Uses and limits of EU-SILC for a spatial analysis of poverty at the regional level in Europe

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Research Context

> Emmanuelle Bonerandi & Co

> **ANR MAILLE:** Mapping and gridding european cohesion
(« La cohésion européenne dans ses filets »)
ANR = The French National Research Agency (Project-based funding to advance French research)

> **Purpose of the project:** run a comparison between the European countries in terms of fight against poverty, with a multilevel approach.

> **Our task:** provide quantitative synthetic views of poverty in Europe to contextualize the qualitative studies.
Two main approaches:

> Keep the multidimensional nature of poverty

Definition of poverty (European Council, 1994). People considered as poor are "people whose resources (material, cultural and social) are so weak that they are excluded from minimal acceptable lifestyles in the Member State in which they live".

→ Problem of multidimensional indicators aggregation (selection of key indicators, creation of composite indexes Vs. exploratory analysis)

> Capturing spatial heterogeneity within countries

- Make out geographic variability hidden at the national level (well-known or lesser-known disparities)
1) First results of our project
   - Recall on the early work with the online EUROSTAT Database
   - Interest of EU-SILC to complete it

2) Pictures of poverty in Europe
   - The regional break down
   - The degree of urbanisation break down

3) From poverty to inequality:
   Effects of social policies on inequalities
1) Results from the EUROSTAT database

• Selection of a set of indicators
  - Expressing the living conditions of the population
  - Available for a maximum of NUTS 2 regions in the EU27
  - Available in 2000 & 2007

• Give a synthetic view of poverty in the European regions
  - Principal Component Analysis (PCA) made on the set of indicators
Main synthetic indicator of poverty, 2007
First component of the analysis

Expresses the life expectancy, household incomes and the infant mortality

The legend corresponds to the position of the regions on the 1st axis of a Principal Component Analysis made on 6 poverty indicators in 2007

Marks out the « eastern » & « western » European regions
Synthetic indicator of integration into society, 2007
Second component of the analysis

Expresses the level of education, employment rates and the male/female equality

- High
- Integration
- Low

The legend corresponds to the position of the regions on the 2nd axis of a Principal Component Analysis made on 6 poverty indicators in 2007.

Marks out the « southern » & « northern » European regions.

COORDINATES OF THE INDICATORS ON THE AXIS

<table>
<thead>
<tr>
<th>Indicator</th>
<th>2nd axis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income of households (PPS/inh)</td>
<td>●●</td>
</tr>
<tr>
<td>Infant mortality rate (%)</td>
<td>●</td>
</tr>
<tr>
<td>Life expectancy</td>
<td>●</td>
</tr>
<tr>
<td>High educated population (%)</td>
<td>●●●</td>
</tr>
<tr>
<td>Employment rate (%)</td>
<td>●●●</td>
</tr>
<tr>
<td>Male/female unemployment ratio</td>
<td>●●●</td>
</tr>
</tbody>
</table>

Explains 26% of the total information.
2) Pictures of poverty in Europe

Complete our first results with the EU-SILC database

• Some aspects of the living conditions were **missing** in the Eurostat database at the regional level: *Laeken indicators, dwelling comfort*.

• Some aspects were **over represented**: *employment, demography*.

• Make use of the second opportunity of spatial approach of poverty: the **degree of urbanisation**

Obtain a balanced overview of the living conditions in Europe
4 different angles to address poverty in Europe, according to the Schuman report

1) **Monetary poverty**: poor populations are those at the bottom of the income scale compared to the population as a whole
   - Median household gross income
   - % of the population bellow the national at risk of poverty threshold
   - % of the population in the first 3 income deciles

2) **Living conditions poverty**: absence of ordinary consumer goods
   - Average number of rooms per inhabitants in the dwelling
   - % of the respondents owning a bath or shower in the dwelling
   - % of the population owning less than 3 items among the following ones: telephone, TV, computer, washing machine, car
   - % of the population with unmet need for medical examination or treatment
3) **Administrative poverty**: people who receive aid intended to alleviate poverty

- % of the population receiving a social exclusion allowance
- % of the population receiving unemployment benefits

4) **Subjective poverty**: based on people's perception of their wealth or their unfulfilled needs

