

Multi-academy Trusts

Do they make a difference to pupil outcomes?

Supplementary statistical analysis for the report *Hierarchy, Markets and Networks: Analysing the ‘self-improving school-led system’ agenda in England and the implications for schools*

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Background and commentary

This report is published as a supplement to the main project research report, *Hierarchy, Markets and Networks: Analysing the 'self-improving school-led system' agenda in England and the implications for schools*.¹ This supplementary analysis is referenced in the main report, but for reasons of space, the findings and methodology of this strand are not covered in detail there. Instead, we are publishing this as a separate report to allow us to fully describe this strand of the project.

The main project report analyses how schools in England have interpreted and begun to respond to the government's 'self-improving school-led system' (SISS) policy agenda, an overarching narrative for schools policy since 2010 that encompasses an ensemble of reforms including academies, multi-academy trusts (MATs) and teaching school alliances (TSAs). Based on a four-year mixed methods study, the report asks whether or not the models of coordination and school support emerging locally since 2010 represent a genuine basis for an equitable and inclusive 'school-led' system. It explores the factors that support and hinder such developments, as well as the implications for schools and school leadership.

The main report includes an extensive discussion of MATs, drawing on the findings from this supplementary analysis as well as multiple school case studies and a national survey of headteachers. We argue in the main report that while MATs are commonly referred to as a form of partnership, they are actually single legal entities in which individual academies do not have any inherent delegated powers. We show that MATs which had originally pursued flatter, more lateral organizational models have been encouraged or required by regional schools commissioners (RSCs) to adopt more corporate, bureaucratic and standardized approaches over time. We also note that MATs have been encouraged to grow or merge by the Department for Education (DfE), in a quest for efficiencies and 'economies of scale'.

In that context, the statistical analysis of MAT impact on pupil attainment and progress set out in this supplementary report is important – in particular because it is the first published analysis to compare schools in MATs over a three-year period with standalone academies and maintained schools with similar characteristics and levels of prior pupil attainment. The analysis set out here uses 2013–15 attainment data and 2016 data on the composition of MATs. We argue that it will be important to replicate this research in future, especially given the changing composition of trusts and alterations to the national assessment and accountability framework in recent years.

1 Greany, T. and Higham, R. (2018) *Hierarchy, Markets and Networks: Analysing the 'self-improving school-led system' agenda in England and the implications for schools* can be downloaded at www.ucl-ioe-press.com/books/education-policy/hierarchy-markets-and-networks/.

Our finding in this paper that there is no positive impact from MAT status overall is largely consistent with other recent studies (Hutchings and Francis, 2017; Andrews, 2019) summarized in the literature review section, despite the fact that those studies use different methodologies. Where this report provides significant new evidence is in terms of MAT size, as we show that pupils in small and mid-sized MATs tend to perform better, on average, than their peers in comparable maintained schools in both phases and, in the primary phase, than comparable standalone academies. Conversely, secondary school pupils in larger MATs (with 16+ schools) tend to do worse compared to those in both standalone academies and maintained schools. As we argue in the main report, these findings suggest that the economic drive for MAT growth promoted in contemporary policy may well be in tension with an educational argument for smaller groupings of schools.

Toby Greany and Rob Higham, UCL IOE

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Summary findings

This report sets out the findings of research that developed a matched sample of schools in multi-academy trusts (MATs) with schools that have equivalent characteristics on a number of dimensions and analysed differences in pupil-level outcomes at Key Stage 2 (KS2) and Key Stage 4 (KS4) over a three-year period (2013–15). The headline findings are as follows.

Overall, there is *no significant impact from MAT status* for pupils in either primary or secondary academies when compared to pupils in similar standalone academies. When compared to pupils in maintained schools, pupils in primary academies in MATs tended to perform better than pupils in comparable maintained primaries, while the difference for pupils in secondary academies was not statistically significant.

Looking at pupil outcomes by type of academy:

- › Pupils in converter academies in MATs were doing significantly better, statistically, than pupils in equivalent maintained schools at both primary and secondary level.
- › However, pupils in converter academies in MATs were not doing significantly better or worse than pupils in equivalent standalone academies.
- › Pupils in sponsor-led academies in MATs were not doing significantly better or worse than pupils in equivalent maintained schools or standalone academies, either at primary or secondary level.

Within these overall findings, there were important differences between MATs of different sizes and across different phases.² After controlling for other relevant characteristics, pupils in small and mid-sized MATs tended to perform better, on average, over the three-year period than their peers in comparable standalone academies and maintained schools. Conversely, pupils in larger MATs tended to do worse, on average. However, these differences were not always statistically significant, and there was some variability across phases of education.

In particular, primary school pupils in MATs with three schools tended to perform significantly better, statistically, than both equivalent maintained schools and equivalent standalone academies. This was also true of primary school pupils in medium-sized MATs (with 4–6 and 7–15 schools) in comparison with equivalent maintained schools, but not in comparison with standalone academies.

Secondary school pupils in large MATs (with 16+ schools) tended to do significantly worse, statistically, than equivalent standalone secondary academies. They also tended to do significantly worse than pupils in

² The size of a MAT is calculated accounting for all schools under the same trust, from all phases of education, and including special schools and alternative provision where applicable.

equivalent secondary maintained schools in terms of average point scores (APS, capped). By comparison, secondary school pupils in MATs with two schools did significantly better, statistically, than pupils in equivalent secondary maintained schools.

Finally, the analysis shows that disadvantaged pupils in MATs tended not to perform significantly better or worse than disadvantaged pupils in comparable standalone academies. This was true for disadvantaged pupils in primary academies when compared to their peers in maintained schools. However, we found that disadvantaged pupils in secondary sponsor-led academies tended to do better than disadvantaged pupils in secondary maintained schools. This was also true for pupils in larger MATs, although the result is likely to be driven by the higher proportion of sponsor-led academies in larger MATs.

Introduction

The academization agenda has been one of the most notable changes in the educational landscape over the past decade. Academies were initially introduced in 2002 by the then New Labour Government as an attempt to raise educational standards in areas characterized by generally high disadvantage and low school performance. The scope of the programme was radically expanded by the Coalition Government's Academies Act 2010, which introduced the freedom for every school to convert to academy status, either independently or as part of a multi-academy trust (MAT). Schools deemed to be lower performing can be forced to become a sponsored academy by the Secretary of State, now almost invariably as part of a MAT.

As shown in Section 2 below, as of 31 January 2016 there were 5,230 academies (including free schools) in England, with 673 MATs consisting of two or more schools. Research on the effect of academization has been growing in recent years (see Section 1), although the focus has often been on the effect of schools becoming academies rather than on the effect of MATs. This research builds on existing analyses of MAT impact, but provides the first published analysis to use propensity score matching (PSM).

Our approach is informed by Chapman and Muijs (2014), who assessed the effect of federations on pupil attainment, and can be summarized in two main steps. First, we used propensity score matching to identify two suitable comparison groups for academies under a MAT (our 'treatment' group), one consisting of comparable standalone academies and one consisting of comparable maintained schools. We then analysed pupil level attainment data and compared pupils on roll in MAT academies to pupils on roll in the schools in our comparison groups.

This report is structured as follows: Section 1 presents the existing literature on academization in general as well as on academy chains and MATs, while Section 2 presents a brief overview of the current academization landscape; Section 3 describes our methodology in detail, including the data used for the analysis, the specifics of the PSM model to identify the two comparison groups, and the outcome modelling strategy for pupil attainment; finally, Section 4 presents our main findings, which are summarized in Section 5 together with our concluding remarks.

Chapter 1

Literature review

This report contributes to the growing literature on academy performance in general and, more specifically, on the performance of academy chains and multi-academy trusts. While the performance of academy schools has attracted substantial attention in recent years, the policy focus on academy chains and MATs has been more recent, so the relevant literature is still quite limited.

The earliest studies on academy performance against national attainment indicators were conducted by PricewaterhouseCoopers (2008) and Machin and Wilson (2008). The PricewaterhouseCoopers analysis was a simple comparison of the variation in the performance of academy schools from the national average; it found positive differences for the early academies in Key Stage 4 results. However, the approach was very simplistic, and the findings should be treated with caution. Conversely, Machin and Wilson (2008) found no significant difference in improvement in GCSE results when comparing academy schools to a group of matched maintained schools.

Machin and Veroit (2011) compared the early cohort of academies (opened between 2001/02 and 2008/09) to a group of maintained schools that were approved to become academies under the old legislation (that is, prior to the Academies Act 2010), and became academies after the 2008/09 academic year. They showed that academization had led to a rapid change in intake (with higher average prior attainment post-academization) and to higher performance of academy schools, in particular for the earlier cohorts. These results were largely confirmed by analysis from the National Audit Office (2010) and the Department for Education (2012), which showed that the performance of the pre-2010 academies improved more quickly than that of comparable maintained schools. However, Machin and Silva (2013) showed that the positive effect reported by Machin and Veroit (2011) was largely related to more able students doing better than in comparison schools, while no significant effect was apparent for students in the lower part of the distribution of prior attainment. A similar finding had also been reported by the National Audit Office (2010).

More recently, Eyles and Machin (2015) replicated the approach of Machin and Veroit (2011) to look at both intake and performance of pupils in academies, compared to pupils in maintained schools that became academies at a later date. They found that academization had a substantial positive effect in increasing the ability of the schools' intake, a result previously found by Wilson (2011). They also found that looking at the attainment of pupils on roll prior to conversion to academy status, and controlling for underlying pupil characteristics, the 'Labour' academies had a significant positive effect on performance.

Recent analysis by the National Foundation for Educational Research (NFER) on the performance of academies that have opened since 2010 has found smaller effects than those identified in previous research. Worth (2015) looked at GCSE results in 2013 and 2014, and analysed the performance of sponsor-led and converter academies separately, in comparison to two groups of matched maintained schools (that is, those that were still maintained schools at the time of the analysis). Worth found that sponsor-led academies outperformed their comparison schools in 2013, when looking at KS4 outcomes that included GCSE equivalencies, but not when equivalencies were excluded. Similarly, Worth found no statistically significant difference in 2014, when changes in the way KS4 performance was measured had reduced the contribution of equivalent qualifications.³ Additionally, Worth (2015) found no significant difference between converter academies and similar maintained schools in 2014.

Worth (2016) expanded previous analysis to include primary schools. The analysis found a small but significant positive effect for secondary sponsor-led academies in 2015 when looking at the percentage of pupils achieving 5 A*–C GCSEs and equivalents (including English and Maths), but no significant effect for average point scores, nor when excluding equivalent qualifications. Additionally, the findings showed a small but significant positive difference between secondary converter academies and their comparison schools. Worth (2016) also found no significant difference in attainment between primary academies (sponsor-led or converter) and similar maintained primary schools.

This brief summary shows that research looking at the pre-2010 academies identified stronger effects from academization than the more recent literature that looked at the post-2010 cohorts. This might be due in part to the simple fact that the early academies were the ones with the most room to improve, but it might also be due to a substantially different policy (and funding) landscape after the 2010 general election, and to the recent changes in school performance measures, which seem to have disproportionately affected sponsor-led academies.⁴

The above literature focuses on the effect of academization in general, and does not attempt to isolate the effect of academy chains and MATs. The focus on chains and trusts is more recent, reflecting the fact that the model of multiple academies overseen by a single sponsor has become widespread only since the Coalition Government was elected in 2010.

3 Following the Wolf review of vocational qualifications, the number of non-GCSE qualifications that could be included in the 2014 performance tables was reduced, and no qualification could be counted as equivalent to more than one GCSE.

4 Parameshwaran and Thomson (2015) show that the number of qualifications entered for pupils with lower prior attainment declined under the new regime. Given that sponsor-led academies have lower-than-average prior attainment, the new regime is likely to have affected them more than other types of schools. In fact, our preliminary analysis indicated that the average fall in attainment between 2013 and 2014 was bigger for sponsor-led academies than for academy converters as well as maintained schools as a whole.

Hill (2010) provided the first overview of the evolution of academy chains, updated and expanded by Hill *et al.* (2012) to include a simple comparison of GCSE performance of academies to national benchmarks. Hutchings *et al.* (2014) provided the first significant analysis of academy chain performance, with a specific focus on the attainment of disadvantaged pupils in secondary sponsor-led academies in 2012 and 2013, showing that there was significant variability in outcomes both within and between chains. While there were some chains that showed positive results, many showed the opposite, and the overall picture did not seem to indicate, on average, any substantial effect of academy chains. Hutchings and her various collaborators (2015, 2016, 2017) replicate the analysis using more recent attainment data with similar results and, in the most recent study, include the primary phase. While some chains have performed consistently above the mainstream average, many have done the opposite, and the overall average effect is limited. The more recent iterations of this research have highlighted the fact that changes in the way equivalent qualifications contribute to school performance data since 2014 have disproportionately affected secondary sponsor-led academies in an adverse way. It is important to keep in mind that these reports mostly focused on the early academy chains, which were groups of sponsor-led academies under the same sponsor, and compared the attainment of disadvantaged pupils to the same results for other types of schools. In particular, they compared their results to standalone sponsor-led academies as well as converter academies and maintained schools, without attempting to create specific comparison groups, or to control for underlying school characteristics. As such, their findings are useful in highlighting the fact that there is substantial variability in the performance of different chains, and that not all chains are doing well for their pupils – but they are essentially descriptive findings.

The Department for Education (2015, 2016) initially published comparisons between academy chains and local authorities (LAs), but more recently (2017, 2018) it has focused on comparing the performance of different MATs using the newly introduced pupil progress measures at KS2 and KS4. Using KS4 attainment data for 2014, the 2015 data showed that, based on current value added and relative improvement in value added over time, the performance of academy chains (in the DfE definition, a chain can include more than one MAT, when the principal sponsor is the same) was not substantially different from that of LAs, with large variability between chains as well as between LAs. The DfE (2016) repeated the analysis using 2015 attainment data, but included KS2 attainment for the first time. This analysis confirmed the broad variability between MATs, but indicated a more positive picture for KS2 attainment than for KS4.

Andrews (2016) compared the performance of MATs and local authorities at both KS2 and KS4, using the approach outlined in DfE (2015). The results were in line with the rest of the literature, showing few differences between local authorities and MATs on aggregate, and wide variation between different MATs and different LAs. Andrews (2016: 33) concluded that: “Taken in aggregate there is not substantial or consistent

evidence for MATs being more effective than local authorities or vice versa' and so argued that the more important question is whether a child is in a high-performing or low-performing MAT or LA rather than being in an academy or a maintained school. This perspective is broadly confirmed by the analysis in Andrews and Perera (2017).

The DfE's 2017 and 2018 analyses focused exclusively on established MATs, comparing them to all other state-funded mainstream schools. The 2018 report analysed pupil progress measures using 2017 data for schools that had been in a MAT for at least three years. In total, 155 MATs were included at KS2 and 62 at KS4 in 2018, a significant increase compared with the 2017 report due to the increasing number of schools in MATs overall, making comparisons over time difficult. The broad picture that emerged from the 2018 report was that primary MATs are performing more closely in line with the national average (for example, the proportion with progress at or above average was 41 per cent in reading, 59 per cent in writing and 51 per cent in maths), while secondary MATs continue to perform below the national average overall (for instance, 45 per cent of MATs performed significantly below average and 31 per cent performed significantly above average on Progress 8).

As can be seen from the summary above, the majority of analyses to date are largely descriptive, comparing between-MAT and MAT-LA performance using national datasets. One analysis by Ambition School Leadership and the Education Policy Institute (2017) does attempt to go further by exploring the relationships between MATs with different characteristics and levels of performance, but finds that there are few clear associations between either the geographic spread within a MAT or the phase mix (primary and secondary) within a trust.

The House of Commons (2017) report on MATs drew together multiple sources of evidence to conclude that the evidence base for judging MAT effectiveness and impact is variable and insufficiently empirical and robust. This was seen to be partly due to the significant changes made to national pupil assessment models and accountability measures in recent years, which has made the analysis of MAT performance challenging (Hutchings and Francis, 2017). Notwithstanding these methodological challenges, the findings reported above do appear to reflect a consensus that there is wide variability in outcomes between different MATs, and relatively small differences between MAT academies and LA schools. As yet, there have been no explicit attempts to estimate a 'MAT effect', whether that be positive, negative or neutral, in the same vein as the 'academy effect' that has been estimated by the strand of literature reported above. This is the main objective of this report. As such, our analysis is not directly comparable to any of the research mentioned in this section.

Chapter 2

Descriptives

As of 31 January 2016, there were 5,512 academies,⁵ of which 5,250 were mainstream academies, 185 special academies and 77 alternative provision academies. Excluding post-16 providers, that left 5,230 mainstream academies, representing 26 per cent of all mainstream schools. At that time, academies represented 18 per cent of all primary schools and 65 per cent of all secondary schools (including all-through schools).

The majority of academies (60 per cent) are part of a MAT with at least two schools⁶ (Table 1), but this is more concentrated in primary academies, with 71 per cent being part of a MAT,⁷ whereas 44 per cent of secondary and all-through academies are in MATs.⁸

The distribution of academies by size of MAT is relatively homogeneous, with 40 per cent of academies being standalone institutions, 18 per cent being part of a MAT with two or three schools, 15 per cent being part of a MAT with four to six schools, and the remaining 27 per cent being part of a MAT with seven or more schools.

It is important to note that here, and in the rest of the report, we define size at an aggregate level, where all schools belonging to a given MAT are counted, including primary and secondary schools, as well as any special school or alternative provision under the same trust. Table 2 shows the distribution of MATs at that time by overall size.⁹ We can see that the percentages are very similar at primary and secondary phase, with about a third of MATs in each phase having only two schools, and a further 20 per cent having three schools.

5 Including free schools, university technical colleges and studio schools.

6 For the purpose of this report, we classify academies as part of a MAT only if the MAT has at least two schools. This means trusts set up as MATs, but that have only one school at the time of analysis, will be treated as single academy trusts, and the corresponding academies as standalone institutions.

7 This included 95 per cent of sponsor-led academies, and about 60 per cent of converter academies and free schools (see Table A1 in the appendix).

8 This included 78 per cent of sponsor-led academies, with only 30 per cent of converter academies and 44 per cent of free schools (see Table A1 in the appendix).

9 Note that MATs may have a mixture of primary and secondary schools. As such, they can be included in both the primary and secondary columns.

Table 1: Percentage of academies by phase and size of trust at 31 January 2016

	Primary n=3,036	Secondary n=2,194	All n=5,230
Standalone	29.1%	55.6%	40.2%
2 schools	10.1%	9.5%	9.8%
3 schools	9.6%	6.0%	8.1%
4–6 schools	19.0%	10.5%	15.4%
7–15 schools	17.0%	7.0%	12.8%
16+ schools	15.3%	11.5%	13.7%

Table 2: Percentage of MATs by phase and size at 31 January 2016

	Primary n=580	Secondary n=408	All n=673
2 schools	33.1%	35.0%	38.3%
3 schools	21.7%	19.4%	21.0%
4–6 schools	28.1%	27.7%	25.9%
7–15 schools	12.8%	12.7%	11.1%
16+ schools	4.3%	5.1%	3.7%

Figure 1 (below) shows that sponsor-led academies represent about a third of primary schools in small and mid-sized MATs, while they represent the majority of schools in larger MATs. This is also true for secondary schools (Figure 2 below), where the proportion of sponsor-led academies is generally greater, ranging from slightly less than a third in smaller MATs to almost half in mid-sized MATs and about three-quarters of secondary schools in larger MATs. Overall, we can clearly see that converter academies tend to concentrate in small and mid-sized MATs, whereas sponsor-led academies are more common in larger MATs. However, it is important to note that these tables and graphs represent a simple snapshot at the end of January 2016. The dynamics of growth and geographical dispersion are likely to be different for different trusts, in different areas of the country and over time.

