Equality of Opportunity for Well-Being

Daniel Mahler
University of Copenhagen

Xavi Ramos
Universitat Autònoma de Barcelona
Two Trends in Normative Economics

- **Trend #1**: A vector of incomes is not sufficient for assessing individuals’ well-being
  - ⇒ Beyond GDP, Multidimensional Poverty & Happiness studies
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  - $\Rightarrow$ Beyond GDP, Multidimensional Poverty & Happiness studies
- **Trend #2**: A vector of incomes is not sufficient for assessing distributional justice
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We attempt to combine the two and measure whether individuals have equal opportunities for well-being
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We attempt to combine the two and measure whether individuals have equal opportunities for well-being

**Research questions:**
Does the measure of well-being matter for assessments of...

1. ...how inequality of opportunity has evolved over time?
2. ...who the most opportunity deprived are?
Why Equality of Opportunity?


A popular idea among politicians

A popular idea among citizens (Cappelen et al., AER (2007))

It may be good for growth (Peragine et al., WBER (2014))

Why Equality of Opportunity for Well-Being?

Philosophers advocated for something broader than incomes: Primary goods (Rawls), Capabilities (Sen), Resources (Dworkin), Welfare (Arneson), Advantage (Cohen)

Looking at incomes could be problematic for 3 reasons:

- It ignores aspects of life that are important to individuals
- It ignores the disutility of effort
- It ignores that individuals have different preferences
Why Equality of Opportunity?

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Motivation

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Motivation

Methodology

Results

Conclusion

Measuring Equality of Opportunity 1/2

- $y = g(c, e)$
  - $y =$ outcome variable, here well-being
  - $c =$ circumstances (non-responsibility variables)
  - $e =$ effort (responsibility variables)
Measuring Equality of Opportunity 1/2

- \( y = g(c, e) \)
  - \( y \) = outcome variable, here well-being
  - \( c \) = circumstances (non-responsibility variables)
  - \( e \) = effort (responsibility variables)

Data: GSOEP from 1984-2014 (\( n > 150,000 \))

- \( c = \{ \text{gender, father's educ., mother's educ., father's occ., age, height, place of birth, #siblings} \} \)
- \( e = \{ \text{work hours, years of educ., self-employed, works in public sector} \} \)
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  - \( c \) = \{gender, father’s educ., mother’s educ., father’s occ., age, height, place of birth, #siblings\}
  - \( e \) = \{work hours, years of educ., self-employed, works in public sector\}

- A measure of Inequality of Opportunity, IOP, should reflect the inequality in \( y \) due to differences in \( c \) but not due to differences in \( e \)
Measuring Well-Being 1/2

4 measures of welfare:

- Income (equivalized net household income)
- Life satisfaction (on a scale from 0-10)
- Multidimensional index (a weighted index of income, health, unemployment, and leisure)
- Equivalent incomes
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Details on equivalent incomes
We estimate equivalent incomes based on a life satisfaction regression (Decancq et al., 2015):

\[
lifesat_{it} = (\beta^{inc} + \gamma_c^{inc} c_i + \gamma_e^{inc} e_i) inc_{it} + (\beta^{dim} + \gamma_c^{dim} c_i + \gamma_e^{dim} e_i) dim_{it} + \alpha_i + \varepsilon_{it}
\]

\[
dim_{it} = (health_{it}, unemployment_{it}, leisure_{it})
\]
Measuring Well-Being 1/2

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\[ \text{lifesat}_{it} = (\beta^{inc} + \gamma^{inc}_c c_i + \gamma^{inc}_e e_i) \text{inc}_{it} + (\beta^{dim} + \gamma^{dim}_c c_i + \gamma^{dim}_e e_i) \text{dim}_{it} + \alpha_i + \epsilon_{it} \]
\[ \text{dim}_{it} = (\text{health}_{it}, \text{unemployment}_{it}, \text{leisure}_{it}) \]

Equivalent incomes are found by solving for \( \text{inc}_{it}^{eq} \) in:

\[ \text{lifesat}(\text{inc}_{it}, \text{dim}_{it}) = \text{lifesat}(\text{inc}_{it}^{eq}, \tilde{\text{dim}}) \]
Measuring Well-Being 2/2

\[ x_A = x_B \]
Measuring Well-Being 2/2

\[ x_A = x_B \]
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Measuring Well-Being 2/2

\[ A = B \]

\[ \tilde{h} \]