- % of the population living in a damp or cold dwelling
- % of the population finding it difficult to make ends meet
- % of the population having payments in arrears
- Average **number of items** the persons can afford, among the following ones: annual holiday, meal with meat or fish every second day, financial expenses, telephone, colour TV, computer, washing machine, car
### Final list of indicators selected from EU-SILC

#### Monetary poverty

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Median household gross income</td>
</tr>
<tr>
<td>2</td>
<td>Proportion of the population bellow the national at risk of poverty threshold</td>
</tr>
<tr>
<td>3</td>
<td>Proportion of the population in the first 3 income deciles</td>
</tr>
</tbody>
</table>

#### Life conditions poverty

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Average number of rooms per inhabitants in the dwelling</td>
</tr>
<tr>
<td>5</td>
<td>Proportion of the population having a bath or shower in the dwelling</td>
</tr>
<tr>
<td>6</td>
<td>Proportion of the population having less than 3 items among the following ones: telephone, TV, computer, washing machine, car</td>
</tr>
<tr>
<td>7</td>
<td>Proportion of the population with unmet need for medical examination or treatment</td>
</tr>
</tbody>
</table>

#### Administrative Poverty

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>Proportion of the population receiving a social exclusion allowance</td>
</tr>
<tr>
<td>9</td>
<td>Proportion of the population receiving unemployment benefits</td>
</tr>
</tbody>
</table>

#### Subjective poverty

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Proportion of the population living in a damp or cold dwelling</td>
</tr>
<tr>
<td>11</td>
<td>Proportion of the population finding difficult or very difficult to make ends meet</td>
</tr>
<tr>
<td>12</td>
<td>Proportion of the population having payments in arrears</td>
</tr>
<tr>
<td>13</td>
<td>Average number of items the persons can afford, among the following ones: Annual holiday, meal with meat or fish every second day, financial expenses, telephone, colour TV, computer, washing machine, car</td>
</tr>
</tbody>
</table>
### PCA results

<table>
<thead>
<tr>
<th>Variable</th>
<th>Axis 1</th>
<th>Axis 2</th>
<th>Axis 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>13 Afford_items</td>
<td>950</td>
<td>-33</td>
<td>-91</td>
</tr>
<tr>
<td>3 3_deciles</td>
<td>-855</td>
<td>353</td>
<td>-157</td>
</tr>
<tr>
<td>4 Nb_rooms</td>
<td>821</td>
<td>-339</td>
<td>-36</td>
</tr>
<tr>
<td>11 Ends_meet</td>
<td>-819</td>
<td>-373</td>
<td>-148</td>
</tr>
<tr>
<td>1 Med_income</td>
<td>790</td>
<td>-152</td>
<td>258</td>
</tr>
<tr>
<td>10 Dwelling</td>
<td>-779</td>
<td>-395</td>
<td>-88</td>
</tr>
<tr>
<td>7 Health</td>
<td>-772</td>
<td>-135</td>
<td>62</td>
</tr>
<tr>
<td>5 Shower</td>
<td>-730</td>
<td>219</td>
<td>239</td>
</tr>
<tr>
<td>6 Own_items</td>
<td>-725</td>
<td>202</td>
<td>362</td>
</tr>
<tr>
<td>12 Arrears</td>
<td>-620</td>
<td>-369</td>
<td>217</td>
</tr>
<tr>
<td>9 Allo_unemp</td>
<td>439</td>
<td>-228</td>
<td>704</td>
</tr>
<tr>
<td>2 At-risk</td>
<td>-299</td>
<td>-725</td>
<td>223</td>
</tr>
<tr>
<td>8 Allo_exclu</td>
<td>-55</td>
<td>466</td>
<td>589</td>
</tr>
</tbody>
</table>

**Information explained**

- **50%** for Axis 1
- **12%** for Axis 2
- **10%** for Axis 3

91 spatial units
Synthetic indicator of poverty, 2007
Major component of the analysis

Expresses monetary poverty, living conditions and subjective poverty

Main indicators represented in the axis among the 13 ones:
- Number of items owned
- Incomes
- Size & comfort of the dwelling
- Ability to make ends meet
- Ability to see a doctor when needed
- Arrears

