Exploring Multidimensional Poverty in China: 2010-2014

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OPHI seminar series

21/11/2016
STRUCTURE

1. Motivation and literature review
2. Dataset and indicators
3. Basic results
4. Disaggregated analysis
5. MD and monetary poverty relationship
6. Conclusions
1.1 Motivation (a)

1. Remarkable achievement in income poverty reduction
(1990 to 2011: 439 million people out of poverty)

![Graph: Incidence of Income Poverty in China (H)]

2. MPI corresponds with anti-poverty policies
Idea of China’s “development-oriented poverty reduction policy”
during the past 30 years has striking similarity with MPI.
1.1 Motivation (b)

MPI corresponds with anti-poverty policies
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1.2 Literature Review and Contribution

Previous studies

* 1990s – policy explorations (Wu, 1999) (Li et al., 2005)
* Early 2000 – conceptual introduction (Shang & Yao, 2005) (Hong, 2005) (Ye, 2005)

Contribution of this paper

1. Systematically calculate MD poverty using AF method with national representativeness, and make it globally comparable.

2. Studying relationship of MD and monetary poverty
2.1 Data

**CFPS:** China Family Panel Studies, conducted by Peking University.

**Nationally representative:** 25 provinces with 94.5% of the population.

**Three waves:** 2010, 2012, 2014

**Sample size:** Over 40,000 eligible individuals each year

**Limitations**
- It cannot be decomposed by provinces (5 provinces, can be)
- Standard errors are relatively high due to sample size.
- The dataset lacks flooring, so covers 9 of the 10 MPI indicators
- Under nutrition seems higher than other national surveys in China
2.2 Indicators

Three Dimensions of Poverty

Health 1/3

Education 1/3

Living Standard 1/3

Ten Indicators

- Nutrition 1/6
- Child Mortality 1/6
- Years of Schooling 1/6
- School Attendance 1/6
- Cooking Fuel 1/18
- Improved Sanitation 1/18
- Safe Drinking Water 1/18
- Electricity 1/18
- Flooring 1/18
- Asset Ownership 1/18
<table>
<thead>
<tr>
<th>Dimension</th>
<th>Indicator (weight)</th>
<th>Deprivation Cut-off</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health (1/3)</td>
<td>Child Mortality (1/6)</td>
<td>No School going household member has completed five years of schooling and no member has completed primary school.</td>
</tr>
<tr>
<td></td>
<td>Nutrition (1/6)</td>
<td>Any child aged 7-15 is not attending school up the age at which they would complete class 8.</td>
</tr>
<tr>
<td>Education (1/3)</td>
<td>Years of Schooling (1/6)</td>
<td>Any child has died in the family.</td>
</tr>
<tr>
<td></td>
<td>Child School Attendance (1/6)</td>
<td>Any person under 70 years of age is malnourished.</td>
</tr>
<tr>
<td>Living Standard (1/3)</td>
<td>Electricity (1/15)</td>
<td>The household has no electricity.</td>
</tr>
<tr>
<td></td>
<td>Improved Sanitation (1/15)</td>
<td>The household does not have a private toilet whether indoor or outdoor, flush, or non-flush.</td>
</tr>
<tr>
<td></td>
<td>Improved Drinking Water (1/15)</td>
<td>The household does not have access to improved drinking water, here defined as well/spring water, tap water, or mineral/purified/filtered water.</td>
</tr>
<tr>
<td></td>
<td>Cooking Fuel (1/15)</td>
<td>The household cooks with dung, wood or charcoal.</td>
</tr>
<tr>
<td></td>
<td>Assets Ownership (1/15)</td>
<td>The household does not own more than one of the following: TV, mobile telephone, bike (motorized), motorbike or refrigerator, and does not own a car or similar vehicle.</td>
</tr>
</tbody>
</table>
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### 3.1 Basic results (a)

**China’s Global MPI results: 2010, 2012, and 2014**

<table>
<thead>
<tr>
<th>Year</th>
<th>M0</th>
<th>Confidence Interval (95%)</th>
<th>H (%)</th>
<th>Confidence Interval (95%)</th>
<th>A (%)</th>
<th>Confidence Interval (95%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>0.035</td>
<td>[0.027, 0.042]</td>
<td>8.2</td>
<td>[6.7, 9.7]</td>
<td>42.4</td>
<td>[41.3, 43.5]</td>
</tr>
<tr>
<td>2012</td>
<td>0.023</td>
<td>[0.016, 0.030]</td>
<td>5.4</td>
<td>[4.1, 6.8]</td>
<td>43.0</td>
<td>[40.2, 45.8]</td>
</tr>
<tr>
<td>2014</td>
<td>0.017</td>
<td>[0.013, 0.020]</td>
<td>4.0</td>
<td>[3.2, 4.9]</td>
<td>41.3</td>
<td>[40.1, 42.5]</td>
</tr>
</tbody>
</table>