Tables 3 (KS2) and 4 (KS4) provide an overview of the overall characteristics and attainment levels of students in different types of academy between 2013 and 2015.¹⁰ On the whole, converter academies in MATs tend to have lower levels of attainment than standalone converter academies, both at KS2 and KS4. However, this does not take into account the composition of these groups. In fact, MAT converter academies also tend to have more challenging intakes of pupils (that is, higher proportions of free school meal/FSM pupils and pupils with lower prior attainment) than standalone converters. The picture is less clear for sponsor-led academies. Taking into account pupil characteristics, as well as considering the overall

¹⁰ The figures in each year refer to the cohorts of pupils taking KS2 and KS4. As such, they refer to only one year group. However, the number of pupils from which the averages are calculated increases year on year, as more schools become academies.

change over a number of years, is therefore important in addressing the question of whether MATs have an impact on student progress and attainment.

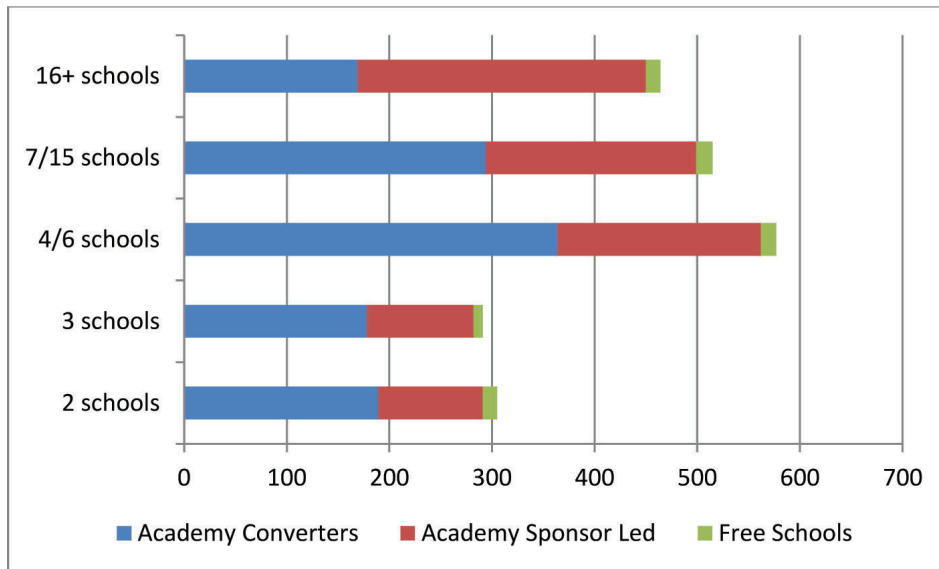


Figure 1: Composition of trusts by size and type of academy: primary academies at 31 January 2016

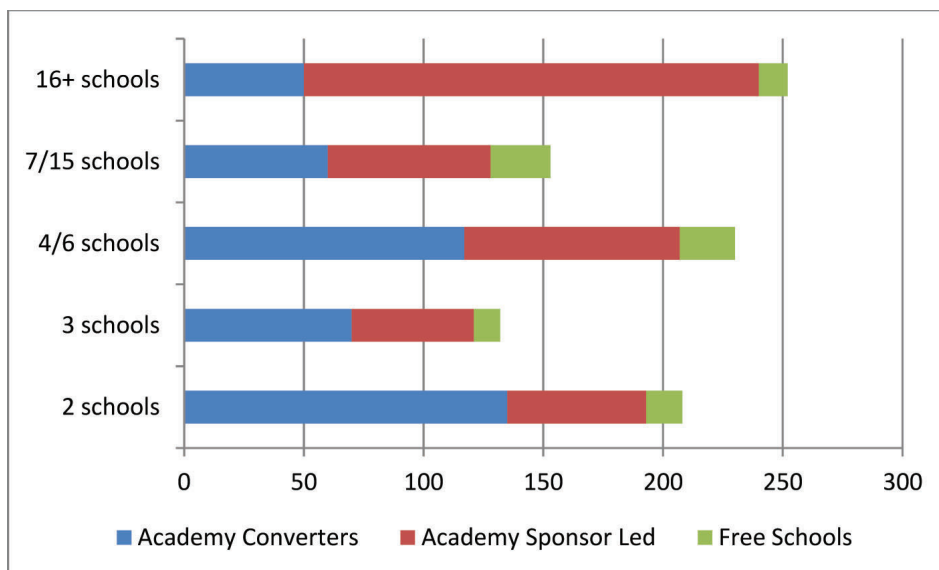


Figure 2: Composition of trusts by size and type of academy: secondary academies at 31 January 2016

Table 3: Intake characteristics and attainment by academy type and year for KS2 cohort

		2013		2014		2015	
		Standalone	MAT	Standalone	MAT	Standalone	MAT
Converter academies	FSM	11.6%	18.2%	12.0%	17.6%	11.7%	15.4%
	KS1 APS	15.9	15.2	15.8	15.2	15.8	15.4
	Lev4	81.9%	79.5%	83.8%	81.4%	85.2%	83.2%
Sponsor-led academies	FSM	32.5%	37.5%	30.5%	31.3%	28.0%	26.6%
	KS1 APS	13.9	13.8	13.9	14.0	14.1	14.2
	Lev4	58.6%	64.1%	68.7%	69.2%	72.8%	71.8%
Free schools	FSM	12.8%	23.8%	12.5%	20.6%	12.1%	15.8%
	KS1 APS	16.7	15.4	15.5	15.3	15.9	15.5
	Lev4	69.8%	66.0%	74.8%	72.5%	70.7%	84.6%

Note: FSM (percentage of pupils known to be eligible for free school meals); KS1 APS (average point score at Key Stage 1, i.e. prior attainment for KS2 pupils); Lev4 (percentage of pupils achieving Level 4 or above at KS2).

Table 4: Intake characteristics and attainment by academy type and year for KS4 cohort

		2013		2014		2015	
		Standalone	MAT	Standalone	MAT	Standalone	MAT
Converter academies	FSM	10.4%	13.5%	10.5%	13.6%	10.0%	12.7%
	KS2 APS	28.7	28.1	28.6	27.9	28.4	27.7
	5A*-C	69.6%	67.1%	65.9%	60.9%	66.3%	61.7%
Sponsor-led academies	FSM	30.2%	27.1%	28.1%	26.1%	27.1%	24.3%
	KS2 APS	26.6	26.5	26.7	26.6	26.4	26.3
	5A*-C	51.5%	51.5%	46.8%	45.2%	45.5%	46.3%
Free schools	FSM	18.5%	22.7%	17.2%	22.8%	15.5%	20.7%
	KS2 APS	29.3	26.9	28.6	26.6	27.5	26.1
	5A*-C	55.5%	38.5%	60.3%	32.0%	49.8%	34.8%

Note: FSM (percentage of pupils known to be eligible for free school meals); KS2 APS (average point score at Key Stage 2, i.e. prior attainment for KS4 pupils); 5A*-C (percentage of pupils achieving at least 5 A*-C GCSEs or equivalents, including English and Maths).

Chapter 3

Methodology

The aim of this research is to measure the impact of MAT status on pupil progress and attainment. In order to identify the effects of MATs on pupil attainment, we compared the outcomes of pupils in schools that are part of a MAT to the outcomes of pupils in comparable standalone schools. We created two comparison groups: a group of standalone academies and a group of standalone (that is, not part of formal federations) maintained schools. We used a propensity score-matching (PSM) methodology to identify the schools to be included in the comparison groups. The final analysis was carried out using pupil level data on attainment, progress in English and Maths and individual characteristics for the pupils on roll in the schools identified by the PSM. Our methodology closely follows that of Chapman & Muijs (2014), who use a similar two-step procedure to evaluate the effect of school federations on pupil attainment.

In this section, we briefly outline the data sources and the analytical methodology used for the analysis.

Data

We collected and analysed a large amount of data to perform the various stages of this analysis. The data sources used included: EduBase, Statistical First Releases from the annual School Census, School Performance Tables and the National Pupil Database.

EduBase is the main source of information on school characteristics. These include:

- › name of the school
- › geographical information (such as the local authority, government office region)
- › school type (for instance, sponsor-led academy, converter academy, community school)
- › type of education provided (for example, mainstream education, special education)
- › phase of education
- › dates of opening and closure (where applicable)
- › school identifiers (URN, DFE number).

EduBase data also includes details of the trust or federation to which each school belongs as well as the necessary information to link schools through time when a change in status has occurred (for example, when a maintained school becomes an academy). The data was downloaded from the EduBase website on 1 February 2016.

The Statistical First Releases from the Annual School Census are DfE official statistics publications that include school level data on pupil characteristics, such as:

- › total number of pupils on roll
- › number and percentage of pupils eligible for free school meals (FSM)
- › number and percentage of pupils with special educational needs (SEN)
- › number and percentage of ethnic minority pupils
- › number and percentage of pupils with English as an additional language (EAL).

This information is published every year by the DfE, and is based on the annual spring School Census, a census of all pupils on roll in every state-funded mainstream and special school in England, collected in January every year. For the purposes of this research, we have collected pupil characteristics data from the academic years 2009/10 through to 2014/15.

The School Performance Tables, published annually by the DfE via a dedicated website, report school level data on pupil attainment at Key Stage 2, Key Stage 4 and Key Stage 5, as well as information on the characteristics of the corresponding pupil cohorts. The data includes a variety of outcome measures. For the purposes of our research, we have collected data for the academic years 2009/10 through to 2014/15, including the variables below.

School level data for Key Stage 2:

- › number of pupils in cohort
- › average point scores (APS)
- › percentage of pupils achieving Level 4 or above (in English and Maths for 2010; and in reading, writing – teacher assessed/TA – and Maths from 2011 onwards).

School level data for Key Stage 4:

- › number of pupils in cohort
- › capped (best 8) average point scores (CAPS)
- › percentage of pupils achieving at least 5 A*–C GCSEs or equivalents, including English and Maths
- › value added (best 8).

Finally, we requested data from the National Pupil Database (NPD), which includes pupil level attainment data for Key Stage 2 and Key Stage 4, for the academic years 2009/10 through to 2014/15, linked to prior attainment for each pupil (KS1 and KS2 respectively), levels of absence, and pupil level census information on FSM eligibility, SEN, EAL and ethnicity for the corresponding academic year.

Propensity score matching

Propensity score matching (PSM) is a quasi-experimental technique used in observational policy evaluation studies to approximate random assignment, and is a widely used methodology in educational research. The aim of PSM is to generate sets of comparable schools based on the estimated probability of being part of a MAT, depending on other school characteristics (see below). Schools actually belonging to a MAT are then matched to other schools with similar estimated probabilities, but that are not actually part of a MAT. The ultimate purpose of PSM in our analysis is to identify three groups of reasonably comparable schools for the subsequent NPD analysis, which looked at the attainment of the pupils on roll at these schools over a three-year period. These groups are:

- › academies within a MAT
- › standalone academies
- › maintained schools (not part of a formal federation).

By its nature, PSM results in a number of schools without a suitable match. This happens because the characteristics of these schools make them less comparable to other schools. Our PSM calculations resulted in a sizeable number of unmatched MAT schools. This is particularly the case for sponsored academies because, on the one hand, there are only a relatively small number of standalone sponsored academies that can be matched to those in a MAT and, on the other hand, most low-attaining schools have now been moved into a sponsored academy arrangement, so it is difficult to find comparable schools in the maintained sector. Insofar as the objective of the final analysis was to compare the progress and attainment of pupils within similar schools in order to identify the effect MATs might have on progress and attainment, it is acceptable to have a sizeable number of unmatched schools in order to make the findings more robust.¹¹

To account for academy conversion at different points in time, we split the PSM calculations into three waves of academization: the pre-2010/11 wave, the 2010/11 wave and the 2011/12 wave. Schools that converted at a later time were not included because we wanted to look at the impact of MAT status over a minimum of three years. This means that the comparison group of maintained schools includes only schools that had retained their maintained status at the time the data was collected.

11 The main reason for generating a control group through PSM is to compare the attainment of pupils in comparable circumstances, other than the fact that their school is part of a MAT. A low match rate can be the result of a small pool of possible comparison schools from which to choose, or the fact that the MAT academies were substantially different from other academies as well as maintained schools. The last point is particularly true for sponsor-led academies, which generally replace low-performing schools, as well as for the early cohorts of converter academies, which were generally some of the highest-performing schools. Relaxing the requirement of the PSM model to increase the number of matched schools might result in a dilution of the idea of comparable circumstances, and a less robust comparison between pupils.

Academies with multiple predecessor schools were also excluded from the analysis, as they were not directly comparable to schools that were single schools throughout the period.

The primary school analysis includes all schools classified as primaries that had KS2 data available starting from the academic year of conversion (or 2009/10 for earlier academies). This excludes academies that were genuinely new provisions, as well as the first waves of free schools. Infant and first schools were not included as they do not have KS2 cohorts. Middle-deemed secondary schools, while having KS2 results, were also excluded.

Similarly, the secondary school analysis includes all schools classified as secondaries that had KS4 data available starting from the academic year of conversion (or 2009/10 for earlier academies). This excludes academies that were genuinely new provisions, as well as the first waves of free schools. High schools (ages 11–14) and middle-deemed secondary schools were not included as they do not have KS4 cohorts.

The variables included in the PSM calculations were as follows:

- › identifier for all-through school
- › identifiers for faith schools (Church of England/Roman Catholic/Other)
- › identifiers for region (London/South/Midlands/North)
- › number of pupils
- › percentage of FSM pupils
- › percentage of SEN pupils
- › percentage of EAL pupils
- › percentage of White British pupils
- › level of absence
- › two measures of attainment.

The measures of attainment used for the calculations were as follows:

- › KS2 average point score and percentage of pupils with Level 4 or above in English and Maths for primary schools
- › KS4 value added and percentage of pupils with at least 5 A*–C (GCSEs or equivalents) including English and Maths for secondary schools.

Table 5 shows a summary of the outcome of the PSM process. More details, including descriptive statistics on the matched groups, are reported in the Appendix. The number of matches between MAT and standalone academies is relatively low, but the numbers increase substantially for matches between MAT academies and standalone maintained schools. This is particularly true for primary schools, as the proportion of academies is much smaller than for secondary schools.

Analysis of pupil outcomes

For the final analysis, we compared the outcomes of pupils in the schools identified by the PSM using multilevel regression models and random-effect logit models, based on pupil level attainment data from the National Pupil Database.

Table 5: Number of matched and unmatched MAT academies by academization route

MAT to standalone academy matching						
Primary schools	Group 1 (pre-2010/11)		Group 2 (ay 2010/11)		Group 3 (ay 2011/12)	
	matched	unmatched	matched	unmatched	matched	unmatched
Converter academies	:	:	5	27	76	56
Sponsor-led academies	:	:	:	:	0	6

MAT to standalone academy matching						
Secondary schools	Group 1 (pre-2010/11)		Group 2 (ay 2010/11)		Group 3 (ay 2011/12)	
	matched	unmatched	matched	unmatched	matched	unmatched
Converter academies	:	:	74	26	137	20
Sponsor-led academies	19	82	8	16	0	27

MAT to standalone maintained matching						
Primary schools	Group 1 (pre-2010/11)		Group 2 (ay 2010/11)		Group 3 (ay 2011/12)	
	matched	unmatched	matched	unmatched	matched	unmatched
Converter academies	:	:	31	1	129	3
Sponsor-led academies	:	:	:	:	5	1

MAT to standalone maintained matching						
Secondary schools	Group 1 (pre-2010/11)		Group 2 (ay 2010/11)		Group 3 (ay 2011/12)	
	matched	unmatched	matched	unmatched	matched	unmatched
Converter academies	:	:	79	21	138	19
Sponsor-led academies	61	40	21	3	26	1

The main outcomes of interest for the analysis of primary school results are:

- › KS2 average point score (APS)
- › pupil achieved Level 4 or above in reading, writing (teacher assessed) and Maths
- › pupil achieved expected progress in reading
- › pupil achieved expected progress in writing
- › pupil achieved expected progress in Maths.

The KS2 APS is a continuous variable, and is analysed using a multilevel regression model, while the other outcome measures are all dichotomous variables, and are analysed using random-effect logit models.

The main outcomes of interest for the analysis of secondary school results are:

- › KS4 capped average point score (CAPS)
- › pupil achieved at least 5 A*-C GCSEs or equivalent including English and Maths
- › pupil achieved expected progress in English
- › pupil achieved expected progress in Maths.

The KS4 CAPS is a continuous variable, and is analysed using a multilevel regression model, while the other outcome measures are all dichotomous variables, and are analysed using random-effect logit models.

The general formulation of the models is as follows:

$$Y_{ij} = \mathbf{X}_i'\boldsymbol{\beta} + \mathbf{T}_i'\boldsymbol{\delta} + \mathbf{M}_i'\boldsymbol{\gamma} + u_j + \varepsilon_{ij}$$

Where:

- › the i subscript identifies pupils and the j subscript schools
- › Y is the outcome of interest
- › \mathbf{X} is a vector of pupil characteristics
- › \mathbf{T} is a vector of year dummies
- › \mathbf{M} is a vector of school characteristics, including whether or not the school is part of a MAT
- › u is the unobserved school effect.

Pupil characteristics include:

- › prior attainment (at KS1 for primary pupils and at KS2 for secondary pupils)
- › gender
- › eligibility for free school meals (dummy for FSM eligibility over the previous six academic years)
- › ethnicity (dummy for ethnic minority pupils)
- › English as an additional language (dummy for EAL pupils)
- › special educational needs (dummies for SEN pupils with a statement and without a statement)
- › overall absence during the full academic year.

The main element in \mathbf{M} is the indicator for schools being part of a MAT. We have included separate indicators for sponsor-led and for converter academies, so that we can identify potential differences in the effect of collaboration between the two types of academies. In a separate formulation of the model, we have split the MAT indicator by the current size of the MAT (as at end of the 2014/15 academic year). To do this, we have split MAT size into five groups: MATs with 2 schools, MATs with 3 schools, MATs with 4–6 schools, MATs with 7–15 schools and MATs with 16 or more schools.¹²

As mentioned above, we analyse the continuous outcome variables with standard multilevel regression models. Multilevel models are very popular tools in the analysis of educational outcomes, as they are suited to analysing data that is naturally grouped into clusters, with a hierarchical structure. This is a very common feature of pupil data, as pupils are clustered

¹² This grouping was largely based on the distribution of schools across MATs of different sizes, as seen in Tables 1 and 2, and the assumption that the interaction between schools in groups of two and three schools would be substantially different from that in larger groups.

into classes, and classes into schools. For the purpose of our analysis, we assume a hierarchical structure with two levels: pupils and schools.

The unobserved school effect is a measure of the difference between clusters, and is assumed to be randomly distributed across schools. That is, u is not correlated with pupil characteristics within each school. This formulation is known as a random intercept model, and is a fairly standard and widely used model in educational research.

The random-effect logit is a model developed for longitudinal data, where multiple observations of the same subjects are available. However, it is directly applicable to hierarchical data as a form of random intercept logistic regression. In this case, the higher-level clusters (that is, schools) are treated as the subjects, and the lower-level elements (the pupils) are treated as the multiple observations for each subject. Random-effect logit models are directly comparable to multilevel logit models, and produce very similar estimates. In both cases, the crucial assumption is that the unobserved school effects are randomly distributed across schools (that is, not correlated with pupil characteristics within each school). However, the two families of models differ in the way the estimation process works, with random-effect models generally less computationally demanding.

Chapter 4

Results

Primary MAT and standalone academies

We look first at the results of the analysis of pupil attainment at Key Stage 2 for academies in a MAT compared to standalone academies, which in this primary matched sample are exclusively converters. The analysis included 141 schools (including the comparison group), with more than 18,000 pupils over the three years. As shown in Table 6, the analysis includes a reasonable distribution of schools across MATs of different sizes.

