EC3401 – Advanced Project

How does academy status impact educational outcomes for UK secondary schools?

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Abstract

This paper explores factors influencing GCSE pass rates using multi-variate regression models. Analysing data on academy status, curriculum status, sixth form facilities, and socio-demographic factors, we investigates the impact on pass rates. We examine the significance of ethnicity proportions and regional variations. Findings reveal some significant relationships, notably the positive influence of sixth form facilities on pass rates. However, certain variables like ethnicity proportions exhibit large coefficients, prompting further investigation into potential multicollinearity or overfitting issues. While the study sheds light on factors affecting pass rates, it underlines the need for larger datasets and rigorous analysis to draw robust conclusions.

Introduction

Education stands as the cornerstone of society and issues surrounding its efficiency are of paramount importance. The question I will aim to answer is whether or not secondary school academy status (whether or not a school is an academy) impacts educational performance in the UK. With the current climate in the UK, of new legislation and reforms regarding academies, this study comes at a turbulent time surrounding the impact of academy conversion, particularly in terms of student achievement.

What are academies? Academies are schools funded by the government and run via an academy trust. They have more control over their own operations compared to state schools and do not have to follow the national curriculum. Some schools can choose to become academies however, if a school funded by the local authority has an 'inadequate' Ofsted rating, it is required to convert into an academy (Department for Education, 2011).

This study utilizes establishment and regional data from government databases to evaluate the influence of academy status on educational outcomes (GOV.UK, 2019). The dataset includes information on individual secondary schools, such as GCSE pass rates, percentage of free school meals, gender specificity, and curriculum type. Ofsted ratings are also considered, albeit not as the primary measure of educational outcomes, as the focus is on pupil achievement.

Our question revolves around whether academy status affects educational performance, with the dependent variable being GCSE pass rates (grades 9-4) and the independent variable being academy status. To address this question, a multivariate regression analysis will be conducted, controlling for various determinants of performance. While it may not be feasible to include all determinants in the model, incorporating numerous factors will enhance accuracy. Our hypothesis is that educational outcomes (measured via GCSE 9-4 pass rates), will be affected by academy status.

Why is this study important? We may be able to gain a more complete understanding of education equity, referring to the notion of ensuring that all students have access to high-quality education and opportunities for success, irrespective of background. The OECD state that "children from disadvantaged households are much more likely to experience poor early learning than others, placing them at greater risk of enduring negative impacts on academic attainment" (OECD, 2023). This "early learning" is usually at the primary school level, despite our study being focused at the secondary school level, the findings may allow us to explore methods to combat education inequity further down the line. Secondly, the potential policy implications could be drastic. Policymakers rely on evidence-based research to implement reforms. Therefore, understanding the impact of school type on educational outcomes may help policymakers design policies that promote positive outcomes for students, whether through regulating school governance, funding mechanisms, or curriculum development. Additionally, the study could promote accountability and transparency within the education system. Stakeholders, including school leaders, policymakers, and the public, can use results from the study to potentially hold schools accountable for their performance and ensure that resources are effectively utilized to support student success.

We aim to add to the existing literature by providing an investigation into the effectiveness of UK academies whilst incorporating contextual factors such as curriculum type, in order to gain a clearer view of the impact of academies on educational outcomes.

Literature Review

First we will explore the literature surrounding gender and ethnicity differences. Sammons (1995), explores patterns of gender and ethnic differences in educational attainment in inner London. The study uses data from the School Matters cohort, examining junior and secondary school performance. Sammons employs regression analysis to explore the relationship between attainment and the factors mentioned prior. The findings suggest that gender and ethnic differences impact attainment. Ethnic minority groups achieved lower results in their junior education, but these differences diminished during secondary education. Gender differences also have an impact; girls consistently outperformed boys in traditional tests of reading and mathematics. Focusing on specifically on the impacts of gender, it may be useful to consider how these effects may be linked with gender specific schools.

Smyth (2010) provides an analysis of the literature on the impact of gender specific schooling. She refers to Steedman's (1983) paper where she used statistical controls for prior student ability and family social background; finding that "little in their examination results is explained by whether schools are mixed or single-sex once allowance is made for differences in intake". However, Smyth also details conflicting reports on the effect of gender specific schooling, especially when taking into consideration the age of Steedman's paper. She puts forward evidence from Spielhofer et al.'s (2004) investigation into the effects of gender specific schooling in England. They found that average achievement levels for males does not differ between single-sex and coeducational settings, but some performance gains are present for lower-achieving boys in single-sex schools. For females, an advantage is found for those attending single-sex schools across a range of achievement outcomes with the greatest advantages found in science and for the lowest prior attainment groups. Furthermore, Smyth presents findings from Malacova (2007). Malcova employed multilevel regression modelling on pupils from 2002 Key Stage 3 to 2004 GCSE to study the impact of single-sex schooling on educational progression. The findings suggest more selective single-sex schools had a performance advantage but, within non-selective schools, only lower ability boys and girls achieved higher grades in a single-sex setting. The literature proves to be complex, with no blanket answer for the impact of gender specific schools. Hence, we will still include it as a regressor.

