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Implications of autonomy and networks for costs and inclusion: comparing patterns of school spending under different governance systems

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Abstract

Policy reform around the globe has increased the autonomy that schools enjoy in spending on resources. This reform assumes that schools face strong incentives to use their resources to maximise pupil attainment and that they know best how to spend their money to achieve this aim. This study provides evidence of the relationship between governance and how schools choose to spend their money. It uses data for all state funded secondary schools in 2009/10, 2011/12 and 2015/2016. This enables a comparison of schools operating under three forms of governance: maintained by a local municipal authority (LMAs); as a single ‘academy’ trust outside local authority control (SATs); or in a network of academy schools governed by a multi-academy trust (MATs). The data provide no support for claims that academy schools will spend less on administration or that networks of schools will enjoy economies of scale. The data do show that academy schools spent proportionately less on teacher salaries and educational support, and more on back office costs, after taking account of pupil characteristics.

Keywords

Academies; economies of scale; school bureaucracy; governance; school costs

Introduction

In recent decades global reforms have encouraged school-based management of educational resources (De Grauwe, 2005). These reforms have been partly justified by beliefs that (i) local schools will have a greater incentive than government officials to use resources efficiently; and (ii) that local schools will have more powerful knowledge about what will be effective in their local context. Research in many countries (e.g. Carney et al., 2007; Davies et al., 2016; Kimber et al, 2011; Moradi et al., 2012) has suggested a range of unintended effects of these reforms, questioning the extent to which the expectations of policymakers are being met in practice. These questions appear to have had little impact on the direction of policy.

This study focuses on reforms in England where policy has driven school-based management into territory that lies beyond what has been explored in many countries. We focus on variation in patterns of spending in secondary schools according to the scope of school-based management afforded by the governance they experience. This comparison divides secondary schools in England into three main groups: Local authority maintained (LAMs), single

academy trusts (SATs) and multi-academy-trusts (MATs). LAMs experience hierarchical governance through municipal authorities, but the vast majority of the school budget (86%) is devolved to schools. SATs are free from municipal control and their spending is directed by their own board of governors. Higham and Earley (2013: 13) summarised the results of a survey of school leaders as showing that “academy status, in particular, was seen to create additional spheres for schools to manage, including financial and site management, pay and conditions and the procurement of services and support”. Schools belonging to MATs are governed collectively by a trust board and each school has its budget ‘top-sliced’ to pay for the operation of the network.

By 2015/16ⁱ 65% of English state-funded secondary schools were ‘academies’ and, of these, 47% belonged to a MAT in which the leadership and administration was at least partially shared in common across the schoolsⁱⁱ. The consequences of policies on school autonomy in general, and ‘academisation’ in particular, have been largely examined either in terms of how the system operates (e.g. Ehren & Perryman, 2018; Eyles & Machin, 2015; Leithwood & Menzies, 1998; Maslowski, Scheerens & Luyten, 2007) or in terms of impact on pupil attainment (e.g. NFER, 2015). However, arguments for these policy shifts have made substantial claims about the benefits of school autonomy and school partnerships for cost efficiency. We have been told that single autonomous schools will be more efficient than local bureaucracies in making resources choices (e.g. Gove, 2011). We have been told that multi-academy trusts will secure cost advantages through economies of scale (Hill et al., 2016) and that these advantages will get bigger as the number of schools in each trust increases (Carter, 2016). But there has been comparatively little analysis of data on school budgets which can tell us something about associations between school governance and resource decisionsⁱⁱⁱ. Existing analysis in the public domain has tended to focus on evidence of what school leaders say they do. For example, the majority of academies surveyed by Cirin (2014) reported that they had used independence from local government to change suppliers.

This study aims to address the gap in the analysis of evidence about what schools actually do with their money. Fairly detailed data on state funded schools in England have been made available by the Department for Education. These data show how each school divided its spending between different categories (including teacher salaries, educational support and ‘back office’). This study examines these data to see if the claims for the efficiency of single academies and multi-academy trusts in England are supported by data from school budgets.