Table 6: Number of MAT primary academies and MATs by size included in the analysis

MAT size	Number of MATs	Number of converter academies
2 schools	20	21
3 schools	11	13
4–6 schools	11	15
7–15 schools	8	20
16+ schools	8	12
Total	58	81

We can see from the estimates in Table 7 (below) that, after controlling for relevant pupil characteristics (prior attainment at KS1, gender, FSM eligibility, ethnicity, EAL, SEN and absence levels), pupils in MAT academies tend to do slightly better than pupils in comparable standalone academies. However, the overall difference is very small and not statistically significant. This is true for all attainment measures considered. It is useful to point out that the test statistics are only just below the required critical values, and the estimates are very close to being statistically significant. This means that, while stressing that we cannot conclude with an acceptable degree of certainty that pupils in MAT academies do better than pupils in comparable standalone academies, there are some indications in that general direction.

How to read the results tables

Each table can be interpreted in the same way and only the main variables of interest to this evaluation are identified in the following tables. Each table has five columns for primary outcomes and four for secondary outcomes. The coefficients identified in the first column of each table represent the average change in the outcome variable for a unit change in the relevant explanatory variable. For example, in Table 7 the explanatory variable for ‘MAT academy’ has a value of 1 for pupils on roll in a MAT academy, and 0 for pupils on roll at a standalone academy. Therefore, on average, a

pupil in a MAT academy had an average point score 0.255 above a similar pupil in a standalone academy. An alternative interpretation is that, on average, one pupil in four in a MAT academy gets an average point score that is one point above similar pupils in non-MAT academy schools.

It should be noted that this is an example of how to interpret the table and the variable identified above in Table 7 is in fact non-significant due to the lack of a * in the Sig. column. An asterisk in this column indicates the level of significance and it is normal practice to use the following to highlight different levels of significance:

- › * a significance level of 0.05, or 95%
- › ** a significance level of 0.01, or 99%
- › *** a significance level of 0.001, or 99.9%.

The greater the significance level, the more certain we can be of the strength of any difference.

All coefficients in the first column of each table can be interpreted in the same way. The other columns, on the other hand, represent binary outcome measures, for which the estimates have a different interpretation. The important indications from these parameters are the sign of the coefficients (which point to the direction of the relationships), and the level of significance.

Key Stage 2 outcomes are as follows:

- › KS2 average point score (continuous measure)
- › pupil achieved Level 4 or above in reading, writing TA and Maths (binary indicator)
- › pupil achieved expected progress in reading (binary indicator)
- › pupil achieved expected progress in writing TA (binary indicator)
- › pupil achieved expected progress in Maths (binary indicator).

Key Stage 4 outcomes are as follows:

- › KS4 average point score, capped (continuous measure)
- › pupil achieved at least 5 GCSEs or equivalent qualifications at A*–C including English and Maths (binary indicator)
- › pupil achieved expected progress in English (binary indicator)
- › pupil achieved expected progress in Maths (binary indicator).

Given that the programme being evaluated is a whole-school programme, it is sensible to focus more on those outcomes that identify overall attainment than on individual subjects. For primary schools, this would be the two outcomes: KS2 APS and KS2 Lev4. For secondary schools it would be: KS4 CAPS and KS4 5 A*–C E&M.

When we split the group of MAT academies by size of MAT, we can see some interesting findings. In fact, Table 7 shows a positive and significant effect of MATs with three schools on the attainment of their pupils. All of

the other coefficients for small and mid-sized MATs are positive but not statistically significant. The coefficient for the largest MATs, on the other hand, is actually negative in most cases, although not statistically significant. The coefficient for the MATs of three schools is the only consistently significant estimate, but the overall pattern of pupils in small MATs doing better than pupils in the larger MATs is consistent across different outcomes and models.

Table 7: Estimation results for primary MAT academies compared to standalone academies

	Average point score		Pupil achieved Level 4 or above		Pupil achieved expected progress in reading		Pupil achieved expected progress in writing		Pupil achieved expected progress in maths	
	Coeff.	Sig.	Coeff.	Sig.	Coeff.	Sig.	Coeff.	Sig.	Coeff.	Sig.
MAT academy	0.255		0.328		0.249		0.310		0.259	
By type										
Converter	0.255		0.328		0.249		0.310		0.259	
Sponsor-led	-		-		-		-		-	
By size of MAT										
2 schools	0.282		0.314		0.230		0.441		0.218	
3 schools	0.600	*	0.760	*	0.579	*	0.785		0.683	*
4–6 schools	0.249		0.224		0.411		0.100		0.301	
7–15 schools	0.336		0.437		0.393		0.179		0.333	
16+ schools	-0.286		-0.142		-0.397		0.023		-0.235	

Table 8: Number of MAT primary academies and MATs by size included in the analysis

MAT size	Number of MATs	Number of converter academies	Number of sponsor-led academies
2 schools	39	43	-
3 schools	21	26	-
4–6 schools	17	31	-
7–15 schools	13	40	1
16+ schools	14	20	4
Total	104	160	5

Primary MAT and standalone maintained schools

This section shows the results of the analysis of pupil attainment at Key Stage 2 for academies in a MAT compared to standalone maintained schools, which in this primary matched sample are both converters and sponsor-led (see Table 5). The analysis included 327 schools (including the comparison group), with almost 40,000 pupils over the three years. As shown in Table 8,

the analysis includes a reasonable distribution of schools across MATs of different sizes, although the number of sponsor-led academies is very small.

We can see from the estimates in Table 9 that, after controlling for relevant pupil characteristics, pupils in MAT academies tend to do better than pupils in comparable standalone maintained schools. Although the difference is not very big, it is statistically significant for all outcome variables considered. However, it is important to note that, in this model, the estimated effect is potentially the result of academization as well as any ‘MAT effect’. It is not possible to disentangle the two.

Table 9: Estimation results for primary MAT academies compared to standalone maintained

	Average point score		Pupil achieved Level 4 or above		Pupil achieved expected progress in reading		Pupil achieved expected progress in writing		Pupil achieved expected progress in Maths	
	Coeff.	Sig.	Coeff.	Sig.	Coeff.	Sig.	Coeff.	Sig.	Coeff.	Sig.
MAT academy	0.310	**	0.421	***	0.204	*	0.348	**	0.248	*
By academy type										
Converter	0.319	**	0.437	***	0.206	*	0.358	**	0.273	**
Sponsor-led	-0.024		-0.134		0.097		0.019		-0.498	
By size of MAT										
2 schools	0.227		0.242		0.076		0.358		0.091	
3 schools	0.582	*	0.700	**	0.377	*	0.672	**	0.642	**
4–6 schools	0.448	*	0.687	***	0.480	**	0.370	*	0.566	**
7–15 schools	0.419	*	0.584	**	0.345	*	0.390	*	0.300	*
16+ schools	-0.205		-0.150		-0.257		-0.099		-0.300	

Separating the effect between converter and sponsor-led academies, we can see that the overall positive effect comes from pupils in converter academies, whereas the coefficient for sponsor-led academies is not statistically significant. This indicates that MATs seem to be making a positive difference for pupils in converter academies, but not for pupils in sponsor-led academies. However, it is important to note again the small number of sponsor-led academies in this sample.

As with our previous model, we have also split the group of MAT academies by size of MAT. This shows that pupils in schools which are part of small or mid-sized MATs tend to do better than pupils in comparable maintained schools, with a positive and statistically significant difference for MATs with 3–15 schools. Again, pupils in larger MATs tend to do worse than their peers in comparable maintained schools, but the difference is not statistically significant.

Secondary MAT and standalone academies

This section shows the results of the analysis of pupil attainment at Key Stage 4 for academies in a MAT compared to standalone academies, which include matched converter and sponsor-led academies (see Table 4). The analysis encompassed 427 schools (including the comparison group), with almost 250,000 pupils over the three years. As shown in Table 10, the analysis covers a reasonable distribution of schools across MATs of different sizes. Although sponsor-led academies are somewhat underrepresented, due to the difficulty in finding suitable matches, they are not nearly or completely absent, as was the case for primary schools.

Table 10: Number of MAT secondary academies and MATs by size included in the analysis

MAT size	Number of MATs	Number of converter academies	Number of sponsor-led academies
2 schools	68	70	2
3 schools	41	39	5
4–6 schools	45	49	5
7–15 schools	22	30	3
16+ schools	14	23	12
Total	190	211	27

Table 11: Estimation results for secondary MAT academies compared to standalone academies

	Average point score (capped)		Pupil achieved 5 A*–C including English and Maths		Pupil achieved expected progress in English		Pupil achieved expected progress in Maths	
	Coeff.	Sig.	Coeff.	Sig.	Coeff.	Sig.	Coeff.	Sig.
MAT academy	-0.744		0.010		0.098		-0.076	
By academy type								
Converter	-0.875		-0.020		0.091		-0.126	
Sponsor-led	3.052		0.351		0.183		0.400	
By size of MAT								
2 schools	6.658		0.307		0.186		0.136	
3 schools	-4.040		-0.197		0.035		-0.228	
4–6 schools	1.378		0.022		0.138		-0.089	
7–15 schools	2.380		0.157		0.188		0.027	
16+ schools	-18.154	***	-0.494	*	-0.153		-0.398	*

We can see from the estimates in Table 11 that, after controlling for relevant pupil characteristics, pupils in MAT academies tend to have similar results to pupils in comparable standalone academies. This is true for all attainment measures considered.

When we split the effect between converter and sponsor-led academies, we can see the two parameters are quite different. However, neither is statistically significant, on any of the outcome measures considered.

Splitting MAT membership by MAT size, the results are less clear and consistent than in the case of primaries. The difference between MAT and standalone academies is generally positive but not significant for small and mid-sized MATs. On the other hand, larger MATs show negative effects on pupil attainment across all outcome measures,¹³ with the effect on CAPS, 5 A*-C (E&M) and Maths progress being statistically significant.

Secondary MAT and standalone maintained schools

This section shows the results of the analysis of pupil attainment at Key Stage 4 for converter and sponsor-led academies in a MAT compared to standalone maintained schools (see Table 5). The analysis included 589 schools, with about 325,000 pupils over the three years. As shown in Table 12, the analysis covers a reasonable distribution of schools across MATs of different sizes. Both converter and sponsor-led academies are well represented in the analysis.

Table 12: Number of MAT secondary academies and MATs by size included in the analysis

MAT size	Number of MATs	Number of converter academies	Number of sponsor-led academies
2 schools	76	69	13
3 schools	43	40	9
4–6 schools	53	50	24
7–15 schools	28	30	18
16+ schools	17	28	44
Total	217	217	108

We can see from the estimates in Table 13 that, after controlling for relevant pupil characteristics, pupils in MAT academies tend to do slightly better than their peers in comparable maintained schools. This is true for all attainment measures considered, but the difference is statistically significant only for progress in English, with progress in Maths being borderline non-significant.

¹³ It is useful to note that, looking more closely at different school types, the negative effect of larger MATs seems mainly to be due to pupils in converter academies performing less well than their peers in comparable standalone academies, whereas the effect of small and medium-sized MATs is similar for pupils in converter and sponsor-led academies. However, this finding is indicative only, as the project resources did not allow for additional analysis by academy type by size of MAT.

As mentioned for the Key Stage 2 analysis, the estimated effect is possibly the result of academization as well as any ‘MAT effect’ itself, and it is not possible to disentangle the two.

When we split the effect between converter and sponsor-led academies, we can see a positive and significant effect of MAT converters across all outcome measures, and a negative but non-significant effect of MAT sponsor-led academies.¹⁴ This is broadly in line with the KS2 comparison.

Table 13: Estimation results for secondary MAT academies compared to standalone maintained

	Average point score (capped)		Pupil achieved 5 A*–C including English and Maths		Pupil achieved expected progress in English		Pupil achieved expected progress in Maths	
	Coeff.	Sig.	Coeff.	Sig.	Coeff.	Sig.	Coeff.	Sig.
MAT academy	2.157		0.074		0.135	*	0.110	
By academy type								
Converter	4.785	*	0.181	*	0.211	**	0.183	**
Sponsor-led	-3.442		-0.142		-0.005		-0.041	
By size of MAT								
2 schools	7.599	**	0.273	**	0.192	*	0.280	**
3 schools	3.383		0.031		0.106		0.000	
4–6 schools	3.348		0.057		0.183	*	0.073	
7–15 schools	4.339		0.158		0.184		0.187	
16+ schools	-7.480	**	-0.157		0.011		-0.022	

Splitting MAT membership by MAT size, the estimates show pupils in schools that are part of small or mid-sized MATs tend to do better than pupils in comparable maintained schools, with a statistically significant difference for MATs with two schools across all outcomes. Again, pupils in larger MATs tend to do worse than their peers in comparable maintained schools,¹⁵ although the difference is statistically significant only for the CAPS measure.

¹⁴ While the effect for sponsor-led academies appears to be negative, the parameters are not significant as there is substantial variability in the outcomes.

¹⁵ The negative effect of larger MATs seems mainly due to pupils in sponsor-led academies performing less well than their peers in comparable standalone maintained schools, whereas the effect of small and medium-sized MATs is similar for pupils in converter and sponsor-led academies. However, this finding is indicative only, as the project resources did not allow for additional analysis by academy type by size of MAT.

Additional analysis and consistency checks

In addition to the analysis described in this section, we have explored the question of whether there is any differential effect of MATs for disadvantaged pupils. We have explored this question by running all of the above models with the interaction between the FSM identifier¹⁶ and the various MAT identifiers. This analysis did not identify any significant differential effects for disadvantaged pupils, except for the comparison between secondary MAT academies and secondary maintained schools. In this case, the findings show that, after controlling for other individual characteristics, disadvantaged pupils in secondary MAT academies tend to do better than their peers in secondary maintained schools. This is mainly driven by disadvantaged pupils in sponsor-led academies, and is also detected in mid-sized (7–15 schools) and large MATs (16 or more schools), which are the groups with the highest concentration of sponsor-led academies.

One of the main questions about the robustness of our findings concerns the validity of the comparison between schools based on our PSM specification. To address this question, we have performed consistency checks by replicating the analysis based on a simpler specification of the PSM model. This alternative formulation has produced a higher number of matches but no substantive difference in the overall findings. While the details of the parameter estimate change slightly, the broad pattern of direction and significance of the estimates is consistent with the one presented in this section, and we have no reason for concern.

¹⁶ Dummy for FSM eligibility over the previous six academic years.

Chapter 5

Conclusions

In 2016, Sir David Carter (2016: 28), the National Schools Commissioner, argued that ‘we need our existing MATs to grow’ in order ‘to be sustainable’. In 2017, Lord Agnew, the minister responsible for academies, said that small MATs should merge together in order to achieve financial viability, arguing that ‘the sweet spot is perhaps somewhere between 12 and 20 schools, or something like 5,000 to 10,000 pupils’ (2017 North Academies Conference speech). The rationale for this growth put forward by the government has been largely economic – for example, that larger MATs will secure economies of scale, more efficient use of resources, more effective management and clearer oversight of academies. However, the findings reported in this paper – that pupils in smaller MATs tend to do better and, conversely, pupils in larger MATs tended to do worse on average in standardized tests than peers in comparable schools – casts doubt on the educational arguments for MAT growth.

The tables below summarize the headline findings from this study.

Schools in MATS, by phase:

	Primary schools (in MATs)	Secondary schools (in MATs)
Compared to equivalent standalone academies	No significance, but positive difference	No significance, and neutral difference
Compared to equivalent maintained schools	Significant and positive	No significance, but positive difference

Schools in MATs, by academy status (converter or sponsor-led):

	Converter	Sponsor-led
Primary schools in MATs, compared to equivalent standalone academies	No significance, but positive difference	[No matched sample]
Secondary schools in MATs, compared to equivalent standalone academies	No significance, and neutral difference	No significance, but positive difference
Primary schools in MATs, compared to equivalent maintained schools	Significant and positive	No significance, and neutral difference
Secondary schools in MATs, compared to equivalent maintained schools	Significant and positive	No significance, but negative difference

Schools in MATs, by MAT size:

	MAT size by number of schools				
	2	3	4–6	7–15	16+
Primaries in MATs, by standalone academies	No significance, but positive difference	Significant and positive	No significance, but positive difference	No significance, but positive difference	No significance, but negative difference
Secondaries in MATs, by standalone academies	No significance, but positive difference	No significance, but negative difference	No significance, and neutral difference	No significance, but positive difference	Significant and negative
Primaries in MATs, by maintained schools	No significance, but positive difference	Significant and positive	Significant and positive	Significant and positive	No significance, but negative difference
Secondaries in MATs, by maintained schools	Significant and positive	No significance, but positive difference	No significance, but positive difference ¹⁷	No significance, but positive difference	Significant and negative¹⁸

In reporting these findings, we recognize that our analysis has limitations. By its nature, while enabling statistically robust findings, the PSM approach does result in a number of schools without a suitable match. Our resources did not allow us to understand whether there were particular types of MAT that made a positive, neutral or negative impact within the size bands given above. As we outlined in the opening section, it will also be important to update this analysis with more recent data as the MAT landscape evolves. Nevertheless, this assessment of MAT impact provides a significant and original contribution on issues of size to the growing literature on MATs and academies. It also reinforces the emerging consensus that, to date, MATs have had no overall positive impact on student outcomes.

17 A positive and statistically significant difference was found for progress in KS4 English only, to the 95 per cent confidence level.

