THE CAREERS & ENTERPRISE COMPANY

Technical note: Further analysis on post-16 destinations for the 2016/17 to 2018/19 cohorts

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About this report:

This technical note presents quantitative analysis relating the level of Gatsby Benchmark achievement reported by English schools from 2016/17 to 2018/19 to the education, employment, or training destinations sustained by their Year 11 leavers. It provides an addendum to the June 2021 report by The Careers & Enterprise Company on the first two of these three annual cohorts and presents alternative analytical methodologies.

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Summary

In June 2021, The Careers & Enterprise Company published a report finding that schools who reported higher Gatsby Benchmark achievement in 2017/18 typically had more positive sustained destinations post-16.[1] New destinations data are typically released annually by England's Department for Education, providing an opportunity in 2022 to update the analysis with a technical addendum to the original report. With stakeholder interest in the research, we have also taken the opportunity to explore more detailed analytical methodologies. We sought particularly to reduce the uncertainty in the previous estimates by analysing data from all three historical Year 11 cohorts for which both Gatsby Benchmark and destinations data are available (2016/17, 2017/18, and 2018/19).

The analysis over three years broadly replicates the patterns identified for the 2017/18 cohort in the June 2021 report. The statistically significant relationship with destinations remains in place, having adjusted for factors like school intake, school structure and academic achievement. The relationship is the equivalent of 6.7%pts not sustaining confirmed Education, Employment or Training routes post-16 (non-EET) for full (all 8) benchmark achievement compared to 7.3%pts for zero benchmark achievement; an 8% improvement. This is a more robust analysis, investigating three cohorts of data rather than one cohort in the June 2021 report. The confidence interval from the June 2021 analysis encompasses this estimate, but it is now estimated with greater precision (e.g. statistically significant at the 1% level now, rather than 5% when using a single cohort of data).

On average, each additional benchmark fully achieved is associated with a 1.1% decline in non-EET rates. The improvement in confirmed EET status is primarily driven by increases in school sixth form and apprenticeship pathways, with more tentative increases in sixth form college pathways, alongside fewer students going into further education, unknown destinations and confirmed NEET destinations. For instance, full benchmark achievement is associated with a 17% increase in apprenticeship uptake post-16 (p-value 0.00). As before, all relationships are approximately twice as strong in the quarter of schools with the most economically disadvantaged intake.

We see four main areas of limitation in the present analysis, each with areas of possible further investigation in the future: assumptions on causality; alternative model specifications; improved model precision and analysis of multi-year effects. Comments are invited as The Careers & Enterprise Company develops research priorities for future years, recognising that post-16 destinations are only one of several ways in which careers provision hopes to improve outcomes.

This note also provides an opportunity to reflect on the role of careers provision in the broader context of NEET policy, in light of recent research highlighting that it would take 150 years of progress at the current rate to eradicate NEET rates[2]. The analysis in this note suggests that careers provision plays a positive role and has the potential to further reduce NEET rates relative to current levels. However, careers provision remains a very small component of students' educational journeys, whether relative to resource invested by the government or time throughout the school year. The level of impact estimated in this analysis suggests a net positive fiscal return to the Exchequer from careers education, even before considering other benefits beyond NEET reduction[3]. Despite this positive contribution, achieving ambitious reductions in NEET outcomes is likely to require other important reforms to support young people in addition to careers provision improvement.

1 Percy, C. & Tanner, E. (2021). The benefits of Gatsby Benchmark achievement for post-16 destinations. London: The Careers & Enterprise Company.

2 Richmond, T., & Regan, E. (2022). Finding a NEET solution: How to prevent young people from falling out of our education system. EDSK. https://www.edsk.org/publications/finding-a-neet-solution/

3 Percy, C. (2020). Personal Guidance in English Secondary Education: An initial Return-on-Investment estimate. London: The Careers & Enterprise Company.

1. Introduction

In June 2021, The Careers & Enterprise Company published a report finding that schools who reported higher Gatsby Benchmark achievement in 2017/18 typically had more positive sustained destinations post-16.[4] New destinations data are typically released annually by England's Department for Education, providing an opportunity in 2022 to update the analysis with a technical addendum to the original report. With stakeholder interest in the relationship, we have also taken the opportunity to invest more resource in the research and explore more detailed analytical methodologies. Please refer to the 2021 report for more details on the policy context for the research.

