Evaluation of Educational Loss in Europe and Central Asia

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American Economic Association Meetings

January 7, 2023, San Antonio Texas

Learning loss due to conflicts, strikes, pandemics



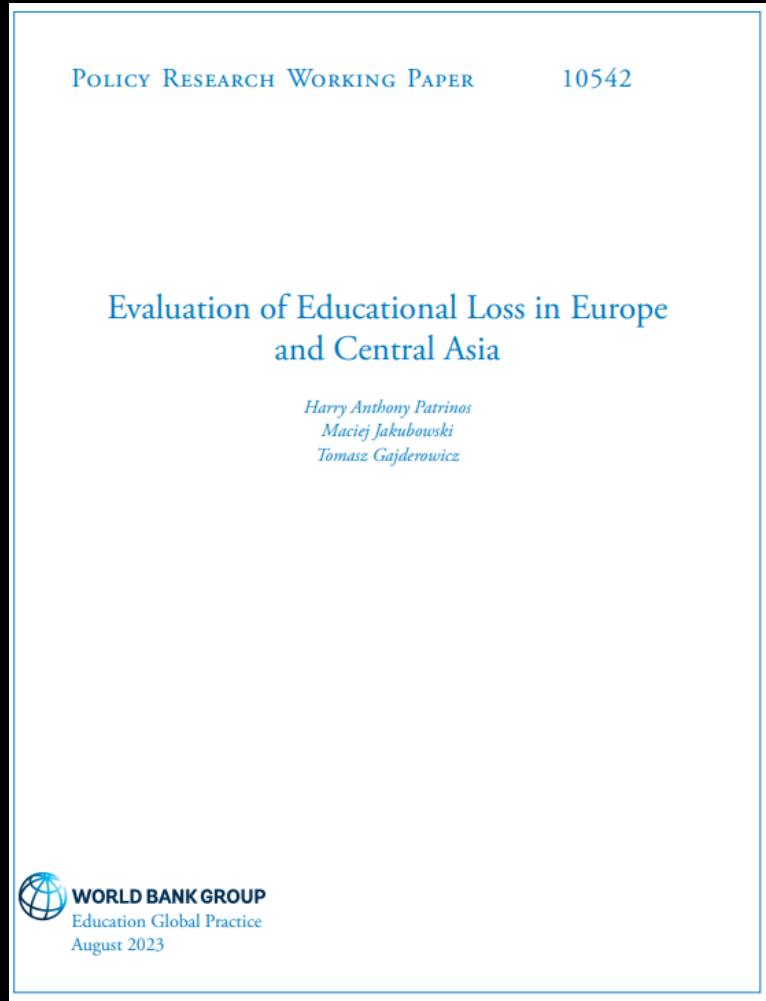






To what extent has the learning progress of school-aged children slowed during the COVID-19 pandemic?

