Are there ethnic inequality traps in education?
Evidence for Brazil and Chile

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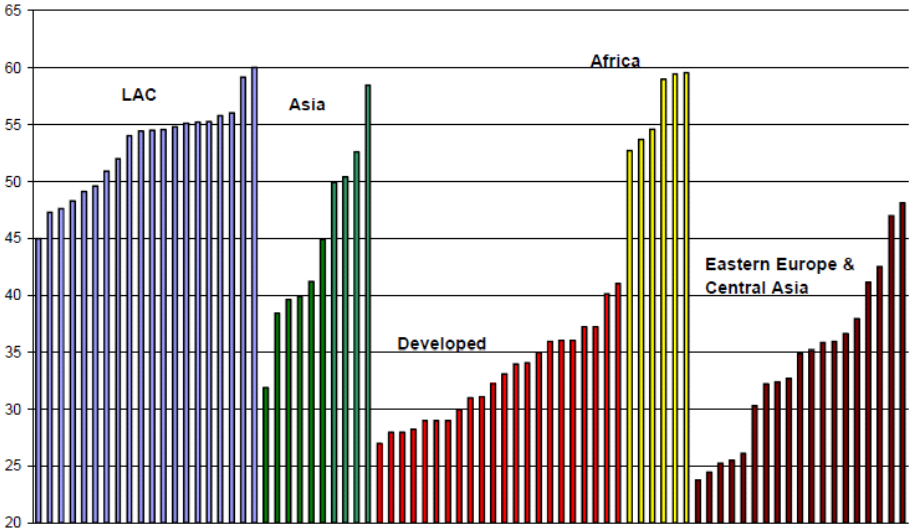
Motivation

Gini coefficient, Household per capita income distribution.
Last available observation in period 1995 - 2005



Source: Gasparini *et al*. (2011) based on WIDER and SEDLAC (CEDLAS and World Bank).

Motivation

- Disparities among other dimensions are also relevant and persistent in LA (Gasparini *et al.*, 2011).
  - Education, access to land, health, etc.
- Moreover, inequalities in these dimensions are also significant between social groups.
  - Ethnicity, gender, region of birth (urban/rural), etc.
- Especially, persistent differences among:
  - **Ethnic groups** (Busso *et al*. 2005; Gandelman *et al.*, 2007).
  - …and particularly, in **educational outcomes** (Chong and Ñopo, 2007; Guerreiro, 2008).

Possible explanation? **Inequality traps**

What is an inequality trap?

Circular process in which **unequal opportunities** lead to **differences in outcomes between social groups** (in a *Roemerian* sense), which contributes to the **persistence of unequal conditions** through an **intergenerational mobility process** (Rao, 2006; Bourguignon and Dessus, 2009; Bourguignon, Ferreira & Walton, JEI 2007 - henceforth BFW07).

Research objectives

- Test conditions compatible with Educational Inequality Traps (EIT) for ethnic groups.
  - **Brazil**: Afro-Brazilians and White-Brazilians (Costa, 2007; Guerreiro, 2008).
  - **Chile** : Indigenous and Non-Indigenous (Valenzuela, 2003; López and Miller, 2008; Agostini *et al*., 2010).

  Are the disadvantaged ethnic groups in these countries trapped in persistently low educational levels compared to the advantaged group?
- Policy relevance: Evidence-based design of public programs – targeted/universal, access/returns…

Why EITs?

- Latin America shows:
  - The **highest persistence** in intergenerational educational trends (Hertz *et al*., 2007) and substantial **gaps in educational outcomes between certain groups** (Gasparini *et al.*, 2011; Harttgen *et al.*, 2010).
- Insufficient educational attainment has long-term consequences
- Education is a key area for policy interventions.
- And also: data driven. No long term intergenerational information on incomes.