Autonomy, chains and resources: predictions in the literature

Autonomy

Advocacy of school autonomy (e.g. Caldwell, 2005) has relied heavily on beliefs about the way in which schools will use autonomy to achieve cost efficiencies that will enable them to allocate more spending to resources that will make a difference to pupils’ attainment. For example, they might make more discerning choices between local suppliers to reduce expenditure on premises. They might be freed from ‘red tape’ allowing them to reduce ‘back office’ costs. They might spend more on teachers, given that the majority of ‘school effects’

on pupil attainment are attributable to teachers (Davies, 2018; Slater, Davies & Burgess, 2012). One strand of the argument (e.g. Caldwell, 2005) assumes that schools will be intrinsically motivated to use their autonomy in the public interest. Another strand (e.g. Hanushek, Link & Woessmann, 2013) assumes that schools will be self-interested and will only act in the public interest if they are constrained to do so by competition from other schools. Studies of charter schools in the US have yielded little support for expectations that schools will use autonomy to increase cost effectiveness. Arsen (2000) found that charter schools in one US state spent a higher proportion on administration than schools under local district control. Baker, Libby & Wiley (2012) reported that charter schools in three US states spent substantially more per pupil than schools under the control of local districts. This study offers a similar comparison for schools in England.

Networks

Networks of schools have developed in several countries where policy has encouraged school autonomy. Between 2000 and 2008 roughly a third of primary children enrolled in private (voucher) schools in Chile attended a Franchise school belonging to a chain (Elacqua et al., 2011). By 2008, the for-profit organisation Edison Schools was running more than 250 US schools (Marsh, Hamilton & Gill, 2008). School networks in England have taken a variety of forms (Salokangas & Chapman, 2014; Simkins, 2015). If they are loosely coupled networks (Bauman, 2001) then individual schools may retain substantial autonomy. Schools in England that have become partners in ‘Teaching School Alliances’ (TSAs) specifically to provide initial and continuing teacher education largely fall within this category. Some Local Authorities have also supported the development of loose-knit school networks^{iv}. In contrast, schools belonging to a ‘multi-academy trust’ (MAT) share a governance structure which makes them more likely to be ‘tight-knit’ (Bauman, 2001) or ‘hard federations’ (Chapman & Muijs, 2014). Although there is considerable variation between MATs (Cirin, 2017), schools in MATs will usually have less freedom than SATs over resources. Indeed, some may have less individual resource autonomy than local authority maintained schools (West & Wolfe, 2018).

Although policy in England is encouraging schools to join MATs (DfE, 2016), from the perspective of the ‘local school management’ argument, MATs appear to be a backward step. The size of this problem depends on the scale of network bureaucracy and the extent to which it reduces competitive pressure on schools. Evidence summarised by West & Wolfe (2018) suggests that some school network managers have enjoyed scope to increase their own benefits. However, the necessary market incentives depend on the possibility of competition, not simply the existence of competition. As long as a market is ‘contestable’ a school network has reason to fear that if it slips into inefficiency it will lose its market share (Baumol, Panzar & Willig, 1982). However, school networks which combine secondary schools with their ‘feeder’ primary schools (vertical integration) and schools which are able to shield themselves from competition through their network’s local market share look like backward steps from a school autonomy perspective.

Even so, threats to efficiency from school chains' market power may be more than offset by economies of scale. A substantial body of evidence suggests that there are significant economies of scale when local authority schools are organised in larger groupings. Comparison of the total spending of local authorities in England (which vary greatly in size) has suggested substantive economies of scale for larger authorities (Andrews & Byrne, 2009). Several studies have investigated the relationship between the size of US school districts (in terms of number of pupils or schools) and costs per pupil. These studies (e.g. Chakraborty, Biswas & Lewis, 2000; Duncombe, Miner & Ruggiero, 1995; Duncombe & Yinger, 2007) consistently report economies of scale. Studies (such as Chakraborty, Biswas & Lewis, 2000) which examine school and district costs find economies of scale at both levels.

Therefore, there appears to be some basis for optimism that collaboration between schools in the form of multi-academy trusts will reduce administrative costs for individual schools. This expectation was confidently expressed in a government commissioned report (Hill et al., 2012) soon after the multi-academy policy was initiated. It was shared by school leaders' whose views were reported in case study research by Woods et al. (2013). A similar impression is given by the results of a survey carried out by Cirin (2017). The proportion of schools in MATs claiming financial efficiencies in spending on ICT, Energy, Printing and Payroll was between 4 and 8 percentage points higher than the proportion of SATs reporting efficiencies in these areas of spending (Cirin, 2017). However, even in these instances the proportion of MAT schools reporting these efficiencies was only between 12 and 27%.

