Construction of Income Concepts and Components

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Learning Event on the
Commitment to Equity Methodology

Commitment to Equity Institute, Tulane University,
and the World Bank
Income Concepts

1. Market Income
   - Contributory Pensions
     - Non-Taxable Income
     - Taxable Income

2. Market Income plus Pensions
   - Gross Income
     - Direct Transfers
     - Direct Taxes
     - Indirect Subsidies
     - Indirect Taxes

3. Disposable Income
   - In-Kind Transfers (Education, Health)
   - Copayments, User Fees

4. Net Market Income
   - Final Income
Consumable Income

• Consumable Income
  = Disposable Income
    + Indirect subsidies
    – Indirect taxes

\[ c = d + B\downarrow i - T\downarrow i \]
Income Concepts

**Market Income**
- Contributory Pensions
  - Gross Income
- Non-Taxable Income
- Taxable Income
  - Direct Transfers
  - Direct Taxes

**Market Income plus Pensions**
- Direct Transfers
  - Net Market Income
  - Direct Taxes

**Gross Income**
- Direct Transfers
  - Disposable Income
  - Indirect Subsidies
  - Indirect Taxes

**Disposable Income**
- Indirect Taxes
  - Consumable Income
- In-Kind Transfers (Education, Health)
  - Copayments, User Fees

**Final Income**
Education

- Valued at government cost for each level
  - Include recurring and investment spending
  - Include administrative costs
  - Possible levels:
    - Day care
    - Preschool
    - Primary
    - Secondary
    - Tertiary
- Disaggregate by geographic area if possible
Imputation method
  – Combine data in survey on who attends public school at each level with national accounts data on spending

If the survey doesn't specifically have a question about whether the child attends public vs. private school:

Inference + Imputation
  – e.g., Sri Lanka
  – Use question from consumption module on whether household paid facility fees to government schools or school fees to private schools to infer whether child attends public

Alternate Survey + Prediction + Imputation
  – See next slide
Education

• Alternate Survey + Prediction + Imputation
  – e.g., United States
  – Main survey asks whether the child attends school, but not public vs. private
  – Find alternate survey that has income data and public vs. private school attendance
  – For sample of children attending school, predict probability of attending public school using covariates common to both surveys as independent variables (probit in alternate survey)
  – Use coefficients to predict probability in main survey
  – Multiply probability by average spending per student by level
    ▪ Expected value of benefit received
Health

• Two main systems: public facilities or public insurance
  • Public facilities
    – Divide total spending in national accounts by number of visits in survey data to obtain spending per visit
    – Disaggregate by type of care as much as possible
      ▪ Primary and in-patient care in Armenia, Indonesia
      ▪ Basic health facility vs. hospital in Peru
      ▪ Three levels of childbirth care in Bolivia
  • Public insurance
    – Divide total spending in national accounts by number of covered individuals to obtain spending per insured
    – Disaggregate by age if possible
      ▪ Spending on public health insurance varies greatly by age
    – Disaggregate by type of public health insurance if applicable
• Some countries: combination of both systems
• Disaggregate by geographic area if possible
  – e.g. Brazil: average spending for each care type-state cell
Health

• Imputation method
  – Combines data from national accounts on amount spent on public health facilities; public health insurance with survey data on who benefits

• Alternate Survey + Imputation
  – Find survey with income data and use of public health facilities or public insurance coverage
  – e.g., Guatemala, South Africa

• Prediction (shouldn't be necessary)
  – If national accounts spending on public health facilities or public health services is not available (very rare)
  – Predict cost of different services using spending on similar services at private facilities in consumption module

• Secondary Source (shouldn't be necessary)
  – Only if no information on use of health services or insurance coverage in main or alternate survey
  – e.g., Chile, Mexico
Income Concepts

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2. **Market Income plus Pensions**
   - Direct Transfers
   - Gross Income

3. **Gross Income**
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4. **Net Market Income**
   - Direct Transfers
   - Indirect Subsidies

5. **Disposable Income**
   - Indirect Taxes

6. **Consumable Income**
   - In-Kind Transfers (Education, Health)

7. **Final Income**
   - Copayments, User Fees
User Fees

• Usually directly identified in survey if common in country
• These user fees can also be used to more accurately approximate education or health benefits
• Use local knowledge to determine most plausible scenario (see Wagstaff, 2012):
  – User fee is independent of benefit (use imputation method described before to calculate benefits)
    ▪ e.g., health in Indonesia
  – Subsidized portion of health care is constant; user fee is total cost minus fixed subsidy
  – User fee is proportion of total cost of care
    ▪ e.g., health in Jordan
Income Concepts

Market Income

Contributory Pensions

Market Income plus Pensions

Non-Taxable Income

Direct Transfers

Gross Income

Taxable Income

Direct Taxes

Disposable Income

Indirect Subsidies

In-Kind Transfers (Education, Health)

Indirect Taxes

Consumable Income

Copayments, User Fees

Final Income
• Final Income
  = Consumable Income
    + Education and Health Benefits
    – Co-payments and User Fees

\[ f = c + B \downarrow k - F \]
Scaling Down

• For all income components imputed using amounts from national accounts
• Scale down benefits to avoid overestimating effect of that component
• Example: primary education benefits
  – Divide primary spending in national accounts by disposable income in national accounts to obtain the ratio $R$
  – Scale down primary education benefits in the survey until the ratio of primary education benefits in the survey to disposable income in survey also equals $R$
# Comparing Brazil and US


## Table 1

Inequality by Income Concept in the United States (2011) and Brazil (2009)