Use and type of curriculum, may also impact educational outcomes. State schools use the national curriculum, however academies can create and use their own curricula. Looking at the literature we find that curricula play an important role in education. Stein and Kaufman (2010), investigate what curricula work best under what kinds of conditions. They focus on how teacher capacity (their level of education, experience, and knowledge) and their use of curriculum influence instruction. Their sample is comprised of 48 teachers implementing two mathematics curricula, "Everyday Mathematics" and "Investigations", in two school districts. Their qualifiers for a of high quality lesson was whether the lesson needed high levels of cognitive demand, if the teachers' pay attention to student thinking and finally if the lesson engaged students in high levels of mathematical reasoning. Their findings, suggest that the implementation of "Investigations" is better than "Everyday Mathematics". They also find that implementation measures were significantly correlated with the teachers preparation of the lesson, agreeing with Megan Westwood Taylor (2016) who suggests that the use of curriculum plays a big role in teaching effectiveness. If the teacher is familiar with the curriculum then there is potential for better use of curriculum in terms of teaching outcomes. Looking at the UK context, Stobart (2001) reviewed the validity of the national curriculum in 2001; concluding that the validity of the National Curriculum hinges on the balance between teacher assessment and testing practises. Suggesting that the emphasis on test results rather than teacher assessment has put the system's effectiveness in question. Thus implying that schools that do not have to use the national curriculum could be at an

advantage. We should note, however, that the latest national curriculum in the UK was implemented in 2014, hence Stobart's claims may be outdated.

There are differing views on academy effectiveness in the UK context. Cole, Barlow-Meade and Littlefair (2013) conducted an investigation into whether English academies were meeting government objectives between 2002 to 2010. They comment on the controversies of the UK academy programme, mainly due to the notion of private ownership. They find that academies cannot inherently increase achievement in line with government expectations and when an increase in shown, it was usually by schools that were already doing well prior to academy conversion. They provide alternative evidence that contradicts this; with the academies appearing to reach government targets, the data can be interpreted as flawed due to government involvement in the data, potentially leading to vested interests. They also find that academy converter schools often had increasing intakes of poorer performing students as well as a decreasing free school meals intake, potentially explaining poorer grades.

The National Education Union presents a case against academies. They suggest that joining a multi-academy trust (MAT) does not increase educational attainment, referencing a report by UCL (2018), where researchers found no positive impact of MATs on attainment. In fact, findings suggest those in larger capacity MATs did worse, especially in secondary schooling. They also reference Martindale (2019), who investigated whether the academies programme increased the number of students taught by teachers who were deemed unqualified; finding that the percentage of teachers without qualification is rising in academies when comparing to non-academy schools. He also finds that the programme is increasing class-based inequality in students access to qualified teaching. Haves (2023) provides a balanced perspective on MATs, detailing advantages like enhanced training opportunities and financial support, juxtaposed with drawbacks such as reduced decision-making ability and financial constraints. This nuanced exploration underlines the complexities of the academy system and the need for comprehensive research to inform policy and practice.

Overall it is clear that the literature surrounding academies, presents both positive and negative views of academisation. Hence the need for further research and investigation, as is being done in this study.

Data

The data I will be using would be a combination of data from different sources. The main dataset comes from the Department of Education "Get Information about Schools" (GIAS) service.

The data taken from this dataset is only including schools listed as "secondary", this results in pupil referral units being excluded. The data is then supplemented with Nomis data from the 2021 UK census, in order to obtain data regarding the local authorities that each school belong to as well as region specific data. This is useful if we want to consider the impact of variables such as ethnic make-up of a region on the GCSE 9-4 pass rates. We have also omitted special schools and closed schools, in order to only focus on the main secondary schooling system and to not conflate results.

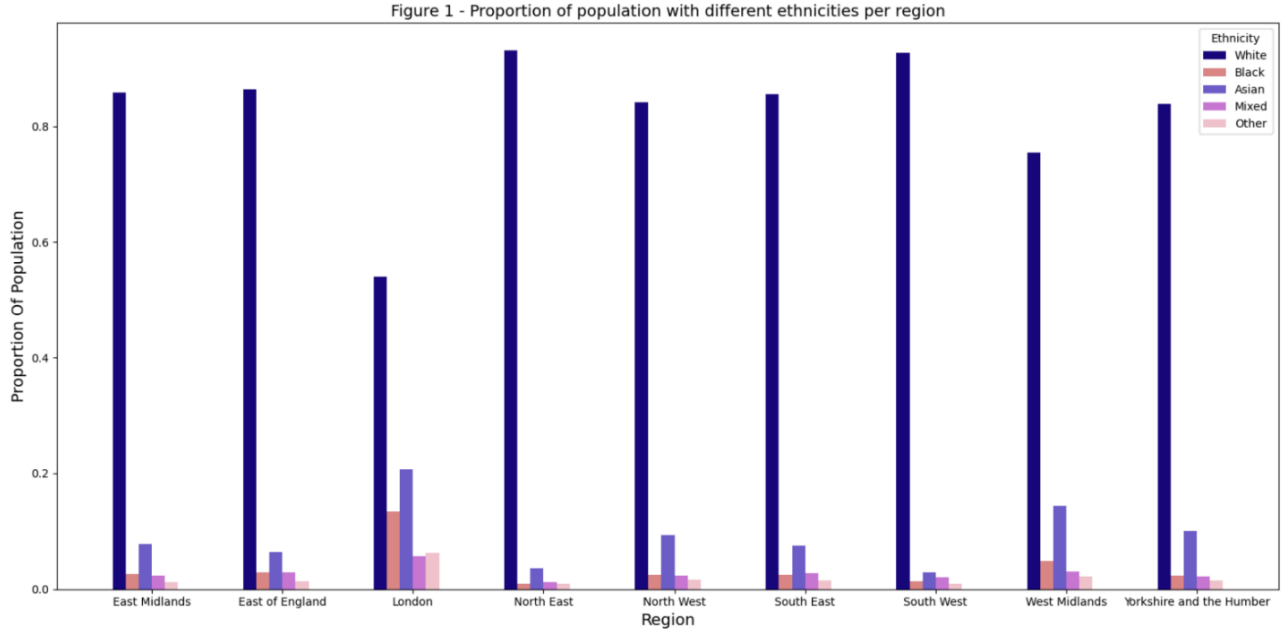
The dataset contains various different school types: voluntary aided schools, community schools, foundation schools, voluntary controlled schools, academy sponsor led schools,