Assessing inequality traps in educational outcomes

Assessing EIT

- Despite its conceptual appeal, there is no comprehensive methodological framework to empirically test the presence of IT.
- BFW07 suggest an indirect evidence-based approach which tests necessary conditions that could characterize this long-term process:
  - Persistent inequality of opportunities.
  - Lack of convergence in mobility patterns between social groups and across generations.
  - Feasible alternative equilibrium with no IT (!).

Assessing EIT

- Our proposed analytic strategy follows BFW07 and has a series of steps for the case of education:
  - Assess inequality of educational opportunities.
  - Analyze intergenerational educational mobility
    - Indicates access to opportunity – ability of each "generation" of the disadvantaged group to overcome its historical disadvantage.

    …and their patterns of convergence over time.
    - An increase in mobility does not mean changes in the relative position of the disadvantaged group over time.
- The analysis will be conducted:
  - Across consecutive generations/birth-cohorts.
  - By ethnic groups (circumstance).

Assessing EIT

- Expected results from the analytical strategy:
- If the evidence indicates that across cohorts and ethnic groups there is:
  1. Persistent differences in educational opportunities.
  2. Non-convergence in intergenerational educational mobility patterns.
- …then the evidence suggests that the disadvantaged ethnic group is caught in an EIT.

Methodology and data

Methodology

- Use two indices (from the family of heterogeneity indices) proposed by Yalonetzky (2009, JOEI 2010) to:
  - Assess Inequality of Opportunities.
  - Compare discrete-time transition matrices (*mobility regimes*).
- Advantages over other measures (HOI, etc.):
  - More suitable for ordinal discrete variables (e.g. educational levels).
  - Same family of indices for mobility and opportunity.
  - Other desirable properties (see Yalonetzky).

Heterogeneity Index to measure Inequality of Opportunities

$$H^{IO} = \frac{1}{\min(G-1, O-1)G} \sum_{g=1}^{G} \sum_{\alpha=1}^{O} \frac{\left(p_{\alpha}^{g} - \tilde{p_{\alpha}}\right)^2}{\tilde{p_{\alpha}}}$$

G = Nº groups
O = Nº outcomes

- Measures the degree of between-group inequality as the degree of association between groups (e.g. ethnicity) and outcomes (e.g. educational attainments):
  - Compares conditional probability vectors (P_{α}^{g}), i.e. distributions of outcomes conditional on belonging to a specific group.
- Ranges between 0 and 1:
  - Equal to 0 if the conditional distribution of educational attainments between ethnic groups is identical (situation of literal equality of opportunity in Roemer's terms).

Heterogeneity Index for transition matrices applied to intergenerational mobility

$$H^{M} = \frac{1}{O}\sum_{j=1}^{O} H_{V_j} \quad \text{where} \quad H_{V_j} = \frac{\sum_{g=1}^{G}\sum_{i=1}^{O} N_{\cdot j}^{g} \frac{\left(p_{i|j}^{g} - p_{i|j}^{*}\right)^2}{p_{i|j}^{*}}}{\min\left(G-1, O-1\right)\sum_{g=1}^{G} N_{\cdot j}^{g}}$$

- Summary index which quantifies the differences (dissimilarity) between transition matrices of groups (e.g. ethnicities) by comparing them element-by-element:
  - Computes the differences between the conditional probability vectors of transition matrices across groups (H_{V_j}).
  - The observed differences are aggregated across H_{V_j} .
- Ranges between 0 and 1: equal to 0 if the conditional distributions of the compared transition matrices are identical (perfect homogeneity between matrices).

So we use…

- H^{IO} to measure the evolution of ethnic differences in educational opportunities across cohorts.
  - Evaluates the ethnic gap in education in time: does it improve or persist for younger cohorts?
- H^{M} to compare transition matrices linking parents and offspring's educational outcomes between advantaged and disadvantaged ethnic groups. Also across cohorts (to observe trends).
  - Group comparison provides information about whether *educational mobility regimes* are different between groups.
  - Evaluation by cohorts answers whether these *mobility regimes* are becoming more alike or different across time: Provides notion of convergence.

