

# Does leadership matter for school performance?

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SPINTAN workshop, 12/13 November 2015

Provisional: please do not quote or cite

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This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement No. 612774

## Acknowledgements

- This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no. 612774
- We thank the Department for Education for granting access to data from the National Pupil Database and School Workforce Census.
- All errors and omissions remain the sole responsibility of the authors.



- This study aims to explore the role of intangibles in school performance, through a case study for schools in England
- Focus on organisational capital component of intangibles – using detailed administrative data on the school workforce – this allows us to identify staff in leadership roles
- Also contributes to discussion on which occupations should be used in measurement of organisational capital within public sector services such as education and health

- Academic and policy concern over pupil attainment in England
- Particular concerns over high variance in attainment both across and within schools
- Introduction of “academies” is major reform in England’s education system – academy schools have greater freedom to make decisions (including over staffing, curriculum and other aspects of school organisation)

- Cross-country evidence (*Bloom et al., 2015*) shows:
  - better educational outcomes are positively associated with management quality
  - management is of higher quality in schools with greater autonomy
- In England, pupils perform better in schools converting to academies compared with pupils in “like” schools (*Eyles and Machin, 2015*)
  - Improvement greatest in schools which gained most autonomy
- Suggest key mechanisms for improvements are changes in head teachers, management structure, and curriculum change



- This study explores the relationship between school leadership and school performance
- We consider
  - Impact of the leadership group
  - Broader leadership roles
  - School autonomy
  - Teacher inputs
  - Other resources
- Analysis currently focuses on secondary schools, using three years of data from 2010/11 to 2012/13

- **School Workforce Census**
  - Census of all publicly funded schools in England
  - Conducted annually, available since 2010
  - Contains information on occupation, pay, qualifications, absence, etc.
- **National Pupil Database**
  - School Census: provides information on school characteristics, such as school type, size and pupil intake
  - Key Stage 4 attainment data: provides information on attainment at age 16
- **Ofsted**
  - school inspection results
  - include ratings for quality of teaching and quality of leadership and management

- Financial returns
  - Provide information on school expenditure and income
  - Collected separately for academies (some differences in format, particularly in earlier years)
  - Expenditure categories include:
    - Teachers
    - Supply teachers
    - Educational support staff
    - Other staff
    - Premises
    - Energy
    - Back office
    - Catering
    - Learning resources
    - ICT resources
    - Other





## Analysis sample: number of secondary schools

	2010/11	2011/12	2012/13
School Census	3312	3267	3285
School Workforce Census	3307 (99.8%)	3251 (99.5%)	3265 (99.4%)
KS4 attainment	3043 (91.9%)	3028 (92.7%)	3057 (93.1%)
Finance data	2803 (84.6%)	2837 (86.8%)	2957 (90.0%)
In all 3 years (SLC, SWF, KS4)	2867 (86.6%)	2867 (87.8%)	2867 (87.3%)
In all 3 years (SLC, SWF, KS4 & finance)	2361 (71.3%)	2361 (72.3%)	2361 (71.9%)

Note: Figures shown in parentheses are number of schools as % of all secondary schools in School Census

## Model specification

We estimate pooled cross-sectional estimates:

$$Y_s = X_s \beta + R_s \gamma + T_t \delta + I_s \kappa + Y_{s-1} + u_s$$

where

- $Y_s$  = average attainment at age 16 in school  $s$
- $Y_{s-1}$  = average attainment at age 11
- $X_s$  = school characteristics
- $I_s$  = leadership and teacher characteristics
- $T$  = year dummies
- $R_s$  = school expenditures