The aims of this research were:

- to test whether the statistical relationship between non-EET outcomes and Gatsby Benchmarks identified for the 2016/17 and 2017/18 Year 11 cohorts could be specified with greater accuracy now that an additional year of data is available;
- to test whether the relationship is stronger for schools serving more economically disadvantaged student cohorts, in line with last year's findings; and
- to explore methodological limitations and possible analytical options for further research on destinations data.

4 Percy, C. & Tanner, E. (2021). The benefits of Gatsby Benchmark achievement for post-16 destinations. London: The Careers & Enterprise Company.

2. Methodology

Source data

The core of the methodology lies in connecting The Careers & Enterprise Company's Compass database with public government data on school-level destinations.

The Compass dataset captures schools' self-reported achievement of the Gatsby Benchmarks, using a detailed survey that breaks the benchmarks into sub-benchmarks and specific activities. Provided school-level data are aggregated and anonymised, The Careers & Enterprise Company has permission to use this dataset for research purposes. In order to work with the most granular aggregate view of careers provision available, this research uses schools' average benchmark score, being a value from 0% to 100% considering on the proportion of each benchmark achieved, with each of the eight benchmarks equally weighted. In other words, schools are credited for partial achievement of benchmarks as well as full benchmark completion.

School destinations data are drawn from published Department for Education sources, being either the Compare School Performance website[5] or the destinations website[6]. The latter appears to identify slightly more schools in its post-16 dataset, but destinations results are the same and there is no difference in the sample of schools ultimately available for analysis having matched to the Compass datasets. Destinations are used as a percentage figure for the proportion of each graduating cohort that sustains education, employment or training during the following academic year. Schools with such small cohorts that percentages might be disclosive of individuals are excluded from the dataset by government.

Only three historical academic years have both school-level Compass data and destinations data when initiating this research in mid 2022: the 2016/17, 2017/18 and 2018/19 Year 11s. In each case the Compass datasets used align as closely as possible with those used in The Careers & Enterprise Company State of the Nation reports in the respective years, albeit with sample size reduction as not all schools had relevant Year 11 cohorts (or had such small cohorts that the government suppresses the statistics) or had control variable data available. The average benchmark score methodology is consistent between 2017/18 and 2018/19, but small adjustments are required to construct the score for the 2016/17 cohort.

We combine the Compass and destinations data with various publicly available information about the school, such as school type, region/rurality, KS4 exam results and value-added, intake FSM, local area unemployment, and Ofsted score (see Appendix for control variables used in the analysis).

Sample selection

The core sample for the 2016/17 and 2017/18 Year 11 cohorts is as reported in the June 2021 report. The 2018/19 Year 11 sample is constructed as follows:

- Non-private schools[7] with Compass data completed between the start of August 2018 and the end of July 2019 (n=3350);
- Who would also have a Year 11 cohort for the relevant year (n=2942[8]);
- Who also have sufficiently sized Year 11 cohorts that DfE release the average EET outcome statistics (n=2889).

For most analyses, we also want to control for the school's KS4 results, which further reduces the sample sizes with some schools not having these results or not publishing them due to small sample sizes. For instance, 2,645 schools meet the above criteria and have Attainment 8 results. For the full set of control variables considered, this sample size reduces to 2,636 schools. Of the 2,636 schools, the vast majority are mainstream schools (academies, community schools, voluntary aided schools), with 192 special schools.

Analyses on other outcome variables, on subsamples, or with different mixes of control variables can have different sample sizes. In this study, statistics is conducted on the subset of schools that have no missing data for the relevant analyses, rather than considering other options, notably multiple imputation or full information maximum likelihood estimation.

5 https://www.find-school-performance-data.service.gov.uk/download-data

6 https://www.gov.uk/government/collections/statistics-destinations

7 Excluding the three markers of non-private school in the DfE EstablishmentType variable from "Get Information About Schools" data downloads (IND, INDSPEC, NMSS). There are few NMSS schools in the sample and results are not sensitive to their inclusion.

