Does an increase in preschool enrollment lead to a decrease in educational inequalities?

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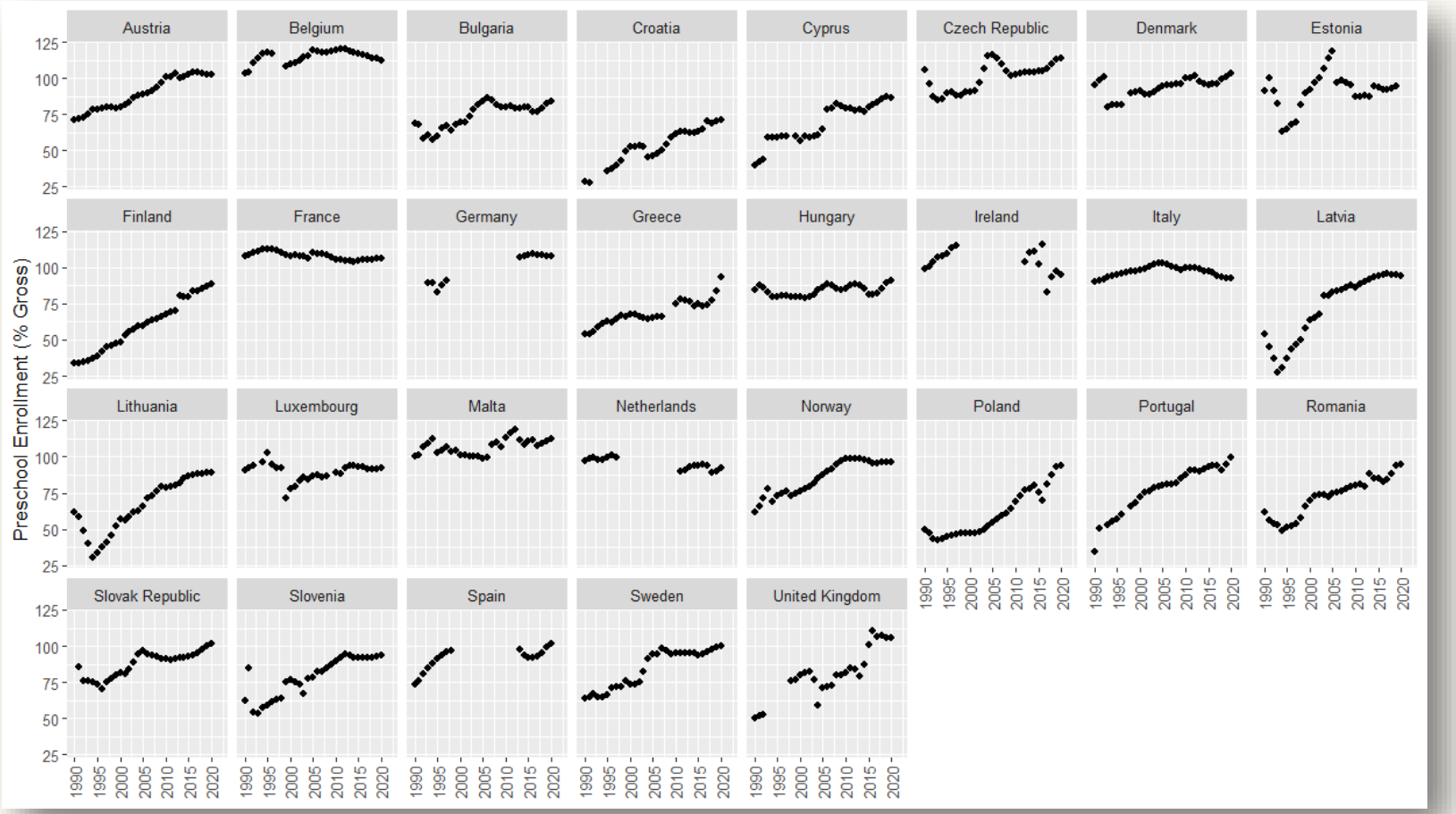
STRIDE (Strategies for Achieving Equity and Inclusion in Education, Training and Learning in Democratic Europe) is co-funded by the European Union (GA 101132339) and UK Research and Innovation (GA 10108849)

