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The Introduction of Academy Schools to England’s Education

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Abstract
We study what has become a high profile example of education policy that highlights the scope to improve outcomes from changing school types – the introduction of academy schools to the English secondary school sector. Our results indicate that, in some settings, academy conversion generated a significant improvement in the quality of pupil intake and generated significant improvements in pupil performance for those who attended schools treated by academy conversion. There is evidence of heterogeneity in the estimated performance effects, as improvements only occur for schools experiencing the largest increase in their school autonomy relative to their predecessor state. Analysis of mechanisms points to changes in headteachers and management structure, and to curriculum change, as key factors underpinning the observed improvements in educational outcomes.

JEL Keywords: Academies; Pupil Intake; Pupil Performance.
JEL Classifications: I20; I21; I28.

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1. Introduction

The academies programme that has been undertaken in English education is turning out to be one of the most radical and encompassing programmes of school reform that has been seen in the recent past in advanced countries. Academies are independent, non-selective, state-funded schools that fall outside the control of local authorities. In most cases, they are conversions of already existing predecessor schools. Thus they are mostly different from US charter schools which are set up from scratch. At the time of writing, nearly 2000 of England’s secondary schools (or 63 percent of around 3100 schools) and a further 2000 (or 13 percent of around 15000) primary schools had become academies. The vast majority became academies after the change of government in May 2010 quickly ushered in the 2010 Academies Act.

The original academies programme which began in the at the start to middle of the 2000s was a smaller scale enterprise that came to England’s education, but is one which has generated considerable interest and controversy, both in terms of English education policy and in terms of whether the key characteristics of academies (compared to state schools) are desirable in a quest to push up educational standards. This is important in a context where some nations have been innovative in their attempts to get closer to what they perceive to be the optimal school type, while others pursue education policies with little deviation from the orthodox model of the traditional local or community school.

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1 The closer comparison to charters in England are free schools which are a recent addition to the education landscape and are also newly set up schools (often by set up by parent or community groups). The closer US comparison to academies are ‘in-district’ charters where an already existent public school is converted to a charter – these are much less commonplace than US charters as a whole (see Angrist et al. 2014), but there are places where conversions of public schools have taken place (like New Orleans and Houston – see, inter alia, Fryer, 2014).
2 In England, secondary schooling takes place from ages 11-16 and primary schooling from ages 5-11.
3 This is nowhere better illustrated in the cross-country differences highlighted in discussions of what kinds of schools do better or worse in the international test score data that has been a key resource in recent economics of education research (see OECD, 2011, or Hanushek and Woessmann, 2010).
The genesis of the academies programme is what we study in this paper. The origin of the academy school model was initiated under the 1997-2010 Labour government where considerable concern was expressed about the performance of some schools in particular local authorities (usually serving urban inner-city disadvantaged neighbourhoods). A widespread recognition emerged that something needed to be done, both to try to improve educational standards but also to confront significant behavioural problems, in these schools where it had been said that ‘teachers had lost control of the corridors’. The proposed solution was to replace an existing school with a new type of state school to be run outside of local authority control and which was managed by a private team of independent co-sponsors. The sponsors of the new academy school delegate the management of the school to a largely self-appointed board of governors who have responsibility for employing all academy staff, agreeing levels of pay and conditions of service and deciding on the policies for staffing structure, career development, discipline and performance management.

We study the impact of academy school conversion on pupil intake and pupil performance. This line of enquiry is aimed at working out how the Labour academy programme functioned and impacted on pupils affected by the programme. To do so we consider data on pupils in schools over the school years 2001/02 to 2008/09 since this facilitates a before/after academy conversion analysis where we can establish a causal impact to be undertaken. Of course, as the discussion has already made clear, that it was very much pupils in disadvantaged schools that participated in academy conversion and so we need to devote significant attention in this before/after analysis to ensure we can define a credible control group of pupils in schools that did not become academies in the sample period. We do so by comparing outcomes of interest for

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4 The school year in England runs from September through July.
children enrolled in academy schools to pupils enrolled in a specific group of comparison
schools, namely those state schools that go on to become academies after our sample period ends.
We discuss the rationale for this and our methods in using this research design (together with
threats to this means of achieving identification) in much more depth below, but it turns out that
this approach produces a well-balanced treatment and control group that differences out key
unobservable factors linked to conversion to academy status.

To preview our findings, we report results that, in some settings, conversion to an
academy generated improvements in both the quality of pupil intake and in pupil performance.
Our results indicate that academy conversion generated a significant improvement in the quality
of pupil intake and generated significant improvements in pupil performance for those who
attended schools treated by academy conversion. There is evidence of heterogeneity in the
estimated performance effects, as improvements only occur for schools experiencing the largest
increase in their school autonomy relative to their predecessor state. Analysis of mechanisms
points to changes in headteachers and management structure, and to curriculum change, as key
factors underpinning the observed improvements in educational outcomes.

Whilst we study a school transformation programme that is rather different to those that
have been implemented elsewhere in the world, our work fits well with two strands of economics
of education research. The first is currently a small, but growing, literature that presents empirical
estimates of the impact of various school types on pupil achievement. For example, US work on
charter schools finds some evidence of achievement gains associated with charter status, and with
the ‘injection’ of charter school features to public schools.\(^5\) In the UK, or England to be more

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\(^5\) This literature is not without its own controversy. Recent, typically small scale, experimental evaluations of
charters in or near particular US cities (Boston and New York) find positive impacts on educational achievement (see
Abdulkadiroglu et al. 2011, 2014; Angrist et al. 2013; Dobbie and Fryer 2011; Hoxby and Murarka 2009). Wider
precise, a small body of work has identified the impact of specific school types on educational and labour market outcomes. The second is a bigger and by now fairly long established literature on school types in the US. These include many studies on Catholic schools and on voucher-subsidised private schools.

In the next section of the paper, we discuss the structure of the secondary schooling system in England and document the rise of academies in the period we study. We also describe the mechanics of how schools become academies and present a brief summary of related studies. Section 3 describes the data, the estimation framework that we adopt and uses this discussion to formulate key hypotheses to be tested in the empirical work. Section 4 presents the main results on the effects of academy conversion on pupil intake and performance. We also report a number of robustness tests of our key findings. We offer conclusions to the paper in section 5.

2. Academy Schools

Academies were first introduced to the English education system in the early 2000s, with the first conversions occurring in secondary schools in the 2002/3 school year. Their introduction can be viewed, certainly with the benefit of hindsight and from now looking back now, as a key development in the history of education in England. First of all, changes in school type like those that have taken place for academies, and the scale of the academies programme, are rarely seen in education systems across the world. Becoming an academy is a large scale school improvement programme. Second, the academies programme has been promoted and pursued on one side with almost evangelical fervour by its advocates, and run down on the other side with an equal lack of

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6 See, for example, the Clark (2009) paper on schools becoming devolved from local authority control in the late 1980s and early 1990s or the work on private schools by Green et al. (2012).

7 See, for example, Altonji, Elder and Taber (2005), Neal (1997) or Evans and Schwab (1995).
enthusiasm and stark criticism by its detractors. This controversy and debate is widespread, and has changed in its focus through time. Lord Adonis’ 2012 book very clearly and eloquently describes this. Adonis was the key player in government in setting up the Labour academies programme, and the more sceptical lines from the organisation set up to oppose academies (the anti-academies alliance\textsuperscript{8}) make the nature of the controversial debate very clear.

The first clutch of academies opened in September 2002. Academies are independent, non-selective, state-funded schools that fall outside the control of local authorities. In most cases, they are conversions of already existing predecessor schools. Academies are managed by a private team of independent co-sponsors. The sponsors of the academy school delegate the management of the school to a largely self-appointed board of governors with responsibility for employing all academy staff, agreeing levels of pay and conditions of service and deciding on the policies for staffing structure, career development, discipline and performance management.

In this section of the paper, we consider their introduction, in terms of the mechanics and in terms of rationale. We discuss how academies relate to the other secondary school types that are in operation in England and we document the scale of the rise in the number of academy schools. We also set the academies programme into its appropriate context in the education research literature by considering other related work that tries to determine what different school types do to pupil outcomes.

Secondary School Types in England and Academy Introductions

There are seven different school types that make up the English secondary education system: independent schools, academy schools, city technology colleges (CTCs), voluntary aided schools, foundation schools, voluntary controlled schools and community schools. Each school

\textsuperscript{8} See the website at http://antiacademies.org.uk.
type is characterised by a unique set of features regarding their school autonomy and governance. This is shown in Table 1. In this Table, we order the different school types by the amount of autonomy that their governing body/management body has, ranging from those with the most (private independent schools that operate outside of the state sector) to those with the least (community schools).