8 e.g. 258 schools start at age 16; a further 52 do not have a GCSE year or are out-of-scope school types for destinations data, e.g. hospital schools; a further 68 opened too recently to be eligible for analysis.

Analytical approach

A generalised linear model with a logit link function and a binomially distributed dependent variable is used to model the outcome as a percentage, i.e. a value derived from a number of underlying yes/no outcomes for whether an individual student has sustained EET or not by around March of the following academic year. Robust standard errors are applied to adjust for heteroskedasticity[9], allowing for some inconsistency in the underlying relationships and binomial family assumptions. With outcomes as complex as student destinations and school characteristics, there is no exactly consistent mechanical relationship driving behaviour. Nonetheless, average patterns can still be derived descriptively from the data and used to inform decision-making at similar aggregate levels. To support comparability with last year's publication, the same control variables are used, with a similar motivation in seeking to address all identified theoretical confounders of the relationship between careers provision and destinations. However, in the limitations section, we consider the potential for different control variable approaches in future analyses.

A primary goal of this follow-up analysis is improved precision in estimates, which is best served with a larger sample size. For that reason, we combine the three cohorts together into a single dataset. Control variable dummies are included to reflect which calendar year is involved, to account for any variation in conditions from year to year as well as a different cohort of schools being included in each year, particularly 2016/17. For instance, early Compass engagers may have had higher engagement because they were in greater need (e.g. perhaps concerned at higher NEET outcomes and hoping career education would support) and/or because they were more innovative and open to new initiatives (which might correlate to broader management quality). In either case, we should control for where the net effect lands.

As Compass self-assessment has been completed by a large proportion of schools in England, this analysis uses standard errors corrected for the finite population of non-private schools in England with at least one cohort member graduating Year 11 in the relevant academic year (even if the actual destination rates are suppressed to preserve non-identifiability). We emphasise that the confidence intervals around estimates should therefore be taken as extrapolating to schools as they were in 2016/17 to 2018/19, as opposed to some future superpopulation of other similar schools, in which case finite population correction is typically not applied. The point estimates themselves can be drawn on as a possible guide to future relationships, subject to much stronger caveats around the consistency of policy and environmental context over time. For 2018/19 this results in a maximum possible sample size of 3771 schools, if there were to be no sample loss due to destination data suppression, limited coverage of Compass usage, or non-availability of included control variables. Across the three cohorts together, this results in a maximum possible sample size of 11,814.

9 As an indicative test on the OLS regression variant, the Breusch–Pagan/Cook–Weisberg test for heteroskedasticity rejects a null of homoskedasticity with p-value 0.00.

3. Findings

The analysis over three years broadly replicates the pattern identified for the 2017/18 cohort in the June 2021 report.

We identify a positive relationship between schools that report higher Gatsby Benchmark achievement and confirmed EET destinations post-16, when adjusting the data to make schools as similar as possible in terms of intake characteristics, structure, and academic achievement (see model 2 in Table 1). The relationship is the equivalent of 6.7%pts of a cohort being non-EET for full benchmark achievement compared to 7.3%pts for zero benchmark achievement- an 8.2% decline, compared to 9.7% estimated just on the 2017/18 cohort reported in the June 2021 analysis. On average, each additional benchmark fully achieved is associated with a 1.1% decline in non-EET rates. This is a similar effect size to 2017/18, with an odds ratio 2% lower in the multi-year analysis.

The methodological extensions on the June 2021 report result in more precise average estimates, as intended and despite the additional noise introduced by combining three years with their attendant heterogeneity. The standard error is now 40% lower for the headline result (full cohort; model 2), with the improvement driven fairly evenly by the increased sample size and correcting for the finite population of schools in England. This is reflected in high statistical significance for the true relationship being positive, i.e. greater than zero, at the 1% level or better for the headline analysis.

As before, the relationship is stronger in schools in the top quarter by intake economic disadvantage, with coefficients approximately twice the size as for the full cohort of schools.

Analysis by route (Table 2) also broadly aligns with the June 2021 report. The improvement in confirmed EET status is driven by reductions in unknown destinations and increased entry to school sixth forms. For the full cohort of schools, but not for the most disadvantaged schools, there is also a highly statistically significant increase in apprenticeship uptake and a more tentative decrease in FE entry.