**Changes of the incidence of poverty: 2010-2014**

<table>
<thead>
<tr>
<th>Year</th>
<th>Headcount ratio (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>8.2%</td>
</tr>
<tr>
<td>2012</td>
<td>5.4%</td>
</tr>
<tr>
<td>2014</td>
<td>4.0%</td>
</tr>
</tbody>
</table>
3.2 Global comparison (a)

Incidence of Global MPI

China
3.2 Global comparison (b)

Incidence of Global MPI

China
3.3 Composition (a)

Raw headcount ratio of people being deprived for each indicator

![Graph showing raw headcount ratio for various indicators over years 2010, 2012, and 2014. The indicators include Years of Schooling, School Attendance, Child Mortality, Nutrition, Electricity, Sanitation, Water, Cooking Fuel, and Assets. Each indicator is represented by a bar for each year, showing the headcount ratio (%).]
3.3 Composition (b)

Censored headcount ratio of people being deprived for each indicator

- Years of Schooling
- School Attendance
- Child Mortality
- Nutrition
- Electricity
- Sanitation
- Water
- Cooking Fuel
- Assets

Censored headcount ratio (%)
3.4 Relative contribution

Relative contribution of each indicator to M0

Years of schooling

Nutrition

Water

Cooking Fuel

Years of Schooling

School Attendance

Child Mortality

Electricity

Sanitation

Water

Cooking Fuel

Assets
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4 Disaggregate Analysis: subgroup comparison

1. Rural/urban
2. West/Central/East
3. Five provinces
4. Gender
5. Marriage Status
6. Education level of HH head
7. Age of HH head
8. Hukou status
9. Migrant status
10. HH size
11. Ethnicity and religion
### 4-1. Poverty in rural and urban areas

<table>
<thead>
<tr>
<th></th>
<th>MPI</th>
<th>Composition (censored headcount ratio, %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>P. S</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>51.2%</td>
<td>0.054</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[0.041,0.067]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.038</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[0.024,0.052]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.028</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[0.022,0.035]</td>
</tr>
<tr>
<td>Urban</td>
<td>50.1%</td>
<td>0.014</td>
</tr>
<tr>
<td>10</td>
<td>48.8%</td>
<td>[0.010,0.018]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.009</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[0.007,0.011]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.007</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[0.004,0.011]</td>
</tr>
</tbody>
</table>
4-2. Poverty in three regions: west, central and east

a. The West is significantly the poorest. Eastern and central regions have similar MPI values.

b. In terms of CHR, West’s composition results are similar to rural area.

c. “Years of schooling”, “nutrition”, “cooking fuel” and “water” are indicators that decrease most in each area.

**MD poverty incidence among 3 regions (%)**
4-3. Poverty in five provinces: 2012

- **Liaoning**
  - MPI: 0.005
  - H: 1.3%
  - A: 41.9%

- **Shanghai**
  - MPI: 0.009
  - H: 2.1%
  - A: 41.4%

- **Henan**
  - MPI: 0.020
  - H: 4.6%
  - A: 43.1%

- **Guangdong**
  - MPI: 0.022
  - H: 5.3%
  - A: 41.0%

- **Gansu**
  - MPI: 0.029
  - H: 7.0%
  - A: 41.0%
4-4. Poverty comparison: gender of the household head

No statistically significant difference between gender.

**MD poverty incidence between gender of HH heads(%)**

<table>
<thead>
<tr>
<th>Year</th>
<th>Female (%)</th>
<th>Male (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>26%</td>
<td>74%</td>
</tr>
<tr>
<td>2012</td>
<td>25%</td>
<td>75%</td>
</tr>
<tr>
<td>2014</td>
<td>24%</td>
<td>76%</td>
</tr>
</tbody>
</table>

Female heads: 2010 (26%), 2012 (25%), 2014 (24%)
Male heads: 2010 (74%), 2012 (75%), 2014 (76%)

[Diagram showing MD poverty incidence between gender of HH heads]
4-5. Poverty comparison: marriage status of household heads

a. People in divorced or widowed families are likely to be poor.
b. Especially, this type of family are more likely to be deprived in “years of schooling”, “school attendance”, “nutrition”, “water”, “cooking fuel” and “assets”.
c. At last, poverty between marriage statuses are narrowing overtime.

