The recruitment and retention of teachers in deprived schools

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Overview of talk

1. Teacher turnover
2. Estimates of turnover in X-sectional data
3. New hires in short panel
4. Quitters in short panel
5. Conclusion

Teacher turnover

- Separation can be:
  - Layoffs (rare)
  - Retirements
  - Quits = go to work in another school, leave teaching (or private sector), leave labour force altogether
- Standard models of quits:
  - Pecuniary factors = wage offers, promotion or wage growth prospects
  - Non-pecuniary factors = characteristics of students, resources, ethos, management, collegiality

Why might teacher turnover matter?

For children…

- Turnover *per se* can be harmful to student progress
- High turnover schools need to recruit novice teachers
- High turnover might signal general motivational problems at the school

For government budgets…

- Most turnover is also wastage out of the profession
- Teacher training costs government about £5.5k plus bursary
- Half of new trainees are no longer in state maintained sector after about 5 years

Is teacher turnover a particular problem in disadvantaged schools?

- Existing UK evidence: Dolton and Newson (2003); Smithers and Robinson (2004)
- Strong US evidence, but very different circumstances
- Why?
  - Urban areas = denser teacher labour markets?
  - Young teachers like to teach in urban areas?
  - Tougher working environment?

Teacher and school two-sided matching models

- Schools have agreeable-ness (A) and individuals have effectiveness (E)
- If teachers and schools agree on the ranking of desirable schools and teachers, then market equilibrium should see…
  - High E teachers matched with high A schools – may continue job search but at low intensity
  - Lower E teachers will tend to be matched with lower A schools, and will engage in higher intensity job search
- If A and E poorly observed pre-search…
  - High E teachers may accept a job at a low A school because it is better to search whilst employed
  - Low E teachers have a chance of a better A school, so that's why you see greater quits out of low A schools.
- Differential separations out of high and low A schools is likely to depend on…
  - the precision of pre-hire measures of A and E
  - the degree of flexibility of wages
  - the degree of exogenous turnover
- Implies disadvantaged schools:
  - Hire teachers who continue their job search, almost regardless of experiences within school
  - Hire relatively ineffective teachers, on average
  - May induce further equilibrium effects – ineffective teachers = poor results = more families move away from school

School Workforce Census

- New annual census of all staff in schools from November 2010 onwards
- We know: teacher and school ID, age, sex, ethnicity, tenure in school and in contract, pay, FTE hours, role, highest qualification, degree subject and teaching subject
- We don’t know: length of service (pension records merger), whether they teach in private schools, training route, who they teach
- Missing observations not a huge problem; missingness on individual variables more serious

Analysis of SWC today

Cross-section of SWC 2010

- Is there a correlation between deprivation of wider neighbourhood and teacher turnover?
- What factors ‘account’ for this correlation?

Matched SWC 2010 and 2011

- What do the new hires in 2011 look like?
- Where do they come from?
- How does this vary by deprivation of school?
- Profile of completed tenures (quits)

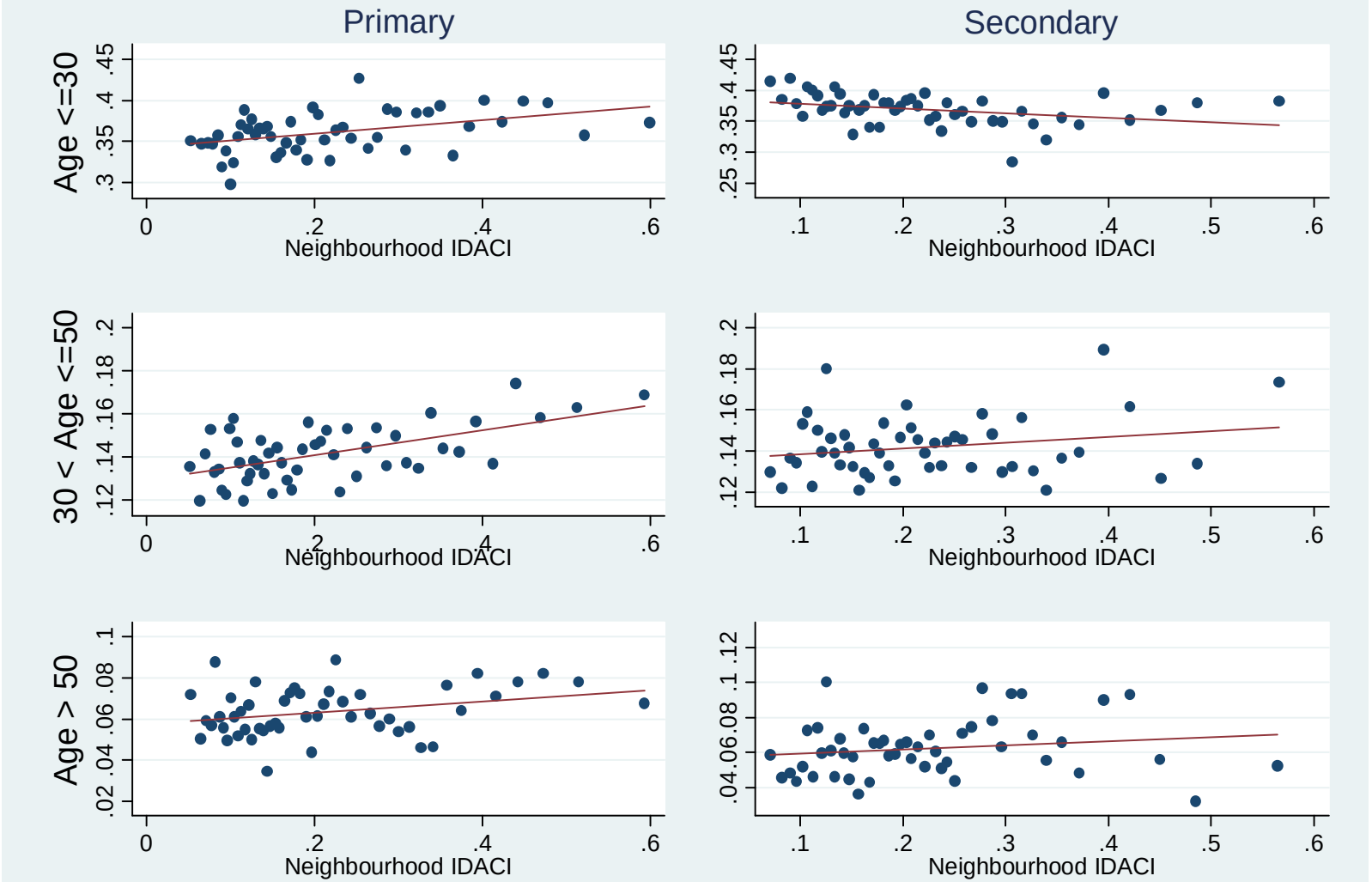
Inferring teacher turnover from cross-sectional data

