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# **Modelling peer effects on school attendance using the pupil absence module of the National Pupil Database**

Will Cook

Manchester Metropolitan University

w.cook@mmu.ac.uk

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- Background
  - Data
  - Method & Results

# Research Question & use of NPD

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Do pupils with Behavioural, Emotional and Social Difficulties (BESD) affect the school attendance of their classmates at primary school?

Using:

- School Census Absence Module
- Longitudinal structure of schools census
- Primary and secondary SEN type

# Why absenteeism?

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- Associated with lower educational attainment, some evidence that this is a causal relationship
- Disproportionately concentrated in disadvantaged groups; increases educational inequality
- An early warning sign of more serious issues and of disengagement from school + research interest in long term effects non-academic outcomes in schools
- Lack of research into the drivers of school absenteeism

# Why BESD peers?

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- Unique SEN grouping?
- Evidence that BESD peers are disproportionately disruptive; almost double the school absence rate than average
- My PhD research (and similar studies from the US) finds that they have negative peer effects on educational attainment (~5-10% S.D. effect on attainment).
- Lack of (quantitative) research into the effects of disruptive peers in schools

# Existing research: drivers of school absence

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- Voluntary and involuntary absenteeism
- Individual, family and school factors
  - Socio-economic status
  - Parental interest
  - School focus on attendance
- Self discipline/School attachment

# Effects on absenteeism from disruptive peers

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- Imberman et al (2012), uses re-allocations of pupils due to Hurricane Katrina used to show that the entry of a pupil with high school absence rate induces higher school absence in the receiving pupils
- Gottfried (2013) finds that the proportion of peers who have been held back a year in elementary schools are associated with higher levels of absence in their classmates. The effects are found to be greater for those receiving a free lunch.

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# Sample Data structure

Sample: 4,677,292 measurements on 539,530 pupils in 15,805 (mainstream)schools

Year	2007	2008	2008	2008	2009	2009	2009	2010	2010
Year grp	4	4	4	5	5	5	6	6	6
Term	Autumn	Spring	Summer	Autumn	Spring	Summer	Autumn	Spring	Summer
Obs.	1	2	3	4	5	6	7	8	9

For each pupil at each of the observation points we observe:

- Absences
- School
- Residence
- FSM status
- Peer group (calculated using a year—term-school identifier and fixed pupil characteristics)