academy converter schools, studio schools, free schools and university technical colleges. We have created a binary variable (AC) which takes the value of 1 if the school is an academy (either a converter academy or an academy sponsor led school), and 0 if otherwise. Binary variables for whether or not each school has to follow the national curriculum (NC), if they are mixed gender schools (Mixed) or not and if they have sixth form facilities or not (S) are also included. If the school has to follow the national curriculum then the binary variable will be 1 and 0 otherwise, if the school is a mixed gender school the respective binary variable will be 1 and 0 otherwise and if the school has sixth form facilities the variable will be 1 and 0 otherwise. We also incorporate the use of Ofsted rating in order to see trends regarding access to high quality schooling. The variable for Ofsted rating is formulated by numbering each rating 1 through 4; 4 being the best "Outstanding" and 1 being the worst "Special Measures".

We include region specific variables such as proportions of the population who are of different ethnicities and region specific dummy variables. The region dummy variables are done by creating a variable for each of the 9 regions in England (London, North East, North West, East of England, East Midlands, West Midlands, Yorkshire and the Humber, South East and South West), returning 1 if the school is in the respective region and 0 if otherwise. The variables are written as follows: 'GOR_London', 'GOR_North_East', etc.

The ethnicity variables are as follows: 'Proportion_White' (showing the proportion of Irish, British, Gypsy Traveller, Romanian, other White ethnicities in the region), 'Proportion_Black' (showing the proportion of Caribbean, African and other Black ethnicities in the region), 'Proportion_Asian' (showing the proportion of Bangladesh, Chinese, Indian, Pakistani and other Asian ethnicities in the region), 'Proportion_Mixed' (showing the proportion of White/Asian, White/Caribbean, White/African and other mixed ethnicities in the region) and 'Proportion_Other' (showing the proportion of any other ethnicities in the region). We will be using 'Proportion_White' as the reference proportion whilst running regressions as it is the largest proportion for all regions in our dataset, shown in figure 1 below:

Figure 1 - Proportion of population with different ethnicities per region



For all 9 regions, the proportion of the population who identify as ethnically white is far larger than any other ethnicity. The region where the effect is the least prevalent is London, where although white is still a vast majority, other ethnicities are relatively high.

The final cleaned dataset is of 3072 schools across England. Some descriptive statistics from the dataset are presented in Table 1:

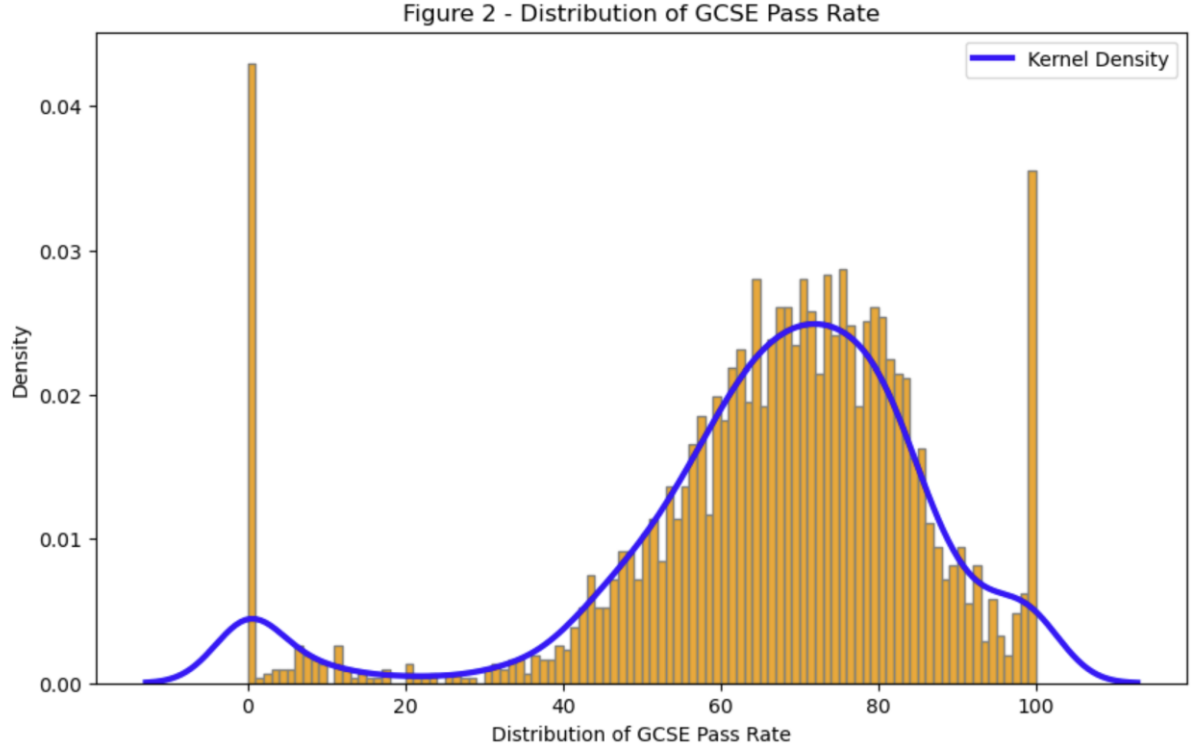
Table 1 - Summary Statistics

	GCSE Pass Rate	NC	AC	Mixed	Percentage of students on free school meals	S	Ofsted
Mean	65.810	0.187	0.707	0.872	24.843	0.618	2.964
Standard Deviation	21.459	0.390	0.455	0.334	14.927	0.486	0.629
Minimum	0	0	0	0	0	0	1
Median	69	0	1	1	22.800	1	3
Maximum	100	1	1	1	88.700	1	4

