Analysis of degree classifications over time

Changes in graduate attainment

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Contents

Summary

1. One of the Office for Students' primary regulatory objectives is to ensure that 'qualifications hold their value over time'. This objective is underpinned by Condition B4 in our regulatory framework, which sets out that higher education providers 'must ensure that qualifications awarded to students hold their value at the point of qualification and over time, in line with sector recognised standards.'

2. A recent publication from the UK Standing Committee for Quality Assessment has investigated this issue and revealed that a growing proportion of the first and upper second class degrees awarded cannot be fully explained by factors such as entry qualifications representative of the typical student at a provider and increased investment in teaching and learning resources. This report builds on this evidence and provides an analysis of changes in the proportion of first and upper second class degrees awarded between 2010-11 and 2016-17. We have used statistical modelling at the individual student (graduate) level to help account for factors – including entry qualifications and other changes to the graduate population – that affect attainment of first and upper second class degrees.

3. Our analysis finds that, across the sector as a whole, 11.6 percentage points of the increase in first and upper second class degrees awarded are unexplained by changes in the graduate population. We report significant differences in the changes in attainment for graduates with different entry qualifications. For example, graduates who entered higher education with the equivalent of grades CCD or below at A-level were almost three times more likely to graduate with first class honours in 2016-17 than in 2010-11.

4. We have analysed changes in the attainment of degree classifications for 148 individual providers. In respect of first class degree attainment the analysis shows that in 2016-17:

    a. 52 per cent of providers (77) show a statistically significant unexplained increase relative to both the sector and their own level in 2010-11.

    b. A further 19 per cent of providers (28) show a statistically significant unexplained level of attainment above that of the sector in 2010-11, but no significant change relative to their own level in 2010-11.

    c. Another 13 per cent of providers (19) show a statistically significant unexplained increase relative to their own level in 2010-11, but attainment not significantly above the sector level in 2010-11.

    Provider-level findings for the academic years 2010-11 and 2016-17 are reported in Annex A and findings for all years are available at www.officeforstudents.org.uk/publications/analysis-of-degree-classifications-over-time-changes-in-graduate-attainment/.

5. Our analysis adds to a growing body of evidence in this area. It is clear there is a significant and growing issue around unexplained inflation in graduate attainment, or 'grade inflation', which needs to be addressed.

6. The analysis corroborates concerns about grade inflation across the higher education sector and reinforces our view that it is essential that all providers take steps to curb inappropriate increases in the awarding of first class and upper second class degrees. We intend to update this analysis as data for later years becomes available. Providers will want to identify how they should approach this issue within their own context, and will need to ensure that any action they take is in line with their access and participation objectives. Where providers do not take sufficient action to address this issue, we may use the full range of our regulatory powers to intervene.

Introduction

7. This report sets out the results of our analysis of changes in the proportion of first and upper second class degrees awarded between 2010-11 and 2016-17. We report on how graduate attainment has changed with time and the extent to which these changes can be explained by changes in the graduate population. This analysis has been undertaken at both the sector level and, for the first time, at the provider level. The sector-level analysis and a summary of the provider-level analysis is in the main body of this report, with detailed provider-level analysis reported separately (in Annex A and available at www.officeforstudents.org.uk/publications/analysis-of-degree-classifications-over-time-changes-in-graduate-attainment/).

8. The graduate population considered in this report is that of England-domiciled first degree graduates who studied full-time and graduated in the academic years from 2010-11 to 2016-17 and were registered at higher education providers in England.

9. The analysis includes all providers awarding at least 10 classified honours degrees in each of the academic years considered (2010-11 to 2016-17), in total including 1,638,490 graduates from 148 providers. A breakdown of this population by graduate characteristics and a breakdown of the population of graduates from all providers are presented in Annex B.

10. We used statistical modelling of individual graduate data to predict expected patterns in degree classification attainment between 2010-11 to 2016-17, taking the following factors into account:

    - the provider at which the graduate was registered
    - year of graduation
    - subject studied
    - qualifications on entry
    - age
    - disability
    - ethnicity
    - gender
    - Participation of Local Areas (POLAR) quintile.