So we use…

- We also compute the H^M index comparing each ethnic group's transition matrix with the *perfect independence matrix*, to have a measure of intergenerational mobility for each group ($H(g)^M$)

Data

- Cross-sectional data from national household surveys.
  - Brazil - 1996 *Pesquisa Nacional por Amostra de Domicílios* (PNAD).
  - Chile – 2006/2009 *Encuesta Nacional de Caracterización Socioeconómica* (CASEN). Pooled data.
  - Include parental education and ethnic identification.

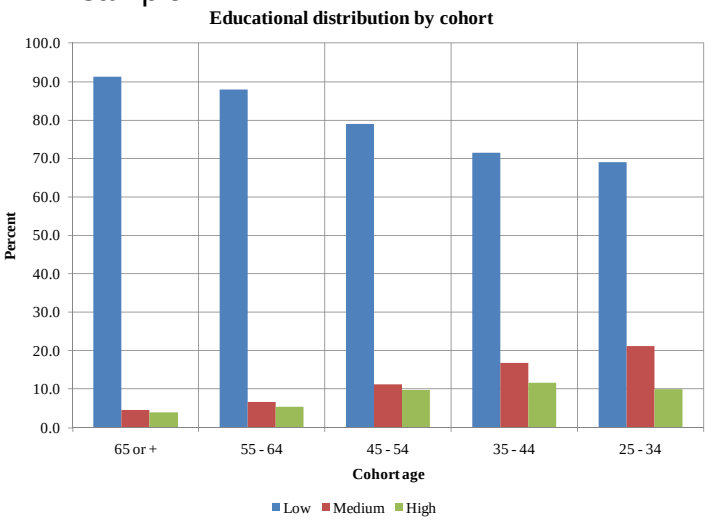
Definitions

- Outcome: educational attainment (parents and individuals) – for adults aged 25 years or older.
  - Low: complete primary schooling or less.
  - Medium: some secondary (incomplete or complete).
  - High: some higher education (incomplete or complete).
- Social Group: ethnicity.
  - Brazil: Afro-Brazilian (40%) and White-Brazilian. Classification: self-perception.
  - Chile: Indigenous (6%) and Non-Indigenous. Classification: language.
- Time dimension: 5 successive birth-cohorts born in ten-year spans.
  - Youngest [25-34] – Eldest [65+].

Results: Evidence for Brazil & Chile

Brazil: How has attainment evolved?

- Educational structure has improved for individuals in the sample



Growth between eldest and youngest cohorts:

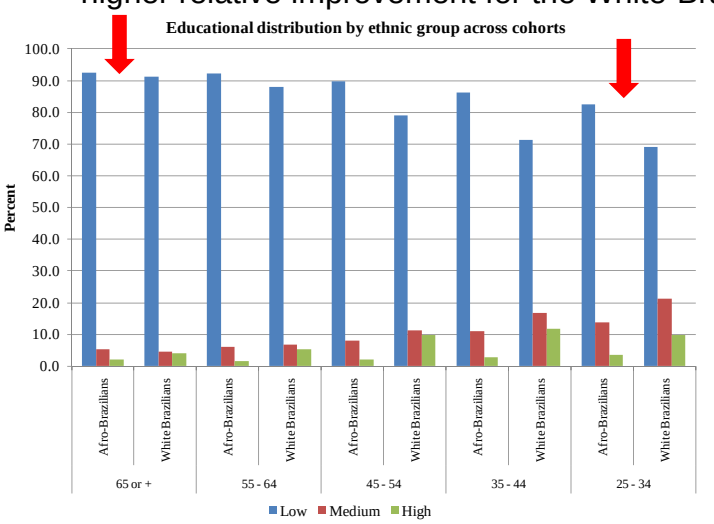
Medium attainment: 16.5 p.p. (youngest: 21%)

High attainment: 6 p.p. (youngest: 10%)

However, almost 70% of Brazilians are still showing low levels of education.