This component explains 50% of the total information

The legend corresponds to the position of the regions on the 1st axis of a Principal Component Analysis made on 13 poverty indicators

First results | Pictures of poverty in Europe | Inequality
Synthetic indicator of poverty: *the regional breakdown*

PCA with a **regional** & **degree of urbanisation** breakdown:

- Each region appears 3 times in the PCA (rural, intermediate, urban)

- Spatial units excluded:
  - < 100 respondents
  - Countries without a degree of urbanisation breakdown (SI, NL)
## PCA2 results

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Axis 1</th>
<th>Axis 2</th>
<th>Axis 3</th>
<th>Axis 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Afford_items</td>
<td>0.94</td>
<td>-0.04</td>
<td>0.06</td>
<td>0.00</td>
</tr>
<tr>
<td>Nb_rooms</td>
<td>0.82</td>
<td>-0.33</td>
<td>-0.10</td>
<td>-0.07</td>
</tr>
<tr>
<td>3_deciles</td>
<td>-0.81</td>
<td>0.39</td>
<td>0.11</td>
<td>-0.10</td>
</tr>
<tr>
<td>Ends_meet</td>
<td>-0.81</td>
<td>-0.35</td>
<td>0.18</td>
<td>0.17</td>
</tr>
<tr>
<td>Health</td>
<td>-0.75</td>
<td>-0.10</td>
<td>0.05</td>
<td>-0.03</td>
</tr>
<tr>
<td>Dwelling</td>
<td>-0.74</td>
<td>-0.43</td>
<td>0.10</td>
<td>-0.06</td>
</tr>
<tr>
<td>Own_items</td>
<td>-0.74</td>
<td>0.27</td>
<td>-0.35</td>
<td>-0.17</td>
</tr>
<tr>
<td>Arrears</td>
<td>-0.65</td>
<td>-0.39</td>
<td>-0.04</td>
<td>0.33</td>
</tr>
<tr>
<td>Shower</td>
<td>-0.63</td>
<td>0.23</td>
<td>-0.28</td>
<td>-0.29</td>
</tr>
<tr>
<td>Allo_unemp</td>
<td>0.39</td>
<td>-0.25</td>
<td>-0.69</td>
<td>0.12</td>
</tr>
<tr>
<td>At-risk</td>
<td>-0.29</td>
<td>-0.68</td>
<td>-0.36</td>
<td>-0.11</td>
</tr>
<tr>
<td>Allo_exclu</td>
<td>-0.13</td>
<td>0.36</td>
<td>-0.66</td>
<td>0.20</td>
</tr>
<tr>
<td>Med_income</td>
<td>0.10</td>
<td>-0.20</td>
<td>-0.03</td>
<td>-0.84</td>
</tr>
</tbody>
</table>

**Information explained**  
43%  12%  10%  8%  

83*3 = 236 spatial units
Position of the spatial units on the synthetic indicator of poverty (Coordinates on the 1st axis of the PCA), 2007

First results

Pictures of poverty in Europe

Inequality

Thinnely populated area

Densely populated area

Major synthetic indicator of poverty

43% of the total information
Position of the spatial units on the synthetic indicator of poverty (Coordinates on the 1st axis of the PCA), 2007

First results

Pictures of poverty in Europe

Inequality

Position of the spatial units on the synthetic indicator of poverty (Coordinates on the 1st axis of the PCA), 2007

Major synthetic indicator of poverty

43% of the total information
2) From poverty to inequality
Effects of social policies on inequalities

Inequality of income between the households, by region, 2007

Before social transfers
After social transfers

GINI index

Source: EU-SILC 2010, M. Martin
Effects of social transfers on inequalities

Comparison between the GINI index before and after social transfers, 2007

Impact of social transfers on inequality

conception: M. Martin
data sources: EU-SILC, 2010
Conclusion 1

Comparison between EU-SILC & EUROSTAT online database results

Data from EU-SILC

Data from Eurostat

→ Confirmation of the results: same structure of poverty
→ Covers the 4 aspects of poverty. Thematically richer
→ Less detailed spatial data
Conclusion 2

- Emphasize time analysis (trajectories over time, using Longitudinal database, as we did with the Eurostat database)

...rather than further spatial analysis (lack of infra-national and spatial data in EU-SILC)