Method

We conducted two descriptive comparisons of school finance data in England. First, we compared the pattern of spending in local authority maintained schools and the pattern of spending in academy schools. We use this comparison to comment on two questions that are raised by our review of policy debate and previous research: (i) do academy schools manage their resources more effectively than local authority schools enabling them to spend more on teaching that will directly benefit pupils? And (ii) do local authority maintained schools show greater concern for the public good through the extent of their spending on special educational needs? Next, we compared spending patterns for single academy schools with spending patterns for schools belonging to multi-academy trusts. We use this comparison to comment on a third question: (iii) do groups of schools benefit from economies of scale by sharing 'back office' costs? Each comparison starts with a cross-sectional analysis of data from 2015/16. Although we are able to control for a range of school characteristics, a cross-sectional analysis cannot detect selection bias resulting from unobserved differences between schools that chose to become academies or chose to join a MAT and other schools. In order to check on the inferences from the cross-sectional comparisons we also conducted comparisons over time. We compare the spending patterns of academy schools in 2015/16 with the spending patterns of the same schools when they were not academies in 2009/10. We also compare spending patterns of schools belonging to MATs in 2015/16 which were SATs in 2011/12.

Study 1 Comparison of spending by local authority maintained and academy schools

The cross-sectional analysis examined factors associated with the proportion of school spending on each of eight categories of spending reported in national data (teachers' salaries, supply teachers, educational support, back office, premises, other staff, learning resources including IT and capital financing). The analysis was conducted through linear regressions which controlled for a range of factors either included in the calculation of government per school funding or related to it (Equation 1).

$$X_{ci} = \beta_1 S_i + \beta_2 P_i + \beta_3 L_i + \beta_4 T_i + \beta_5 G_i \quad (\text{Equation 1})$$

Where:

X_{ci} refers to the spending of school i ($c = 1 \dots 8$ categories of spending).

S_i refers to the full-time equivalent measure of the number of pupils enrolled at the school;

P_i is a vector of pupil cohort characteristics (% eligible for free school meals, % of pupils with English as their second language, % of pupils with a statement of special educational needs or an Education, Health and Care (EHC) plan, % of pupils receiving support for educational special needs but without a statement or EHC);

L_i is a dummy variable taking the value 1 if the school is in London;

T_i is a vector of school types (faith school or not and dummies for offering schooling for primary age pupils and for pupils aged 16-18). Government funding per pupil for these age groups was different from per pupil funding for pupils aged 11-16.

G_i is a dummy variable taking the value of 1 for academy schools

The study uses national data for 2015/16 when local authority (LA) governed (35%), single academy schools (34%) and multi-academy trusts (MATs) (31%) each accounted for a substantial proportion of all secondary schools in England. Any comparison of spending by academy schools and local authority schools needs to be interpreted in the context of the proportion of school funding for LA schools that was retained by local authorities. Local authorities were responsible for distributing the budget to all schools. They retained a proportion of this budget to cover costs for which they were responsible. These fell into two categories: items that related to local authority responsibilities for all schools (including academies) and items that related to local authority responsibilities for LA schools only. In 2015/16 local authorities allocated just over 86% of their budget for secondary schools in the form of delegated individual school budgets (ISBs). These ISBs included provision for overheads in maintained schools meaning that it should be fair to compare maintained and academy schools' reporting of back office costs on the basis of school-level financial statements. The budget retained by LAs was used in four different ways. The first two categories applied to all schools (whether LA maintained or not) funding administration of the schools system (e.g. school admissions) and redistributing funds to meet high-needs (such as low-income families and special educational needs and free admission to libraries). The third involved providing funds for non-maintained schools (academies and independent schools). The final category, 'other grants' applied to maintained secondary schools but not to non-

maintained schools. This final category accounted for 0.5% of LAs' secondary school budget (DfE, 2016)^v. However, the reporting of spending by MAT schools also has to be treated with care. In their spending accounts, MAT schools were asked to report their contribution to their parent trust in a separate line that was not included in the categories used to present school-level funding (with a notable lack of transparency in the use of public funds). We address this gap by relying Cirin (2017) who reported on the basis of survey evidence, that the average top-slice of MAT schools by MAT trusts was about 5%.

The data set comprised all the 3157 state funded schools that provided education for at least the age range 14-16. Six schools were excluded from the analysis because the reported spending for these schools appeared strange (negative or zero spending on teachers' salaries). Descriptive data are presented in Table 1.