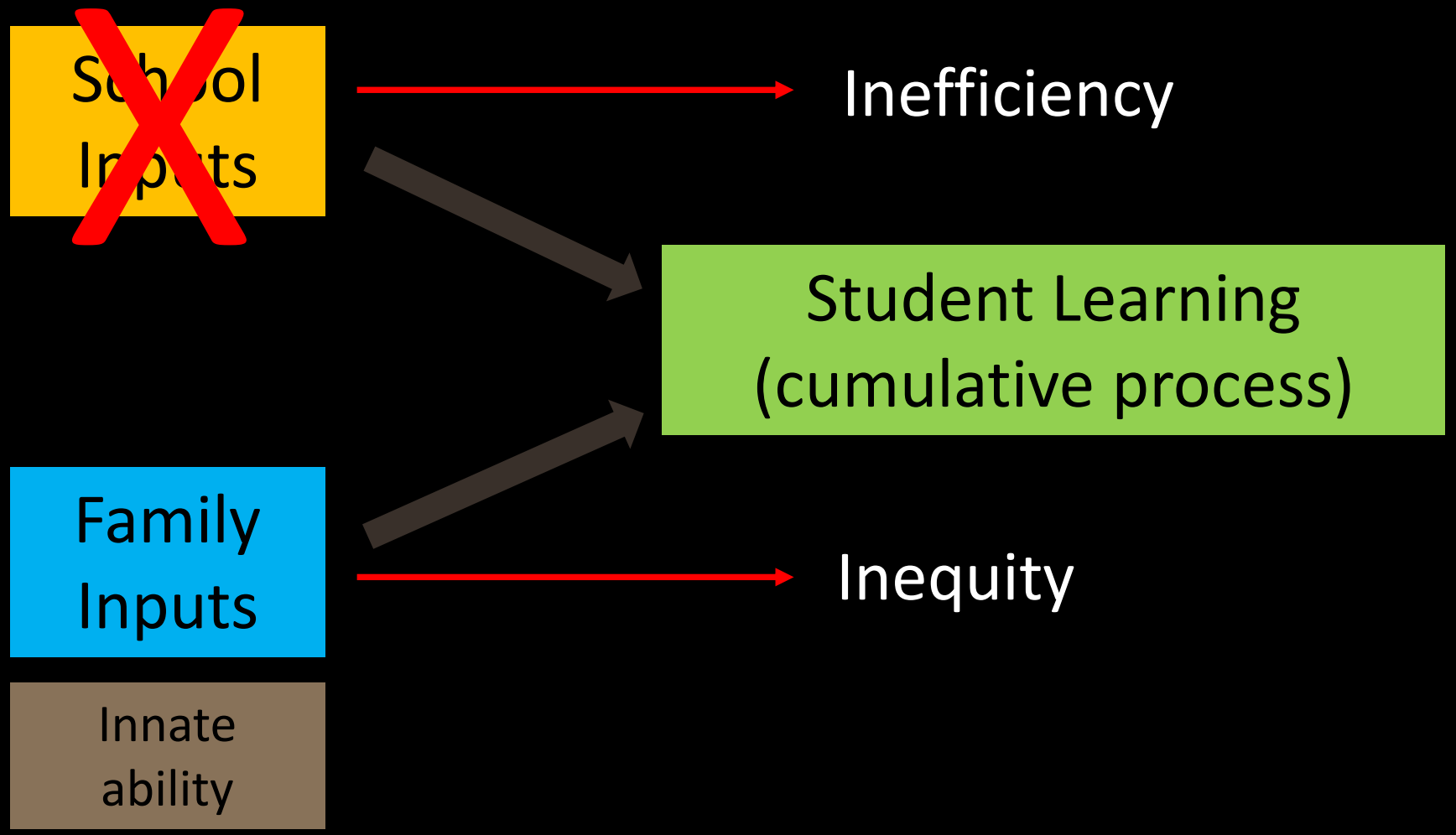
- Pre-registered analysis of first international assessment to since pandemic to estimate impact of COVID-19 on student reading
- Effect of closures on achievement is modeled by predicting deviation of most recent results from linear trend in reading using data from all rounds from 31 economies in Europe and Central Asia
- Reading scores declined by an average of 20 percent of a standard deviation
- Equivalent to just less than a year of schooling
- Losses larger for students in schools that faced relatively longer closures
- No significant differences by sex
- Lower-achieving students experienced much larger losses



Literature Review

- Learning crisis before COVID-19 (Angrist et al. 2021, 2022; McKinsey 2022; World Bank 2017)
- Simulations of effect of school closures on learning outcomes forecast significant declines in global level of schooling and learning outcomes (Azevedo et al. 2021)
- Early reviews of national data showed actual losses (Engzell et al 2021; Haelermans et al. 2022; Jack et al. 2022; Maldonado and De Witte 2022; Donnelly and Patrinos 2021; Betthäuser et al. 2023; Hammerstein et al. 2021; Patrinos et al. 2023; Zierer 2021)
- Robust studies suggest learning losses on average amounting to 0.17 of a standard deviation, or at least one-third of a year's worth of learning
- Most studies observe increases in inequality where certain demographics of students experienced learning losses that were more significant than others

Why expect learning loss?



