



Is it all about the dollar?

Teacher Supply in England, evidence
from the LFS, SWC and the DLHE

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Teachers Are Important

- Outside of the family unit teachers are the most influential adults in young peoples lives.
- There is strong evidence that teachers have a casual effect on:
 - Educational attainment
 - Labour market outcomes
 - Non-cognitive skills (i.e. effort, self-control, confidence, emotional stability)



Four Questions:

- Are teachers underpaid?
- Do teachers who quit sort into higher paying occupations?
- Do wages affect Teacher Supply?
- Do wages affect pupil performance?



Are Teacher Underpaid?

- Relative to their social/economic contribution
 - Teacher pay is typically linked with experience not ability
 - For a given level of experience bad teachers tend to be paid too much and good teachers tend to be paid too little.
 - Chetty et al. (2011), Hanushek et al.(2015)



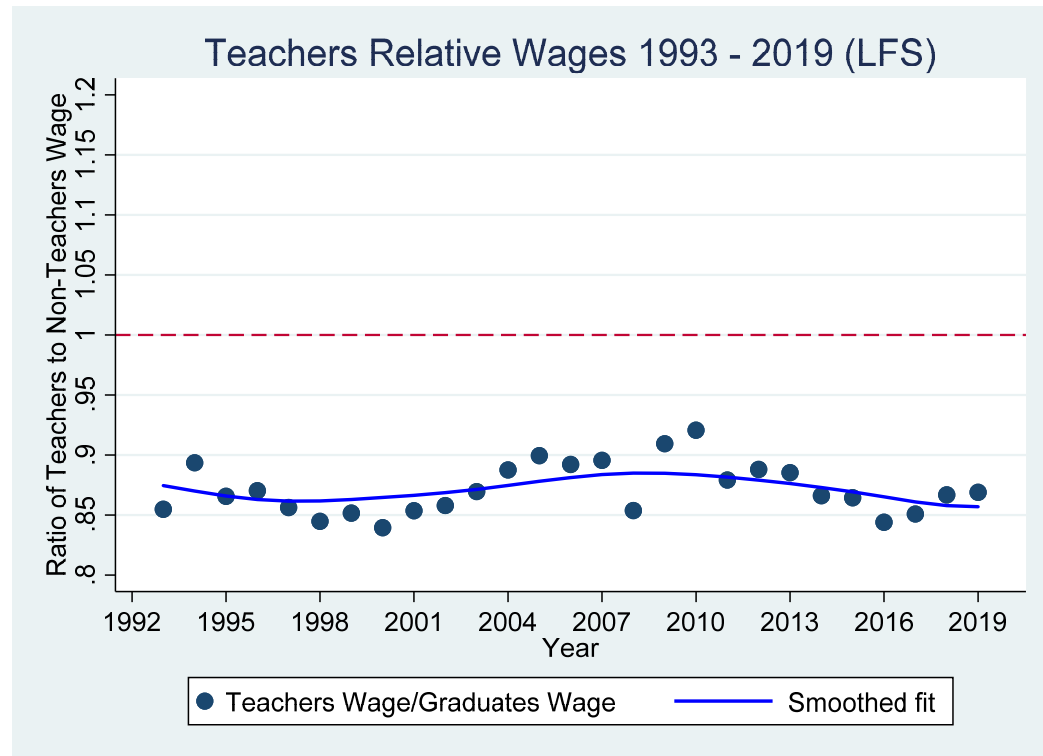
Are Teacher Underpaid?

- Compared to what they would have earned had they not gone into teaching?
- Do this by comparing current teachers earnings to the earnings of some non-teacher group such as:
 - Non-manual occupations
 - Graduates



Are Teacher Underpaid?

- Teachers tend to earn less than the average graduate (~13% less)
- Might explain why policy makers struggle to recruit graduates from the top end of the ability distribution
- Does not mean current teachers could earn more in a different occupation as teachers differ from graduates on observable and unobservable characteristics





