Understanding the Drivers of Intergenerational Educational Mobility in Developing Countries

Forhad Shilpi
DECRG
October 26, 2021
A quiz: Where is the most expensive single family home located? India or USA?

• PPP Per capita GDP in 2019 at 2017 constant price:
  • USA: $62,630 vs. India: $6,713
Bel Air
House in Los Angles: $250 million
Antilia in Mumbai, India: $1 billion
Intergenerational persistence is higher in Developing Countries

• Rising and historically high Inequality around the World. The main concern is whether it is because of inequality of opportunity?

• Human capital is one of the main mechanisms through which inequality is transmitted across generations. An attractive policy option: Investment in human capital, particularly education to weaken the association between children and parents’ outcomes.

Intergenerational persistence and education policies

• Does education help to reduce persistence?
  • Not much variations in relative educational mobility across OECD countries despite differences in policies (e. g. UK) => Education is not the great leveler [Clark (2014), Bukodi and Goldthorpe (2019), Salvanes (forthcoming)]

• Debate is not about whether children’s outcomes surpassed that of parents (absolute mobility) but whether children’s outcomes are dependent on parent’s status (relative mobility)

• Talk will focus on drivers of intergenerational educational mobility
Determinants of Intergenerational Mobility

- Across groups comparisons (geographical areas, ethnicity, religion, gender etc.):
  - Cross country regressions: Van der Weide et al (2020); Neidhöfer et al. (2018)

- Determinants: mostly from developed countries and for income mobility
  - Geography/neighborhood: Chetty et al. (2016), Chetty and Hendren (2016); Alesina et al. (2021), Emran and Shilpi (2015), Asher et al. (2018)
  - Returns to education: Aronson and Majumder (2008), Davis and Mazumder (2017)
  - Credit Constraints: Caucutt and Lochner (2021); Restuccia and Urrutia (2004)
  - Education policies: for surveys, see WDR(2018), Stuhler and Biagi (2018), Salvanes (2021): school expansion, compulsory schooling, early childhood programs, public vs. private schools, early track choice, admission to elite programs, school quality
Outline

• Data and measurement issues
• Conceptual framework and Empirical evidence:
  • Are estimates of relative mobility/persistence constant across entire distribution of parent’s education?
  • School quality: Would it improve mobility? Question is not whether it will improve educational outcomes but whether it will improve outcomes for children coming from poorer background relatively more
  • How do gender bias influence intergenerational persistence between boys and girls?
When Measure Matters: Co-residency, Truncation Bias, and Intergenerational Mobility in Developing Countries

Emran, Greene, Shilpi (2018)
Co-residency and Truncation bias

• Gold standard in data for estimation of intergenerational mobility: Swedish and Danish birth registry which track every member of the household/family so one can construct entire family tree

• Most household surveys and censuses impose require members to be resident so we do not observe those members who are away for longer term. Sample is truncated and cause downward bias in the estimates of relative mobility

• Co-residency pattern vary across countries and overtime, so does the degree of truncation bias

• Two examples: India (REDS panel), Bangladesh (MATLAB panel)

• Inter-country and across period comparisons could be misleading if we ignore this truncation bias

• For other measurement and estimation issues: see forthcoming book *Social Mobility in Developing Countries*
Figure 1a: Probability of non-residency in Bangladesh

Figure 1b: Probability of non-residency in India

Figure 2b: Fitted Lines between Father and Son’s Education
Full and coresident samples, Bangladesh

Slope=0.55
Slope=0.42

Figure 3b: Fitted Lines between Father and Son’s Education
Full and coresident samples, India

Slope=0.49
Slope=0.43

Emran, Greene, Shilpi (2018)

\[ E^C = \beta_0 + \beta_1 E^P + \epsilon \]
Conceptual Framework
Drivers of Intergenerational mobility

• Most of the economics literature on intergenerational mobility uses the following regression model:

\[ E^c = \beta_0 + \beta_1 E^p + \epsilon \]

• To understand how policy can influence this association, we need to start from the question: why do we see this association between children and parent’s education?

• A simple conceptual framework developed extending the Becker, Kominers, Murphy and Spenkuch (2015, 2018), Becker and Tomes (1979, 1986)
Sources of Parent and Child Correlation in Education

Financial Channel
- Credit Constraints
- Social Norms, Attitudes
- Labor Market Returns
- Preference, Altruism

Non-Financial Channel
- Parent’s Education
- School

Ability Correlation
- Role model

Sorting

Public investment and policies
Education production function

\[ E^c = \delta_0 + \delta_1 I - \delta_2 I^2 + \delta_3 I \cdot E^p + \delta_4 E^p \]

\[ \delta_i = \pi_i^0 q^{\mu_i} \]

where \( q \) is an indicator of school quality and \( i = \{0,1,2\} \)
Optimal Investment and Intergenerational Transmission of education

• Optimal investment under credit constraint:

\[ I^* = \theta_0 + \theta_1 E^P \]

• Intergenerational transmission/regression equation (IGRE):

\[ E^{c*} = \psi_0 + \psi_1 E^p + \psi_2 (E^p)^2 \]
Is Intergenerational Educational Persistence Heterogenous with respect to Parent’s Education?
Intergenerational Regression Equation: Non-linear in many cases

\[ E_{C*} = \psi_0 + \psi_1 E^P + \psi_2 (E^P)^2 \]
Relative mobility is heterogenous over the distribution of parent’s education.
Complementarities, Returns to Education, and Intergenerational Educational Mobility: Theory and Evidence from the Rural-Urban Divide in Indonesia

Ahsan, Emran and Shilpi (2021)
Would better school inputs reduce intergenerational persistence?