11. The modelling predicts that there should be little variation in the proportion of students attaining first and upper second class degrees between 2010-11 and 2016-17, meaning that the sector-level increase of 11.6 percentage points in first class degree attainment over this time period cannot be explained by these factors alone.

12. While some of this increase may be explained by factors which are not accounted for in the analysis, such as improvements in teaching, there is clearly a need for the sector to examine this pattern, to protect the long-term value of degree qualifications.

13. We first present the overall sector-level change in the observed proportion of graduates who attained a first class or an upper second or first class degree in the academic years 2010-11 to 2016-17. We then disaggregate this by the entry qualifications of the graduates.

14. We then present findings from statistical modelling that allows us to determine how much of the observed increase in first or upper second degree classifications over time can be attributed to changes in the graduate population, and how much remains 'unexplained'. To investigate changes in graduate attainment at the sector-level, fixed effects logistic regression was employed. To investigate changes in attainment at the provider level, mixed effects (or multi-level) logistic regression was used. Full details of the modelling used may be found in Annexes D (sector-level) and E (provider-level).

Results

Analysis of degree classifications: Changes in attainment at the sector level

Sector overview

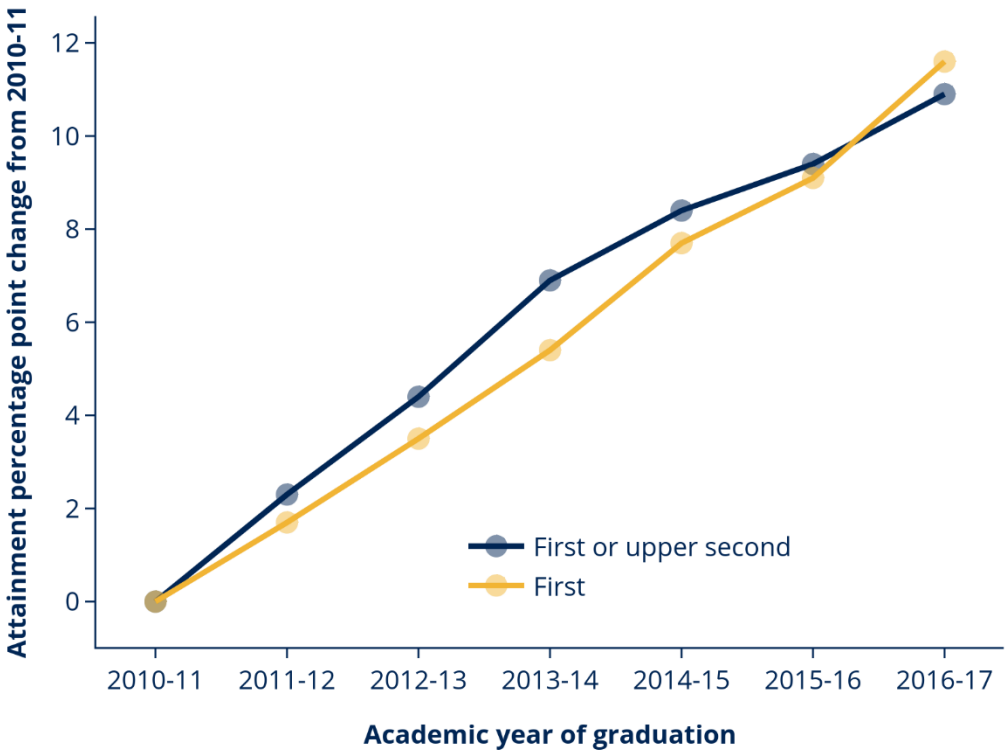
15. Table 1 shows the percentage of graduates attaining classified degrees in the academic years 2010-11 and 2016-17. The proportion of graduates attaining a first class degree increased by 11 percentage points in this time period while the proportion attaining an upper second class degree has remained the same.

