



The effect of school spending on different types of pupils

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Using school resources effectively: what is the evidence base? 17 March, London

Background

Increasing amounts of money are being spent in schools around the world.

- England: real increase from £3,060 in 2000 to £5,180 in 2010 per pupil.
 - Britain in 2009 spent 4.5% of GDP on schooling compared to EU average of 3.8%.
- is it worth spending more?



Background 2

Attainment has improved in Britain over last decade, but attainment gaps between students from different backgrounds remain

- FSM half as likely to obtain good school-leaving results at age 16 as non-FSM pupils
- SEN pupils less than a third as likely to obtain good school-leaving results as non-SEN
- Black Caribbean boys lag behind

Why do we care?

Differences between pupils persist and exacerbate over the life span: “self-productivity and dynamic complementarity”

Background 3

Raising attainment of disadvantaged groups is a policy objective: Introduction of the Pupil Premium in England in 2011: a premium for each FSM pupil with the aim of closing attainment gaps (2013/14: £900; 2014/15: £1,330 (primary), £935 (secondary)).

This research predates pupil premium but can help answer:

- Which groups benefit more/less from money spent in school?
- What types of expenditure benefit which groups of pupils?
- How to spend money to close attainment gaps?

Returns to school expenditure (England)

Increasing expenditure per pupil by £1000 increases test scores by xx of a standard deviation:

- 1.8% Maths, 6.8% Science and -2.5% English at age 14, (Steele et al. 2008)
- 4-5% at age 11, (Holmlund et al. 2010)
- 25% at age 11 in urban schools (Gibbons et al. 2011)
- 6% at age 16 (Nicoletti & Rabe 2012)

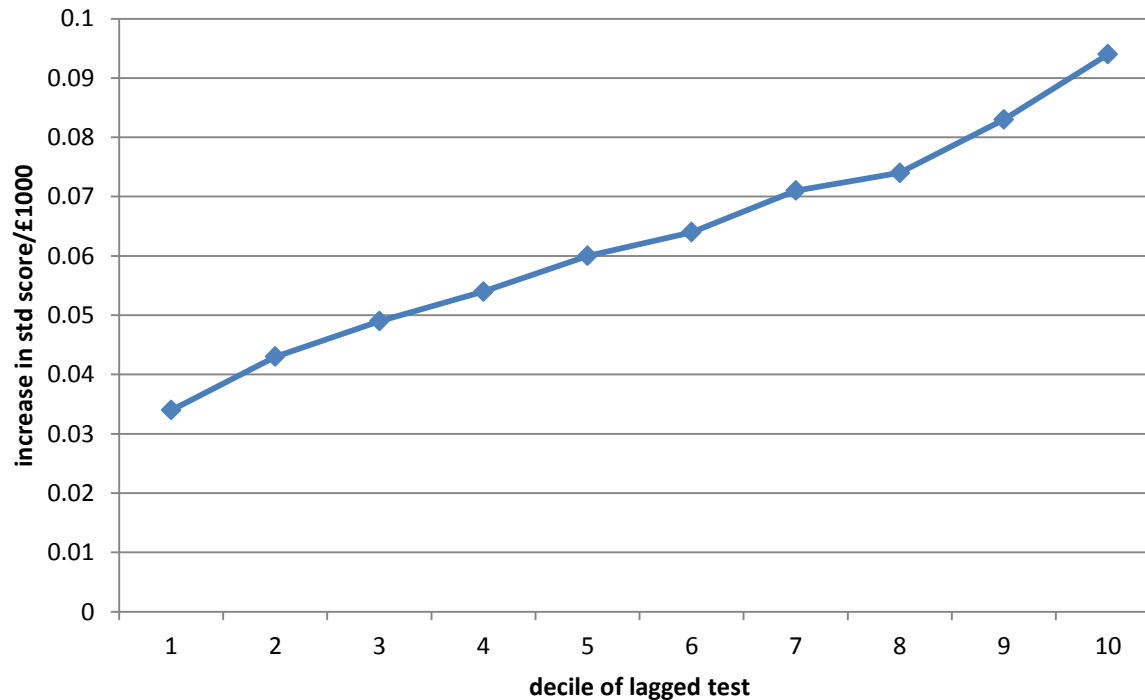
How much is this: In GCSEs, to get from a grade B to a grade A need to increase test scores by 90% of a standard deviation