• 18-40 years old in IFLS 2014 data: data on these (adult) children’s cognitive ability (measured by Raven’s test and 2 memory tests) available only for this round.
• Less truncation as modules were designed to collect non-resident information.
• Earlier rounds of data are used to estimate:
  • education expenditure when children in our sample were in school
  • Returns to education in parent’s generation
• Intergenerational Regression Equation is convex in rural areas but linear in urban areas
• The question can not be answered with estimation of intergenerational regression alone.
Intergenerational absolute and relative mobility in Indonesia
Investment in Children’s Education

• Analytical Steps:
  • Estimate returns to education for parent’s and children’s generation
  • With reduced form parameters estimated for rural and urban areas, we invert the system of equations to derive structural parameters. We calibrate parent’s preference parameters to match with regression predictions.

\[ l^* = \theta_0 + \theta_1 E^P \]
Educated parents make more efficient investment decision

• The estimates of structural parameters imply: Interaction of investment and parental education is positive and significant

$$\tilde{\delta}_r^r > \tilde{\delta}_u^u > 0$$

• Coefficient of interaction term is larger in rural areas than urban areas

• Next, we recover coefficients of school input terms assuming school quality 20% higher in urban areas which roughly corresponds to difference in teacher-pupil ratios between these two areas.
Parental Investment: complementary or substitute to school quality?

- Complementary if:
  \[
  \frac{\partial}{\partial q} \left( \frac{\partial E^c}{\partial l} \right) = \mu_1 \delta_1 - 2\mu_2 \delta_2 l^* > 0
  \]

- Substitute if:
  \[
  \frac{\partial}{\partial q} \left( \frac{\partial E^c}{\partial l} \right) = \mu_1 \delta_1 - 2\mu_2 \delta_2 l^* < 0
  \]

- Parental inputs are complementary to school quality.
Improve Absolute mobility but decrease Relative Mobility
Main Take-ways

- Improvement in school quality => improve educational outcomes for the entire distribution of father’s education
- But it decreases relative mobility => increase inequality for the next generation. Evidence is somewhat different from Card, Domnisoru and Taylor (2018) for USA.
- More targeted policy interventions to counter this inequality increasing effect
- INPRES School construction: Improves absolute mobility (Duflo, 2001), we find it improves relative mobility at the lower tail of parental education distribution for boys but no effect on mobility of girls.
Is Gender Destiny?

Gender Bias and Intergenerational Educational Mobility in India

Emran, Jiang, Shilpi (2020)
Narrowing of gender gap in schooling in India

Gender Difference in Schooling: Urban India

Gender Difference in Schooling: Rural India
Estimates from typical linear Intergenerational Regression Equation

<table>
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<th></th>
<th>Urban</th>
<th>Rural</th>
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<tbody>
<tr>
<td></td>
<td>Sons</td>
<td>Daughters</td>
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<tr>
<td><strong>India</strong></td>
<td></td>
<td></td>
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<tr>
<td>Father’s Education</td>
<td>0.46***</td>
<td>0.52***</td>
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<tr>
<td></td>
<td>(0.0074)</td>
<td>(0.0080)</td>
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<tr>
<td>Intercept</td>
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<td>5.97***</td>
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<tr>
<td></td>
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<td>(0.075)</td>
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<tr>
<td>N</td>
<td>9449</td>
<td>9070</td>
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</tbody>
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\[ E^c = \beta_0 + \beta_1 E^p + \epsilon \]
Is higher intergenerational persistence for girls due to gender bias?

Theoretical model highlights three sources of bias:

- **Family**: Invest less on girl’s education either because parents underestimate girl’s ability or assign higher welfare weights to son’s than daughter’s education (pure son preference)
- **School**: Lack of toilets (Adukia, 2017), female teachers
- **Labor market**: Returns to education could be lower for women than men though evidence from Mincerian regressions suggest the opposite
Does gender difference in relative mobility reflect gender bias in investment by parents?

• Answer depends on the specification of education production function:
  
  • If education production function is CRS, it implies a linear intergenerational regression equation. In that case, gender bias in investment in education will affect only absolute mobility but not relative mobility.

• The intergenerational regression equation is concave for both sons and daughters regardless of location.

• In urban India: linear IRE misses out the convergence between gender for college educated parents
Gender differences in Absolute Mobility
Gender Differences in Relative Mobility
Gender Differences in Education Expenditure

Investment in Children's Education: Urban India

Investment in Children's Education: Rural India

Av. Education Expenditure (RS.)

Father's Education (Years)

Daughter
Son
Sources of Gender Differences in Intergenerational Mobility

- Parent non-financial effects outweigh bias in investment against girls, eliminating gender gaps for college educated fathers in urban areas. Similar role model effect (Emran and Shilpi, 2011).

- Rural-urban comparison: higher selective abortion in urban than rural areas, and evidence of pure son preference in rural areas

- School environment un-favorable to girls in both urban and rural areas

- Patrilineal vs. Matrilineal States: No gender differences in matrilineal states. Social norms embedded in patrilineal and patrilocal system play very important role in gender differences in intergenerational mobility

- College educated parents able to offset the biases rooted in social norms
Concluding remarks

• Better data!
• Conceptual framework appropriate for the context to uncover mechanisms
• No a priori reason to expect persistence to be constant across entire distribution of parent’s education
• Education policies alone may not be sufficient to increase intergenerational mobility: educated parents give such a leg up to their children that investing in schools alone may not be enough.
• Social norms important not just for educational mobility but also for occupational mobility. Good news is that parental education can offset adverse influence of social norms.