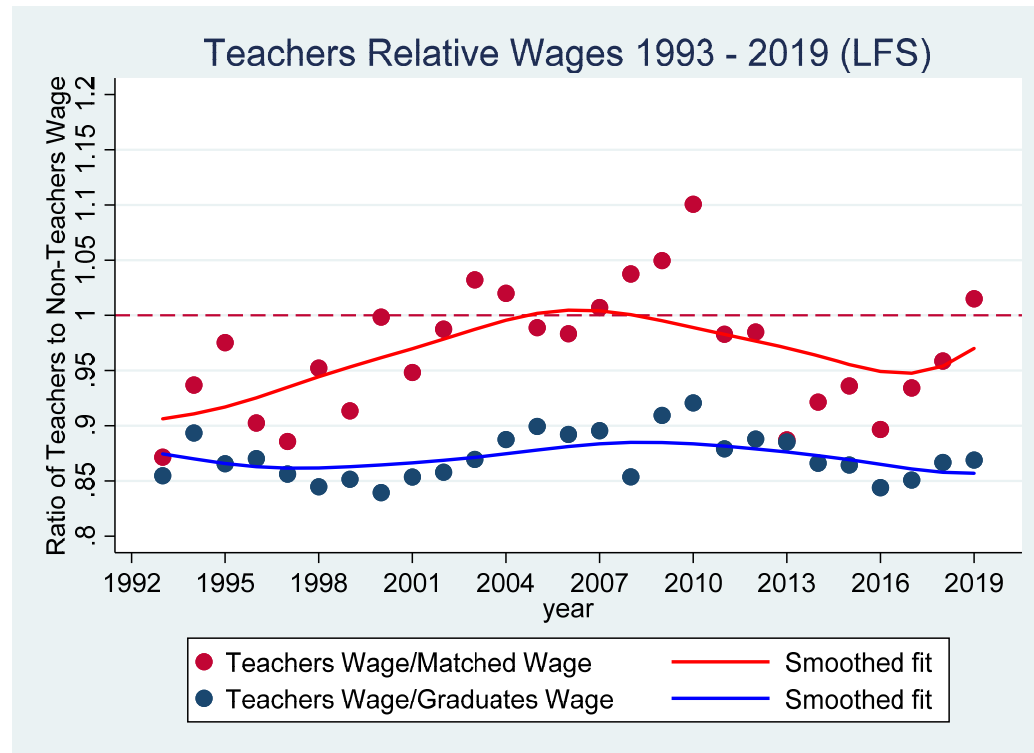
Are Teacher Underpaid?

- To get around non-random selection into teaching we use propensity score matching.
 - Compare teachers to non-teaching graduates who look most like them based on observable characteristics



Are Teacher Underpaid?

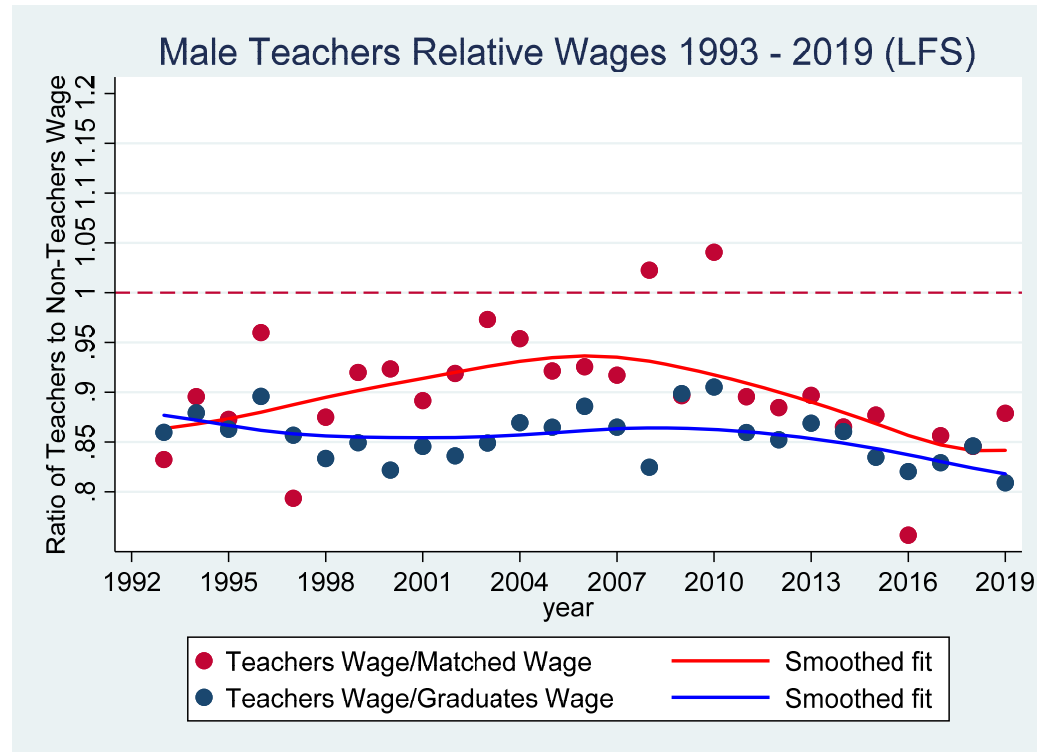
- Accounting for non-random selection teachers don't appear to be significantly underpaid (~3% less)
- Relative Wages were lowest in the 90's and since the public sector pay freeze (2010).
- Data from 2019 suggests that teachers relative wages may have picked up