Table 1: Analyses of non-EET outcomes for the 2016/17 to 2018/19 Year 11 cohorts combined

Model description	Full cohort or schools serving more economically disadvantaged areas[1]	Sample size (schools)	Coefficient on careers provision for sustained EET	Standard error [p-value]	Average non-EET rate for zero vs full benchmarks **	
(1) Direct GLM – No control variables (robust SE)	Full cohort	5949	0.2244	0.0547 [0.000]*	9.2%	7.5%
	Economically disadvantaged	1555	0.2927	0.0900 [0.001]	18.1%	14.2%
(2) GLM – Same control variables as June 2021 report (robust SE)	Full cohort ***	5453	0.0993	0.0360 [0.006]*	7.3%	6.7%
	Economically disadvantaged	1159	0.0842	0.1026 [0.023]	13.8%	11.8%
(3) OLS regression – Same control variables as June 2021 report[2]	Full cohort	5453	0.0085	0.0035 [0.015]	7.5%	6.6%
	Economically disadvantaged	1159	0.0240	0.0124 [0.053]	14.0%	11.6%

1 Top quarter of schools in the analytical sample by FSM proportion for the relevant Year 11 cohorts; threshold of 42%. Note that this rate is higher than commonly reported national average data since smaller schools in the sample tended to have higher FSM rates than the average, such that the simple average across schools is much higher than a cohort-weighted average. Finite population correction similarly reduced by 75%.

2 Run without finite population correction or robust SE as a simple descriptive baseline for the linear correlation strength. For reference, the significance level is better than 5% if robust SE or FPC are used.

GLM: Generalised Linear Model; OLS: Ordinary Least Squares; SE: standard errors; FPC: Finite Population Correction * Bootstrapped standard errors on the non-FPC dataset produce an SE estimate within 10% of the robust standard errors on the non-FPC dataset using 200-250 replications, with bootstrapped SEs being almost identical in (1) and 10% lower in (2); ** Being one minus the confirmed EET rate, as the original dependent variable; i.e. those confirmed NEET combined with those with unknown destinations. Marginal effects calculated based on other variable values aligning with the actual dataset distribution; *** Outlier analysis performed on the headline specification identifies few outliers by the 4/N Cook's D heuristic (n=2), whose removal marginally increases the coefficient size but with no material difference in the reported results. Arbitrarily dropping the top 1% of outliers reduces the coefficient to 0.08 (p-value 0.01).

Table 2: Analyses of route type via model (2) from table 1

	Full cohort of schools			Top quarter by economic disadvantage of intake		
Route	Sample size	P-value on careers provision	Avg change in % participation on the specified route from zero to full benchmarks	Sample size	P-value on careers provision	Avg change in % participation on the specified route from zero to full benchmarks
Further Education (FE)	5450	0.066	38.3% - 36.9%	1159	0.784	41.9% - 41.3%
School Sixth Form (SSF)	5427	0.110	32.7% - 33.7%	1156	0.026	18.1% - 20.9%
Sixth Form College (SFC)	5307	0.546	11.9% - 12.3%	1154	0.031	12.3% - 9.6%
Apprenticeships	5383	0.000	3.6% - 4.2%	1135	0.433	2.5% - 2.3%
Work	5390	0.919	3.4% - 3.5%	1147	0.745	3.6% - 3.8%
Confirmed NEET	5443	0.205	6.0% - 5.8%	1159	0.249	11.1% - 10.2%
Unknown destination	5053	0.001	1.5% - 1.1%	1137	0.006	2.9% - 1.7%
Overall EET	5453	0.006	92.7% - 93.3%	1159	0.023	86.2% - 88.2%

4. Limitations and possible extensions

We see four main areas of limitation in the present analysis, in addition to the specific comments in the previous sections. Each area has the potential for further investigation in the future. The four areas are: assumptions on causality; alternative model specifications; improved model precision; and analysis of multi-year effects. Stakeholder and researcher comments are invited as The Careers & Enterprise Company develops research priorities for future years, recognising that post-16 destinations are only one of several ways in which careers provision hopes to improve outcomes for young people.

Assumptions on causality

The presented analysis uses cross-sectional data. Inference of the estimated correlations as a typical causal relationship requires assumptions about the available control variables with respect to a directed acyclic graph and assumptions that any subgroup heterogeneity does not render the overall average estimate unusable for policy purposes.

