INTERGENERATIONAL TRANSMISSION OF LOCKDOWN CONSEQUENCES:

PROGNOSIS OF THE LONGER-RUN PERSISTENCE OF COVID-19 IN LATIN AMERICA

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April 2021

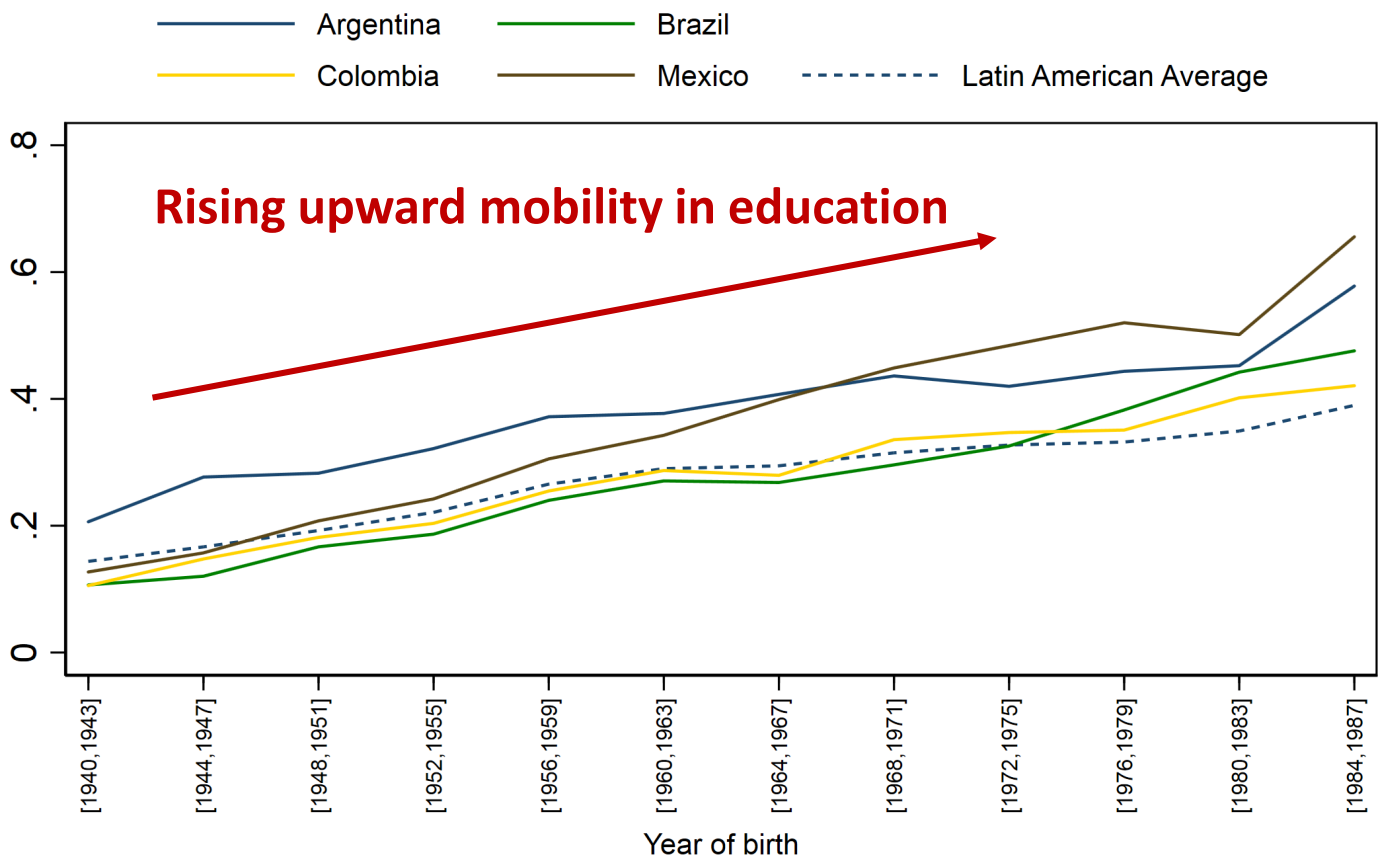
twitter: **@GNeidhofer**

Leibniz Gemeinschaft ZEW

Once upon a time...

... in Latin America

Probability of disadvantaged children to complete secondary education



Graph from Lustig/Neidhöfer/Tommasi "Short and long run distributional impacts of COVID-19 in Latin America. Data source: MOBILITY-LATAM Data; see Neidhöfer, G., Serrano, J., & Gasparini, L. (2018). Educational inequality and intergenerational mobility in Latin America: A new database. *Journal of Development Economics*.

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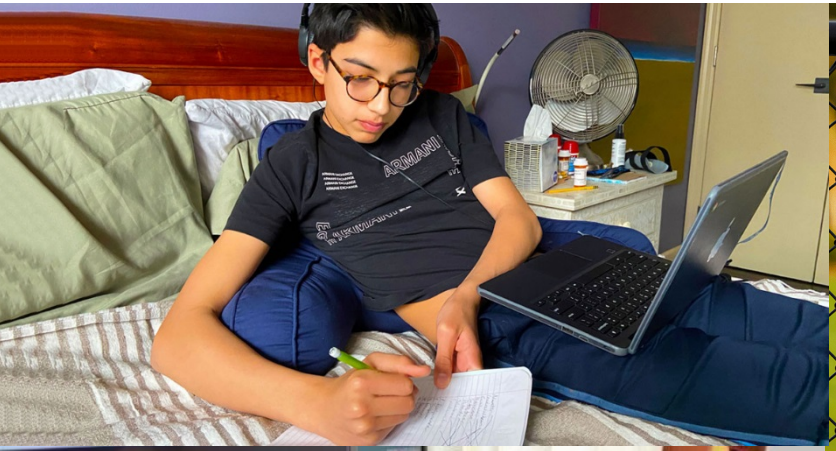
…AND THEN THERE WAS COVID-19



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PROGNOSIS OF THE LONGER-RUN PERSISTENCE OF COVID-19

Aim: Estimate the **effects of the pandemic shock on human capital.**

Exercise: Estimate **counterfactual pandemic scenario** for past generations.

What if past cohorts would have experienced such a situation as today?

Main channel: School closures
(+ parental job loss and health shocks)

Main **questions**:

- How strong could the shock affect **educational inequality (of opportunity) ?**
- Have **public policies** been able to **mitigate the negative impact** ?

COUNTERFACTUAL EXERCISE

Human capital approach (loosely following Adda, 2016):

$$\widehat{educ_{ijc}} = educ_{ijc} - \boldsymbol{\kappa_{jc}}$$

$educ$	*reported years of education*
$\boldsymbol{\kappa}$	***share of the school year lost***
$\widehat{educ}$	*post-pandemic counterfactual*
i	*individual*
j	*socio-economic background*
c	*country*

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educational loss
due to COVID-19 $\epsilon(0,1)$

$$\kappa_{jc} = \alpha_j \cdot K_{jc}$$

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instructional loss

Depends on:

- **Days of school lost**
- **Mitigation strategies**:
  - **Offline** education = via cellphone + tv + radio + printed copies
  - **Online** education * **internet coverage** in socioeconomic group
- Outbreak of COVID-19 (likelihood of infection and death in hh)
- Parental job loss

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parental factor of substitution

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→ our estimates aim at capturing a lower bound

$$\kappa_{jc} = \alpha_j \cdot K_{jc}$$

$$K_{jc} = \frac{t_c \left(1 - f_c \cdot \delta - n_c \cdot A_{jc} \cdot (1 - \delta)\right) + \tau}{T_c}$$

t	**days lost** = date of school reopening – date of school closure (counting school vacations)
T	**total days** of schooling in regular year
f	index of **offline education** = (education via cellphone + tv + radio + printed copies)/4
n	index of **online education** = digital conditions (from SIGED, 2020)
a	**internet coverage** in socioeconomic group j
δ	weight of online vs offline education (set to 0.5)
τ	instructional loss due to COVID-19 **infection** or **death** in household

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$$\kappa_{jc} = \alpha_j \cdot K_{jc}$$

Conceptually based on the literature analyzing the effect that parents have on the human capital of their children (see e.g. "Summer learning loss").

$$\alpha_j = 1 - \underbrace{\frac{educ^{parents}}{\max(educ^p)}}$$

parental factor of substitution

For $educ^p = 0$	→ the **entire K-portion** of the schoolyear is lost.
For $educ^p = \max(educ^p)$	→ parents **substitute** school perfectly.