Table 1 Descriptive statistics for spending per pupil in state funded secondary schools 2015-16

	Mean	Standard deviation	n
<i>Continuous variables (dependent)</i>			
% spent on teaching staff	53.3	7.3	3153
% spent on supply teachers	2.2	2.0	3153
% spent on educational support	9.8	3.9	3153
% spent on premises	6.5	3.4	3153
% spent on back office	10.9	5.0	3153
% spent on catering	2.7	2.8	3153
% spent on other staff	2.3	2.3	3153
% spent on energy	1.6	0.8	3153
% spent on learning resources	4.3	2.9	3153
% spent on ICT	1.0	1.0	3153
% spent on consultancy	1.9	2.3	3153
% other spending	4.5	4.7	3153
<i>Continuous variable (control variables)</i>			
Number of pupils enrolled (FTE)	970	407	3151
% capacity used	83.0	20.1	3151
% of pupils eligible for Free school meals (FSM)	15.7	11.2	3035
% English 2nd language	15.2	20.1	3035
% pupils statement or EHC	1.9	1.4	2857
% pupils SEN supported	11.7	7.0	3025
<i>Dummy variables</i>			
		%	
% of schools in London		15	3151
% of secondary schools also providing some primary education		5	3151
% of secondary schools providing education for 16-18 year-olds		68	3151
% of faith schools		19	3151
% of academy schools		65	3151

We checked on the risk of selection bias in the cross-sectional comparison by comparing the distribution of spending by 1297 secondary schools that were academies in 2015/16 but which had been local authority-maintained schools in 2009/10. The academic year 2015/16 was the most recent for which data on academy school spending has been published and the base year of 2009/10 meant that we included all schools that had converted to academy status during the expansion of the academy school system under the post-2010 governments. Of course, this excludes academies that were newly established during this period. We only included schools that reported GCSE entries for 2015/16 (excluding sixth form colleges and middle schools). We also compared the comparison of financial data with the Department for Education school level data on the school workforce.

Study 2

Model

The implications for school spending of joining a multi-academy trust may be observed through a comparison of single academies which maintained that status and single academies that subsequently joined a multi-academy trust. The question addressed by this model is how single or multi-academy trust status affected the distribution of school spending.

Data

Secondary school spending data were taken from Excel spreadsheets of school level data for academy school spending in the years 2009/10, 2011/12 and 2015/16 provided by the Department for Education (DfE). These data were matched with other data sets providing school and pupil characteristics. The data for 2015/16 were the most recent publicly available when this paper was being prepared. These tables also included information on the number of students in the school (roll), proportion of students eligible for free schools and public examination results. These data were combined with data on school capacity taken from other DfE tables. Reporting of financial data from schools and local authorities in England needs to be treated with some caution and cases were excluded either if the per pupil data in the original table appeared doubtful (e.g. allocation to categories not summing to roughly 100%, spending on teacher salaries of less than 30%, negative spending in any category).

Results (1) a comparison of the spending patterns of local authority maintained schools and academy schools in 2015/16

The cross-sectional analysis enables a comparison of the proportion spent on each of teacher salaries, supply teachers, educational support, back office, premises, other staff, learning resources and capital financing by LA and academy schools. Of course, these data tell us nothing about the relative efficiency between LA and academy schools of each pound spent on back office. However, the arguments deployed for the benefits of school autonomy, suggest that academy schools would choose to spend less in categories not directly related to pupil attainment and more on resources that do. At the time that data were collected, research was suggesting that schools should spend less on buildings and administration (Woolner et al., 2007), less on educational support through teaching assistants (Blatchford, et al., 2012; Gerber

et al., 2001) and more on teacher salaries (Figlio, 1997; Slater et al., 2012). Table 2 provides a simple comparison of the proportion spent by LA schools and academies in each of these categories. Each of these differences was statistically significant ($p < .01$).

Table 2 Proportion of spending on back office, premises and capital financing: local authority and academy schools in England 2015/2016

% of total spending on	Local authority controlled schools	Academy schools
Teachers	54.1	52.8
Educational support	10.6	9.4
Back Office	10.0	11.3
Premises	6.8	6.4
Other	4.3	4.6
n	1093	2060

We also compared school workforce data for local authority maintained and academy schools in 2015/16. There was no significant difference in pupil-teacher ratio, but average teacher salary was 2.6% higher in local authority-maintained schools. At first, this looks surprising given that the proportion of teachers in leadership roles (presumably on higher salary scales) was 12% higher in academy schools. It seems probable that the higher salaries in LAMs reflected the age profile of staff. LAMs employed just over 5% more staff aged over 50 compared to academy schools. These data suggest that academy schools were more likely to be trying to attract new younger staff by offering posts of responsibility (and career prospects) whilst still keeping their overall salary below lower than LAMS. The proportion of staff other than teachers per pupil was 18% higher in academies. Given the comparison of spending on educational support in Table 2 and the difference between LAMs' and academies' spending on catering it appears likely that this difference was due to academies' spending on auxiliary staff who did not directly support teaching.