# Data: Schools Census Absence module

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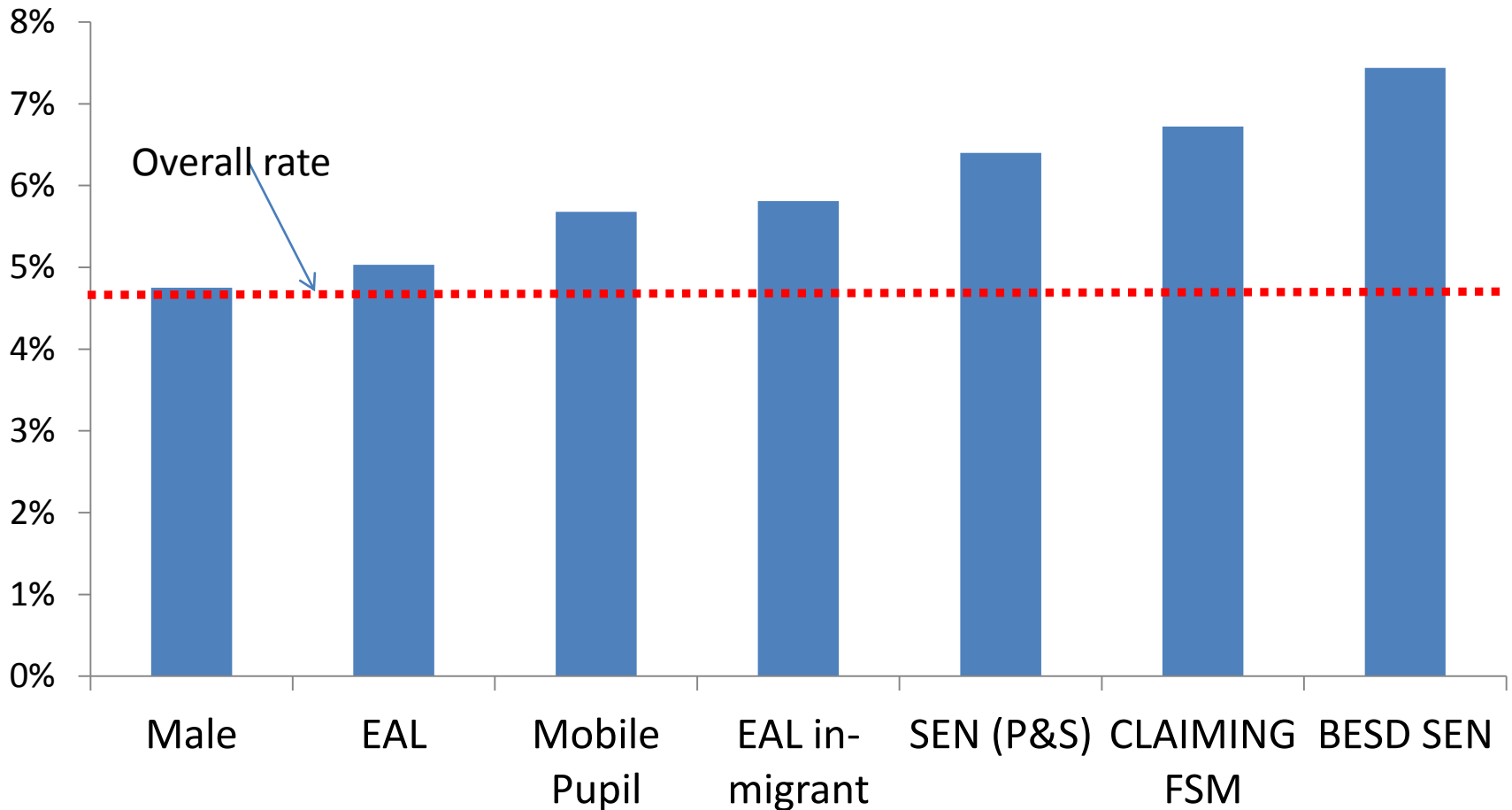
- Collection began in 2006/07, but much missing data in this first year.
- Data is collected for the previous term on the school census date (autumn, spring and half of summer term)
- Data is recorded as the number of half days missed and the number of half day sessions possible
- Reasons for absence (not all schools); authorised/unauthorised

