The Relevance of Multi-Dimensional Poverty Measures to Thinking about Gender

Gender Development Seminar Series,
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Sabina Alkire
Why MD measures?

**Overview** “While assessing quality-of-life requires a plurality of indicators, there are strong demands to develop a single summary measure.” *Stiglitz Sen Fitoussi Commission Report*

**Ethics** “Human lives are battered and diminished in all kinds of different ways.” *Amartya Sen*

**Effectiveness** “Acceleration in one goal often speeds up progress in others;” to meet MDGs strategically we need to see them together. *Roadmap towards Implementation …*

**Coordination** “the issues around poverty are interconnected and demand crosscutting solutions” *UNDP MDG Report 2010*
New Multidimensional Poverty Measures

- Provide an **overview** of multiple indicators at-a-glance
- Show **progress** quickly and directly (Monitoring/Evaluation)
- Inform **planning** and **policy** design
- **Target** poor people and communities
- Reflect people’s **own understandings** (Flexible)
- **High Resolution** – zoom in for details by region, group, or indicator
Alkire Foster Methodology

1. Select Dimensions, Indicators and Weights (Flexible)
2. Set Deprivation cutoffs for each indicator (Flexible)
3. Apply to indicators for each person from same survey
4. Set a poverty cutoff to identify who is poor (Flexible)
5. Calculate MPI ($M_0$) – for ordinal data,
   Reflects incidence, intensity
6. If data are cardinal, $M_1$ and $M_2$ – normalized & squared gap

**Properties:** decomposable by population subgroups, dimensional monotonicity, post-identification factor decomposability plus usual.

Alkire, Sabina and James Foster  *J. of Public Economics* 2011
AF Method: Achievement Matrix

\[
Y = \begin{bmatrix}
13.1 & 14 & 4 & 1 \\
15.2 & 7 & 5 & 0 \\
12.5 & 10 & 1 & 0 \\
20 & 11 & 3 & 1 \\
\end{bmatrix}
\]

\[
z = (13 \quad 12 \quad 3 \quad 1) \quad \text{Cutoffs}
\]
AF Method: Deprivation and Censored Matrix

Deprivation Matrix

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

Censored Deprivation Matrix, \( k=2 \)

\[ g^0(k) = \begin{bmatrix}
0 & 0 & 0 & 0 \\
0 & 1 & 0 & 1 \\
1 & 1 & 1 & 1 \\
0 & 0 & 0 & 0 \\
\end{bmatrix} \]
AF Method: Adjusted Headcount Ratio $M_0$

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

\[ g^0(k) = \begin{bmatrix}
0 & 0 & 0 & 0 \\
0 & 1 & 0 & 1 \\
1 & 1 & 1 & 1 \\
0 & 0 & 0 & 0
\end{bmatrix} \]

\[ \begin{array}{c|c|c}
\text{Domains} & c(k) & c(k)/d \\
\hline
0 & 0 & 2/4 \\
0 & 1 & 2/4 \\
1 & 1 & 4/4 \\
0 & 0 & 0
\end{array} \]

A = average deprivation share among poor = 3/4
Aggregation: Adjusted FGT Family

Adjusted FGT is $M_\alpha = \mu(g^\alpha(\tau))$ for $\alpha \geq 0$

Domains

$$g^\alpha(k) = \begin{bmatrix}
0 & 0 & 0 & 0 & 0 \\
0 & 0.42^\alpha & 0 & 1^\alpha \\
0.04^\alpha & 0.17^\alpha & 0.67^\alpha & 1^\alpha \\
0 & 0 & 0 & 0 & 0
\end{bmatrix}$$

Persons

**Theorem 1** For any given weighting vector and cutoffs, the methodology $M_{k\alpha} = (\rho_k, M_\alpha)$ satisfies: decomposability, replication invariance, symmetry, poverty and deprivation focus, weak and dimensional monotonicity, nontriviality, normalisation, and weak rearrangement for $\alpha \geq 0$; monotonicity for $\alpha > 0$; and weak transfer for $\alpha \geq 1$. 
Example: International MPI

Published in *Human Development Reports* since 2010 for over 100 countries
Build a deprivation score for each person
(H/Ed draw on all data of hh members)
Identify who is poor

A person is multidimensionally poor if they are deprived in 33% of the dimensions.
Aggregation: Alkire & Foster $M_0$

The $M_0$ is the product of two components:

**Formula:**  \[ M_0 = H \times A \]

1) *Incidence* \~ the percentage of people who are disadvantaged, or the headcount $H$.