We also use panel element of data to estimate school fixed effects

$$y_{st} = X_{st} \beta + R_{st} \gamma + T_t \delta + I_{st} \kappa + c_s + y_{st-1} + u_{st}$$

where

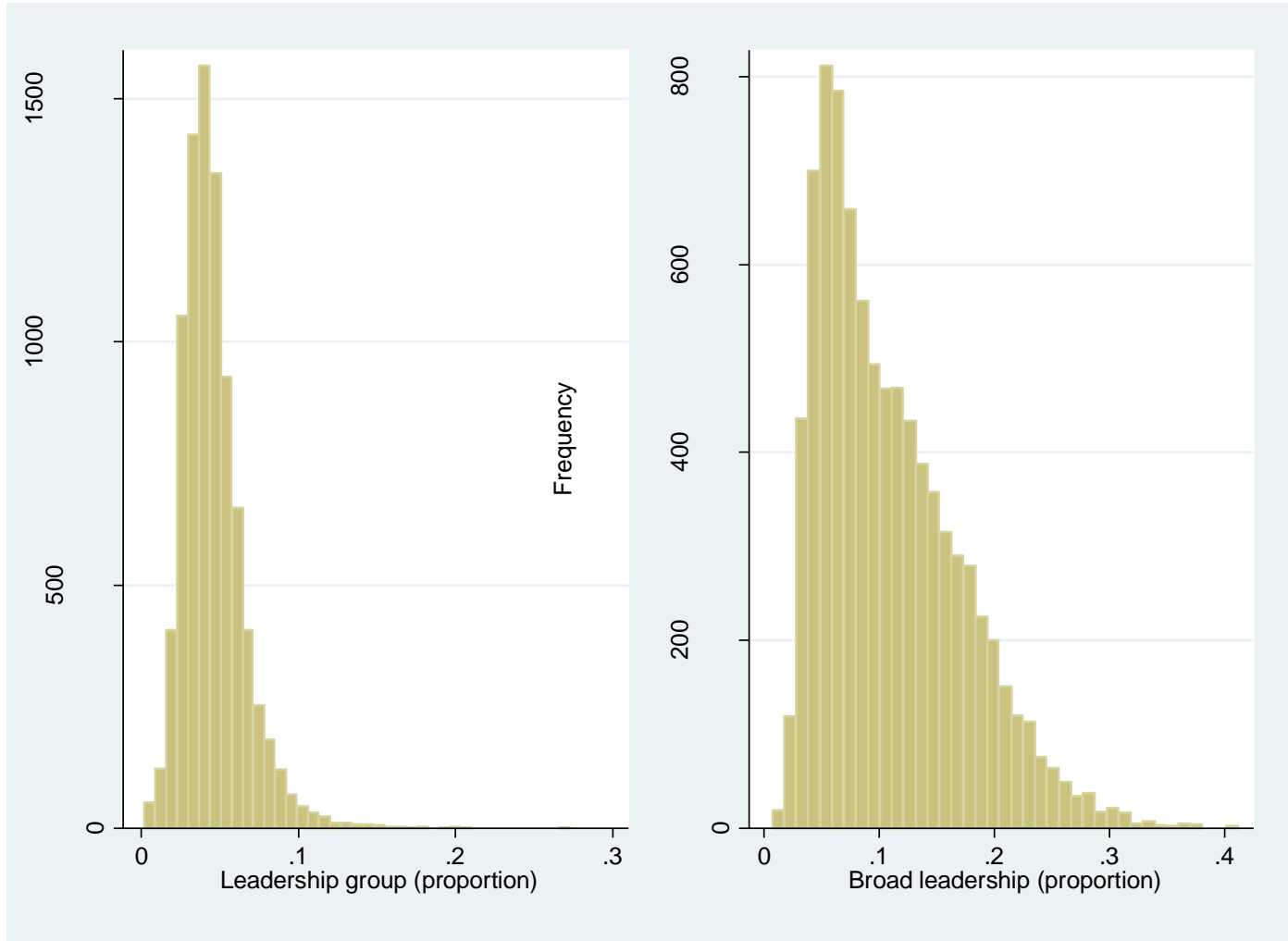
- $c_s$  = school-specific unobserved time-invariant characteristics



## Identifying school leaders

- We have information on both **post** and **role**
- **Post** allows us to identify heads, deputies and assistants (“leadership group”)
- **Role** additionally allows us to identify other leadership roles, specifically:
  - Bursar, Business manager, Head of House, Head of Department, Head of Year, Learning manager, SEN Co-ordinator
  - We combine these categories to construct “broad leadership group”
- Both leadership measures constructed as % of total school workforce
- On average, the leadership group accounts for almost 5% of the workforce, compared with around 11% for the broad leadership group

