From access to learning: education policies in decentralized Indonesia

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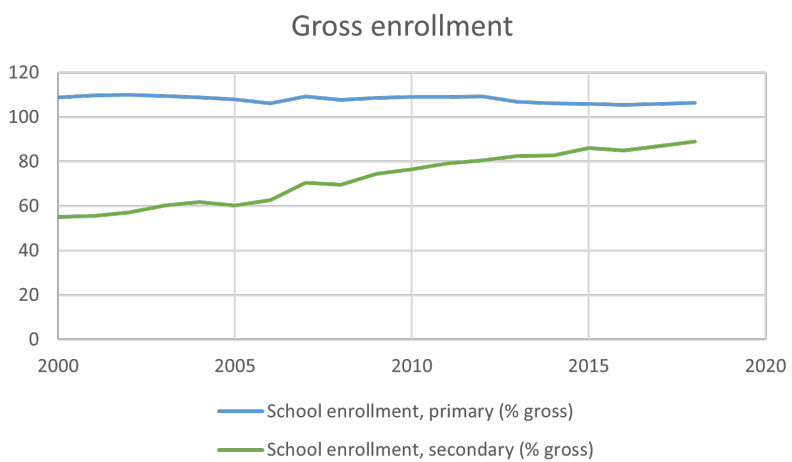
Outline

- Indonesia education context
- Three studies
  - Social Accountability and Teacher incentives
  - Cheating in national exams
  - School integration

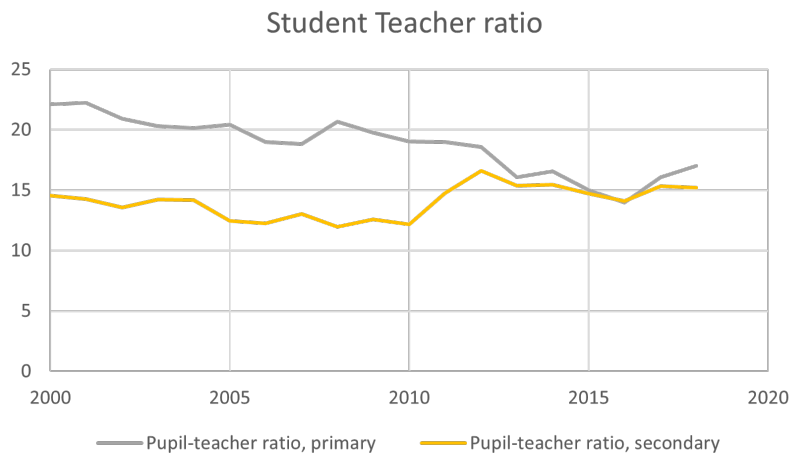
Joint work with Emilie Berkhout, Goldy Dharmawan,Amanda Beatty, Daniel Suryadarma, Arya Gaduh, Jan Priebe, Dewi Susanti,Rahmawati and Arya Swarnata

Indonesia education context

High enrolment, compulsory until junior secondary



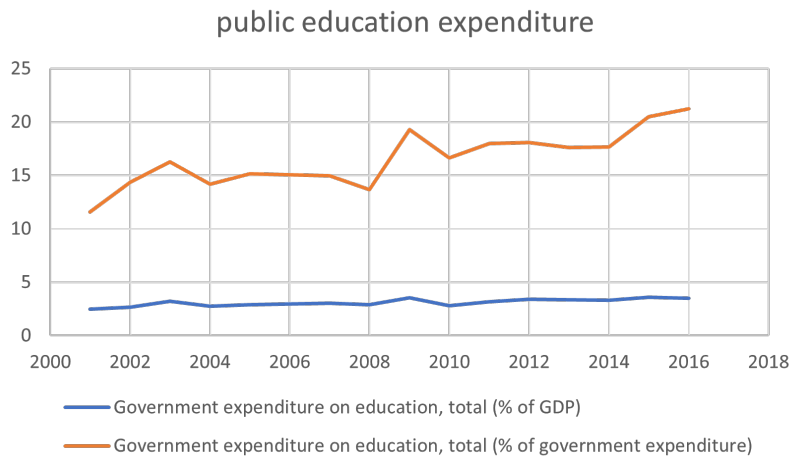
Low student teacher ratio



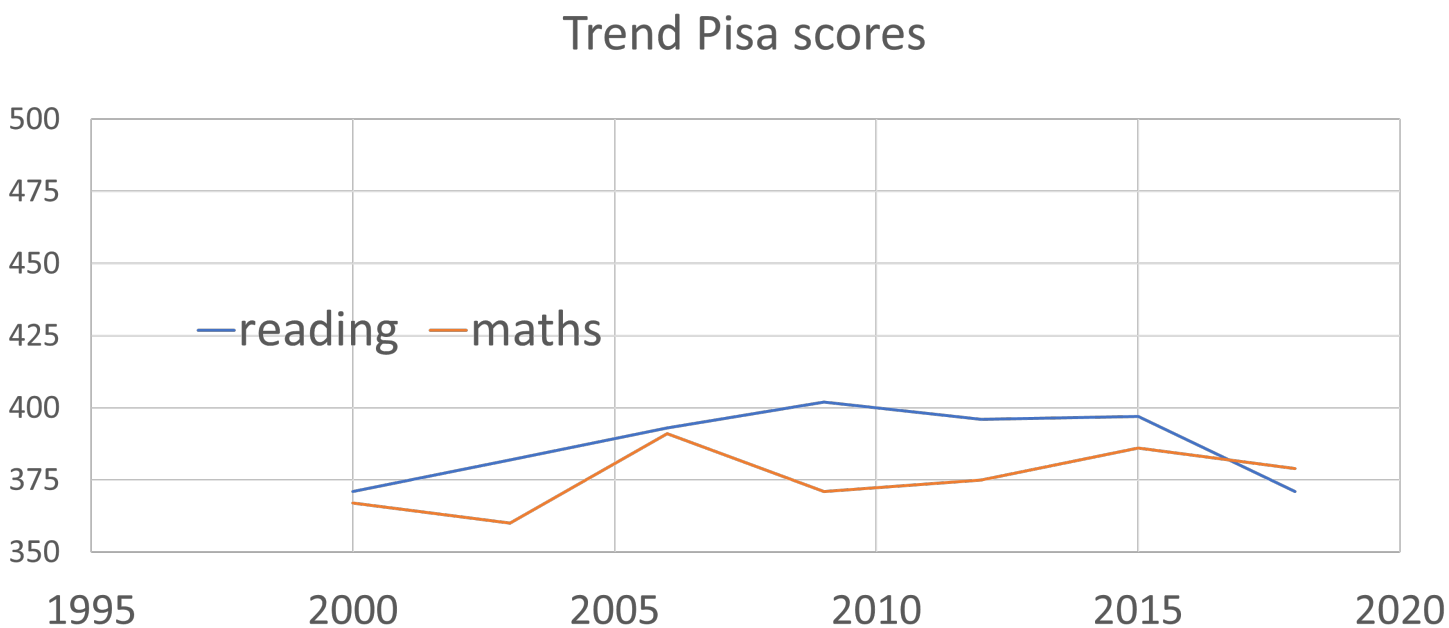
Indonesia education context

- Basic education decentralized to district level in 2001.
- 514 districts in Indonesia
- Government education expenditure increasing
- Civil servant teachers paid well (USD650 per month).
- Contract teachers receive much lower salaries
- Public schools are generally preferred over private