# Data: Absence module

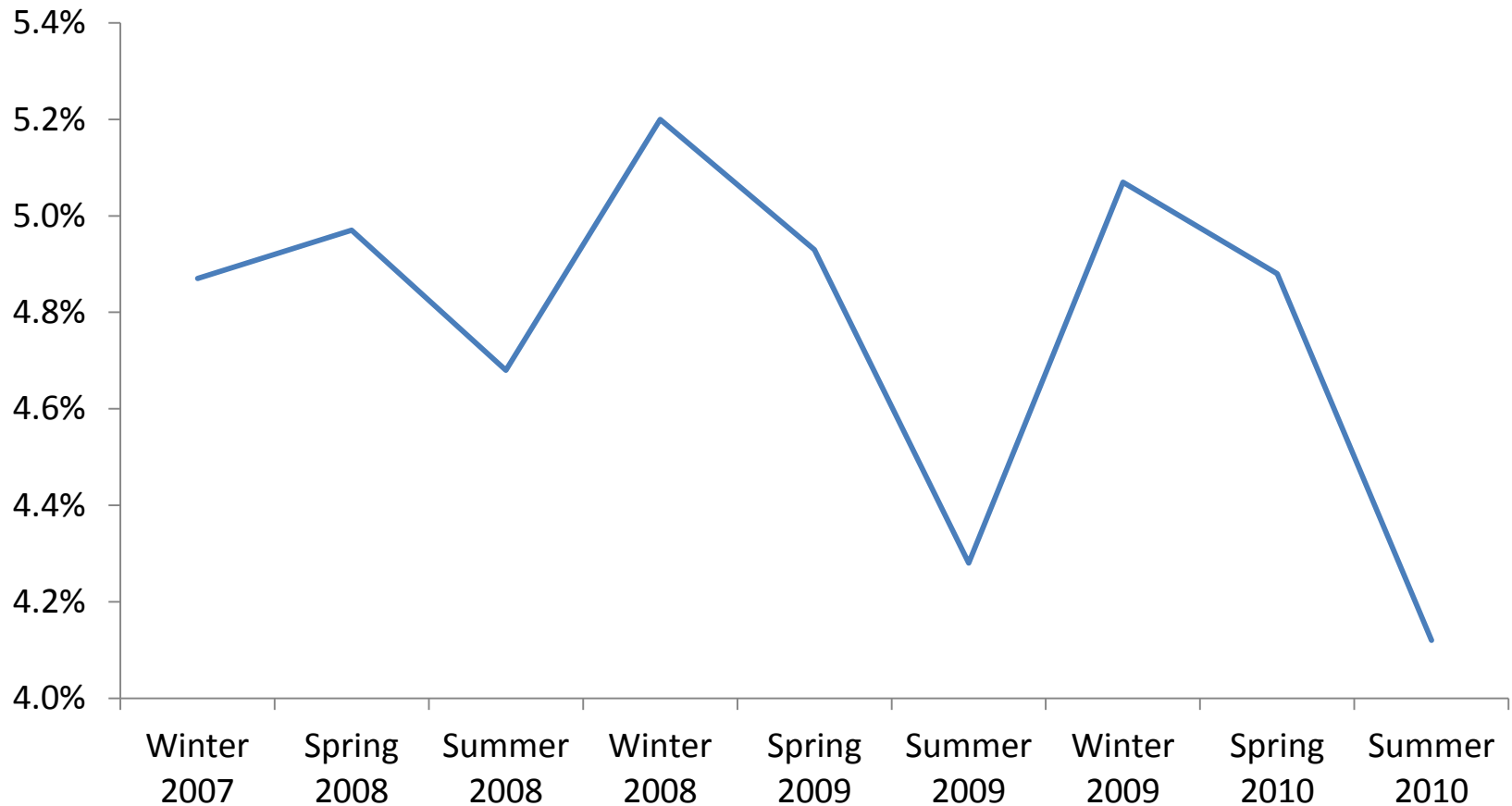
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- Naturally lends itself to longitudinal analysis
- Data needs reshaping
- Outcome variable is the total absence rate, i.e. the number of sessions missed divided by the number of possible sessions.
- Assurance against mismeasurement: legal requirements; ONS; testing of persistent absence target discontinuity.