We consider that current control variables control tolerably for confounders identified to date, but do not see this as a complete exercise, even acknowledging that the intention is to surface a simplified typical relationship out of a complex, effectively intractable underlying reality. Please see the Appendix for regression modelling adding control variables in stages. While still working with the same underlying type of data, possible extensions include:

- Using additional control variables that capture other possible confounding factors. For instance, we might better adjust for local area circumstances by using the Index of Multiple Deprivation or youth-specific metrics (e.g. IDACI).
- Explicitly modelling the primary selection effect by which schools become eligible for this analysis: their decision to use the Compass tool in the relevant academic years.
- Using matching techniques to compare schools in very similar circumstances but different benchmark achievement, which may provide a better grasp than control variables.

Managing missing data in the control variables via multiple imputation or full information maximum likelihood techniques.

As more years of destinations data become available, we may be able to control for school-level idiosyncrasies via longitudinal panel methods. However, such approaches will require assumptions on theories of change for the time lag between Gatsby Benchmark progress and improved outcomes. In the current approach, current Gatsby Benchmark achievement is implicitly an approximate indicator of recent provision quality as well as immediate provision, since improvement is typically gradual from year to year.

Alternative model specifications

A number of alternative model specifications could be explored, including structural equation modelling (to interpret Gatsby Benchmark achievement explicitly as a proxy for underlying careers provision quality rather than as an outcome driver in its own right) or multiple overimputation (to mitigate measurement error). For estimations on national cohort changes, we may wish to weight regressions by cohort size and analyse changes based on individual schools' progress in Gatsby Benchmarks rather than via national averages. Similarly, we might construct measures of careers provision that emphasise activities that would have been participated in by the graduating Year 11 cohort.

Stakeholders have also observed that there is a different baseline level of risk in different pathway choices. Some post-16 choices are harder to sustain on average than others. Apprenticeships in a new environment may have lower average completion rates than those who stay in the same school to pursue A-levels. Churn is much higher in early labour market roles than those staying in education. Even if career guidance helps people make the right choice for them, doing something new and very different to Key Stage 4 provision will always contain some risks – even if those risks are well worth taking for a given individual. We could investigate measuring and adjusting for these differences in baseline risk statistically, effectively identifying whether schools get better sustainment rates given the mix of pathways their students typically choose.

We may also investigate the subset of benchmarks that reflect group activity or overall provision most strongly. Correlational relationships identified on such benchmarks using observational data are more likely to approximate the true causal relationship, since there is less risk of endogeneity contaminating the findings. Specifically, where activities are highly targeted to individual students – whether as a result of students choosing to participate or teachers targeting individual students – other research designs like randomised control trials are often needed. This is because students or teachers would naturally decide on participation based on whether they think the activity will help them, i.e. individuals at greater risk are often most likely to participate, but activities are not expected to *fully* mitigate all differential risk, so it can appear that participants have worse outcomes than non-participants, even though the activity has helped to *partly* reduce risk.

Improved model precision

Upon interrogating the replication results above, two possible issues are identified that suggest the modelling may be inefficient, i.e. we are not making optimal use of the control variables.

First, some of the control variables are highly correlated with each other, reducing the precision of model estimates.[10] Second, it is possible that some of the control variables influence the outcome in non-linear ways that are not captured in the linear model, or there is some other potential to improve the model specification.[11]

An exercise could be conducted to test the inclusion of squared terms and removing or collapsing highly correlated variables, guided, for instance, by goals of reducing variance inflation factors without too large a reduction in adjusted R^2 in the OLS regression variant, and of reducing the link test misspecification on the generalised linear model.