<table>
<thead>
<tr>
<th></th>
<th>Market Income</th>
<th>Gross Income</th>
<th>Disposable Income</th>
<th>Post-Fiscal Income</th>
<th>Final Income</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Benchmark case</strong></td>
<td></td>
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</tr>
<tr>
<td><strong>United States</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gini</td>
<td>0.446</td>
<td>0.415</td>
<td>0.376</td>
<td>0.380</td>
<td>0.319</td>
</tr>
</tbody>
</table>
| Reduction (pp)  
(a)     | -0.031        | -0.070       |                   | -0.065             | -0.127       |
| Reduction (%)  
(b)     | -0.069        | -0.157       |                   | -0.147             | -0.285       |
| **Brazil**            |               |              |                   |                    |              |
| Gini                 | 0.548         | 0.528        | 0.513             | 0.510              | 0.431        |
| Reduction (pp)  
(a)     | -0.020        | -0.036       |                   | -0.038             | -0.117       |
| Reduction (%)  
(b)     | -0.037        | -0.065       |                   | -0.069             | -0.214       |
| **Sensitivity analysis** |          |              |                   |                    |              |
| **United States**    |               |              |                   |                    |              |
| Gini                 | 0.481         | 0.415        | 0.372             | 0.376              | 0.314        |
| Reduction (pp)  
(a)     | -0.067        | -0.109       |                   | -0.105             | -0.168       |
| Reduction (%)  
(b)     | -0.139        | -0.227       |                   | -0.218             | -0.348       |
| **Brazil**            |               |              |                   |                    |              |
| Gini                 | 0.570         | 0.530        | 0.512             | 0.509              | 0.428        |
| Reduction (pp)  
(a)     | -0.040        | -0.058       |                   | -0.061             | -0.142       |
| Reduction (%)  
(b)     | -0.069        | -0.102       |                   | -0.107             | -0.250       |
Comparing Brazil and US


a. United States (2011)

b. Brazil (2009)

Cumulative proportion of the population

Cumulative proportion of tax or transfer

- 45 Degree Line
- Market Income
- Indirect Taxes
- Health and Education
- All Taxes
- Indirect Subsidies
- Direct Transfers
- Social Spending
Even if poverty decreases
  – Poor can be made poorer
  – Or non-poor made poor
Fiscal Impoverishment
Higgins and Lustig (2015)

• In Brazil ($2.50 PPP per day poverty line)
  – Inequality is reduced
  – Poverty is reduced
  – But one-third of the (consumable income) poor are made poorer (or non-poor made poor) by taxes and transfers

• There is fiscal impoverishment if
  \[ y_i^1 < y_i^0 \text{ and } y_i^1 < z \text{ for some } i \]

• There are fiscal gains to the poor if
  \[ y_i^1 > y_i^0 \text{ and } y_i^0 < z \text{ for some } i \]
# Problems with Conventional Measures

Higgins and Lustig (2015)

<table>
<thead>
<tr>
<th>Measure</th>
<th>Issue</th>
<th>Example with $Z = (6, 10]$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poverty (and stochastic dominance)</td>
<td>↓ poverty $\not\Rightarrow$ no FI (anonymity)</td>
<td>$y^0 = (5, 8, 20)$, $y^1 = (9, 6, 18)$</td>
</tr>
<tr>
<td>Horizontal equity</td>
<td>Horizontally equitable $\not\Rightarrow$ no FI</td>
<td>$y^0 = (1, 1, 7, 7, 13)$, $y^1 = (3, 3, 6, 6, 11)$</td>
</tr>
<tr>
<td></td>
<td>No FI $\not\Rightarrow$ horizontally equitable</td>
<td>$y^0 = (5, 5, 6, 20)$, $y^1 = (5, 7, 6, 18)$</td>
</tr>
<tr>
<td>Progressivity</td>
<td>Progressive $\not\Rightarrow$ no FI</td>
<td>$y^0 = (1, 3, 7, 13)$, $y^1 = (3, 4, 6, 11)$</td>
</tr>
<tr>
<td></td>
<td>No FI $\not\Rightarrow$ progressive</td>
<td>$y^0 = (1, 3, 7, 14)$, $y^1 = (1, 5, 8, 11)$</td>
</tr>
</tbody>
</table>
Axiomatic Measure
Higgins and Lustig (2015)

\[ f(y^0, y^1; z) = k \sum_{i=1}^{n} \left( \min\{y_i^0, z\} - \min\{y_i^0, y_i^1, z\} \right) \]

- Pre-fisc poor and impoverished \((y_i^1 < y_i^0 < z)\) contributes fall in income, \(y_i^0 - y_i^1\)
- Pre-fisc non-poor and impoverished \((y_i^1 < z \leq y_i^0)\) contributes amount to transfer her back to poverty line, \(z - y_i^1\)
- Non-impoverished pre-fisc non-poor \((y_i^0 \geq z \text{ and } y_i^1 \geq z)\) contributes \(z - z = 0\)
- Non-impoverished pre-fisc poor \((y_i^0 < z \text{ and } y_i^1 \geq y_i^0)\) contributes \(y_i^0 - y_i^0 = 0\)
Conventional Measures in Brazil

Higgins and Lustig (2015)

(a) First Order Stochastic Dominance
(Cumulative Distribution Functions)

(b) Global Progressivity
(Lorenz and Concentration Curves)
• At the $2.50 per person per day poverty line:
  – 34.9% of the consumable income poor are fiscally impoverished
  – Total fiscal impoverishment of over $676 million, or 10% of budget of Bolsa Família
  – Fiscal impoverishment per impoverished person is about 8% of their income
  – Not all fiscally impoverished are excluded from safety net: for example, 65% receive Bolsa Familia
Decomposing the Poverty Gap

Higgins and Lustig (2015)

(a) Total FI and FGP
(Billions of Dollars per Year)

(b) Total Poverty Gaps
(Billions of Dollars per Year)