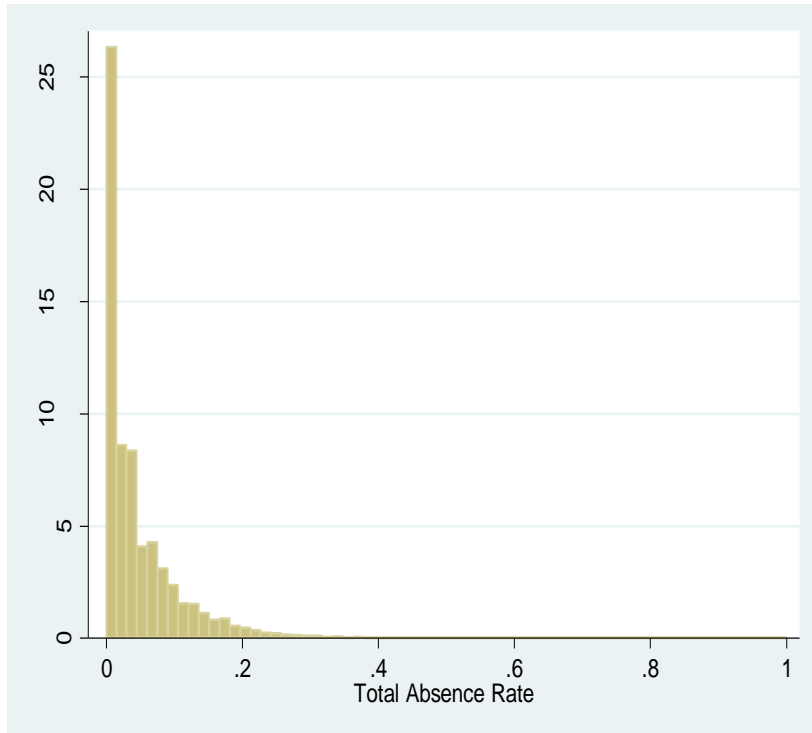
# Absence rate by pupil characteristic



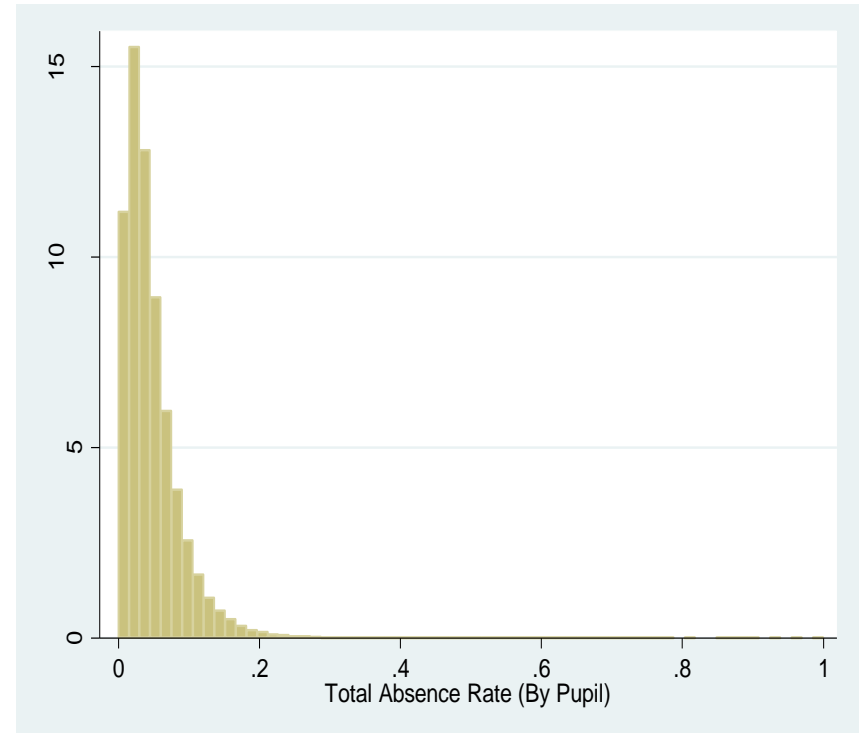
# Absence rate by term



# Absence rate distributions



By observation



By pupil

Variance components (non-mobile pupils):  
observation/pupil/school = 71%/17%/2%

# Data: SEN type

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- Standard NPD Extract: Statemented, School Action Plus, School Action
- Pupils who have a statement of SEN and those at School Action Plus are also recorded with a primary and secondary SEN type (Sensitive data item).
- **SEN Types:** Specific learning difficulty; Moderate learning difficulty; Severe learning difficulty; Profound and multiple learning difficulty; Behaviour, emotional and social difficulty; Speech, language and communication needs; Hearing impairment; Visual impairment; Multi-sensory impairment; Physical difficulty; Autistic spectrum disorder; Other difficulty/disability

# Data: SEN type

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## **BESD:**

*‘a learning difficulty where children and young people demonstrate features of emotional and behavioural difficulties such as: being withdrawn or isolated, disruptive and disturbing; being hyperactive and lacking concentration; having immature social skills; or presenting challenging behaviours arising from other complex special needs. ‘*

- In this study I take the BESD status as at the end of KS2 as the indicator of whether a pupil has BESD.



# BESD peer group variable

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- 'Treatment' variable is the %of BESD peers in a pupils' year group in a given term; averages about 3%.

Enough variation?

- 66% of pupils have at least one BESD peer in their year group at some point during the period studied (about half of these have variation in %BESD of at least +/- 1 BESD peer during this period).