However, it is possible that these differences are biased by differences between the characteristics of pupils educated in LA and academy schools or differences in the representation of different school types (such as primary and 16-18 provision). Therefore, regression analyses were undertaken to control for these factors and the results are presented in Tables 3A and 3B. We do not present results for spending on other staff, energy, learning resources and 'other' as there was little discernible association between academy status and the proportion of spending devoted to each of these categories. The proportion of the total variance accounted for by the independent variables is mostly small, ranging from .03 to .53 with a mean of .16, but the size of the coefficient on 'academy status' does stand out in several spending categories. When interpreting these associations it is important to remember that there is also a large variation between academies.

Academy schools devoted higher proportions of their spending to back office and catering and lower proportions to teacher salaries, educational support and educational consultancy. Tables

3A and 3B show that the differences presented in Table 2 are more or less unaffected by the inclusion of controls for pupil and school characteristics.

Table 3A Factors associated with the proportion (%) of school spending on teachers, supply teachers, educational support and back office

	Teachers	Supply	Support	Back Office
	B (p)	B (p)	B (p)	B (p)
(Constant)	50.2 (<.001)	3.2 (<.001)	8.4 (<.001)	13.2 (<.001)
Number of pupils/100	.10 (.03)	.001 (.93)	.06 (.01)	-.08 (.01)
% capacity utilised	.07 (<.001)	-.014 (<.001)	-.002 (.62)	-.03 (<.001)
% eligible for FSM	-.13 (<.001)	.017 (<.001)	.067 (<.001)	.01 (.26)
% English 2nd language	-.03 (<.001)	.010 (<.001)	-.004 (.39)	.02 (.003)
% pupils statement/EHC	-.43 (<.001)	-.036 (.17)	.629 (<.001)	-.01 (.91)
% pupils SEN supported	-.01 (.53)	.008 (.17)	.018 (.08)	.02 (.19)
London or not	1.59 (<.001)	.230 (.05)	-1.027 (<.001)	-.61 (.04)
Faith school	.64 (.05)	.009 (.92)	-.550 (.001)	-.13 (.58)
Provides primary	-.34 (.56)	.264 (.12)	1.062 (.001)	-.67 (.11)
Provides 16-18	1.31 (<.001)	-.134 (.12)	-.641 (<.001)	-.56 (.01)
Academy	-1.66 (<.001)	-.251 (.001)	-.953 (<.001)	1.290 (<.001)
R ²	.16	.08	.15	.06
n	2844	2844	2844	2844

Source: Department for Education school level data for 2015/16

Table 3B Factors associated with the proportion of school spending on premises, other staff, learning resources and capital financing

	Premises	Catering	ICT	Educational Consultancy
	B (p)	B (p)	B (p)	B (p)
(Constant)	8.91 (<.001)	.70 (.02)	1.442 (<.001)	3.78 (<.001)
FTE	-.01 (.80)	-.02 (.20)	.01 .119	-.03 (.011)
% capacity utilised	-.02 (.001)	.01 (.08)	.001 .458	.004 (.05)
% eligible for FSM	-.001 (.84)	.01 (.08)	-.002 .311	.02 (<.001)
% English 2nd language	-.01 (.09)	.01 (.03)	.003 .010	.00 (.97)
% pupils statement/EHC	-.07 (.11)	-.05 (.11)	.00 .988	-.03 (.23)
% pupils SEN supported	-.03 (.002)	-.01 (.49)	-.004 .221	.00 (.95)
London or not	.87 (<.001)	-.07 (.65)	-.003 .959	-.11 (.26)
Faith school	.36 (.023)	.25 (.04)	.010 .845	.06 (.48)
Provides primary	-.60 (.04)	.60 (.01)	.047 .607	-.11 (.42)
Provides 16-18	-.73 (<.001)	-.20 (.07)	-.040 .387	.19 (.01)
Academy	-.26 (.05)	2.56 (<.001)	-.534 (<.001)	-3.46 (<.001)
R ²	.03	.21	.07	.53
n	2844	2844	2844	2844