- We have a distribution of elapsed tenure (how long each teachers has been in their school so far)
- Renewal theory states relationship between elapsed and completed tenure:
  - Suppose completed tenure, τ, has pdf $g(\tau)$ with mean μ
  - then pdf of elapsed tenure, ε, is $f(\varepsilon) = [1-G(\varepsilon)]/\mu$
- If turnover process runs a long time, then expected completed tenure is equal to two times the elapsed tenure

Inferring teacher turnover from cross-sectional data

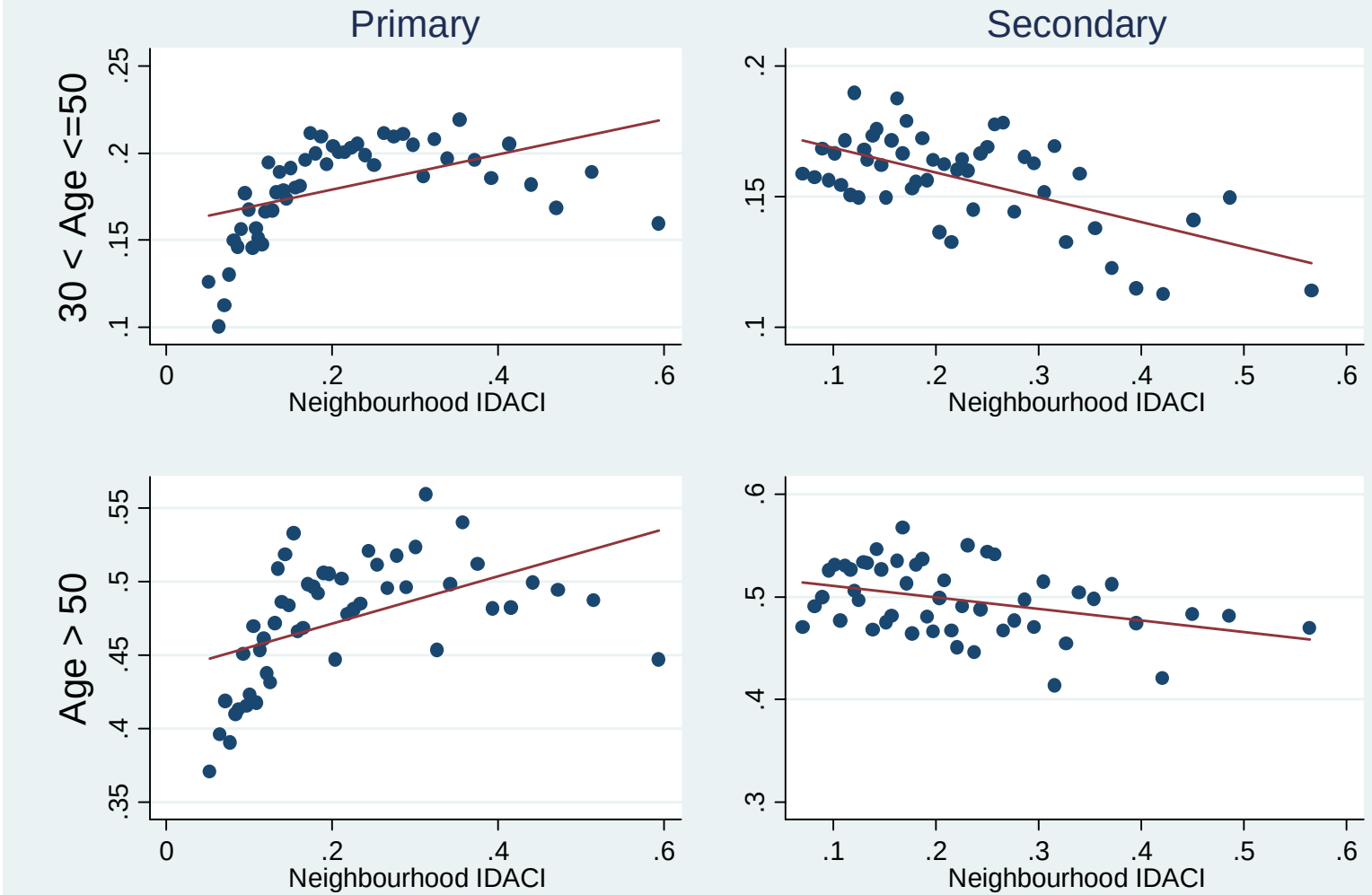
- We use tenure data to infer separation rates
- Compare numbers of teachers with elapsed tenure of:
  - (0-2 years) and (2-4 years)
  - (0-5 years) and (5-10 years)
- In steady state these are separation rates
- (2-4 years – 0-2 years)/(0-2 years)