18 A positive and statistically significant difference was found for KS4 CAPS, to the 99 per cent confidence level.

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Appendix

Table 1: Number and percentage of academies by type and overall size of MAT

All schools	Converter academies		Sponsor-led academies		Free schools		TOTAL	
	N	%	N	%	N	%	N	%
Standalone	1,768	52.1%	177	11.6%	158	50.6%	2,103	40.2%
2 schools	324	9.5%	160	10.5%	29	9.3%	513	9.8%
3 schools	248	7.3%	155	10.2%	20	6.4%	423	8.1%
4–6 schools	481	14.2%	288	18.9%	38	12.2%	807	15.4%
7–15 schools	354	10.4%	273	17.9%	41	13.1%	668	12.8%
16+ schools	219	6.5%	471	30.9%	26	8.3%	716	13.7%
TOTAL	3,394	100.0%	1,524	100.0%	312	100.0%	5,230	100.0%
Primary schools	Converter academies		Sponsor-led academies		Free schools		TOTAL	
	N	%	N	%	N	%	N	%
Standalone	789	39.8%	46	4.9%	49	41.9%	884	29.1%
2 schools	189	9.5%	102	10.9%	14	12.0%	305	10.0%
3 schools	178	9.0%	104	11.1%	9	7.7%	291	9.6%
4–6 schools	364	18.4%	198	21.2%	15	12.8%	577	19.0%
7–15 schools	294	14.8%	205	21.9%	16	13.7%	515	17.0%
16+ schools	169	8.5%	281	30.0%	14	12.0%	464	15.3%
TOTAL	1,983	100.0%	936	100.0%	117	100.0%	3,036	100.0%
Secondary schools	Converter academies		Sponsor-led academies		Free schools		TOTAL	
	N	%	N	%	N	%	N	%
Standalone	979	69.4%	131	22.3%	109	55.9%	1,219	55.6%
2 schools	135	9.6%	58	9.9%	15	7.7%	208	9.5%
3 schools	70	5.0%	51	8.7%	11	5.6%	132	6.0%
4–6 schools	117	8.3%	90	15.3%	23	11.8%	230	10.5%
7–15 schools	60	4.3%	68	11.6%	25	12.8%	153	7.0%
16+ schools	50	3.5%	190	32.3%	12	6.2%	252	11.5%
TOTAL	1,411	100.0%	588	100.0%	195	100.0%	2,194	100.0%

Table 2: Number of matched and unmatched MAT academies by academization route (MAT academy to standalone academy matching)

	Group 1 (pre-2010/11)		Group 2 (ay 2010/11)		Group 3 (ay 2011/12)	
	matched	unmatched	matched	unmatched	matched	unmatched
Primary schools						
Converter academies	:	:	5	27	76	56
Sponsor-led academies	:	:	:	:	0	6
<hr/>						
	Group 1 (pre-2010/11)		Group 2 (ay 2010/11)		Group 3 (ay 2011/12)	
	matched	unmatched	matched	unmatched	matched	unmatched
Secondary schools						
Converter academies	:	:	74	26	137	20
Sponsor-led academies	19	82	8	16	0	27

Table 3: Sample composition of matched primary academies (MAT academy to standalone academy matching)

	Group 1 (pre-2010/11)		Group 2 (ay 2010/11)		Group 3 (ay 2011/12)	
	MAT	Standalone	MAT	Standalone	MAT	Standalone
	n=-	n=-	n=5	n=5	n=76	n=55
Number of pupils	:	:	287	258	299	296
CofE schools	:	:	0	0	12	7
RoC schools	:	:	0	0	6	4
Other faith schools	:	:	0	0	0	0
London	:	:	1	0	7	5
South	:	:	4	3	40	28
Midlands	:	:	0	2	10	9
North	:	:	0	0	19	13
% FSM	:	:	12.7	8.0	13.0	10.8
% White British	:	:	78.8	85.0	84.0	83.7
% EAL	:	:	12.6	5.8	8.2	8.3
Absence	:	:	4.6	4.5	4.1	4.0
KS2 average point score	:	:	28.5	28.4	29.1	29.3
% pupils achieving Level 4 or above	:	:	85.4%	83.4%	85.0%	87.2%

Table 4: Sample composition of matched secondary academies (MAT academy to standalone academy matching)

	Group 1 (pre-2010/11)		Group 2 (ay 2010/11)		Group 3 (ay 2011/12)	
	MAT n=19	Standalone n=14	MAT n=82	Standalone n=64	MAT n=137	Standalone n=111
Number of pupils	938	867	1,000	997	941	951
CofE schools	2	2	5	6	7	6
RoC schools	0	0	0	0	11	11
Other faith schools	1	0	0	0	0	0
London	4	2	12	9	16	14
South	5	4	44	30	64	47
Midlands	6	3	13	13	25	24
North	4	5	13	12	32	26
% FSM	24.4	31.0	10.6	10.9	11.9	12.3
% White British	67.0	65.4	82.5	82.2	79.3	76.6
% EAL	17.3	18.1	6.8	7.1	10.6	12.1
Absence	7.5	7.9	5.9	5.9	5.7	5.6
% pupils achieving 5 A*-C (including English & Maths)	47.7%	40.1%	68.0%	67.6%	64.3%	66.2%
KS4 value added	1009.0	1007.8	1007.8	1005.1	1005.7	1005.9

Table 5: Number of matched and unmatched MAT academies by academization route (MAT academy to standalone maintained matching)

Primaries	Group 1 (pre-2010/11)		Group 2 (ay 2010/11)		Group 3 (ay 2011/12)	
	matched	unmatched	matched	unmatched	matched	unmatched
Converter academies	:	:	31	1	129	3
Sponsor-led academies	:	:	:	:	5	1

Secondaries	Group 1 (pre-2010/11)		Group 2 (ay 2010/11)		Group 3 (ay 2011/12)	
	matched	unmatched	matched	unmatched	matched	unmatched
Converter academies	:	:	79	21	138	19
Sponsor-led academies	61	40	21	3	26	1

Table 6: Sample composition of matched primary academies (MAT academy to standalone maintained matching)

	Group 1 (pre-2010/11)		Group 2 (ay 2010/11)		Group 3 (ay 2011/12)	
	MAT n=-	Standalone n=-	MAT n=31	Maintained n=31	MAT n=134	Maintained n=132
Number of pupils	:	:	292	301	276	278
CofE schools	:	:	2	1	15	10
RoC schools	:	:	0	0	15	21
Other faith schools	:	:	0	0	0	0
London	:	:	6	9	11	12
South	:	:	16	15	66	57
Midlands	:	:	4	3	30	30
North	:	:	5	4	27	33
% FSM	:	:	19.1	20.7	17.7	18.6
% White British	:	:	79.2	68.5	78.4	77.1
% EAL	:	:	10.3	17.0	10.6	11.6
Absence	:	:	5.0	4.8	4.3	4.2
KS2 average point score	:	:	28.1	28.4	28.7	28.8
% pupils achieving Level 4 or above	:	:	81.1%	81.5%	83.2%	83.5%

Table 7: Sample composition of matched secondary academies (MAT academy to standalone maintained matching)

	Group 1 (pre-2010/11)		Group 2 (ay 2010/11)		Group 3 (ay 2011/12)	
	MAT n=61	Maintained n=56	MAT n=100	Maintained n=93	MAT n=164	Maintained n=139
Number of pupils	838	849	981	947	916	909
CofE schools	4	4	5	6	8	9
RoC schools	0	0	0	0	11	12
Other faith schools	1	1	0	0	1	1
London	14	16	14	13	19	16
South	18	13	43	39	70	57
Midlands	14	15	20	17	34	35
North	15	12	23	24	41	31
% FSM	25.3	26.5	15.1	15.0	14.7	14.5
% White British	67.9	63.4	79.3	79.4	78.8	77.3
% EAL	16.2	21.0	11.1	11.1	10.4	11.8
Absence	7.3	7.2	6.5	6.3	5.9	5.8
% pupils achieving 5 A*-C (including Eng & Maths)	50.3%	50.5%	61.5%	63.8%	61.0%	60.6%
KS4 value added	1016.1	1002.2	1005.2	1004.2	1003.3	1003.7

Table 8: Estimation models summary

Model	Comparison	Phase	Outcome variable	Main identifiers
Model 1A	MAT academy vs standalone academy	KS2	KS2 average point score	MAT academy
Model 1B	MAT academy vs standalone academy	KS2	KS2 average point score	MAT converter; MAT sponsor-led by size of MAT
Model 1C	MAT academy vs standalone academy	KS2	KS2 average point score	MAT academy
Model 2A	MAT academy vs standalone academy	KS2	Pupil achieved Level 4 or above	MAT converter; MAT sponsor-led by size of MAT
Model 2B	MAT academy vs standalone academy	KS2	Pupil achieved Level 4 or above	MAT academy
Model 2C	MAT academy vs standalone academy	KS2	Pupil achieved Level 4 or above	MAT converter; MAT sponsor-led by size of MAT
Model 3A	MAT academy vs standalone academy	KS2	Pupil achieved expected progress in reading	MAT academy
Model 3B	MAT academy vs standalone academy	KS2	Pupil achieved expected progress in reading	MAT converter; MAT sponsor-led by size of MAT
Model 3C	MAT academy vs standalone academy	KS2	Pupil achieved expected progress in reading	MAT academy
Model 4A	MAT academy vs standalone academy	KS2	Pupil achieved expected progress in writing (TA)	MAT academy
Model 4B	MAT academy vs standalone academy	KS2	Pupil achieved expected progress in writing (TA)	MAT converter; MAT sponsor-led by size of MAT
Model 4C	MAT academy vs standalone academy	KS2	Pupil achieved expected progress in writing (TA)	MAT academy
Model 5A	MAT academy vs standalone academy	KS2	Pupil achieved expected progress in Maths	MAT converter; MAT sponsor-led by size of MAT
Model 5B	MAT academy vs standalone academy	KS2	Pupil achieved expected progress in Maths	MAT academy
Model 5C	MAT academy vs standalone academy	KS2	Pupil achieved expected progress in Maths	MAT converter; MAT sponsor-led by size of MAT
Model 6A	MAT academy vs maintained school	KS2	KS2 average point score	MAT academy
Model 6B	MAT academy vs maintained school	KS2	KS2 average point score	MAT converter; MAT sponsor-led by size of MAT
Model 6C	MAT academy vs maintained school	KS2	KS2 average point score	MAT academy
Model 7A	MAT academy vs maintained school	KS2	Pupil achieved Level 4 or above	MAT converter; MAT sponsor-led by size of MAT
Model 7B	MAT academy vs maintained school	KS2	Pupil achieved Level 4 or above	MAT academy
Model 7C	MAT academy vs maintained school	KS2	Pupil achieved Level 4 or above	MAT converter; MAT sponsor-led by size of MAT
Model 8A	MAT academy vs maintained school	KS2	Pupil achieved expected progress in reading	MAT academy
Model 8B	MAT academy vs maintained school	KS2	Pupil achieved expected progress in reading	MAT converter; MAT sponsor-led by size of MAT
Model 8C	MAT academy vs maintained school	KS2	Pupil achieved expected progress in reading	MAT academy
Model 9A	MAT academy vs maintained school	KS2	Pupil achieved expected progress in writing (TA)	MAT converter; MAT sponsor-led by size of MAT
Model 9B	MAT academy vs maintained school	KS2	Pupil achieved expected progress in writing (TA)	MAT academy
Model 9C	MAT academy vs maintained school	KS2	Pupil achieved expected progress in writing (TA)	MAT converter; MAT sponsor-led by size of MAT

Model	Comparison	Phase	Outcome variable	Main identifiers
Model 10A	MAT academy vs maintained school	KS2	Pupil achieved expected progress in Maths	MAT academy
Model 10B	MAT academy vs maintained school	KS2	Pupil achieved expected progress in Maths	MAT converter; MAT sponsor-led
Model 10C	MAT academy vs maintained school	KS2	Pupil achieved expected progress in Maths	by size of MAT
Model 11A	MAT academy vs standalone academy	KS4	KS4 average point score (capped)	MAT academy
Model 11B	MAT academy vs standalone academy	KS4	KS4 average point score (capped)	MAT converter; MAT sponsor-led
Model 11C	MAT academy vs standalone academy	KS4	KS4 average point score (capped)	by size of MAT
Model 12A	MAT academy vs standalone academy	KS4	Pupil achieved 5 A *-C including English and Maths	MAT academy
Model 12B	MAT academy vs standalone academy	KS4	Pupil achieved 5 A *-C including English and Maths	MAT converter; MAT sponsor-led
Model 12C	MAT academy vs standalone academy	KS4	Pupil achieved 5 A *-C including English and Maths	by size of MAT
Model 13A	MAT academy vs standalone academy	KS4	Pupil achieved expected progress in English	MAT academy
Model 13B	MAT academy vs standalone academy	KS4	Pupil achieved expected progress in English	MAT converter; MAT sponsor-led
Model 13C	MAT academy vs standalone academy	KS4	Pupil achieved expected progress in English	by size of MAT
Model 14A	MAT academy vs standalone academy	KS4	Pupil achieved expected progress in Maths	MAT academy
Model 14B	MAT academy vs standalone academy	KS4	Pupil achieved expected progress in Maths	MAT converter; MAT sponsor-led
Model 14C	MAT academy vs standalone academy	KS4	Pupil achieved expected progress in Maths	by size of MAT
Model 15A	MAT academy vs maintained school	KS4	KS4 average point score (capped)	MAT academy
Model 15B	MAT academy vs maintained school	KS4	KS4 average point score (capped)	MAT converter; MAT sponsor-led
Model 15C	MAT academy vs maintained school	KS4	KS4 average point score (capped)	by size of MAT
Model 16A	MAT academy vs maintained school	KS4	Pupil achieved 5 A *-C including English and Maths	MAT academy
Model 16B	MAT academy vs maintained school	KS4	Pupil achieved 5 A *-C including English and Maths	MAT converter; MAT sponsor-led
Model 16C	MAT academy vs maintained school	KS4	Pupil achieved 5 A *-C including English and Maths	by size of MAT
Model 17A	MAT academy vs maintained school	KS4	Pupil achieved expected progress in English	MAT academy
Model 17B	MAT academy vs maintained school	KS4	Pupil achieved expected progress in English	MAT converter; MAT sponsor-led
Model 17C	MAT academy vs maintained school	KS4	Pupil achieved expected progress in English	by size of MAT
Model 18A	MAT academy vs maintained school	KS4	Pupil achieved expected progress in Maths	MAT academy
Model 18B	MAT academy vs maintained school	KS4	Pupil achieved expected progress in Maths	MAT converter; MAT sponsor-led
Model 18C	MAT academy vs maintained school	KS4	Pupil achieved expected progress in Maths	by size of MAT

Table 9: Model 1A: KS2 average point score, MAT academies vs standalone academies

Variables	Coefficient	Std. err.	z-score	p value	[95% Conf.	Interval]
KS1 average point score	0.848	0.006	131.45	0.000	0.835	0.860
Female	-0.537	0.036	-15.08	0.000	-0.607	-0.467
FSM (ever 6) pupil	-0.337	0.047	-7.13	0.000	-0.429	-0.244
BME pupil	0.097	0.065	1.48	0.138	-0.031	0.224
Unclassified ethnicity	0.417	0.244	1.71	0.086	-0.060	0.895
EAL pupil	0.768	0.078	9.87	0.000	0.615	0.920
SEN pupil (no statement)	-1.042	0.058	-17.90	0.000	-1.156	-0.928
SEN pupil (with statement)	-2.681	0.140	-19.17	0.000	-2.955	-2.407
Overall absence	-5.052	0.485	-10.43	0.000	-6.002	-4.102
Junior school	-0.490	0.238	-2.06	0.040	-0.957	-0.023
MAT academy	0.255	0.143	1.79	0.074	-0.024	0.535
Year						
2013/14	0.249	0.043	5.75	0.000	0.164	0.334
2014/15	0.200	0.043	4.63	0.000	0.115	0.284
_cons	16.777	0.161	104.22	0.000	16.462	17.093
school level:						
var(_cons)	0.637	0.083			0.494	0.822

Model 1	
Number of obs	18,431
Number of groups	141
Observations per group	
min	18
avg	131
max	505

Table 10: Model 1B: KS2 average point score, MAT academies vs standalone academies

Variables	Coefficient	Std. err.	z-score	p value	[95% Conf.	Interval]
KS1 average point score	0.848	0.006	131.45	0.000	0.835	0.860
Female	-0.537	0.036	-15.08	0.000	-0.607	-0.467
FSM (ever 6) pupil	-0.337	0.047	-7.13	0.000	-0.429	-0.244
BME pupil	0.097	0.065	1.48	0.138	-0.031	0.224
Unclassified ethnicity	0.417	0.244	1.71	0.086	-0.060	0.895
EAL pupil	0.768	0.078	9.87	0.000	0.615	0.920
SEN pupil (no statement)	-1.042	0.058	-17.90	0.000	-1.156	-0.928
SEN pupil (with statement)	-2.681	0.140	-19.17	0.000	-2.955	-2.407
Overall absence	-5.052	0.485	-10.43	0.000	-6.002	-4.102
Junior school	-0.490	0.238	-2.06	0.040	-0.957	-0.023
MAT converter	0.255	0.143	1.79	0.074	-0.024	0.535
MAT sponsor-led	0.000	(omitted)				
Year						
2013/14	0.249	0.043	5.75	0.000	0.164	0.334
2014/15	0.200	0.043	4.63	0.000	0.115	0.284
_cons	16.777	0.161	104.22	0.000	16.462	17.093
school level:						
var(_cons)	0.637	0.083			0.494	0.822

Table 11: Model 1C: KS2 average point score, MAT academies vs standalone academies

Variables	Coefficient	Std. err.	z-score	p value	[95% Conf.	Interval]
KS1 average point score	0.848	0.006	131.44	0.000	0.835	0.860
Female	-0.537	0.036	-15.08	0.000	-0.607	-0.467
FSM (ever 6) pupil	-0.336	0.047	-7.11	0.000	-0.429	-0.243
BME pupil	0.097	0.065	1.49	0.136	-0.031	0.225
Unclassified ethnicity	0.423	0.244	1.74	0.083	-0.055	0.900
EAL pupil	0.769	0.078	9.89	0.000	0.617	0.921
SEN pupil (no statement)	-1.043	0.058	-17.91	0.000	-1.157	-0.929
SEN pupil (with statement)	-2.682	0.140	-19.18	0.000	-2.956	-2.408
Overall absence	-5.054	0.485	-10.43	0.000	-6.004	-4.105
Junior school	-0.459	0.236	-1.94	0.052	-0.922	0.004
MAT size:						
2 schools	0.282	0.205	1.38	0.168	-0.119	0.683
3 schools	0.600	0.248	2.42	0.016	0.113	1.087
4–6 schools	0.249	0.239	1.04	0.296	-0.218	0.717
7–15 schools	0.336	0.214	1.57	0.117	-0.084	0.757
16+ schools	-0.286	0.257	-1.11	0.266	-0.790	0.218
Year						
2013/14	0.249	0.043	5.75	0.000	0.164	0.334
2014/15	0.199	0.043	4.62	0.000	0.115	0.284
_cons	16.773	0.159	105.43	0.000	16.462	17.085
school level:						
var(_cons)	0.600	0.079			0.465	0.776

Table 12: Model 2A: KS2 pupil achieved Level 4 or above, MAT academies vs standalone academies

Variables	Coefficient	Std. err.	z-score	p value	[95% Conf.	Interval]
KS1 average point score	0.533	0.014	39.36	0.000	0.507	0.560
Female	-0.184	0.062	-2.99	0.003	-0.305	-0.064
FSM (ever 6) pupil	-0.193	0.071	-2.73	0.006	-0.332	-0.055
BME pupil	0.051	0.112	0.46	0.646	-0.168	0.270
Unclassified ethnicity	0.422	0.498	0.85	0.397	-0.554	1.399
EAL pupil	0.272	0.130	2.08	0.037	0.016	0.527
SEN pupil (no statement)	-1.510	0.073	-20.64	0.000	-1.654	-1.367
SEN pupil (with statement)	-2.099	0.192	-10.91	0.000	-2.476	-1.722
Overall absence	-5.010	0.703	-7.12	0.000	-6.389	-3.632
Junior school	-0.575	0.292	-1.97	0.049	-1.147	-0.003
MAT academy	0.328	0.178	1.84	0.066	-0.022	0.678
Year						
2013/14	0.485	0.073	6.60	0.000	0.341	0.629
2014/15	0.359	0.073	4.92	0.000	0.216	0.502
_cons	-5.041	0.248	-20.34	0.000	-5.526	-4.555
schurn						
var(_cons)	0.906	0.132			0.681	1.206

Table 13: Model 2B: KS2 pupil achieved Level 4 or above, MAT academies vs standalone academies

Variables	Coefficient	Std. err.	z-score	p value	[95% Conf.	Interval]
KS1 average point score	0.533	0.014	39.36	0.000	0.507	0.560
Female	-0.184	0.062	-2.99	0.003	-0.305	-0.064
FSM (ever 6) pupil	-0.193	0.071	-2.73	0.006	-0.332	-0.055
BME pupil	0.051	0.112	0.46	0.646	-0.168	0.270
Unclassified ethnicity	0.422	0.498	0.85	0.397	-0.554	1.399
EAL pupil	0.272	0.130	2.08	0.037	0.016	0.527
SEN pupil (no statement)	-1.510	0.073	-20.64	0.000	-1.654	-1.367
SEN pupil (with statement)	-2.099	0.192	-10.91	0.000	-2.476	-1.722
Overall absence	-5.010	0.703	-7.12	0.000	-6.389	-3.632
Junior school	-0.575	0.292	-1.97	0.049	-1.147	-0.003
MAT converter	0.328	0.178	1.84	0.066	-0.022	0.678
MAT sponsor-led	0.000	(omitted)				
Year						
2013/14	0.485	0.073	6.60	0.000	0.341	0.629
2014/15	0.359	0.073	4.92	0.000	0.216	0.502
_cons	-5.041	0.248	-20.34	0.000	-5.526	-4.555
schurn						
var(_cons)	0.906	0.132			0.681	1.206

Table 14: Model 2C: KS2 pupil achieved Level 4 or above, MAT academies vs standalone academies

