline some of them (which, unfortunately, have not been discussed in the book).

1. The counting approach that underlies the AF identification method is a procedure that, roughly speaking, adds up the number of deprivations across dimensions to decide whether the individuals experiencing them should be considered poor or not. While this is reflective of the current state of the literature, it is the reviewer’s opinion that the limitations of the approach – and not only its undeniable merits – should have been brought to the fore as well. Inter alia, the counting approach is a quantitatively-oriented method that overlooks certain qualitative aspects of the identification of the poor, ignoring the interrelationships that might exist between dimensions. For the counting approach, what counts to be counted as poor is the count of dimensions in which individuals are deprived – irrespective of the nature of the variables contributing to the count. Yet, one might argue that the lack of deprivation in some dimensions might somehow compensate for the deprivations experienced in others (e.g.: high quality college education might compensate for the temporary lack of income, or a good health insurance could somehow compensate for a poor health status) – an issue that cannot be modelled within the AF framework even when one makes room for weighted deprivations.

2. Related to the former, the inability of the AF family of poverty measures to take into account the eventual interactions that might exist between dimensions affects not only the identification of the poor but also the measurement of poverty levels (i.e.: the ‘aggregation step’). As they are defined, the AF indices satisfy the so-called Strong Focus axiom but violate Weak Focus; that is: the possibility of trade-offs between achievements below and above the poverty lines is ruled out. Yet, as Dutta et al (2003:205) contend “*One can argue that there is no reason why, other things remaining the same, a change in the level of over-achievement of an individual in terms of an attribute should not be allowed to affect the assessment of the overall deprivation of that individual*”. As shown in Permanyer (2014), our assessments of multidimensional poverty levels can differ to a large extent when the Strong version of the axiom is weakened to allow for the possibility of having non-trivial interactions between deprived and non-deprived attributes.

3. Like the well-known Headcount ratio, the AF family of poverty measures is discontinuous. One of the consequences of this discontinuity is that certain regressive Pigou-Dalton transfers might decrease poverty rather than increasing it, a somewhat disturbing result. Consider the following illustrative example in a two-member society with four well-being dimensions,  $q=3$  (i.e.: an individual must be deprived in at least three attributes to be considered as poor), the four poverty thresholds set at 0.3 (i.e.:  $z_i=0.3$  for all  $i \in \{1,2,3,4\}$ ) and

$$x_1=(0.1,0.1,0.11,0.1), x_2=(0.1,0.1,0.29,1).$$

Suppose there is a regressive Pigou-Dalton transfer where individual 1 transfers 0.01 units of the third attribute to individual 2. After the transfer one has that

$$x'_1=(0.1,0.1,0.1,0.1), x'_2=(0.1,0.1,0.3,1),$$

so the second individual is no longer poor. According to the Alkire-Foster class of poverty measures, poverty has decreased after the transfer.

4. When aggregating information about the poor, the AF method assumes that each pair of variables has the same elasticity of substitution (i.e.: all pairs of variables are either complements or substitutes). While this is reflective of the current state of the literature, it is an overly restrictive assumption that is unlikely to be satisfied in practice.

5. Another attractive feature of the AF method is the alleged possibility of knowing the contribution of each dimension to overall poverty levels once the identification step is over (this is the so-called ‘dimensional decomposability’ property, see Alkire and Foster 2011: 481-482). According to this model, it is possible to conclude that deprivations in variable  $X$  have contributed to overall multidimensional poverty levels by, e.g., 40% – thereby giving an apparently clear and appealing message to researchers or policy-makers aiming to identify the single most important dimension that contributes to poverty so as to eradicate it in the most effective way. We argue that this dimension decomposability approach might give a misleading picture of the ways in which multidimensional poverty is articulated because it disregards the *joint* patterns of deprivation that individuals must experience in order to classify them as poor. Decision-makers guided by dimensional decomposability have incentives to allocate resources to reduce deprivations in the dimension contributing the most to overall poverty levels (say,  $X$ ), irrespective of the huge difference it may make to experience deprivations in  $X$  *jointly* with deprivations in  $Y$  rather than experiencing deprivations in  $X$  *and*  $Z$ . The ability to express the contribution of each dimension to overall poverty *separately* is gained at the expense of losing information on the patterns of joint deprivation individuals might experience.

6. As acknowledged in the book, the counting approach is fundamentally related to the axiomatic literature on freedom, and more specifically to the work of Pattanaik and Xu (1990). In that paper, Pattanaik and Xu adopt a non-preference based (NPB) approach to axiomatically characterize an opportunity set ranking on the basis of the number of

elements they contain. Given the dismal view expressed by the authors after the crudeness of the strongly quantitative nature of their results, it is somewhat surprising that this approach is used to justify the ethical foundations of the counting approach. Like most existing multidimensional poverty measures, the AF method does not take into account individuals' preferences as regards the importance of the different dimensions included in the poverty assessments (i.e.: weights) or whether the different dimension pairs should be treated as complements or substitutes. Yet, an emerging strand of the literature suggests that these preferences should be center place when deciding how to aggregate individuals' multiple deprivations (see Decancq et al 2014).

All in all, "Multidimensional poverty measurement and analysis" constitutes an impressive and highly useful piece of work that is easily accessible for a wide ranging readership including academics and more policy-oriented users working on the measurement of poverty. What some of these users might miss in the book is an attempt at self-criticism indicating the limitations of the measurement approach the authors are proposing.

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