Source: Department for Education school level data for 2015/16

To check on the results in Tables 2-3 we compared the 2009/10 and 2015/16 spending patterns of schools that had switched from Local Authority control to academy status during this period. This comparison using simple paired-sample t-tests is shown in Table 4. This table shows broadly similar patterns to Tables 2-3. Local Authority controlled schools that became academies reduced the percentage per pupil they spent on teaching staff, educational support, learning resources and educational consultancy. However, these reductions are smaller than the differences between academies and LA maintained schools in Tables 2-3. The schools that became academies increased the proportion of their spending on catering, supply teachers and back office. The newly created academies also increased the proportion of their ‘self-generated’ income from an average of 4.5% in 2009/10 to 6.2% in 2015/16 but we did not detect clear associations between this change and the pattern of school spending.

Table 4 The change between 2009 and 2015 in the proportion per pupil spent on each category of spending (secondary schools which were academies in 2015 but not in 2009, n=1297)

% per pupil spent on	2009		2015		2015-2009 difference (p)
	Mean	s.d.	Mean	s.d.	
Salaried teaching staff	57.9	5.1	54.6	6.7	<.001
Supply teachers	1.6	1.1	1.8	1.8	<.001
Educational support	9.3	2.9	8.9	3.8	<.001
Premises	6.3	2.5	6.4	3.3	.23
Back office	8.9	3.0	10.6	3.8	<.001
Catering	0.9	0.8	3.5	3.2	<.001
Other staff	1.8	1.4	2.3	2.7	<.001
Energy	1.7	0.6	1.4	0.6	<.001
Learning resources	4.9	2.2	4.5	3.5	<.001
ICT	1.5	1.0	0.8	0.8	<.001
Educational consultancy	1.1	1.2	0.6	1.0	<.001
Other	4.2	2.4	4.5	3.5	.01

Sources: Department for Education school level data for 2009/10 and 2015/16

Results (2) a comparison of spending patterns in single academies and schools in multi-academy trusts

We begin a comparison of SATs and MATs with a cross-sectional analysis of data for 2015/16. In this academic year MATs employed a higher ratio of TAs to teachers (22% higher) and a higher ratio of teachers in leadership positions to classroom teachers (21%). MATs also employed more auxiliary staff per pupil (7%). SATs employed 22% more teachers over 50. So it is unsurprising that a simple comparison of spending categories suggests a lot of differences between SATs and MATs.

Table 5 takes account of other factors that may affect the proportion that a school spends on each category. The table only reports on spending categories where the analysis suggested an

association with being a SAT or MAT. There was no evidence of a meaningful difference between SATs and MATs in spending on teachers or back office.

Table 5 Factors associated with the proportion of school spending on educational support, premises, energy and learning resources in SATs and MATs in 2015/16 (n=1790)

	Educational support	Premises	Energy	Learning resources
	<i>B</i> (p)	<i>B</i> (p)	<i>B</i> (p)	<i>B</i> (p)
(Constant)	6.80 (<.001)	8.79 (<.001)	2.51 (<.001)	4.19 (<.001)
FTE	.03 (.41)	-.02 (.51)	-.01 (.10)	-.01 (.81)
% capacity utilised	.005 (.44)	-.01 (.02)	-.01 (<.001)	.004 (.46)
% eligible for FSM	.08 (<.001)	-.01 (.33)	.003 (.12)	.004 (.63)
% English 2nd language	-.01 (.15)	-.01 (.16)	-.003 (.02)	-.002 (.76)
% pupils statement/EHC	.58 (<.001)	-.05 (.43)	-.05 (<.001)	-.05 (.43)
% pupils SEN supported	.01 (.41)	-.04 (.001)	-.002 (.47)	-.01 (.32)
London or not	-1.05 (.001)	1.29 (<.001)	-.01 (.93)	-.27 (.30)
Faith school	-.43 (.09)	.34 (.11)	.16 (.001)	.09 (.67)
Provides primary	.93 (.02)	-.68 (.04)	.02 (.79)	-.28 (.40)
Provides 16-18	-.45 (.05)	-.57 (.004)	-.02 (.63)	.45 (.02)
MAT	.47 (.01)	-.34 (.04)	.07 (.05)	-.44 (.006)
R ²	.12	.04	.10	.01

The associations reported in Table 5 suggested only minor differences between the spending patterns of SATs and MATs. We found no differences between schools that were the only secondary school in their MAT and other MAT schools. We also found no differences between schools that belonged to MATs which only included schools in adjacent postcode areas and other MAT schools.

