Out-of-School Rate Modelling

October 25, 2021
Overview

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Motivation
Objectives

This project seeks to:

- Produce complete and coherent OOS rate estimates and uncertainty intervals for all countries in the years 1999-2020 for all school ages,
- Address data challenges of misaligned sources, incomplete administrative data, and negative administrative observations, and
- Forecast forward at least one full school enrollment cycle from 2020, ending in 2030-2035.
Data Sources

1. Administrative data, collected by UIS, combined with population estimates from WPP 2019,
2. Census data retrieved from IPUMS, and
3. Household survey data (DHS, MICS).

<table>
<thead>
<tr>
<th>Source</th>
<th>Observations</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admin</td>
<td>86,204</td>
<td>85.05%</td>
</tr>
<tr>
<td>Census</td>
<td>4,359</td>
<td>4.3%</td>
</tr>
<tr>
<td>Survey</td>
<td>10,796</td>
<td>10.65%</td>
</tr>
</tbody>
</table>
Data Challenges

Administrative Data

- Enrollment and population are sourced separately causing discrepancies.
- 159 of 186 countries have negative OOS observations.
- 20% of observations are negative.

Survey Data

- Survey data is limited and is occasionally highly biased.

![Countries by Number of Surveys](chart.png)
Model Components

- Underlying true OOS rates are modeled strictly between 0% and 100%. They are driven by:
  1. A time series of baseline OOS rates at the entry age
  2. Cohort dropout patterns:
     - Each cohort is tracked over time creating a late entry/dropout curve
     - Changes in the shape of late entry/dropout curves happen gradually between cohorts
  3. Short- to medium-term period shocks

- Survey specific bias
- Source specific variability
Case Study: Burkina Faso
Case Study: Burkina Faso

Graphs showing trends in OOS Rate and Probit OOS Rate from 1999 to 2020, with age as the x-axis and OOS Rate as the y-axis. The graphs display data from Admin, Census, DHS, MICS, and Model.
Case Study: Iraq
Case Study: Mexico
Case Study: Mexico - Reconciling Data
Case Study: Mexico - Reconciling Data

Mexico 2010-2015 Results by Cohort

- 2010
- 2011
- 2012
- 2013
- 2014
- 2015

Probit OOS

age

Admin, Census, MICS, Model

admin dominated
reconciled
Discussion & Next Steps

The OOS model in its current state is capable of identifying consistent patterns in OOS rates and producing coherent estimates for all countries with available data. Going forward:

- Finalize and validate the model (early 2022).
- Publish results along with interactive visualizations for end users (early 2022).
- Integrate the OOS rate estimates with completion rate estimates for a unified education status picture (mid 2022). Visually,...
Breakdowns would be constrained such that the on-time and late proportions match the corresponding primary completion rates. For example, in 2020, the on-time, late up to 5 years, and post-primary dropout proportions must sum to ~44%.