What we do

- Use NPD data on pupils taking GCSEs 2007-2010, matched to CFR data
- Estimate “education production model” to investigate effect of school spending on pupil test results
- Similar schools can have substantially different funding levels:
 - 23% real increase in spending between 2005 and 2010
 - Funding allocation rules vary regionally and Spend-plus Methodology and Minimum Funding Guarantee drive wedge between need and funding
 - We control for factors used in funding allocation formulas
- Distinguish students with different levels of past abilities
- Distinguish students belonging to different (target) groups
- Distinguish between different types of expenditure

Pupils with different levels of past test scores

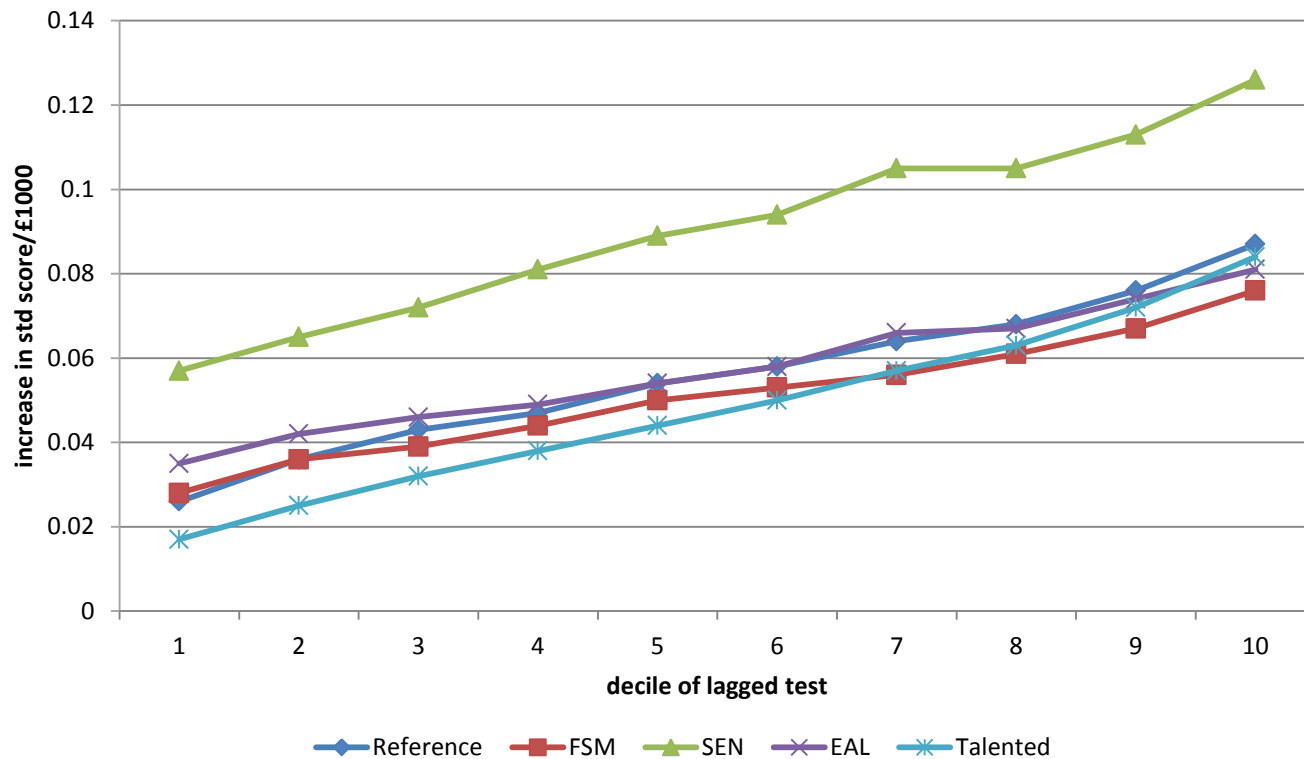
Effect of expenditure per pupil
by attainment at the end of primary school