**MD poverty incidence among HH heads' marriage status (%)**

<table>
<thead>
<tr>
<th>Year</th>
<th>Single</th>
<th>Married or Cohabitation</th>
<th>Divorced or Widowed</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>12%</td>
<td>9%</td>
<td>6%</td>
</tr>
<tr>
<td>2012</td>
<td>9%</td>
<td>9%</td>
<td>7%</td>
</tr>
<tr>
<td>2014</td>
<td>3%</td>
<td>9%</td>
<td>7%</td>
</tr>
</tbody>
</table>
4-6. Poverty comparison: Education level of the household head

a. Illiteracy heads group is the poorest. Poverty tends to decrease as household head’s education level increases.

b. People in higher educated groups are less likely to be deprived in ‘school attendance’ or health related indicators.

c. Overtime, for the subgroups of “no education” and “1-6 years” is reducing from 2010-2014. Main reducing indicators are “years of schooling”, “electricity”, “sanitation”, “cooking fuel” and “assets”
4-7. Poverty comparison: age of the household head (Okojie, 2002)

![Graph showing poverty comparison by age of the household head]
4-7. Poverty comparison: age of the household head

a. People living with 36 to 60 years old household heads are the least poor. The poorest is the oldest group.

b. The oldest group is highly deprived in almost all the indicators except “school attendance” due to usually they do not live with their grandchildren.

c. Improvement for all the groups are fast, which indicates a good sign of the equal coverage of the social anti-poverty projects.

**MD poverty incidence among age of HH heads (%)**

<table>
<thead>
<tr>
<th>Year</th>
<th>16-35</th>
<th>36-60</th>
<th>60+</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>16%</td>
<td>67%</td>
<td>17%</td>
</tr>
<tr>
<td>2012</td>
<td>15%</td>
<td>68%</td>
<td>17%</td>
</tr>
<tr>
<td>2014</td>
<td>15%</td>
<td>66%</td>
<td>19%</td>
</tr>
</tbody>
</table>
4-8. Poverty comparison: Hukou

a. People living with rural *hukou* household heads are more likely to be poor.

b. Rural *hukou* group has lower CHR compares to rural/urban, because of the rural migrants.
4-9. Poverty comparison: Migrant action

1. *Whole-family-moved-out* -- the whole family have moved out from rural to urban.
2. *Rural households with partial migrants* -- part of the members are working outside, while the rest are remaining in rural area.
4. *Urban non-migrants* -- urban residents.
4-9. Poverty comparison: Migrant action

a. Migration action strongly associated with multidimensional poverty reduction through different mechanisms. Especially, the whole-family-move-out group.

b. We suggest to create equal opportunity for rural migrants to enjoy the social welfare systems in order to help them get rid of MD poverty.

**MD Poverty incidence among migrant action (%)**

<table>
<thead>
<tr>
<th>Year</th>
<th>Whole Family Move Out</th>
<th>Partially Migrants</th>
<th>Rural Residents</th>
<th>Urban Residents</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>24%</td>
<td>29%</td>
<td>33%</td>
<td>25%</td>
</tr>
<tr>
<td>2012</td>
<td>25%</td>
<td>29%</td>
<td>31%</td>
<td>26%</td>
</tr>
<tr>
<td>2014</td>
<td>29%</td>
<td>29%</td>
<td>30%</td>
<td>26%</td>
</tr>
</tbody>
</table>
4-10. Poverty comparison: household size

a. The larger the HH size, the higher the poverty level. Except 1-2 members families. This is very similar to the income poverty conclusion.

b. 1-2 members families are mainly deprived in ‘years of schooling’, ‘assets’ and ‘cooking fuel’.

c. The larger size groups are more likely to be deprived in ‘school attendance’, ‘child mortality’, ‘nutrition’, ‘water’ and ‘cooking fuel’.

d. Overtime, the poverty are decreasing for subgroups of 1-2/3/4/5 members.