Proportion of teachers with tenure of 0-2 years



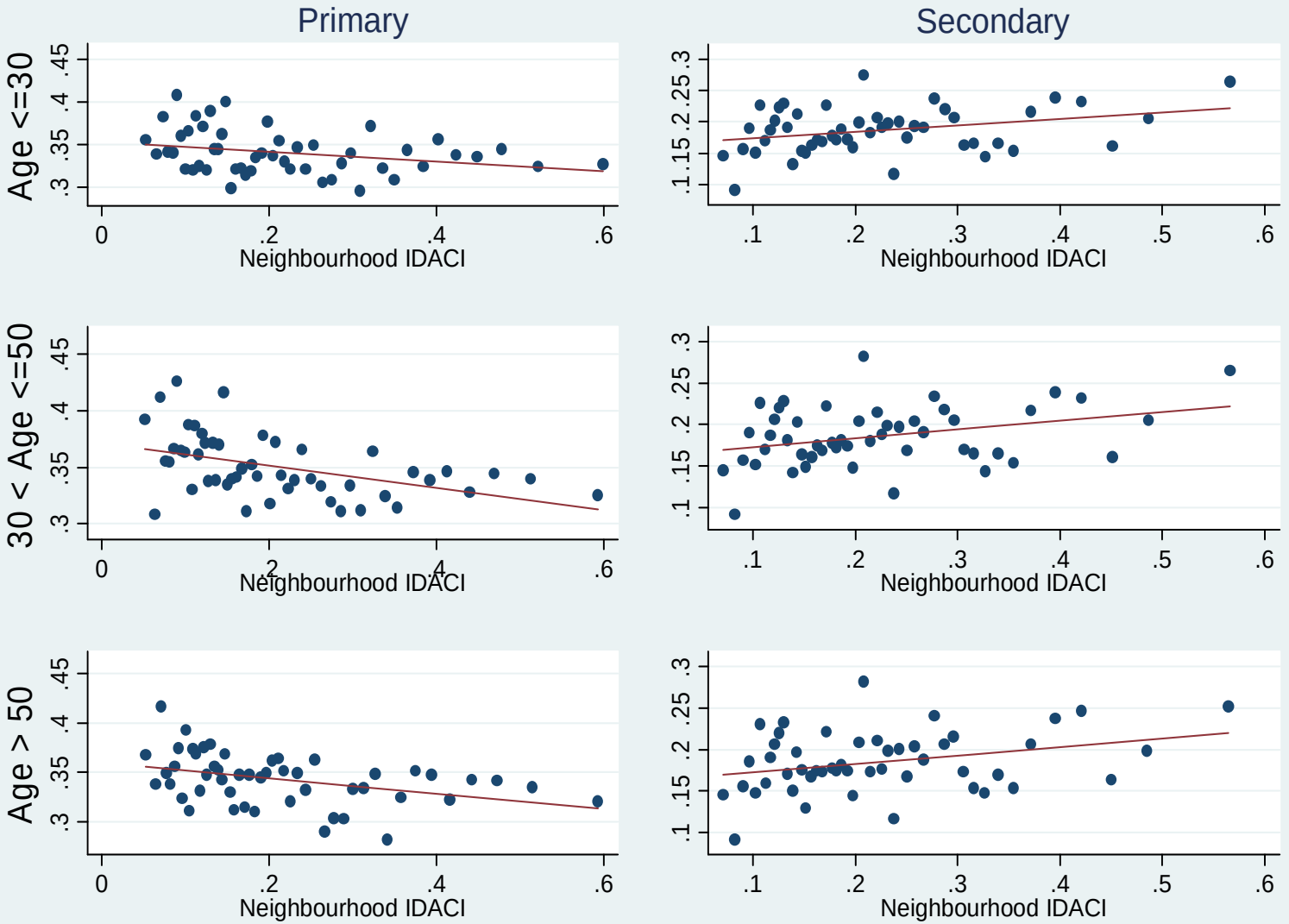
Unit is a 2-percentile

Proportion of teachers with tenure of 10+ years



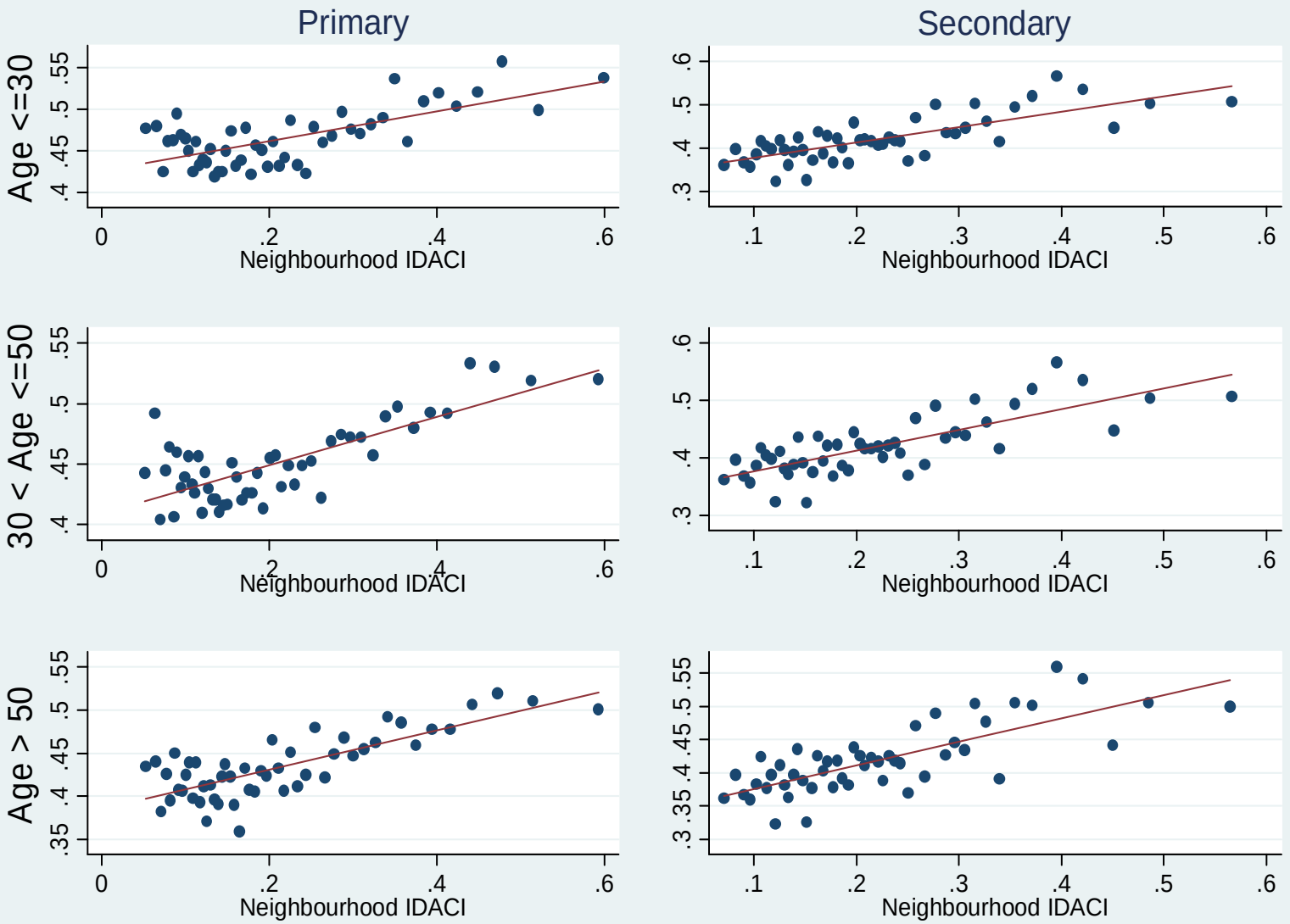
Unit is a 2-percentile

Separation rate at 2 years



Unit is a 2-percentile

Separation rate at 5 years

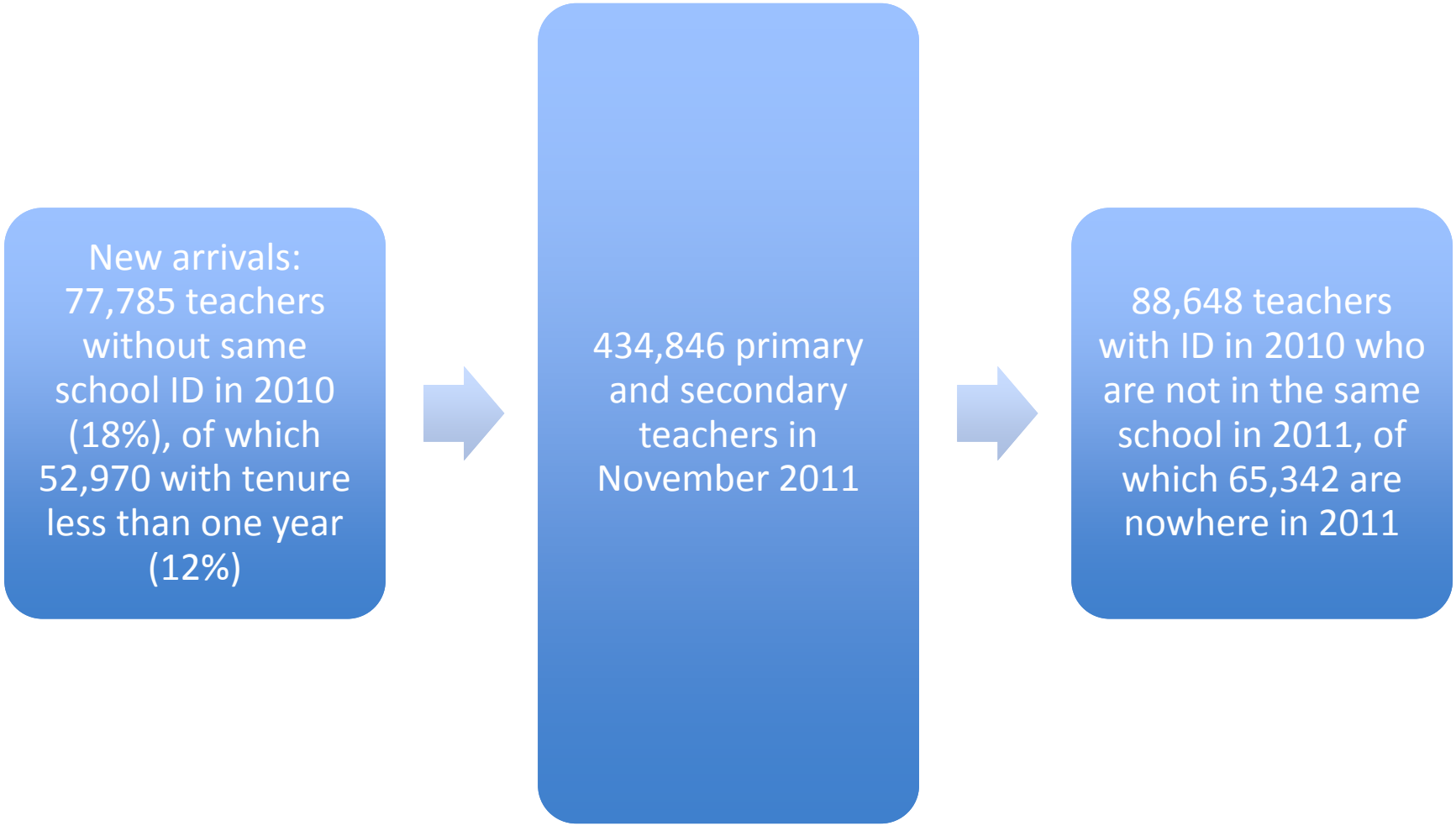


Unit is a 2-percentile

Conditional relationship between school disadvantage and turnover

	Primary			Secondary	
	Short tenure	**Long tenure**		**Short tenure**	**Long tenure**
Base	16.38	-5.32		12.57	-26.70
+ pupil char.	12.87	*-0.00*		12.57	-21.36
+ market	7.60	*3.72*		12.02	-17.48
+ teacher	4.68	5.85		4.37	-8.25
Separation:	**(0-2) | (2-4)**	**(0-5) | (5-10)**		**(0-2) | (2-4)**	**(0-5) | (5-10)**
Base	*4.94*	12.96		*16.88*	20.51
+ pupil char.	*4.32*	10.27		23.13	18.97
+ market	*4.01*	4.40		*20.00*	17.18
+ teacher	*3.09*	*-0.24*		*16.25*	*5.90*