Preschool expansion policies

- In last 25 years, preschool expansion policies in many EU countries
  - Increasing number of children attending preschool (e.g., increasing enrollment of disadvantaged groups)
  - Increasing time spent in preschool (e.g., preschool for children below the age of three)
- Often two aims
  1. Strengthen compatibility of family and career
  2. Improve pre-school skills, especially of children at risk of low academic performance → decrease educational inequalities in school

Preschool expansion policies



- UNESCO data for EU countries plus Norway and UK
- Gross enrollment ratio (can be > 100% in case of overage or underage preschoolers)
- ➢ Increases in many countries
- ➢ Longstanding high rates in others

Research question

Does preschool expansion reduce educational inequalities?

country-level research question

mean test score differences between students with a high versus low socioeconomic status (SES)

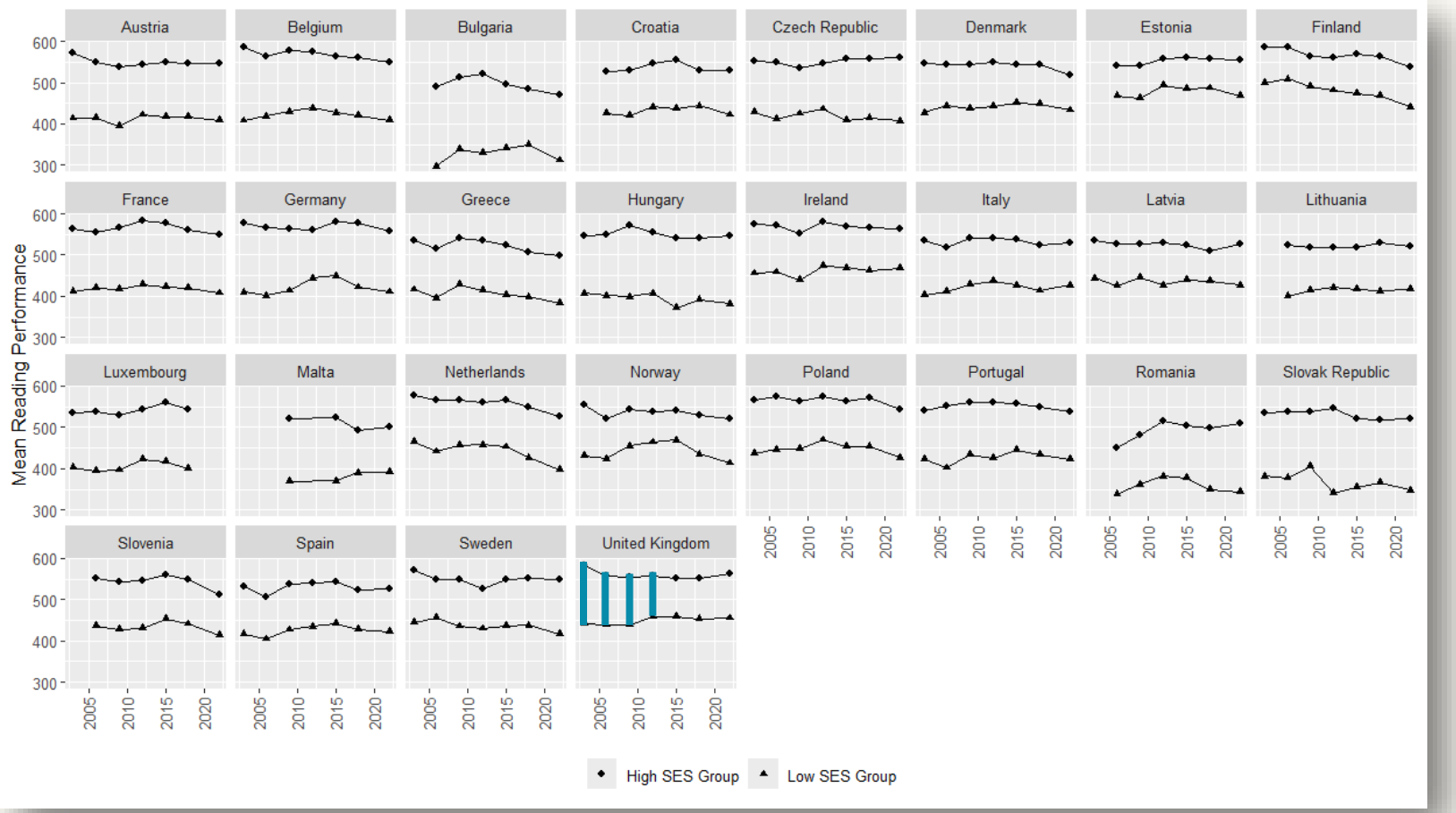
ideal (but impossible) would be a randomized experimental research design