Note:

EITHER Instructional loss **randomly attributed to share α_j of the population** in group *j*
concentrated instructional losses

OR **Share α_j of the instructional loss attributed to all individuals** in group *j*
dispersed instructional losses

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ELEMENTS OF K (INSTRUCTIONAL LOSS)

country	t	T	offline	online	internet (j=illiterate)	internet (j=some tertiary)	COVID-19 (09/2020) Cases per inhabitant	COVID-19 (09/2020) Deaths per inhabitant	Avg. HH size	$E[\kappa_{jc}]$ (j=illiterate)	$E[\kappa_{jc}]$ (j=some tertiary)
ARG	**154**	**180**	**0.75**	**0.69**	**0.63**	**0.78**	**0.01090**	**0.00023**	**3.3**	**0.35**	**0.04**
BOL	157	200	0.50	0.25	0.12	0.76	0.01062	0.00062	3.5	0.58	0.07
BRA	157	200	0.50	0.63	0.49	0.91	0.01972	0.00060	3.3	0.47	0.05
CHL	154	190	0.75	0.75	0.68	0.90	0.02245	0.00062	3.6	0.30	0.03
COL	150	200	0.75	0.75	0.32	1.00	0.01350	0.00043	3.5	0.38	0.03
CRI	154	200	0.50	0.50	0.66	0.79	0.00989	0.00011	3.5	0.45	0.06
DOM	72	197	0.25	0.44	0.67	0.80	0.00932	0.00018	3.5	0.27	0.03
ECU	100	200	0.75	0.56	0.29	0.85	0.00637	0.00061	3.8	0.27	0.03
SLV	158	200	0.50	0.38	0.14	0.96	0.00411	0.00012	4.1	0.57	0.06
GTM	145	180	0.75	0.56	0.31	1.00	0.00448	0.00016	4.8	0.43	0.04
HND	162	200	1.00	0.56	0.13	0.90	0.00669	0.00021	3.9	0.38	0.03
MEX	**136**	**185**	**0.25**	**0.50**	**0.33**	**1.00**	**0.00504**	**0.00054**	**3.7**	**0.58**	**0.06**
PAN	163	185	0.50	0.38	0.30	0.86	0.02317	0.00050	3.7	0.61	0.07
PRY	158	200	0.75	0.38	0.28	1.00	0.00344	0.00007	4.6	0.45	0.05
PER	154	185	0.50	0.69	0.15	0.87	0.02141	0.00093	3.8	0.58	0.05
URY	75	180	0.25	1.00	0.46	0.90	0.00049	0.00001	2.8	0.27	0.02
VEN	121	180	0.25	0.33	0.63	0.78	0.00191	0.00002	3.3	0.52	0.07

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On average, **children of illiterate parents** in **Argentina** lost **35%** of instructional time due to COVID-19, in **Mexico almost 60%.**

Expected instructional loss
among individuals in socioeconomic group *j*

SIMULATION

OF EFFECTS ON INTERGENERATIONAL PERSISTENCE

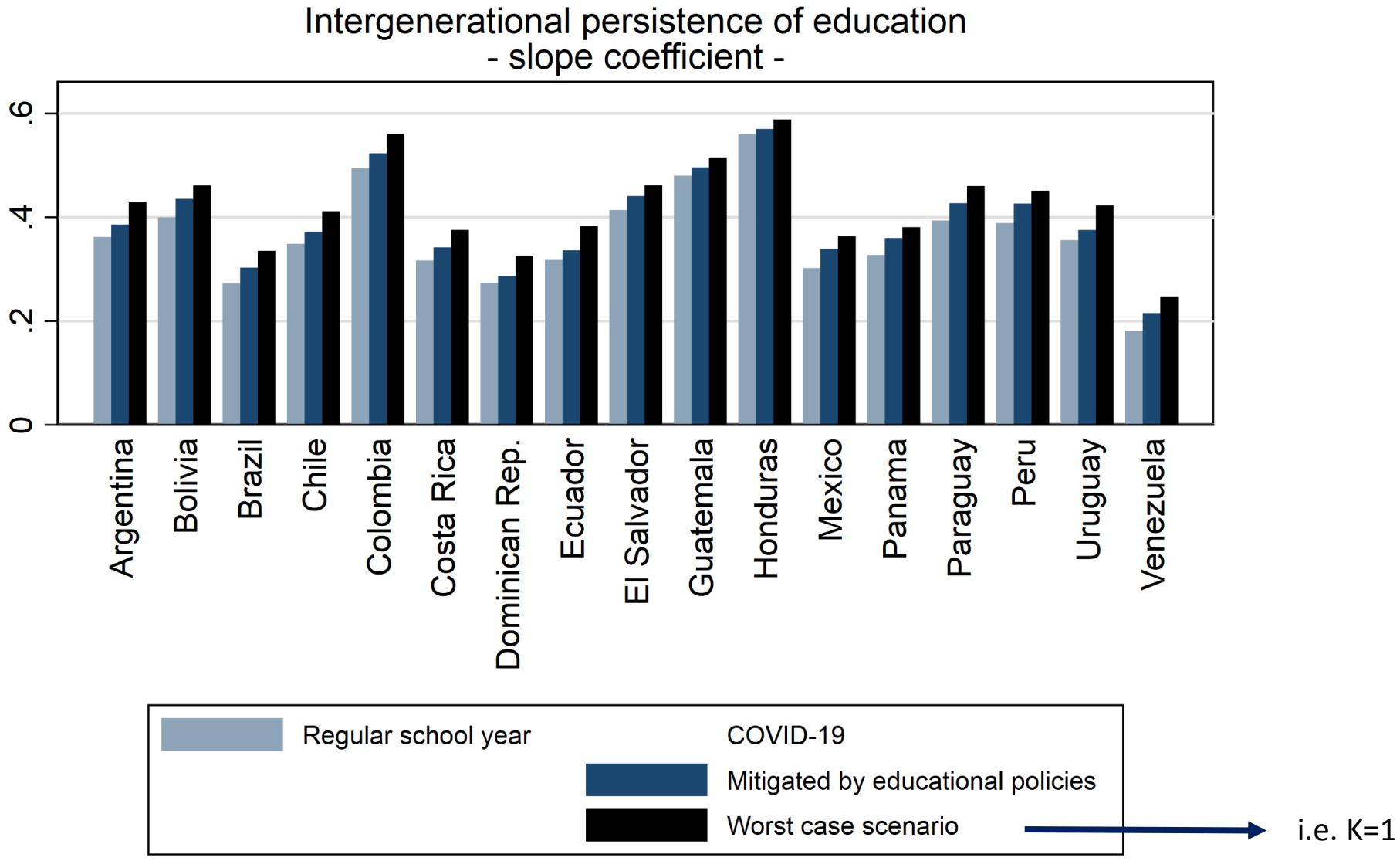
MICRO-DATA

- Latinobarometro 1998-2017
  - Harmonized representative survey for 18 Latin American countries
  - Very suitable to study intergenerational persistence (see Neidhöfer et al., 2018; Neidhöfer, 2019)
- People born 1987-94 (respondent‘s age > 23)
- Information on own and parental education

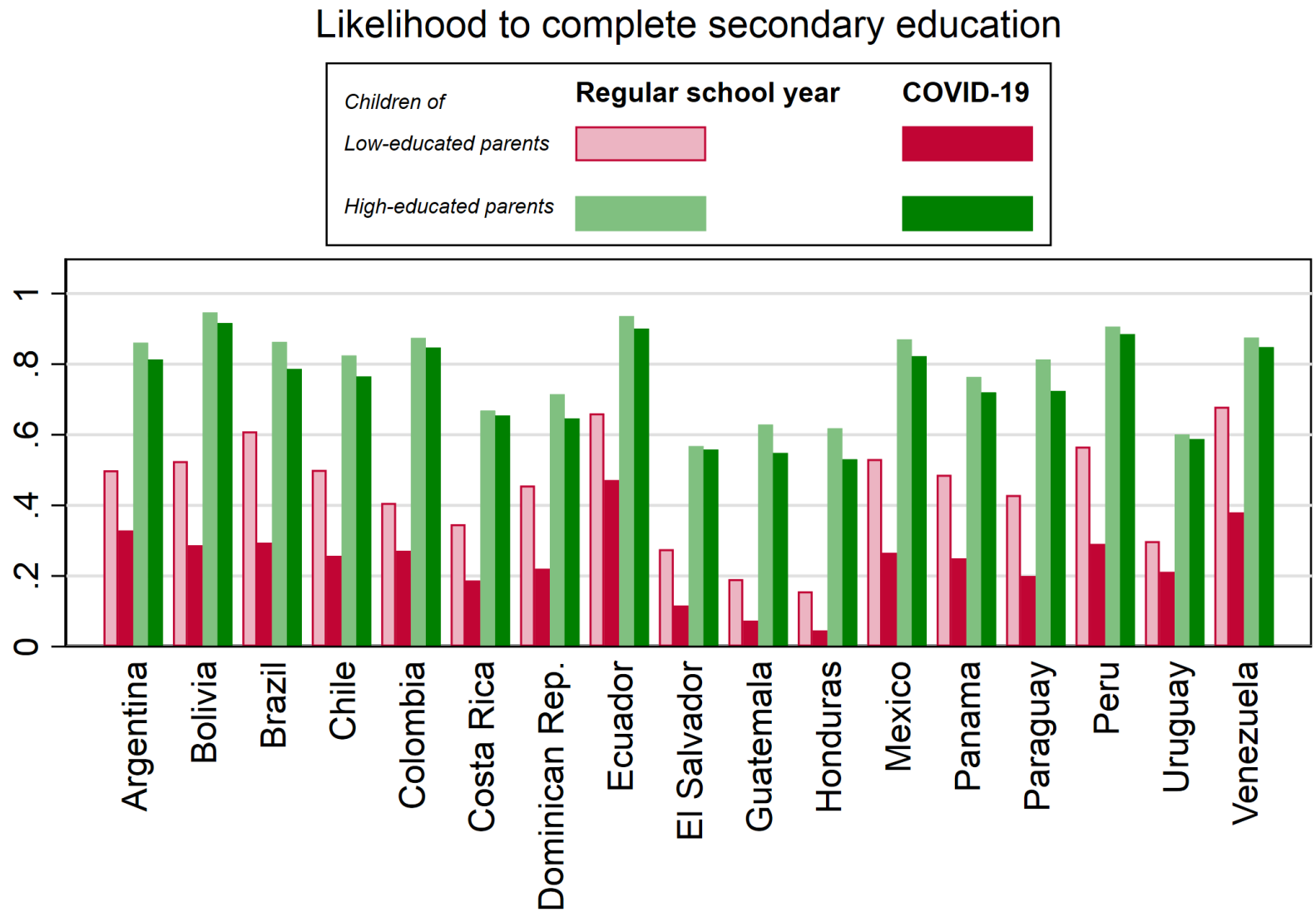
MEASUREMENT

- $Educ^c = \alpha + \beta Educ^p + \varepsilon$ → **slope coefficient**
  - Where *Educ* are years of schooling of parents (p) and children (c)

- $P(Educ^c \geq s | Educ^p)$ → **proability of upward mobility / top persistence**
  - Where s is a completed secondary degree (12 years of schooling)



Source: own estimates using Latinobarometro 1998-2017.