Are Teacher Underpaid?

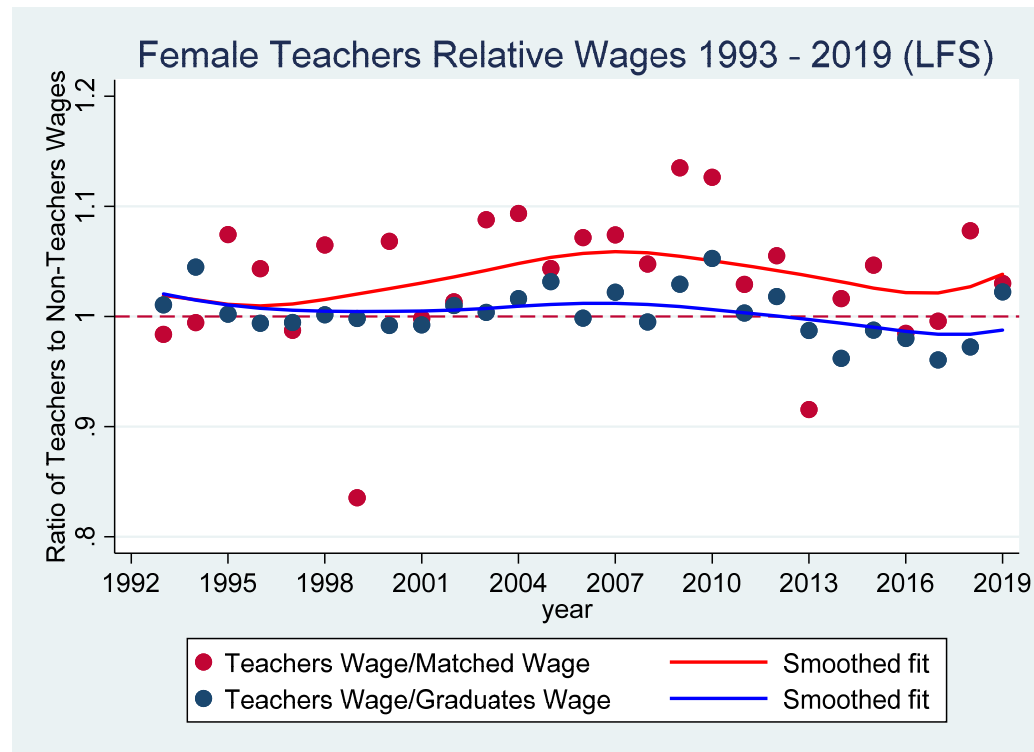
- Male Teachers tend to be paid ~15% less than the average male graduate
- Accounting for non-random selection they still tend to earn ~10% less





Are Teacher Underpaid?