→ we conduct longitudinal country-fixed effects regression analysis

Outcome: Socioeconomic inequalities

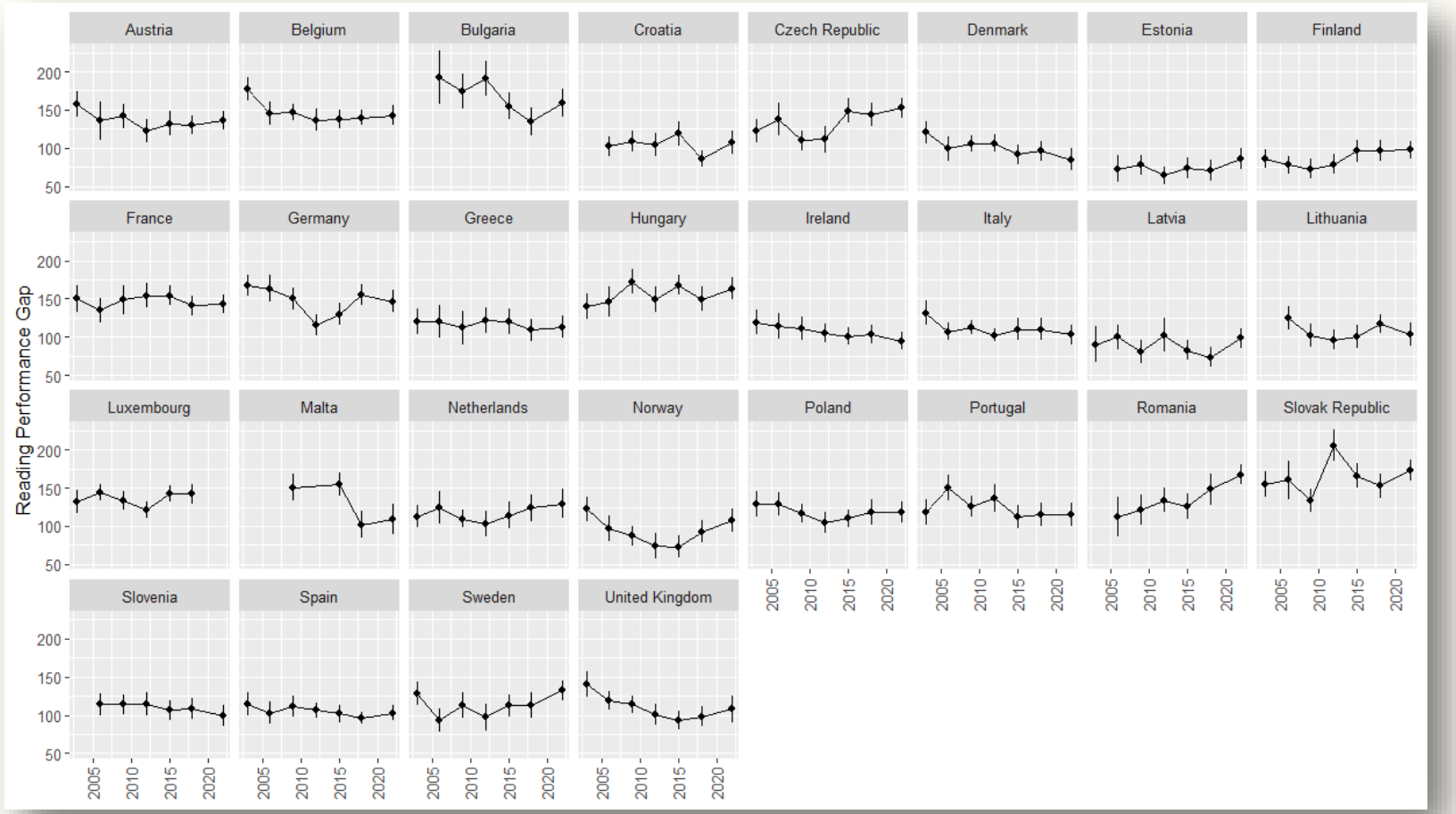
- PISA 2003-2022 data (Cypriot data missing so far)
- Mean reading performance scores
- High vs. low SES: Country-specific top vs. bottom 10% of ESCS (Index of Economic, Social, and Cultural Status)