We also analysed change in the spending patterns (2011/12 to 2015/16) of schools that were single academy schools in 2011/12. This analysis excludes schools that were established by academy trusts (and which therefore never existed as ‘single academy schools’). A quarter of the 801 single academy schools in 2011/12 had joined multi-academy trusts by 2015/16 (Table 6).

Table 6 Governance status in 2015/16 of schools that were academies in 2011/12

	n	%
Single academy trust (SAT)	577	72.0
Multi-academy trust (MAT)	201	25.1
No record in 2015/16	23	2.9
	801	

The proportion of spending on back office rose over the period in schools that remained single academies and in single academies that joined MATs. The increase was smaller in schools that joined MATs. Schools that remained as single academies reduced their spending on educational consultancy more than schools that joined MATs. The increase in spending on catering was much greater in schools that joined MATs.

Differences between the cross-sectional analysis and results in Table 7 may have arisen from the exclusion of new academy schools from the longitudinal analysis in Table 7. We divided MATs in two types (Table 8). MATs were labelled ‘local Trusts’ if they only included schools in one or neighbouring local authorities. Other MATs were labelled ‘Chains’ since they included schools that were not local partners. The average number of secondary schools in a MAT was 6. However, two thirds of MAT schools belonged to a MAT in which there were 4 secondary schools or less and 34% of MAT schools belonging to a trust in which they were the only secondary school. Table 8 shows that schools in local Trusts were much more likely to have converted to academy status from being a Local Authority Maintained School. Therefore, schools in local Trusts were more likely than schools in Chains to be included in the analysis in Table 7. However, once we took account of our control variables the only observable difference between schools in chains and schools in local MATs was that schools in chains spent a slightly higher proportion on learning resources.

Table 7 Change in percentage spending between 2011/12 and 2015/16 for schools that remained as single academies and schools that joined multi-academy trusts

% per pupil spent on	SAT in 2015 /2016	In MAT in 2015/16	<i>p</i>	Effect size (Cohen’s d)
Salaried teaching staff	-.07	-.18	.84	0.01
Supply teachers	.63	.35	.09	0.18
Educational support	.18	-.64	.01	0.19
Premises	-.48	-1.02	.09	0.18
Back office	2.09	1.40	.06	0.19
Catering	.20	2.73	<.001	1.43
Other staff	-.07	.07	.60	0.05
Energy	-.08	-.07	.66	0.02
Learning resources	-.26	-.23	.91	0.01
ICT	-.49	-.60	.29	0.11
Educational consultancy	-.67	-.24	<.001	0.44
Other	-1.61	-1.64	.93	0.01

Table 8 Types of school in local MATs and Chain MATs in 2015/16

	MAT is a local Trust	MAT is a Chain	Total
Academy led by sponsor	179	264	443
Academy Converter	361	95	456
Free School	19	33	52
Free Studio School	24	4	28
Free School (University Technical College)	4	1	5
Average number of schools in MAT	2	12	
Number of Schools	586	397	984

Therefore, our analysis of school-level spending data found little indication that MAT schools gained a substantial cost advantage over SAT schools through being able to share the

administrative burden through their academy trust. We did find that schools that joined MATs between 2011 and 2015 increased their spending on back office by a smaller percentage compared to schools that remained as SATs. However, this was insufficient to be observable in our cross-sectional analysis of all SATs and MATs in 2015/16. Moreover, the most reasonable interpretation of the MAT school level data is that it excludes the top-slice to academy trusts. Some of this top-slice will have been used to fund classroom support and teacher development. However, it seems unlikely that the proportion of the top-slice going to fund back office and managerial administration was less than the proportion of these items in school-level budgets.

Discussion

Our main concern has been to examine assertions about the cost advantages of academy secondary schools. In so doing we have taken account of the top-slicing by LAs of the budgets for the schools they maintain and the top-slicing by academy trusts of the schools in MATs. The average level and the use of funds of LA top-slicing is publicly reported. The average level of top-slicing by MATs has been estimated by survey returns (Cirin, 2017). The average use by academy trusts of their top-slice is not publicly reported and company reports lodged by academy trusts (unlike the accounts provided to the Charities Commissions by most private schools – including private school chains) do not provide this information.