Note: All values are to 3 decimal places

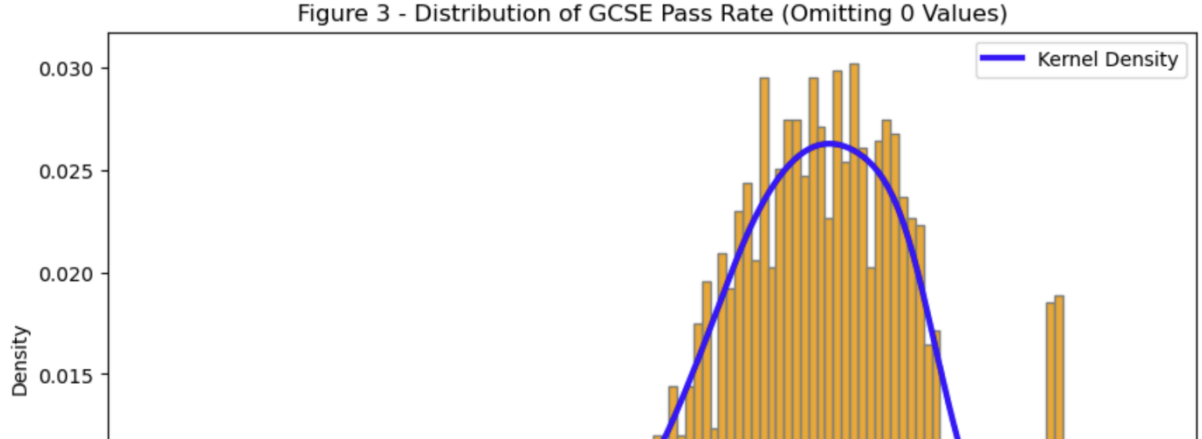
Looking at 'GCSE Pass Rate' we see a mean of 65.81 with a median of 69, suggesting that there is skew to the left. This can be further illustrated by looking at the kernel density graph shown in Figure 2:

Figure 2 - Distribution of GCSE Pass Rate



We see a left skew and an increased bump in the kernel density at 0, suggesting that there are either outliers in the data or that 0 values may represent absence of data. We can see how the distribution of GCSE pass rate changes by omitting all the 0 values for pass rate and recreating the same distribution graph. This is shown in figure 3:

Figure 3 - Distribution of GCSE Pass Rate (Omitting 0 Values)



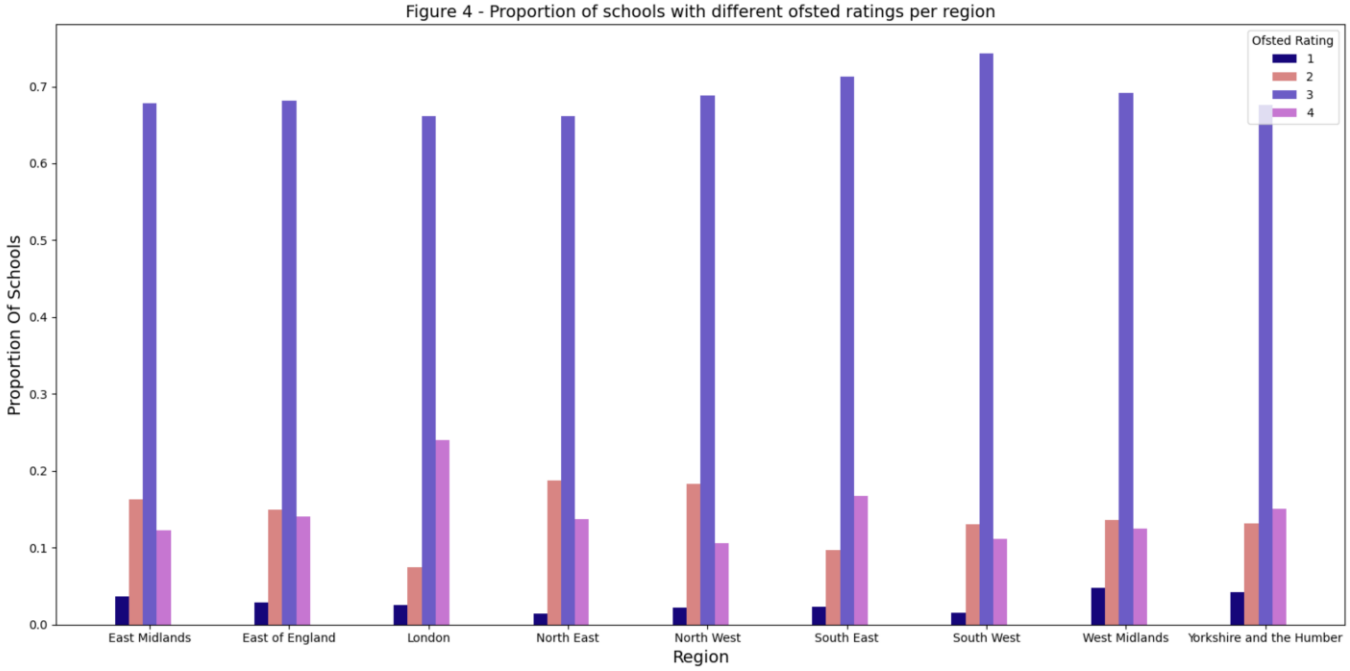
We can see that the left skew still remains, however the peak is steeper around the 70% pass rate. This is expected as we have omitted 0 values, hence the likelihood of other outcomes would have increased. Thus, explaining the increased peak around the 100% pass rate.

Continuing with Table 1, the ‘Percentage of students on free school meals’ column, we observe that the mean and median are not too far apart, suggesting a relatively symmetrical distribution. Moreover, if we now look at the ‘Ofsted’ variable, we see a similar pattern, with the distribution seeming to be symmetric.