And by ethnic groups?

- Higher average educational attainment for both. **<u>BUT</u>**, higher relative improvement for the White-Brazilians



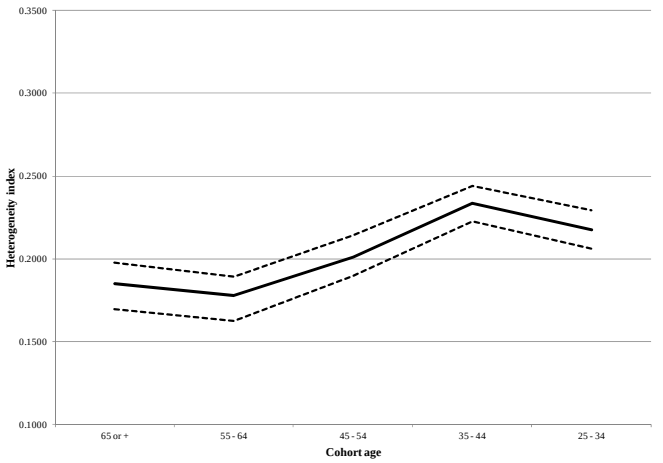
***Larger gap** in youngest than in eldest cohort:*

Higher reduction in % in low education for WB than AB.

Higher improvement in medium and high educational levels for WB than AB.

Brazil: Inequality in educational opportunities between ethnic groups and cohorts

Estimates of the Heterogeneity Index of IO (C.I. with 500 reps)



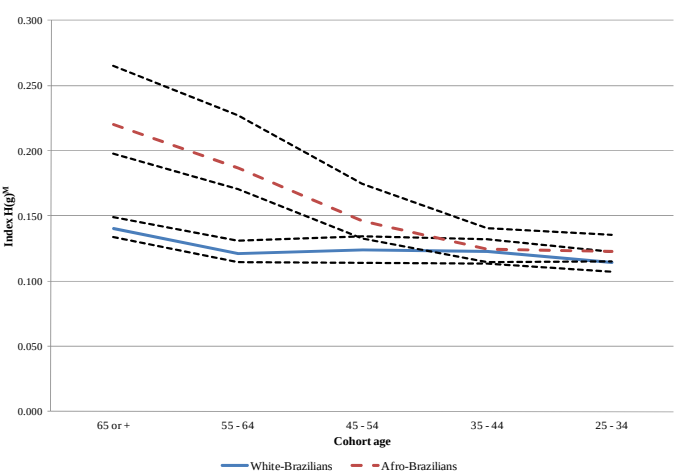
Significant ethnic differences in educational opportunities.

Increase in these differences between youngest and eldest cohorts.

Persistent ethnic gaps in educational opportunities.

Brazil: Intergenerational educational mobility by ethnic groups & cohorts

Estimates of the Heterogeneity index for transition matrices & perfect independence matrix (C.I. with 500 reps)

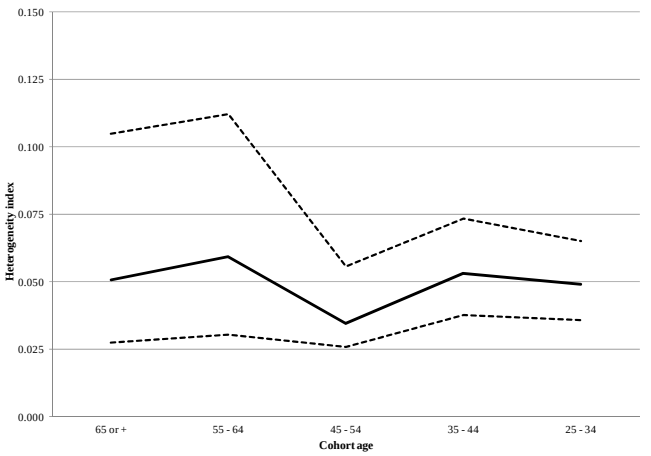


Significant departure from perfect independence, though nearer in younger cohorts.