(Agostinelli et al. 2022; de Hoyos 2022)

Data

- PIRLS 2021 is the first international student assessment after COVID-19
- We use data from 31 ECA economies (French and Flemish Belgium)
- We compare PIRLS results from assessment rounds in 2001, 2006, 2011, 2016, 2021
- 582,112 students in all PIRLS rounds, 30 million grade 4 students across 20 years
- PIRLS include plausible values measuring reading achievement and information on student socio-demographic characteristics (e.g., age, grade, and gender)
- School principals surveyed provide details on how instruction affected by closures
- PIRLS merged with data from UNESCO on total number of weeks schools were closed

Empirical Strategy

We model the effect of school closures on student achievement by predicting the deviation of the most recent 2021 results from an estimated linear trend in reading achievement using data from all PIRLS rounds

We estimate each country's linear trend separately and include country-level fixed effects to control for unobserved time-invariant country characteristics

$$Y_{ijk} = \sum_{k=1}^{n} \alpha_k + \sum_{k=1}^{n} \beta_k * time + \tau D_{2021} + \gamma X_{ijk} + \varepsilon_{ijk}$$

Issues

- Age and grade of student may vary – in some cases test delayed or done at 5th grade
- Additionally control for student age (10 dummies, one for each age decile, to allow for a non-linear age effect), student grade, for the average age effect calculated as a mean age for each round and country
- We re-estimated all regressions for countries from countries that did not postpone assessment due to the pandemic

Heterogeneity

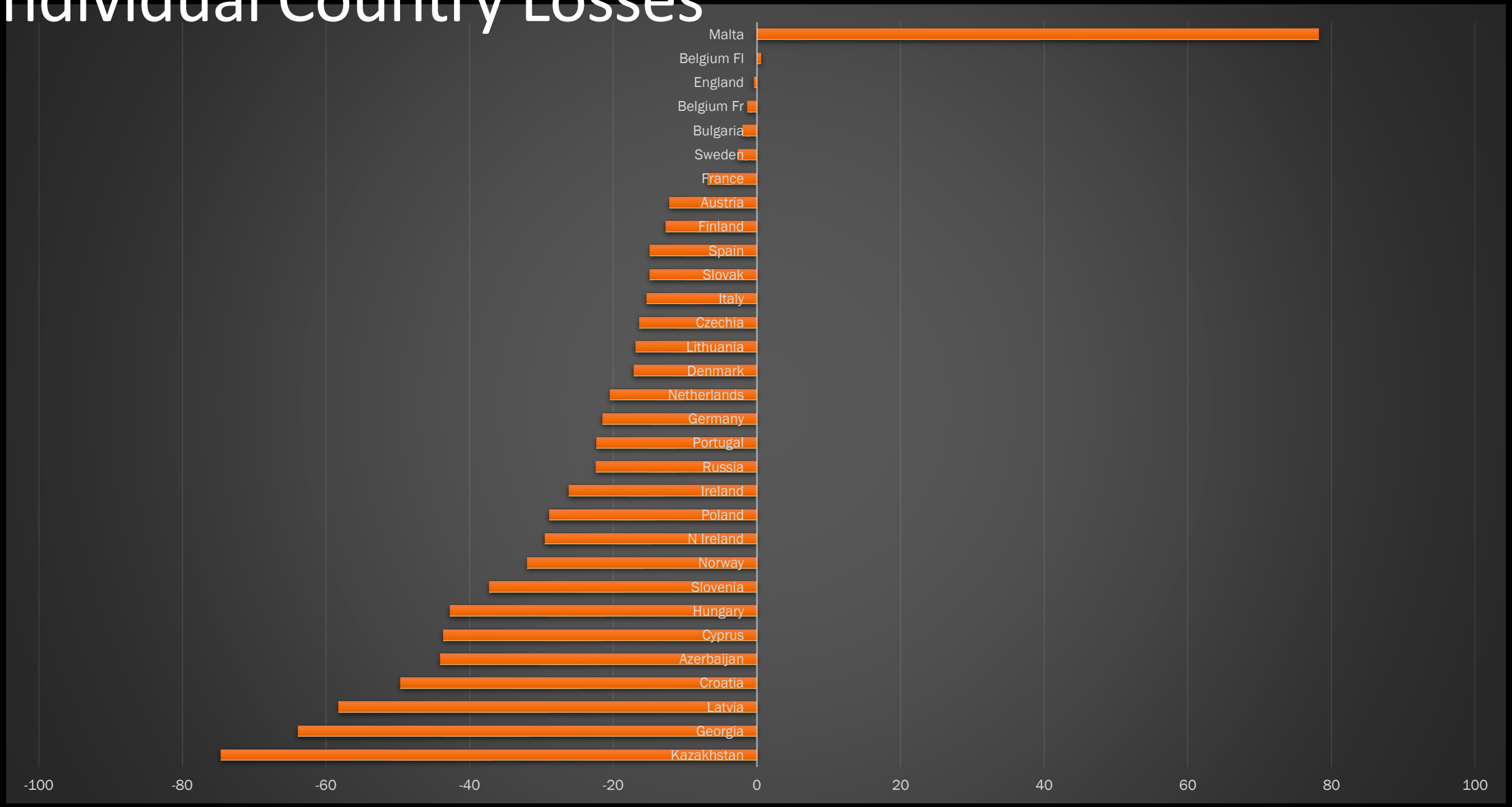
- Duration: baseline is >8 weeks of closures; compare 2-8 weeks, and <2 weeks
- Gender and achievement: interaction with gender and quantile regressions (Chernozhukov et al. 2022)
- Countries: interactions with country dummy variables and 2021 data in same model