Note: Complete secondary education defined as having obtained at least 12 years of schooling.
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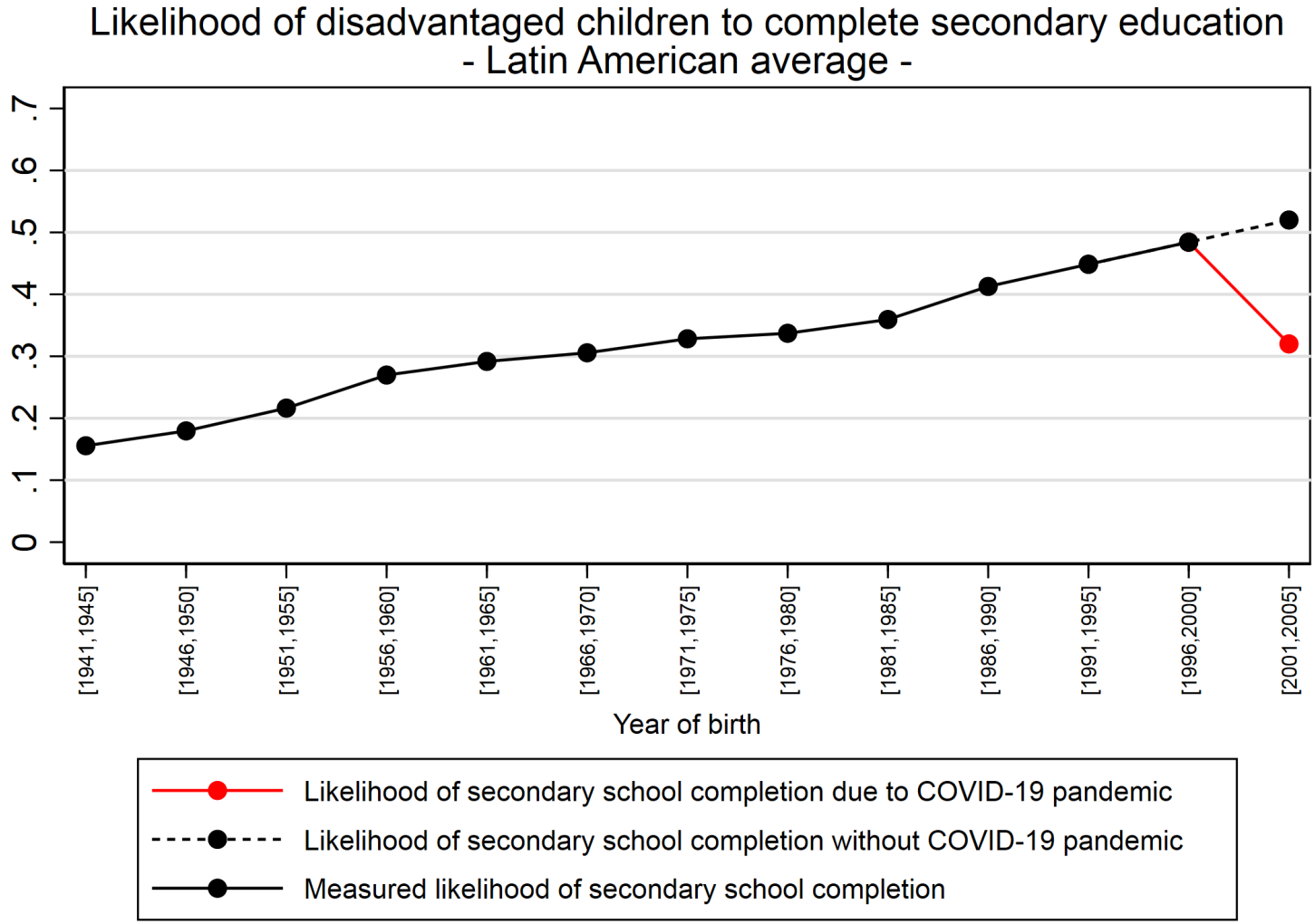
LIKELIHOOD TO COMPLETE SECONDARY OF LOW BACKGROUND CHILDREN BACK TO THE LEVELS OF THE 60S



COUNTERFACTUAL EXERCISE (CONT'D)

- **Parental job loss may cause educational drop out** (Duryea et al., 2007; Cerutti et al., 2019).

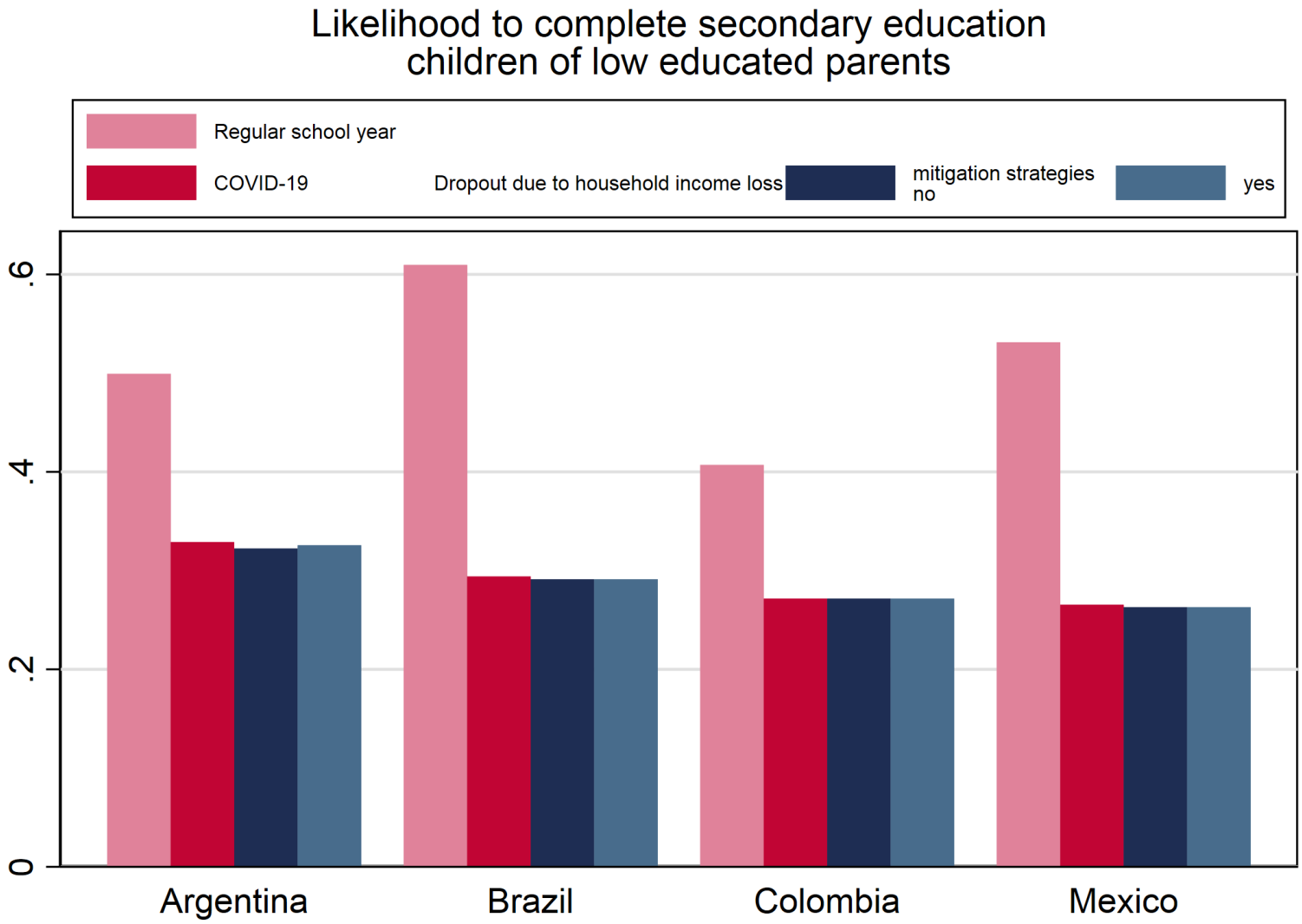
- New **counterfactual** measure of years of schooling is

$$\widetilde{e_{ijc}} = \widehat{e_{ijc}} - \alpha_j \cdot D_{jc}$$

- D_{jc} **the probability of parents with educational background j in country c to lose >50% of their income due to the pandemic**.