Looking at the binary variables; ‘AC’, ‘NC’ , ‘Mixed’ and ‘S’. Looking at the mean for ‘NC’ we see that it is low at 0.187, suggesting that the majority of the schools in our sample do not have to follow the national curriculum. The mean value for ‘AC’ is 0.707, suggesting that the majority of schools in our sample are academies, thus partially explaining the mean for ‘NC’. For ‘Mixed’ the mean is 0.872, showing that the majority of schools are of mixed gender. Finally, looking at ‘S’ the mean value is 0.618 showing that the majority of schools have sixth form facilities.

We can also explore the relationship between Ofsted rating and region, which would be able to inform us on access to better schools. This is seen in figure 4 below:

Figure 4 - Proportion of schools with different ofsted ratings per region

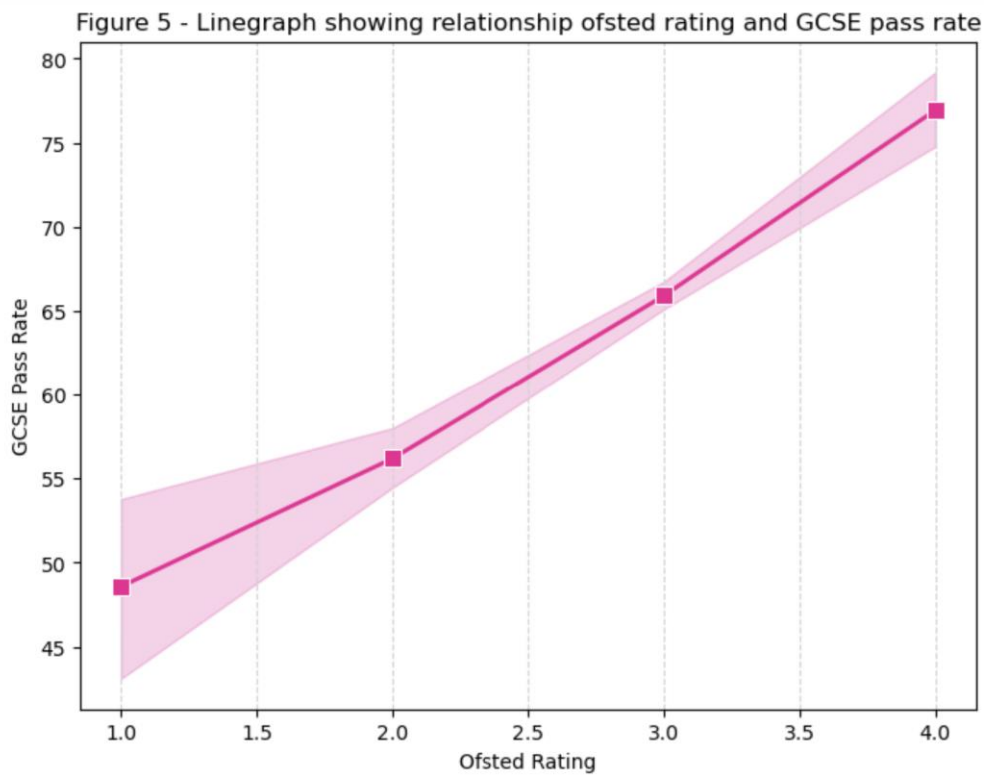


For all regions, the most common Ofsted rating is 3 (‘Good’). The next most common is 2 (‘Requires Improvement’), the regions where this is not the case are London, Yorkshire and the Humber and the South East. In these regions the second most common rating is 4 (‘Outstanding’). This suggests that these areas, may have better access to higher quality schooling. It is worth noting that for 3 out of 6 of the regions where ‘Requires Improvement’ schools are the second most common, they are closely followed by ‘Outstanding’ schools.

Overall, the fact that ‘Good’ schools are the most prevalent in every region within our sample, suggests that access to high quality schooling is fairly uniform, albeit with deviations in certain regions. The largest deviations are seen in the London region where ‘Outstanding’ schools are far more prevalent as the second most common Ofsted rating than any other region.

Furthermore, it will be useful to consider the relationship between GCSE pass rate and Ofsted rating. This is shown in the line-graph presented in figure 5:

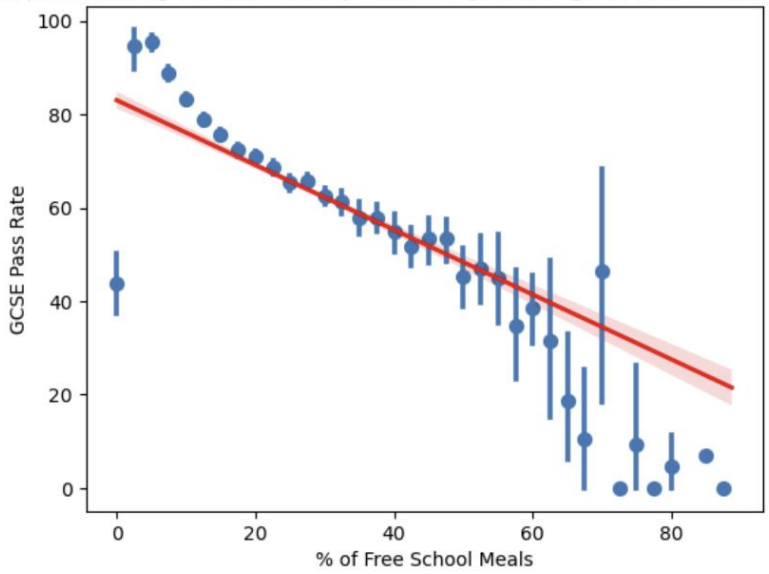
Figure 5 - Linegraph showing relationship ofsted rating and GCSE pass rate



There is a positive correlation between Ofsted rating and GCSE pass rate, with variation decreasing with Ofsted rating. This is in line with the idea that Ofsted rating is supposed to be a measure of school quality, and the quality of schooling is supposed to be correlated with pass rates.