Outcome: Socioeconomic inequalities



- High-SES students outperform low-SES students in reading across countries
- Gaps vary slightly over time in some countries

Outcome: Socioeconomic inequalities



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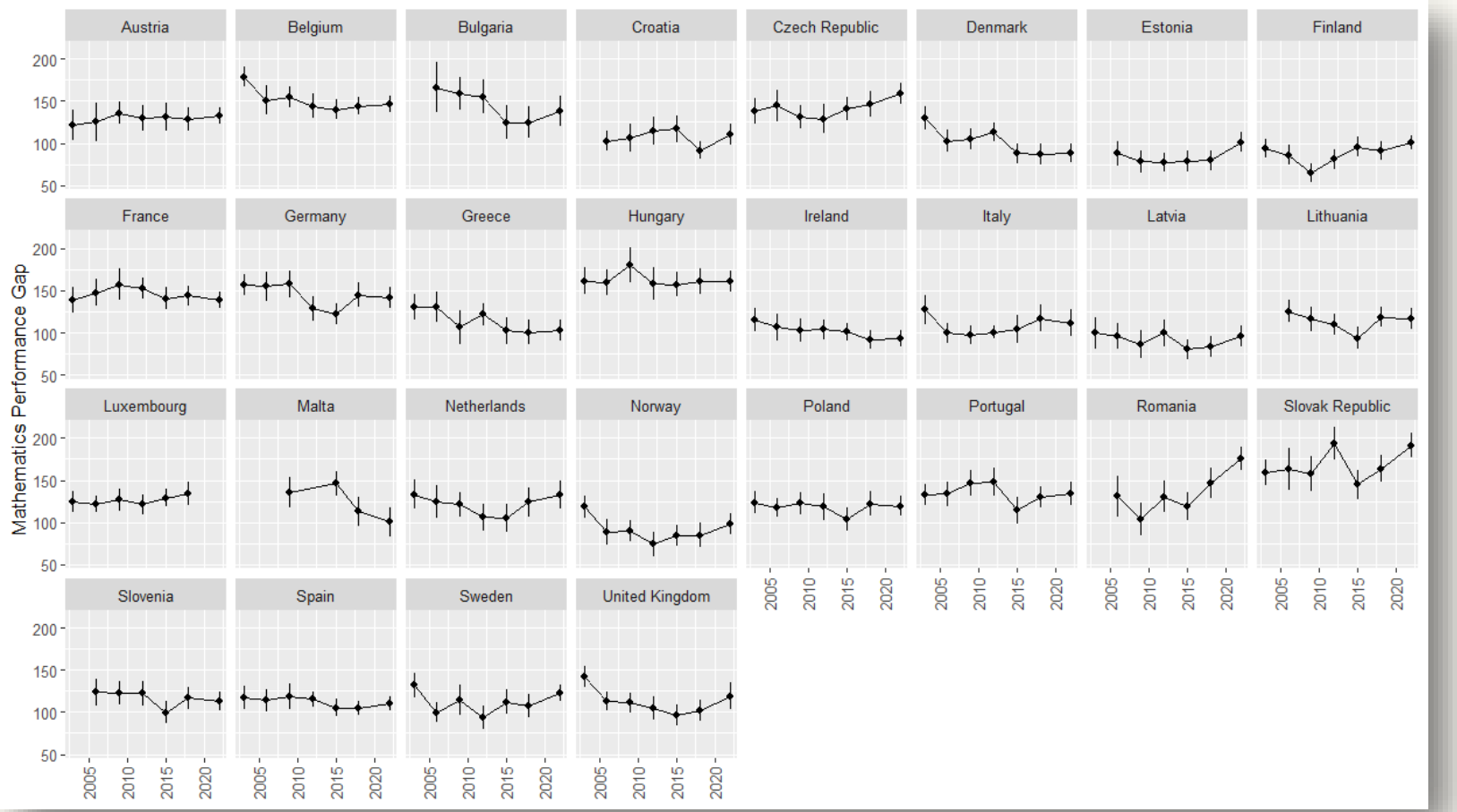