Increased model precision would also be required to analyse changes year to year in the relationship of interest. As schools come under increasing pressure to achieve Gatsby Benchmarks, there is a risk that the target becomes decoupled from the careers provision quality it measured in the past – a feature common enough in public policy that it is referred to as Goodhart's Law. Considering post-16 NEET outcomes in particular, it is important to recognise that the Gatsby Benchmarks, by design, emphasise a model of universal provision. They describe a model of careers provision aimed at helping all students achieve their next best steps, rather than being narrowly focused on NEET prevention. There is space for personalisation to individual students via Benchmark 3 ("addressing the needs of each student"), but most activities are deemed to have been successful if they reach the "overwhelming majority" or over 75% of students. This is part of the value of the Benchmarks and can be contrasted with past implementations of careers guidance which often adopted a "deficit model", explicitly emphasising the minority of students at high risk and seeking to provide targeted support to bring them

10 High variance inflation factors on the OLS regression variant, with five regressors having VIF well over 10 and average VIF of 4.2.

11 Squared predicted values prove to have predictive value in a link test regression for the full cohort of schools (p-value < 0.05), albeit not the economically disadvantaged subset of schools. Indicatively, the RESET test for omitted variables on the OLS variant using powers of fitted values rejects no omitted variables (p-value 0.00).

back onto low-risk pathways compensating for perceived "deficits" in their current set-up.

As schools increasingly use Gatsby Benchmarks to design and drive their careers provision, it is possible that the focus on improving provision for the "overwhelming majority" has absorbed much of the new resource, in line with the principles and incentives set by the benchmarks and the Compass tool. If so, this would translate into a weakened statistical link between benchmark achievement and NEET reduction, since students at risk of NEET post-16 are only a small minority in the vast majority of schools. This would be true even if support for NEET remained as good as ever or even better, but not necessarily in a way that is closely linked to the benchmarks. Indeed, trends suggest post-16 EET rates have been stable at around 94% from 2014/15 to 2019/20.[12]

Analysis of multi-year effects

A hypothesis informed by US empirical research (Sink et al., 2008[13]) points towards a theory of change that incorporates the need for improved careers provision throughout Key Stage 4 (and perhaps earlier) rather than just in Year 11.

An initial test of this hypothesis explores whether a simple average of benchmark completion percentage from 2018/19 and 2017/18 proves to be more closely correlated with NEET outcomes than the 2018/19 benchmark completion data alone. In this case, 1954 schools qualify for the analysis, with average benchmark data available for both relevant years. The two year average benchmark score has a coefficient of 0.13 (p-value 0.085) as opposed to 0.09 (p-value 0.234) on the same sample of schools. This is suggestive of a stronger relationship on post-16 sustained EET outcomes where careers provision is measured over two years than one, consistent with the hypothesis from the US. More years of data would be needed to explore this in detail.

12 https://explore-education-statistics.service.gov.uk/find-statistics/key-stage-4-destination-measures/2019-20

13 Student academic achievement was higher in Washington State middle schools with a comprehensive approach to supporting students that includes career guidance, counselling, and post-18 study preparation. However, this difference was only observed in schools with at least 5 years of programme implementation. *Reference: Sink, C. A., Akos, P., Turnbull, R. J., & Mvududu, N. (2008). An Investigation of Comprehensive School Counseling Programs and Academic Achievement in Washington State Middle Schools. Professional School Counseling, 12(1). https://doi.org/10.1177/2156759x0801200105*

Appendix: Descriptive statistics

The core set of control variables, mostly drawn from www.compare-school-performance.service.gov.uk, were:

1. Level of disadvantage, via local area levels of employment (job density in LA and unemployment rate in LA district) and school-level disadvantage measured by proportion of pupils eligible for free school meals, as areas with greater deprivation may find it harder to engage employers in support of career provision or may choose to prioritise employment-focused activity in schools;
2. School structure, which may influence the common and expected pathways for students, via CEC measure of school type (mainstream, special schools, alternative provision, or other), school size (number of pupils), whether the school has selective admissions, whether the school has its own sixth form, and whether the school is boys-only, girls-only, or mixed;
3. Variables to capture possible variation by geographic circumstances, dummy variables for the nine government regions of England and dummy variables for level of rurality;
4. Measures of school performance and academic results, which may influence overall school priorities and the relative emphasis on careers provision, via average GCSE results and progress scores from 2017/18 (Attainment 8 and Progress 8 measures) and the latest Ofsted score as of July 2018 (entered as a categorical value, allowing Missing to be a value as schools without an Ofsted score may have different structural characteristics);
5. Whether the school falls into a government-designated Opportunity Area, being neighbourhoods of high deprivation in receipt of additional state support.