AB: greater increase in mobility than WB, which leads to the same level of indep. to parental education for both ethnic groups, for the younger cohorts

Brazil: Differences in intergenerational educational mobility between ethnic groups & cohorts

Estimates of the Heterogeneity index for transition matrices (C.I. with 500 reps)



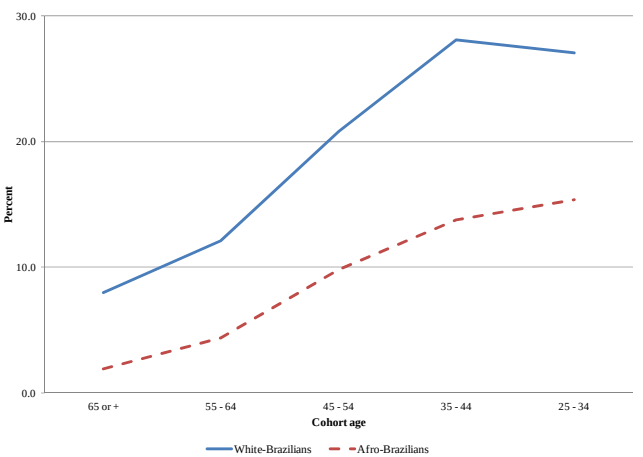
The index is statistically different from 0 for all cohorts: the mobility patterns are different between WB and AB

No statistically significant reduction of the H^M between the eldest and youngest cohorts.

Non-convergence in educational mobility patterns between ethnic groups.

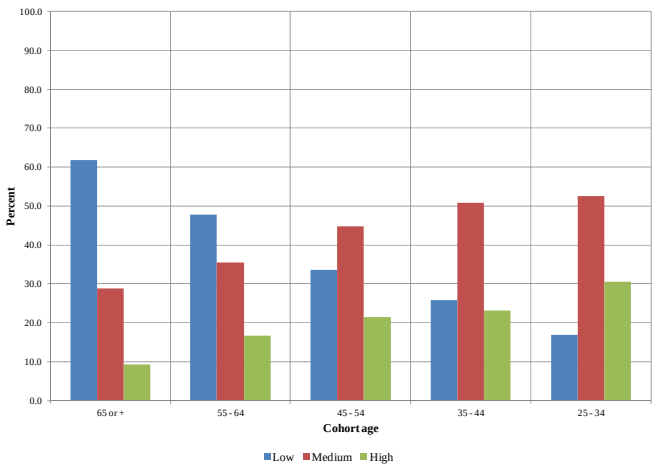
Possible explanations for this trend

Even though upward mobility has increased for both ethnic groups, **it was higher for WB** (immobility and downward mobility was not substantially different between groups).



Chile: How has attainment evolved?

- Educational structure has significantly improved for individuals in the sample



Growth between eldest and youngest cohorts:

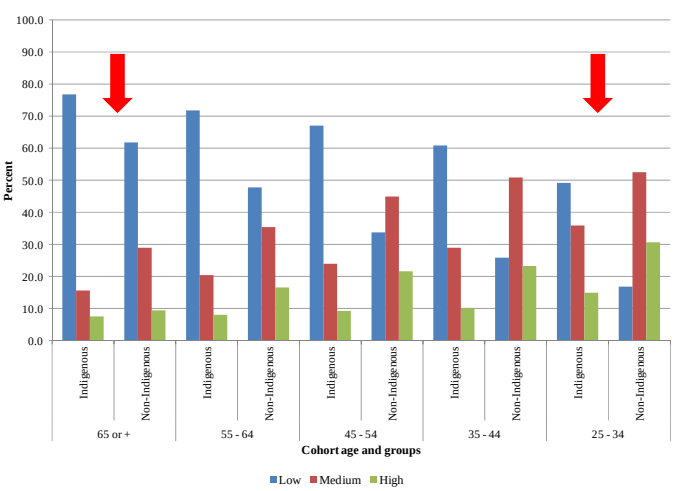
Medium attainment grew almost 24 p.p. (youngest: 53%)

High attainment: 21.2 p.p. (youngest: nearly 31%)

Only 17% of Chileans are still showing low levels of education.