In the time period we study, the rationale for setting up an academy was multi-faceted. However, the main reason was very clearly to replace existing failing schools in an explicit aim to try to generate school improvement through moving away from the conventional type of school that had populated the English secondary sector in the past. This was the main aim in the majority of conversions. There were some other cases, for example where schools that already had more autonomy than a typical state community school became an academy, or as a means for fee-charging independent schools to broaden their intake of pupils by becoming academies (Department for Children, Schools and Families 2007), but these were the exception rather than the norm.

In the time period we study (i.e. prior to the Academies Act of 2010, which altered the notion of academy status) the path to establish an academy school in a local authority involved a number of steps. The key feature was a need to sign up a sponsor, who works with the Local Authority where the school operates, to complete a formal Expression of Interest (this makes the case of need for a new academy in the proposed area and details of feasibility). The phase is completed when the LA and sponsor send the expression of interest to the Secretary of State for Education for his or her approval. If the EOI is approved by the Secretary of State for Education,

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9 These are described in detail in the Appendix.
then the process moves on to the feasibility stage and beyond that to conversion of the already existing school to an academy.

In Table 2, we show the number of state-maintained English secondary schools – of each school type – in operation at the start and end of the eight year period beginning in the school year 2001/2 that we study in this paper. The Table shows that by the 2008/9 school year, there were 133 academies. These were gradually introduced, with the first three opening in 2002/3, and then speeding up in the subsequent school years as follows: 2003/4 - 9; 2004/5 - 5; 2005/6 - 10; 2006/7 - 20; 2007/8 - 36; 2008/9 - 50. The Table shows reductions in the other secondary school types as the share of academies rose to a share of 4 percent of the secondary sector by 2008/9.

In Table 3, we look in more detail at which types of school converted to academy status. The upper panel of the Table shows all schools that get academy status, whilst the lower panel shows conversions for the sample of schools on which we have data available pre- and post-academy conversion. The main differences between the samples in the upper and lower panel is the small number of new academies (12), for which there is no predecessor school and 5 conversions from independent schools, for which we do not have any predecessor school data.

Table 3 shows that the vast majority of academy schools were actually academy conversions from predecessor schools. The Table also shows that (at least) one school from every secondary school type converted to an academy. However, the majority of academy conversions occur in community schools (the ‘typical’ state school with the lowest levels of autonomy outlined in Table 1). In the period we study, school years 2001/2 through 2008/9, there are seven cohorts of converting academies on which we have data on 106 schools, and there are two cohorts of schools (100 schools) that have been approved to become academies but their
conversion occurs after our analysis period ends in 2008/9. We refer to the former as ‘current’ academies and the latter as ‘future’ academies.

**Related Literature**

Whilst there is quite a lot of work on the impact of attending different types of schools on pupil enrolment and performance, there is much less research on what happens when the type of school attended by pupils changes. Whilst in a much earlier time period, and in a very different setting, a study related to the questions we analyse is the analysis of grant-maintained (GM) schools\(^\text{10}\) by Clark (2009) in England in the late 1980s and early 1990s. He utilises a regression-discontinuity design that exploits the fact that schools wishing to become GM schools were required to win the support of the parents with children who were enrolled at the school. He finds that the narrow GM vote winners experienced a significant improvement in pupil performance (of 0.25 standard deviations) compared to the narrow GM vote losers. Thus the change in school type brought about performance improvements.

In the US, the growing body of work on charter schools is relevant because, at least in some dimensions, charter schools have similarities to academies. However, most charters are new schools and so the relevance is reduced. The more convincing studies in the charter school literature exploit the fact that some schools use lotteries to allocate places when the school is oversubscribed. Examples of this kind include: Abdulkadiroglu et al. (2011), who estimate the impact of charter attendance on student achievement using Boston data; Hoxby and Murarka (2009), which evaluates the effect of charter schools in New York City on their students’ test scores; and Angrist et al. (2010), who evaluate the impact of a specific Charter School (in Lynn, 10 GM schools were renamed as foundation schools (see Table 1) in the Schools Act 1998.
Massachusetts) that is run by the Knowledge is Power Program (KIPP) which is targeted at low income students that qualify for free school meals and was set-up by Teach for America veterans.

These studies are relatively small scale evaluations in that their treatment group is often a small sample of schools (or even a single school in the case of Angrist et al. 2010). Interestingly, they do find positive effects for lotteried in pupils. Abdulkadiroglu et al. (2011) find that the lotteried in pupils experience significant improvements in their English language scores and math scores at both middle and high schools, with effects being larger for the latter. Hoxby and Murarka (2009) also find that lotteried in pupils experience significant improvements in both their maths scores and reading scores between the third and eighth grade compared to the lotteried out pupils who remain in traditional public schools. Angrist et al. (2010) find that lotteried in students who attend KIPP Academy Lynn, a school that serves students in grades five through to eight, experience significant improvements in their maths scores and reading scores. In a separate study, Dobbie and Fryer (2011) look at schools in Harlem in New York, with results being broadly similar results to those of Angrist et al. (2010).

An issue with these experimental studies is that lotteries only occur in the schools that are oversubscribed. Given that successful schools are more likely to be oversubscribed, estimates that exploit the lottery process are likely to be upper bounds. As an alternative, some studies adopt non-experimental methods to appraise the charter school model. However, they tend to produce more mixed results. For example, the CREDO (2009) study uses propensity score matching methods finding charter school performance to be no better (or worse) than neighbouring traditional public schools. A problem with non-experimental methods is concern about how well they deal with selection bias compared to the lottery based estimates. An informative study that addresses this issue is by Hoxby and Murarka (2007). They estimate treatment effects for charter
schools using both non-experimental methods and lottery based estimates, finding that their non-experimental estimates replicate their lottery-based estimates. Angrist et al. (2011) also compare experimental lottery estimates with observational estimates on a large sample of Massachusetts schools, reporting positive urban charter school effects in both cases.

On academies themselves, so far there is very little rigorous research work. There are early studies by Machin and Wilson (2008) and evaluations by Price Waterhouse Coopers (PwC Report 2008), plus a more recent report by the National Audit Office (2010). Machin and Wilson (2008) looked at differences in pupil performance in academy schools compared to the performance of a matched group of schools, finding modest, statistically insignificant, relative improvements. The PwC Report (2008) reported higher percentage point increases in the results of academies compared to the national average (which is not a good comparison since academies are well below average performers in their predecessor state\(^{11}\)). It is noteworthy that both Machin and Wilson (2008) and PwC (2008) admitted their studies were in the early days of academy schools, so drawing any firm conclusions from their results is precipitous.

More recently, a National Audit Office report (National Audit Office 2010) looked at the performance of academies compared to a selected group of maintained schools for academies converting in the 2002/3 to 2007/8 school years and who had been open for at least two years. Their comparison group is composed of schools with similar pupil intakes and performance to the pre-treatment academies. They report a significant improvement in pupil performance in the academies compared to the comparison group. They argue this result is driven by relatively more advantaged pupils attending the academy as compared to the predecessor school.

\(^{11}\) See the discussion around Table 4 below.
3. Data and Conceptual Framework

Data

Our main data source is pupil level data from the National Pupil Database (NPD). The NPD is a centrally collected data source that contains the pupil and school characteristics (school census) combined with the annual National Curriculum key stage attainment data at the pupil level. The school census data contains information on pupil-level background characteristics for all pupils in the English maintained sector. This data has been collected three times per year (January, May and September) from the 2001/2002 school year onwards. For this paper, we only use the year-on-year January collection because this collection is the most available and consistent through time.

In England, compulsory education is organised around four key stages for eleven years of schooling from ages 5 to 16. These are key stage 1 (in years 1 and 2) and key stage 2 (years 3 to 6) in primary school; and key stage 3 (years 7 to 9) and key stage 4 (years 10 and 11) in secondary school. In studying whether academy conversion impacts on schools, our two outcomes of interest are pupil intake and pupil performance. To study intake, we look at the key stage test scores (KS2) that pupils take at the end of primary school (aged 10/11 at the end of year 6) before they make the transition to secondary school. To study performance, we look at the key stage 4 (KS4) examinations that pupils take at the end of compulsory schooling (aged 15/16 at the end of year 11). These are known as GCSEs (General Certificate of Secondary Education).

12 The use of pupil-level data throughout is the key innovation compared to the earlier version of this paper (Machin and Vernoit, 2010). Of course, use of pupil-level data (which the earlier version did not have full access to) makes the analysis much more appropriate in that the right level of treatment is the effect of schools on the pupils that attend them compared to schools they would otherwise have attended. Put another way, changing pupil composition could render school-level estimates biased. Perhaps ironically, the key features of the results we report below using pupil-level data are not qualitatively different from the earlier school-level analysis.

