The effects of increasing compensatory resource allocation on student achievement

Evidence from the Equity grant in the Swedish compulsory school

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Motivation

- Strong links between parental background and student performance (Holmlund, Sjögren & Öckert 2020; Currie & Goodman 2020).
- School segregation may reinforce inequalities through differences in learning environments (Åslund et al. 2011; Chetty & Hendren 2018).
- Evidence shows that resources can raise achievement, especially for disadvantaged students (e.g., Krueger 1999; Jackson, Johnson & Persico 2016; Fredriksson, Öckert & Oosterbeek 2016; Biasi 2023).
- But results for compensatory policies are mixed (e.g., Machin, McNally & Meghir 2004, 2010; Leuven et al. 2007; Lafortune, Rothstein & Schanzenbach 2018; Borgen et al. 2025).

This paper

- This paper: evaluation of the largest compensatory grant to primary schools in Sweden
- Largest (compensatory) grant for primary school in Sweden in recent decades
- Estimate effect of grant on
  - Teaching inputs (teacher density, class size)
  - Student achievement (central exam test scores)
  - Eligibility for upper secondary education

Institutional setting

What is the Equity grant?

- What is the Equity Grant?
  - Government grant for primary schools (grades 0–9)
  - Distributed to school organizers (290 municipalities and 560 independent schools)
  - Strong increase over time: from SEK 1 billion (2018) to about SEK 8 billion (2025)
  - Grant size / pupil: from SEK 850 to SEK 16 000 (per pupil costs/year: SEK 140 000)
- Why was the Equity Grant introduced?
  - Significant socioeconomic school segregation and large achievement gaps between providers/schools (SOU 2017:35)
  - Goal: reduce achievement gaps between different providers/schools
- How can the Equity Grant be used?
  - The grant can be used for additional expenditures (not to compensate)
  - Main usage: additional teaching staff, teaching material, pupil-health related

How is the Equity grant distributed?

- The grant is compensatory: more money to organizers with many disadvantaged students
- Each organizer is assigned an index value based on the socioeconomic composition of its students
- Approach
  - Regress whether you not achieve qualifications for upper secondary school on background chars.
  - Out of sample prediction for all pupils
  - Calculate average predicted value and normalize to 100 (and use this to distribute the grant)
- School organizers' discretion
  - How to distribute grant between schools (of same organizer)
  - How to distribute grant among different grades (0-9)

Method and data

Difference-in-differences

- Estimation of effects of Equity Grant:

$$Y_{ipt} = \alpha + \sum_{t=2013}^{2022} \beta_k \left(\text{Index}_p \times D_t^k\right) + \gamma_p + \delta_t + X_{it}'\theta + \varepsilon_{ipt} \quad (1)$$

- **Event study DiD:** compare development of outcomes for school organizers with low/high index before/after introduction
- We use fixed index from 2016 (intention to treat)
- Controls
  - Year and school organizer FE (δ_t, γ_p)
  - Pupils' socio-economic background: gender; parental education and income; immigration background
- Identification: the trend between groups would have been parallel in the absence of the reform.

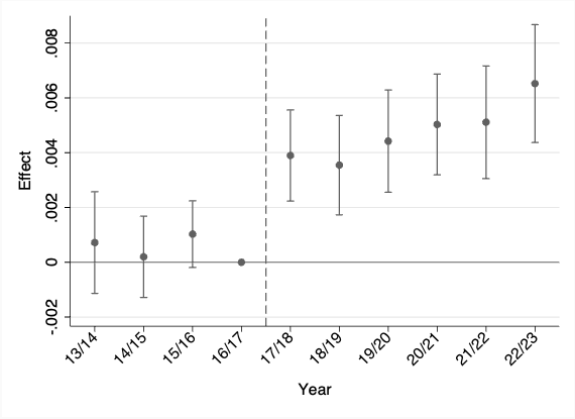
Results

For which expenditures do organizers use the Equity Grant?