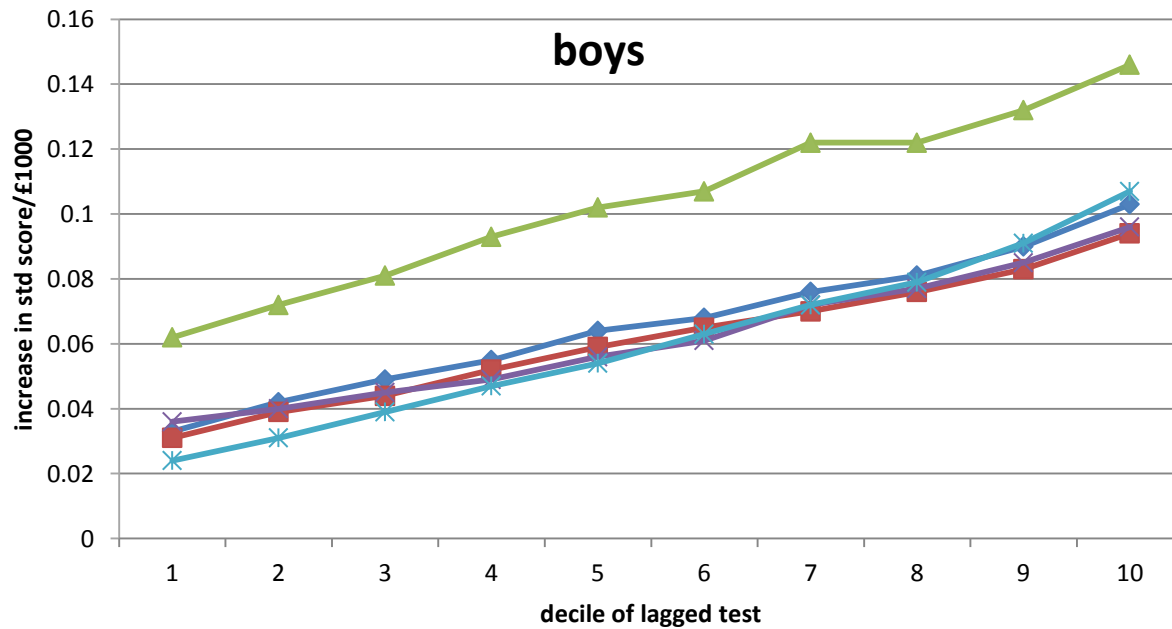
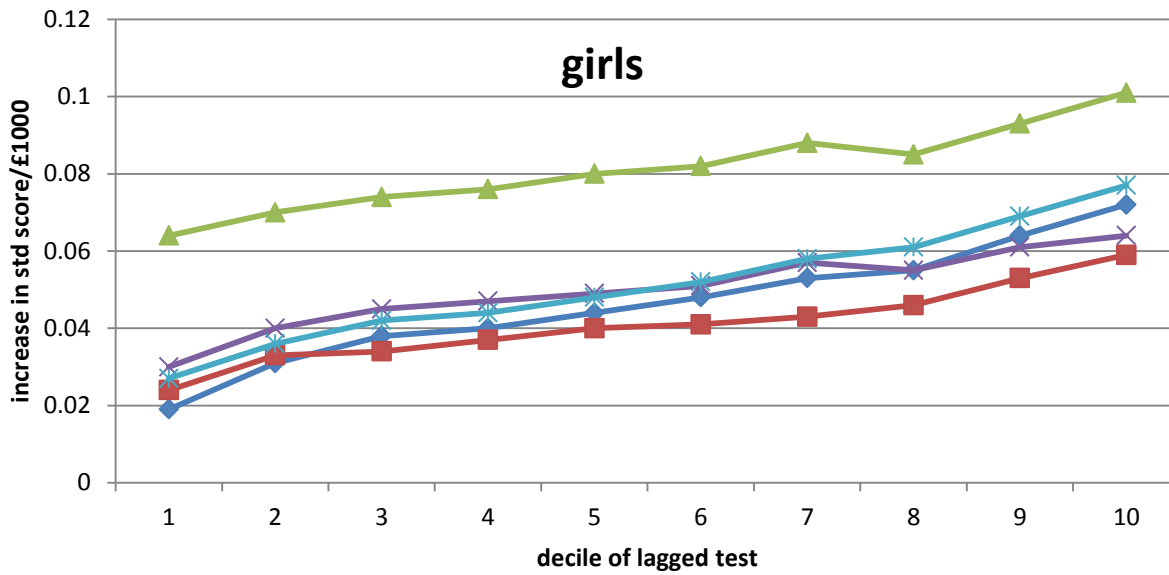