13 More details are given in the Data Appendix.
We are able to analyse the pupil-intake of the secondary schools by using the pupil year and the school identifier that is contained in the school census data and its predecessor the pupil level annual school census (PLASC). This allows us to identify – for each year - the secondary school attended by each pupil. We are then able to look at the ‘intake quality’ of each secondary school – for each year – by matching their year 7 pupils to their KS2 results. That is, we match each pupil entering year 7 of a secondary school over the 2001/02 to 2008/09 academic years to their KS2 results over the 2000/01 to 2007/08 academic years.

The impact of academy conversion needs to be analysed at the individual pupil-level. This is because the underlying composition of students attending schools may change over time (in fact, this is our purpose for looking for changes in pupil intakes resulting from academy conversion) and so we wish to study whether attending a converted school has potential to impact on pupil performance in an attempt to identify the causal impact of attending and being educated in an academy school.

One further practical issue concerns the definition of schools that convert to academies. There are a small number of examples where more than one predecessor school combines to create one academy school. Where this occurs, we create one hypothetical pre-academy school. This adopts hypothetical characteristics that are a weighted-average – based on their student population at the time of the merge - of the characteristics of the merged schools.

Modelling Approach

So as to isolate the impact of an academy conversion, we define the academic year that the academy status is awarded as the first academic year that the academy school starts operating (i.e. ‘opens for business’). We then use the academic year that the academy status is awarded
(and the years after) as the base that we need to calculate the before/after conversion effect on the outcomes of interest.

We have two outcomes of interest. In the first we investigate the impact of academy school conversion on pupil intake based on the standardised KS2 total points score\(^ {14} \) (with a population mean of zero and a standard deviation of one) of pupils who enrol into year 7 of the academy school (the first year of secondary school). The second outcome is from investigating the impact of an academy school conversion on its pupil performance by looking at the KS4 performance of pupils attending academies. The main measure of KS4 performance that we use in this paper is the standardised total points score of individual year 11 students, but we also consider different measures below.

*Impact on Pupil Intake*

We begin our empirical study looking at difference-in-differences (D-i-D) in an event study setting by comparing what happens to pupil intake before and after conversion for pupils attending schools that do and do not convert to an academy in the sample period. We begin with the following equation for pupil \( i \) in school \( s \) in year \( t \), where the key parameter of interest is the differences-in-differences coefficient \( \delta \):

\[
KS2_{ist} = \alpha_s + \alpha_t + \delta A_s * I(E \geq t = C) + \sum_{j=1}^{J} \lambda_{ij} X_{jist} + u_{ist} \tag{1}
\]

In (1) KS2 denotes a standardised key stage 2 test score, \( A \) is a dummy variable that is equal to 1 if the secondary school attended by the pupil in year 7 (the entry year of secondary school) is in the treatment group (i.e. converts into an academy at any time during the sample period). This is calculated by totalling (for each pupil) their raw scores in English, Maths and Science. We then average across the three before standardising.

\(^{14}\) This is calculated by totalling (for each pupil) their raw scores in English, Maths and Science. We then average across the three before standardising.
period) and it is equal to 0 if the school is in the comparison group (as discussed below this will be schools that do not convert to be an academy in the sample period, but do convert after the sample period ends). The indicator variable I(E\geq t=C) denotes an event E of academy conversion in year C, X denotes a set of control variables, \( \alpha_s \) denotes school fixed effects, \( \alpha_t \) denotes year fixed effects (included to take account of year effects that are common to all schools) and \( u_t \) is an error term.

The estimate of \( \delta \) in equation (1) shows the average difference in KS2 scores for pupils attending academy schools (in years after the event of conversion in t=C) relative to the predecessor school (in pre-conversion years t<C) compared to pupils in the control schools. To implement the full event study we estimate separate treatment effects for pre- and post-conversion years as follows

\[
\text{KS2}_{ist} = \alpha_s + \alpha_t + \sum_{e=t-4}^{t+\delta} \delta_e A_{ist} + I(E = e) + \sum_{j=1}^{6} \lambda_{2j} X_{ist} + u_{2ist}
\]

where our data enables us to estimate four pre-conversion \( \delta \)'s and six post-conversion \( \delta \)'s.

We also allow for heterogeneous effects by recognising that academies with different forms of predecessor school gain different amounts of autonomy when they become an academy. We therefore consider differences by what we can be referred to as 'autonomy distance' by considering whether the predecessor school was a community school or not. The presumption is that the autonomy distance is bigger for community schools as compared to the other schools (see the earlier discussion around Table 3). We implement this by estimating separate versions of the D-i-D event study of equation (2) for the case of academy conversions where the predecessor school was a community or non-community school.

\(^{15}\) X contains both cohort-school and pupil specific controls. It is subscripted with i because the cohort-school controls are still pupil specific as each pupil’s own characteristics have been excluded when calculating cohort-school means.
Impact on Pupil Performance

To study pupil performance effects we look at the Key Stage 4 (KS4) performance of year 11 students in academies. We restrict the analysis to those who are of the age that the treatment of academy conversion would mean they were enrolled in the school prior to conversion. This is to ensure that the academy conversion itself was exogenous to enrollment in secondary school. It means that the event study is limited to four years post conversion, including the year of conversion itself, so that children affected by conversion in year 7 could have up to four post-conversion years of education in the academy.

The equations we estimate for KS4 outcomes are thus:

\[
\text{KS4}_{ist} = \alpha_s + \alpha_t + \theta A_s \ast I(E \geq t = C) + \sum_{j=1}^{J} \pi_{1j} X_{jist} + v_{1ist}
\]  \hspace{1cm} (3)

\[
\text{KS4}_{ist} = \alpha_s + \alpha_t + \theta A_s \ast I(E \geq t = C) + \sum_{j=1}^{J} \pi_{2j} X_{jist} + \phi_{KS2_{ist}} + v_{2ist}
\]  \hspace{1cm} (4)

\[
\text{KS4}_{ist} = \alpha_s + \alpha_t + \sum_{c=t-4}^{t-1} \theta_c A_s \ast I(E = c) + \sum_{j=1}^{J} \pi_{3j} X_{jist} + \phi_{KS2_{ist}} + v_{3ist}
\]  \hspace{1cm} (5)

where equations (4) and (5) are value added models that control for pupil-level KS2.

In (3) and (4) \( \theta \) is now the average impact and we are able to estimate four pre-conversion \( \theta \)'s and four post-conversion \( \theta \)'s. As with the KS2 analysis, we will also estimate the D-i-D event study of equation (4) for the case of academy conversions where the predecessor school was a community or non-community school.

Definition of Comparison Schools

In Table 4, we compare average pre-treatment characteristics of academy schools and other types of maintained English secondary schools. It shows that academies have significantly different characteristics from the other schools types. This is true of pupil characteristics (like the proportions eligible for free school meals, the proportion white and the proportion of special
educational needs) and of pupil performance (like the headline school leaving age measure of the proportion getting 5 or more A*-C GCSEs and equivalents and the Key Stage 2 primary school points score).

This is not surprising. It is because, in their predecessor state, academies were typically poorly performing schools. This was the whole point of Labour’s academy programme. Thus, a naive comparison between academy schools and all other state-maintained schools will suffer from significant selection bias. A related problem is that schools that go on to become academies may have common unobservable characteristics (e.g. they have a type of school ethos that is more in line with the academy model).

Looking in more detail within the group of academies it does, however, turn out that the schools that convert to academy status between 2002/3 and 2008/9 have very similar pre-treatment characteristics to the schools that will later become academies. A set of balancing tests is given in the final row of the Table and one cannot reject the null hypothesis that the 106 academies that convert in the sample period and the 100 future academies have the same sets of characteristics. Our empirical approach (considered in more detail below) bases itself on this, modelling the converters during the sample period as the treatment group and the future converters as a balanced comparison group in a difference-in-differences setting.

4. Empirical Results

Academies and Pupil Intake

In Table 5, we investigate whether an academy school conversion has an impact on the pupil-intake of the school. As has already been noted, we track the pupil-intake quality of each school over the 2001/02 to 2008/09 period by looking at how standardised KS2 mean points
scores of year 7 pupils in schools that have converted to academies compare with the test scores of those attending schools yet to convert. This Table shows five different specifications to report estimates of the impact of academy status on its pupil intake. We begin with the raw differences-in-differences estimate in column (1). We add time-varying controls in column (2). In column (3), we estimate heterogeneous effects in the event study setting, and in columns (4) and (5) we respectively look at pupils in community and non-community predecessor schools.

