Intergenerational Mobility and the Rise and Fall of Inequality: Lessons from Latin America Author: Guido Neidhöfer

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- Construct a measure of individual relative educational position (proxy for well-being)
- Stylized analysis of Great Gatsby Curve
- Establishing a link between income inequality and intergenerational mobility (between and within country) through association between inequality experienced in childhood (and adolescence) and intergenerational mobility as adults
- Evaluating the role of factors in intergenerational mobility (interacted with child age)
 - investment in human capital (public expenditure in education)
 - economic growth (GDP per capita)

- Research attempting to tie inequality to growth (Alesina and Rodrik 1994, Atkinson 1997, Benabou 1996, Corneo and Jeanne 2001, Barro 2000, Banerjee and Duflo 2003, Barro 2008, Brzezinski 2013)
- Discussions on inequality of opportunity based on circumstances (ex-ante) and inequality of effort (ex-post) (Marreiro and Rodriguez 2012, Brunori et al. 2013, Ferreira and Gignoux 2011, Checchi et al. 2010)
- Negative relationship between inequality and intergenerational mobility (Becker and Tomes 1979, Loury 1981, Galor and Zeira 1993, Owen and Weil 1998, Maoz and Moav 1999, and Hassler et al. 2007, Chetty et al. 2014, Guell et al. 2015)
- Research on the Great Gatsby Curve (Krueger 2012, Corak 2013)

- Analysis using harmonized data across countries and time periods (gains in comparability): both *cross-country* and *within-country*
- Focus on intergenerational mobility in developing countries, which normally have poorer data
- Emphasis on Latin America

- Micro data: surveys
 - Latinobarómetro. 18 countries, N=120,166
 - Harmonized Household Surveys. 9 countries. N=390,404
- Macro data: inequality, growth and public expenditures in education
 - SEDLAC (CEDLAS and the World Bank) t=1974-2013
 - World Bank Data t=1970-2013

- Parental welfare is a function of both their own utility of consumption and that of their children $(U_{parents} = U(Consumption, U_{children}))$
- Low-income households can invest less in human capital of children
 - Budget constraints
 - Credit market imperfections (esp. in developing countries, e.g. Latin America)
- Challenge for children to exceed human capital of parents without intervention
- Latin American countries have experienced decreasing inequality (though still high) and low mobility

- Great Gatsby Curve confirmed across and within countries
- Economic growth and increases in public expenditures drive improvements in mobility
 - 15 Gini points $\uparrow \implies$ 9-14% mobility \downarrow
 - \$2000 of per capita GDP $\uparrow \implies$ 6-9% mobility \uparrow
 - 2% public education spending $\uparrow \implies$ 8-9% mobility \uparrow

• Construction of the measure

- Mean educational attainment according to
 - Country of residence
 - Year of birth (cohort)
 - Sex
- Y: years of education. \bar{Y} : Mean Y of *i*'s reference group (above criteria). $y_i \equiv (Y_i \bar{Y})/\bar{Y}$
- Compare patterns with educational attainment across measures of well-being
 - Income
 - Socioeconomic level
 - Number of goods

Mean Years of Education and Well-Being





Source: Neidhöfer (2016): Figure 1

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Mean Relative Educational Position and Well-Being





Source: Neidhöfer (2016): Figure 1

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- Intergenerational persistence of socioeconomic status
- $y_i = \alpha + \beta * y_i^{parents} + \delta X_i + \epsilon_i$ where y_i^p is as y_i and X_i are controls for sex, age (polynomial), and survey year.

Table: Intergenerational mobility regression coefficients (1980-1995) (β_i)

Country	Coefficient	Country	Coefficient
Argentina	0.242	Guatemala	0.373
Bolivia	0.248	Honduras	0.358
Brazil	0.254	Mexico	0.200
Chile	0.374	Nicaragua	0.294
Colombia	0.291	Panama	0.328
Costa Rica	0.267	Paraguay	0.234
Domin. Rep.	0.253	Peru	0.286
Ecuador	0.318	Uruguay	0.329
El Salvador	0.256	Venezuela	0.199

N=67,279; *R*²=0.226

Notes: All coeff. sig. at 1% level. Source: Neidhöfer (2016): Table 1

Great Gatsby Curve (Corak 2012)

- Countries with higher inequality tend to be those with lower mobility, i.e. those with a greater fraction of economic advantage (disadvantage) passed on from parents to children (Corak 2013)
- Plot this using intergenerational earnings elasticity for fathers/sons



Great Gatsby Curve for Latin America: 1998 Cohort



Source: Neidhöfer (2016): Figure 3

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Great Gatsby Curve for Latin America: 2006 Cohort