- To estimate these probabilities, we rely on the microsimulation exercise adopted in Lustig et al. (2020) to Argentina, Brazil, Colombia, and Mexico.

Additional impact of income loss is marginal

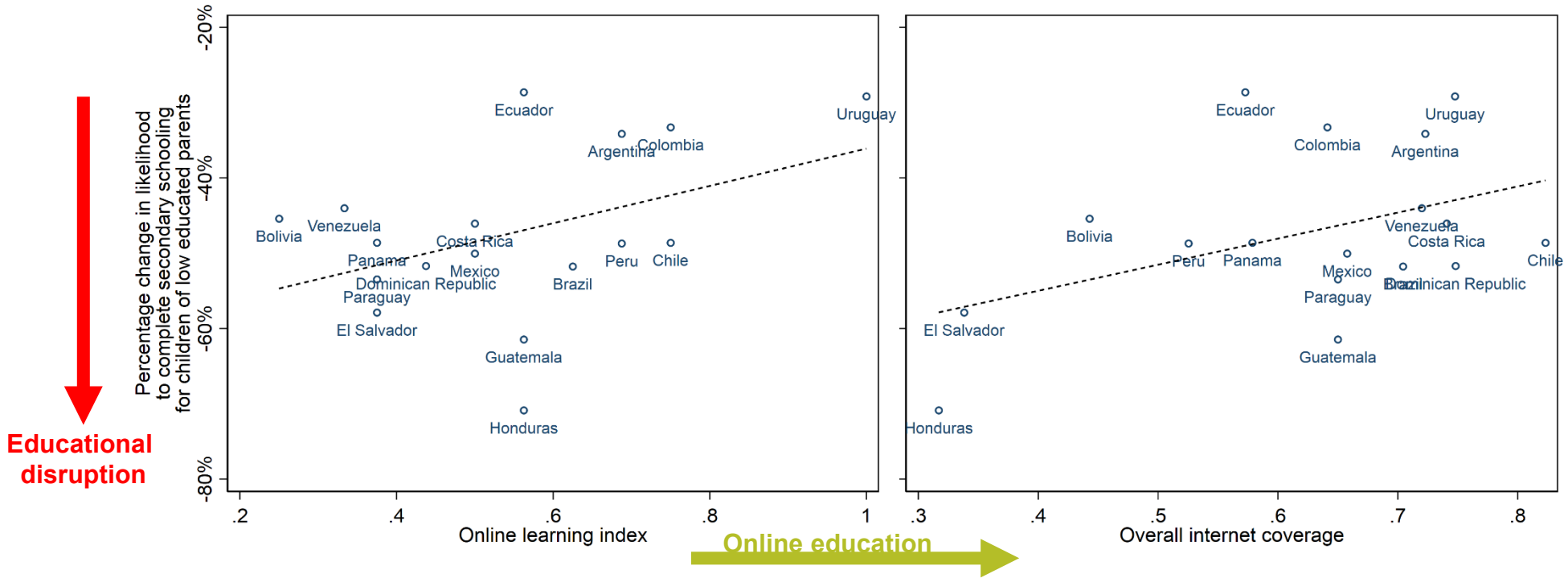


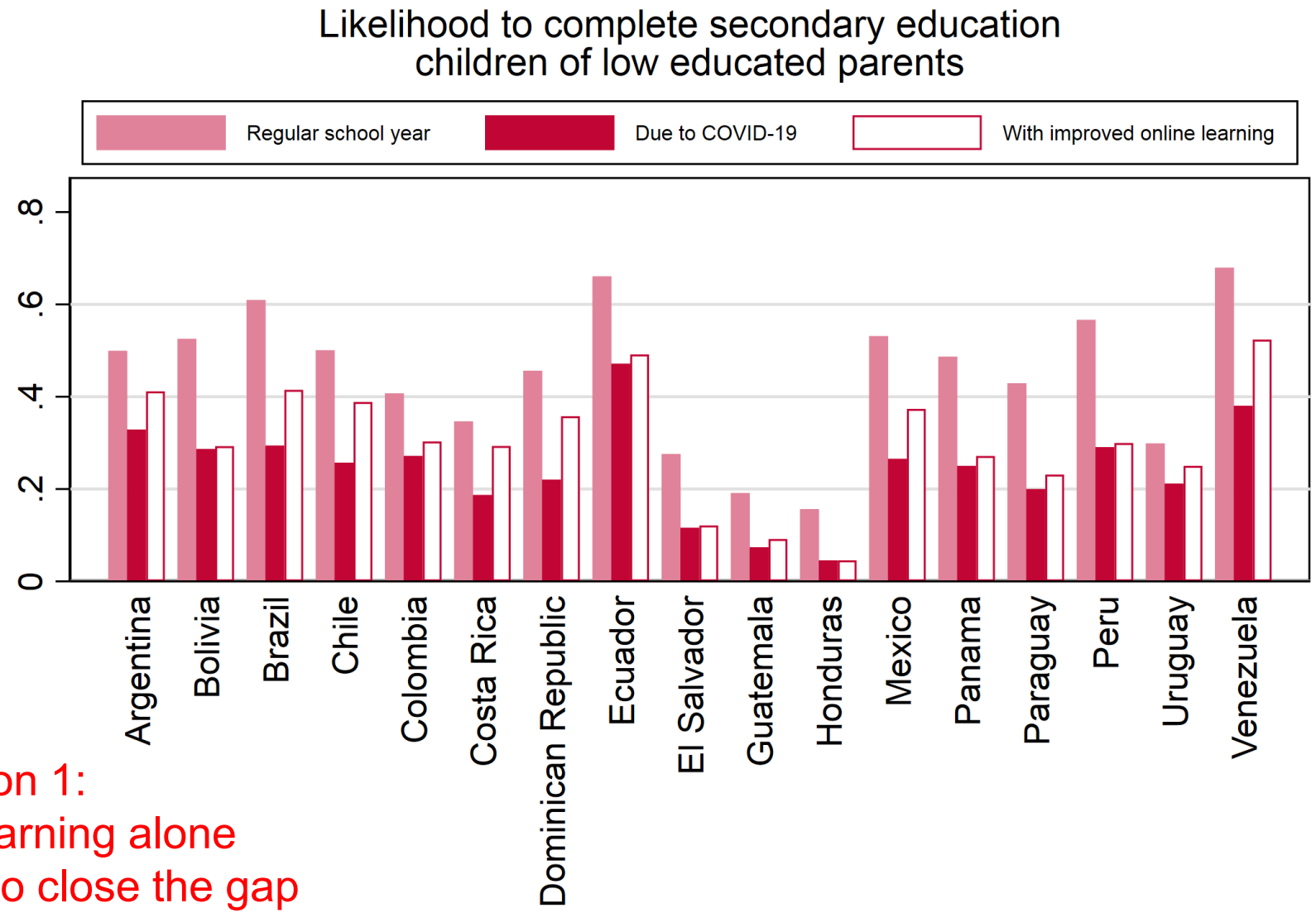
Method:

Estimate P(income loss>50%)= D_{jc} by education of household head w/ and w/o mitigation strategies (microsimulation as in Lustig et al. (2020)) and impute instructional loss of 1 year to $\alpha_j \cdot D_{jc}$ share of the within group population (by parental background)