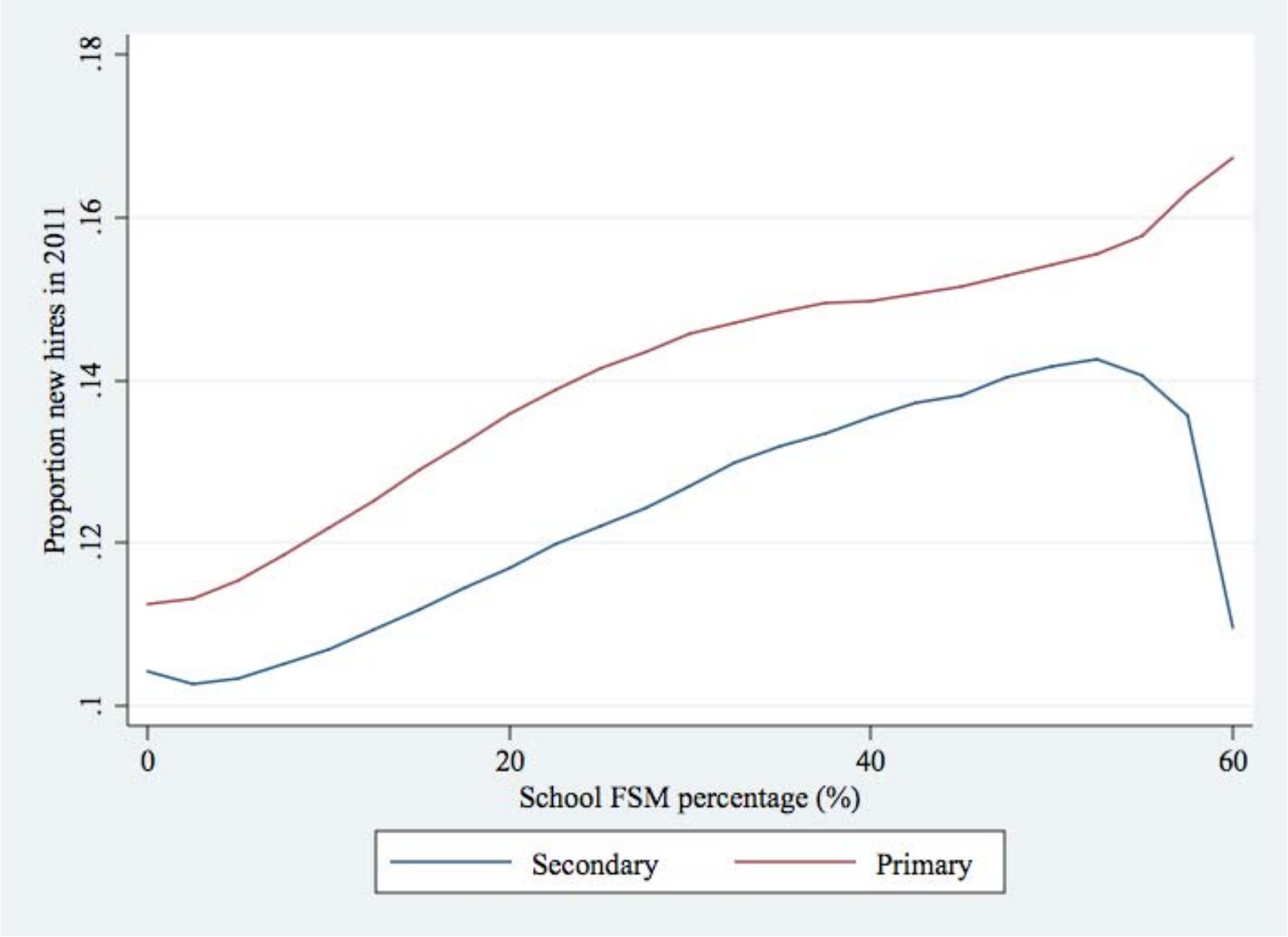
Poor quality match between 2010 and 2011 School Workforce Census



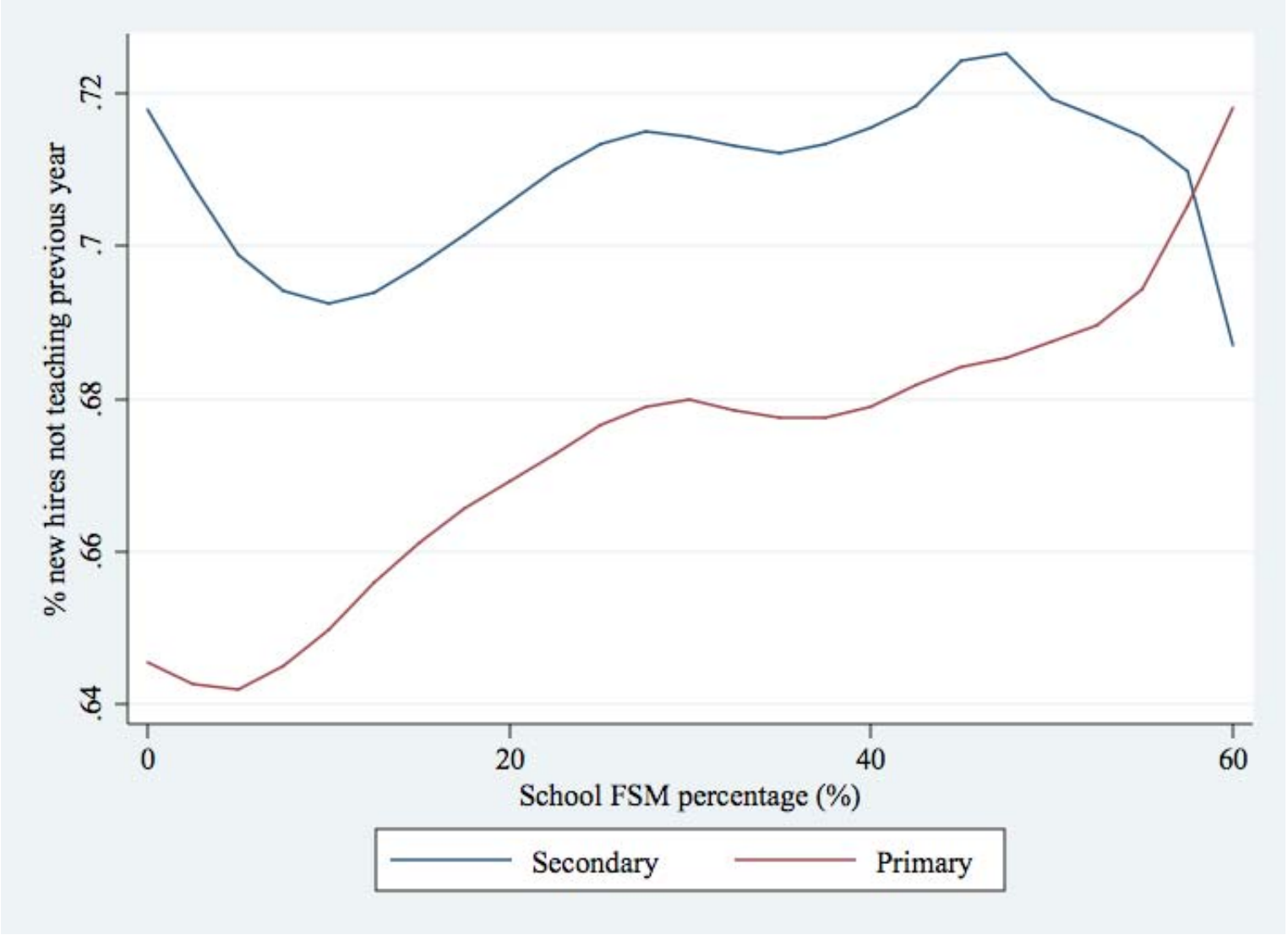
Characteristics of new hires

	New hires	Stayers	Within school diff.
Mean age	33 years	40 years	8 years younger
Age under 30	50%	18%	
Age over 50	6%	24%	
Female	74%	75%	2pp fewer women
White	86%	90%	3pp fewer white
Black	2%	2%	
Asian	4%	3%	