Increasing public spending



Indonesia education context



1. Social Accountability and Teacher incentives

- Over a 1000 islands, many remote underdeveloped regions
- High absenteeism rate (19 perc.) of teachers in schools in remote areas
- Government provides allowance equal to base salary for selected teachers working in remote areas item Accountability is missing
    - But absenteeism rate among recipients is even higher than non-recipients in same school
- Can social accountability improve learning?
    - Indonesia has had successful community development programs, but they mostly focused on building infrastructure.
    - Worldwide weak evidence. Community insufficiently empowered.
- Can social accountability be strengthened by linking it to teacher performance pay?

This paper

A randomized control trial conducted in 270 villages in remote areas which tested 3 different ways of combining social accountability and teacher incentives

Social Accountability mechanism (SAM)

Facilitator supports:

- Raise awareness of learning deficiencies
- Formulate service agreement
- Teacher specific scorecard
- Monitoring by user committee
- Monthly village meeting and report

SAM+ Camera(CAM)

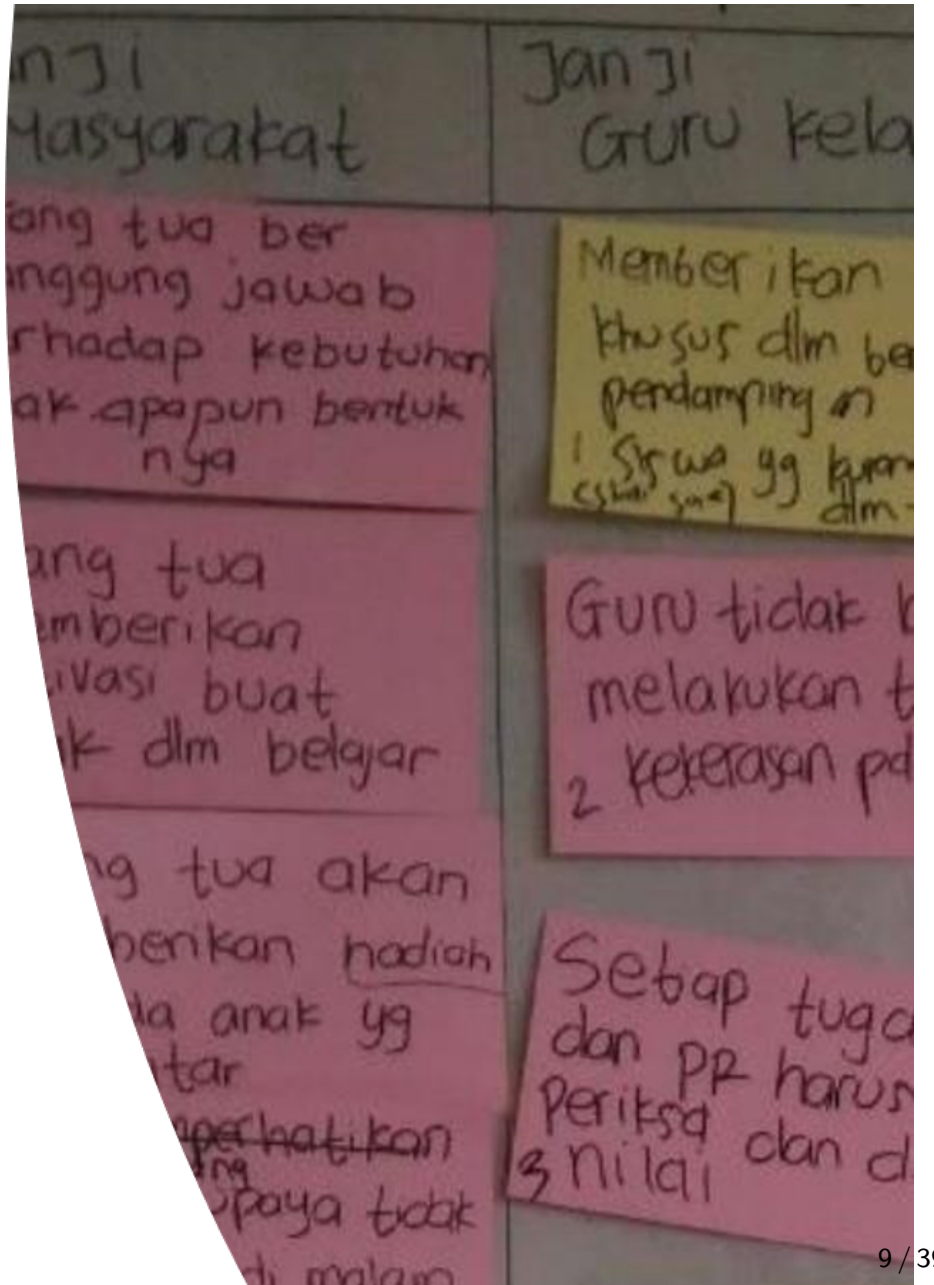
Camera:

- Tamper proof camera
- Teacher records presence
- Read out during monthly meeting
- Remote area allowance cut proportional to absence
- No allowance if more than 15 perc. absence
- No salary consequence for other teachers

SAM+ Score

Score:

- Remote area allowance cut proportional to overall teacher scorecard



Timeline

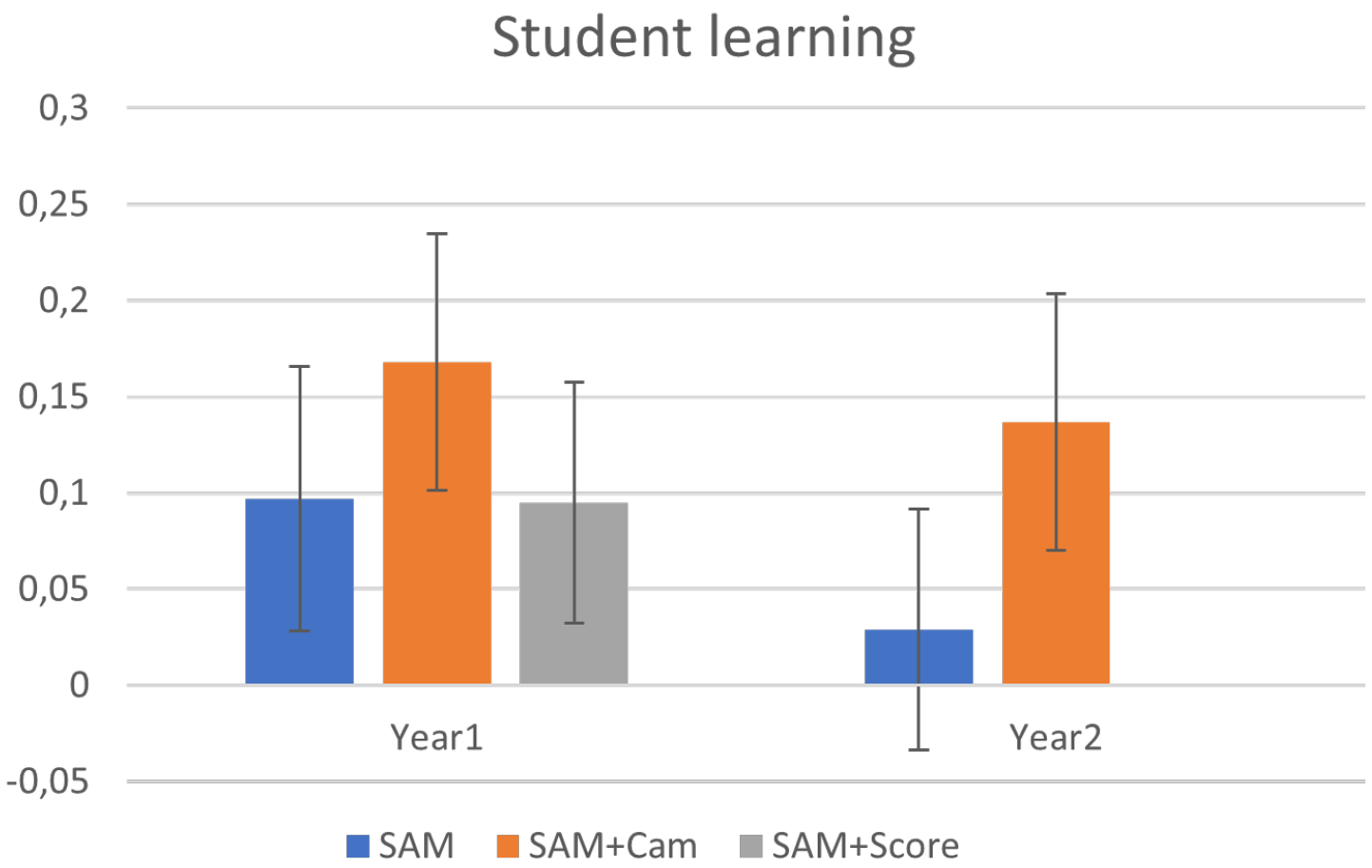
YEAR 1

- Facilitators visit village to set up project and support monthly meetings
- Train village cadre to take over their role

Year 2

- No village facilitation
- Projects support only at district level
- No SAM+Score data collection , No grade 1 and 2 test scores.

Results Year 1 and 2



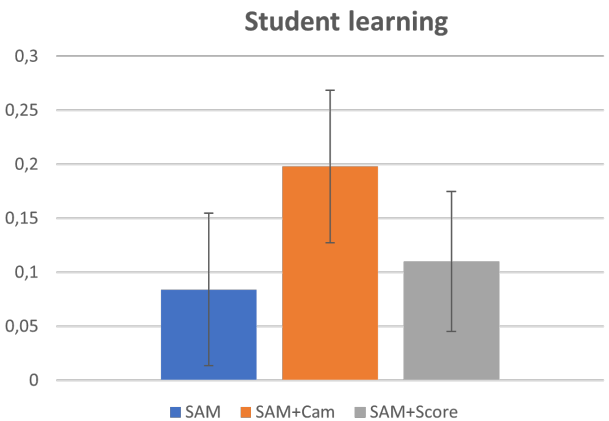
Results Year 1

Teachers:

- Insignificant hours effects
- SAM+CAM: teachers with remote area allowance increase hours, but others decrease
- SAM SAM+CAM more focus on learning enhancing activities
- Higher teacher satisfaction

Top-down supervision:

- SAM+CAM: More supervision visits
- School principal does more teacher evaluation.

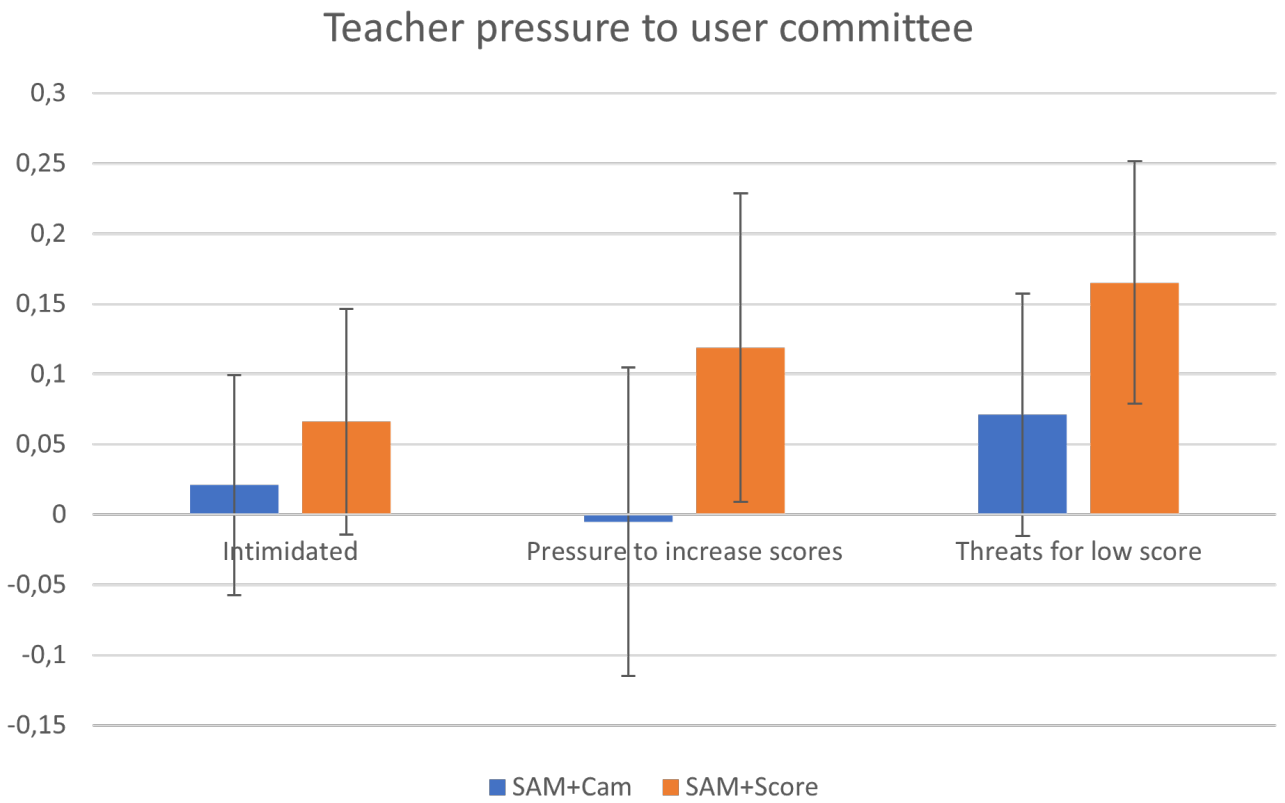


Parents:

- More meetings with teachers.
- Less child labor
- SAM+CAM: More education expenditure
- No effect on homework support
- Higher satisfaction

Unintended effects Year 1

- More pressure to increase scores in SAM+Score



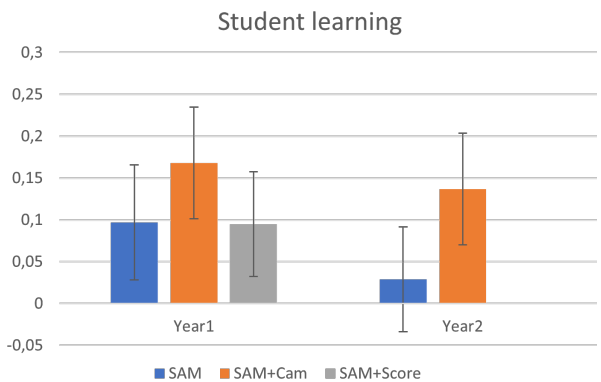
Results Year 2

Teachers:

- Insignificant hours effects
- Higher teacher satisfaction

Top-down supervision:

- School principal does more teacher evaluation.
- but also more excused absenteeism



Parents:

- More meetings with teachers.
- SAM+CAM: More education expenditure
- No effect on homework support
- Higher satisfaction

Conclusion

- Social accountability can raise learning outcomes in remote areas
  - Parents own investments are part of the story
- Teacher pay incentive adds value
  - Absence index works better than comprehensive performance index
  - Weak power of user committee vs teachers could explain result
- Sustainability
  - SAM+CAM only treatment that produces sustained learning effects
  - Effects weaken, especially among teachers. Some village level support needed
  - Intervention locally accepted, also among teachers.

2. Cheating in national exams

- Cheating on high stakes exams is a concern all over the world
  - Results are misleading as a signal for ability used by schools, employers and policy makers
  - Less effort into teaching and studying when opportunity to cheat
- When cheating is widespread is becomes hard to fight, because students, teachers and bureaucrats have a reason to keep it a secret
- Few evaluations of anti-fraud interventions (Singh, 2020; Dee et al,. 2019; Borcan et al., 2017; Bertoni et al., 2013)

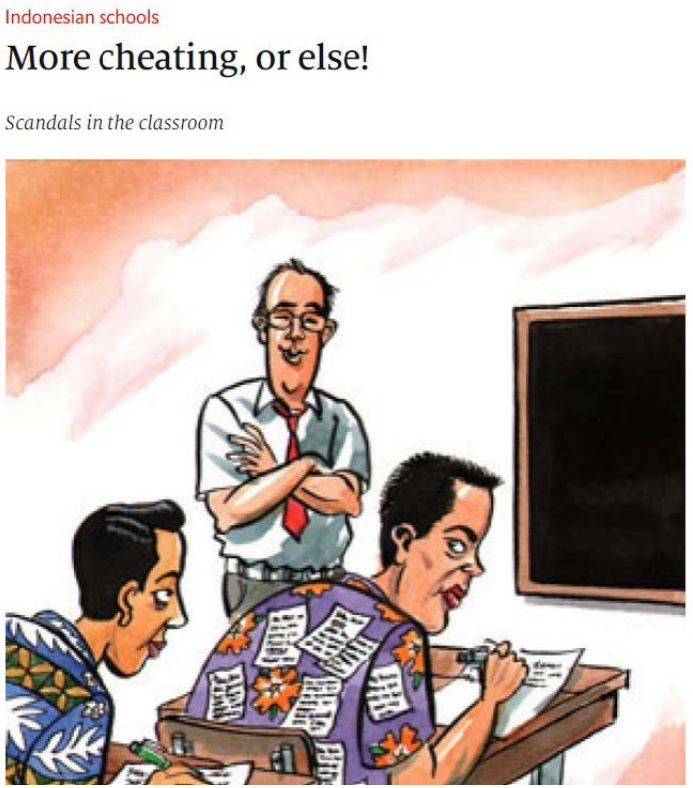
This paper

We evaluate a nation wide policy intervention in Indonesia that aims to prevent cheating on junior high school exams with computers

Exams in Indonesia

- Exams in grade 6, 9 and 12 in mathematics, Indonesian, English and science
- Determines acceptance into higher school levels
- Used as a measure of school quality by local governments and parents
- News articles report that students can buy answer sheets and that many teachers encourage cheating

Economist, 2011



Integrity Index revealed extent of cheating problem

- The GoI has generated the integrity index at the school-level since 2015 (Rahmawati & Asrijanty, 2016)
- Combination of previously developed methods to identify answer copying from response patterns (for example, see Jacob & Levitt, 2003)
    - Acknowledged method to measure cheating (Angrist et al., 2017; Martinelli et al., 2018)
- Scale from 0 to 100, where a higher score means less cheating
    - < 70 means sufficient evidence for substantial cheating
    - Based on qualitative assessment and score consistency over time