# Variation in leadership group within schools

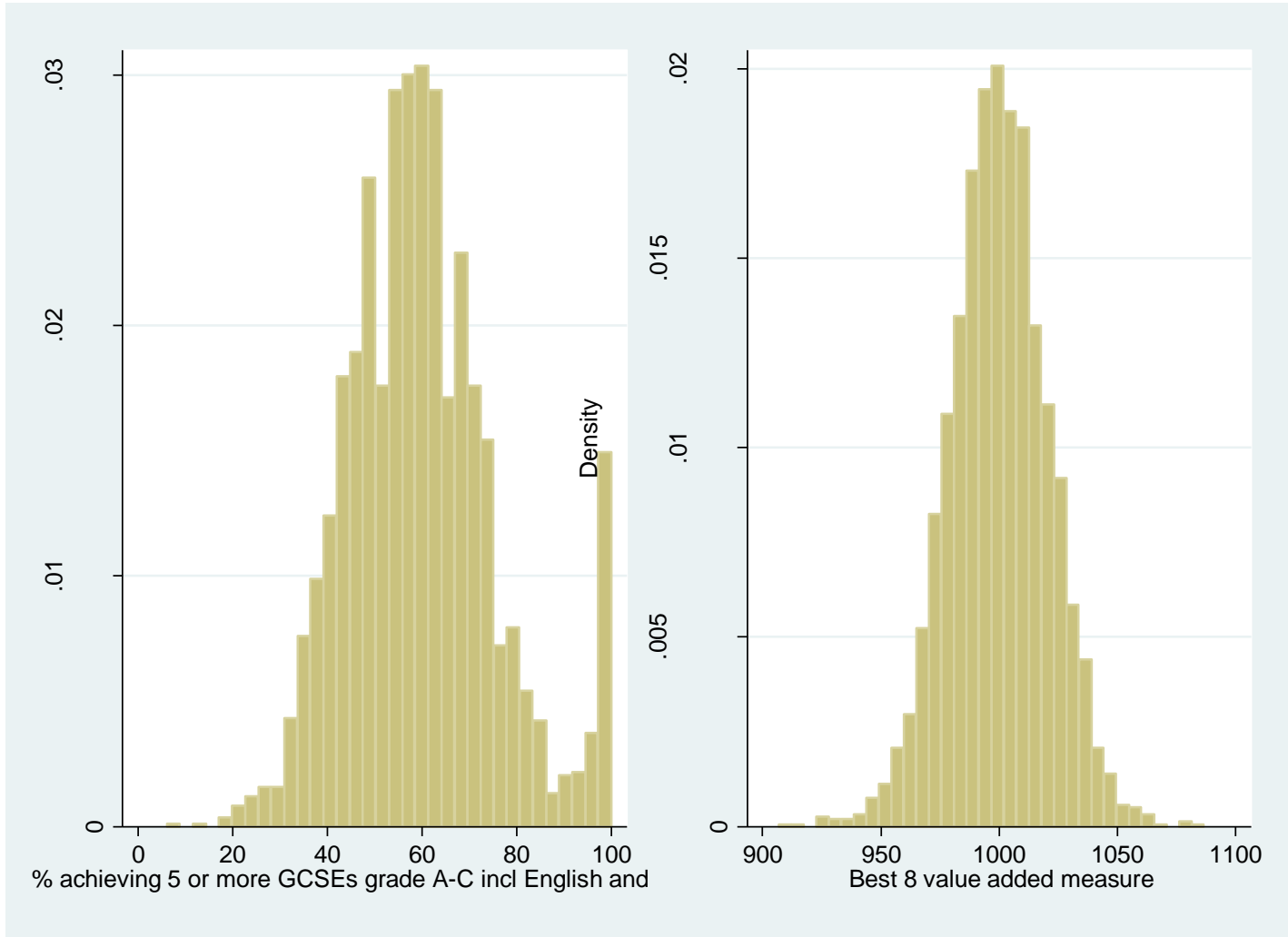


- Measure of autonomy
  - Schools scored based on approach in Eyles and Machin (2015)
  - Points awarded for various aspects of autonomy
  - Scale ranges from 0 (least autonomy – community schools) to 4 (most autonomy – independent schools)
  - Academies scored 3 (highest possible score in our data as no independent schools in sample)
- Teachers
  - Proportion of workforce
  - Expenditure on teachers