MITIGATION THROUGH ONLINE LEARNING

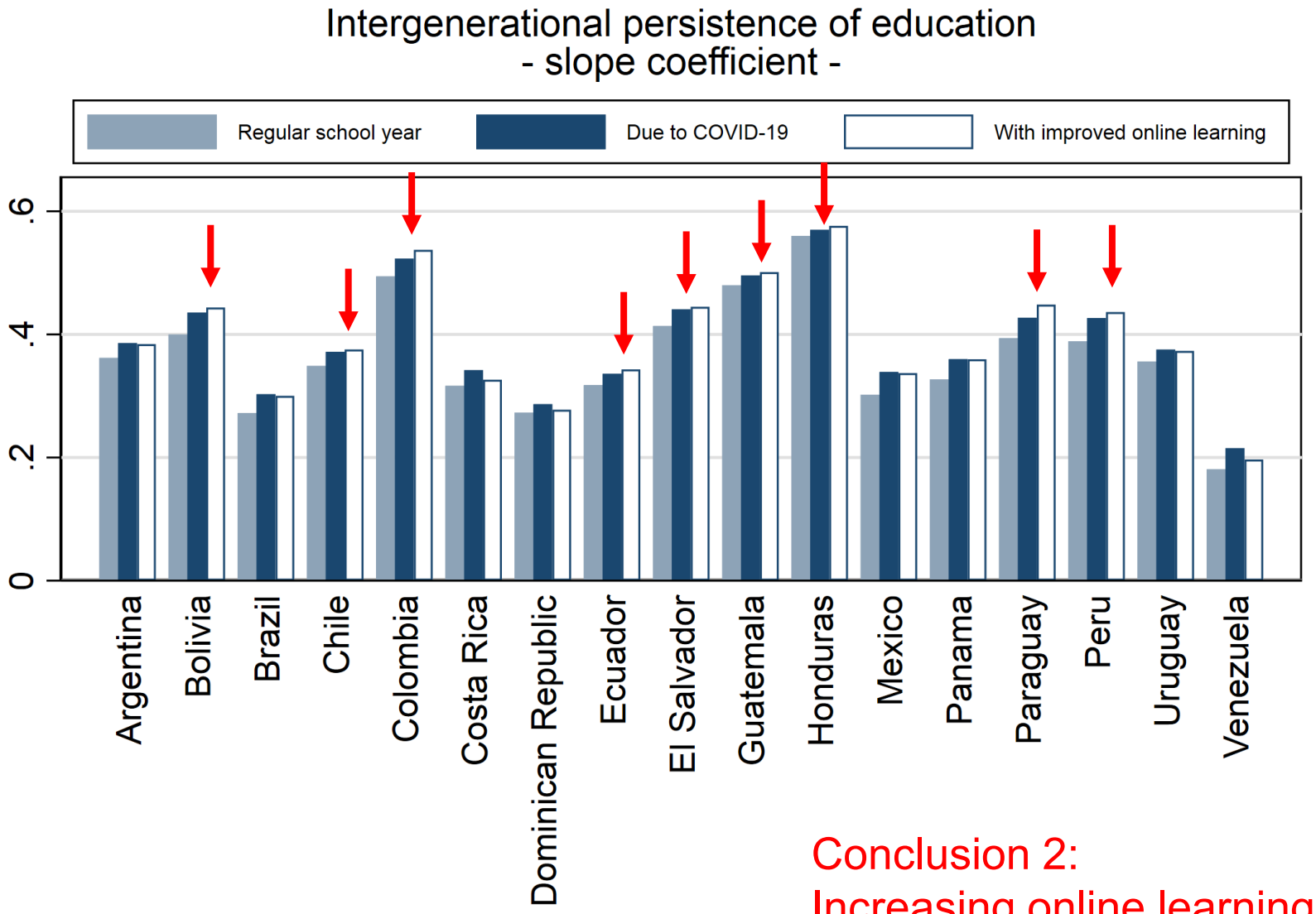
- Online learning to reduce instructional loss during the pandemic (e.g. Clark et al., 2020)
- Expansion useful in the context of Latin America?





Conclusion 1:
Online learning alone
not able to close the gap

Method: set online learning to 100% and weight δ to 1.
Note: Complete secondary education defined as having obtained at least 12 years of schooling.
Source: own estimates using Latinobarometro 1998-2017.



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Conclusion 2:
Increasing online learning without changes to digital infrastructure may have **regressive effect**

CAVEATS

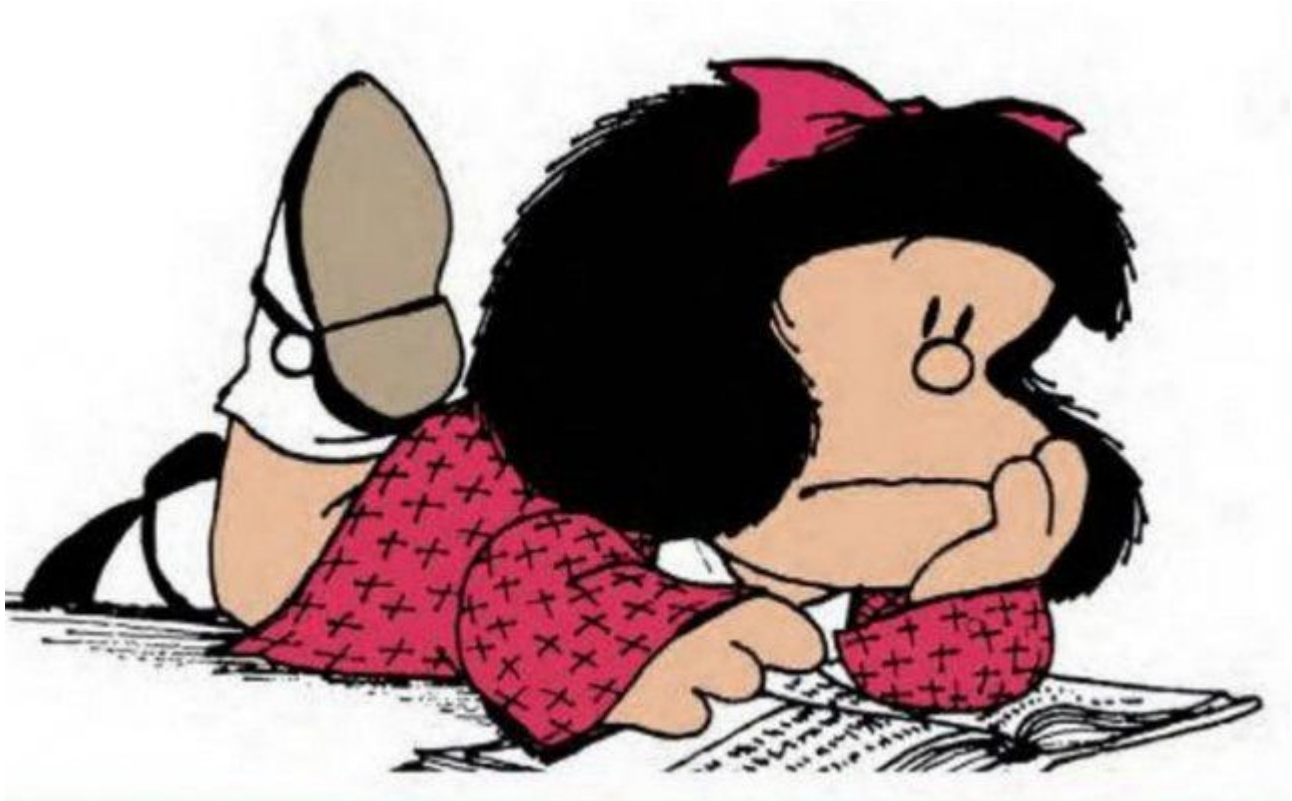
- No **cumulative** effects of learning loss and no **additional** effect on other features (e.g. nutrition, obesity, mental health, teenage pregnancy)
  - even stronger learning losses → **our estimates are a lower bound**

- Same human capital loss for all ages (or, equivalently, all individuals in the sample are hit at the same age)
  - **bias not clear**: may be easier to make up in earlier grades **OR** older children might be less dependent on their parents
    → **anyway, unlikely to offset the entire effect**

TO SUM UP…

- **Asymmetric** COVID-19 shock **imperils equality of opportunity**
- **Educational mitigation strategies not sufficient** to close the gap so far…
- Increasing relative returns to skills may cause **higher income inequality in the long-run**

WHAT CAN BE DONE?



SOME THOUGHTS

- **Is it safe to re-open schools?** 

- **Rethink schooling!**

  → Develop tools to sustain the learning process **in and outside** of the classroom.

- Is **online education** enough to level the playing field? **NO!**

  – Not without targeted infrastructural investment.

- **Focus on the most vulnerable children** at risk to fall behind.

- **Protect the financing of public education** from cuts and reallocation of funding.

- **Benefit from comparative advantages** of international cooperation.

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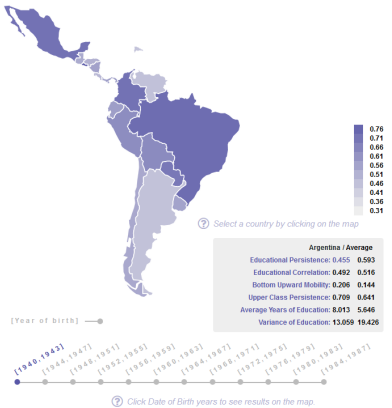
THANKS A LOT FOR YOUR ATTENTION!
COMMENTS ARE WELCOME!