We can also consider the relationship between pass rate and the percentage of students who are on free school meals. This is shown in figure 6:

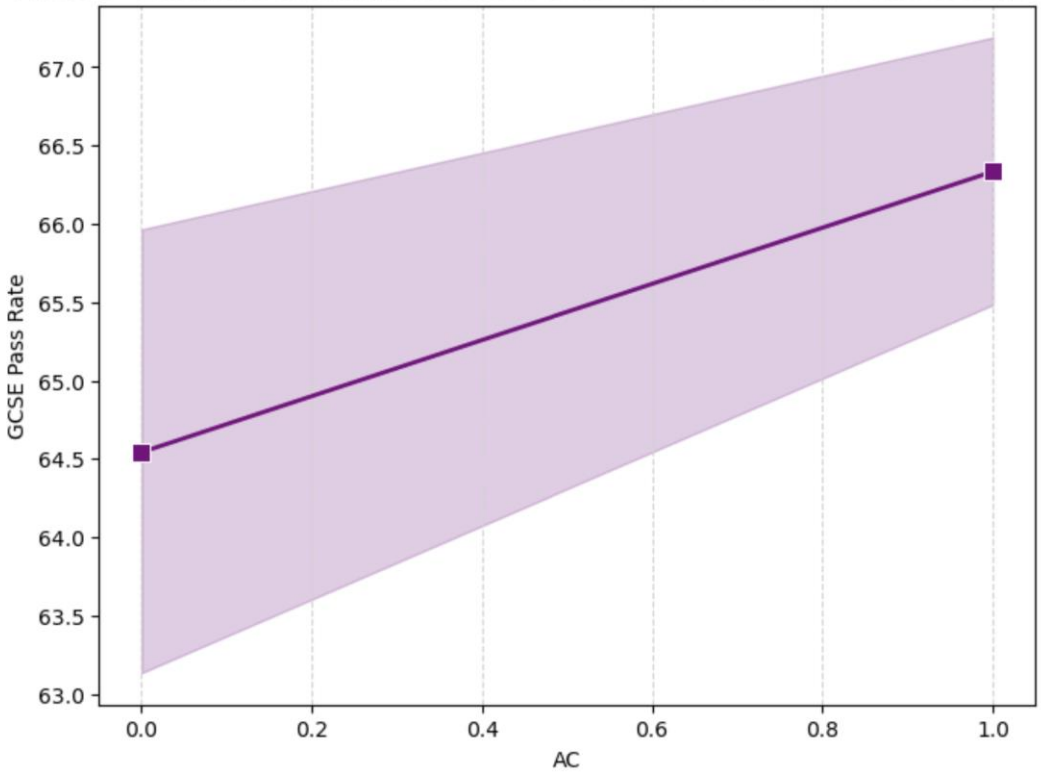
Figure 6 - Regression plot showing the relationship between percentage of free school meals and GCSE pass rate



Studying figure 6, we can see that as the percentage of students on free school meals increases the GCSE pass rate decreases. We see that at the 70% pass rate level, there is large variation, suggesting that at some percentages of students on free school meals, the relationship between pass rate is weaker.

Moving our attention to AC (whether or not the school is an academy or not), we can investigate the perceived relationship between GCSE pass rate via figure 7. It should be noted however, that correlation does not directly imply causation and the statistical analysis later in the paper will provide more concreteness.

Figure 7 - Linegraph showing relationship between academy status and GCSE pass rate



Looking at figure 7, we can see a positive correlation between academy status and pass rate. However, as seen in our literature review, there is a case to be put forward that academies do not actually increase performance. This supposed correlation could be due to other factors at play, hence, statistical analysis is key.

Hypothesis and Methodology

The hypothesis that we are testing is whether or not academy status of a school would impact the educational outcomes (measured by the GCSE 9-4 pass rate).

We will be employing a multivariate OLS regression method to try and isolate the impact of academies on educational attainment. The model specifications we will be using are shown below:

Model 1

$$Y_s = \alpha + \beta_1 AC_s + \beta_2 NC_s + \beta_3 Percentage\ of\ students\ on\ free\ school\ meals_s + \beta_4 Mixed_s + \beta_5 Ofsted_s + \beta_6 S_s + \varepsilon$$

With Y_s being the GCSE 9-4 pass rate for each school, AC_s being a binary variable illustrating if each school is an academy, NC_s being a binary variable showing if the school is required to follow the national curriculum, $Percentage\ of\ students\ on\ free\ school\ meals_s$ being the percentage of students on free school meals for each school, $Mixed_s$ being a binary variable showing if the school is a mixed gender school for each school, $Ofsted_s$ being a variable showing the school's most recent Ofsted rating in numerical form and S_s being another binary variable showing whether school has sixth form facilities for each school. Note that ε represents the error term and α represents the intercept.

Model 2

$$Y_s = \alpha + \beta_1 AC_s + \beta_2 NC_s + \beta_3 Percentage\ of\ students\ on\ free\ school\ meals_s + \beta_4 Mixed_s + \beta_5 S_s + \varepsilon$$

The difference with this specification is the removal of the Ofsted variable. This is done as the Ofsted variable can be argued to be a measure of school quality that is directly related to GCSE pass rate (our dependant variable).