## Measures of school performance

- Percent of pupils achieving 5 or more GCSEs (or equivalents) at grade A\*-C including English and Mathematics
  - headline measure of pupil attainment
  - often used in school league tables
  - forms part of government’s “floor standards” (threshold of 40% in 2013)
- Best 8 value added
  - measure of pupil progress from end KS2 to end KS4 (from approximately age 11 to 16)
  - points awarded for each achieved GCSE grade; the “best 8” are summed

# Performance, age 16 attainment



## % achieving 5 A\*-C grades (including E&M)

	OLS			FE		
	(1)Raw	(2) With controls	(3) Controls & finance	(1)Raw	(2) With controls	(3) Controls & finance
Broad leaders	2.61 (1.53)	4.2** (2.54)	3.77** (2.30)	-1.54 (-0.43)	0.94 (0.27)	0.42 (0.12)
Leadership group	19.4*** (3.62)	25.08*** (4.79)	26.89*** (5.15)	-7.8 (-0.94)	-11.71 (-1.43)	-10.87 (-1.33)
Teachers	16.85*** (14.23)	8.34*** (6.96)	6.05*** (4.88)	1.1 (0.59)	1.16 (0.63)	0.99 (0.53)
Autonomy	1.01*** (13.13)	0.85*** (10.99)	0.76*** (8.88)	0.30*** (3.26)	-0.26** (-2.48)	-0.28** (-2.46)
R2	0.69	0.72	0.73	0.12	0.15	0.15
N	8737	8737	8737	8737	8737	8737

Controls: % eligible for FSM, % male, number of pupils, % British, % SEN, % English as Additional Language. Models also include prior attainment and gender of headteacher