Variables	Coefficient	Std. err.	z-score	p value	[95% Conf.	Interval]
KS1 average point score	0.533	0.014	39.37	0.000	0.507	0.560
Female	-0.184	0.062	-2.99	0.003	-0.305	-0.063
FSM (ever 6) pupil	-0.193	0.071	-2.73	0.006	-0.332	-0.054
BME pupil	0.053	0.112	0.47	0.637	-0.166	0.272
Unclassified ethnicity	0.433	0.498	0.87	0.385	-0.543	1.409
EAL pupil	0.273	0.130	2.09	0.036	0.017	0.528
SEN pupil (no statement)	-1.510	0.073	-20.63	0.000	-1.654	-1.367
SEN pupil (with statement)	-2.096	0.192	-10.90	0.000	-2.473	-1.720
Overall absence	-5.021	0.703	-7.14	0.000	-6.399	-3.642
Junior school	-0.535	0.292	-1.83	0.067	-1.107	0.037
MAT size:						
2 schools	0.314	0.256	1.23	0.220	-0.188	0.817
3 schools	0.760	0.313	2.42	0.015	0.145	1.374
4–6 schools	0.224	0.303	0.74	0.460	-0.370	0.819
7–15 schools	0.437	0.273	1.60	0.110	-0.099	0.973
16+ schools	-0.142	0.320	-0.44	0.658	-0.769	0.485
Year						
2013/14	0.485	0.073	6.60	0.000	0.341	0.629
2014/15	0.360	0.073	4.93	0.000	0.217	0.503
_cons	-5.049	0.247	-20.47	0.000	-5.532	-4.566
schurn						
var(_cons)	0.867	0.127			0.651	1.156

Table 15: Model 3A: KS2 pupil achieved/expected progress in reading, MAT academies vs standalone academies

Variables	Coefficient	Std. err.	z-score	p value	[95% Conf.	Interval]
KS1 average point score	0.009	0.011	0.88	0.379	-0.012	0.030
Female	-0.041	0.064	-0.63	0.526	-0.166	0.085
FSM (ever 6) pupil	-0.196	0.076	-2.57	0.010	-0.346	-0.046
BME pupil	-0.115	0.113	-1.02	0.310	-0.336	0.107
Unclassified ethnicity	0.406	0.532	0.76	0.446	-0.637	1.448
EAL pupil	0.387	0.144	2.69	0.007	0.105	0.669
SEN pupil (no statement)	-1.364	0.086	-15.90	0.000	-1.532	-1.195
SEN pupil (with statement)	-2.402	0.156	-15.38	0.000	-2.708	-2.096
Overall absence	-1.042	0.701	-1.49	0.138	-2.416	0.333
Junior school	-0.412	0.204	-2.02	0.043	-0.811	-0.012
MAT academy	0.249	0.132	1.89	0.059	-0.009	0.507
Year						
2013/14	0.298	0.076	3.93	0.000	0.149	0.446
2014/15	0.243	0.075	3.23	0.001	0.096	0.391
_cons	2.960	0.219	13.52	0.000	2.531	3.389
schurn						
var(_cons)	0.400	0.073			0.280	0.573

Table 16: Model 3B: KS2 pupil achieved/expected progress in reading, MAT academies vs standalone academies

Variables	Coefficient	Std. err.	z-score	p value	[95% Conf.	Interval]
KS1 average point score	0.009	0.011	0.88	0.379	-0.012	0.030
Female	-0.041	0.064	-0.63	0.526	-0.166	0.085
FSM (ever 6) pupil	-0.196	0.076	-2.57	0.010	-0.346	-0.046
BME pupil	-0.115	0.113	-1.02	0.310	-0.336	0.107
Unclassified ethnicity	0.406	0.532	0.76	0.446	-0.637	1.448
EAL pupil	0.387	0.144	2.69	0.007	0.105	0.669
SEN pupil (no statement)	-1.364	0.086	-15.90	0.000	-1.532	-1.195
SEN pupil (with statement)	-2.402	0.156	-15.38	0.000	-2.708	-2.096
Overall absence	-1.042	0.701	-1.49	0.138	-2.416	0.333
Junior school	-0.412	0.204	-2.02	0.043	-0.811	-0.012
MAT converter	0.249	0.132	1.89	0.059	-0.009	0.507
MAT sponsor-led	0.000	(omitted)				
Year						
2013/14	0.298	0.076	3.93	0.000	0.149	0.446
2014/15	0.243	0.075	3.23	0.001	0.096	0.391
_cons	2.960	0.219	13.52	0.000	2.531	3.389
schurn						
var(_cons)	0.400	0.073			0.280	0.573

Table 17: Model 3C: KS2 pupil achieved/expected progress in reading, MAT academies vs standalone academies

Variables	Coefficient	Std. err.	z-score	p value	[95% Conf.	Interval]
KS1 average point score	0.010	0.011	0.91	0.363	-0.011	0.031
Female	-0.041	0.064	-0.65	0.516	-0.167	0.084
FSM (ever 6) pupil	-0.191	0.076	-2.50	0.012	-0.341	-0.041
BME pupil	-0.107	0.113	-0.95	0.342	-0.329	0.114
Unclassified ethnicity	0.432	0.531	0.81	0.416	-0.609	1.474
EAL pupil	0.389	0.144	2.70	0.007	0.107	0.670
SEN pupil (no statement)	-1.365	0.086	-15.91	0.000	-1.533	-1.196
SEN pupil (with statement)	-2.401	0.156	-15.39	0.000	-2.707	-2.096
Overall absence	-1.040	0.701	-1.48	0.138	-2.414	0.335
Junior school	-0.351	0.196	-1.79	0.074	-0.735	0.034
MAT size:						
2 schools	0.230	0.180	1.28	0.201	-0.123	0.584
3 schools	0.579	0.230	2.52	0.012	0.128	1.030
4–6 schools	0.411	0.227	1.81	0.070	-0.034	0.857
7–15 schools	0.393	0.207	1.90	0.057	-0.012	0.799
16+ schools	-0.397	0.222	-1.79	0.073	-0.832	0.038
Year						
2013/14	0.297	0.076	3.93	0.000	0.149	0.445
2014/15	0.242	0.075	3.21	0.001	0.094	0.390
_cons	2.937	0.217	13.54	0.000	2.512	3.363
schurn						
var(_cons)	0.347	0.066			0.239	0.504

Table 18: Model 4A: KS2 pupil achieved/expected progress in writing (TA), MAT academies vs standalone academies

Variables	Coefficient	Std. err.	z-score	p value	[95% Conf. Interval]
KS1 average point score	0.013	0.014	0.94	0.349	-0.014 0.039
Female	0.213	0.085	2.52	0.012	0.048 0.379
FSM (ever 6) pupil	-0.098	0.099	-0.99	0.321	-0.292 0.096
BME pupil	-0.262	0.143	-1.83	0.067	-0.544 0.019
Unclassified ethnicity	0.136	0.611	0.22	0.824	-1.061 1.333
EAL pupil	0.241	0.185	1.30	0.193	-0.122 0.605
SEN pupil (no statement)	-1.501	0.108	-13.84	0.000	-1.713 -1.288
SEN pupil (with statement)	-2.602	0.184	-14.17	0.000	-2.962 -2.242
Overall absence	-4.497	0.779	-5.77	0.000	-6.024 -2.970
Junior school	-0.409	0.255	-1.60	0.110	-0.910 0.092
MAT academy	0.310	0.167	1.86	0.063	-0.016 0.636
Year					
2013/14	0.102	0.095	1.07	0.282	-0.084 0.287
2014/15	0.398	0.102	3.90	0.000	0.198 0.598
_cons	3.685	0.279	13.21	0.000	3.138 4.232
schurn					
var(_cons)	0.610	0.119			0.416 0.894

Table 19: Model 4B: KS2 pupil achieved/expected progress in writing (TA), MAT academies vs standalone academies

Variables	Coefficient	Std. err.	z-score	p value	[95% Conf.	Interval]
KS1 average point score	0.013	0.014	0.94	0.349	-0.014	0.039
Female	0.213	0.085	2.52	0.012	0.048	0.379
FSM (ever 6) pupil	-0.098	0.099	-0.99	0.321	-0.292	0.096
BME pupil	-0.262	0.143	-1.83	0.067	-0.544	0.019
Unclassified ethnicity	0.136	0.611	0.22	0.824	-1.061	1.333
EAL pupil	0.241	0.185	1.30	0.193	-0.122	0.605
SEN pupil (no statement)	-1.501	0.108	-13.84	0.000	-1.713	-1.288
SEN pupil (with statement)	-2.602	0.184	-14.17	0.000	-2.962	-2.242
Overall absence	-4.497	0.779	-5.77	0.000	-6.024	-2.970
Junior school	-0.409	0.255	-1.60	0.110	-0.910	0.092
MAT converter	0.310	0.167	1.86	0.063	-0.016	0.636
MAT sponsor-led	0.000	(omitted)				
Year						
2013/14	0.102	0.095	1.07	0.282	-0.084	0.287
2014/15	0.398	0.102	3.90	0.000	0.198	0.598
_cons	3.685	0.279	13.21	0.000	3.138	4.232
schurn						
var(_cons)	0.610	0.119			0.416	0.894

Table 20: Model 4C: KS2 pupil achieved/expected progress in writing (TA), MAT academies vs standalone academies

Variables	Coefficient	Std. err.	z-score	p value	[95% Conf.	Interval]
KS1 average point score	0.013	0.014	0.96	0.339	-0.014	0.040
Female	0.214	0.085	2.53	0.011	0.048	0.380
FSM (ever 6) pupil	-0.102	0.099	-1.03	0.305	-0.295	0.092
BME pupil	-0.269	0.144	-1.88	0.061	-0.551	0.012
Unclassified ethnicity	0.131	0.610	0.21	0.830	-1.065	1.328
EAL pupil	0.242	0.185	1.30	0.193	-0.122	0.605
SEN pupil (no statement)	-1.498	0.108	-13.81	0.000	-1.711	-1.286
SEN pupil (with statement)	-2.601	0.184	-14.17	0.000	-2.961	-2.242
Overall absence	-4.479	0.779	-5.75	0.000	-6.007	-2.952
Junior school	-0.409	0.254	-1.61	0.107	-0.906	0.089
MAT size:						
2 schools	0.441	0.236	1.86	0.062	-0.023	0.904
3 schools	0.785	0.307	2.56	0.010	0.184	1.387
4–6 schools	0.100	0.284	0.35	0.723	-0.456	0.657
7–15 schools	0.179	0.258	0.69	0.489	-0.328	0.685
16+ schools	0.023	0.297	0.08	0.937	-0.560	0.606
Year						
2013/14	0.102	0.095	1.08	0.280	-0.083	0.288
2014/15	0.401	0.102	3.92	0.000	0.200	0.601
_cons	3.671	0.278	13.21	0.000	3.127	4.216
schurn						
var(_cons)	0.568	0.113			0.384	0.839

Table 21: Model 5A: KS2 pupil achieved/expected progress in Maths, MAT academies vs standalone academies

Variables	Coefficient	Std. err.	z-score	p value	[95% Conf.	Interval]
KS1 average point score	0.076	0.011	7.06	0.000	0.055	0.098
Female	-0.347	0.065	-5.33	0.000	-0.475	-0.219
FSM (ever 6) pupil	-0.251	0.076	-3.29	0.001	-0.400	-0.101
BME pupil	-0.039	0.116	-0.34	0.733	-0.266	0.188
Unclassified ethnicity	0.702	0.548	1.28	0.200	-0.372	1.776
EAL pupil	0.524	0.144	3.63	0.000	0.241	0.807
SEN pupil (no statement)	-1.320	0.086	-15.35	0.000	-1.488	-1.151
SEN pupil (with statement)	-1.835	0.164	-11.16	0.000	-2.158	-1.513
Overall absence	-4.076	0.672	-6.06	0.000	-5.394	-2.758
Junior school	-0.517	0.275	-1.88	0.060	-1.055	0.022
MAT academy	0.259	0.173	1.50	0.133	-0.079	0.597
Year						
2013/14	0.045	0.078	0.58	0.564	-0.108	0.198
2014/15	-0.050	0.077	-0.65	0.515	-0.202	0.101
_cons	2.542	0.237	10.73	0.000	2.077	3.006
schurn						
var(_cons)	0.778	0.129			0.561	1.077

Table 22: Model 5B: KS2 pupil achieved/expected progress in Maths, MAT academies vs standalone academies

Variables	Coefficient	Std. err.	z-score	p value	[95% Conf.	Interval]
KS1 average point score	0.076	0.011	7.06	0.000	0.055	0.098
Female	-0.347	0.065	-5.33	0.000	-0.475	-0.219
FSM (ever 6) pupil	-0.251	0.076	-3.29	0.001	-0.400	-0.101
BME pupil	-0.039	0.116	-0.34	0.733	-0.266	0.188
Unclassified ethnicity	0.702	0.548	1.28	0.200	-0.372	1.776
EAL pupil	0.524	0.144	3.63	0.000	0.241	0.807
SEN pupil (no statement)	-1.320	0.086	-15.35	0.000	-1.488	-1.151
SEN pupil (with statement)	-1.835	0.164	-11.16	0.000	-2.158	-1.513
Overall absence	-4.076	0.672	-6.06	0.000	-5.394	-2.758
Junior school	-0.517	0.275	-1.88	0.060	-1.055	0.022
MAT converter	0.259	0.173	1.50	0.133	-0.079	0.597
MAT sponsor-led	0.000	(omitted)				
Year						
2013/14	0.045	0.078	0.58	0.564	-0.108	0.198
2014/15	-0.050	0.077	-0.65	0.515	-0.202	0.101
_cons	2.542	0.237	10.73	0.000	2.077	3.006
schurn						
var(_cons)	0.778	0.129			0.561	1.077

Table 23: Model 5C: KS2 pupil achieved/expected progress in Maths, MAT academies vs standalone academies

Variables	Coefficient	Std. err.	z-score	p value	[95% Conf.	Interval]
KS1 average point score	0.077	0.011	7.07	0.000	0.055	0.098
Female	-0.347	0.065	-5.33	0.000	-0.475	-0.219
FSM (ever 6) pupil	-0.251	0.076	-3.29	0.001	-0.400	-0.101
BME pupil	-0.037	0.116	-0.32	0.750	-0.264	0.190
Unclassified ethnicity	0.710	0.548	1.30	0.195	-0.364	1.783
EAL pupil	0.525	0.144	3.63	0.000	0.242	0.808
SEN pupil (no statement)	-1.319	0.086	-15.35	0.000	-1.488	-1.151
SEN pupil (with statement)	-1.835	0.164	-11.16	0.000	-2.158	-1.513
Overall absence	-4.068	0.672	-6.05	0.000	-5.386	-2.751
Junior school	-0.457	0.272	-1.68	0.094	-0.991	0.077
MAT size:						
2 schools	0.218	0.244	0.89	0.372	-0.260	0.697
3 schools	0.683	0.306	2.23	0.026	0.084	1.282
4–6 schools	0.301	0.296	1.02	0.309	-0.279	0.881
7–15 schools	0.333	0.265	1.25	0.210	-0.188	0.853
16+ schools	-0.235	0.305	-0.77	0.440	-0.833	0.362
Year						
2013/14	0.045	0.078	0.58	0.563	-0.108	0.198
2014/15	-0.050	0.077	-0.64	0.519	-0.201	0.102
_cons	2.521	0.235	10.72	0.000	2.061	2.982
schurn						
var(_cons)	0.726	0.123			0.521	1.011

Table 24: Model 6A: KS2 average point score, MAT academies vs maintained schools

Variables	Coefficient	Std. err.	z-score	p value	[95% Conf.	Interval]
KS1 average point score	0.818	0.004	189.50	0.000	0.809	0.826
Female	-0.576	0.025	-23.36	0.000	-0.625	-0.528
FSM (ever 6) pupil	-0.304	0.031	-9.90	0.000	-0.364	-0.244
BME pupil	-0.048	0.043	-1.11	0.266	-0.131	0.036
Unclassified ethnicity	0.196	0.161	1.21	0.224	-0.120	0.512
EAL pupil	0.849	0.049	17.48	0.000	0.753	0.944
SEN pupil (no statement)	-1.038	0.038	-27.22	0.000	-1.113	-0.963
SEN pupil (with statement)	-2.733	0.096	-28.36	0.000	-2.922	-2.544
Overall absence	-4.243	0.310	-13.67	0.000	-4.851	-3.635
Junior school	-0.356	0.166	-2.14	0.032	-0.681	-0.030
MAT academy	0.310	0.097	3.21	0.001	0.121	0.500
Year						
2013/14	0.238	0.030	7.92	0.000	0.179	0.297
2014/15	0.180	0.030	6.02	0.000	0.122	0.239
_cons	17.043	0.105	162.56	0.000	16.837	17.248
school level:						
var(_cons)	0.698	0.060			0.590	0.825

Model 6	
Number of obs	39,888
Number of groups	327
Observations per group	
min	13
avg	122
max	505

Table 25: Model 6B: KS2 average point score, MAT academies vs maintained schools

Variables	Coefficient	Std. err.	z-score	p value	[95% Conf. Interval]
KS1 average point score	0.818	0.004	189.50	0.000	0.809 0.826
Female	-0.576	0.025	-23.35	0.000	-0.624 -0.528
FSM (ever 6) pupil	-0.303	0.031	-9.89	0.000	-0.363 -0.243
BME pupil	-0.047	0.043	-1.10	0.273	-0.131 0.037
Unclassified ethnicity	0.198	0.161	1.23	0.219	-0.118 0.514
EAL pupil	0.848	0.049	17.48	0.000	0.753 0.944
SEN pupil (no statement)	-1.038	0.038	-27.22	0.000	-1.113 -0.963
SEN pupil (with statement)	-2.734	0.096	-28.36	0.000	-2.923 -2.545
Overall absence	-4.241	0.310	-13.66	0.000	-4.849 -3.632
Junior school	-0.360	0.166	-2.17	0.030	-0.685 -0.035
Sponsor group	-0.260	0.391	-0.67	0.506	-1.026 0.506
MAT converter	0.319	0.098	3.26	0.001	0.128 0.511
MAT sponsor-led	-0.024	0.557	-0.04	0.966	-1.116 1.068
Year					
2013/14	0.238	0.030	7.92	0.000	0.179 0.297
2014/15	0.181	0.030	6.03	0.000	0.122 0.239
_cons	17.051	0.105	162.01	0.000	16.845 17.258
school level:					
var(_cons)	0.691	0.059			0.584 0.817

Table 26: Model 6C: KS2 average point score, MAT academies vs maintained schools

Variables	Coefficient	Std. err.	z-score	p value	[95% Conf.	Interval]
KS1 average point score	0.818	0.004	189.50	0.000	0.809	0.826
Female	-0.576	0.025	-23.35	0.000	-0.624	-0.528
FSM (ever 6) pupil	-0.303	0.031	-9.86	0.000	-0.363	-0.242
BME pupil	-0.046	0.043	-1.07	0.287	-0.129	0.038
Unclassified ethnicity	0.200	0.161	1.24	0.214	-0.116	0.516
EAL pupil	0.850	0.049	17.52	0.000	0.755	0.945
SEN pupil (no statement)	-1.038	0.038	-27.23	0.000	-1.113	-0.964
SEN pupil (with statement)	-2.734	0.096	-28.36	0.000	-2.923	-2.545
Overall absence	-4.242	0.310	-13.67	0.000	-4.850	-3.633
Junior school	-0.327	0.164	-1.99	0.046	-0.648	-0.006
MAT size:						
2 schools	0.227	0.146	1.55	0.120	-0.059	0.514
3 schools	0.582	0.180	3.23	0.001	0.229	0.934
4-6 schools	0.448	0.168	2.66	0.008	0.118	0.779
7-15 schools	0.419	0.151	2.77	0.006	0.122	0.716
16+ schools	-0.205	0.189	-1.08	0.278	-0.575	0.165
Year						
2013/14	0.238	0.030	7.92	0.000	0.179	0.297
2014/15	0.180	0.030	6.02	0.000	0.121	0.239
_cons	17.040	0.104	163.95	0.000	16.836	17.243
school level:						
var(_cons)	0.668	0.057			0.565	0.791

Table 27: Model 7A: KS2 pupil achieved Level 4 or above, MAT academies vs maintained schools