Model 3

$$Y_s = \alpha + \beta_1 AC_s + \beta_2 NC_s + \beta_3 Percentage\ of\ students\ on\ free\ school\ meals_s + \beta_4 Mixed_s + \beta_5 S_s + \beta_6 Proportion\_Asian_s + \beta_7 Proportion\_Black_s + \beta_8 Proportion\_Mixed_s + \beta_9 Proportion\_Other_s + \varepsilon$$

In this specification we include the proportions of the population that are of different ethnicities for the region that the school is in. We also exclude the Ofsted variable again in order to not conflate the interpretation of results. Note that the proportion of the population who identify as ethnically white, is used as the reference proportion.

Model 4

$$Y_s = \alpha + \beta_1 AC_s + \beta_2 NC_s + \beta_3 Percentage\ of\ students\ on\ free\ school\ meals_s + \beta_4 Mixed_s + \beta_5 S_s + \beta_6 GOR\_London_s + \beta_7 GOR\_North\_East + \beta_8 GOR\_Yorkshire\_Humber_s + \beta_9 GOR\_South\_East_s + \beta_{10} GOR\_South\_West_s + \beta_{11} GOR\_East\_Midlands_s + \beta_{12} West\_Midlands_s + \beta_{13} GOR\_East\_of\_England_s + \varepsilon$$

This specification includes the dummy variables for each region within our dataset. This is done in order to control for anything that is region specific with the estimated effect of AC status being from variation in AC status within region as opposed to across the entire nation. Again we exclude the Ofsted variable.

Results and Analysis

In this section we will conduct analysis of the results from our empirical models. The following tables will illustrate the regression results for our models, note that for all our models the standard errors are hetereoskedasticy robust.

Table 2- Regression results for Model 1

Regressors	Coefficients	Standard Error	Z-Score
Constant	55.38	3.221	17.194
Mixed	-8.6886	1.132	-7.677
AC (Academy status)	18.0734	1.933	9.352
NC (Curriculum status)	20.5564	1.975	10.410
Percentage of students on free school meals	-0.6810	0.032	-21.472
S (Sixth form status)	1.6868	0.669	2.520
Ofsted	5.8265	0.648	8.986
R^2 = 0.364			

*Note: Coefficients with * are significant at the 95% significance level*

Looking at the results for model 1, we see that there are no significant results. This does not necessarily mean that we cannot gain some insight, we can look at direction of movement. Looking at 'Mixed', we can see that the coefficient is negative, suggesting that schools that are of mixed gender are correlated with lower GCSE pass rates. Although, results are insignificant, a potential reason for this could be due to the fact that a number of selective schools may only be one gender schools (the idea being that selective schools, often select the best students, and thus should have better grades). The coefficients for 'AC', 'NC' and 'S' are all positive. Suggesting that a school being an academy, having to adhere to the national curriculum and having sixth form facilities could all possibly lead to higher GCSE pass rates, holding the other regressors constant. The coefficient for the 'percentage of students on free school meals' is negative, potentially indicating that an increase in the percentage of students on free school meals will result in decreased pass rates, holding the other regressors constant. Finally, we have 'Ofsted', whose coefficient is positive, suggesting that an increase within the Ofsted rating will potentially lead to better pass rates, holding other regressors constant. It is to be noted that these ideas on direction can only be speculative at this stage due to the absence of significance. Looking at the R^2 of 0.364, we can see that the model explains 36.4% of the variation in pass rate. Additionally, by observing the standard errors, we can see that generally, they are quite low, suggesting relatively precise estimates. We shall compare standard errors for each model specification.

Table 3 - Regression results for model 2

Regressors	Coefficients	Standard Error	Z-Score
Constant	72.6531	2.322	31.284
Mixed	-9.7247	1.154	-8.429
AC (Academy status)	19.4699	2.005	9.710
NC (Curriculum status)	22.1681	2.042	10.854
Percentage of students on free school meals	-0.7168	0.030	-23.591
S (Sixth form status)	2.4958	0.696	3.587
R^2 = 0.336			

*Note: Coefficients with * are significant at the 95% significance level*

In this model we omit the 'Ofsted' variable due to the fact that it can be argued to be directly linked with pass rate. Again the results are insignificant, at the 95% confidence level. The direction of movement for all the variables are the same, however the coefficients have changed (albeit not by a sizeable amount) this is to be expected as we have taken out a regressor. The R^2 for this model is also lower at 0.336, this is partly due to this model having one less regressor present. In terms of standard errors they are only slightly changed.

Table 4 -Regression results for model 3

Regressors	Coefficients	Standard Error	Z-Score
Constant	66.4512	2.481	26.782
Mixed	-7.2518	1.205	-6.016
AC (Academy status)	22.7459	1.994	11.405
NC (Curriculum status)	24.1750	2.036	11.873
Percentage of students on free school meals	-0.7900	0.031	-25.211
S (Sixth form status)	**1.2304***	0.706	1.742
Proportion_Asian	15.8326	4.205	3.765
Proportion_Black	**19.8748***	13.490	1.473
Proportion_Mixed	**-13.7122***	46.395	-0.296
Proportion_Other	79.3949	27.911	2.845
R^2 = 0.364			

*Note: Coefficients with * are significant at the 95% significance level. We use the proportion of the population who ethnically class themselves as white as a reference proportion.*