Resources:

- Working paper: CEQ, ECINEQ, UdeSA, ZEW

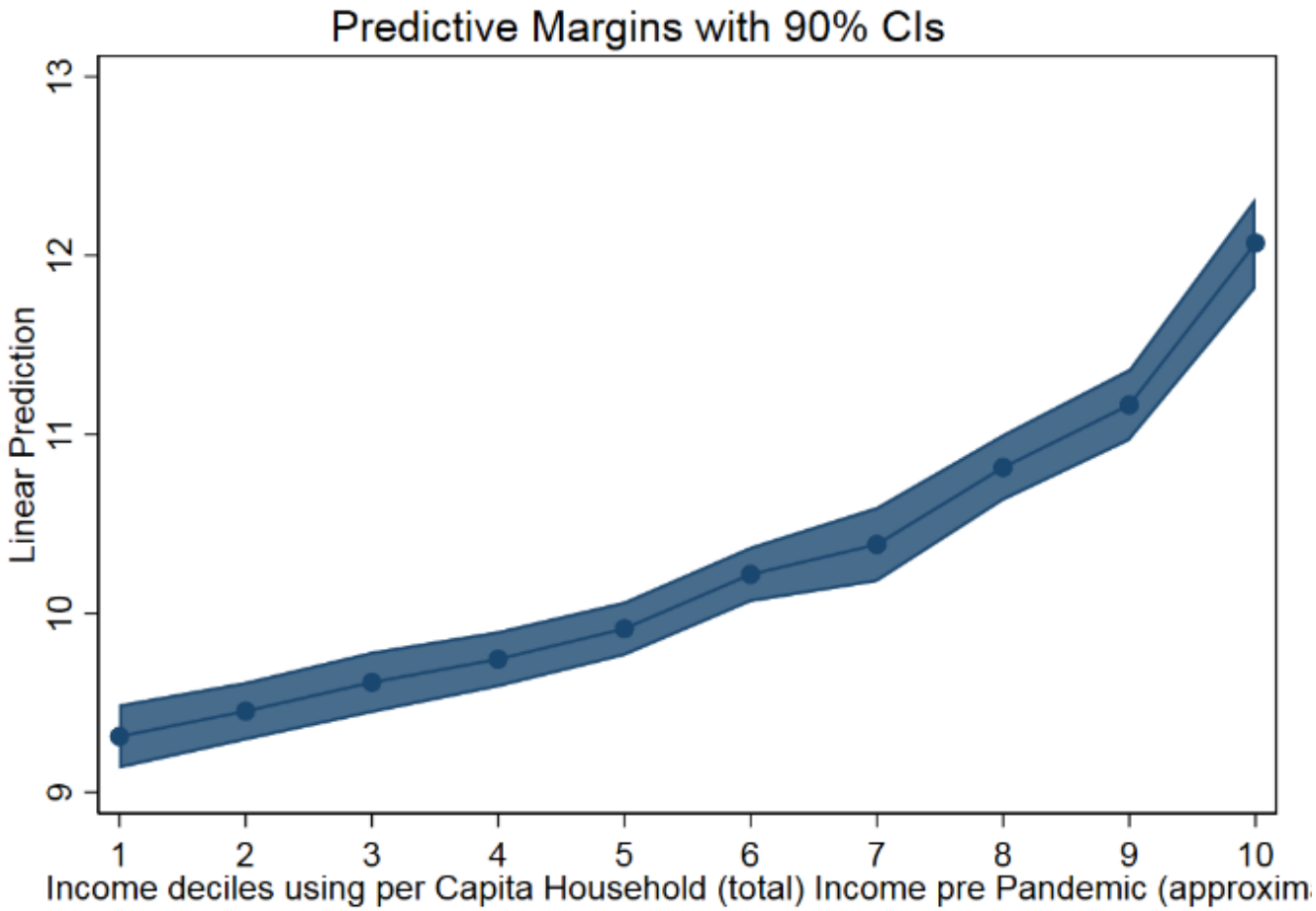
- Americas QUARTERLY **"Back to the 1960s? Education May Be Latin America's Most Lasting Scar from COVID-19" by Nora Lustig and Guido Neidhöfer and Mariano Tommasi** | December 3, 2020
  Spanish translation published by *El Tiempo* (Colombia)

- On intergenerational mobility in Latin America:
  https://mobilitylatam.website/



CHANNELS: HOMESCHOOLING INEQUALITY

Average number of weekly hours doing homeschooling



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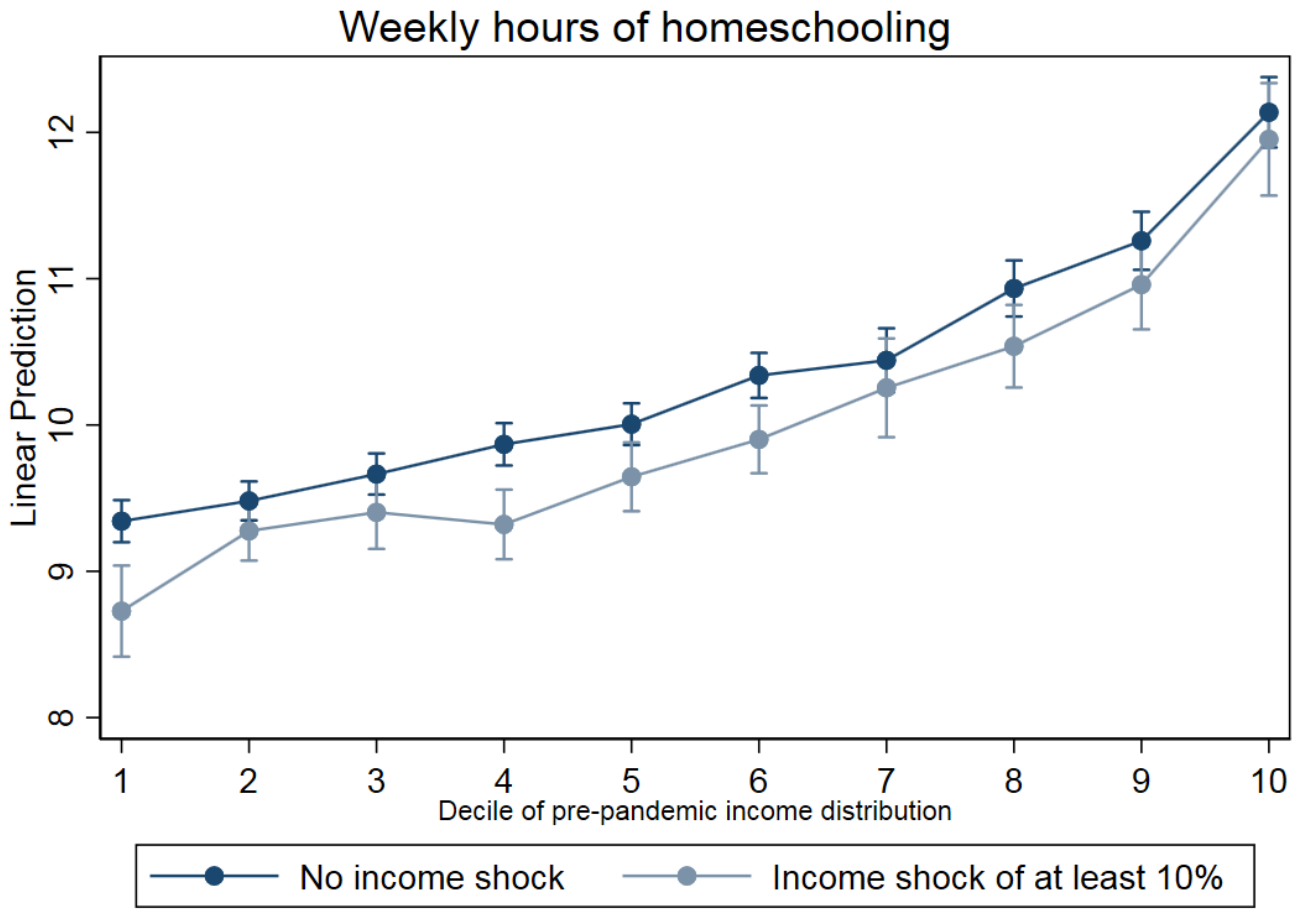

APPENDIX

MICROSIMULATION (FOLLOWING LUSTIG ET AL., 2020)
HOUSEHOLDS LOSING >50% OF THEIR INCOME (IN %)

Without mitigation programs

Level of education	Argentina	Brazil	Colombia	Mexico
Illiterate	5.5	6.9	9.1	6.9
Incomplete primary	8.6	12.0	9.6	9.9
Complete primary	12.9	14.6	13.1	13.3
Incomplete Secondary	14.8	16.4	16.2	15.9
Complete Secondary	12.3	14.2	14.3	12.5
Incomplete Tertiary	9.1	12.0	12.1	8.9
Complete Tertiary	6.9	5.5	9.2	6.6

With mitigation programs

Level of education	Argentina	Brazil	Colombia	Mexico
Illiterate	2.1	5.1	8.6	6.9
Incomplete primary	7.6	9.3	9.3	9.9
Complete primary	10.9	11.9	12.9	13.3
Incomplete Secondary	12.4	13.6	15.8	15.9
Complete Secondary	10.9	12.3	14.2	12.5
Incomplete Tertiary	8.4	10.8	12.1	8.9
Complete Tertiary	6.8	5.0	9.1	6.6