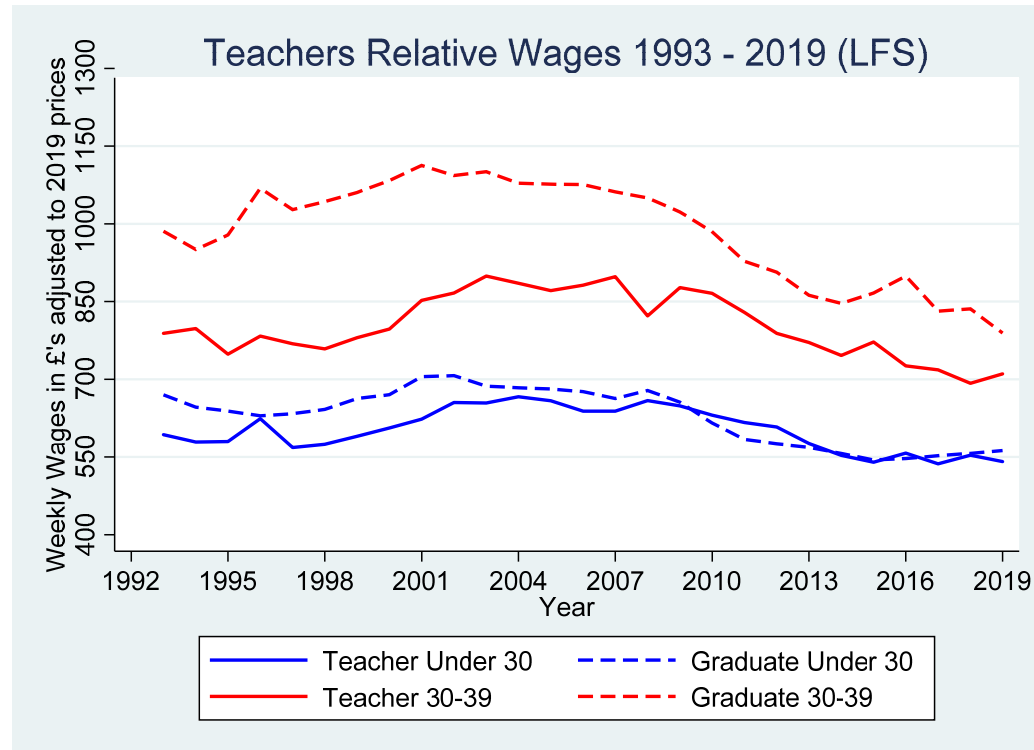
- Female Teachers tend to earn a similar amount to the average graduate
- Accounting for non-random selection they earn ~3% more
- This might explain why men are far less likely to enter the and more likely to leave the profession





Are Teacher Underpaid?

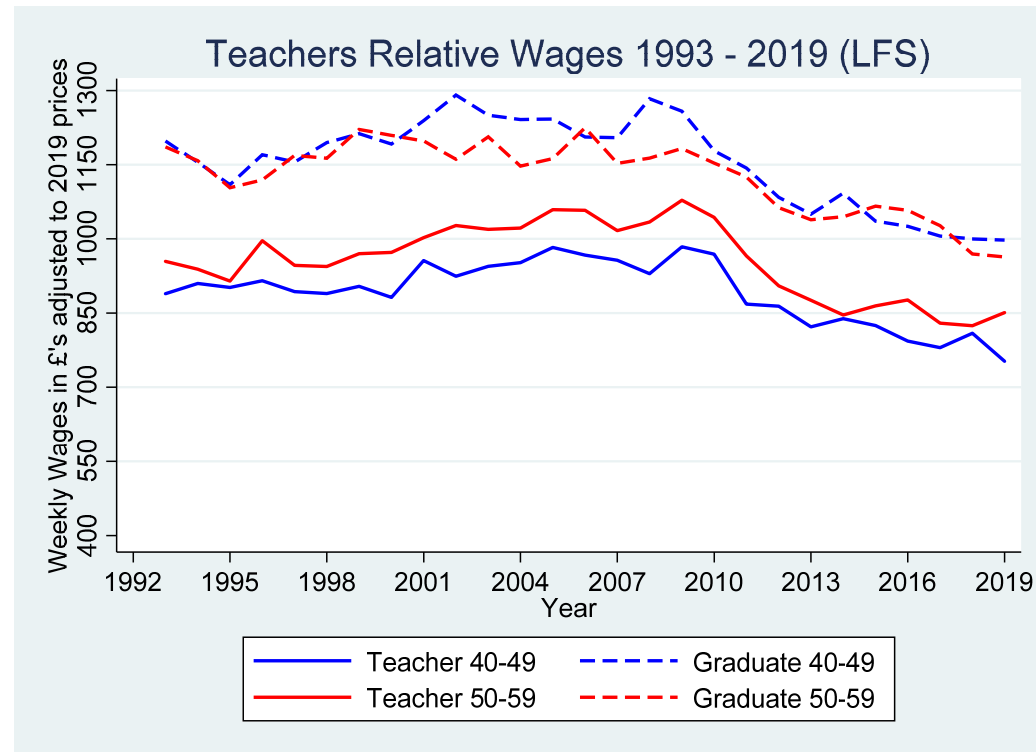
- Teachers initial wages are highly competitive
- But grow at a slower rate over the age distribution
- If young teachers quit due to pecuniary factors it's the growth of earnings, not current earnings, that drive this decision