Source: Neidhöfer (2016): Figure 3

- A relationship between inequality experienced during childhood and intergenerational mobility as adults controlling for cross-country heterogeneity
- Focus is on economic growth (GDP per capita) and investment in education (Public expenditures on education as a share of GDP)
- First, look at trends in inequality, mobility, growth, and education spending by country

Growth between Cohorts: 1998-2006



Model: Determinants of Intergenerational Mobility

- Baseline (as earlier), but countries are now pooled: $y_{ic} = \alpha + \beta * y_{ic}^{p} + \delta X_{ic} + \epsilon_{ic}$
- To account for specific country characteristics (c) experienced in childhood cohort (j). Ω_{jc} ∈ {Inequality, country fixed effects, economic growth, public educ.}
 y_{ijc} = α + β * y^p_{ijc} + δX_{ijc} + γ * y^p_{ijc} * Ω_{jc} + τΩ_{jc} + ε_{ijc}
- Three specifications
 - Early Childhood (0-6)
 - Primary School Age (6-12)
 - Adolescence (12-18)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
	Latinobarometro (18 countries)				Harmonized Household Surveys (9 countries)				
$P.E.^*\overline{Gini}(0 \le age \le 6)$	0.19 <i>2***</i> (0.0667)	0.192*** (0.0667)	0.142** (0.0719)	0.363** (0.1639)	1.217*** (0.2699)	1.251*** (0.2725)	0.246 (0.4435)	-1.189 (1.6530)	
$P.E.^*\overline{GDPp.c.}(0 \le age \le 6)$			-0.014*** (0.0039)	-0.013* (0.007 <i>2</i>)			-0.027*** (0.0072)	-0.01 <i>6</i> * (0.0082)	
P.E.*Starting age compulsory $(0 \le age \le 6)$				-0.000 (0.0113)				0.027 (0.0255)	
Р.Е.	0.25 <i>6***</i> (0.0073)	0.256*** (0.0073)	0.257*** (0.0069)	0.243*** (0.0099)	0.240*** (0.0063)	0.241*** (0.0064)	0.274*** (0.0108)	0.204*** (0.0223)	
Demographic controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Country fixed effects	No	Yes	Yes	Yes	No	Yes	Yes	Yes	
Observations R ² N_clust	33007 0.193 193	33007 0.193 193	33007 0.194 193	15777 0.192 138	63843 0.207 54	63843 0.208 54	63843 0.209 54	22362 0.150 28	

Data: Latinobarometro 1998-2013 (1)-(4), Harmonized household surveys (4)-(8).

Cluster a djusted s.e. by country and birthyear. Statistical significance level * 0.1 ** 0.05 *** 0.01.

P.E. = Parental Education (Normalized)

Source: Neidhöfer (2016): Table 2

Results: Primary School Age Specification

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
	Latinobarometro (18 countries)				Harmonized Household Surveys (9 countries)				
$P.E^*\overline{Gini}(6 \le age \le 12)$	0.130 ** (0.0651)	0.130 ** (0.0651)	0.048 (0.0609)	0.107 (0.0745)	0.826 *** (0.2157)	0.877 *** (0.2124)	0.734 *** (0.2140)	0.833 ** (0.4030)	
$P.E.^{\star}\overline{GDPp.c.}(6 \le age \le 12)$			-0.010 ⁺⁺⁺ (0.0022)	-0.010 ⁺⁺⁺ (0.0026)			-0.010 *** (0.0033)	-0.010 ⁺⁺⁺ (0.0035)	
$P.E.^{\bullet}\overline{Pub.Educ}(6 \le age \le 12)$				-0.009 ** (0.0039)				-0.016 ⁺ (0.0090)	
Ρ.Ε.	0.254 *** (0.0044)	0.254 *** (0.0044)	0.252 *** (0.0039)	0.250 *** (0.0048)	0.253 *** (0.0059)	0.253 *** (0.0059)	0.259 *** (0.0070)	0.259 *** (0.0080)	
Demographic controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Country fixed effects	No	Yes	Yes	Yes	No	Yes	Yes	Yes	
Observations	62911	62911	62911	53912	139610	139610	139610	130915	
R ²	0.185	0.185	0.185	0.179	0.225	0.225	0.226	0.225	
N_clust	290	290	290	255	97	97	97	85	

Data: Latinobarometro 1998-2013 (1)-(4), Harmonized household surveys (4)-(8).

Cluster adjusted s.e. by country and birthyear. Statistical significance level * 0.1 ** 0.05 *** 0.01.