And by ethnic groups?

- Higher average educational attainment for both. **<u>BUT</u>**, higher relative improvement for the Non-Indigenous



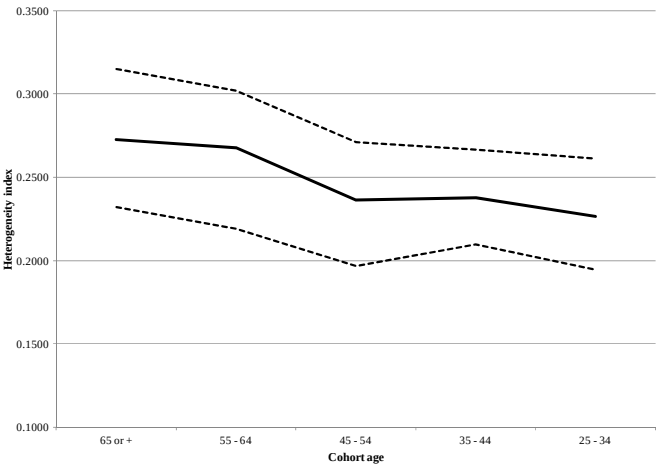
***Larger gap** in youngest than in eldest cohort.*

Much higher reduction in % in low education for Non-Indigenous than Indigenous.

% in medium education increased more for indigenous, but % in high education grew 65% more for Non-Indigenous.

Chile: Inequality in educational opportunities between ethnic groups and cohorts

Estimates of the Heterogeneity Index of IO (C.I. with 500 reps)

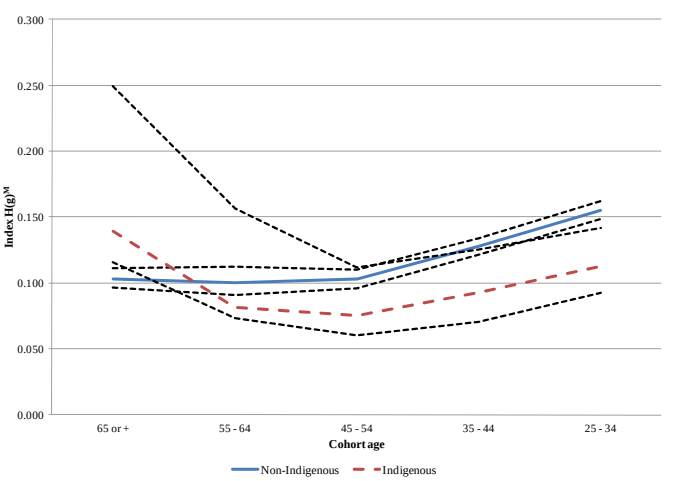


Significant ethnic differences in educational opportunities.

Persistent ethnic gaps in educational opportunities.