- Past high achievers subsequently get more out of school inputs,
- Need to make group comparisons at same levels of past skills

Target groups

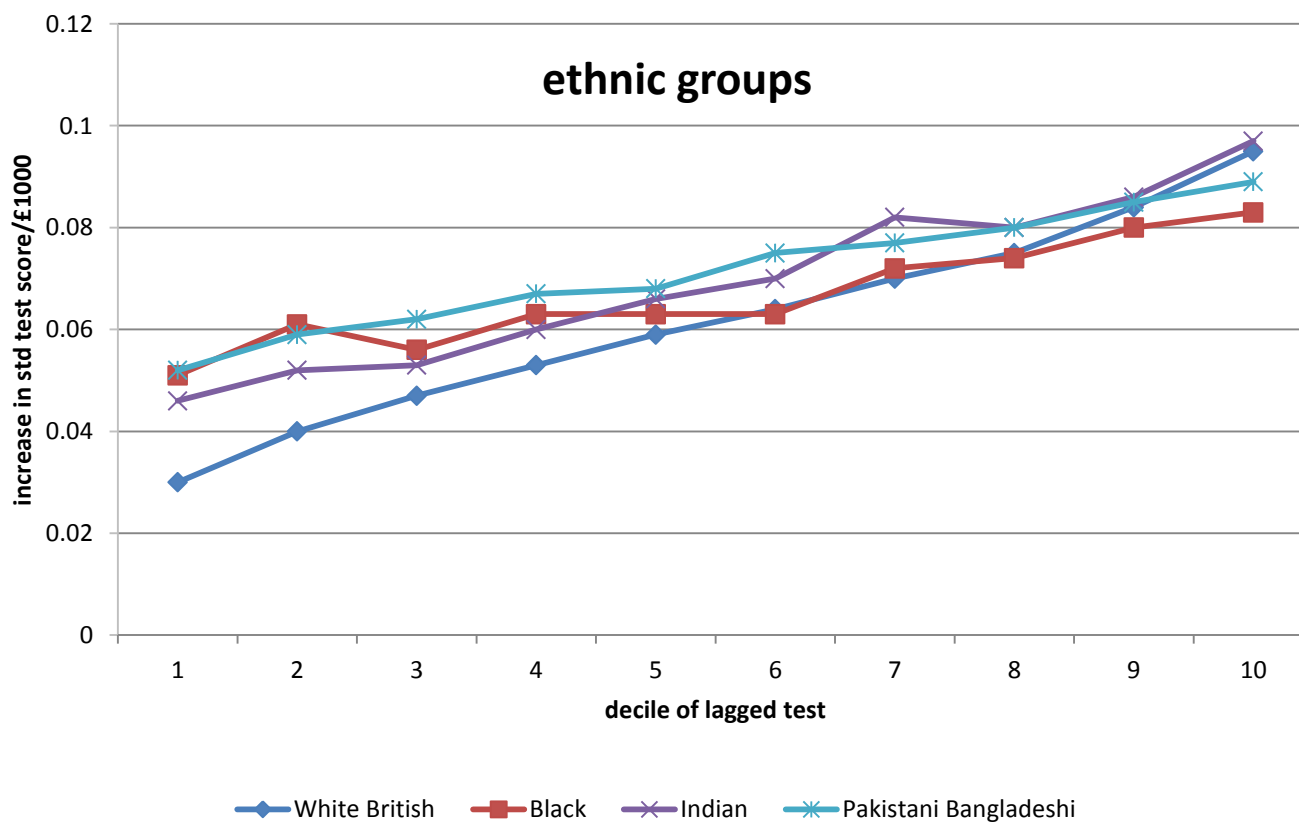
Effect of expenditure per pupil by target group and past attainment decile