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# Methodology I

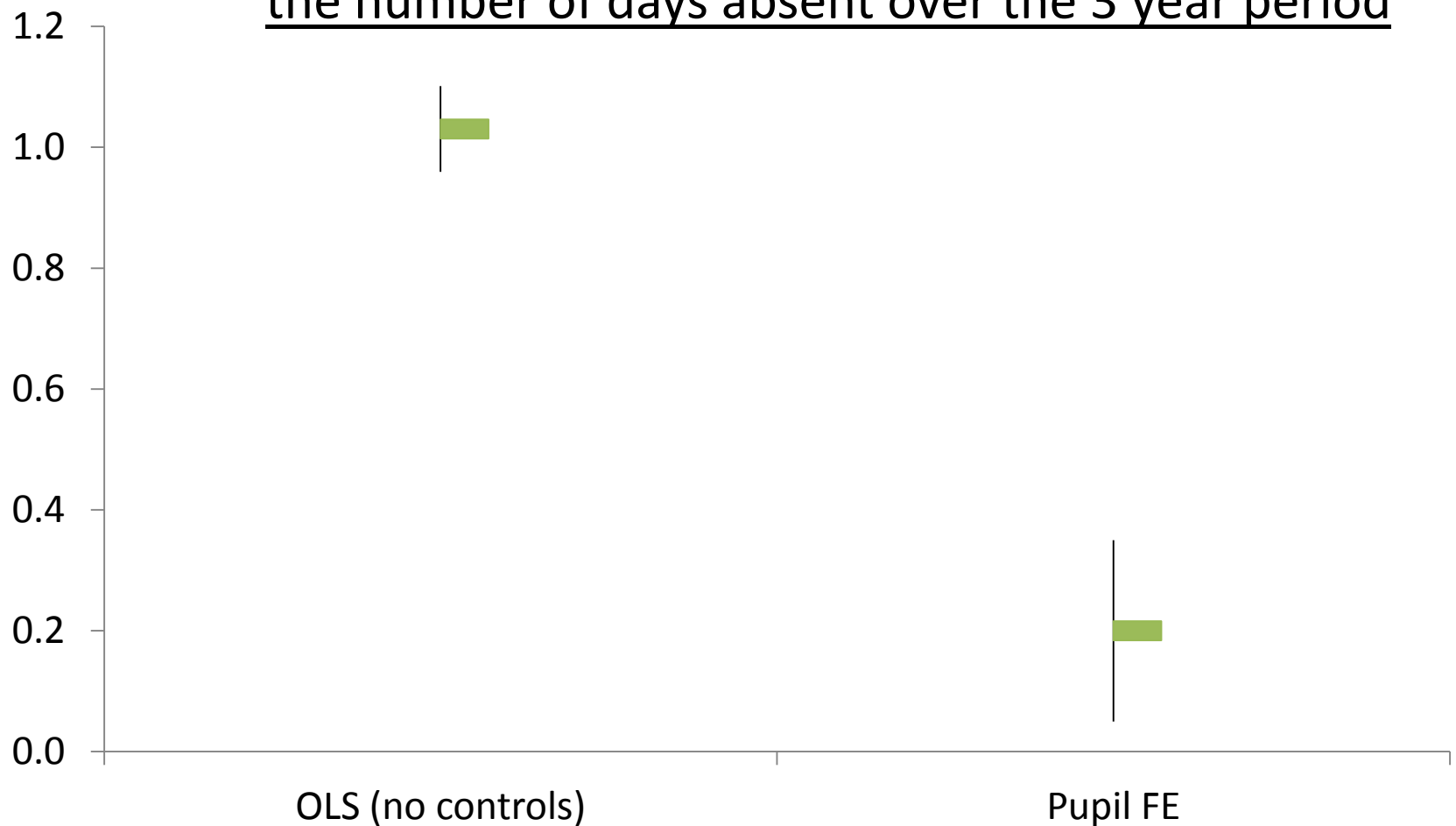
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$$Y_{tij} = \mathbf{x}_{tij}\beta + \mathbf{s}_{t,j}\delta + \gamma(\text{besdpeer})_{t,j} + \mathbf{m}_{ij}\phi + \tau T_t + \theta_j^{(t)} + \alpha_i + \varepsilon_{tij}$$

- Empirical challenge is that pupils who tend to have BESD peers also tend to have characteristics that are associated with higher than average school absence.
- Limited pupil levels controls in the NPD
- Pupil fixed effects models control for all time invariant pupil level characteristics

# Results: Pupil fixed effects

Effect of 1 BESD peer in the averagely sized classroom on the number of days absent over the 3 year period



# Methodology II

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- In pupil fixed effect models the variation in %BESD is generated by both i) the mobility of BESD pupils and ii) the mobility of pupils between schools with different levels of BESD peers.
- Problem: ii) may be associated with confounding variables at the pupil and school levels.
- Testing finds that a move to a school with lower %BESD is associated with a residential move to a less deprived neighbourhood (IDACI) and a reduced likelihood of claiming FSM.