P.E. = Parental Education (Normalized)

Source: Neidhöfer (2016): Table 3

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)		
	Lat	Latinobarometro (18 countries)				Harmonized Household Surveys (9 countries)				
$P.E.^{\bullet}\overline{Gini}(12 \le age \le 18)$	0.221***	0.221***	0.101	0.109	0.832***	0.873***	0.797***	1.681+++		
	(0.0701)	(0.0701)	(0.0637)	(0.0673)	(0.2708)	(0.2619)	(0.2215)	(0.2491)		
$P.E.^{\star}\overline{GDPp.c.}(12 \le age \le 18)$			-0.009+++	-0.006***			-0.014+++	-0.008+++		
			(0.0017)	(0.0018)			(0.0028)	(0.0018)		
$P.E.^{\bullet}\overline{Pub.Educ}(12 \le age \le 18)$				-0.014+++				-0.030+++		
				(0.0030)				(0.0064)		
P.E.	0.257***	0.257***	0.253***	0.248***	0.271+++	0.271+++	0.271***	0.272***		
	(0.0040)	(0.0040)	(0.0036)	(0.0033)	(0.0061)	(0.0061)	(0.0056)	(0.0042)		
Demographic controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Country fixed effects	No	Yes	Yes	Yes	No	Yes	Yes	Yes		
Observations	87937	87937	87907	78845	203787	203787	203787	195320		
R ²	0.189	0.189	0.189	0.181	0.240	0.241	0.242	0.241		
N_clust	365	365	364	329	134	134	134	128		

Data: Latinobarometro 1998-2013 (1)-(4), Harmonized household surveys (4)-(8).

Cluster adjusted s.e. by country and birthyear. Statistical significance level * 0.1 ** 0.05 *** 0.01.

P.E. = Parental Education (Normalized)

Source: Neidhöfer (2016): Table 4

Results: Determinants of Intergenerational Mobility



Source: Neidhöfer (2016): Appendix Figure A6.

- 15 Gini points $\uparrow \implies$ 9-14% mobility \downarrow
- \$2000 of per capita GDP $\uparrow \implies$ 6-9% mobility \uparrow
- 2% public education spending $\uparrow \implies$ 8-9% mobility \uparrow

- Great Gatsby Curve confirmed across and within countries: higher (lower) income inequality during childhood is associated with lower (higher) intergenerational mobility as adults
- Lower upward mobility of individuals at the bottom of the distribution
- Positive relationship between mobility and both economic growth and public expenditures (drivers)
- Highlights the importance of public investment in children's human capital as a channel to improve mobility

And now for some additional considerations...

- Economic interpretation
- Measurement error
- Outliers
- Public spending efficiency (policy more generally)
- Controls for race/ethnicity? Rural vs. urban?
- Slope of intergenerational transmission by gender?

- Ex: Argentinian coefficient 0.242 \implies a 10% increase in parental educ rel. to the mean for their reference group is associated with a 2.4% increase in the children's generation is this a big effect?
- GDPxPB and educ expenditures have small coeff
- GinixPB has very diff magnitude from one dataset to another, unlike PB coeff
- Marginal effects results may take a generation to achieve

• Between different surveys/time periods

- Big differences in inequality measures
 - Venezuela ineq in 2005=0.474, 2006=0.433 too low probably
 - Dominican, Nicaragua, Peru, Paraguay
- Why is education so much lower in HH surveys than in Latinobarometro?
- Confidence intervals really high for some countries for more recent cohorts. Problem given small marginal effects?

- Not all countries have had declining inequality (exceptions: costa rica, dominican, uruguay)
- Countries which have made the biggest change in intergenerational persistence (>10%): Paraguay -55.7%, Venezuela -33.7%, Honduras 32%, Costa Rica -29%, Nicaragua 21.4% why?
- Outliers: venezuela, paraguay, honduras



Gatsby Curve: 2006

Gatsby Curve 2006 (no outliers)



Gatsby Curve 1998



Gatsby Curve 1998 (no outliers)



- Effects of ex-ante vs. ex-post spending: Checchi et al. 2010 find that ex ante equality of opportunity exhibits positive correlation with public expenditure in education, whereas ex post equality of opportunity is also positively associated with fiscal redistribution.
- Efficiency of spending: Afonso, Schuknecht, Tanzi (2010) use PISA scores to proxy for educational achievements. Find more redistributive public spending and education achievements ⇒ a more equal income distribution.

- Would be helpful to have discussion of policy changes in and out of sample driving overall results as well as results for individual countries
 e.g., people have much more education in Chile
- Gender differences: Higher educational attainment of low-education women may more greatly benefit intergenerational education than that of low-education men (Pronzato 2012, Black et al. 2005) reinforcing, multiplying effects
- Which parent matters in transmission?
- Race/ethnicity big factor in mobility
- Rural/urban?

- Robustness check with public expenditure per student would be helpful to see
- Numerical example would be helpful for relative educational position graphs and marginal effects
- Structuring/ordering of tables, graphs

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Thanks!