Ethnic groups

Effect of expenditure per pupil by ethnic group and lagged attainment decile

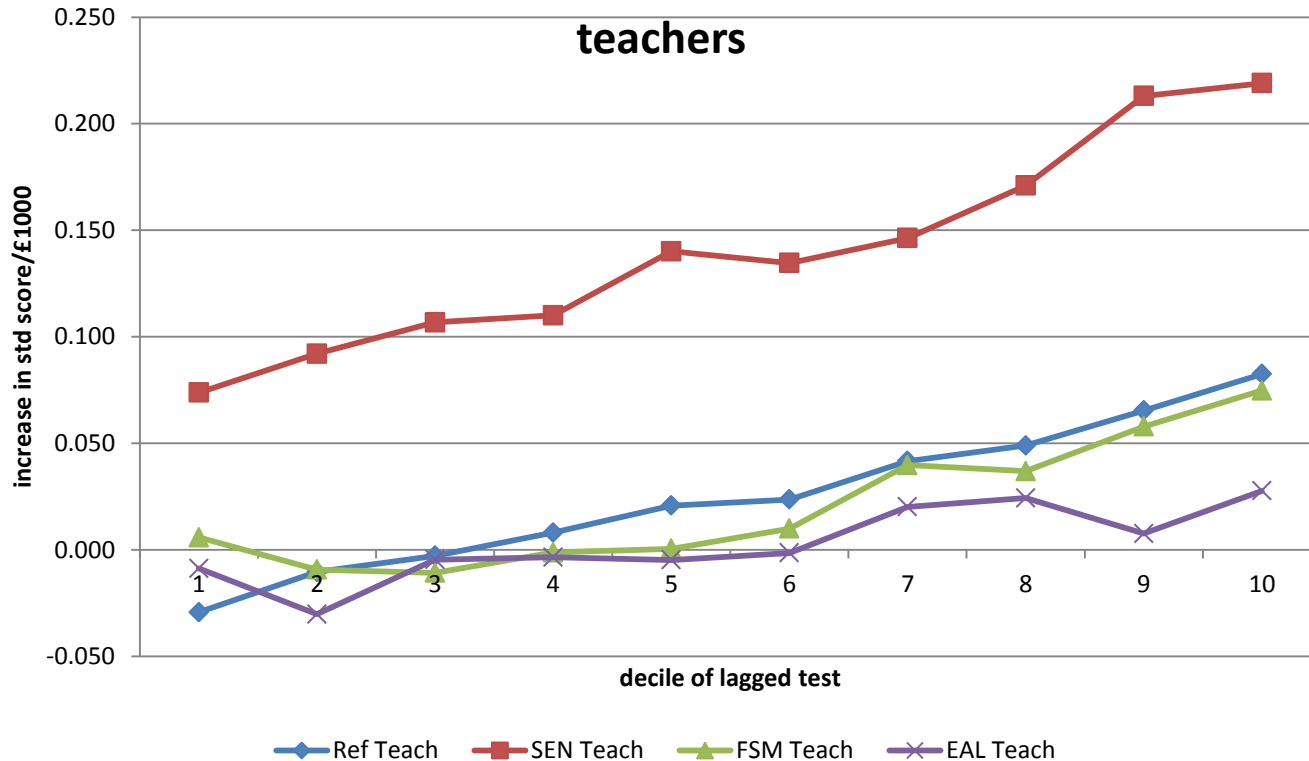


Types of expenditure in schools

<i>School expenditure</i>	mean	std dev
Expenditure per pupil (£)	4,959	689
Expenditure teaching staff (£)	2,883	296
Expenditure education support staff (£)	418	162
Expenditure supply teachers (£)	105	65
Expenditure learning resources (£)	327	118
Other expenditure (£)	1,499	362