Income (inc)

Health (h)

\[ x_A = x_B \]

\[ u_A \]

\[ u_B \]
Measuring Well-Being 2/2

\[ x_A = x_B \]

\[ inc_{eq}^A \]

\[ inc_{eq}^B \]

\[ u_A \]

\[ u_B \]

\[ \tilde{h} \]

\[ \text{Income (inc)} \]

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RQ1: Measuring inequality of opportunity over time

1. Convert welfare levels into ranks $r^y_{it} = F_t(y_{it})$
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1. Convert welfare levels into ranks: $r^y_{it} = F_t(y_{it})$
2. ‘Clean’ effort variables: $e_{it} = \gamma c_i + \eta_{it}$
3. Regress well-being on circumstances and ‘cleaned’ effort: $r^y_{it} = \alpha c_i + \beta \eta_{it} + \epsilon_{it}$
RQ1: Measuring inequality of opportunity over time

1. Convert welfare levels into ranks: $r_{it}^y = F_t(y_{it})$
2. ‘Clean’ effort variables: $e_{it} = \gamma c_i + \eta_{it}$
3. Regress well-being on circumstances and ‘cleaned’ effort:
   
   $r_{it}^y = \alpha c_i + \beta \eta_{it} + \epsilon_{it}$

   - As a baseline, we consider $\epsilon_{it}$ a responsibility variable
   - Unfair advantage $= \alpha c_i$
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3. Regress well-being on circumstances and ‘cleaned’ effort: \( r_{it}^y = \alpha c_i + \beta \eta_{it} + \epsilon_{it} \)
   - As a baseline, we consider \( \epsilon_{it} \) a responsibility variable
   - Unfair advantage = \( \alpha c_i \)

4. Calculate opportunity ranks: \( r_{it}^{y\text{unfair}} = F_t(\alpha c_i) \)
Measuring Equality of Opportunity 2/2

**RQ1: Measuring inequality of opportunity over time**

1. Convert welfare levels into ranks: $r_{it}^y = F_t(y_{it})$
2. ‘Clean’ effort variables: $e_{it} = \gamma c_i + \eta_{it}$
3. Regress well-being on circumstances and ‘cleaned’ effort: $r_{it}^y = \alpha c_i + \beta \eta_{it} + \epsilon_{it}$
   - As a baseline, we consider $\epsilon_{it}$ a responsibility variable
   - Unfair advantage = $\alpha c_i$
4. Calculate opportunity ranks: $r_{it}^{y_{unfair}} = F_t(\alpha c_i)$
5. $IOP_t = \text{cor}(r_t^y, r_t^{y_{unfair}})$
RQ1: Measuring inequality of opportunity over time

1. Convert welfare levels into ranks: $r^y_{it} = F_t(y_{it})$
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5. $IOP_t = cor(r^y_t, r^{y\text{unfair}}_t)$

RQ2: Characterizing the most opportunity deprived

1. Compare the average opportunity rank for individuals with a given circumstance
Who are the Most Opportunity Deprived? 1/2

Father’s Education
- Primary school
- Secondary school
- Tertiary school

Mother’s Education
- Primary school
- Secondary school
- Tertiary school

Father’s Occupation
- Blue-collar, untrained
- Blue-collar, trained
- Not-employed
- White-collar
- Self-employed
- Civil servant

Place of Upbringing
- City
- Medium city
- Small city
- Countryside

Average rank
Log Income
Life Satisfaction
Multidim. Index
Equivalent Inc.
Who are the Most Opportunity Deprived? 1/2

Father’s Education
- Primary school
- Secondary school
- Tertiary school

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Average rank

1. Log Income
2. Life Satisfaction
3. Multidim. Index
4. Equivalent Inc.
Who are the Most Opportunity Deprived? 1/2

- Father’s Education
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  - White-collar
  - Self-employed
  - Civil servant

- Place of Upbringing
  - City
  - Medium city
  - Small city
  - Countryside

### Average rank
- Log Income
- Life Satisfaction
- Multidim. Index
- Equivalent Inc.
Who are the Most Opportunity Deprived? 2/2