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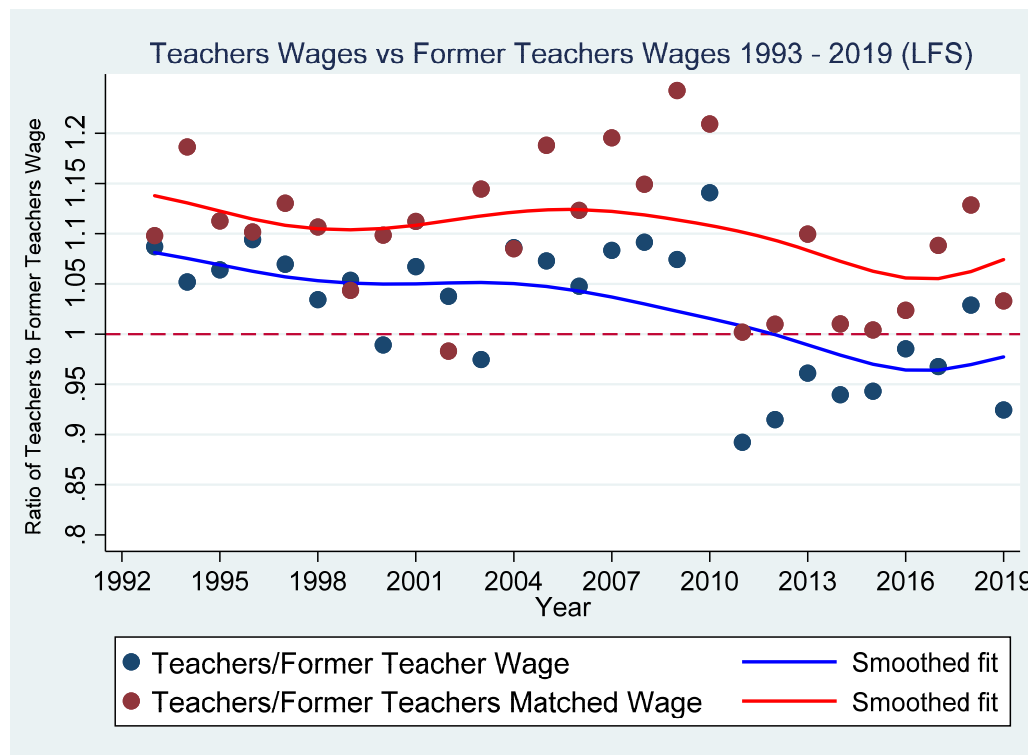


Are Teacher Underpaid?

- Our matching strategy matches on observable characteristics
 - But graduates who sort into teaching clearly differ on unobservable characteristics to non-teaching graduates
 - Matching current teachers to former teachers reduces the bias driven by unobservable differences

Teachers who quit sort into higher paying occupations?

- Teachers who quit tend to sort into similarly paying occupations (~2.5% less)
- Using former teachers to estimate current teachers outside option suggests that current teachers earn ~10% more than they would in their outside option





Are Teacher Underpaid?

- Teachers earn less than the average graduate
 - When you account for non-random selection no strong evidence teachers could earn more in their outside option
- Teachers initial wages are highly competitive
 - But grow at a slower rate than the average graduate
- Male teachers face a significant wage penalty teaching. Female teachers do not.



Wages and Teacher Supply

- Teacher Supply:
 - Retention of current teachers
 - Return of qualified teachers who are no longer teaching
 - Recruitment of graduates into Initial Teacher Training Programmes