We found that after controlling for other factors, academy schools spent a higher proportion of their budgets on back office and a lower proportion on teachers' salaries. Moreover, schools that became academies between 2009/10 and 2015/16 increased the proportion they spent on back office. The effect size (Cohen's *d*) for this increase was 0.5. The size of this increase is more than the funding retained by LAs for the sole benefit of maintained schools, although the actual LA subsidy may be under-estimated by reported figures. Nonetheless, it is very difficult to find any support in reported spending patterns for the assertion (e.g. Gove, 2011) that academy schools will be more cost efficient than maintained schools. One possible explanation is that secondary schools in England had already exhausted the scope for cost improvements whilst using their devolved budgets when still maintained by local authorities. If this explanation were to stand the results would not present a challenge to the expectations of those (e.g. Caldwell, 2005; Hanushek, Link & Woessman, 2013) who have asserted that school autonomy will necessarily mean greater cost efficiency. However, given reports from the analysis of autonomous schools in the US (Arsen, 2000; Bake, Libby & Wiley, 2012), the claims for the necessary cost-efficiency of autonomous schools may bear further scrutiny.

A government funded report (Hill et al., 2012, 10) also asserted that the growth of school chains was driven in part by a search for “a cost-effective operating model with enough academies contributing to the funding of the central support functions of the chain.” The same study concluded that academy chains did benefit from economies of scale. Another government funded report (Cirin, 2017) claimed that survey results showed that school leaders in MATs believed they were now enjoying economies of scale through belonging to a school network. However, neither our cross-sectional nor longitudinal analyses found evidence to support these

claims. These analyses compared SATs and MATs and the data for MATs excluded the top-slice taken by the MAT trust. The comparisons found no evidence to support claims of economies of scale. It seems unlikely that the proportion of the top-slice allocated to back office was lower or that the proportion allocated to classroom teachers was higher than the proportions of spending on these categories in individual schools. Of course, patterns of spending do vary between MATs and it seems plausible that some MATs have been successful in securing economies of scale. But on average, there is insufficient evidence to back the claim. Government funded reports on the development of MATs made sparse reference to the costs of organising networks (Davies, 2018). It seems possible that predictable challenges were kept out of focus.

The data also suggest there may be some cause for concern over the consequences of academy status for school spending on inclusion. The availability of school budget data provides good opportunities for reviewing the impact of policies that affect resource decision making and the consequences for efficiency and fairness for children. Of course, these data only provide broad brush pictures, but they do indicate useful directions for more fine-grained enquiry. England has put itself in the forefront of devolving resource decisions to schools and encouraging the growth of school chains (or MATs). The evaluation of this policy matters not just in England, but also for other countries considering this path for school policy.

One possible interpretation of these data is not very encouraging. The shift of control of resource decisions from local authorities to ‘self-managing’ or single autonomous schools involved some loss of economies of scale and was accompanied by a reduction in spending on educational support. The latter may reflect better decision-making with local knowledge and the incentives that resource control entails. It might also reflect a weakening of concern for outcomes (e.g. in relation to inclusion) which are not rewarded by headline indicators in local markets. It was plausible to imagine that when autonomous schools joined together in networks that they would gain some benefits from economies of scale. However, the headline spending figures suggest that networks may not yet be large enough to secure these economies of scale whilst incurring additional back office costs in ‘network management’. Perhaps, more worrying, schools in MATs spend even less than single academies on educational support. Since this result from our cross-sectional analysis is not replicated in data for MAT schools that changed their status from being a SAT in 2009 suggests that the problem is concentrated in new schools established by MATs. Does this mean even greater efficiency or greater neglect of the social good beyond the immediate interest of the school as an organisation? We need stronger research evidence to begin to answer these questions.

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Notes

ⁱ This study uses 2015/16 data which is the most recent year for which financial data are available for each type of state-funded secondary school.

ⁱⁱ See Hill et al. (2012) and Chapman (2015) for detailed descriptions of policy and practice in academy school chains in England.

ⁱⁱⁱ Belfield & Sibbels provided a detailed analysis of long-term changes in total and average school spending, but they did not offer direct comparison of the distribution of spending by academies and other schools.

^{iv} Such as the Birmingham Education Partnership (See <https://bep.education/>)

^v Uncertainties and ambiguities in the way that LAs report their spending data mean that this figure should be treated with some caution. It may underestimate the additional support that LAs provide to maintained schools. But it is not possible to discern how this support affects the way that schools allocate spending between alternative categories.