- High-SES students outperform low-SES students in reading across countries
- Gaps vary slightly over time in some countries
- Similar patterns in mathematics

Analyses

Does preschool expansion reduce educational inequalities?

- Country-fixed effects regression of test score gaps on earlier preschool enrollment rates allows to compare countries with themselves
- This means that we account for any time-stable predictors (e.g., countries' general economic prerequisites, stable policy differences)
- We add further control variables to account for potential time-variant predictors of differences in achievement gaps (e.g., major demographic or economic changes)
  - GDP per capita
  - Percent at risk of relative poverty
  - Total number of children
  - Net migration
  - PISA coverage index 3

Results for test score gaps in mathematics

	M1 b(SE)		
Intercept	100.83(7.80)***		
Preschool enrollment	0.25(0.09)**		
Country-fixed effects	no		
Control variables	no		
Adjusted R^2	.033		
Country-by-year obs.	186		

Results for test score gaps in mathematics

	M1 b(SE)	M2 b(SE)	
Intercept	100.83(7.80)***	147.72(9.40)***	
Preschool enrollment	0.25(0.09)**	-0.21(0.10)*	
Country-fixed effects	no	yes	
Control variables	no	no	
Adjusted R^2	.033	.758	
Country-by-year obs.	186	186	

Results for test score gaps in mathematics

	M1 b(SE)	M2 b(SE)	M3 b(SE)
Intercept	100.83(7.80)***	147.72(9.40)***	181.80(24.78)***
Preschool enrollment	0.25(0.09)**	-0.21(0.10)*	-0.16(0.10)
Country-fixed effects	no	yes	yes
Control variables	no	no	yes
Adjusted R^2	.033	.758	.764
Country-by-year obs.	186	186	186

Results for test score gaps in reading

	M1 b(SE)	M2 b(SE)	M3 b(SE)
Intercept	98.58(8.29)***	148.16(10.47)***	142.60(27.49)***
Preschool enrollment	0.27(0.10)**	-0.13(0.11)	-0.09(0.11)
Country-fixed effects	no	yes	yes
Control variables	no	no	yes
Adjusted R^2	.034	.734	.744
Country-by-year obs.	186	186	186

Results

Does preschool expansion reduce educational inequalities?

- Cross-sectionally, *more* inequalities observed in countries that had higher preschool enrollment rates 10 years before. This can go back to all sorts of economic or political or further between-country differences
- Once country-fixed effects are estimated, we see a small *negative* effect of earlier preschool enrollment on inequalities in mathematics (not reading)
- Once further potential time-variant predictors are controlled for, differences not significantly different from zero in both reading and mathematics

➢ No robust evidence for increasing preschool enrollment rates leading to decreasing educational inequalities at school

Discussion

Does preschool expansion reduce educational inequalities?

- Statistical power too small to show significant effects (max. 7 measurement points per country)?
- Gross enrollment ratio imperfect measure?
- True effect of expanding preschool on reducing educational inequalities between low- and high-SES students at age 15 too small?
  - How large is effect of increasing enrollment rates on enrollment of low- vs. high-SES children?
  - How large is effect of attending vs. not attending preschool on reading and mathematics test scores at age 15?

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