Table 3: Control variable build up

We add sets of control variables in decreasing order of how fixed they are and increasing order of how much they might mediate the relationship between Gatsby Benchmarks and destinations in a given year. The regression output for the average Gatsby Benchmark score is reported.

Control variable set	Coefficient	St. Error	P-value	N
None	0.2244	0.0547	0.000	5949
+ Year control (i.e. time effects and school cohort effects)	0.4223	0.0667	0.000	5949
+ School structure (school type, sixth form presence, gender mix, whether selective)	0.0824	0.0438	0.060	5949
+ School location features (region, rurality, local area unemployment and job density, opportunity area status)	0.0848	0.0441	0.055	5881
+ School intake features (cohort size, FSM eligibility)	0.0995	0.0407	0.014	5679
+ School grades (Attainment 8, Progress 8)	0.1109	0.0363	0.002	5453
+ School quality indicator (Ofsted grade)	0.0993	0.0360	0.006	5453

Table 4: Key variables descriptive statistics

	2016/17 (n=435)		2017/18 (n=2382)		2018/19 (n=2636)	
Variable	Median	IQ Range	Median	IQ Range	Median	IQ Range
EET Outcomes***	95%	5%	94%	5%	94%	5%
Gatsby Completion Score***	55%	30%	53%	31%	80%	22%
Number of pupils completing KS4***	171	81	157	91	158	90.5
LA District Unemployment Rate	4.2	1.9	4.1	1.9	3.9	1.8
LA Job Density (# jobs per person aged 16-64)***	0.8	0.2	0.8	0.2	0.8	0.3
Percentage eligible for free school meals at end of KS4	0.2	0.2	0.3	0.2	0.3	0.2
Average Attainment 8 (ATT8SCR)	45.7	8.8	45.4	10.3	45.2	10.6
Progress 8 (P8MEA)**	0.0	0.5	-0.1	0.6	-0.1	0.7

Kruskall-Wallis test for equality of ranked distribution across the three year cohorts; *** Different at 1% level or lower; ** Different at 5% level or lower; * Different at 10% level or lower. Note. Non-parametric testing and sample statistics reported as variables fail a normality test across the cohorts.

Variable (% distribution)	2016/17	2017/18	2018/19
Boys only intake (y/n)	3.7	4.6	4.4
Girls only intake (y/n)	5.8	6.1	5.9
Has own sixth form (y/n)**	70.8	67.0	64.5
Selective admissions (y/n)	5.5	4.9	4.1
In Opportunity Area (y/n)***	1.4	6.1	5.1
Region* **			
East Midlands	11.3	8.9	8.6
East of England	13.3	12.6	10.5
London	14.7	10.3	10.5
North East	3.9	4.1	5.4
North West	11.5	15.4	15.4
South East	14.3	16.0	16.0
South West	10.3	10.2	10.5
West Midlands	15.9	12.0	12.5
Yorkshire and the Humber	4.8	10.5	10.6
School type (CEC coding)* **			
Further Education College	0.0	0.4	0.4
Mainstream school	97.2	93.2	92.3
Special school (SEND)	2.8	6.3	7.3
Other	0.0	0.1	0.0
Level of rurality around school			
Rural hamlet and isolated dwellings in a sparse setting	0.0	0.1	0.1
Rural hamlet and isolated dwellings	1.2	1.5	1.5
Rural village in a sparse setting	0.2	0.2	0.2
Rural village	1.8	1.3	1.8
Rural town and fringe in a sparse setting	0.5	0.8	0.9
Rural town and fringe	8.5	9.1	9.4
Urban city and town in a sparse setting	0.5	0.3	0.2
Urban city and town	52.4	50.7	49.1
Urban minor conurbation	2.1	3.4	3.3
Urban major conurbation	32.9	32.5	33.5
Ofsted grading* **			
Serious Weaknesses	0.2	1.2	1.3
Special Measures	2.3	3.4	2.2
Requires improvement	13.3	13.2	14.3
Good	52.4	50.3	50.8
Outstanding	23.2	15.6	14.7
Not available / completed	8.5	16.3	16.6

Pearson's chi-squared test for the hypothesis that the rows and columns in a two-way table are independent; asterisk coding as above.

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