- Place of Birth
  - West Germany
  - East Germany
  - Abroad

- Height
  - Less than 170cm
  - More than 170cm

- Gender
  - Male
  - Female

- Number of siblings
  - 2 or less
  - More than 2

- Age
  - Less than 30
  - 30 to 55
  - More than 55

- Average rank
  - Log Income
  - Life Satisfaction
  - Multidim. Index
  - Equivalent Inc.
Who are the Most Opportunity Deprived? 2/2

- Place of Birth:
  - West Germany
  - East Germany
  - Abroad

- Height:
  - Less than 170cm
  - More than 170cm

- Gender:
  - Male
  - Female

- Number of siblings:
  - 2 or less
  - More than 2

- Age:
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  - 30 to 55
  - More than 55

- Average rank
- Log Income
- Life Satisfaction
- Multidim. Index
- Equivalent Inc.
Who are the Most Opportunity Deprived? 2/2

- Place of Birth: West Germany, East Germany, Abroad
- Height: Less than 170cm, More than 170cm
- Gender: Male, Female
- Number of siblings: 2 or less, More than 2
- Age: Less than 30, 30 to 55, More than 55

Graph showing various metrics such as Log Income, Life Satisfaction, Multidim. Index, and Equivalent Inc. with data points distributed across different categories.
Inequality of Opportunity Over Time

Welfare levels over time

Inequality over time
Conclusion

- Does the measure of well-being matter for identifying who the most opportunity deprived are?
  - Not much

- Does the measure of well-being matter for assessments of inequality of opportunity over time?
  - Not much
    (but this is not robust to certain other ways of measuring IOP)

- In general, this is encouraging news for people that care about going beyond GDP:

  *For questions of distributive justice, how welfare is measured has relatively little importance*
Thank you

daniel.mahler@econ.ku.dk
Relevant Literature

- Measurement of Equality of Opportunity
  - Roemer & Trannoy (2015), Ramos & Van da gaer (2015), Ferreira & Peragine (2016), and many more

- Measurement of welfare matters for policy design
  - Blanchflower & Oswald (2004), Stevenson & Wolfers (2008), Benjamin et al. (2014), Decancq and Neumann (2016)

- Fairness and welfare should be combined
  - Marc Fleurbaey, Erik Schokkaert, Francois Maniquet, Koen Decancq,... (many, many papers)
  - Ravallion (2015)

Contribution

We look at whether the measurement of well-being matters in an Equality of Opportunity framework
A Word of Caution from Roemer

On the use of well-being as the outcome variable:

“[I prefer] to apply the theory to problems where outcomes are observable, for I believe that in all policy applications, planners will be concerned to deliver equity (here, equal opportunity) with respect to the achievement of a particular objective, which is the concern of their ministry.”

Roemer (2012)
## Appendix

### Summary Statistics

<table>
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<th>mean</th>
<th>sd</th>
<th>min</th>
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<td><strong>Circumstance Variables</strong></td>
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<td>Mother’s Educ.: Secondary School</td>
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<td>0.42</td>
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<tr>
<td>Mother’s Educ.: More Than Secondary School</td>
<td>0.07</td>
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<td>Father’s Occupation: Blue-Collar (untrained)</td>
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<td>0.35</td>
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<td>Father’s Occupation: Blue-Collar (trained)</td>
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<td>Place of Upbringing: Small City</td>
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<tr>
<td>Place of Birth: West Germany</td>
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<td>Place of Birth: East Germany</td>
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<td>Height</td>
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<td><strong>Effort Variables</strong></td>
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<td>Years of Education</td>
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<td>Self-Employed</td>
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<td>Works in Public Sector</td>
<td>0.18</td>
<td>0.39</td>
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</table>
Measures of Well-Being

Figure: Histograms over Welfare Measures

Table: Spearman’s Correlations

<table>
<thead>
<tr>
<th></th>
<th>Log Income</th>
<th>Life Sat.</th>
<th>Multidim. Index</th>
<th>Equivalent Inc.</th>
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<tr>
<td>Log Income</td>
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<td>Life Satisfaction</td>
<td>0.21</td>
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<tr>
<td>Multidim. Index</td>
<td>0.19</td>
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<td>Equivalent Inc.</td>
<td>0.63</td>
<td>0.27</td>
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</table>
Welfare and Inequality Over Time

Levels of Well-Being

Inequality in Well-Being