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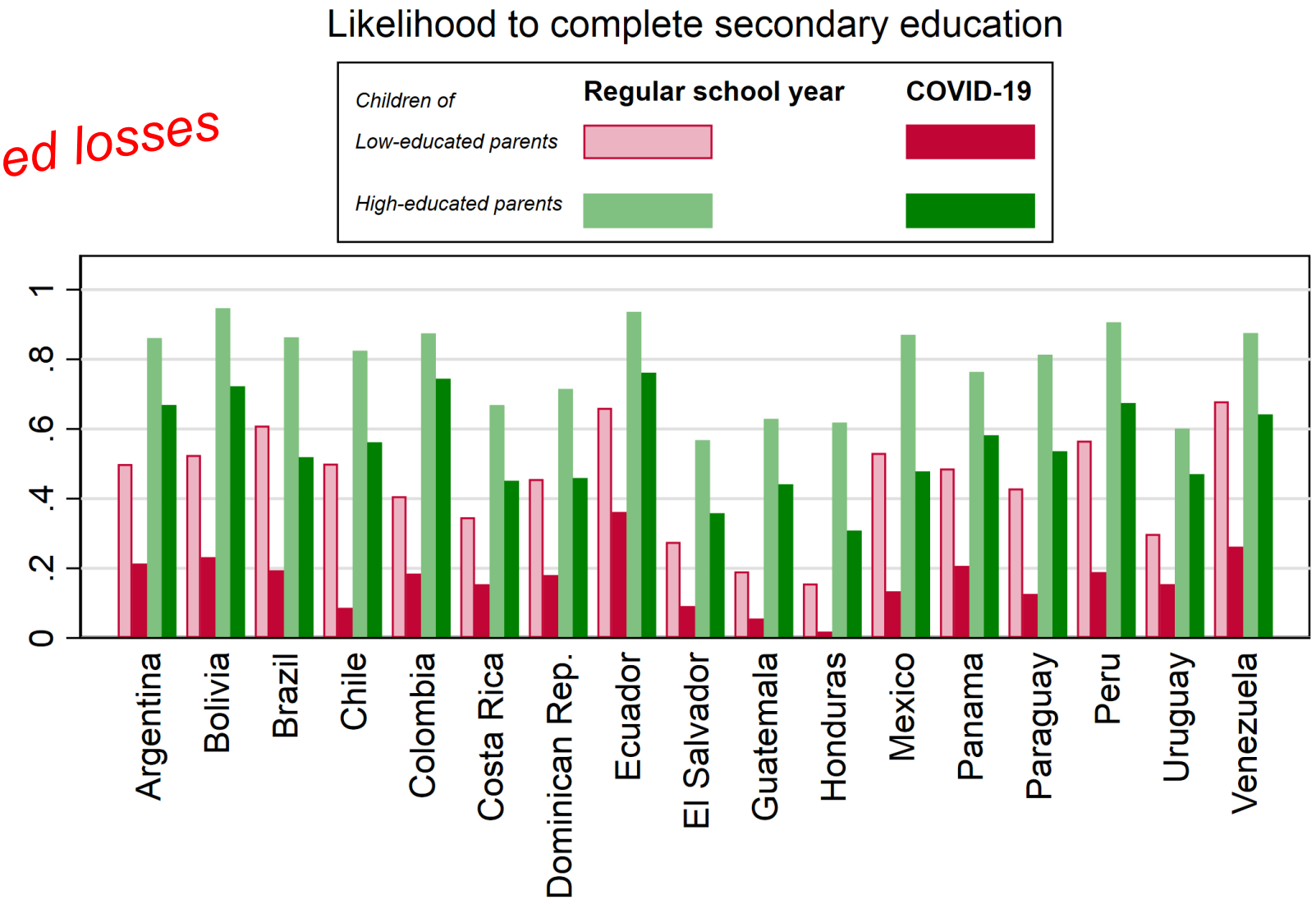
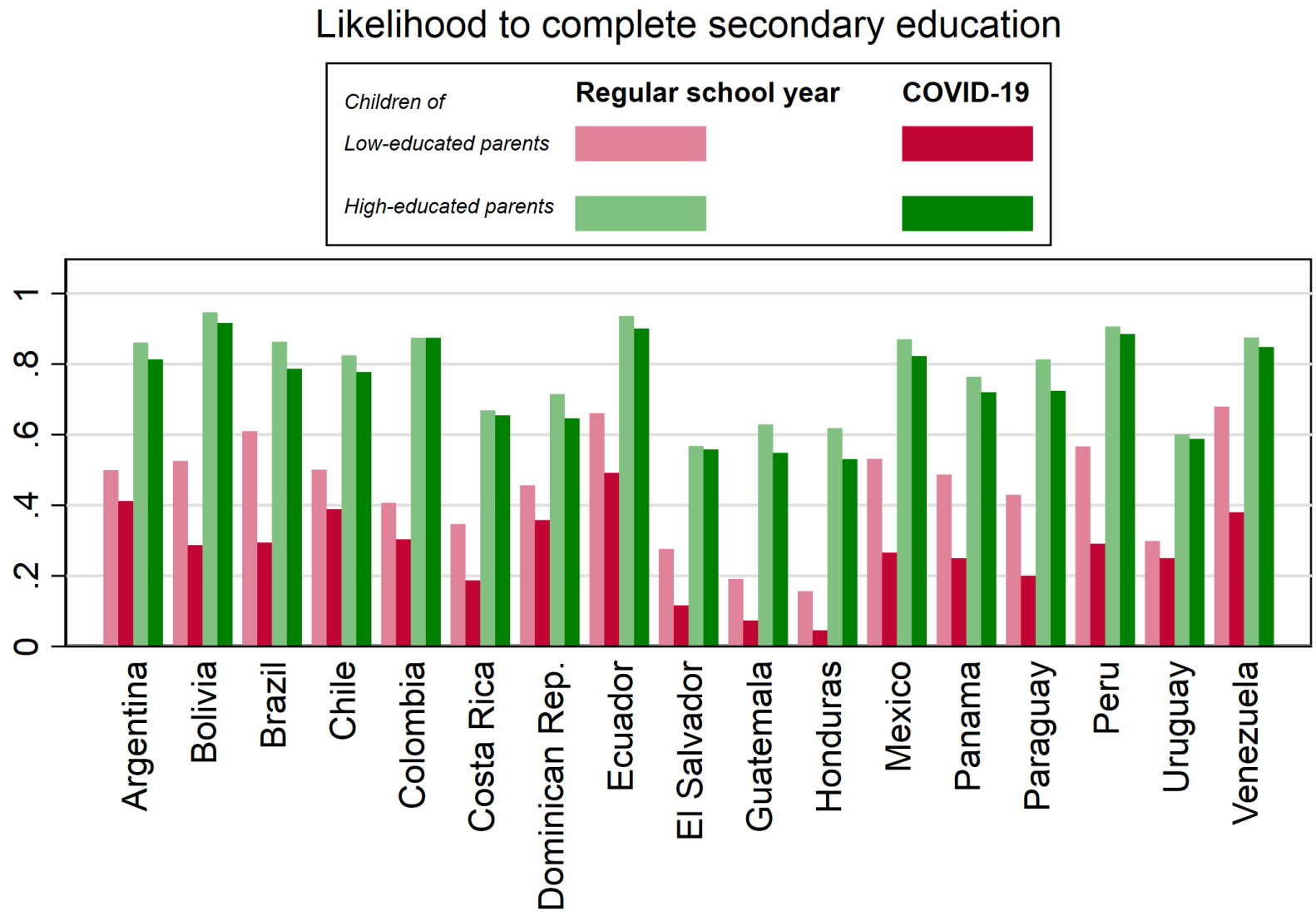
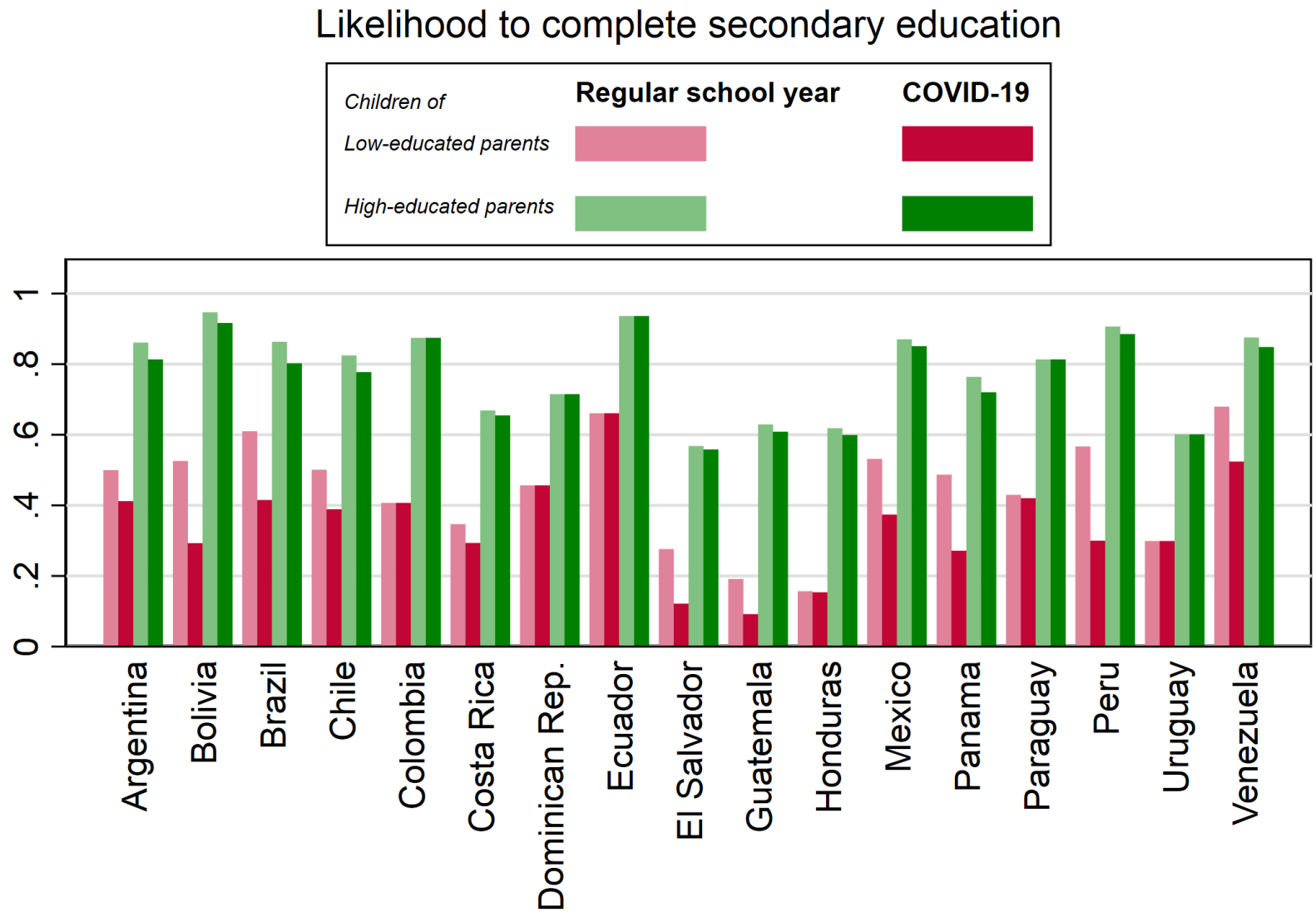
dispersed losses



Note: Complete secondary education defined as having obtained at least 12 years of schooling.
Source: own estimates using Latinobarometro 1998-2017.