Results

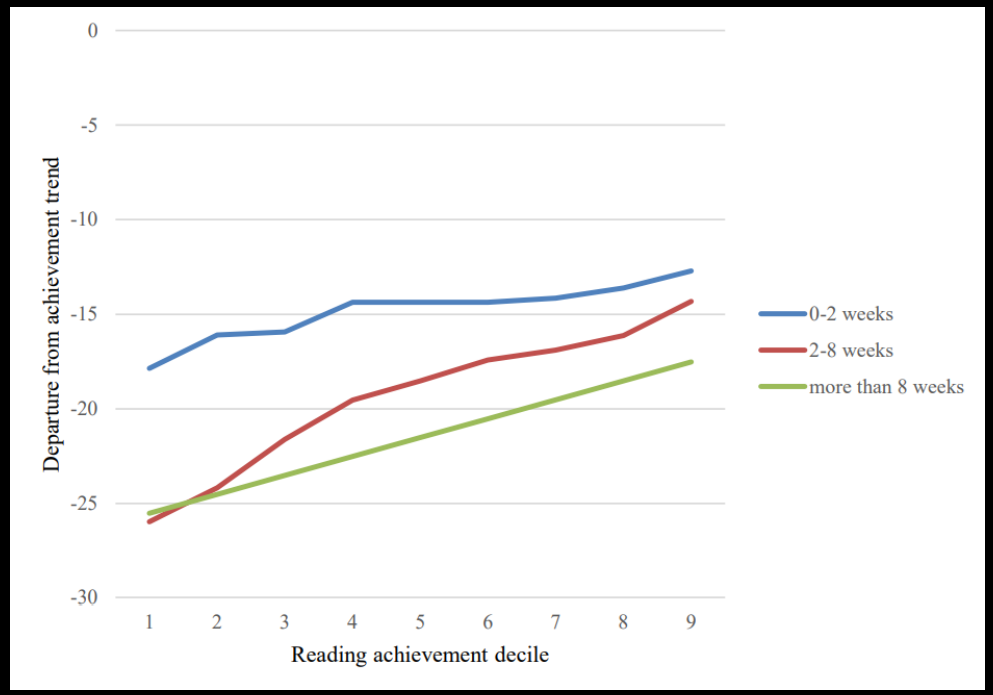
Table 2. Student Reading Achievement Trends and Estimated Decline in Scores due to School Closures, All ECA+ Countries