Variables	Coefficient	Std. err.	z-score	p value	[95% Conf.	Interval]
KS1 average point score	0.528	0.008	63.14	0.000	0.511	0.544
Female	-0.211	0.038	-5.50	0.000	-0.286	-0.136
FSM (ever 6) pupil	-0.181	0.043	-4.21	0.000	-0.265	-0.096
BME pupil	-0.109	0.065	-1.68	0.092	-0.236	0.018
Unclassified ethnicity	-0.077	0.248	-0.31	0.756	-0.563	0.409
EAL pupil	0.584	0.075	7.79	0.000	0.437	0.731
SEN pupil (no statement)	-1.344	0.045	-29.98	0.000	-1.432	-1.256
SEN pupil (with statement)	-1.565	0.123	-12.77	0.000	-1.805	-1.325
Overall absence	-4.344	0.425	-10.23	0.000	-5.176	-3.512
Junior school	-0.318	0.189	-1.69	0.092	-0.688	0.052
MAT academy	0.421	0.111	3.78	0.000	0.203	0.639
Year						
2013/14	0.289	0.046	6.28	0.000	0.199	0.379
2014/15	0.242	0.046	5.29	0.000	0.152	0.332
_cons	-5.141	0.149	-34.39	0.000	-5.434	-4.848
school level:						
var(_cons)	0.842	0.082			0.696	1.018

Model 7	
Number of obs	39,891
Number of groups	327
Observations per group	
min	13
avg	122
max	505

Table 28: Model 7B: KS2 pupil achieved Level 4 or above, MAT academies vs maintained schools

Variables	Coefficient	Std. err.	z-score	p value	[95% Conf.	Interval]
KS1 average point score	0.528	0.008	63.14	0.000	0.511	0.544
Female	-0.211	0.038	-5.48	0.000	-0.286	-0.135
FSM (ever 6) pupil	-0.179	0.043	-4.18	0.000	-0.264	-0.095
BME pupil	-0.107	0.065	-1.65	0.098	-0.234	0.020
Unclassified ethnicity	-0.076	0.248	-0.31	0.758	-0.562	0.410
EAL pupil	0.584	0.075	7.80	0.000	0.437	0.731
SEN pupil (no statement)	-1.344	0.045	-29.98	0.000	-1.431	-1.256
SEN pupil (with statement)	-1.565	0.123	-12.77	0.000	-1.805	-1.325
Overall absence	-4.341	0.424	-10.23	0.000	-5.173	-3.509
Junior school	-0.327	0.188	-1.74	0.082	-0.695	0.041
Sponsor group	-0.215	0.441	-0.49	0.626	-1.080	0.650
MAT converter	0.437	0.112	3.89	0.000	0.217	0.657
MAT sponsor-led	-0.134	0.627	-0.21	0.831	-1.362	1.095
Year						
2013/14	0.289	0.046	6.28	0.000	0.199	0.379
2014/15	0.243	0.046	5.30	0.000	0.153	0.333
_cons	-5.135	0.150	-34.29	0.000	-5.428	-4.841
school level:						
var(_cons)	0.828	0.081			0.684	1.003

Table 29: Model 7C: KS2 pupil achieved Level 4 or above, MAT academies vs maintained schools

Variables	Coefficient	Std. err.	z-score	p value	[95% Conf.	Interval]
KS1 average point score	0.528	0.008	63.14	0.000	0.511	0.544
Female	-0.210	0.038	-5.47	0.000	-0.286	-0.135
FSM (ever 6) pupil	-0.178	0.043	-4.14	0.000	-0.262	-0.093
BME pupil	-0.105	0.065	-1.61	0.107	-0.232	0.022
Unclassified ethnicity	-0.069	0.248	-0.28	0.780	-0.555	0.417
EAL pupil	0.588	0.075	7.84	0.000	0.441	0.734
SEN pupil (no statement)	-1.344	0.045	-30.00	0.000	-1.432	-1.256
SEN pupil (with statement)	-1.563	0.123	-12.76	0.000	-1.803	-1.323
Overall absence	-4.348	0.424	-10.24	0.000	-5.180	-3.516
Junior school	-0.273	0.185	-1.48	0.140	-0.636	0.089
MAT size:						
2 schools	0.242	0.166	1.46	0.146	-0.084	0.569
3 schools	0.700	0.206	3.40	0.001	0.296	1.103
4–6 schools	0.687	0.196	3.51	0.000	0.303	1.071
7–15 schools	0.584	0.175	3.34	0.001	0.241	0.927
16+ schools	-0.150	0.213	-0.70	0.481	-0.568	0.268
Year						
2013/14	0.288	0.046	6.27	0.000	0.198	0.379
2014/15	0.242	0.046	5.28	0.000	0.152	0.332
_cons	-5.148	0.148	-34.68	0.000	-5.439	-4.857
school level:						
var(_cons)	0.794	0.078			0.655	0.963

Table 30: Model 8A: KS2 pupil achieved expected progress in reading, MAT academies vs maintained schools

Variables	Coefficient	Std. err.	z-score	p value	[95% Conf. Interval]
KS1 average point score	0.002	0.007	0.23	0.817	-0.012 0.015
Female	-0.090	0.041	-2.21	0.027	-0.170 -0.010
FSM (ever 6) pupil	-0.145	0.047	-3.07	0.002	-0.237 -0.052
BME pupil	0.021	0.069	0.30	0.762	-0.114 0.156
Unclassified ethnicity	0.330	0.299	1.10	0.269	-0.255 0.915
EAL pupil	0.231	0.084	2.77	0.006	0.068 0.395
SEN pupil (no statement)	-1.205	0.054	-22.35	0.000	-1.311 -1.099
SEN pupil (with statement)	-2.182	0.102	-21.30	0.000	-2.383 -1.981
Overall absence	-1.196	0.428	-2.79	0.005	-2.035 -0.357
Junior school	-0.442	0.131	-3.38	0.001	-0.698 -0.186
MAT academy	0.204	0.083	2.47	0.013	0.042 0.366
Year					
2013/14	0.299	0.049	6.13	0.000	0.203 0.394
2014/15	0.233	0.048	4.84	0.000	0.139 0.327
_cons	2.975	0.135	21.98	0.000	2.710 3.240
school level:					
var(_cons)	0.369	0.045			0.290 0.468

Model 8	
Number of obs	39888
Number of groups	327
Observations per group	
min	13
avg	122
max	505

Table 31: Model 8B: KS2 pupil achieved expected progress in reading, MAT academies vs maintained schools

Variables	Coefficient	Std. err.	z-score	p value	[95% Conf.	Interval]
KS1 average point score	0.002	0.007	0.23	0.818	-0.012	0.015
Female	-0.090	0.041	-2.20	0.028	-0.170	-0.010
FSM (ever 6) pupil	-0.144	0.047	-3.05	0.002	-0.236	-0.051
BME pupil	0.022	0.069	0.32	0.747	-0.113	0.158
Unclassified ethnicity	0.332	0.299	1.11	0.266	-0.253	0.917
EAL pupil	0.231	0.084	2.76	0.006	0.067	0.395
SEN pupil (no statement)	-1.205	0.054	-22.35	0.000	-1.311	-1.100
SEN pupil (with statement)	-2.183	0.102	-21.31	0.000	-2.384	-1.982
Overall absence	-1.196	0.428	-2.79	0.005	-2.035	-0.357
Junior school	-0.443	0.131	-3.39	0.001	-0.699	-0.186
Sponsor group	-0.276	0.315	-0.88	0.381	-0.893	0.341
MAT converter	0.206	0.084	2.45	0.014	0.041	0.370
MAT sponsor-led	0.097	0.460	0.21	0.832	-0.804	0.999
Year						
2013/14	0.299	0.049	6.14	0.000	0.204	0.395
2014/15	0.233	0.048	4.85	0.000	0.139	0.328
_cons	2.983	0.136	21.99	0.000	2.718	3.249
school level:						
var(_cons)	0.366	0.045			0.288	0.465

Table 32: Model 8C: KS2 pupil achieved expected progress in reading, MAT academies vs maintained schools

Variables	Coefficient	Std. err.	z-score	p value	[95% Conf.	Interval]
KS1 average point score	0.002	0.007	0.25	0.806	-0.011	0.015
Female	-0.090	0.041	-2.20	0.028	-0.170	-0.010
FSM (ever 6) pupil	-0.142	0.047	-3.02	0.003	-0.235	-0.050
BME pupil	0.027	0.069	0.39	0.699	-0.109	0.162
Unclassified ethnicity	0.341	0.299	1.14	0.254	-0.244	0.926
EAL pupil	0.238	0.084	2.84	0.005	0.074	0.401
SEN pupil (no statement)	-1.206	0.054	-22.37	0.000	-1.312	-1.100
SEN pupil (with statement)	-2.183	0.102	-21.32	0.000	-2.384	-1.982
Overall absence	-1.191	0.428	-2.78	0.005	-2.029	-0.353
Junior school	-0.409	0.128	-3.20	0.001	-0.659	-0.158
MAT size:						
2 schools	0.076	0.121	0.63	0.530	-0.161	0.312
3 schools	0.377	0.154	2.44	0.015	0.074	0.680
4–6 schools	0.480	0.151	3.18	0.001	0.184	0.775
7–15 schools	0.345	0.135	2.56	0.011	0.081	0.610
16+ schools	-0.257	0.155	-1.66	0.098	-0.562	0.047
Year						
2013/14	0.299	0.049	6.13	0.000	0.203	0.394
2014/15	0.232	0.048	4.82	0.000	0.138	0.326
_cons	2.963	0.135	22.00	0.000	2.699	3.227
school level:						
var(_cons)	0.342	0.043			0.268	0.437

Table 33: Model 9A: KS2 pupil achieved expected progress in writing (TA), MAT academies vs maintained schools

Variables	Coefficient	Std. err.	z-score	p value	[95% Conf. Interval]
KS1 average point score	0.003	0.008	0.35	0.724	-0.013 0.019
Female	0.088	0.052	1.71	0.088	-0.013 0.190
FSM (ever 6) pupil	-0.144	0.059	-2.47	0.014	-0.259 -0.030
BME pupil	0.020	0.087	0.22	0.822	-0.152 0.191
Unclassified ethnicity	0.271	0.379	0.72	0.474	-0.471 1.014
EAL pupil	0.158	0.104	1.52	0.130	-0.046 0.362
SEN pupil (no statement)	-1.520	0.066	-23.15	0.000	-1.649 -1.391
SEN pupil (with statement)	-2.471	0.118	-20.87	0.000	-2.703 -2.239
Overall absence	-3.508	0.473	-7.42	0.000	-4.434 -2.582
Junior school	-0.337	0.164	-2.05	0.040	-0.659 -0.015
MAT academy	0.348	0.103	3.37	0.001	0.146 0.551
Year					
2013/14	0.180	0.059	3.03	0.002	0.064 0.297
2014/15	0.343	0.062	5.55	0.000	0.222 0.464
_cons	3.634	0.167	21.75	0.000	3.306 3.961
school level:					
var(_cons)	0.565	0.072			0.441 0.724

Model 9	
Number of obs	39888
Number of groups	327
Observations per group	
min	13
avg	122
max	505

Table 34: Model 9B: KS2 pupil achieved expected progress in writing (TA), MAT academies vs maintained schools

Variables	Coefficient	Std. err.	z-score	p value	[95% Conf. Interval]
KS1 average point score	0.003	0.008	0.35	0.724	-0.013 0.019
Female	0.089	0.052	1.72	0.085	-0.012 0.190
FSM (ever 6) pupil	-0.143	0.059	-2.43	0.015	-0.257 -0.028
BME pupil	0.022	0.087	0.25	0.799	-0.149 0.194
Unclassified ethnicity	0.275	0.379	0.73	0.467	-0.467 1.018
EAL pupil	0.157	0.104	1.51	0.131	-0.047 0.361
SEN pupil (no statement)	-1.520	0.066	-23.15	0.000	-1.649 -1.392
SEN pupil (with statement)	-2.472	0.118	-20.88	0.000	-2.705 -2.240
Overall absence	-3.508	0.473	-7.42	0.000	-4.434 -2.582
Junior school	-0.341	0.164	-2.08	0.037	-0.663 -0.020
Sponsor group	-0.285	0.390	-0.73	0.466	-1.050 0.480
MAT converter	0.358	0.105	3.41	0.001	0.152 0.563
MAT sponsor-led	0.019	0.565	0.03	0.973	-1.089 1.127
Year					
2013/14	0.181	0.059	3.05	0.002	0.065 0.298
2014/15	0.344	0.062	5.56	0.000	0.223 0.465
_cons	3.641	0.167	21.76	0.000	3.313 3.969
school level:					
var(_cons)	0.559	0.071			0.436 0.717

Table 35: Model 9C: KS2 pupil achieved expected progress in writing (TA), MAT academies vs maintained schools

Variables	Coefficient	Std. err.	z-score	p value	[95% Conf.	Interval]
KS1 average point score	0.003	0.008	0.34	0.730	-0.013	0.019
Female	0.089	0.052	1.72	0.085	-0.012	0.190
FSM (ever 6) pupil	-0.141	0.059	-2.40	0.016	-0.256	-0.026
BME pupil	0.029	0.088	0.33	0.744	-0.143	0.200
Unclassified ethnicity	0.281	0.379	0.74	0.457	-0.461	1.024
EAL pupil	0.164	0.104	1.58	0.115	-0.040	0.368
SEN pupil (no statement)	-1.520	0.066	-23.15	0.000	-1.649	-1.391
SEN pupil (with statement)	-2.472	0.118	-20.89	0.000	-2.704	-2.240
Overall absence	-3.505	0.472	-7.42	0.000	-4.431	-2.580
Junior school	-0.315	0.162	-1.95	0.052	-0.632	0.002
MAT size:						
2 schools	0.358	0.155	2.31	0.021	0.054	0.661
3 schools	0.672	0.200	3.36	0.001	0.280	1.065
4–6 schools	0.370	0.186	1.99	0.046	0.006	0.734
7–15 schools	0.390	0.169	2.31	0.021	0.060	0.720
16+ schools	-0.099	0.198	-0.50	0.618	-0.486	0.289
Year						
2013/14	0.180	0.059	3.03	0.002	0.063	0.297
2014/15	0.343	0.062	5.55	0.000	0.222	0.464
_cons	3.623	0.166	21.77	0.000	3.297	3.950
school level:						
var(_cons)	0.535	0.069			0.415	0.690

Table 36: Model 10A: KS2 pupil achieved expected progress in Maths, MAT academies vs maintained schools

Variables	Coefficient	Std. err.	z-score	p value	[95% Conf.	Interval]
KS1 average point score	0.059	0.007	8.89	0.000	0.046	0.073
Female	-0.491	0.041	-11.99	0.000	-0.571	-0.411
FSM (ever 6) pupil	-0.167	0.047	-3.59	0.000	-0.258	-0.076
BME pupil	-0.063	0.068	-0.93	0.355	-0.197	0.071
Unclassified ethnicity	-0.317	0.244	-1.30	0.192	-0.795	0.160
EAL pupil	0.443	0.084	5.28	0.000	0.278	0.607
SEN pupil (no statement)	-1.160	0.053	-21.73	0.000	-1.265	-1.056
SEN pupil (with statement)	-1.818	0.106	-17.23	0.000	-2.025	-1.611
Overall absence	-2.811	0.405	-6.95	0.000	-3.604	-2.018
Junior school	-0.278	0.164	-1.70	0.089	-0.599	0.043
MAT academy	0.248	0.100	2.49	0.013	0.053	0.444
Year						
2013/14	0.147	0.049	2.99	0.003	0.051	0.243
2014/15	0.028	0.048	0.57	0.566	-0.067	0.122
_cons	2.480	0.140	17.65	0.000	2.205	2.756
school level:						
var(_cons)	0.606	0.068			0.487	0.755

Model 10	
Number of obs	39888
Number of groups	327
Observations per group	
min	13
avg	122
max	505

Table 37: Model 10B: KS2 pupil achieved expected progress in Maths, MAT academies vs maintained schools

Variables	Coefficient	Std. err.	z-score	p value	[95% Conf.	Interval]
KS1 average point score	0.059	0.007	8.88	0.000	0.046	0.072
Female	-0.490	0.041	-11.98	0.000	-0.570	-0.410
FSM (ever 6) pupil	-0.165	0.047	-3.56	0.000	-0.257	-0.074
BME pupil	-0.061	0.068	-0.89	0.375	-0.194	0.073
Unclassified ethnicity	-0.314	0.243	-1.29	0.197	-0.791	0.163
EAL pupil	0.442	0.084	5.28	0.000	0.278	0.606
SEN pupil (no statement)	-1.160	0.053	-21.73	0.000	-1.265	-1.056
SEN pupil (with statement)	-1.819	0.106	-17.24	0.000	-2.026	-1.612
Overall absence	-2.809	0.405	-6.94	0.000	-3.602	-2.016
Junior school	-0.291	0.162	-1.79	0.074	-0.609	0.028
Sponsor group	-0.126	0.388	-0.32	0.745	-0.888	0.635
MAT converter	0.273	0.100	2.72	0.007	0.076	0.470
MAT sponsor-led	-0.498	0.546	-0.91	0.362	-1.568	0.573
Year						
2013/14	0.147	0.049	3.00	0.003	0.051	0.243
2014/15	0.028	0.048	0.59	0.557	-0.066	0.122
_cons	2.483	0.141	17.66	0.000	2.207	2.758
school level:						
var(_cons)	0.592	0.067			0.474	0.738

Table 38: Model 10C: KS2 pupil achieved expected progress in Maths, MAT academies vs maintained schools

Variables	Coefficient	Std. err.	z-score	p value	[95% Conf.	Interval]
KS1 average point score	0.059	0.007	8.90	0.000	0.046	0.073
Female	-0.490	0.041	-11.98	0.000	-0.570	-0.410
FSM (ever 6) pupil	-0.165	0.047	-3.54	0.000	-0.256	-0.074
BME pupil	-0.058	0.068	-0.85	0.395	-0.192	0.076
Unclassified ethnicity	-0.308	0.243	-1.26	0.206	-0.785	0.170
EAL pupil	0.447	0.084	5.33	0.000	0.283	0.612
SEN pupil (no statement)	-1.160	0.053	-21.73	0.000	-1.265	-1.056
SEN pupil (with statement)	-1.818	0.106	-17.23	0.000	-2.025	-1.611
Overall absence	-2.804	0.404	-6.94	0.000	-3.597	-2.012
Junior school	-0.228	0.159	-1.44	0.151	-0.539	0.083
MAT size:						
2 schools	0.091	0.146	0.62	0.533	-0.195	0.377
3 schools	0.642	0.188	3.42	0.001	0.274	1.010
4–6 schools	0.566	0.180	3.15	0.002	0.214	0.918
7–15 schools	0.300	0.158	1.91	0.057	-0.008	0.609
16+ schools	-0.300	0.186	-1.61	0.108	-0.665	0.065
Year						
2013/14	0.147	0.049	2.99	0.003	0.050	0.243
2014/15	0.027	0.048	0.56	0.573	-0.067	0.121
_cons	2.464	0.139	17.69	0.000	2.191	2.737
school level:						
var(_cons)	0.556	0.064			0.445	0.696

Table 39: Model 11A: KS4 average point score (capped), MAT academies vs standalone academies

Variables	Coefficient	Std. err.	z-score	p value	[95% Conf.	Interval]
KS2 average point score	3.595	0.019	184.69	0.000	3.557	3.633
Female	19.475	0.246	79.22	0.000	18.994	19.957
FSM (ever 6) pupil	-22.448	0.307	-73.13	0.000	-23.049	-21.846
BME pupil	4.344	0.407	10.66	0.000	3.546	5.143
Unclassified ethnicity	3.644	1.184	3.08	0.002	1.324	5.965
EAL pupil	16.248	0.494	32.86	0.000	15.279	17.218
SEN pupil (no statement)	-45.987	0.352	-130.70	0.000	-46.677	-45.298
SEN pupil (with statement)	-72.032	0.871	-82.66	0.000	-73.740	-70.324
Overall absence	-317.875	1.427	-222.78	0.000	-320.671	-315.078
All-through school	12.686	9.374	1.35	0.176	-5.686	31.058
Upper school	-6.892	6.661	-1.03	0.301	-19.947	6.162
MAT academy	-0.744	2.397	-0.31	0.756	-5.443	3.955
Year						
2013/14	-31.078	0.279	-111.28	0.000	-31.625	-30.530
2014/15	-29.390	0.280	-104.94	0.000	-29.939	-28.841
_cons	281.376	1.912	147.15	0.000	277.628	285.124
school level:						
var(_cons)	595.539	41.282			519.883	682.204