2) *Intensity* of people’s deprivation \~ the average share of dimensions in which disadvantaged people are deprived $A$. 
Use: High Resolution Lens

• Break down by population subgroup
  – Spatial, Social Groups
• Break down by indicators
• Show (weighted) composition of deprivations
• Across time – panel or time series dynamics
• With robustness tests, standard errors, etc.
In theory

AF measures…

can be unfolded and folded in different ways…

so you see how it’s made…

and how it can be changed.
Observation:

• In practice, decomposition by gender is easy.

• Break down by population subgroup
  – Spatial, Social Groups, GENDER, AGE

• But no decomposition by gender, age, etc is possible if household is unit of analysis.
Gendered measures: Constraints

• **Most** measures to date use the household as the unit of analysis.

• Justifications:
  – Data Limitations (MPI)
  – Policy (targeting, CCTs)
  – Incentives (foster intra-household sharing)
  – Cost (new surveys)
Gendered MD Measures

• Unit of analysis is the person (e.g. adult or child)
• Data: accurate for individual across time period.
• Data: comparable across individuals (eligibility)
  – Women-only variables?
  – Different ages?
• Household level variables: can apply
Outline

Illustrates gendered measures

• 18 European Countries (EU-SILC data)
• Burkina Faso (others’ work)
• Women’s Empowerment in Agriculture Index

• Much of this is work in progress
Example 1:

*Multidimensional poverty measurement in 18 European countries, 2006-2010*

Sabina Alkire, Mauricio Apablaza, Euijing Jung

*Work in Progress*

Paper builds 4 MD Pov measures with different indicators using AF, and compares dynamics across 5 time periods.

**Unit of analysis: person** (household variables – income, material deprivation – are shared). Intra-hh data not available but individual level data are.
Multidimensional poverty measurement in 18 European countries, 2006-2010, ‘B’

Women are poorer: all countries; all periods
Multidimensional poverty composition in 18 European countries, ‘B’, by gender

Composition varies but not hugely.

2006

2010
Example 2:

Gender Inequality in Multidimensional Welfare Deprivation in West Africa: The Case of Burkina Faso and Togo

Akoété Ega Agbodji, Yélé Maweki Batana & Dénis Ouédraogo

Work in Progress – non-OPHI work
6 equally-weighted dimensions
Unit of analysis: individual adults

Raw Headcounts:

<table>
<thead>
<tr>
<th>Burkina Faso</th>
<th>Dimensions</th>
<th>National</th>
<th>By gender</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Male</td>
</tr>
<tr>
<td></td>
<td>Access to credit</td>
<td>52.6</td>
<td>50.2</td>
</tr>
<tr>
<td></td>
<td>Employment</td>
<td>49.5</td>
<td>31.9</td>
</tr>
<tr>
<td></td>
<td>Education</td>
<td>71.6</td>
<td>63.4</td>
</tr>
<tr>
<td></td>
<td>Housing*</td>
<td>53.8</td>
<td>53.1</td>
</tr>
<tr>
<td></td>
<td>Assets*</td>
<td>69.5</td>
<td>68.5</td>
</tr>
<tr>
<td></td>
<td>Basic utilities*</td>
<td>54.1</td>
<td>52.5</td>
</tr>
</tbody>
</table>
**M_{0} and H by Gender:**
Disparity is higher among the poorest (by intensity)