	(1)	(2)	(3)	(4)	(5)
Departure from linear trend in 2021	-15.27***	-16.43***		-15.69***	-7.90
Principal report on how many weeks school was affected					
>8 weeks			-19.16***		
0-2 weeks (difference from *>8 weeks*)			5.97*		
2-8 weeks (difference from *>8 weeks*)			1.43		
UNESCO data on school closures					
weeks with full closures				-0.08	
weeks full or partial closures					-0.32*
Additional controls					
country fixed effects	Yes	Yes	Yes	Yes	Yes
country*year	Yes	Yes	Yes	Yes	Yes
student grade	No	Yes	Yes	Yes	Yes
student age	No	Yes	Yes	Yes	Yes
country average student age	No	Yes	Yes	Yes	Yes
N of students	582112	581887	570955	581887	581887

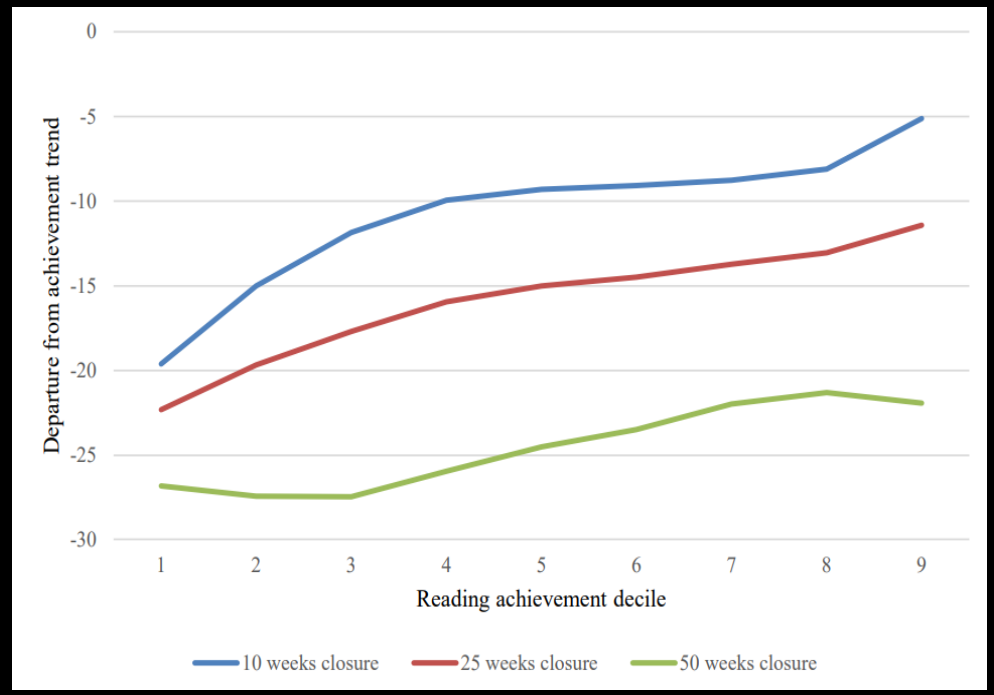
Individual Country Losses



Quantile Regression Estimates of Differences between Schools More or Less Affected by Pandemic



Principal reported



UNESCO

Comparisons

- Robust estimates of learning loss from 18 ECA countries published prior: 0.17 SD losses (Patrinos 2023) – similar to our 0.20 SD losses
- Global estimates using PIRLS (55 countries & regions): 0.33 SD losses or just over a year's worth of learning (Jakubowski et al. 2023)
  - Losses are larger for students in schools that faced relatively longer closures and for lower-achieving students

Conclusions

- We estimate impact of COVID-19 on student reading on standardized tests over time for ECA countries
- We model effect of closures on achievement by predicting deviation of most recent results from a linear trend in reading achievement using data from all rounds
- Scores declined 2016 to 2021 by 20% of a standard deviation, just less than a year's worth of schooling
- No significant differences by sex
- Lower-achieving students experienced much larger losses
- In EU countries losses were greater for weaker students and those experiencing longer school closures, in line with other studies (Goldhaber et al. 2022; Jack et al. 2022; Patrinos 2023)
- Losses are larger in all ECA countries compared to EU countries only

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