Model 11	
Number of obs	248,883
Number of groups	427
Observations per group	
min	99
avg	583
max	1,780

Table 40: Model 11B: KS4 average point score (capped), MAT academies vs standalone academies

Variables	Coefficient	Std. err.	z-score	p value	[95% Conf.	Interval]
KS2 average point score	3.595	0.019	184.67	0.000	3.557	3.633
Female	19.473	0.246	79.21	0.000	18.991	19.955
FSM (ever 6) pupil	-22.428	0.307	-73.05	0.000	-23.029	-21.826
BME pupil	4.361	0.407	10.70	0.000	3.562	5.160
Unclassified ethnicity	3.653	1.184	3.09	0.002	1.332	5.973
EAL pupil	16.259	0.494	32.88	0.000	15.290	17.228
SEN pupil (no statement)	-45.985	0.352	-130.70	0.000	-46.674	-45.295
SEN pupil (with statement)	-72.039	0.871	-82.66	0.000	-73.747	-70.331
Overall absence	-317.878	1.427	-222.78	0.000	-320.675	-315.082
All-through school	13.594	9.114	1.49	0.136	-4.270	31.458
Upper school	-8.955	6.482	-1.38	0.167	-21.659	3.749
Sponsor group	-21.142	5.777	-3.66	0.000	-32.466	-9.819
MAT converter	-0.875	2.460	-0.36	0.722	-5.697	3.947
MAT sponsor-led	3.052	7.156	0.43	0.670	-10.975	17.078
Year						
2013/14	-31.078	0.279	-111.28	0.000	-31.625	-30.531
2014/15	-29.390	0.280	-104.94	0.000	-29.939	-28.841
_cons	283.530	1.950	145.42	0.000	279.708	287.351
school level:						
var(_cons)	561.348	38.930			490.005	643.078

Table 41: Model 11C: KS4 average point score (capped), MAT academies vs standalone academies

Variables	Coefficient	Std. err.	z-score	p value	[95% Conf.	Interval]
KS2 average point score	3.595	0.019	184.67	0.000	3.557	3.633
Female	19.473	0.246	79.21	0.000	18.991	19.955
FSM (ever 6) pupil	-22.442	0.307	-73.11	0.000	-23.044	-21.841
BME pupil	4.341	0.407	10.65	0.000	3.542	5.139
Unclassified ethnicity	3.637	1.184	3.07	0.002	1.317	5.958
EAL pupil	16.244	0.494	32.85	0.000	15.275	17.213
SEN pupil (no statement)	-45.988	0.352	-130.71	0.000	-46.678	-45.298
SEN pupil (with statement)	-72.037	0.871	-82.66	0.000	-73.745	-70.329
Overall absence	-317.873	1.427	-222.78	0.000	-320.670	-315.077
All-through school	11.248	9.096	1.24	0.216	-6.580	29.076
Upper school	-8.305	6.493	-1.28	0.201	-21.031	4.421
MAT size:						
2 schools	6.658	3.296	2.02	0.043	0.199	13.118
3 schools	-4.040	3.996	-1.01	0.312	-11.872	3.791
4-6 schools	1.378	3.674	0.38	0.708	-5.822	8.578
7-15 schools	2.380	4.497	0.53	0.597	-6.435	11.194
16+ schools	-18.154	4.390	-4.14	0.000	-26.758	-9.549
Year						
2013/14	-31.078	0.279	-111.28	0.000	-31.626	-30.531
2014/15	-29.391	0.280	-104.94	0.000	-29.940	-28.842
_cons	281.460	1.860	151.34	0.000	277.815	285.105
school level:						
var(_cons)	559.094	38.786			488.017	640.524

Table 42: Model 12A: KS4 pupil achieved 5 A*-C GCSEs or equivalent, including English and Maths, MAT academies vs standalone academies

Variables	Coefficient	Std. err.	z-score	p value	[95% Conf.	Interval]
KS2 average point score	0.143	0.001	122.68	0.000	0.141	0.145
Female	0.493	0.011	44.87	0.000	0.471	0.514
F5M (ever 6) pupil	-0.636	0.013	-48.48	0.000	-0.662	-0.610
BME pupil	0.104	0.019	5.42	0.000	0.066	0.142
Unclassified ethnicity	0.146	0.055	2.68	0.007	0.040	0.253
EAL pupil	0.487	0.024	20.38	0.000	0.440	0.533
SEN pupil (no statement)	-1.408	0.016	-90.01	0.000	-1.439	-1.378
SEN pupil (with statement)	-1.559	0.044	-35.77	0.000	-1.645	-1.474
Overall absence	-8.653	0.095	-91.46	0.000	-8.838	-8.467
All-through school	0.527	0.498	1.06	0.290	-0.449	1.504
Upper school	-0.400	0.352	-1.13	0.256	-1.091	0.291
MAT academy	0.010	0.127	0.08	0.938	-0.239	0.259
Year						
2013/14	-0.360	0.013	-28.07	0.000	-0.385	-0.335
2014/15	-0.352	0.013	-27.29	0.000	-0.377	-0.327
_cons	-2.149	0.102	-21.08	0.000	-2.349	-1.949
school level:						
sd(_cons)	1.293	0.049			1.200	1.393

Model 12	
Number of obs	248,883
Number of groups	427
Observations per group	
min	99
avg	583
max	1,780

Table 43: Model 12B: KS4 pupil achieved 5 A*-C GCSEs or equivalent, including English and Maths, MAT academies vs standalone academies

Variables	Coefficient	Std. err.	z-score	p value	[95% Conf.	Interval]
KS2 average point score	0.143	0.001	122.66	0.000	0.141	0.145
Female	0.493	0.011	44.87	0.000	0.471	0.514
FSM (ever 6) pupil	-0.635	0.013	-48.44	0.000	-0.661	-0.610
BME pupil	0.104	0.019	5.44	0.000	0.067	0.142
Unclassified ethnicity	0.147	0.055	2.69	0.007	0.040	0.254
EAL pupil	0.487	0.024	20.39	0.000	0.440	0.534
SEN pupil (no statement)	-1.408	0.016	-90.01	0.000	-1.439	-1.378
SEN pupil (with statement)	-1.559	0.044	-35.77	0.000	-1.645	-1.474
Overall absence	-8.653	0.095	-91.46	0.000	-8.839	-8.468
All-through school	0.571	0.493	1.16	0.247	-0.395	1.536
Upper school	-0.464	0.349	-1.33	0.184	-1.147	0.220
Sponsor group	-0.825	0.311	-2.65	0.008	-1.434	-0.216
MAT converter	-0.020	0.133	-0.15	0.880	-0.281	0.240
MAT sponsor-led	0.351	0.385	0.91	0.362	-0.403	1.105
Year						
2013/14	-0.360	0.013	-28.07	0.000	-0.385	-0.335
2014/15	-0.352	0.013	-27.30	0.000	-0.377	-0.327
_cons	-2.065	0.105	-19.58	0.000	-2.272	-1.858
school level:						
sd(_cons)	1.277	0.049			1.185	1.376

Table 44: Model 12C: KS4 pupil achieved 5 A*-C GCSEs or equivalent, including English and Maths, MAT academies vs standalone academies

Variables	Coefficient	Std. err.	z-score	p value	[95% Conf.	Interval]
KS2 average point score	0.143	0.001	122.66	0.000	0.141	0.145
Female	0.493	0.011	44.87	0.000	0.471	0.514
FSM (ever 6) pupil	-0.636	0.013	-48.47	0.000	-0.662	-0.610
BME pupil	0.104	0.019	5.41	0.000	0.066	0.142
Unclassified ethnicity	0.146	0.055	2.68	0.007	0.039	0.253
EAL pupil	0.486	0.024	20.37	0.000	0.440	0.533
SEN pupil (no statement)	-1.409	0.016	-90.02	0.000	-1.439	-1.378
SEN pupil (with statement)	-1.559	0.044	-35.77	0.000	-1.645	-1.474
Overall absence	-8.653	0.095	-91.46	0.000	-8.839	-8.468
All-through school	0.480	0.492	0.98	0.329	-0.485	1.445
Upper school	-0.423	0.350	-1.21	0.227	-1.109	0.263
MAT size:						
2 schools	0.307	0.178	1.72	0.085	-0.042	0.657
3 schools	-0.197	0.216	-0.92	0.360	-0.620	0.225
4-6 schools	0.022	0.199	0.11	0.912	-0.367	0.411
7-15 schools	0.157	0.243	0.64	0.519	-0.320	0.634
16+ schools	-0.494	0.236	-2.09	0.037	-0.958	-0.031
Year						
2013/14	-0.360	0.013	-28.07	0.000	-0.385	-0.335
2014/15	-0.352	0.013	-27.30	0.000	-0.377	-0.327
_cons	-2.147	0.101	-21.31	0.000	-2.345	-1.950
school level:						
sd(_cons)	1.276	0.049			1.184	1.374

Table 45: Model 13A: KS4 pupil achieved expected progress in English, MAT academies vs standalone academies

Variables	Coefficient	Std. err.	z-score	p value	[95% Conf.	Interval]
KS2 average point score	0.043	0.001	41.13	0.000	0.040	0.045
Female	0.659	0.011	59.14	0.000	0.637	0.681
FSM (ever 6) pupil	-0.428	0.013	-33.24	0.000	-0.453	-0.402
BME pupil	0.163	0.019	8.42	0.000	0.125	0.201
Unclassified ethnicity	0.150	0.054	2.79	0.005	0.044	0.255
EAL pupil	0.302	0.024	12.39	0.000	0.254	0.350
SEN pupil (no statement)	-0.679	0.014	-47.35	0.000	-0.707	-0.651
SEN pupil (with statement)	-0.669	0.034	-19.47	0.000	-0.737	-0.602
Overall absence	-5.815	0.073	-80.15	0.000	-5.957	-5.673
All-through school	0.017	0.275	0.06	0.952	-0.522	0.555
Upper school	-0.225	0.194	-1.16	0.246	-0.606	0.155
MAT academy	0.098	0.070	1.39	0.166	-0.040	0.235
Year						
2013/14	-0.010	0.013	-0.78	0.435	-0.035	0.015
2014/15	-0.063	0.013	-4.95	0.000	-0.088	-0.038
_cons	0.357	0.062	5.76	0.000	0.235	0.478
school level:						
sd(_cons)	0.709	0.027			0.658	0.763

Model 13	
Number of obs	243,920
Number of groups	427
Observations per group	
min	95
avg	571
max	1,762

Table 46: Model 13B: KS4 pupil achieved expected progress in English, MAT academies vs standalone academies

Variables	Coefficient	Std. err.	z-score	p value	[95% Conf.	Interval]
KS2 average point score	0.043	0.001	41.12	0.000	0.040	0.045
Female	0.659	0.011	59.13	0.000	0.637	0.681
FSM (ever 6) pupil	-0.427	0.013	-33.19	0.000	-0.452	-0.402
BME pupil	0.164	0.019	8.45	0.000	0.126	0.202
Unclassified ethnicity	0.150	0.054	2.79	0.005	0.045	0.255
EAL pupil	0.303	0.024	12.41	0.000	0.255	0.350
SEN pupil (no statement)	-0.679	0.014	-47.35	0.000	-0.707	-0.651
SEN pupil (with statement)	-0.670	0.034	-19.48	0.000	-0.737	-0.602
Overall absence	-5.815	0.073	-80.16	0.000	-5.957	-5.673
All-through school	0.031	0.274	0.11	0.911	-0.506	0.567
Upper school	-0.251	0.194	-1.29	0.196	-0.630	0.129
Sponsor group	-0.288	0.173	-1.66	0.096	-0.627	0.051
MAT converter	0.091	0.074	1.24	0.217	-0.054	0.236
MAT sponsor-led	0.183	0.214	0.85	0.394	-0.238	0.603
Year						
2013/14	-0.010	0.013	-0.78	0.434	-0.035	0.015
2014/15	-0.063	0.013	-4.95	0.000	-0.088	-0.038
_cons	0.386	0.064	6.03	0.000	0.261	0.512
school level:						
sd(_cons)	0.705	0.026			0.655	0.758

Table 47: Model 13C: KS4 pupil achieved expected progress in English, MAT academies vs standalone academies

Variables	Coefficient	Std. err.	z-score	p value	[95% Conf.	Interval]
KS2 average point score	0.043	0.001	41.12	0.000	0.040	0.045
Female	0.659	0.011	59.13	0.000	0.637	0.681
FSM (ever 6) pupil	-0.427	0.013	-33.22	0.000	-0.452	-0.402
BME pupil	0.163	0.019	8.41	0.000	0.125	0.201
Unclassified ethnicity	0.150	0.054	2.78	0.005	0.044	0.255
EAL pupil	0.302	0.024	12.39	0.000	0.254	0.350
SEN pupil (no statement)	-0.679	0.014	-47.35	0.000	-0.707	-0.651
SEN pupil (with statement)	-0.670	0.034	-19.48	0.000	-0.737	-0.602
Overall absence	-5.815	0.073	-80.16	0.000	-5.957	-5.673
All-through school	-0.003	0.273	-0.01	0.991	-0.538	0.533
Upper school	-0.240	0.194	-1.24	0.215	-0.621	0.140
MAT size:						
2 schools	0.186	0.099	1.88	0.060	-0.008	0.381
3 schools	0.035	0.120	0.29	0.770	-0.200	0.270
4-6 schools	0.138	0.110	1.25	0.213	-0.079	0.354
7-15 schools	0.188	0.136	1.39	0.165	-0.078	0.454
16+ schools	-0.153	0.132	-1.16	0.246	-0.411	0.105
Year						
2013/14	-0.010	0.013	-0.78	0.433	-0.035	0.015
2014/15	-0.063	0.013	-4.95	0.000	-0.088	-0.038
_cons	0.358	0.062	5.81	0.000	0.237	0.479
school level:						
sd(_cons)	0.703	0.026			0.653	0.757

Table 48: Model 14A: KS4 pupil achieved expected progress in Maths, MAT academies vs standalone academies

Variables	Coefficient	Std. err.	z-score	p value	[95% Conf.	Interval]
KS2 average point score	0.082	0.001	80.46	0.000	0.080	0.084
Female	0.176	0.011	15.85	0.000	0.154	0.198
F5M (ever 6) pupil	-0.494	0.013	-38.28	0.000	-0.520	-0.469
BME pupil	0.129	0.020	6.59	0.000	0.091	0.168
Unclassified ethnicity	0.085	0.054	1.58	0.113	-0.020	0.191
EAL pupil	0.642	0.025	25.54	0.000	0.592	0.691
SEN pupil (no statement)	-0.927	0.014	-64.15	0.000	-0.956	-0.899
SEN pupil (with statement)	-1.167	0.036	-32.69	0.000	-1.237	-1.097
Overall absence	-7.881	0.084	-93.42	0.000	-8.046	-7.716
All-through school	0.207	0.324	0.64	0.523	-0.428	0.841
Upper school	-0.076	0.229	-0.33	0.739	-0.525	0.372
MAT academy	-0.076	0.083	-0.92	0.356	-0.239	0.086
Year						
2013/14	-0.414	0.013	-31.80	0.000	-0.439	-0.388
2014/15	-0.345	0.013	-26.20	0.000	-0.370	-0.319
_cons	-0.082	0.070	-1.17	0.241	-0.219	0.055
school level:						
sd(_cons)	0.836	0.032			0.776	0.901

Model 14	
Number of obs	244,457
Number of groups	427
Observations per group	
min	96
avg	573
max	1,764

Table 49: Model 14B: KS4 pupil achieved expected progress in Maths, MAT academies vs standalone academies

Variables	Coefficient	Std. err.	z-score	p value	[95% Conf.	Interval]
KS2 average point score	0.082	0.001	80.45	0.000	0.080	0.084
Female	0.176	0.011	15.84	0.000	0.154	0.198
FSM (ever 6) pupil	-0.494	0.013	-38.22	0.000	-0.519	-0.468
BME pupil	0.130	0.020	6.63	0.000	0.092	0.169
Unclassified ethnicity	0.086	0.054	1.59	0.111	-0.020	0.192
EAL pupil	0.642	0.025	25.56	0.000	0.593	0.691
SEN pupil (no statement)	-0.927	0.014	-64.14	0.000	-0.956	-0.899
SEN pupil (with statement)	-1.167	0.036	-32.70	0.000	-1.237	-1.097
Overall absence	-7.881	0.084	-93.43	0.000	-8.047	-7.716
All-through school	0.252	0.319	0.79	0.428	-0.372	0.877
Upper school	-0.115	0.225	-0.51	0.609	-0.557	0.327
Sponsor group	-0.712	0.201	-3.54	0.000	-1.106	-0.318
MAT converter	-0.126	0.086	-1.46	0.143	-0.294	0.043
MAT sponsor-led	0.400	0.249	1.61	0.108	-0.088	0.888
Year						
2013/14	-0.414	0.013	-31.80	0.000	-0.439	-0.388
2014/15	-0.345	0.013	-26.20	0.000	-0.370	-0.319
_cons	-0.010	0.072	-0.14	0.886	-0.151	0.130
school level:						
sd(_cons)	0.822	0.031			0.763	0.885

Table 50: Model 14C: KS4 pupil achieved expected progress in Maths, MAT academies vs standalone academies

Variables	Coefficient	Std. err.	z-score	p value	[95% Conf.	Interval]
KS2 average point score	0.082	0.001	80.44	0.000	0.080	0.084
Female	0.176	0.011	15.85	0.000	0.154	0.198
FSM (ever 6) pupil	-0.494	0.013	-38.26	0.000	-0.520	-0.469
BME pupil	0.129	0.020	6.58	0.000	0.091	0.168
Unclassified ethnicity	0.085	0.054	1.58	0.114	-0.020	0.191
EAL pupil	0.641	0.025	25.53	0.000	0.592	0.691
SEN pupil (no statement)	-0.927	0.014	-64.15	0.000	-0.956	-0.899
SEN pupil (with statement)	-1.167	0.036	-32.70	0.000	-1.237	-1.097
Overall absence	-7.881	0.084	-93.43	0.000	-8.047	-7.716
All-through school	0.177	0.320	0.55	0.579	-0.449	0.804
Upper school	-0.087	0.227	-0.38	0.701	-0.532	0.358
MAT size:						
2 schools	0.136	0.116	1.17	0.240	-0.091	0.364
3 schools	-0.228	0.140	-1.63	0.104	-0.502	0.047
4–6 schools	-0.089	0.129	-0.69	0.489	-0.342	0.163
7–15 schools	0.027	0.158	0.17	0.862	-0.282	0.337
16+ schools	-0.398	0.154	-2.59	0.010	-0.699	-0.096
Year						
2013/14	-0.414	0.013	-31.80	0.000	-0.439	-0.388
2014/15	-0.345	0.013	-26.20	0.000	-0.370	-0.319
_cons	-0.081	0.069	-1.17	0.241	-0.216	0.054
school level:						
sd(_cons)	0.824	0.031			0.765	0.888

Table 51: Model 15A: KS4 average point score (capped), MAT academies vs maintained schools