Multidimensional deprivation rates in Burkina Faso

<table>
<thead>
<tr>
<th>Level</th>
<th>Cutoff</th>
<th>Headcount H (%)</th>
<th>MPI (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>All</td>
<td>Men</td>
</tr>
<tr>
<td><strong>National</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>k = 1</td>
<td>98.3</td>
<td>97.8</td>
<td>98.7</td>
</tr>
<tr>
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</tr>
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<td>k = 3</td>
<td>78.3</td>
<td>71.8</td>
<td>83.6</td>
</tr>
<tr>
<td>k = 4</td>
<td>52.6</td>
<td>40.7</td>
<td>62.5</td>
</tr>
<tr>
<td>k = 5</td>
<td>18.4</td>
<td>9.3</td>
<td>25.8</td>
</tr>
<tr>
<td><strong>Rural</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>k = 1</td>
<td>99.9</td>
<td>99.9</td>
<td>100.0</td>
</tr>
<tr>
<td>k = 2</td>
<td>98.1</td>
<td>97.3</td>
<td>98.8</td>
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<td>k = 5</td>
<td>23.6</td>
<td>12.0</td>
<td>32.8</td>
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<tr>
<td><strong>Urban</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>k = 1</td>
<td>93.9</td>
<td>92.7</td>
<td>95.0</td>
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<td>k = 2</td>
<td>74.0</td>
<td>68.8</td>
<td>78.9</td>
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<td>19.9</td>
<td>13.8</td>
<td>25.6</td>
</tr>
<tr>
<td>k = 5</td>
<td>4.3</td>
<td>2.5</td>
<td>5.9</td>
</tr>
</tbody>
</table>
Gender differences by region

Women poorer than men all regions
Disparity is higher in intensity among the poorest (right) $k=3$

Regions ranked from the least deprived to the most deprived
Women’s Empowerment in Agriculture Index (pilot findings)
Purpose

• Design, develop, and test an index to measure the greater inclusion of women in agricultural sector growth that has occurred as a result of US Government intervention under the Feed the Future Initiative.

• What is “greater inclusion”? The concept of Inclusive Agricultural Sector Growth is broad and multi-dimensional.

• Feed the Future defines it as: “the empowerment of women in their roles and engagement throughout the various areas of the agriculture sector, as it grows, in both quantity and quality.”
Innovations in survey design and implementation

• Index components designed to be applicable across countries and cultures
• Men and women from the same household are interviewed
• The survey questionnaire modules focus on men’s and women’s empowerment in agriculture
• The index applies to women in households with male adults--as well as those with only female adults.
Bangladesh

- Southern part of the country
  - 25 villages from 5 rural districts (Khulna, Madaripur, Barguna, Patuakhali and Jessore)
    - 18 households randomly selected from each village (14 dual adult; 4 female adult only)

- Sample size: 450 households (800 individuals)
Guatemala

- Western highlands, large indigenous population
  - 25 villages from 28 targeted municipalities from 5 departamentos (Quetzaltengo, San Marcos, Huehuetenango, El Quiché and Totonicapán)
  - 14 households randomly selected from each village (11 dual adult; 3 female adult only)

- Sample size: 350 households (626 individuals)
Uganda

- Northern, Central, and Eastern
  - 25 Local Councils in 25 Parishes in 5 preselected rural districts: Kole and Amuru (North), Masaka and Luwero (Central) and Iganga (Eastern)
  - 14 households randomly selected from each LC (11 dual adult; 3 female adult only)
- Sample size: 350 households (625 individuals)
How is the Index constructed?

WEAI is made up of two sub indices

Women’s Empowerment in Agriculture Index (WEAI)

Gender parity Index (GPI)

Five domains of empowerment (5DE)
A direct measure of women’s empowerment in 5 dimensions

All range from zero to one; higher values = greater empowerment

Women’s achievement’s relative to the primary male in hh
Five Domains of Women’s Empowerment in Agriculture

Ten Indicators
- Input in productive decisions 1/10
- Autonomy in production 1/10
- Ownership of assets 1/15
- Purchase, sale, or transfer of assets 1/15
- Access to and decisions on credit 1/15
- Control over use of income 1/5
- Group Member 1/10
- Speaking in Public 1/10
- Leisure 1/10
- Workload 1/10
Who is empowered?