# Methodology III

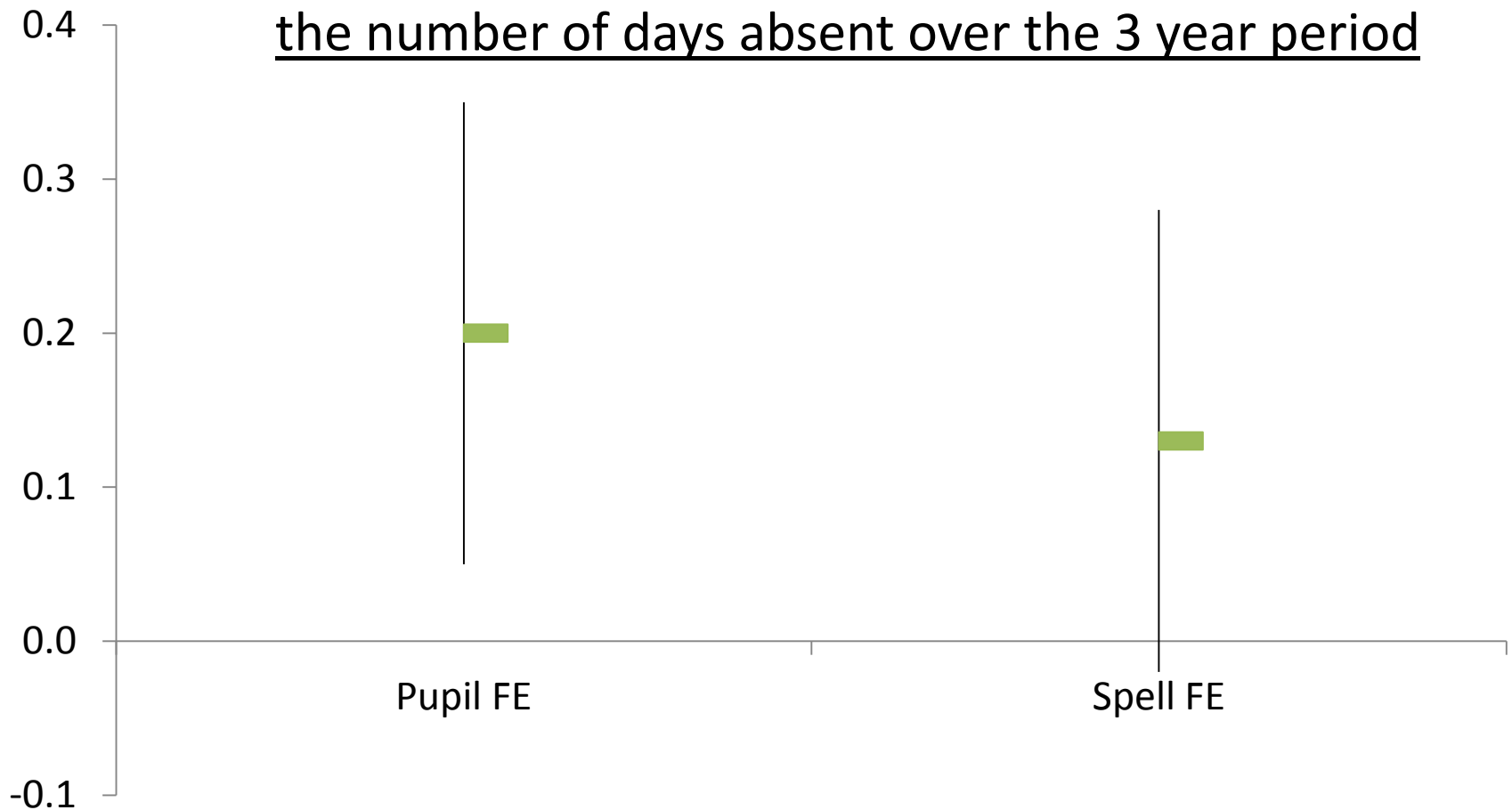
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- The solution is to implement a fixed effect model where the fixed effect is defined as a pupil school pairing – ‘spell fixed effects’.
- Now the only variation in the %BESD is due to the mobility of BESD pupils .
- Causal interpretation is now based on the claim that the *timing* of variation of %BESD for each individual pupil is not correlated with confounding unobserved factors.