Proportion new hires by school FSM



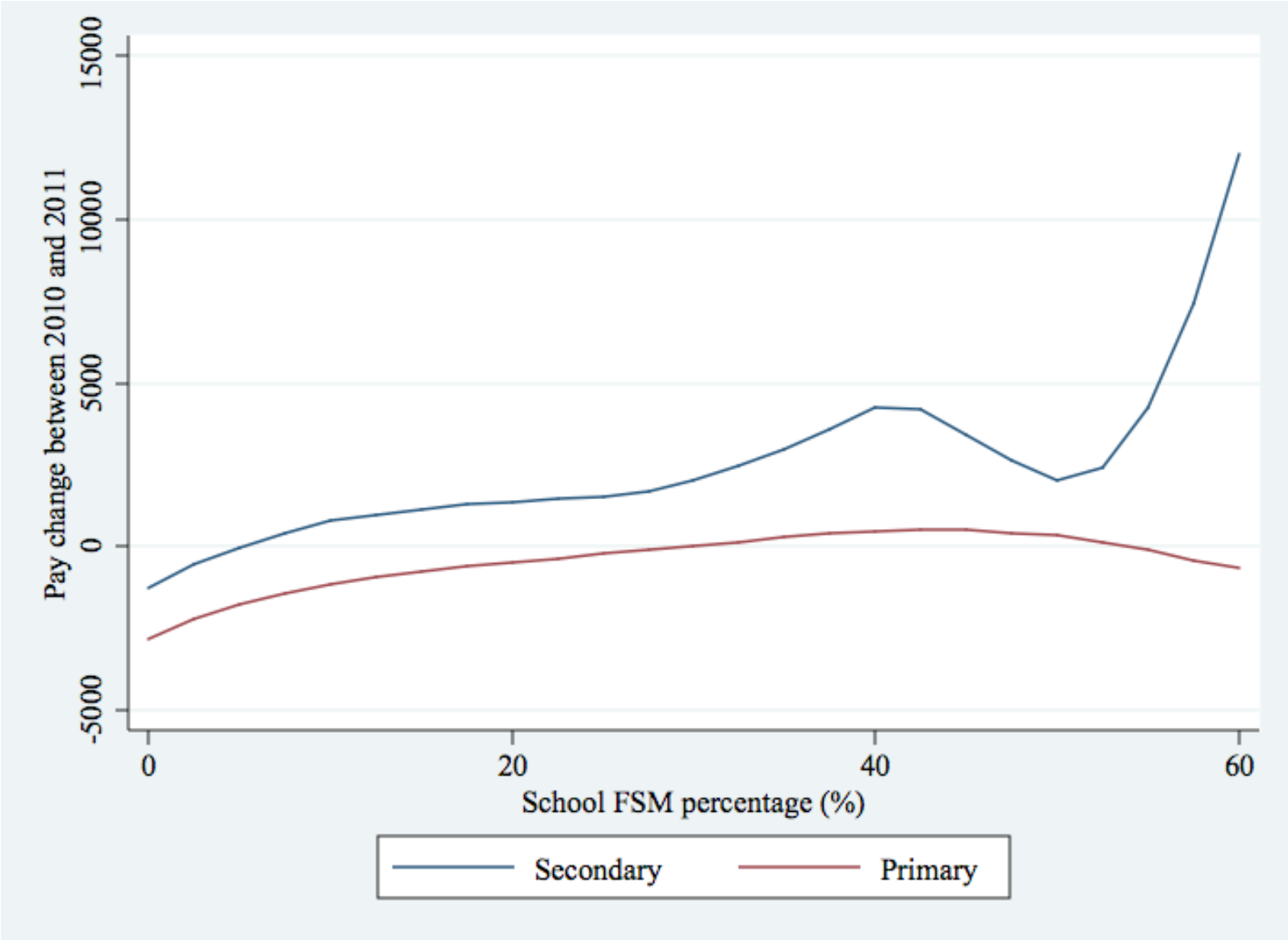
New hires more likely to be brand new teachers in deprived schools



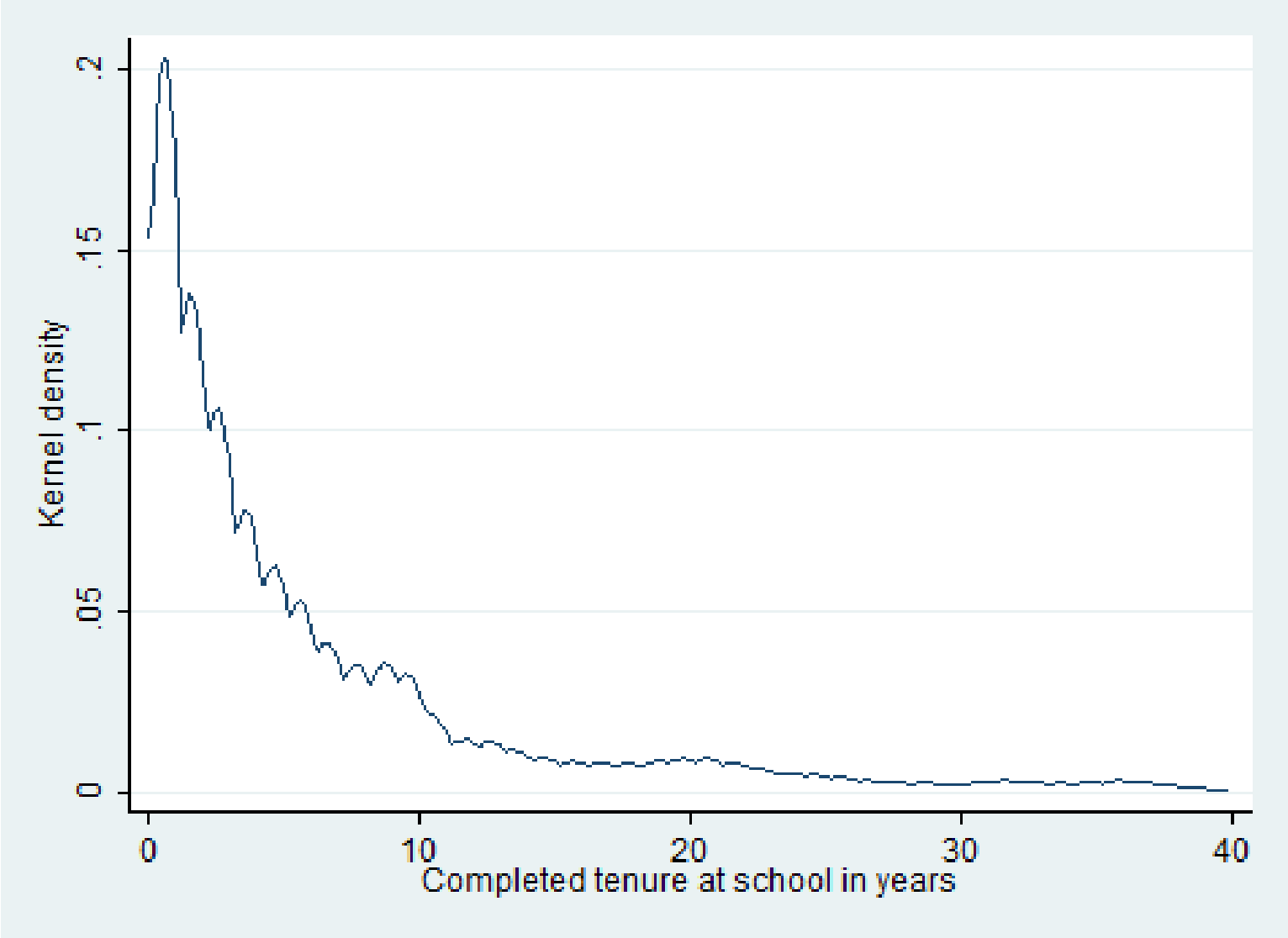
Characteristics of new hires by deprivation of school