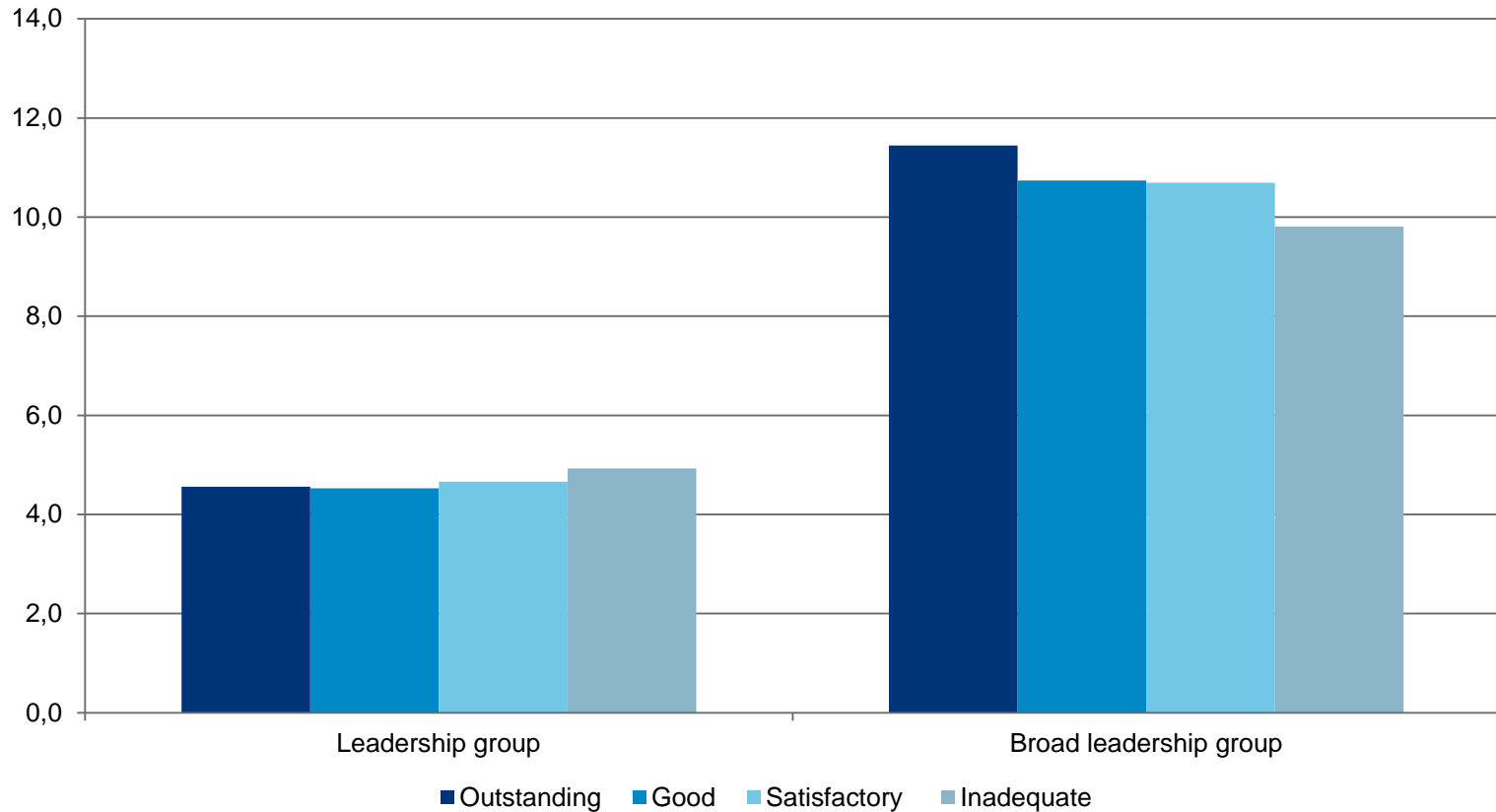
## Best 8, value added

	OLS			FE		
	(1)Raw	(2) With controls	(3) Controls & finance	(1)Raw	(2) With controls	(3) Controls & finance
Broad leaders	13.74*** (3.61)	16.00*** (4.29)	14.47*** (3.93)	-1.06 (-0.17)	-1.80 (-0.29)	-3.06 (-0.49)
Leadership group	58.08*** (4.97)	80.46*** (6.82)	82.78*** (7.07)	7.06 (0.49)	-0.64 (-0.04)	0.36 (0.03)
Teachers	36.75*** (14.90)	14.42*** (5.47)	10.02*** (3.64)	-3.22 (-0.98)	-1.65 (-0.50)	-2.20 (-0.67)
Autonomy	2.68*** (15.66)	2.72*** (15.56)	2.35*** (12.14)	-0.25 (-1.57)	-0.17 (-0.90)	-0.09 (-0.46)
R2	0.07	0.16	0.18	0.00	0.01	0.02
N	8737	8737	8737	8737	8737	8737

Controls: % eligible for FSM, % male, number of pupils, % British, % SEN, % English as Additional Language. Models also include prior attainment and gender of headteacher