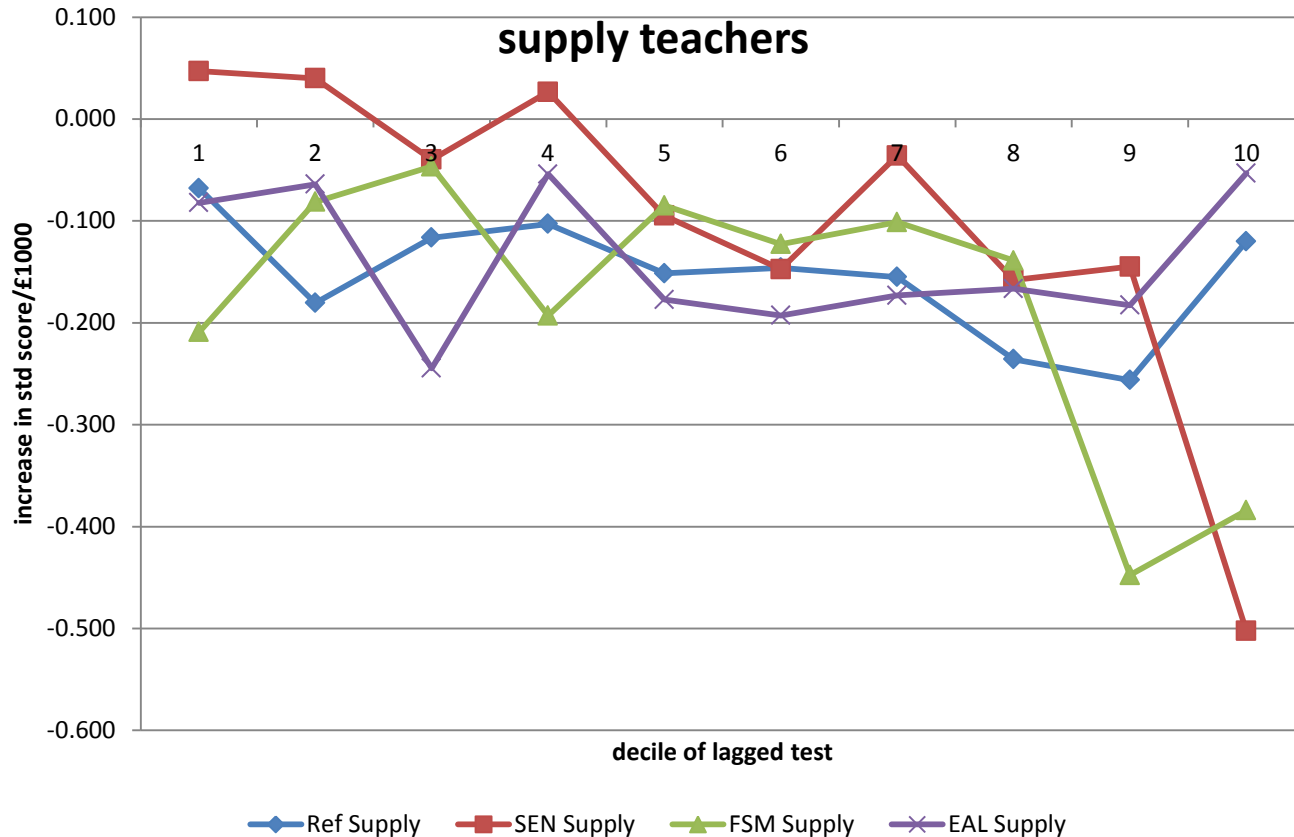
NB: school spending may be related to unobserved school characteristics that also affect outcomes. We largely control for unobserved school characteristics by estimating sibling FE models on siblings attending same school.