	Most affluent quintile = 1	quintile = 2	quintile = 3	quintile = 4	Most deprived quintile = 5	Diff per 1 pp change in FSM	Within LA diff
Mean age	32.9	32.6	32.5	32.3	31.9	-0.0260	0.0094
Age under 30	48%	50%	50%	51%	53%		
Age over 50	7%	7%	7%	7%	6%		
Female	72%	74%	74%	74%	76%	0.0008	0.0017
White	89%	89%	87%	85%	81%	-0.0023	-0.0007
Black	1%	1%	1%	2%	4%		
Asian	2%	2%	3%	5%	6%		

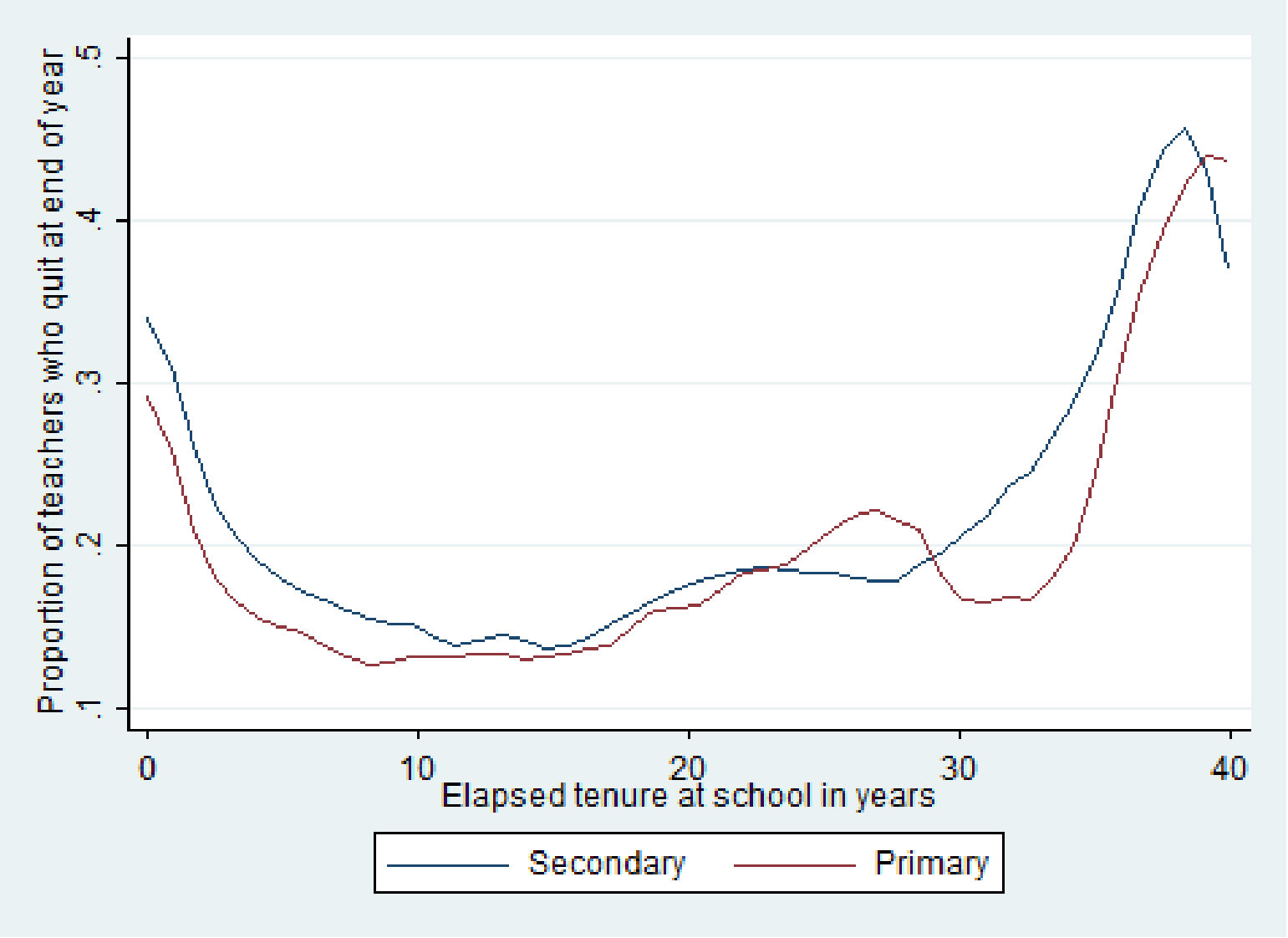
Change in pay for movers



Completed tenure for quitters



Quit rate by tenure



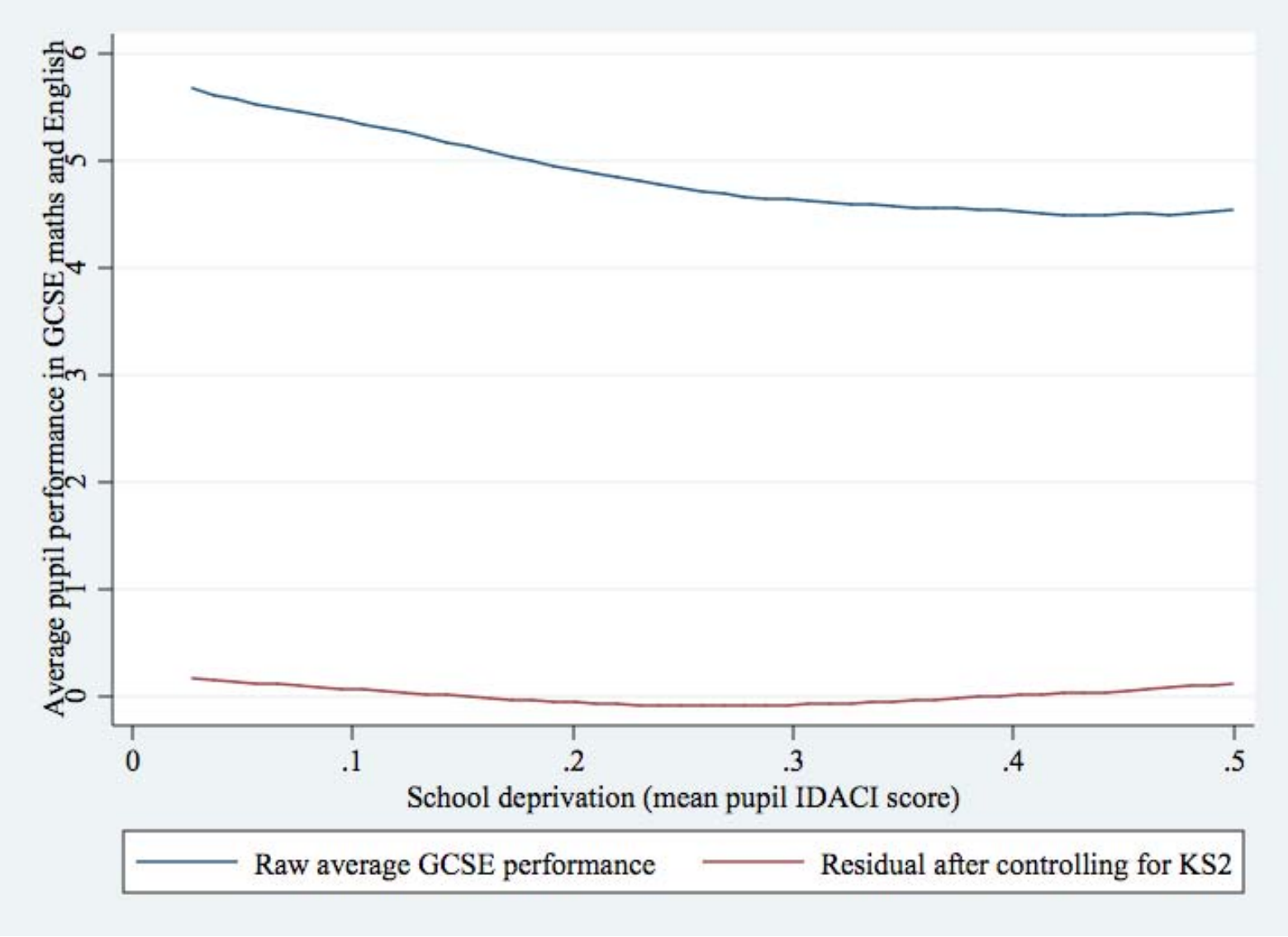
	Logit	School F.E.	Logit
Tenure 1 to 3 y	0.55	0.49	0.55
Tenure 3 to 5 y	0.42	0.37	0.42
Tenure 5 to 10 y	0.33	0.27	0.33
Tenure 10 to 20 y	0.28	0.23	0.28
Tenure 20 to 40 y	0.34	0.30	0.34
Age 60s	3.22	3.81	3.25
Age 50s	1.33	1.41	1.33
Age 40s	0.79	0.77	0.80
Age 30s	0.83	0.81	0.83
Female*age60s	1.22	1.22	1.21
Female*age50s	1.06	1.09	1.07
Female*age40s	1.20	1.22	1.20
Female*age30s	1.13	1.13	1.13
Female	0.80	0.85	0.79
Ethnicity black	1.33	1.08	1.21
Ethnicity asian	1.12	1.02	1.05
% FSM			1.01

Ofsted seems to think there is a 'quality' issue at deprived schools

	2003	2004	2005	2006	2007	2008	2009
Excellent	8%	3%	18%				
Outstanding/v. good	11%	12%	11%	6%	11%	12%	9%
Good	15%	14%	13%	11%	12%	11%	12%
Satisfactory	17%	17%	16%	14%	16%	14%	14%
Unsatisfactory	22%	17%	13%	19%	16%	18%	16%
Poor	26%	17%	22%				
Very poor	16%						

Note: Average free school meal eligibility for schools given judgment in year

Less clear in recent GCSE data



Correlation between % new hires and secondary school effectiveness

- For best 8 GCSE subjects (z-score)
  - With pupil background controls +0.069
  - With pupil background controls and LA FX +0.089
- For average GCSE maths and English score
  - With pupil background controls n.s.
  - With pupil background controls and LA FX n.s.
- For between department (mat, eng, sci) pupil fixed effects – no correlation

Summary

- Teacher turnover does appear to vary by neighbourhood deprivation of school
- Differences between affluent and deprived schools are not very large
- Largely accounted for by market and teacher characteristics
  - Either preferences of young teachers
  - Or low market attractiveness of disadvantaged schools
- Not clear how disruptive teacher turnover is to the performance of a school

Outstanding research questions

- Can we develop a more sophisticated model of school and teacher matching?
- How do school experiences affect the propensity of teachers to move jobs or leave the profession?
- Do deprived schools face a different teacher labour market?
  - Quality of the applicant pool?
  - Quality of their teacher stock?

Answering these questions

- In School Workforce Census
  - Better data linkage, more variables
  - More years of data
- In IOE administrative records and a survey of new trainees
  - Full academic and career history
  - Personality, motivation, attitudes to teaching, stress
- Looking for natural randomisation – placement experiences on PGCE courses