The estimated coefficients in the Table show that academies, post-conversion, attract pupils, at year 7, with significantly higher KS2 test scores than those schools that convert after our sample ends. Column (1) shows that, on average, pupils enrolling in an academy at year 7 have a KS2 mean points score that is 0.063 standard deviations higher than those attending schools yet to attain academy status. The intake quality (on average) falls a little, but remains significantly higher by 0.058 standard deviations when we add the controls in column (2).

The event study estimates in column (3) show there to be no pre-conversion differences in levels or trends in KS2 between pupils in year 7 of treatment and control schools. They show a significant conversion year impact of 0.038σ, which gradually rises year on year post conversion, reaching 0.175σ by event year t+6. These results suggest that (on average) there has been a step-change in the pupil intake of schools when they convert to academy status. Academies seem to be attracting and admitting higher ability pupils once they convert to academy status. As shown by the rising coefficients for years post-conversion, and in Figure 1, this seems to be grow over time, suggesting important compositional shifts in the new enrollments to academies over time.

The latter makes it clear that plausibly exogenous treatment for pupils attending academy schools only occurs for children who were already enrolled pre-conversion. This set of pupils is
therefore the set of pupils we look at for evaluating the impact of academy conversion on pupil performance, which we turn to next.

*Academies and Pupil Performance*

Table 6a shows the impact of academy conversion on the KS4 outcomes of year 11 children. Column (1) shows that being in an academy school increases pupil’s KS4 standardised test scores by a statistically significant 0.063 of a standard deviation. Adding the pupil-level prior achievement measure (KS2) and control variables marginally reduces this to 0.057σ, and remains significant. Thus pupil achievement is significantly higher on average, and so is value added for pupils attending schools that converted to become an academy.

Column (3) shows the event study D-i-D estimates. These show no discernible pre-treatment trends, but a significant positive, and rising over time, impact upon conversion. In the year of conversion KS4 test scores are 0.038σ higher, and this rises to 0.175σ by year t+3. Figure 2 very clearly shows the significant upturn after treatment and control pupils look very similar pre-conversion. It also makes it clear that academy conversion seemed to raise pupil performance.

In columns (5)-(8), we replicate the early/late regression of column (4) using different dependent variables. In column (5), rather than using the total points score, we consider the proportion getting 5 A*-C GCSEs (and their equivalents) and in column (6) the proportion getting 5 A*-C GCSEs (and their equivalents) but including GCSEs in Maths and English. With some subtleties, the same overall pattern of results is clear. In column (7) and (8) we look separately at GCSEs and equivalents. Again we find significant improvements in both.

Finally, in columns (8) and (9), and graphically in Figure 3, we show separate KS4 results for academies where the predecessor schools were respectively community and non-community
schools. Significant – and sizable – effects are seen for the former, whilst there is no improvement for the latter. These results thus reveal an important finding in terms of the overall interpretation of our results. They suggest that the schools experiencing the largest increase in school autonomy via academy conversion (see Table 1) – community schools – were the only ones to experience the performance improvements, and here the effects were estimated to be large, reaching $0.40\sigma$ by (t+3).

These conversions from community schools enabled a gain of responsibility for the majority of the curriculum of the school (except the core subjects: English, Maths, Science and IT); the structure and length of the school day; the school budget and all staffing decisions (in the case of community schools that convert to academies). In the next section of the paper we look at which of these underlying mechanisms may have been behind the observed performance improvements. Prior to that, however, we consider a couple of empirical extensions and study the robustness of the key findings.

*Extensions and Robustness*

It is possible that some pupils in academy conversions may have not been at the school prior to its conversion. In fact almost 98 percent of pupils were treated by the conversion (by which we mean they were already enrolled pre-conversion). And if we exclude the small number of students who were not enrolled, we obtain highly similar results. These are shown in Table 6b which takes the same structure as Table 6a.

A second extension we have considered is to estimate the most detailed KS4 models separately by cohort. Recall that we have schools converting to academies in the school years 2002/3 through 2007/8. Figure 4 looks what happens if we estimate the models separately by
cohort. It is very clear that a null hypothesis of the same average effects across cohorts is not rejected by the data.

Next we consider a falsification test. This is a test of whether the estimated \( \theta \) coefficients reflect unaccounted pre-existing differences in the outcomes of interest for our treatment group compared to our control group. To do this falsification exercise, we altered the year in which each cohort of academy school became an academy to that of an earlier time period. We then re-estimated our models calculating the \( \theta \) coefficients based on a ‘fake’ year (four years before) where we pretended schools converted to academies. If the \( \theta \) coefficients in this falsification exercise give similar results to that of our original specification, then we would worry that the results of our original specifications would reflect pre-existing differences in the outcomes of interest. To avoid any contamination when pupils attend schools that actually have converted, as oppose to attending during the ‘fake’ conversion, it is necessary for there to be no overlap, at the school level, between fake post-academy years and actual post-academy years. This means that we have to shorten the post-treatment fake periods for the first three academy cohorts. Thus the sample size drops.

We conduct the falsification exercise over the eight year period between the 1998/99 and 2004/05 academic years. Table 7 shows the results, and the estimated \( \theta \) coefficients for the academy conversion are always close to zero and statistically insignificant. This fake policy experiment does seem to rule out that our results are driven by pre-existing unobservables. However, as already noted, it was carried out on a slightly different sample and so in columns (3) and (4) of Table 7, we report the original specifications for the same sample. They are very similar to the main KS4 results of the paper reported in columns (3) and (4) of Table 6a.
Finally, we consider a different measure of whether academisation under the Labour programme resulted in improved school performance by looking at Ofsted inspections of schools before and after conversion, again relative to control schools. Table 8 shows transition matrices for treatment and control schools in the 2000s. This typically constitutes an inspection ranking (of Outstanding, Good, Satisfactory or Inadequate) before and after academy conversion for academies and in the early and late 2000s for comparison schools. Not all schools were inspected twice in this period so we analyse a sub-set of schools.

The descriptive statistics in Table 8 show that academies were, on average, more likely to move up the rankings before and after conversion as compared to comparison schools. Ordered probit estimates reported in Table 9 confirm this and show a statistically significant improvement in inspection rankings of academies. We take this as complementary and corroborative evidence in line with the KS4 performance gains we have already reported, and that being granted academy status operates to generate overall school improvements.

5. Mechanisms

We have so far demonstrated significant performance in KS4 amongst pupils treated by academy conversion. The results also imply, since community predecessor conversions significantly raise pupil performance, that these performance impacts come about from improved autonomy that effectively acts as to facilitate school improvement. This, however, begs the question – through what mechanisms can this come about? We address this important question in this Section of the paper.

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16 Ofsted is the Office for Standards in Education, Children's Services and Skills which is a government department of Her Majesty's Chief Inspector of Schools in England which undertakes inspections of schools as part of the strongly enforced school accountability system that operates in England.
To begin a discussion of mechanisms, we draw on the Department for Education’s (2014) survey of academy schools that was undertaken to shed light on the question of ‘Do Academies Make Use of Their Autonomy?’. This survey collected information on a wide array of changes that may have occurred following academy conversion.¹⁷ These are summarised in Table 10 for 23 of the Labour academies we analyse in this paper, and for 148 academies (including the 23) overall.

The responses are ranked in order of the percent making the particular change considered in the survey for the 23 Labour academies in the first column of Table 10. The three at the top of the list of eighteen possibilities were ‘changed school leadership’, followed by ‘procured services that were previously provided by the local authority’ and ‘changed the curriculum you offer’. Over 75 percent of the schools said they made these changes. Broadly the same ranking is present for the 148 academies.

When asked what the most important change was, two answers clearly dominate: ‘changed school leadership’ (at 56 percent) and ‘changed the curriculum you offer’ (at 26 percent). Furthermore, both of these were reported to be linked to improved outcomes (in 73 and 77 percent of cases respectively). Other changes that were notably linked to improved outcomes were ‘Increased the length of the school day’ (63 percent) and ‘Collaborated with other schools in more formalised partnerships’ (45 percent).

Study of differences between our treatment and control schools in the D-i-D event study setting is highly supportive of this. We can look at whether headteachers change on conversion

¹⁷ In May 2013 the Department for Education sent a questionnaire to all 2919 open academies. Of the 720 respondents, 148 were sponsored academies, with 74 of these being secondary schools. Of the 74, 23 converted pre-May 2010 and thus were academies at some point in our sample period.
and whether teachers in place get removed. Results for headteacher changes are reported in Table 11a. There is seen to be a very strong differential headteacher turnover, concentrated in the conversion year, as shown in columns (3) to (5) of the Table. Headteachers were some 63 percent more likely to change in all schools when conversion took place (and 65 and 59 percent higher in conversions from community and non-community schools respectively).