# Results: Pupil and spell fixed effects

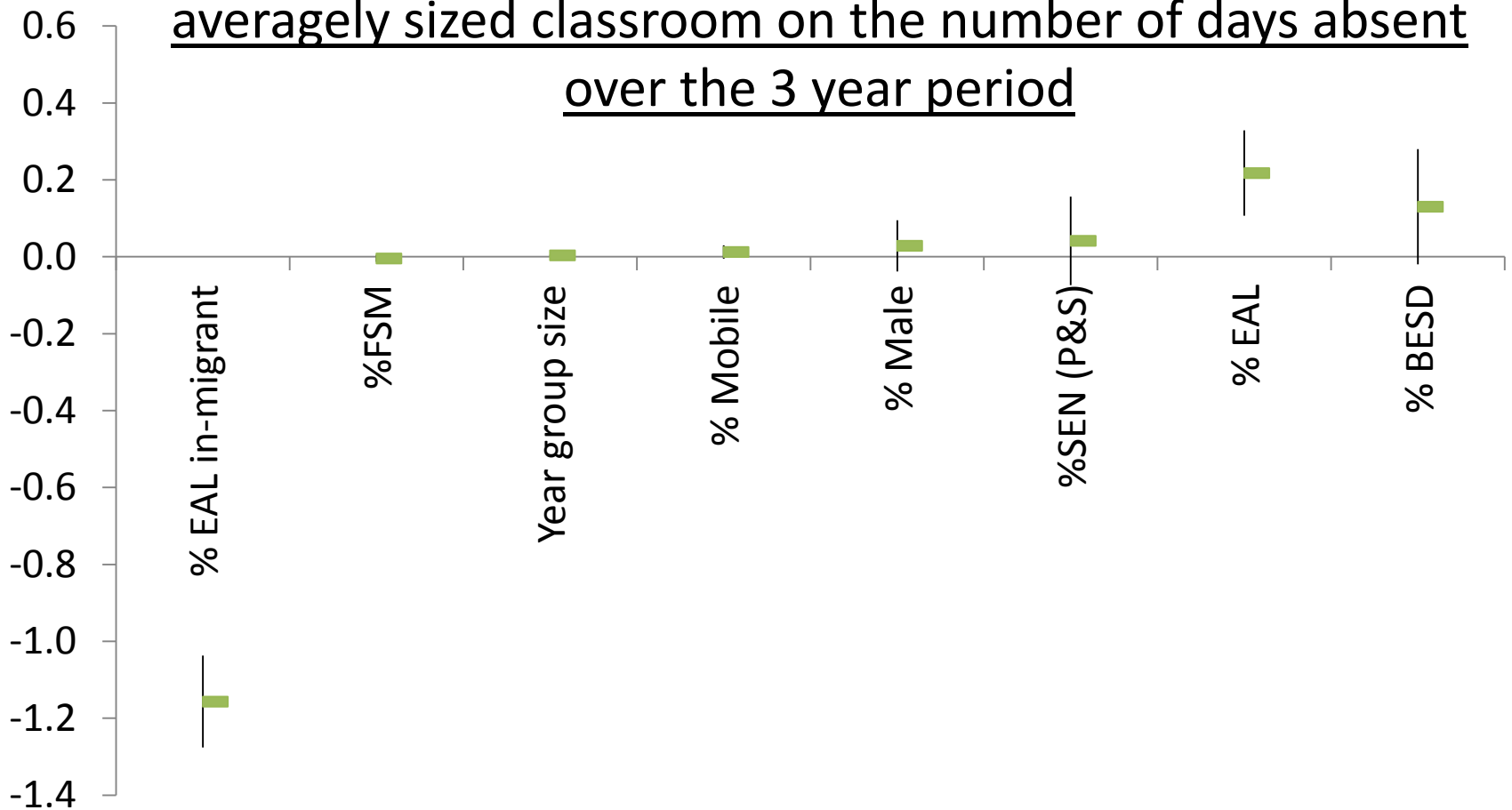
Effect of 1 BESD peer in the averagely sized classroom on the number of days absent over the 3 year period



