Nowcasting Global Poverty

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Outline

• Three central methodological questions
  1. How do we create out-of-sample predictions?
  2. How do we measure the accuracy of the predictions?
  3. Is accuracy all we should care about?

• Findings on nowcasting poverty
1. How do we create out-of-sample predictions?
1. How do we create out-of-sample predictions?

![Diagram showing training and test data blocks for Lithuania, Bangladesh, and Turkmenistan. The diagram includes years from 1990 to 2022, with blocks indicating training and test data periods.]
1. How do we create out-of-sample predictions?

- Training data
- Test data

**Last block**

|    | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Lithuania |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Bangladesh |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Turkmenistan |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |

**Regular cross validation**

|    | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Lithuania |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Bangladesh |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Turkmenistan |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
1. How do we create out-of-sample predictions?

- **Last block**
- **Regular cross validation**
- **Spatial block cross validation**
- **Temporal block cross validation**
1. How do we create out-of-sample predictions?
1. How do we create out-of-sample predictions?
How do we measure the accuracy of the predictions?

Loss function: Mean absolute deviation in pct. points

$$\text{Loss} = \sum_{i=1}^{C} w_{\text{country}} \times |p_{\text{true}}_{\text{country},\text{time}} - p_{\text{country}}_{\text{country},\text{time}}|$$
Is accuracy all we should care about?

Criteria for evaluating different methods

1. Accuracy
2. Simplicity
3. Credibility
4. Ease of implementation
5. Stability
How may nowcasting poverty be different?

![Graph showing density of daily consumption per capita (2011 USD PPP) with a poverty line at approximately 1.9. The graph is labeled 2016 (last survey).]
Findings on nowcasting poverty

- Nowcasts are more accurate if we utilize the past distribution -- even when it is old.

- A model which simply scales the past distribution by growth in real GDP per capita performs nearly as well as machine learning models using 1000+ variables.

- What works on average does not work in all context.