	(1) Totalt	(2) Teaching	(3) Premises	(4) Food	(5) Equip.	(6) Health	(7) Others	(8) Tot w/o EG	(9) EG
Effekt	4.198***	2.241***	0.0259	0.0269	-0.326	0.243**	1.999**	1.095	3.103***
(Std-fel)	(0.820)	(0.653)	(0.387)	(0.209)	(0.373)	(0.124)	(0.796)	(0.818)	(0.0826)
Observat.	7 074 379	7 074 379	7 074 379	7 074 379	7 074 379	7 074 379	7 074 379	7 074 379	7 071 931
R^2	0.848	0.739	0.779	0.760	0.674	0.688	0.658	0.861	0.965
Adj. R^2	0.848	0.739	0.779	0.760	0.674	0.688	0.658	0.861	0.965

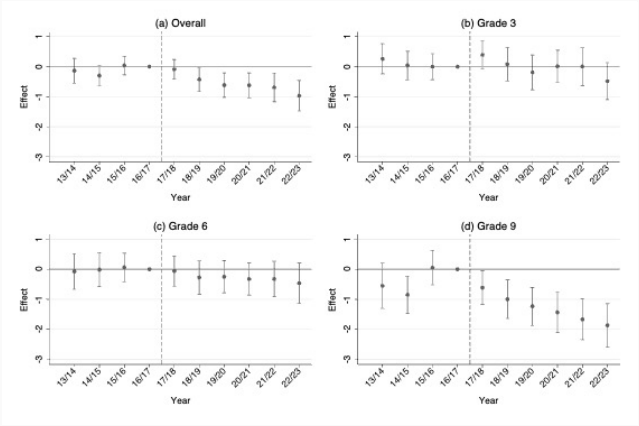
- Outcome variables
  - Expenditures in categories (in thousand SEK / pupil)
  - Inflation adjusted
  - Only municipal school organizers (2016–2022)
- Main results:
  - Largest effect for teaching related expenditures
  - No substitution (Column (8))

Teacher input I: teacher density



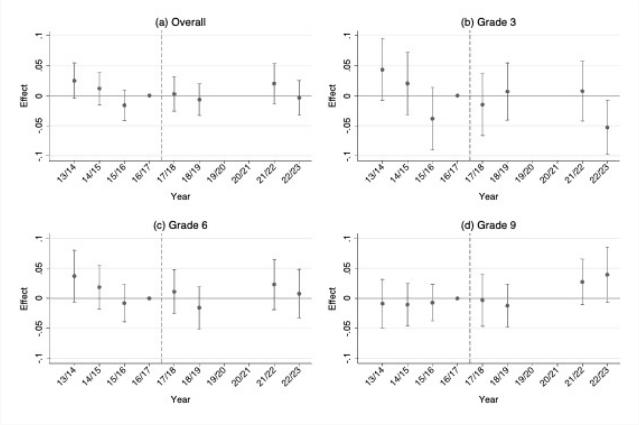
- Teacher density (number of teachers per student) increases with the size of the grants
- Parallel pre-trends
- But: difficult to separate by school level or grade

Teacher input II: class size



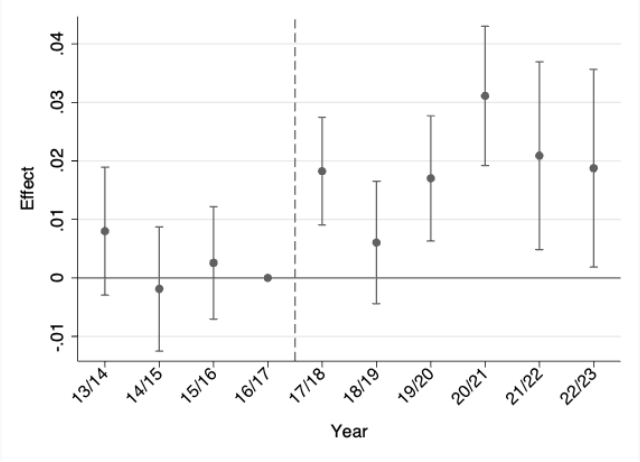
- Mirror image of teacher density: higher grants lead to smaller average class sizes
- Does not capture the effect of additional teachers in the classroom or at grade level
- Almost no effect in grade 3; clear effect in grade 9

Do extra teachers improve student performance? National tests in 3/6/9



- National tests in Math and Swedish
- On average, no effect
- Small positive effect in grade 9
- Not shown:
  - Stronger for migration bg pupils
  - Students with low-educated parents

Do extra teachers improve student performance? Vocational/academic programs



- Enrollment in academic or vocational upper secondary programs (0=not enrolled in regular programs)
- Positive effect on eligibility for upper secondary education (report/WP)
- Positive effect on enrollment in vocational or academic programs

Conclusion

Conclusions

- The Knowledge Grant has increased teacher density among providers with weaker student composition
- Indications of a stronger resource shift towards higher grades
- On average, no effects on test results, but a clear pattern in grade 9
- Statistically significant effects on upper secondary eligibility – weaker providers have caught up
- Why no earlier effect?
  - How do schools/providers allocate funds?
  - Early "investments" yield the highest returns
- Resources matter, but compensatory allocation requires substantial funding

Appendix

The Equity Grant over Time