Variables	Coefficient	Std. err.	z-score	p value	[95% Conf.	Interval]
KS2 average point score	3.782	0.017	217.89	0.000	3.748	3.816
Female	20.131	0.217	92.65	0.000	19.706	20.557
FSM (ever 6) pupil	-21.532	0.260	-82.80	0.000	-22.042	-21.023
BME pupil	4.104	0.367	11.18	0.000	3.385	4.823
Unclassified ethnicity	4.887	1.062	4.60	0.000	2.806	6.968
EAL pupil	18.816	0.423	44.53	0.000	17.988	19.644
SEN pupil (no statement)	-46.044	0.307	-150.16	0.000	-46.645	-45.443
SEN pupil (with statement)	-72.757	0.762	-95.44	0.000	-74.251	-71.263
Overall absence	-316.328	1.214	-260.53	0.000	-318.708	-313.948
All-through school	-0.363	5.823	-0.06	0.950	-11.775	11.049
Upper school	-4.451	6.018	-0.74	0.460	-16.246	7.345
MAT academy	2.157	1.783	1.21	0.226	-1.337	5.652
Year						
2013/14	-35.631	0.251	-141.96	0.000	-36.123	-35.139
2014/15	-34.385	0.252	-136.28	0.000	-34.879	-33.890
_cons	270.818	1.440	188.01	0.000	267.995	273.641
school level:						
var(_cons)	455.106	27.007			405.136	511.239

Model 15

Number of obs	324,733
Number of groups	589
Observations per group	
min	102
avg	551
max	1,780

Table 52: Model 15B: KS4 average point score (capped), MAT academies vs maintained schools

Variables	Coefficient	Std. err.	z-score	p value	[95% Conf. Interval]
KS2 average point score	3.782	0.017	217.87	0.000	3.748 3.816
Female	20.133	0.217	92.66	0.000	19.707 20.558
FSM (ever 6) pupil	-21.517	0.260	-82.74	0.000	-22.027 -21.007
BME pupil	4.115	0.367	11.22	0.000	3.396 4.834
Unclassified ethnicity	4.884	1.062	4.60	0.000	2.803 6.965
EAL pupil	18.824	0.423	44.55	0.000	17.996 19.652
SEN pupil (no statement)	-46.043	0.307	-150.16	0.000	-46.644 -45.442
SEN pupil (with statement)	-72.761	0.762	-95.45	0.000	-74.256 -71.267
Overall absence	-316.331	1.214	-260.53	0.000	-318.711 -313.951
All-through school	1.815	5.763	0.31	0.753	-9.480 13.110
Upper school	-6.910	5.952	-1.16	0.246	-18.577 4.756
Sponsor group	-2.507	2.458	-1.02	0.308	-7.324 2.310
MAT converter	4.785	2.141	2.23	0.025	0.588 8.982
MAT sponsor-led	-3.442	2.812	-1.22	0.221	-8.954 2.071
Year					
2013/14	-35.631	0.251	-141.96	0.000	-36.123 -35.139
2014/15	-34.385	0.252	-136.28	0.000	-34.880 -33.891
_cons	271.853	1.746	155.71	0.000	268.431 275.275
school level:					
var(_cons)	440.834	26.171			392.411 495.231

Table 53: Model 15C: KS4 average point score (capped), MAT academies vs maintained schools

Variables	Coefficient	Std. err.	z-score	p value	[95% Conf.	Interval]
KS2 average point score	3.782	0.017	217.88	0.000	3.748	3.816
Female	20.131	0.217	92.65	0.000	19.705	20.557
FSM (ever 6) pupil	-21.525	0.260	-82.77	0.000	-22.034	-21.015
BME pupil	4.105	0.367	11.19	0.000	3.386	4.824
Unclassified ethnicity	4.881	1.062	4.60	0.000	2.800	6.962
EAL pupil	18.812	0.423	44.52	0.000	17.984	19.640
SEN pupil (no statement)	-46.045	0.307	-150.16	0.000	-46.646	-45.444
SEN pupil (with statement)	-72.761	0.762	-95.45	0.000	-74.255	-71.267
Overall absence	-316.329	1.214	-260.53	0.000	-318.709	-313.949
All-through school	-0.831	5.739	-0.14	0.885	-12.078	10.417
Upper school	-6.304	5.951	-1.06	0.289	-17.967	5.359
MAT size:						
2 schools	7.599	2.677	2.84	0.005	2.353	12.845
3 schools	3.383	3.299	1.03	0.305	-3.082	9.848
4-6 schools	3.348	2.781	1.20	0.229	-2.103	8.799
7-15 schools	4.339	3.316	1.31	0.191	-2.160	10.838
16+ schools	-7.480	2.813	-2.66	0.008	-12.993	-1.966
Year						
2013/14	-35.631	0.251	-141.96	0.000	-36.123	-35.139
2014/15	-34.386	0.252	-136.28	0.000	-34.880	-33.891
_cons	270.864	1.419	190.90	0.000	268.083	273.645
school level:						
var(_cons)	439.021	26.068			390.789	493.205

Table 54: Model 16A: KS4 pupil achieved 5 A*-C GCSEs or equivalent, including English and Maths, MAT academies vs maintained school

Variables	Coefficient	Std. err.	z-score	p value	[95% Conf.	Interval]
KS2 average point score	0.144	0.001	144.32	0.000	0.142	0.146
Female	0.481	0.009	51.55	0.000	0.462	0.499
F5M (ever 6) pupil	-0.599	0.011	-55.40	0.000	-0.620	-0.578
BME pupil	0.086	0.016	5.29	0.000	0.054	0.118
Unclassified ethnicity	0.173	0.047	3.68	0.000	0.081	0.265
EAL pupil	0.524	0.019	27.13	0.000	0.486	0.562
SEN pupil (no statement)	-1.361	0.013	-101.83	0.000	-1.388	-1.335
SEN pupil (with statement)	-1.556	0.039	-40.36	0.000	-1.631	-1.480
Overall absence	-8.875	0.082	-108.11	0.000	-9.036	-8.714
All-through school	0.100	0.241	0.41	0.678	-0.373	0.573
Upper school	-0.101	0.249	-0.41	0.684	-0.589	0.387
MAT academy	0.074	0.074	1.00	0.315	-0.071	0.219
Year						
2013/14	-0.401	0.011	-36.67	0.000	-0.422	-0.379
2014/15	-0.397	0.011	-36.09	0.000	-0.419	-0.375
_cons	-2.506	0.063	-39.99	0.000	-2.629	-2.383
school level:						
sd(_cons)	0.882	0.029			0.828	0.940

Model 16	
Number of obs	324,733
Number of groups	589
Observations per group	
min	102
avg	551
max	1,780

Table 55: Model 16B: KS4 pupil achieved 5 A*-C GCSEs or equivalent, including English and Maths, MAT academies vs maintained school

Variables	Coefficient	Std. err.	z-score	p value	[95% Conf.	Interval]
KS2 average point score	0.144	0.001	144.30	0.000	0.142	0.146
Female	0.481	0.009	51.55	0.000	0.462	0.499
FSM (ever 6) pupil	-0.598	0.011	-55.35	0.000	-0.619	-0.577
BME pupil	0.086	0.016	5.31	0.000	0.055	0.118
Unclassified ethnicity	0.173	0.047	3.68	0.000	0.081	0.265
EAL pupil	0.524	0.019	27.14	0.000	0.486	0.562
SEN pupil (no statement)	-1.361	0.013	-101.84	0.000	-1.388	-1.335
SEN pupil (with statement)	-1.556	0.039	-40.36	0.000	-1.632	-1.480
Overall absence	-8.875	0.082	-108.12	0.000	-9.036	-8.715
All-through school	0.163	0.240	0.68	0.498	-0.308	0.633
Upper school	-0.182	0.248	-0.74	0.461	-0.668	0.303
Sponsor group	-0.029	0.102	-0.29	0.774	-0.230	0.171
MAT converter	0.181	0.089	2.03	0.042	0.006	0.356
MAT sponsor-led	-0.142	0.117	-1.21	0.226	-0.371	0.088
Year						
2013/14	-0.401	0.011	-36.67	0.000	-0.422	-0.379
2014/15	-0.397	0.011	-36.09	0.000	-0.419	-0.375
_cons	-2.494	0.075	-33.15	0.000	-2.641	-2.346
school level:						
sd(_cons)	0.873	0.028			0.819	0.931

Table 56: Model 16C: KS4 pupil achieved 5 A*-C GCSEs or equivalent, including English and Maths, MAT academies vs maintained school

Variables	Coefficient	Std. err.	z-score	p value	[95% Conf. Interval]
KS2 average point score	0.144	0.001	144.30	0.000	0.142 0.146
Female	0.481	0.009	51.55	0.000	0.462 0.499
FSM (ever 6) pupil	-0.599	0.011	-55.38	0.000	-0.620 -0.577
BME pupil	0.086	0.016	5.28	0.000	0.054 0.118
Unclassified ethnicity	0.173	0.047	3.68	0.000	0.081 0.265
EAL pupil	0.524	0.019	27.13	0.000	0.486 0.562
SEN pupil (no statement)	-1.361	0.013	-101.84	0.000	-1.388 -1.335
SEN pupil (with statement)	-1.556	0.039	-40.36	0.000	-1.632 -1.480
Overall absence	-8.876	0.082	-108.12	0.000	-9.036 -8.715
All-through school	0.071	0.240	0.29	0.768	-0.400 0.541
Upper school	-0.134	0.248	-0.54	0.589	-0.621 0.353
MAT size:					
2 schools	0.273	0.112	2.44	0.015	0.053 0.493
3 schools	0.031	0.138	0.22	0.824	-0.240 0.301
4-6 schools	0.057	0.116	0.49	0.622	-0.171 0.285
7-15 schools	0.158	0.139	1.14	0.256	-0.115 0.430
16+ schools	-0.157	0.118	-1.34	0.182	-0.387 0.073
Year					
2013/14	-0.401	0.011	-36.67	0.000	-0.422 -0.379
2014/15	-0.397	0.011	-36.09	0.000	-0.419 -0.375
_cons	-2.505	0.062	-40.22	0.000	-2.627 -2.383
school level:					
sd(_cons)	0.875	0.028			0.821 0.932

Table 57: Model 17A: KS4 pupil achieved expected progress in English, MAT academies vs maintained schools

Variables	Coefficient	Std. err.	z-score	p value	[95% Conf.	Interval]
KS2 average point score	0.046	0.001	50.52	0.000	0.044	0.047
Female	0.655	0.009	69.14	0.000	0.637	0.674
FSM (ever 6) pupil	-0.410	0.011	-38.52	0.000	-0.431	-0.389
BME pupil	0.137	0.017	8.26	0.000	0.104	0.169
Unclassified ethnicity	0.130	0.046	2.84	0.004	0.040	0.219
EAL pupil	0.348	0.020	17.46	0.000	0.309	0.387
SEN pupil (no statement)	-0.666	0.012	-54.85	0.000	-0.690	-0.642
SEN pupil (with statement)	-0.671	0.029	-22.89	0.000	-0.729	-0.614
Overall absence	-5.970	0.061	-97.24	0.000	-6.090	-5.850
All-through school	0.185	0.173	1.07	0.285	-0.154	0.525
Upper school	-0.110	0.178	-0.62	0.536	-0.458	0.238
MAT academy	0.135	0.053	2.56	0.010	0.032	0.239
Year						
2013/14	0.020	0.011	1.82	0.069	-0.002	0.041
2014/15	-0.064	0.011	-5.90	0.000	-0.086	-0.043
_cons	0.112	0.048	2.32	0.020	0.018	0.206
school level:						
sd(_cons)	0.626	0.020			0.589	0.666

Model 17

Number of obs	317,017
Number of groups	589
Observations per group	
min	101
avg	538
max	1,762

Table 58: Model 17B: KS4 pupil achieved expected progress in English, MAT academies vs maintained schools

Variables	Coefficient	Std. err.	z-score	p value	[95% Conf.	Interval]
KS2 average point score	0.046	0.001	50.51	0.000	0.044	0.047
Female	0.655	0.009	69.15	0.000	0.637	0.674
FSM (ever 6) pupil	-0.410	0.011	-38.47	0.000	-0.431	-0.389
BME pupil	0.137	0.017	8.27	0.000	0.104	0.169
Unclassified ethnicity	0.130	0.046	2.85	0.004	0.040	0.219
EAL pupil	0.348	0.020	17.47	0.000	0.309	0.387
SEN pupil (no statement)	-0.666	0.012	-54.84	0.000	-0.690	-0.642
SEN pupil (with statement)	-0.671	0.029	-22.89	0.000	-0.729	-0.614
Overall absence	-5.970	0.061	-97.24	0.000	-6.090	-5.850
All-through school	0.199	0.173	1.15	0.250	-0.140	0.539
Upper school	-0.146	0.178	-0.82	0.412	-0.494	0.203
Sponsor group	0.063	0.074	0.85	0.395	-0.082	0.207
MAT converter	0.211	0.064	3.28	0.001	0.085	0.337
MAT sponsor-led	-0.005	0.084	-0.06	0.952	-0.171	0.160
Year						
2013/14	0.020	0.011	1.82	0.069	-0.002	0.041
2014/15	-0.064	0.011	-5.90	0.000	-0.086	-0.043
_cons	0.086	0.057	1.51	0.130	-0.025	0.198
school level:						
sd(_cons)	0.623	0.020			0.586	0.663

Table 59: Model 17C: KS4 pupil achieved expected progress in English, MAT academies vs maintained schools

Variables	Coefficient	Std. err.	z-score	p value	[95% Conf.	Interval]
KS2 average point score	0.046	0.001	50.51	0.000	0.044	0.047
Female	0.655	0.009	69.14	0.000	0.637	0.674
FSM (ever 6) pupil	-0.410	0.011	-38.49	0.000	-0.431	-0.389
BME pupil	0.137	0.017	8.26	0.000	0.104	0.169
Unclassified ethnicity	0.129	0.046	2.84	0.005	0.040	0.219
EAL pupil	0.348	0.020	17.46	0.000	0.309	0.387
SEN pupil (no statement)	-0.666	0.012	-54.85	0.000	-0.690	-0.642
SEN pupil (with statement)	-0.671	0.029	-22.90	0.000	-0.729	-0.614
Overall absence	-5.970	0.061	-97.24	0.000	-6.090	-5.850
All-through school	0.179	0.173	1.04	0.300	-0.160	0.519
Upper school	-0.127	0.178	-0.72	0.474	-0.476	0.222
MAT size:						
2 schools	0.192	0.081	2.38	0.017	0.034	0.350
3 schools	0.106	0.099	1.07	0.287	-0.089	0.300
4–6 schools	0.183	0.084	2.19	0.028	0.019	0.347
7–15 schools	0.184	0.100	1.84	0.066	-0.012	0.380
16+ schools	0.011	0.085	0.13	0.895	-0.155	0.177
Year						
2013/14	0.020	0.011	1.81	0.070	-0.002	0.041
2014/15	-0.064	0.011	-5.90	0.000	-0.086	-0.043
_cons	0.113	0.048	2.34	0.019	0.018	0.207
school level:						
sd(_cons)	0.624	0.020			0.586	0.663

Table 60: Model 18A: KS4 pupil achieved expected progress in Maths, MAT academies vs maintained schools

Variables	Coefficient	Std. err.	z-score	p value	[95% Conf.	Interval]
KS2 average point score	0.084	0.001	94.68	0.000	0.082	0.086
Female	0.184	0.009	19.74	0.000	0.166	0.202
F5M (ever 6) pupil	-0.454	0.011	-42.84	0.000	-0.474	-0.433
BME pupil	0.120	0.016	7.31	0.000	0.088	0.152
Unclassified ethnicity	0.091	0.046	1.98	0.048	0.001	0.182
EAL pupil	0.666	0.020	33.27	0.000	0.627	0.705
SEN pupil (no statement)	-0.914	0.012	-74.83	0.000	-0.938	-0.890
SEN pupil (with statement)	-1.116	0.031	-36.17	0.000	-1.177	-1.056
Overall absence	-8.267	0.073	-112.64	0.000	-8.411	-8.124
All-through school	-0.040	0.184	-0.22	0.830	-0.400	0.321
Upper school	0.103	0.189	0.54	0.586	-0.268	0.474
MAT academy	0.110	0.056	1.95	0.052	-0.001	0.220
Year						
2013/14	-0.459	0.011	-41.72	0.000	-0.480	-0.437
2014/15	-0.410	0.011	-36.88	0.000	-0.431	-0.388
_cons	-0.457	0.050	-9.14	0.000	-0.555	-0.359
school level:						
sd(_cons)	0.668	0.022			0.627	0.712

Model 18	
Number of obs	318,012
Number of groups	589
Observations per group	
min	101
avg	540
max	1,762

Table 61: Model 18B: KS4 pupil achieved expected progress in Maths, MAT academies vs maintained schools

Variables	Coefficient	Std. err.	z-score	p value	[95% Conf.	Interval]
KS2 average point score	0.084	0.001	94.66	0.000	0.082	0.086
Female	0.184	0.009	19.75	0.000	0.166	0.202
FSM (ever 6) pupil	-0.453	0.011	-42.77	0.000	-0.474	-0.432
BME pupil	0.121	0.016	7.34	0.000	0.088	0.153
Unclassified ethnicity	0.091	0.046	1.97	0.048	0.001	0.182
EAL pupil	0.666	0.020	33.29	0.000	0.627	0.705
SEN pupil (no statement)	-0.914	0.012	-74.83	0.000	-0.938	-0.890
SEN pupil (with statement)	-1.116	0.031	-36.18	0.000	-1.177	-1.056
Overall absence	-8.268	0.073	-112.64	0.000	-8.411	-8.124
All-through school	0.007	0.183	0.04	0.969	-0.352	0.366
Upper school	0.044	0.188	0.24	0.814	-0.325	0.414
Sponsor group	-0.032	0.078	-0.41	0.683	-0.185	0.121
MAT converter	0.183	0.068	2.69	0.007	0.050	0.317
MAT sponsor-led	-0.041	0.089	-0.45	0.650	-0.216	0.135
Year						
2013/14	-0.459	0.011	-41.72	0.000	-0.480	-0.437
2014/15	-0.410	0.011	-36.88	0.000	-0.432	-0.388
_cons	-0.444	0.059	-7.49	0.000	-0.560	-0.328
school level:						
sd(_cons)	0.662	0.021			0.621	0.705

Table 62: Model 18C: KS4 pupil achieved expected progress in Maths, MAT academies vs maintained schools

Variables	Coefficient	Std. err.	z-score	p value	[95% Conf.	Interval]
KS2 average point score	0.084	0.001	94.67	0.000	0.082	0.086
Female	0.184	0.009	19.74	0.000	0.166	0.202
FSM (ever 6) pupil	-0.453	0.011	-42.82	0.000	-0.474	-0.433
BME pupil	0.120	0.016	7.30	0.000	0.088	0.152
Unclassified ethnicity	0.091	0.046	1.98	0.048	0.001	0.182
EAL pupil	0.666	0.020	33.26	0.000	0.626	0.705
SEN pupil (no statement)	-0.914	0.012	-74.84	0.000	-0.938	-0.890
SEN pupil (with statement)	-1.116	0.031	-36.17	0.000	-1.177	-1.056
Overall absence	-8.268	0.073	-112.64	0.000	-8.411	-8.124
All-through school	-0.073	0.183	-0.40	0.690	-0.432	0.286
Upper school	0.097	0.189	0.51	0.609	-0.274	0.467
MAT size:						
2 schools	0.280	0.085	3.27	0.001	0.112	0.447
3 schools	0.000	0.105	0.00	0.999	-0.206	0.206
4–6 schools	0.073	0.089	0.83	0.407	-0.100	0.247
7–15 schools	0.187	0.106	1.77	0.077	-0.020	0.394
16+ schools	-0.022	0.090	-0.24	0.808	-0.197	0.154
Year						
2013/14	-0.459	0.011	-41.72	0.000	-0.480	-0.437
2014/15	-0.410	0.011	-36.88	0.000	-0.431	-0.388
_cons	-0.456	0.050	-9.18	0.000	-0.553	-0.358
school level:						
sd(_cons)	0.662	0.021			0.622	0.705