# Leadership and Ofsted

**% leaders by Ofsted rating for leadership quality**



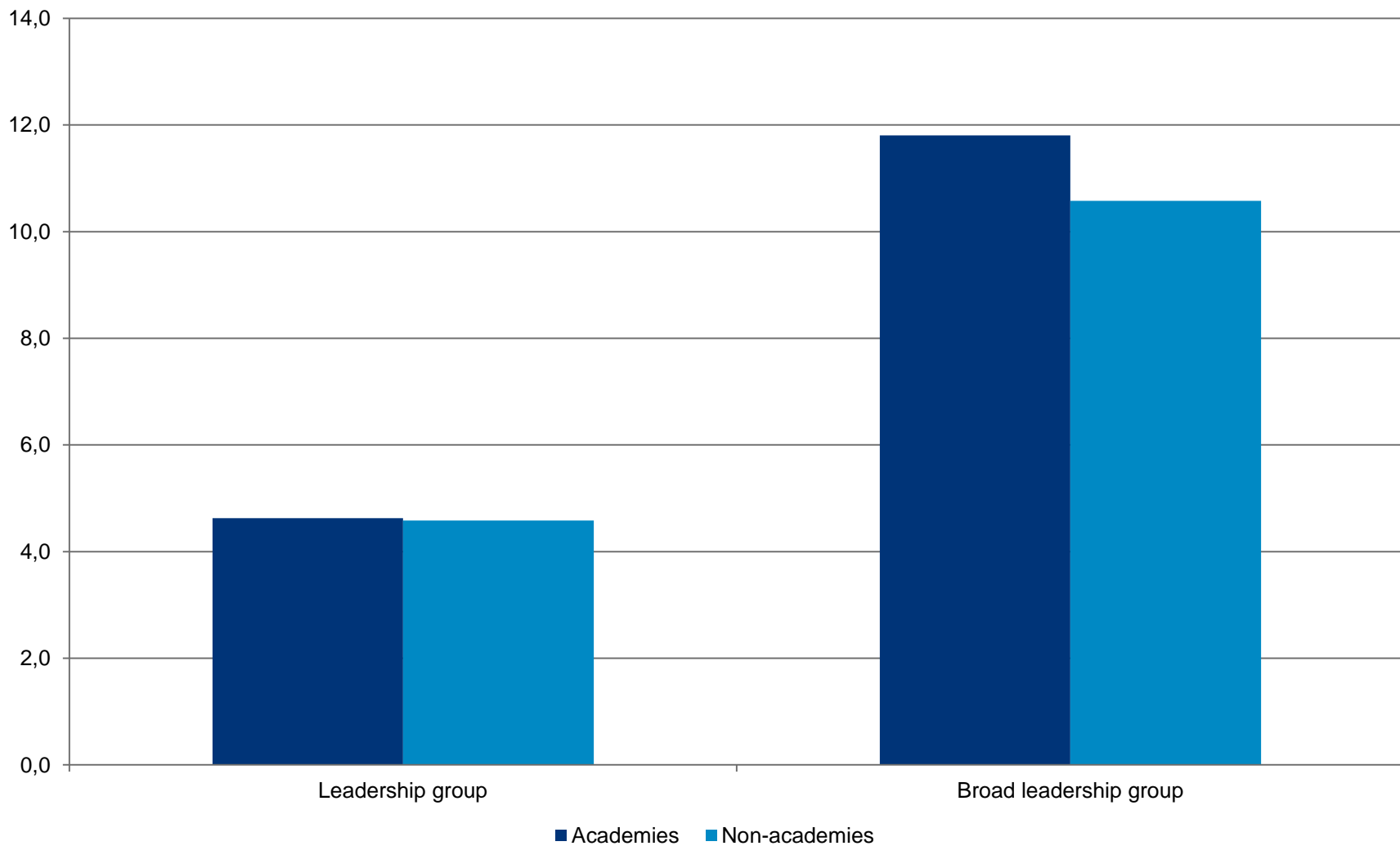
# Regression results, including inspection ratings

	% achieving 5 A*-C grades (including E&M)			Best 8 value added		
	(1) Raw	(2) With controls	(3) With controls and finance	(1) Raw	(2) With controls	(3) With controls and finance
Broad leaders	1.47 (0.98)	2.55 * (1.71)	2.14 (1.44)	9.57 *** (2.83)	9.82 *** (2.90)	8.55 ** (2.55)
Leadership group	17.14 *** (3.61)	19.26 *** (4.07)	21.02 *** (4.46)	80.5 *** (7.74)	76.74 *** (7.18)	78.52 *** (7.38)
Teachers	11.62 *** (11.04)	5.97 *** (5.52)	4.13 *** (3.68)	14.87 *** (6.64)	3.82 (1.59)	1.62 (0.65)
Autonomy	0.62 *** (9.05)	0.44 *** (6.21)	0.39 *** (4.94)	1.67 *** (10.88)	1.74 *** (10.84)	1.5 *** (8.46)
Ofsted - teaching	4.54 *** (18.22)	3.84 *** (15.87)	3.73 *** (15.53)	8.66 *** (15.53)	7.5 *** (13.67)	7.23 *** (13.30)
Ofsted- leadership	1.3 *** (5.44)	1.4 *** (6.08)	1.4 *** (6.12)	3.2 *** (5.94)	3.2 *** (6.10)	3.19 *** (6.14)
Ofsted - missing	20.14 *** (47.72)	18.22 *** (43.65)	18.1 *** (43.51)	43.92 *** (47.86)	40.05 *** (43.23)	39.44 *** (42.70)
r2	0.76	0.77	0.78	0.27	0.31	0.33
N	8737	8737	8737	8737	8737	8737