A woman who has achieved ‘adequacy’ in 80% or more of the weighted indicators is empowered.
5DE Methodology

- The 5DE is based on the Alkire Foster methodology (uses $1-M_0$) and reflects:
  - **Incidence of Empowerment** - The percentage of women who are empowered
  - **Adequacy among the Disempowered** - The weighted share of indicators in which disempowered women enjoy adequate achievements

- Based on each woman’s empowerment profile
- Identifies *who* is empowered
- Shows *how* women are disempowered
- Rigorous properties
Gender Parity Index (GPI)

Reflects two things:

1. The percentage of women who enjoy gender parity. A woman enjoys gender parity if
   - she is empowered or
   - if her empowerment score is equal to or greater than the empowerment score of the primary male in her household.

2. The empowerment gap - the average percentage shortfall that a woman without parity experiences relative to the male in her household.

The GPI adapts the Foster Greer Thorbecke Poverty Gap measure to reflect gender parity.
Formula

5DE = H_e + H_d A_e

H_e is the percentage of empowered women
H_d is the percentage of disempowered women
A is the average absolute empowerment score among the disempowered

GPI = H_p + H_w R_p

H_p is percentage of women with gender parity
H_d is the percentage of women without gender parity
R is the women’s relative parity score compared to men

H_e + H_d = 100%
H_p + H_w = 100%
Lilian, Uganda

Empowerment Score = 83%

Has achieved parity with her husband Wilson
Bangladesh Pilot results

- 31.9% of women are empowered

- Disempowered women have adequate achievements in 60.7% of domains

- 59.8% of women enjoy gender parity

- Households without gender parity have a 25.2% empowerment gap between the woman and man

Overall, the WEAI score is 0.749
Bangladesh: How to increase empowerment?

![Bar chart showing various empowerment metrics](image_url)
Bangladesh: How to increase empowerment?

Contribution of each indicator to disempowerment of women and men
Guatemala Pilot results

- 22.8% of women are empowered
- Disempowered women have adequate achievements in 58.3% of domains
- 35.8% of women have gender parity
- 29.1% empowerment gap

Overall, the WEAI score is 0.692
Guatemala: How to increase empowerment?

- Leisure
- Workload
- Speaking in public
- Group member
- Control over use of income
- Access to and decisions on credit
- Purchase, sale, or transfer of assets
- Ownership of assets
- Autonomy in production
- Input in productive decisions
Uganda Pilot results

• **37.3%** of women are **empowered**

• Disempowered women have adequate achievements in **64.4%** of domains

• **54.4%** of women have **gender parity**

• **22.4%** empowerment gap

Overall, the WEAI score is **0.789**
Uganda: How to increase empowerment?

- Leisure
- Workload
- Speaking in public
- Group member
- Control over use of income
- Access to and decisions on credit
- Purchase, sale, or transfer of assets
- Ownership of assets
- Autonomy in production
- Input in productive decisions
Empowerment, wealth and education

- **Wealth** – clear association with empowerment in Uganda, but an imperfect proxy in Bangladesh and Guatemala:
  - 76% in top three quintiles are disempowered in Guatemala

- **Education** – significant influence in Guatemala and Uganda but insignificant for men and women in Bangladesh:
  - In Uganda, 35% of women with less than primary schooling are empowered vs. 45% with primary education
  - 31% of women with less than primary education were empowered in Bangladesh vs. 33% with primary schooling
Relevance for policymaking

1) Captures empowerment directly:
   - Using new data, not proxies
   - Shows how to empower women in each context

2) Three ways to change it:
   - Empower women
   - Increase scores among disempowered women
   - Increase gender parity & reduce gap
Options and Concrete Ways Forward

Child Poverty Measures
- gendered data are generally available. DHS, MICS.

Female Poverty Measures
- a women-only AF measure using DHS/MICS data is possible
- could include woman-specific indicators – reproductive health

Individual Level Gendered Data
- can compare \( M_0, H, A \); composition, raw & censored headcounts

Intrahousehold data
- can compare \( M_0, H, A \); composition, raw & censored headcounts
- can compare intra-household gender parity
- can compare other intra-household clustering and parity

Panel data
- can also compare sequencing of pov exits