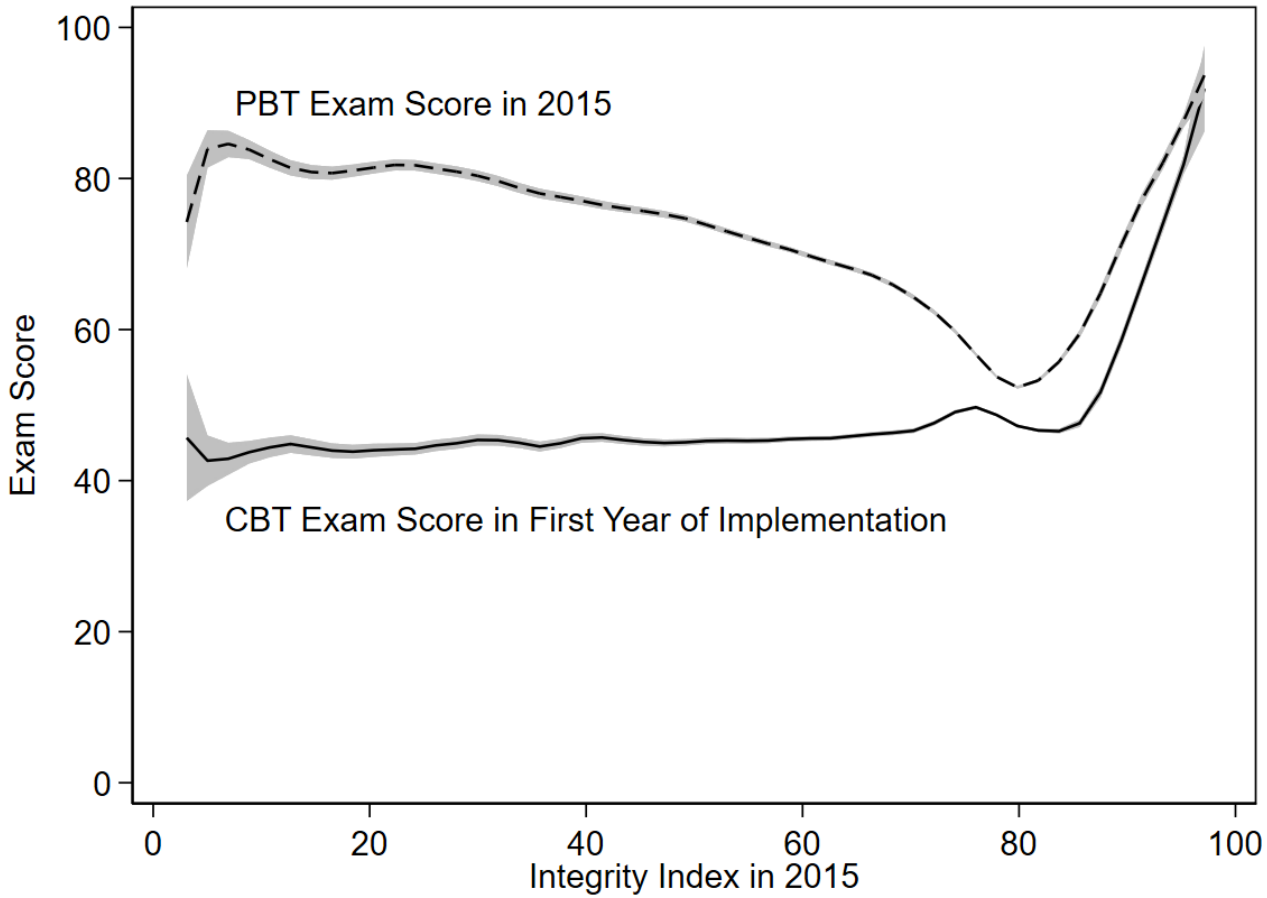
A third of over 50,000 junior secondary schools had an integrity index below 70 in 2015

Computer-Based Testing (CBT)

	Paper Test	**Computer Test**
Versions	20 per classroom	1 per student
Grading	Centrally	Automatically
Proctor	Teacher from random school in the district	Teacher from random school in the district

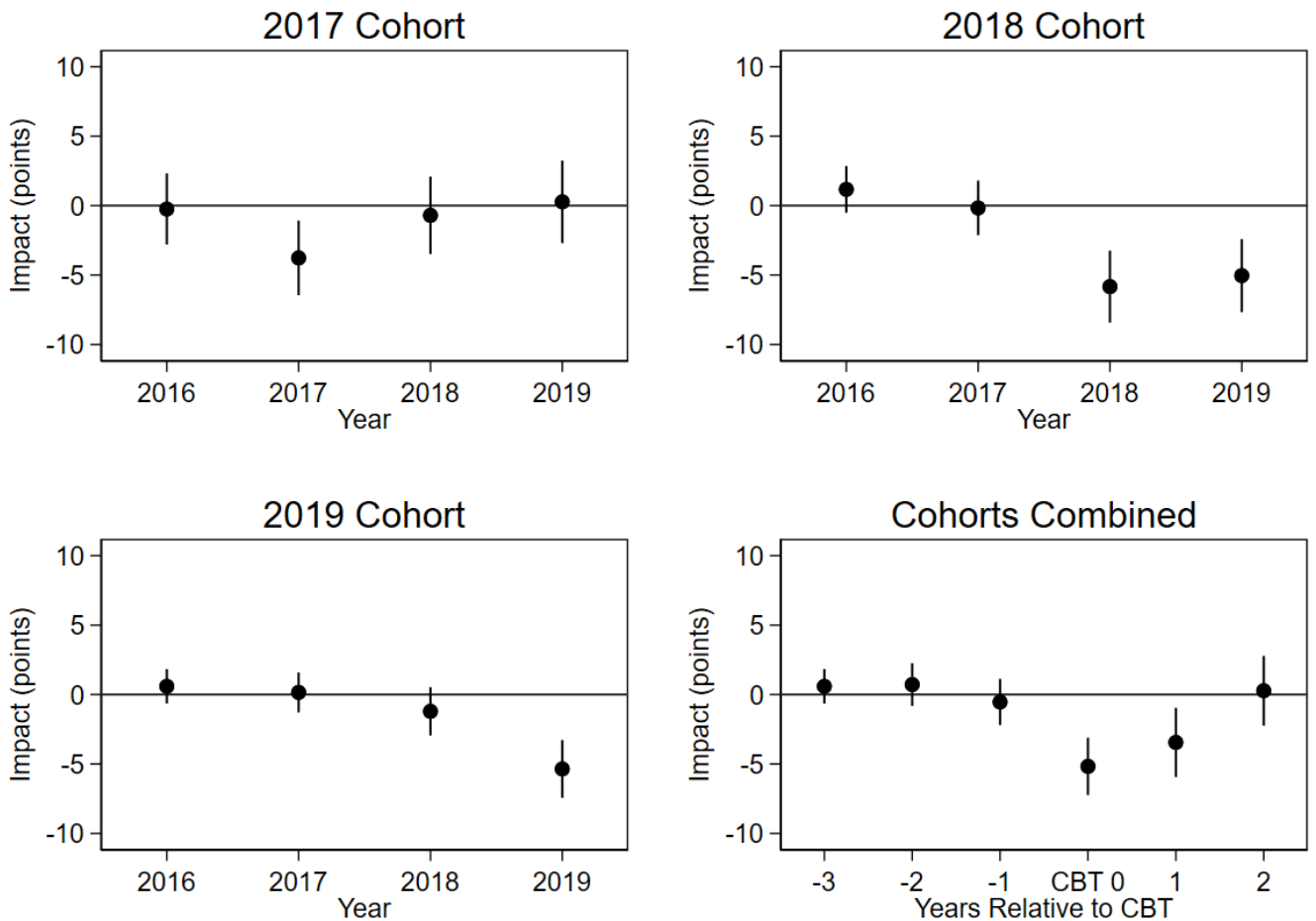
- Items are drawn from same item bank with 120,000 items
- Answer sheets useless for CBT students

The difference between PBT and CBT scores correlates with integrity



Impact on average exam scores

Drop in scores is equal to approximately 0.4 s.d.