Effect of expenditure per pupil on teachers



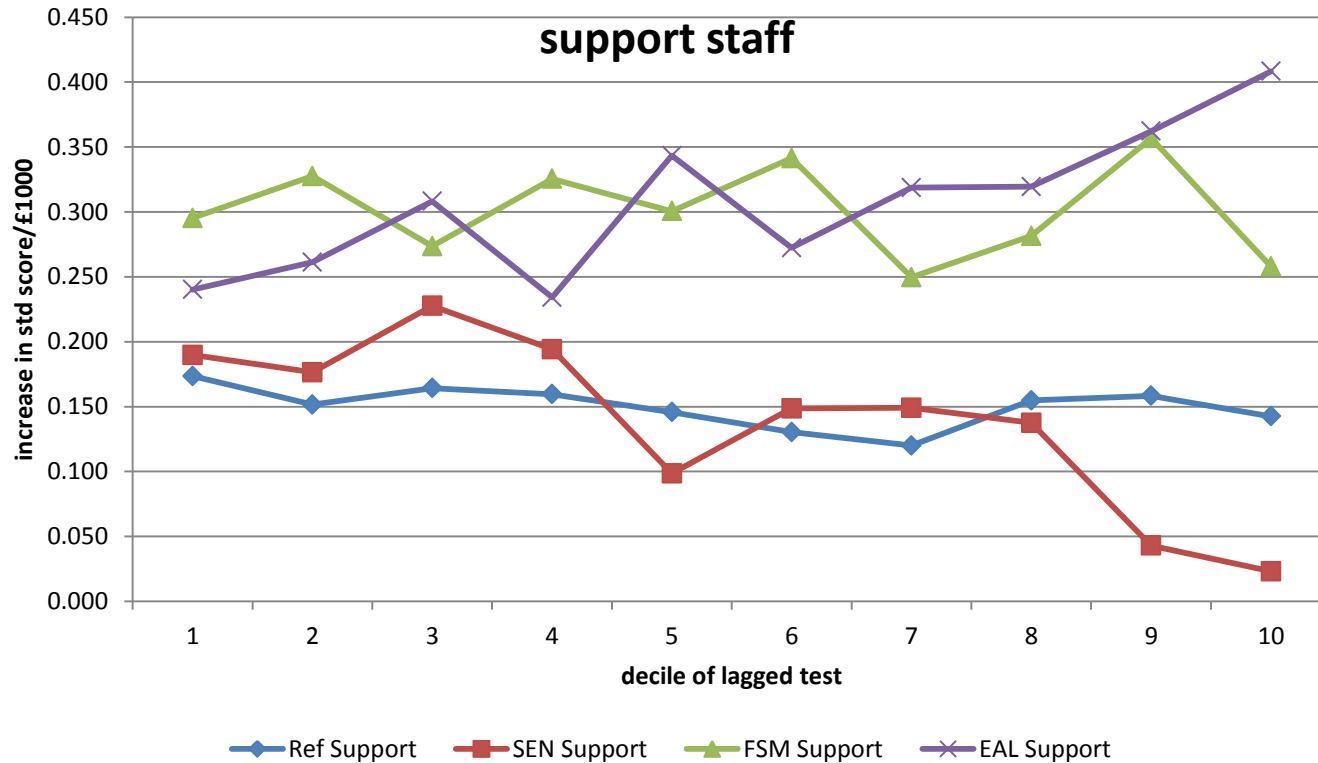
- Teaching expenditure follows pattern of dynamic complementarity
- Teachers most productive for SEN children