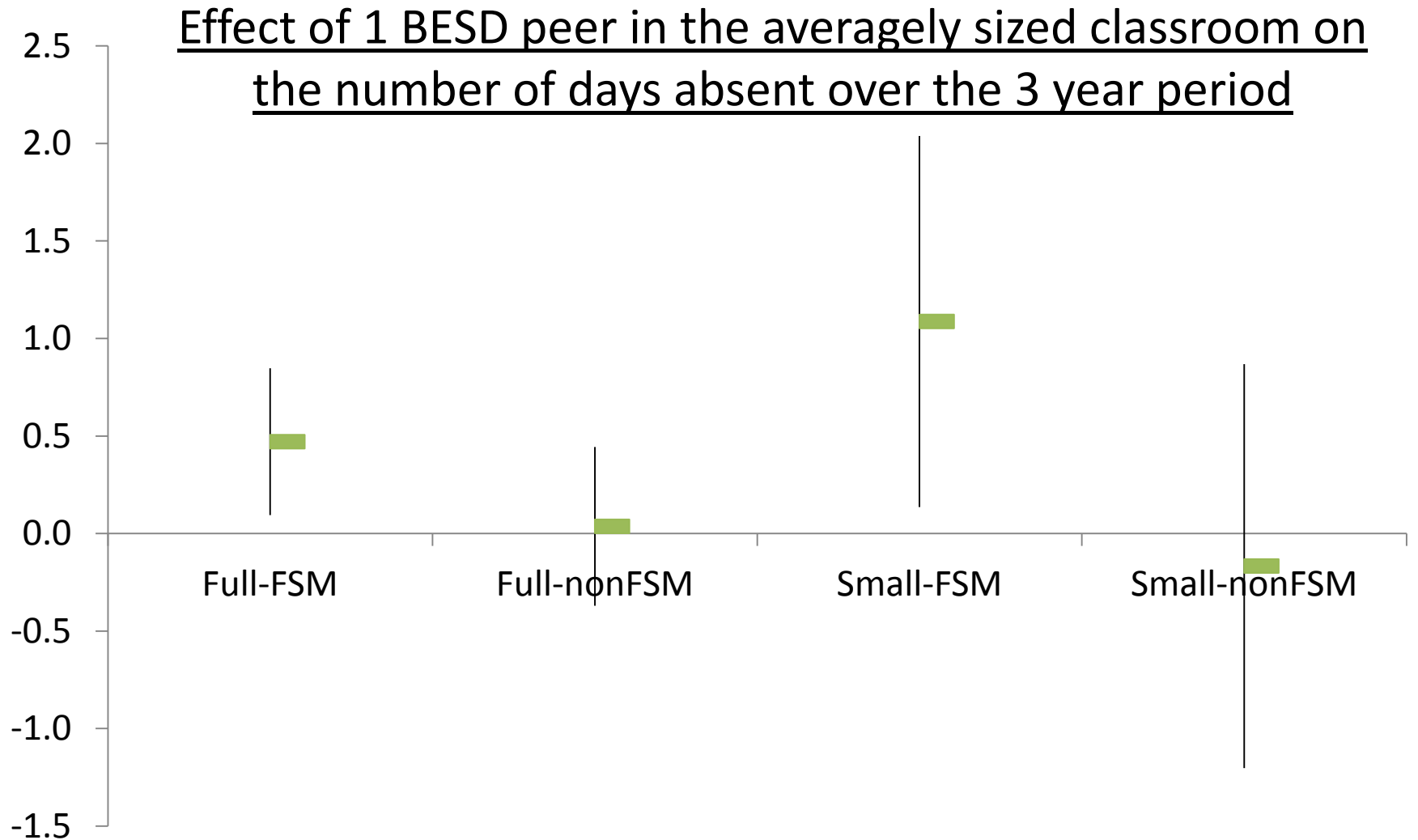


# Results: Other peer group effects (Spell FE)

Effect of 1 additional peer by peer characteristic in the averagely sized classroom on the number of days absent over the 3 year period



# Results: Heterogeneity by FSM status and school size



# Robustness Checks

The estimated effect of %BESD may still be driven by unobserved factors that vary over time with both the %BESD and a pupil's absence rate.

- Removal of time trends; point estimates for %BESD are unchanged but SE increases substantially. Co-efficient on % EAL and % EAL in-migrant reduces to near zero and n.s.
- 'placebo' forward leads of the %BESD variable: co-efficient on forward lead = 0.

# Discussion

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- Overall, little evidence of an effect on school absence from BESD peers on average. However there do appear to be small effects on FSM pupils' absence.(FSM pupils are on average absent for 30 days over the final three years of primary school. )
- Finding of heterogenous effects by FSM status concur with the two similar studies in the US and other work that suggests that non-academic peer effects from disruptive pupils are stronger for economically disadvantaged pupils.
- Broader conclusions about i) externalities of early years development, and, ii) the drivers of the attainment gap between FSM and non-FSM pupils.

# Further work

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- Using time varying BESD status
  - Does identification reduce negative effects?
- Relating peer effects, absence and attainment
  - Do the estimated effects on absence translate into reduced attainment?
- Using additional cohorts of data
  - Help with problem of lack of variation & effect heterogeneity/non-linear effects
- Predictive uses of absence data? Complementary to prior attainment?

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