Thus a strong feature of academy conversions is to replace the headteacher. The same is not true of the rank and file teaching staff (unlike in US charters). Teachers were not differentially removed at the time of academy conversion as is shown in Table 11b.

Finally, in Table 12 we consider curriculum change, again in the D-i-D event study setting. To do so we can look at whether new subjects were introduced to curriculum in the school for year 11 students in the years of our sample. The estimates reported in the Table uncover some evidence of differential curriculum change occurring for academy conversions in the years post-conversion.

Thus evidence from the schools we study seems very much in line with the key features of the Department for Education survey. Changes in school leadership and in the curriculum offered by the school seem to underpin the KS4 improvements observed for pupils enrolled in schools that became academies in the Labour years.

6. Conclusions

In this paper, we study what has become a high profile case of education policy – the introduction of academy schools into the English secondary school sector. It is widely believed that these changes have allowed schools to gain more autonomy and flexible governance by changing their school structure. We study academy conversions in an event based difference-in-differences
setting that compares what happens to outcomes of pupils treated by academy conversion relative to a comparable set of pupils in comparison schools that did not change their status in the period we study.

We consider the impact of academy school conversion on their pupil intake and pupil performance. Our results indicate that, in some settings, academy conversion generated a significant improvement in the quality of pupil intake and generated significant improvements in pupil performance for those who attended schools treated by academy conversion. There is evidence of heterogeneity in the estimated performance effects as improvements only occur for schools experiencing the largest increase in their school autonomy relative to their predecessor state. We view these findings as complementing the existing work (from very different settings, like US charter schools) on whether different school types can affect pupil performance.

In undertaking this empirical study, we offer new evidence about what happens when poorly performing disadvantaged schools are converted to a new type of state school that is characterised by greater autonomy and more flexible governance. Moreover, we look at possible mechanisms that underpin the estimated pupil performance effects, both by studying survey evidence and by generating direct evidence from our samples of pupils and schools. We use these to show that two key factors underpinning the observed improvements in pupil performance in school leaving exams were changes in headteachers/management structure and curriculum change.

Before finishing, it seems important to place our conclusions in their appropriate policy context, given the very big and rapid education reforms that have occurred recently in England. We study the sponsored academies set up under the Labour government’s programme, which set up 133 academies in the school years we study and which had 203 up and running in May 2010.
when a new coalition government was voted in. Since the election, the academies programme has been massively expanded and taken on a new direction, with the number of conversions skyrocketing and with the new convertors not only being in the secondary sector, but also covering primary schools, and even reaching outside the state sector to some private schools. Moreover, the new coalition academies need not have a sponsor when they are converted. Mass academisation seems to be the order of the day in English education.

It is noteworthy that a key feature distinguishing these new coalition academies is that, on average, they are not characterised by poor performance and disadvantage in their predecessor state like the sponsored academies introduced and approved under the previous Labour government which we analyse in this paper. The way some of them are run is also different with, for example, some of the post May 2010 academies being run as chains of schools by major sponsors. It is too early to do so yet, but in due course (and once they have been in existence long enough), it will be an important research challenge to determine whether or not these new convertor and chain run academies are able to deliver the kinds of performance improvements for students enrolling in them that the Labour programme we study here seemed to do.
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Figure 1:
Event Study Estimates of Academy Conversion, Key Stage 2, Year 7, 2001/2-2008/9

Notes: From column (3) specification, Table 5.
Figure 2:
Event Study Estimates of Academy Conversion, Key Stage 4, Year 11, 1997/8 to 2008/9

Notes: From column (3) specification, Table 6.
Figure 3:
Event Study Estimates of Academy Conversion, Key Stage 4, Year 11, 1997/8 to 2008/9,
Variations by Autonomy Distance

Notes: From column (8) and (9) specifications, Table 6.
Figure 4:
Event Study Estimates of Academy Conversion, Key Stage 4, Year 11, 1997/8 to 2008/9, Variations by Cohort

Key Stage 4 Points Score by Cohort

Notes: From cohort specific estimates of column (3) specification, Table 6.
### Table 1 - Characteristics of Autonomy and Governance in English Secondary Schools

|                             | Non-LA Admission Authority | Maintained by Non-LA body | Not obliged to follow National Curriculum | Fee Charging |
|-----------------------------|----------------------------|---------------------------|------------------------------------------|--------------|
| Registered independent school\(^4\) | ✓                          | ✓                         | ✓                                        | ✓            |
| Academy\(^b\)              | ✓                          | ✓                         | ✓                                        | x            |
| City technology college\(^c\) | ✓                          | ✓                         | ✓                                        | x            |
| Voluntary-aided\(^d\)       | ✓                          | x                         | x                                        | x            |
| Foundation\(^e\)            | ✓                          | x                         | x                                        | x            |
| Voluntary-controlled\(^f\)  | x                          | x                         | x                                        | x            |
| Community\(^g\)             | x                          | x                         | x                                        | x            |

Notes:

a - Registered independent schools are independent of the local authority (LA), and are fee-charging.

b - Academy schools (prior to 2010/11): all ability independent specialist schools, which do not charge fees, and are not maintained by the local authority; established by sponsors from business, faith, HE institutions or voluntary groups, working in partnership with central government. Sponsors and the DfE provide the capital costs for the Academy. Running costs are met by the DfE in accordance with the number of pupils, at a similar level to that provided by local authorities for maintained schools serving similar catchment areas.

c - City Technology Colleges: all ability independent schools, which do not charge fees, and are not maintained by the local education authority. Their curriculum has a particular focus on science and technology education (see West and Bailey, 2013). They were established by sponsors from business, faith or voluntary groups. Sponsors and the DfE provided the capital costs for the CTC. Running costs are met by the DfE in accordance with the number of pupils, at a similar level to that provided by local authorities for maintained schools serving similar catchment areas.

d – Voluntary-aided schools are maintained by the local authority. The foundation (generally religious) appoints most of the governing body. The governing body is responsible for admissions and employing the school staff. Land at voluntary-aided schools is usually owned by trustees, although the local authority often owns any playing field land (DfE, 2012).

e - Foundation (formerly grant-maintained) schools are maintained by the local authority. The governing body is responsible for admissions, employing the school staff, and either the foundation or the governing body owns the school’s land and buildings (DfE, 2012).

f – Voluntary-controlled schools are maintained by the local authority. These are mostly religious schools where the local authority continues to be the admission authority. Land at voluntary-controlled schools is usually owned by trustees, although the local authority often owns any playing field land (DfE 2012).

g - Community schools are maintained by the local authority. The local authority is responsible for admissions, employing the school staff, and it also owns the school’s land and buildings.
|                      | 2001/2       | 2008/9       |
|----------------------|--------------|--------------|
| Academy              | 0 (0.0)      | 133 (4.0)    |
| City technology college | 14 (0.4)   | 3 (0.1)      |
| Voluntary aided      | 555 (16.0)   | 537 (16.0)   |
| Foundation           | 609 (17.5)   | 560 (16.7)   |
| Voluntary controlled | 116 (3.3)    | 111 (3.3)    |
| Community            | 2177 (62.7)  | 2017 (59.9)  |
| Total                | 3471         | 3361         |

Notes: Source – School Census. Includes middle schools. Excludes special schools. This is partially available from Tables 2.1 and 2.2 in [http://www.education.gov.uk/rsgateway/DB/SBU/b000796/b02-2008.pdf](http://www.education.gov.uk/rsgateway/DB/SBU/b000796/b02-2008.pdf) and Table 2a in [http://www.education.gov.uk/rsgateway/DB/SFR/s000925/sfr09-2010.pdf](http://www.education.gov.uk/rsgateway/DB/SFR/s000925/sfr09-2010.pdf).
Table 3: The Nature of Academy Conversions

A. All Schools

| Pre-Academy School Type | All | New | Independent | City technology college | Voluntary aided | Foundation | Voluntary controlled | Community |
|------------------------|-----|-----|-------------|-------------------------|-----------------|------------|---------------------|-----------|
| All academies          | 244 | 12  | 5           | 12                      | 18              | 34         | 2                   | 161       |
| All academies, 2001/2-2008/9 | 133 | 12  | 5           | 12                      | 10              | 15         | 1                   | 78        |
| Future academies, after 2008/9 | 111 | 0   | 0           | 0                       | 8               | 19         | 1                   | 83        |