MD poverty incidence among age of HH heads (%)
4-11. Poverty comparison: ethnic and religion

a. We find ethnic minorities are significantly poorer than the majority; Almost all of the indicators are highly deprived within the minorities.
b. No differences between religion and non-religion groups.

**MD poverty incidence for Ethnic/religion HHs (%)**

<table>
<thead>
<tr>
<th>Year</th>
<th>Han</th>
<th>Minority</th>
<th>Non-religion</th>
<th>Religion</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>86%</td>
<td>13%</td>
<td>82%</td>
<td>20%</td>
</tr>
<tr>
<td>2012</td>
<td>87%</td>
<td>29%</td>
<td>64%</td>
<td>26%</td>
</tr>
</tbody>
</table>
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5.1 MD and monetary poverty (a)

- 13.1% Income Poor
- 8.2% MD Poor
- 8.2% MPI Poor

8.2% MD Poor and 2.8% MPI Poor overlap with 13.1% Income Poor.
## 5.1 MPI and monetary poverty (b)

### Table Overlap and mismatch results over time

<table>
<thead>
<tr>
<th></th>
<th>2010</th>
<th>2012</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>H(%)</td>
<td>CI (95%)</td>
<td>H</td>
</tr>
<tr>
<td>MPI poor</td>
<td>8.2</td>
<td>[6.6, 9.7]</td>
<td>5.4</td>
</tr>
<tr>
<td>Expenditure poor</td>
<td>10.7</td>
<td>[9.3, 12.2]</td>
<td>9.9</td>
</tr>
<tr>
<td>Overlap of income &amp; MPI</td>
<td>2.8</td>
<td>[1.7, 3.8]</td>
<td>2.2</td>
</tr>
<tr>
<td>Overlap of expenditure &amp; MPI</td>
<td>2.4</td>
<td>[1.5, 3.4]</td>
<td>1.3</td>
</tr>
<tr>
<td>Proportion of overlap in MPI (income measure)</td>
<td>33.9%</td>
<td>40.7%</td>
<td>35.0%</td>
</tr>
<tr>
<td>Proportion of overlap in MPI (expenditure measure)</td>
<td>29.8%</td>
<td>24.4%</td>
<td>19.4%</td>
</tr>
<tr>
<td>Proportion of overlap in income poverty</td>
<td>21.1%</td>
<td>14.7%</td>
<td>9.4%</td>
</tr>
<tr>
<td>Proportion of overlap in expenditure poverty</td>
<td>22.7%</td>
<td>13.3%</td>
<td>13.4%</td>
</tr>
</tbody>
</table>
5.2 Further investigate: quintiles

Headcount ratio of MD poverty in each quintiles

<table>
<thead>
<tr>
<th>Year</th>
<th>1st-quintile</th>
<th>2nd-quintile</th>
<th>3rd-quintile</th>
<th>4th-quintile</th>
<th>5th-quintile</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Income</td>
<td>Expenditure</td>
<td>Income</td>
<td>Expenditure</td>
<td>Income</td>
</tr>
<tr>
<td>2010</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2012</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2014</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

OPHI Oxford Poverty & Human Development Initiative
5.3 Subsidy receiving status

Incidence of MD poverty in each subgroup

<table>
<thead>
<tr>
<th>Year</th>
<th>Subsidy Receiving Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>82.3% No subsidy</td>
</tr>
<tr>
<td>2012</td>
<td>87.8% No subsidy</td>
</tr>
<tr>
<td>2014</td>
<td>86.7% No subsidy</td>
</tr>
<tr>
<td>2010</td>
<td>17.7% Receive subsidies</td>
</tr>
<tr>
<td>2012</td>
<td>12.2% Receive subsidies</td>
</tr>
<tr>
<td>2014</td>
<td>13.3% Receive subsidies</td>
</tr>
</tbody>
</table>
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1. China’s Global MPI value is very low and it keeps reducing over time.
2. Rural area is poorer than urban, west is poorer that the central and east - implies the unbalance of regional development affects poverty. But “large provinces” poverty ranking tells economic growth dose not necessary go together with MD poverty reduction.
3. Household heads with higher education, smaller HH size, migration actions associate with lower MD poverty; while being divorced or widowed, belong to minority ethnics, holding a rural hukou associate with higher likelihood of being poor.
4. N, YS, CF and W are the main contributors. But the contributors varies depending on the subgroups.
5. Mismatch exists between monetary and MD poverty, showing MPI could be a good complementary for income poverty.
Question and comments are welcome!