Note: Standard errors are corrected for clustering at the district level. Results for cohorts combined are sample-weighted average effects.

Heterogeneity by integrity and familiarity with computers

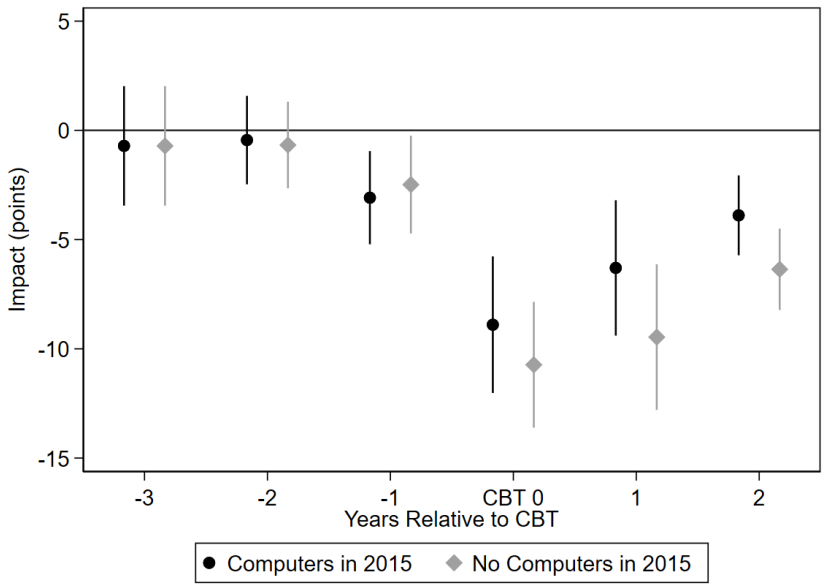


Figure: 2015 Integrity $<$ 70

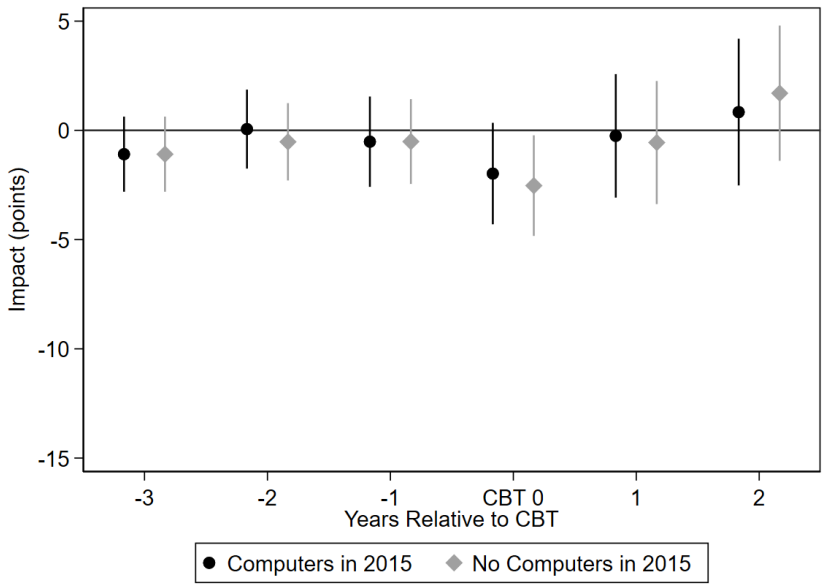
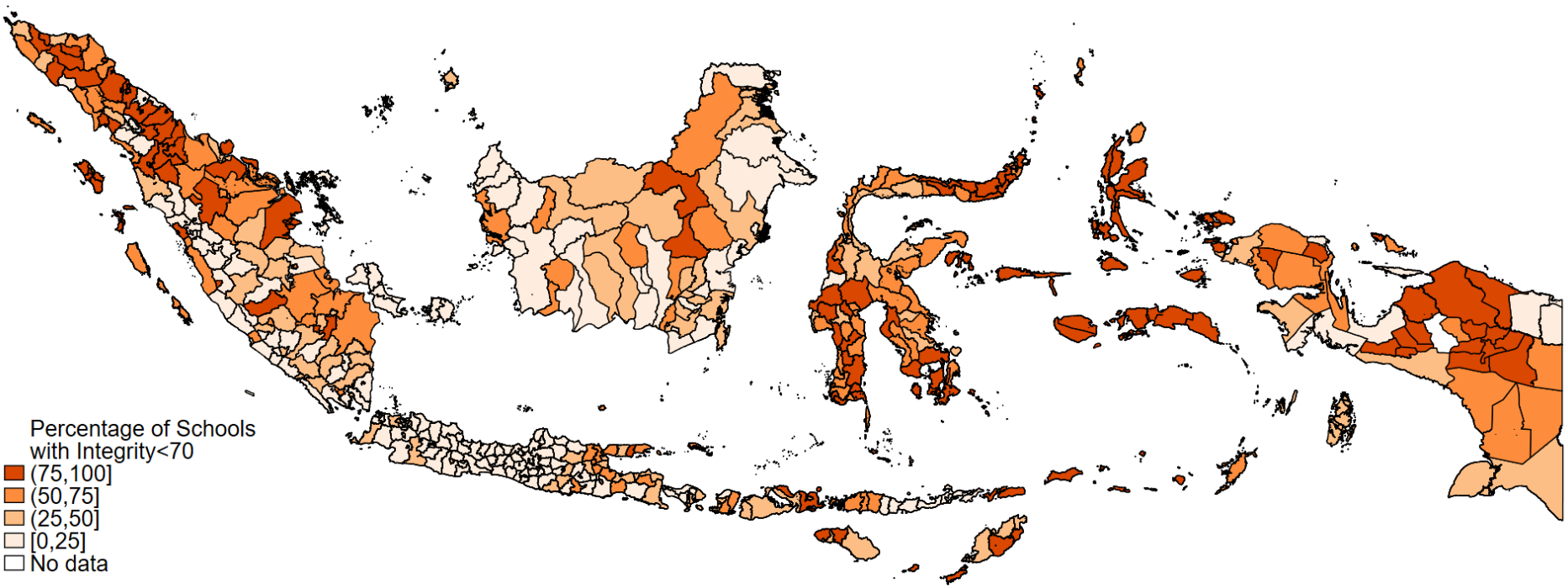


Figure: 2015 Integrity $>=$ 70

Note: Figure presents sample-weighted average effects across cohorts. Standard errors are corrected for clustering at the district level.

Who cheats?

- Spatial variation explains most of the cheating variation, while school characteristics have little explanatory power
- Other studies found evidence for 'cheating culture' within schools (Martinelli et al. 2018 and Bertoni et al. 2013)



CBT also affects cheating practices on PBT exams

- In districts with a higher fraction of CBT schools, the integrity score of paper based schools improved more

Exam scores improved again with time. Did learning outcomes improve?