B. All Schools With Full Data (Pre- and Post-Academy Conversion)

| Pre-Academy School Type | All | New | Independent | City technology college | Voluntary aided | Foundation | Voluntary controlled | Community |
|------------------------|-----|-----|-------------|-------------------------|-----------------|------------|---------------------|-----------|
| All academies          | 206 | 0   | 0           | 12                      | 12              | 33         | 1                   | 148       |
| Become academies, 2001/2-2008/9 | 106 | 0   | 0           | 12                      | 8               | 15         | 1                   | 70        |
| Future academies, after 2008/9 | 100 | 0   | 0           | 0                       | 4               | 18         | 0                   | 78        |

Notes: Source for upper panel, same as Table 2. Source for lower panel, own calculations from Edubase, School Performance Tables and Annual Schools Census.
Table 4: Pre-Conversion Characteristics and Tests of Balancing

| Key stage 2 points score (mean) | Key stage 4 points score (mean) | Proportion getting 5 or more A*-C GCSEs or equivalents (mean) | Proportion male | Proportion white | Proportion eligible for free school meals | Proportion special educational needs | Number of Schools |
|---------------------------------|---------------------------------|--------------------------------------------------------------|----------------|----------------|------------------------------------------|-------------------------------------|------------------|
| City technology college         | 76.087                          | 59.153                                                       | 0.988          | 0.451          | 0.931                                    | 0.117                               | 0.098            | 2                |
| Voluntary aided                 | 66.525                          | 44.136                                                       | 0.603          | 0.501          | 0.791                                    | 0.148                               | 0.170            | 535              |
| Foundation                      | 65.381                          | 44.084                                                       | 0.603          | 0.521          | 0.834                                    | 0.114                               | 0.183            | 482              |
| Voluntary controlled            | 66.792                          | 43.985                                                       | 0.596          | 0.527          | 0.907                                    | 0.100                               | 0.176            | 116              |
| Community                       | 61.935                          | 38.966                                                       | 0.488          | 0.507          | 0.840                                    | 0.181                               | 0.219            | 2177             |
| Academies (Pre-conversion)      | 56.245                          | 32.358                                                       | 0.351          | 0.526          | 0.742                                    | 0.323                               | 0.273            | 106              |

A. All Schools

B. Academy Schools

| Current academies (treatment group) | 56.245 | 32.358 | 0.351 | 0.526 | 0.742 | 0.323 | 0.273 | 106 |
|-------------------------------------|--------|--------|-------|-------|-------|-------|-------|-----|
| Future academies (control group)    | 55.716 | 31.393 | 0.315 | 0.507 | 0.804 | 0.284 | 0.263 | 100 |
| Difference                          | 0.528  | 0.965  | 0.037 | 0.019 | -0.062| 0.039 | 0.010 |     |

Notes: Standard errors clustered at school level reported in parentheses. Both panels refer to characteristics in the 2001/2 school year. The top panel is maintained schools in the UK, which do not convert to academies prior to, or in, the academic year 2010/2011 and have data available. All variables with the exception of KS4 points score and the proportion achieving five or more A*-Cs refers to characteristics of the incoming 2001/2 cohort i.e. year 7 pupils in 2001/2.
Table 5: Pupil Intake, Key Stage 2, Year 7, 2001/2 to 2008/9

| | Pupils in All Schools | Pupils in Community Predecessor School | Pupils in Non-Community Predecessor School |
|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) |
| Academy x Post-Conversion (E = t to t+6) | 0.063 (0.024) | 0.057 (0.021) | | | |
| Academy x (E = t-4) | -0.023 (0.016) | -0.020 (0.019) | -0.032 (0.025) | | |
| Academy x (E = t-3) | -0.011 (0.013) | -0.012 (0.018) | -0.021 (0.021) | | |
| Academy x (E = t-2) | -0.007 (0.016) | -0.004 (0.020) | -0.009 (0.028) | | |
| Academy x (E = t-1) | 0.000 (0.014) | 0.014 (0.017) | -0.023 (0.026) | | |
| Academy x (E = t) | 0.038 (0.020) | 0.081 (0.022) | -0.027 (0.035) | | |
| Academy x (E = t+1) | 0.062 (0.025) | 0.126 (0.025) | -0.016 (0.043) | | |
| Academy x (E = t+2) | 0.116 (0.036) | 0.190 (0.037) | -0.022 (0.060) | | |
| Academy x (E = t+3) | 0.089 (0.045) | 0.198 (0.045) | -0.058 (0.068) | | |
| Academy x (E = t+4) | 0.087 (0.040) | 0.157 (0.041) | -0.052 (0.073) | | |
| Academy x (E = t+5) | 0.157 (0.062) | 0.243 (0.065) | -0.012 (0.079) | | |
| Academy x (E = t+6) | 0.175 (0.043) | 0.210 (0.046) | 0.104 (0.064) | | |

Notes: Robust standard errors (clustered at the school level) are reported in parentheses. Control variables at pupil level are dummies for whether the pupil is male, the pupil’s major ethnicity group, whether is eligible for free school meals and whether special educational needs. Control variables at the school level are means for all the pupils in the individual’s year-group and school with the individual themselves excluded, for the following: proportion male, proportion white, proportion of pupils eligible for free school meals and the proportion of pupils with special educational needs.
Table 6a: Pupil Performance, Key Stage 4, Year 11, 2001/2 to 2008/9

| Pupils in All Schools | Pupils in Community Predecessor School | Pupils in Non-Community Predecessor School |
|-----------------------|---------------------------------------|-------------------------------------------|
| Key Stage 4 Points Score | Key Stage 4 A*-C | Key Stage 4 A*-C with English and Maths GCSE | Key Stage 4 GCSE Points | Key Stage 4 GCSE Equivalents | Key Stage 4 Points Score |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| Academy x Post-Conversion (E = t to t+3) | 0.082 (0.029) | 0.079 (0.029) | | | | | | |
| Academy x (E = t-4) | -0.010 (0.020) | 0.015 (0.030) | 0.010 (0.017) | -0.005 (0.019) | -0.016 (0.053) | -0.015 (0.025) | -0.018 (0.034) | |
| Academy x (E = t-3) | -0.033 (0.020) | -0.029 (0.029) | -0.006 (0.016) | -0.031 (0.019) | -0.066 (0.056) | -0.052 (0.026) | -0.021 (0.033) | |
| Academy x (E = t-2) | -0.016 (0.020) | 0.000 (0.028) | -0.010 (0.015) | -0.021 (0.021) | -0.047 (0.058) | -0.004 (0.024) | -0.049 (0.032) | |
| Academy x (E = t-1) | 0.009 (0.016) | 0.002 (0.026) | -0.007 (0.014) | 0.004 (0.020) | -0.009 (0.054) | 0.029 (0.020) | -0.033 (0.024) | |
| Academy x (E = t) | 0.020 (0.024) | 0.008 (0.033) | 0.017 (0.019) | -0.007 (0.025) | -0.010 (0.062) | 0.067 (0.030) | -0.062 (0.037) | |
| Academy x (E = t+1) | 0.125 (0.041) | 0.088 (0.057) | 0.076 (0.027) | -0.010 (0.033) | 0.156 (0.089) | 0.236 (0.044) | -0.047 (0.056) | |
| Academy x (E = t+2) | 0.203 (0.061) | 0.176 (0.086) | 0.085 (0.031) | 0.040 (0.041) | 0.211 (0.119) | 0.326 (0.059) | -0.014 (0.100) | |
| Academy x (E = t+3) | 0.207 (0.080) | 0.081 (0.126) | 0.124 (0.044) | 0.114 (0.056) | 0.054 (0.151) | 0.395 (0.066) | -0.045 (0.109) | |
| KS2 Standardised Test Score | 0.688 (0.008) | 0.688 (0.008) | 0.714 (0.012) | 0.694 (0.012) | 0.739 (0.009) | 0.215 (0.013) | 0.706 (0.008) | 0.640 (0.014) |
| School Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | |
| Control Variables | No | Yes | Yes | Yes | Yes | Yes | Yes | Yes | |
| Year Dummies | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | |
| R-Squared | 0.143 | 0.491 | 0.492 | 0.342 | 0.356 | 0.540 | 0.290 | 0.460 | 0.535 |
| Sample Size | 273880 | 273880 | 273880 | 280556 | 280556 | 273880 | 273880 | 197772 | 76108 |
| Number of Schools | 206 | 206 | 206 | 206 | 206 | 206 | 206 | 148 | 58 |