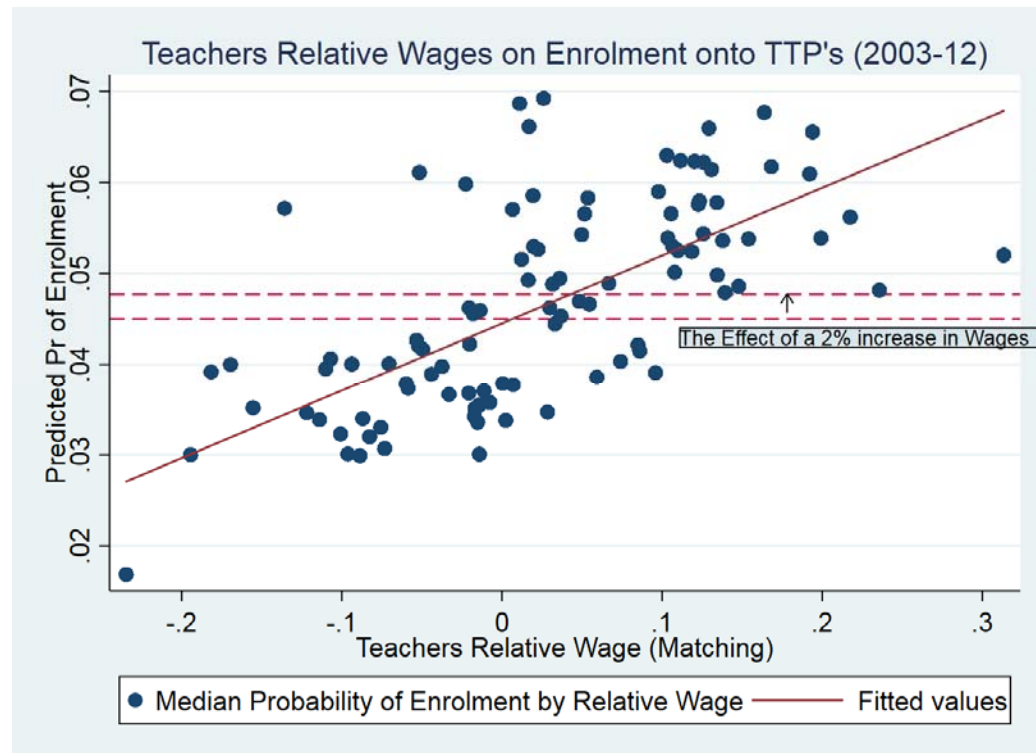
Wages and Teacher Supply

- Using the LFS and the Destination of Leavers from Higher Education (2003-2012) we exploit the regional variation in teachers relative wages to estimate the effect of wages on the supply of graduates into teacher training programs.



Wages and Teacher Supply

- A1sd increase in relative wages increases graduate enrolment onto Teacher Training Programmes by 0.05sd
- This is stronger than the effect of teacher training bursaries (0.007sd)
- But significantly smaller than the effect of job security (0.12sd)





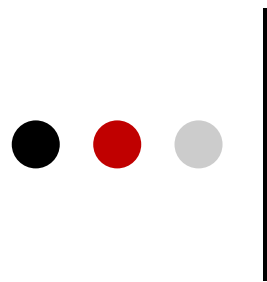
Wages and Teacher Supply

- Do higher wages attract better teachers?
 - No direct measure of teacher quality
- Effect is driven by non-Russell group graduates
 - Relationship between teachers cognitive skills and pupil performance Hanushek et. al (2019)
 - Class sizes don't have a statistically and/or economically significant effect on pupil performance Woessmann and West (2002)
 - Higher wages are not necessarily welfare improving for pupils
- Effect is driven by female graduates and white graduates
 - Negative effect on teacher diversity



Wages and pupil performance

- Estimate the effect of teachers relative wages on pupil performance on grade 4 math and science tests through an efficiency wage model
- Use 5 waves of the Trends in International Mathematics and Science Study (1995, 2003, 2007, 2011 and 2015) and the LFS to estimate each TIMSS teachers relative wage



Wages and pupil performance

- Consistent with our efficiency wage model we find that teachers relative wages are positively associated with Grade 4 pupil performance in England

Data: TIMSS waves 1995, 2003, 2007, 2011 and 2015	Grade 4 Science Scores	Grade 4 Math Scores
Wage Differences	0.392**	0.325+
	(0.199)	(0.205)
Constant	-0.554***	-0.880***
	(0.0669)	(0.0611)
n	24120	24120

+ $p < 0.15$, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Controls include Teacher, School, Student characteristics and year fixed effects. Standard errors are clustered at the class level.



Four Questions:

- Are teachers underpaid?
 - No
- Do teachers who quit sort into higher paying occupations?
 - No
- Do wages affect Teacher Supply?
 - Yes. But the effect size is modest
- Do wages affect pupil performance?
 - Yes



Thank You

- Any Questions?

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