- Without additional resources, the decline in the effect over time is likely to have come from additional effort from students and teachers

We rule out several other explanations

- Students do not move from CBT schools to PBT schools
- Not due to familiarity with computer as the trend is similar for schools with and without computer labs before the intervention
- Not explained by a decline in cheating in the comparison schools. We still find that scores recover when we correct our estimates for the integrity index of these schools
- Not due to new cheating methods because there are few reported cases of cheating on the computer-based exams

Conclusions

- Technology could potentially contribute to the transition from a cheating culture to a learning culture
  - Cheating was locally concentrated
  - Points to existence of "cheating culture" in certain regions
- CBT was successful at reducing, if not eliminating, cheating
  - -5.2 points or -0.4 s.d. when schools switch to computers
- Schools that still took the exam on paper cheat less as more schools around them switch to computers
  - Shows that cheating is more difficult when others don't cheat
- Exam scores increase over time when cheating is no longer possible
  - Suggests that learning outcomes improve

3. School Integration

- In large education markets, some schools are more in demand than others. Favourite schools usually select best students that can pay.
- In publicly funded systems, school admission policies might counter this tendency in order to create more equity in school admission
  - More inter-generational mobility, social cohesion
  - More/less learning?
- Understanding the impacts of different admission policies is complex because it affects all students in the system
  - Admitting one student means rejecting another and benefits of preferred schools could vary by student type
  - Student composition changes which might affect teacher behavior and learning of students whose access remains the same

This paper

We evaluated system-wide learning impacts of a massive influx of low-scoring students into high quality public schools

Setting

Yogyakarta has 16 public junior high schools and 41 private schools

- Public schools accommodate about 60 percent of students
- Education is compulsory up to grade 9

Public schools are considered higher quality

- Score 40% higher on the grade 9 exam than private schools
- Better resources
  - Teachers have 9 more years of experience on average
  - 45 percentage points more certified teachers
  - Teacher monthly salary is twice as high

The Zoning Policy

Public schools traditionally reserved for higher-testing students

- Students rank schools according to preference
- Allocation based on grade 6 exam scores using Deferred Acceptance mechanism

Admission criteria changed in 2018

- Mostly based on distance from student homes to schools
- Central Government wants to encourage "equal distribution of education quality"

Policy shift away from test-based admissions to proximity-based admissions

Note that share of seats for students from Yogyakarta increased

Percent of seats allocated based on:	PRE-ZONING	ZONING 1
UASDA score (Yogyakarta residents)	55	15
UASDA score (non-Yogyakarta residents)	20	5
Poverty status (UASDA rank)	25	0
Proximity to school (Yogyakarta residents)	0	75
"Special talents" (UASDA rank)	0	0
Relocation (UASDA rank)	0	5

May 2018

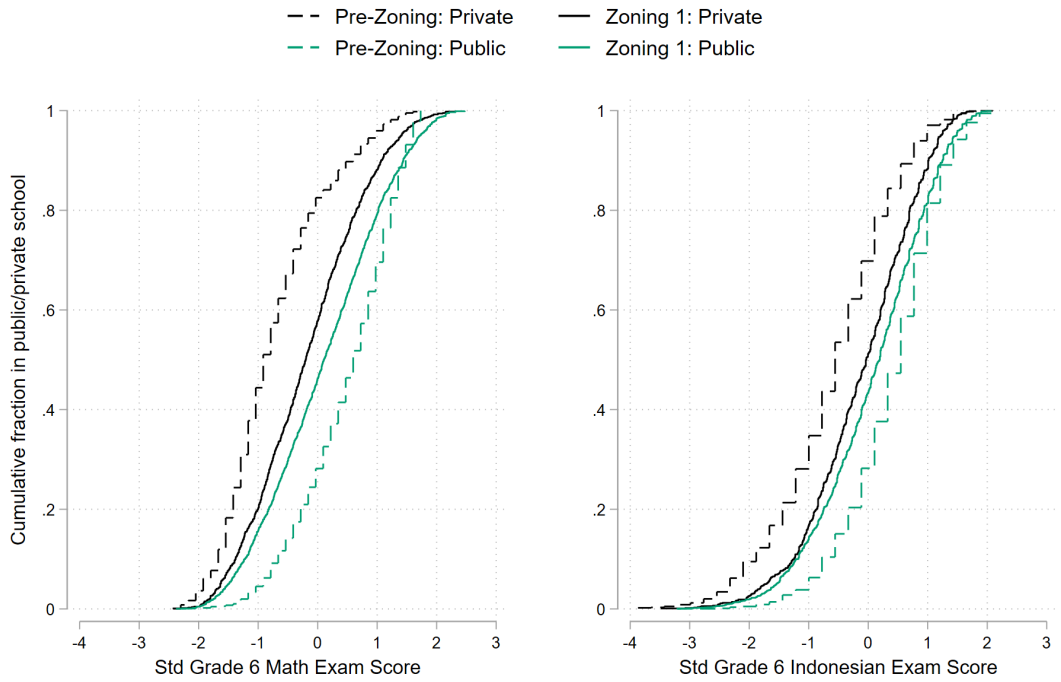
Data

- Primary school leaving exams (UASDA) for all students in Yogyakarta 2017 (old policy),2018 and 2019
- Grade 7 and 8 test scores from all 16 public schools + 30 out of 41 random private schools in 2019 and 2020

Analysis Samples:

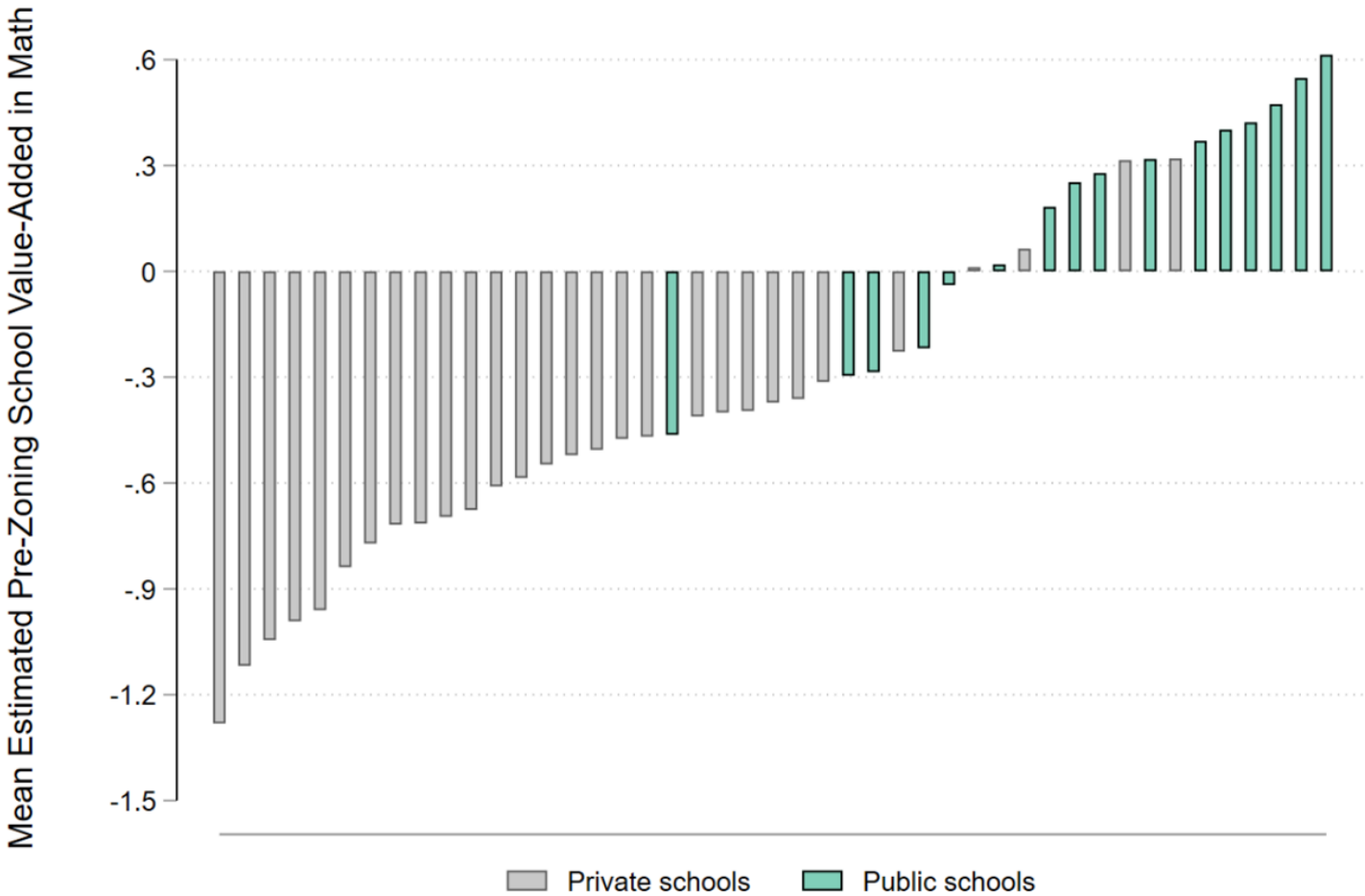
- students for which we could match test with school leaving exam
- 89% of all seats for Yogya graduates
- Main impact analysis
  - pre-zoning: 2017 exam with 2019 test in grade 8
  - Zoning 1: pre-zoning: 2018 exam with 2020 test in grade 8

Student composition changed drastically



	Public			Private		
	PZ	Z1	Diff	PZ	Z1	Diff
Std UASDA math	0.5	0.1	-0.4***	-0.7	-0.2	+0.5***
Std UASDA Indonesian	0.4	0.1	-0.3***	-0.6	-0.2	+0.4***
Std Asset Index	0.0	-0.1	-0.1	0.0	0.2	+0.2***

Public schools deliver more value added



Change in school environment

Measured school quality by school value-added (SVA)

	(1)	(2)	(3)	(4)	(5)
	All	Always Access	Gained Access	Lost Access	Never Acces
School value added (math)	0.06***	0.02	0.40***	-0.28***	0.03
	(0.02)	(0.03)	(0.08)	(0.09)	(0.03)
School value added (Indonesian)	0.08***	0.01	0.46***	-0.24***	0.01
	(0.02)	(0.01)	(0.07)	(0.07)	(0.04)
Average UASDA in school	-0.10	-0.36***	0.50***	-0.30***	0.28***
	(0.06)	(0.07)	(0.11)	(0.10)	(0.06)
Observations	7475	3509	1728	1383	855

Note: Table presents coefficients for zoning cohort dummy. Coefficients are conditional on the UASDA score, gender, household assets, mother's education and kelurahan. Standard errors corrected for clustered at school level.

Effect on learning

Two main findings

1. Heterogeneous effects from public schools
   - Benefit to lower-scoring "gained access" smaller than loss for higher-scoring "lost access"
2. Negative effects from lower scoring peers, but no positive effects from higher scoring peers

	(1)	(2)	(3)	(4)	(5)
	All	Always Access	Gained Access	Lost Access	Never Access
Mathematics	-0.07	-0.13	0.12	-0.22*	0.00
	(0.06)	(0.08)	(0.09)	(0.12)	(0.06)
Indonesian	-0.08*	-0.15**	0.10	-0.30***	-0.10
	(0.05)	(0.06)	(0.10)	(0.11)	(0.10)
Combined	-0.08*	-0.13*	0.12	-0.24***	-0.04
	(0.06)	(0.08)	(0.09)	(0.11)	(0.07)

Explaining the findings

Hypothesis

- Public schools were specialized in teaching high scoring students, private schools in low scoring students
- Public schools adjust teaching with more lower scoring students, private schools do not adjust with more higher scoring students

Self-reported teacher survey results

	(1) Public	(2) Private	(3) Difference
Teacher changed teaching methods	0.78	0.39	0.39***
	(0.42)	(0.49)	[0.08]
Teacher changed difficulty level of tasks	0.28	0.10	0.18**
	(0.45)	(0.30)	[0.07]
School implemented tracking	0.32	0.23	0.09
	(0.47)	(0.42)	[0.08]

Explaining the findings

	(1)	(2)	(3)	(4)	(5)
	All	Always Access	Gained Access	Lost Access	Never Access
Finds instruction level difficult					
Zoning	-0.03*	-0.08***	0.06**	-0.06**	-0.00
	(0.02)	(0.02)	(0.03)	(0.03)	(0.02)
Pre-zoning mean	0.26	0.26	0.27	0.25	0.26
Aspires to go to university					
Zoning	-0.04***	-0.03*	-0.09***	-0.02	-0.07***
	(0.01)	(0.02)	(0.03)	(0.02)	(0.03)
Pre-zoning mean	0.81	0.89	0.64	0.88	0.71
Takes tutoring at school					
Zoning	-0.10**	-0.07	-0.23***	-0.03	-0.08
	(0.05)	(0.06)	(0.05)	(0.05)	(0.06)

Conclusion

- School value-added is not constant with student composition
  - Behavioral changes at teacher and student level based on student composition point to equilibrium effects
  - When change in student composition is large
  - Schools might need time to adjust to new student composition
- Diversifying the student body can have negative effects on students other than the primary target beneficiaries
  - High-scoring students were harmed
  - Benefits to low-scoring students were limited
- Aggregate test scores are not the only policy consideration for school integration

THANK YOU

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