Notes: Robust standard errors (clustered at the school level) are reported in parentheses. Control variables included are unchanged from the Table 5 regressions although we now additionally include a separate intercept for pupils for whom KS2 data is unavailable. We also include a cohort level control for average KS2 attainment. As with the previous results cohort controls for each pupil are means for all the pupils in the individual’s year-group and school with the individual themselves excluded.
### Table 6b: Restricting to Treated Pupils in Academies, Key Stage 4, Year 11, 2001/2 to 2008/9

| Pupils in All Schools | Pupils in Community Predecessor School | Pupils in Non-Community Predecessor School |
|-----------------------|----------------------------------------|--------------------------------------------|
| **Key Stage 4 Points Score** | **Key Stage 4 A*-C** | **Key Stage 4 A*-C with English and Maths GCSE** | **Key Stage 4 GCSE Points** | **Key Stage 4 GCSE Equivalents** | **Key Stage 4 Points Score** |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| Academy x Post-Conversion (E = t to t+3) | 0.089 (0.027) | 0.093 (0.028) | | | | | | |
| Academy x (E = t-4) | -0.011 (0.020) | 0.008 (0.029) | 0.008 (0.016) | -0.009 (0.018) | -0.013 (0.052) | -0.017 (0.025) | -0.018 (0.034) | |
| Academy x (E = t-3) | -0.033 (0.020) | -0.030 (0.028) | -0.007 (0.016) | -0.034 (0.020) | -0.064 (0.056) | -0.050 (0.025) | -0.005 (0.034) | |
| Academy x (E = t-2) | -0.017 (0.019) | -0.008 (0.027) | -0.012 (0.015) | -0.022 (0.021) | -0.049 (0.058) | -0.006 (0.023) | -0.052 (0.031) | |
| Academy x (E = t-1) | 0.013 (0.016) | 0.004 (0.025) | -0.006 (0.014) | 0.006 (0.020) | -0.003 (0.054) | 0.034 (0.020) | -0.033 (0.024) | |
| Academy x (E = t) | 0.037 (0.023) | 0.018 (0.033) | 0.025 (0.018) | 0.003 (0.023) | 0.016 (0.062) | 0.086 (0.028) | -0.051 (0.037) | |
| Academy x (E = t+1) | 0.145 (0.040) | 0.101 (0.056) | 0.092 (0.026) | 0.007 (0.032) | 0.180 (0.087) | 0.258 (0.044) | -0.027 (0.053) | |
| Academy x (E = t+2) | 0.203 (0.062) | 0.173 (0.088) | 0.093 (0.032) | 0.042 (0.040) | 0.213 (0.124) | 0.330 (0.061) | -0.003 (0.099) | |
| Academy x (E = t+3) | 0.184 (0.086) | 0.049 (0.134) | 0.132 (0.047) | 0.111 (0.057) | 0.030 (0.160) | 0.378 (0.079) | -0.038 (0.108) | |
| **KS2 Standardised Test Score** | 0.687 (0.007) | 0.687 (0.007) | 0.708 (0.012) | 0.700 (0.012) | 0.737 (0.009) | 0.214 (0.013) | 0.705 (0.008) | 0.639 (0.014) |
| **School Fixed Effects** | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| **Control Variables** | No | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| **Year Dummies** | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| **R-Squared** | 0.146 | 0.494 | 0.452 | 0.342 | 0.357 | 0.542 | 0.292 | 0.463 | 0.537 |
| **Sample Size** | 270733 | 270733 | 270733 | 270733 | 270733 | 270733 | 270733 | 195809 | 74924 |
| **Number of Schools** | 206 | 206 | 206 | 206 | 206 | 206 | 206 | 148 | 58 |

Notes: Robust standard errors (clustered at the school level) are reported in parentheses. Control variables included are unchanged from the Table 5 regressions although we now additionally include a separate intercept for pupils for whom KS2 data is unavailable. We also include a cohort level control for average KS2 attainment. As with the previous results cohort controls for each pupil are means for all the pupils in the individual’s year-group and school with the individual themselves excluded.
Table 7: Fake Policy (t-4) For Pupil Performance, Key Stage 4, Year 11, 1998/9 to 2004/5

|                              | Key Stage 4 Points Score | Key Stage 4 A*-C | |                              | Key Stage 4 Points Score | Key Stage 4 A*-C |
|------------------------------|--------------------------|-------------------|--------------------------|--------------------------|
|                              | (1)                      | (2)               |                          | (3)                      | (4)               |
| Academy x (E = t-8)          | 0.025 (0.020)            | 0.031 (0.027)     | Academy x (E = t-4)      | -0.011 (0.02)          | 0.011 (0.030)     |
| Academy x (E = t-7)          | -0.009 (0.002)           | -0.007 (0.028)    | Academy x (E = t-3)      | -0.036 (0.020)         | -0.033 (0.029)    |
| Academy x (E = t-6)          | -0.027 (0.018)           | -0.023 (0.027)    | Academy x (E = t-2)      | -0.018 (0.020)         | 0.000 (0.029)     |
| Academy x (E = t-5)          | -0.018 (0.017)           | -0.005 (0.026)    | Academy x (E = t-1)      | 0.011 (0.016)          | 0.004 (0.026)     |
| Academy x (E = t-4)          | -0.021 (0.020)           | -0.042 (0.026)    | Academy x (E = t)        | 0.023 (0.024)          | 0.010 (0.034)     |
| Academy x (E = t-3)          | 0.001 (0.027)            | 0.012 (0.040)     | Academy x (E = t+1)      | 0.129 (0.041)          | 0.092 (0.058)     |
| Academy x (E = t-2)          | 0.038 (0.037)            | 0.020 (0.049)     | Academy x (E = t+2)      | 0.205 (0.061)          | 0.182 (0.086)     |
| Academy x (E = t-1)          | 0.066 (0.044)            | 0.024 (0.060)     | Academy x (E = t+3)      | 0.209 (0.080)          | 0.088 (0.126)     |

P-value for test of joint significance 0.210 0.280

KS2 Standardised Test Score 0.688 (0.008) 0.714 (0.012)

School Fixed Effects Yes Yes School Fixed Effects Yes Yes
Control Variables Yes Yes Control Variables Yes Yes
Year Dummies Yes Yes Year Dummies Yes Yes
R-Squared 0.157 0.116 R-Squared 0.492 0.342
Sample Size 250849 254433 Sample Size 263144 269379
Number of Schools 197 197 Number of Schools 197 197

Notes: Robust standard errors (clustered at the school level) are reported in parentheses. Compared to Table 6, control variables for specifications (1) and (2) are more limited for this earlier time period and comprise whether the pupil is male and the school level mean of proportion male for all the pupils in the individual’s year-group and school with the individual themselves excluded.
### Table 8: Ofsted Inspection Ratings Transition Matrices, Inspections in the 2000s

#### Current Academies

| Before Conversion (First Inspection) | Post-Conversion (Second Inspection) |
|--------------------------------------|--------------------------------------|
| Outstanding                          | Good                                 | Satisfactory | Inadequate | Total |
| Outstanding                          | 5                                    | 1            | 0          | 1     | 7     |
| Good                                 | 3                                    | 3            | 2          | 3     | 11    |
| Satisfactory                         | 0                                    | 4            | 10         | 1     | 15    |
| Inadequate                           | 2                                    | 5            | 5          | 1     | 13    |
| Total                                | 10                                   | 13           | 17         | 6     | 46    |

Percent Improvement in Ranking = 41
Percent No Change in Ranking = 41
Percent Reduction in Ranking = 17

#### Future Academies

| “Before Conversion” (First Inspection) | “Post-Conversion” (Second Inspection) |
|----------------------------------------|----------------------------------------|
| Outstanding                            | Good                                   | Satisfactory | Inadequate | Total |
| Outstanding                            | 4                                     | 1            | 0          | 0     | 5     |
| Good                                   | 1                                     | 7            | 17         | 5     | 30    |
| Satisfactory                           | 1                                     | 7            | 26         | 6     | 40    |
| Inadequate                             | 0                                     | 3            | 14         | 2     | 19    |
| Total                                  | 6                                     | 18           | 57         | 13    | 94    |

Percent Improvement in Ranking = 28
Percent No Change in Ranking = 41
Percent Reduction in Ranking = 31

Notes: For schools with two OfSted inspections in the 2000s, 46 in upper panel, 94 in lower panel.
Table 9: Ordered Probit Estimates of Change in Ofsted Ranking, School Level

|                               | Pr[Change in Ofsted Ranking] |
|-------------------------------|-----------------------------|
|                               | (1)                          | (2)                          |
| Current Academies (Treatment Group) | 0.747 (0.232)               | 0.863 (0.251)                |
| Control Variables             | No                           | Yes                          |
| Sample Size (Number of Schools) | 137                          | 137                          |
| Marginal Effects:             |                              |                              |
| Pr[Change = 2|Treatment=1] – Pr[Change=2|Treatment=0] | 0.272 (0.088)               | 0.313 (0.090)                |
| Pr[Change = 1|Treatment=1] – Pr[Change=1|Treatment=0] | -0.054 (0.034)              | -0.071 (0.041)               |
| Pr[Change = 0|Treatment=1] – Pr[Change=0|Treatment=0] | -0.218 (0.063)              | -0.242 (0.065)               |