Chile: Intergenerational educational mobility by ethnic groups & cohorts

Estimates of the Heterogeneity index for transition matrices & perfect independence matrix (C.I. with 500 reps)

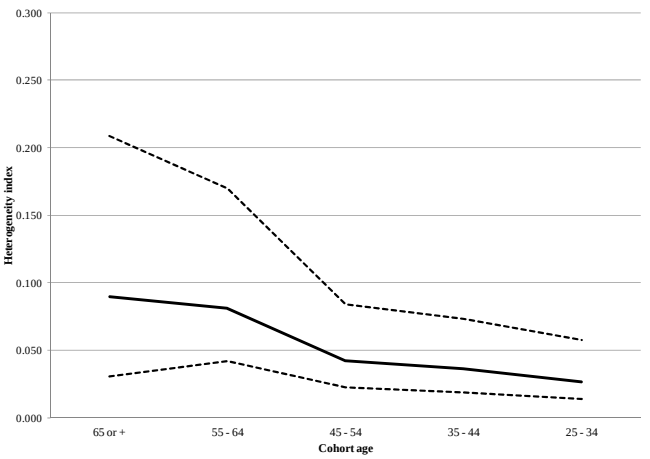


Significant departure from perfect independence.

Similar level of indep. to parental education for both ethnic groups, for every cohort

Chile: Differences in intergenerational educational mobility between ethnic groups & cohorts

Estimates of the Heterogeneity index for transition matrices (C.I. with 500 reps)



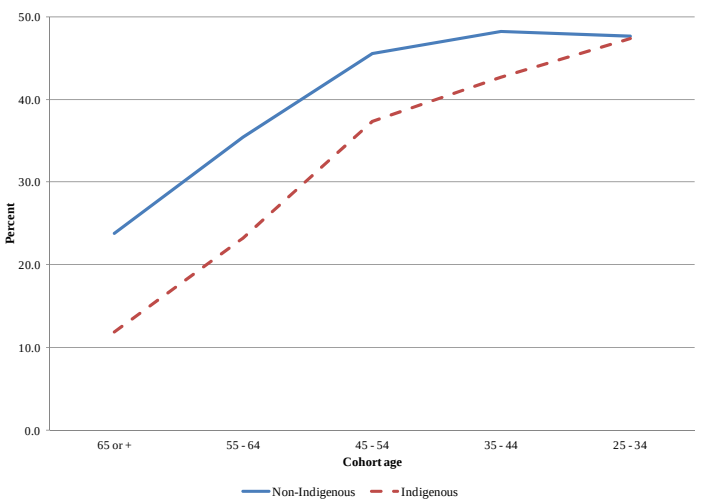
The index is statistically different from 0 for all cohorts: the mobility patterns are different between Indigenous and Non-Indigenous

No statistically significant reduction of the H^M between the eldest and youngest cohorts.

Non-convergence in educational mobility patterns between ethnic groups.

However, in Chile…

Upward mobility has increased more for the Indigenous



Conclusions

Preliminary conclusions

- In Brazil:
  - Persistent ethnic differences in educational opportunities across cohorts.
    - Average education improves for both groups, but the ethnic gap does not fall.
  - Non-convergence in intergenerational educational mobility patterns between ethnic groups across cohorts.
    - The “effect” of father’s education on AB has become more different from that of father’s education on WB.
    - Higher upward mobility for WB compared to AB.
  - These findings suggest that Afro-Brazilians are caught in an Educational Inequality Trap.
- Similar analysis for Chile: preliminary evidence is less suggestive that indigenous subject to EIT.

Policy discussion

- Two-tiered policies for disadvantaged groups:
  1. **Short-run**: Affirmative action policies and subsidies to compensate for existing ethnic disparities of present generations.
     - Wage subsidies, support for private businesses, preferential treatment in jobs (affirmative action).
     - Could be a component of social programs such as Bolsa Familia and Chile Solidario…focused directly on the disadvantaged ethnic group.
  2. **Long-run**: Components to mitigate the persistence of worse outcomes for disadvantaged ethnic groups.
     - Endowments: foster access and quality of education. Policies to prevent dropping-out at the secondary level and increase access to the tertiary education (e.g. credit policies to overcome existing constraints).

Thanks!

More studies:
http://cedlas.econo.unlp.edu.ar

SEDLAC: CEDLAS-WB project:
http://sedlac.econo.unlp.edu.ar