Effect of expenditure per pupil on supply teachers



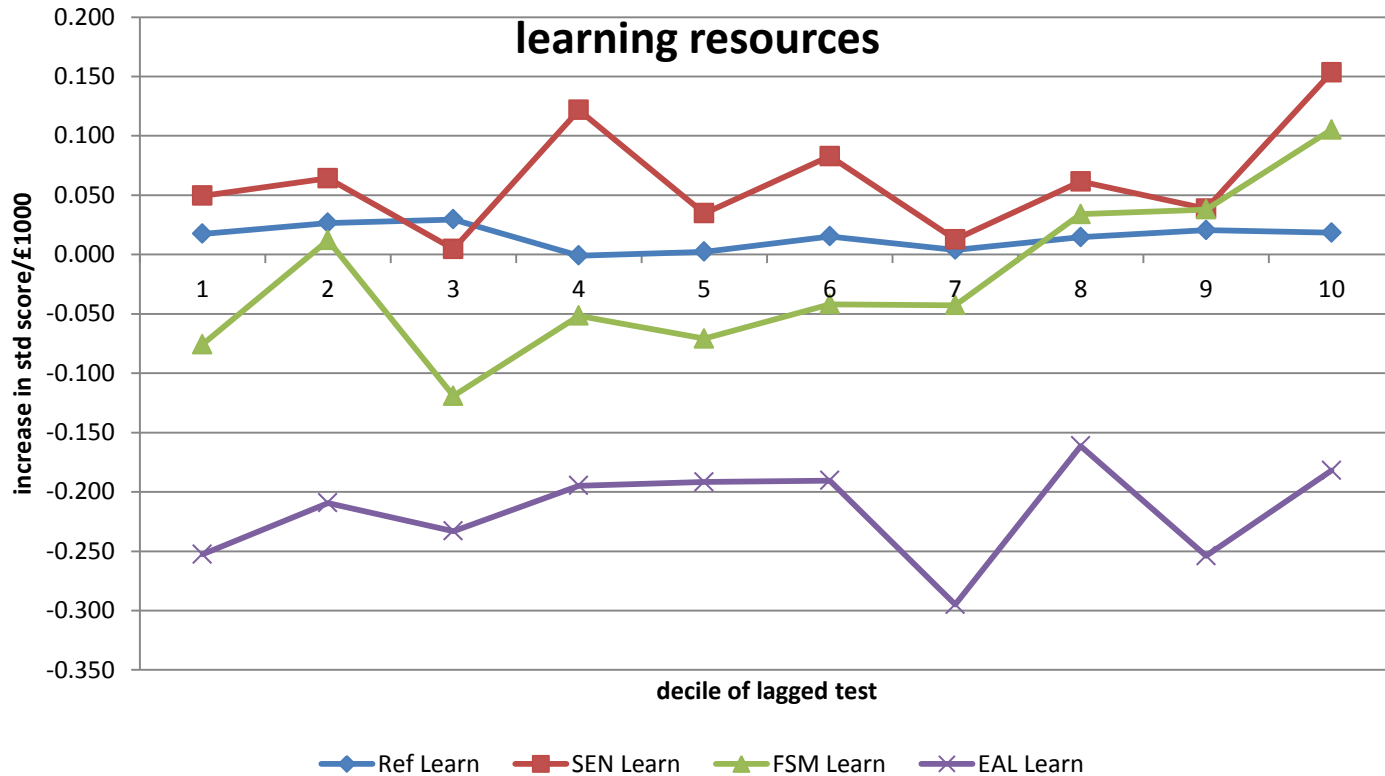
→ Supply teachers are not good for learning

Effect of expenditure per pupil on support staff



→ Education support staff have equalising effect and help EAL & FSM pupils

Effect of expenditure per pupil on learning resources



→ Learning resources have equalising effect and help SEN pupils in particular

Conclusions

Three main factors affect productivity of school expenditure per pupil:

1. the level of the pupil's lagged cognitive ability (dynamic complementarity)
2. the extra help schools usually give to subgroups of pupils, especially low achievers, and
3. the way schools spend their money.

Conclusions 2

For policy some conclusions are:

- Example of SEN success shows that priorities in school can make a difference to outcomes for pupils. Indication that able FSM girls should be targeted more, 'quietly non-achieving'.
- Weight national funding formula in favour of early years, i.e. primary school.
- Teaching assistants have been effective in helping FSM and EAL pupils - benefit of small group and one-on-one sessions
- Temporary teachers from supply agencies are ineffective on average, own-school staff to cover absences may be better



Thank you for coming today
to discuss our results!