Notes: The dependent variable is coded as 0 for a reduction in Ofsted rating, 1 for no change and 2 for an improvement. Robust standard errors in parentheses. The control variables included in specification (2) are average KS2 score of incoming pupils, average KS4 score of year 11 pupils, proportion male, proportion white, proportion of pupils eligible for free school meals and the proportion of pupils with special educational needs. Year of inspection dummies are also included.
Table 10: Department of Education Survey of Changes After Academy Conversion, 23 Labour Academies and 148 Sponsored Academies

| Change                                                                 | 23 Labour Academies | 148 Academies Including the 23 Labour Academies | Linked to Improved Outcomes |
|------------------------------------------------------------------------|---------------------|-------------------------------------------------|-----------------------------|
| Changed school leadership                                              | 87                  | 72                                              | 56                          | 73                          |
| Procured services that were previously provided by the LA              | 78                  | 83                                              | 5                           | 17                          |
| Changed the curriculum you offer                                       | 74                  | 61                                              | 26                          | 77                          |
| Changed the performance management system for teachers                 | 74                  | 70                                              | 3                           | 39                          |
| Collaborated with other schools in more formalised partnerships         | 70                  | 68                                              | 8                           | 45                          |
| Introduced savings in back-office functions                            | 70                  | 55                                              | 0                           | 12                          |
| Added non-teaching positions                                           | 70                  | 50                                              | 3                           | 31                          |
| Reconstituted your governing body                                      | 65                  | 76                                              | 0                           | 26                          |
| Changed your pattern of capital expenditure                            | 65                  | 54                                              | 1                           | 19                          |
| Increased the number of pupils on roll                                 | 61                  | 41                                              | 0                           | 12                          |
| Hired teachers without qualified teacher status (QTS)                  | 48                  | 24                                              | 0                           | 14                          |
| Introduced or increased revenue-generating activities                   | 48                  | 34                                              | 0                           | 8                           |
| Changed your admission criteria                                        | 43                  | 20                                              | 0                           | 7                           |
| Increased the length of the school day                                 | 39                  | 18                                              | 0                           | 63                          |
| Changed staff pay structures                                           | 30                  | 24                                              | 0                           | 9                           |
| Sought to attract pupils from a different geographical area            | 13                  | 12                                              | 0                           | 11                          |
| Changed the length of school terms                                     | 9                   | 6                                               | 0                           | 22                          |
| Reduced the number of pupils on roll                                    | 4                   | 3                                               | 0                           | 0                           |

Notes: Taken from Department for Education (2014).
## Table 11a: Estimates of Change in Headteacher Before and After Academy Conversion

|                        | All Schools | Community Predecessor School | Non-Community Predecessor School |
|------------------------|-------------|------------------------------|---------------------------------|
|                        | (1)         | (2)                          | (3)                             | (4)                             | (5)                             |
| Academy x Post-Conversion (E = t to t+3) | 0.353 (0.042) | 0.369 (0.043)               |                                  |                                  |
| Academy x (E = t-4)    | 0.092 (0.055) | 0.024 (0.065)               | 0.255 (0.098)                   |
| Academy x (E = t-3)    | -0.012 (0.043) | -0.023 (0.055)               | -0.015 (0.072)                 |
| Academy x (E = t-2)    | 0.025 (0.049) | 0.026 (0.059)               | 0.042 (0.089)                  |
| Academy x (E = t-1)    | 0.068 (0.050) | 0.094 (0.060)               | 0.019 (0.091)                  |
| Academy x (E = t)      | 0.628 (0.054) | 0.654 (0.065)               | 0.589 (0.095)                  |
| Academy x (E = t+1)    | 0.012 (0.052) | 0.027 (0.064)               | 0.013 (0.095)                  |
| Academy x (E = t+2)    | 0.135 (0.078) | 0.170 (0.102)               | 0.072 (0.130)                  |
| Academy x (E = t+3)    | 0.070 (0.101) | 0.117 (0.138)               | 0.045 (0.148)                  |

**School Fixed Effects** | Yes | Yes | Yes | Yes | Yes
**Control Variables** | No | Yes | Yes | Yes | Yes
**Year Dummies** | Yes | Yes | Yes | Yes | Yes
**R-Squared** | 0.247 | 0.251 | 0.327 | 0.336 | 0.347
**Sample Size** | 1623 | 1623 | 1623 | 1164 | 459
**Number of Schools** | 206 | 206 | 206 | 148 | 58

Notes: Control variable are percentage of year 7 intake male, white-origin, free school meal status and special educational needs status. Also included is the average KS2 score of each schools year 7 intake, average KS4 points score of their year 11 class and year. Clustered standard errors are in parentheses.
## Table 11b: Estimates of Teacher Attrition Before and After Academy Conversion

|                          | All Schools | Community Predecessor School | Non-Community Predecessor School |
|--------------------------|-------------|------------------------------|---------------------------------|
|                          | (1)         | (2)                          | (3)                             |
| Academy x Post-Conversion (E = t to t+3) | -0.001 (0.130) | 0.001 (0.140) |                       |
| Academy x (E = t-4)      | 0.02 (0.02) | 0.002 (0.018) | 0.057 (0.046) |
| Academy x (E = t-3)      | 0.001 (0.014) | -0.002 (0.016) | -0.003 (0.030) |
| Academy x (E = t-2)      | 0.009 (0.012) | -0.001 (0.012) | 0.027 (0.026) |
| Academy x (E = t-1)      | 0.007 (0.015) | 0.005 (0.017) | 0.015 (0.023) |
| Academy x (E = t)        | 0.014 (0.016) | 0.002 (0.018) | 0.011 (0.03) |
| Academy x (E = t+1)      | -0.006 (0.017) | -0.015 (0.018) | 0.036 (0.037) |
| Academy x (E = t+2)      | -0.017 (0.022) | -0.014 (0.028) | -0.017 (0.038) |
| Academy x (E = t+3)      | -0.009 (0.029) | -0.033 (0.037) | 0.047 (0.048) |

School Fixed Effects Yes Yes Yes Yes Yes
Control Variables No Yes Yes Yes Yes
Year Dummies Yes Yes Yes Yes Yes
R-Squared 0.368 0.370 0.372 0.397 0.403
Sample Size 1599 1599 1599 1148 403
Number of Schools 206 206 206 148 58

Notes: Control variable are percentage of year 7 intake male, white-origin, free school meal status and special educational needs status. Also included is the average KS2 score of each schools year 7 intake, average KS4 points score of their year 11 class and year. Clustered standard errors are in parentheses.
Table 12: Probability of Curriculum Change Before and After Academy Conversion

|                                | All Schools | Community Predecessor School | Non-Community Predecessor School |
|--------------------------------|-------------|-----------------------------|---------------------------------|
|                                | (1)         | (2)                         | (3)                             |
| Academy x Post-Conversion (E = t to t+3) | 0.110 (0.049) | 0.102 (0.055)              |                                 |
| Academy x (E = t-4)            | 0.066 (0.066) | 0.069 (0.067)              | 0.078 (0.150)                   |
| Academy x (E = t-3)            | 0.039 (0.080) | 0.045 (0.095)              | 0.055 (0.145)                   |
| Academy x (E = t-2)            | 0.031 (0.074) | 0.076 (0.091)              | -0.017 (0.130)                  |
| Academy x (E = t-1)            | 0.06 (0.069)  | 0.036 (0.083)              | 0.137 (0.131)                   |
| Academy x (E = t)              | 0.123 (0.066) | 0.072 (0.071)              | 0.222 (0.143)                   |
| Academy x (E = t+1)            | 0.194 (0.095) | 0.154 (0.103)              | 0.242 (0.188)                   |
| Academy x (E = t+2)            | 0.049 (0.103) | -0.004 (0.102)             | 0.097 (0.233)                   |
| Academy x (E = t+3)            | -0.008 (0.121)| -0.117 (0.128)             | 0.157 (0.258)                   |

School Fixed Effects: Yes
Control Variables: No
Year Dummies: Yes
R-Squared: 0.783
Sample Size: 1623
Number of Schools: 206

Notes: Dependent variable is the log of new subjects taken in that year. Control variables are as for Table 11. Clustered standard errors in parentheses.