Note: Complete secondary education defined as having obtained at least **11.75** years of schooling.
Source: own estimates using Latinobarometro 1998-2017.



Note: Complete secondary education defined as having obtained at least **11.5** years of schooling.
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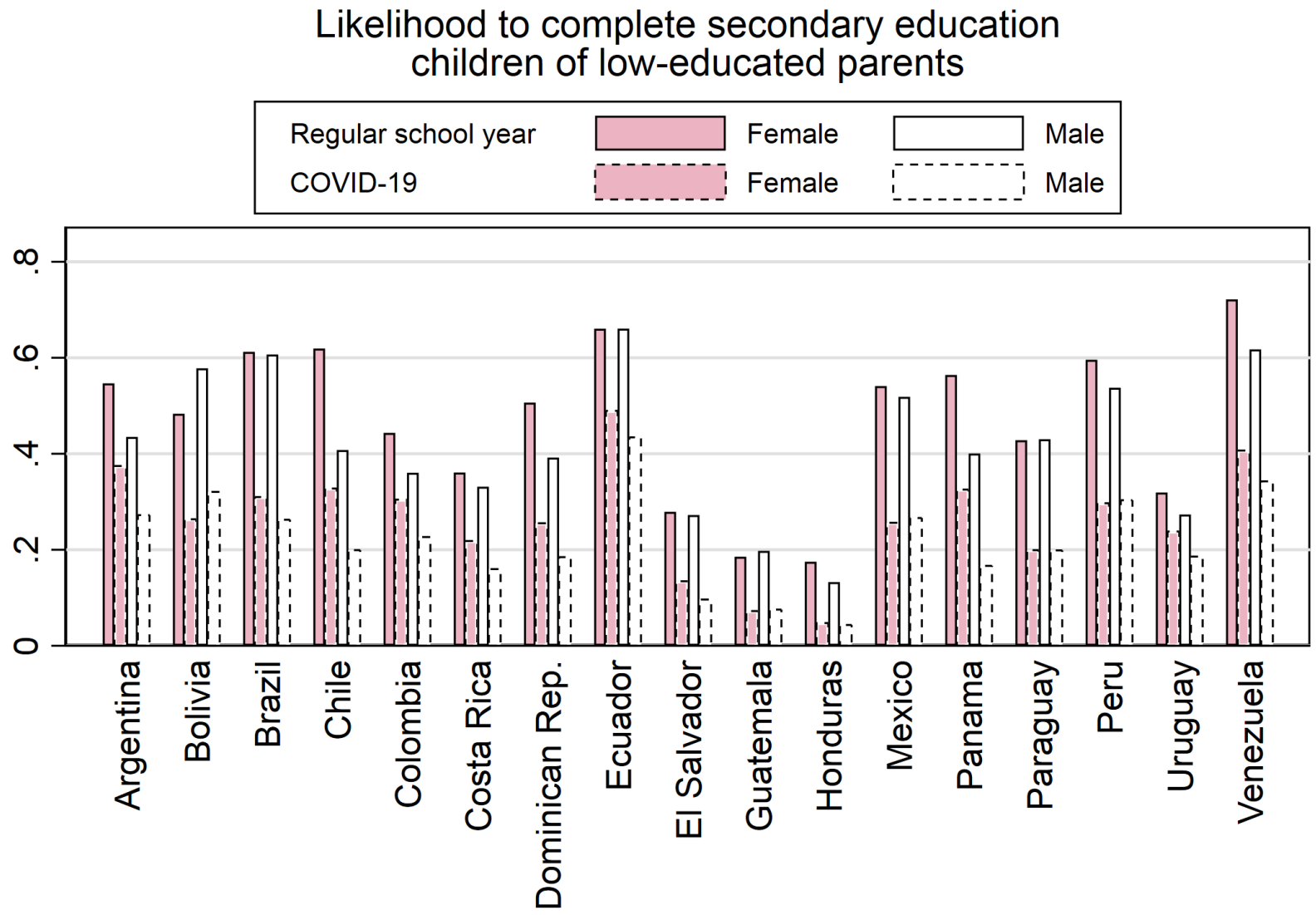

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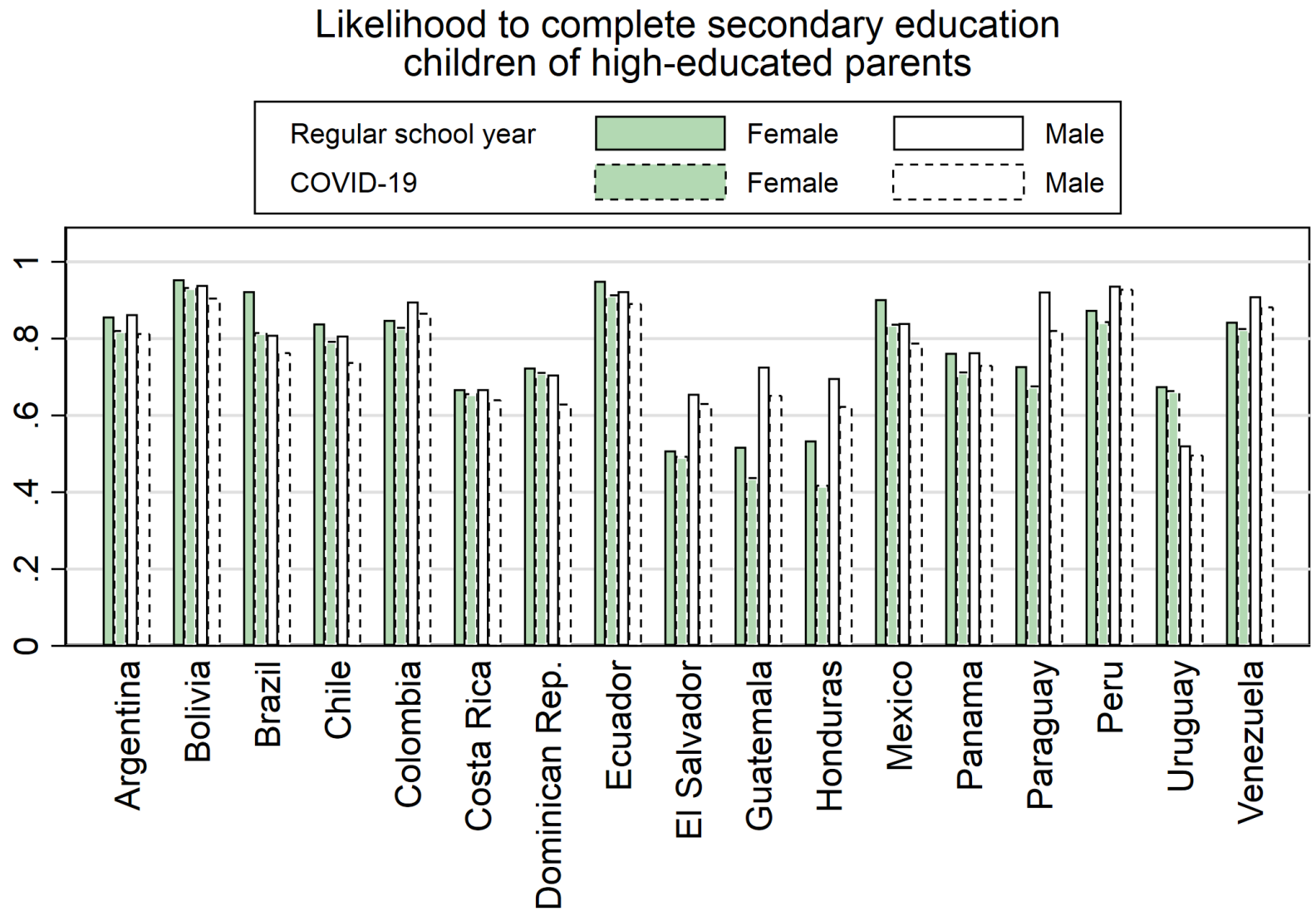

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