Controls: % eligible for FSM, % male, number of pupils, % British, % SEN, % English as Additional Language. Models also include prior attainment and gender of headteacher

# Leadership and academy status

% leaders by academy status



## By academy status

	5 A*-C grades, incl E&M			Best 8 value added		
	(1) Raw	(2) With controls	(3) With controls and finance	(1) Raw	(2) With controls	(3) With controls and finance
<b>Academies</b>						
Broad leaders	4.2 (1.39)	5.87* (1.95)	5.85 (1.96)	17.14** (2.52)	17.09** (2.53)	16.96** (2.54)
Leadership group	21.52** (2.38)	16.15* (1.83)	21.61 (2.43)	56.74*** (2.84)	45.5** (2.30)	56.81*** (2.87)
Teachers	20.06*** (9.04)	11.04*** (4.87)	9.76 (4.17)	44.41*** (9.76)	16.13*** (3.24)	12.26** (2.38)
r2	0.74	0.77	0.77	0.06	0.15	0.17
N	2753	2753	2753	2753	2753	2753
<b>Non-academies</b>						
Broad leaders	1.8 (0.88)	3.39* (1.71)	2.73 (1.39)	11.75** (2.55)	15.6*** (3.49)	13.41 (3.04)
Leadership group	18.92*** (2.81)	31.11*** (4.71)	33.07 (5.06)	62.46*** (4.28)	103.07*** (6.92)	105.47 (7.16)
Teachers	15.63*** (11.08)	7.07*** (4.96)	4.05 (2.74)	33.34*** (11.26)	12.85*** (4.08)	6.66 (2.02)
r2	0.64	0.68	0.69	0.04	0.14	0.17
N	5984	5984	5984	5984	5984	5984

Note: results from pooled OLS models

## % achieving 5 A\*-C grades (including E&M)

	Low prior attainment	Average prior attainment	High prior attainment
Broad leaders	-0.06 (-0.04)	7.43*** (2.83)	0.94 (0.82)
Leadership group	22.59*** (4.62)	36.02*** (4.36)	6.37 (1.75)
Teachers	4.88*** (4.10)	6.81*** (3.45)	1.40 (1.62)
Autonomy	0.56*** (6.82)	1.35*** (9.92)	0.20 (3.34)
R2	0.21	0.30	0.12
N	8127	8589	8681

- On average, school leaders account for around 5% of the school workforce
- Outside of the main leadership group, many other staff in schools also have leadership responsibilities
- Cross-sectional models suggest size of the leadership group (both narrowly and broadly defined) is positively associated with school performance (in terms of the attainment measures considered here)
- When introducing school fixed effects, leadership no longer shows a significant association with school performance.
  - Size of leadership group correlated with unobservable fixed traits of schools, which drive correlation between leadership and performance
  - But – concerns over reliability of short panel?

- Quality of leadership is important in explaining performance (as is quality of teaching). But even controlling for leadership quality, size of leadership group remains significantly associated with performance.
- Little evidence to suggest that leadership matters more in schools with academy status
- Some indication that leadership may matter more for pupils in the middle of the attainment distribution, and to some extent for pupils in the lower part of the attainment distribution





- Extend analysis to primary schools
- Improvements to data
  - including school linking
- Check robustness to alternative model specifications
  - and further exploration of panel results
- Also explore:
  - Alternative performance measures
  - Further consideration of distribution of performance
  - What happens when schools switch to academy status
  - Composition of leadership group

