Measuring Poverty from a Multidimensional Perspective

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Launch of Multidimensional Peer Network

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Why Multidimensional Poverty?

- **Missing Dimensions**
  - Just low income?

- **Capability Approach**
  - Conceptual framework

- **Data**
  - More sources

- **Tools**
  - Unidimensional measures into multidimensional

Why Multidimensional Poverty?

- ## Demand
  - ### Governments and other organizations
    - Can see effects of good policies on poverty: good governance
    - Coordination of Ministries: help overcome "silo" problem

Challenge

- A government would like to create an official multidimensional poverty indicator

- Desiderata
  - It must **understandable** and easy to describe
  - It must conform to a **common sense** notion of poverty
  - It must fit the **purpose** for which it is being developed
  - It must be **technically** solid
  - It must be **operationally** viable
  - It must be easily **replicable**

- What would you advise?

Our Proposal - Overview

Identification – Dual cutoffs

Deprivation cutoffs – each deprivation counts

Poverty cutoff – in terms of breadth of deprivation

Aggregation – Adjusted FGT

Reduces to FGT in single variable case

Background papers

Alkire and Foster "Counting and Multidimensional Poverty Measurement" forthcoming *Journal of Public Economics*

Alkire and Santos "Acute Multidimensional Poverty: A new Index for Developing Countries" OPHI WP 38

Alkire and Foster "Understandings and Misunderstandings of Multidimensional Poverty Measurement" *J. of Economic Inequality*

Adjusted Headcount Ratio

Concept - Poverty as multiple deprivations

- Mirrors identification used by NGOs – BRAC
- Depends on joint distribution

Ordinal data

- Dirt floors vs covered floors
- Qualitative data into quantitative data

Transparent

- Defined by variables, deprivation cutoffs, deprivation values, poverty cutoff
- Can be replicated and tested for robustness

Adjusted Headcount Ratio

Can be implemented at many levels

Cross country – MPI in the HDR's since 2010

Country – Mexico, Colombia, El Salvador, etc.

State – Sao Paolo, Minas Gerais

Local village level – DR, India, Bhutan

Evaluation – Impacts on poverty (Smith and Robano 2012)

As a coordination tool – Ministries in Colombia

In constructing other measures – Gross national happiness index (Bhutan), Women's Empowerment in Agriculture Index (USAID/IFPRI), Service delivery performance measure (Allwine and Foster, 2011), Corruption (Foster et al, *WBER* 2012)

Intro to: Multidimensional Methods

Matrix of achievements for *n* persons in *d* equally important domains

$$y = \begin{bmatrix} 13.1 & 14 & 4 & 1 \\ 15.2 & \underline{7} & 5 & \underline{0} \\ \underline{12.5} & 10 & \underline{1} & 0 \\ 20 & \underline{11} & 3 & 1 \end{bmatrix}$$ Persons

z (13   12   3   1)   Cutoffs

<u>These entries fall below cutoffs</u>

Deprivation Matrix

Replace entries: 1 if deprived, 0 if not deprived

Domains

$$g^0 = \begin{bmatrix} 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 1 \\ 1 & 1 & 1 & 1 \\ 0 & 1 & 0 & 0 \end{bmatrix}$$

Persons

Identification – Dual Cutoff Approach

Q/ Who is poor?

A/ Fix cutoff k, identify as poor if $c_i \geq k$ (**Ex: k = 2**)

Domains c

$$g^0 = \begin{bmatrix} 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 1 \\ 1 & 1 & 1 & 1 \\ 0 & 1 & 0 & 0 \end{bmatrix} \quad \begin{matrix} 0 \\ \underline{2} \\ \underline{4} \\ 1 \end{matrix}$$ Persons

Note

Includes both union and intersection

Especially useful when number of dimensions is large

Union becomes too large, intersection too small

Next step - *aggregate* into an overall measure of poverty

Aggregation

Censor data of nonpoor

$$g^0(k) = \begin{bmatrix} 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 1 \\ 1 & 1 & 1 & 1 \\ 0 & 0 & 0 & 0 \end{bmatrix} \quad \begin{array}{c} c(k) \\ 0 \\ \underline{2} \\ \underline{4} \\ 0 \end{array}$$

Domains   c(k)

Persons

Aggregation – Headcount Ratio

$$g^0(k) = \begin{matrix} & \text{Domains} & & c(k) \\ \begin{bmatrix} 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 1 \\ 1 & 1 & 1 & 1 \\ 0 & 0 & 0 & 0 \end{bmatrix} & & \begin{matrix} 0 \\ \underline{2} \\ \underline{4} \\ 0 \end{matrix} & \text{Persons} \end{matrix}$$

Two poor persons out of four: **H = ½** 'incidence'
      Critiques

Aggregation – Adjusted Headcount Ratio

Adjusted Headcount Ratio = M_0 = HA = $\mu(g^0(k))$ **= 6/16 = .375**

$$
\begin{array}{ccc}
 & \text{Domains} & c(k) \quad c(k)/d \\
g^0(k) = \begin{bmatrix} 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 1 \\ 1 & 1 & 1 & 1 \\ 0 & 0 & 0 & 0 \end{bmatrix} & \begin{array}{c} 0 \\ \underline{2} \\ \underline{4} \\ 0 \end{array} & \begin{array}{c} \\ 2/4 \\ 4/4 \\ \end{array} \quad \text{Persons}
\end{array}
$$

A = average intensity among poor = 3/4

Note: if person 2 has an additional deprivation, M_0 rises

Aggregation – Adjusted Headcount Ratio

Observations

M_0 uses **ordinal** data

Similar to traditional **gap** P_1 = HI

HI = per capita poverty gap

= headcount H times average income gap I among poor

HA = per capita deprivation

= headcount H times average intensity A among poor

Decomposable across **dimensions** after identification

$M_0 = \sum_j H_j/d$ where H_j are "censored" headcount ratios

Extends easily to the case where deprivations have **different** values

Revisit Objectives

- ## Desiderata

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- ## What do you think?

Thank you