After adding in the different ethnicity proportions for the regions that the schools are in, we begin to see significant results. The coefficient for 'S', is 1.2304 and is significant at the 95% significance level, this suggests that if a school has sixth form facilities, then pass rate increases by 1.2304 percentage points, holding all other regressors constant. The coefficient for the proportion of the region (that the school is in) who are classed as ethnically black is 19.8748, suggesting that a unit increase in the proportion of ethnically black people in the region will lead to an increase of 19.87 percentage points in pass rate holding all other regressors constant. Looking at that result and the others for the ethnic proportions, they seem out of place. This may be due to the issue of multicollinearity or overfitting. Despite the significance of the result, the value of the coefficient seems too large. Another explanation, could be issues with the sample. This could be rectified by using a larger sample both in terms of the number of schools as well as the years included in the dataset (i.e. not just using the last available year). The same logic can be applied to the coefficient for the proportion of the region (that the school is in) who are classed as ethnically mixed race. The

coefficient of -13.7122 is useful in telling us the direction of movement, but the size of the coefficient despite of its significance seems be to too large to be deemed useful. Regarding direction of movement, we may be able to infer that an increase in the proportion of ethnically mixed people in the region may lead to a decrease in pass rates, holding all other regressors constant. Looking at the R^2 value of 0.364, we find that the model has a better fit than of model 2 but the same as model 1. If we compare standard errors, we find that for the regressors that were in the previous model, the differences are small. However, for the new ethnicity variables the standard errors are quite large, in particular for Proportion_Black (13.490), Proportion_Mixed (46.395) and Proportion_Other (27.911). Thus implying that there is large random variation in the data, hence suggesting that the coefficients are less accurate. Which, when looking at the coefficients in context, seem to hold true.

Moving our attention to our main variable (AC), we still find that the coefficient is insignificant at the 95% confidence level. However, the direction of movement is still positive, suggesting that if a school has academy status it may lead to higher pass rates, holding all other regressors constant. Moreover, we can look at the relative size of the coefficient, despite its insignificance. The fact that AC's coefficient is relatively large (with the exceptions of the ethnic proportion variables) suggests that it may play a larger role in explaining the variation in pass rates. However, as stated prior, due to the insignificance of the coefficient (coupled with the high z-score of 11.405), we cannot conclude anything concretely regarding AC, only speculatively. A similar thought process can be taken with NC.

Table 5 - Regression results for model 4

Regressors	**Coefficients**	**Standard Error**	**Z-Score**
Constant	70.9026	2.562	27.671
Mixed	-7.9397	1.205	-6.591
AC (Academy status)	21.3529	2.004	10.657
NC (Curriculum status)	23.1419	2.054	11.267
Percentage of students on free school meals	-0.7790	0.032	-24.648
S (Sixth form status)	1.8395	0.708	2.597
GOR_London	6.7703	1.376	4.920
GOR_North_East	3.9831	1.520	2.620
GOR_Yorkshire_Humber	3.3039	1.201	2.752
GOR_South_East	-2.3863	1.204	-1.982
GOR_South_West	-2.7974	1.258	-2.224
GOR_East_Midlands	**-0.7959***	1.292	-0.616
GOR_West_Midlands	**0.8015***	1.345	0.596
GOR_East_of_England	-3.4035	1.317	-2.585
R^2 = 0.360			

*Note: Coefficients with * are significant at the 95% significance level. We use the North West as the reference region.*

Coming onto table 5, we are now looking at the results for the regression of the model that is the same as model 2 but with the inclusion of region specific variables. The reason for adding these variables is to make sure that the region variables will control for any variations that are region specific, meaning that the estimated effect of AC will only come from variation that occurs within the region not nationwide. In terms of significant results we have two in this model. Both are region dummies. The first being the region dummy for the East Midlands, with a coefficient of -0.7959, suggesting that if the school is situated in the East

Midlands then pass rates will decrease by 0.7959 percentage points, holding other regressors constant. The second significant result shown in this model is the region dummy for the West Midlands, with a coefficient of 0.8015, suggesting that if the school was situated in the West Midlands, then pass rates will increase by 0.8015 percentage points, holding other regressors constant. Looking at the AC variable in this model, we see the same pattern talked about in model 3, where the large coefficient and direction of travel allow us to speculate that the if a school is an academy it will have a potentially large positive impact on pass rates (relative to the other regressors), however the insignificance of the coefficient means that we cannot state this with any concreteness. All the region variables have low standard errors. Suggesting that the data points do not deviate too far from their respective regression lines. Regarding the other region variables, the direction of travel can still be analysed in order to gain some potential insight into the data. The region variables for London, the North West, Yorkshire and the Humber are all positive, suggesting that if the school is situated in these areas pass rates could increase, holding all other regressors constant. The variables for the South East, South West and East of England are all negative. Potentially suggesting that if the school is situated in these areas, then pass rates may decrease (holding all other regressors constant). Finally, we will comment on the R^2 value of 0.360. This suggests that 36% of the variation in pass rate is explained by the model, which is less than model 4 but more than model 2.

Conclusion

This dissertation has delved into the multifaceted dynamics influencing school pass rates, employing regression analysis across various models. The findings underline the significance of certain factors, notably the positive association between the presence of sixth form facilities and pass rates.

While ethnicity proportions and regional variations show some significant relationships, caution is warranted due to potential issues of multicollinearity and overfitting. Efforts to mitigate issues of multicollinearity and ensure robust data collection should be prioritized to enhance the reliability of future analyses.

Looking at academy status, we found insignificant regression results, however the direction of travel indicated that a school being an academy may lead to better pass rates. This is by no means concrete evidence, however it gives a platform for more research potentially using larger datasets.

Moving forward, policymakers should consider the implications of these potential findings. The link between pass rates and sixth form facilities could be studied to investigate causality (as the link may be due to a proxy effect). The disproportionate impact of ethnicity proportions may underline the need for targeted interventions aimed at addressing systemic inequalities within education systems.

Potential improvements to the study include the addition of qualitative methods such as interviews with teachers of academies and case study research, in order to gain a more comprehensive understanding of the impact of academies. This may be key, due to the quality of teaching, organisation and curriculum being hard to measure.

Overall, this study provides valuable insights into the complex interplay of factors shaping educational outcomes and offers a foundation for evidence-based policy interventions aimed at fostering equitable and inclusive education systems.

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