Table 1: Degree classifications summary for academic years 2010-11 and 2016-17

	2010-11		2016-17	
Degree classification	Number	Percentage	Number	Percentage
First	33,810	16%	66,675	27%
Upper second	110,375	51%	123,625	51%
Other classified	71,325	33%	54,195	22%
Total	215,505	100%	244,495	100%

16. Figure 1 shows this increase for all years from 2010-11 to 2016-17. It presents the observed percentage point change of graduates receiving first class and upper second class degrees relative to 2010-11. Figure 1 demonstrates that changes in degree classifications at the sector level relative to 2010-11 appear to be driven by the continued increase in the attainment of first class degrees.

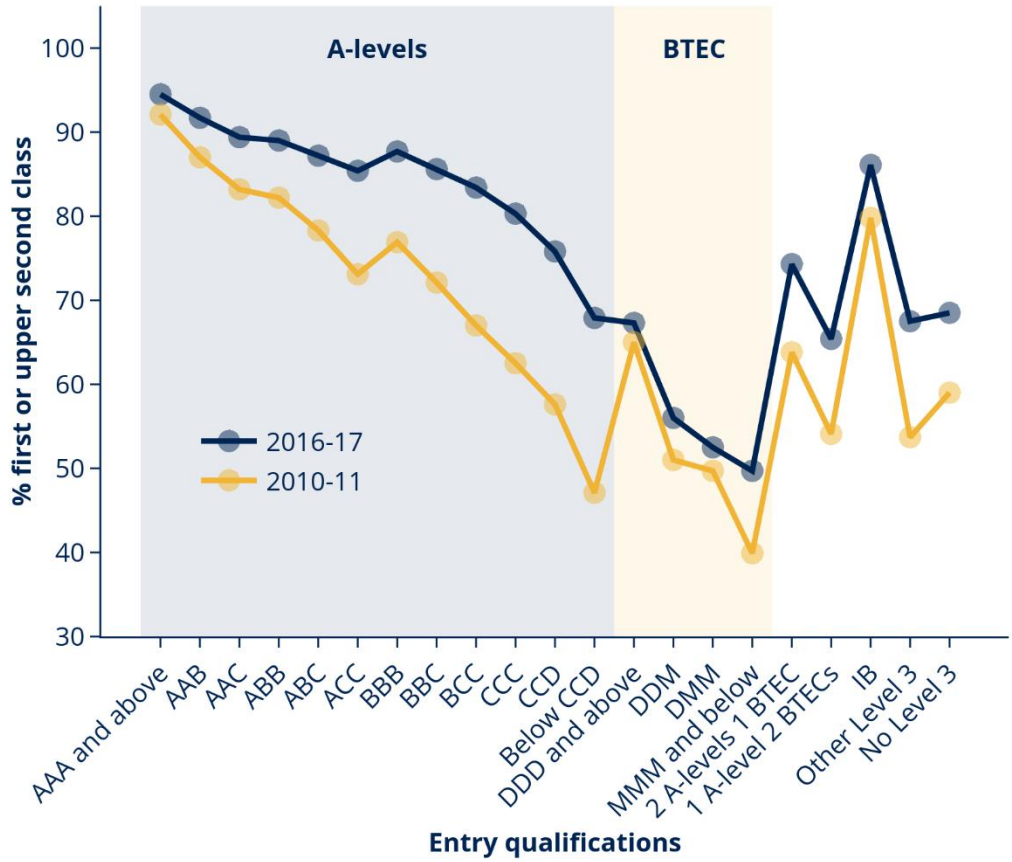
Figure 1: Sector level degree classification changes relative to 2010-11



17. Figures 2 and 3 present changes in attainment of first and upper second class degrees combined and first class degrees only, respectively, in relation to graduates' entry qualifications. Although there is an increase in attainment for all entry qualifications, this is most evident for graduates who entered with A-levels or equivalent, and less clearly pronounced for graduates who entered with BTEC (D = Distinction, M = Merit) and other qualifications.

18. Figure 2 suggests that there has been little change in attainment for graduates who entered higher education with high A-levels or equivalent qualifications. Graduates who entered with three As at A-level or equivalent have seen an increase in first or upper second class degrees of two percentage points. The greatest increase in attainment is observed for graduates who entered with the equivalent of CCD grades at A-levels or below, with a 21 percentage point increase: a relative increase of 44 per cent.

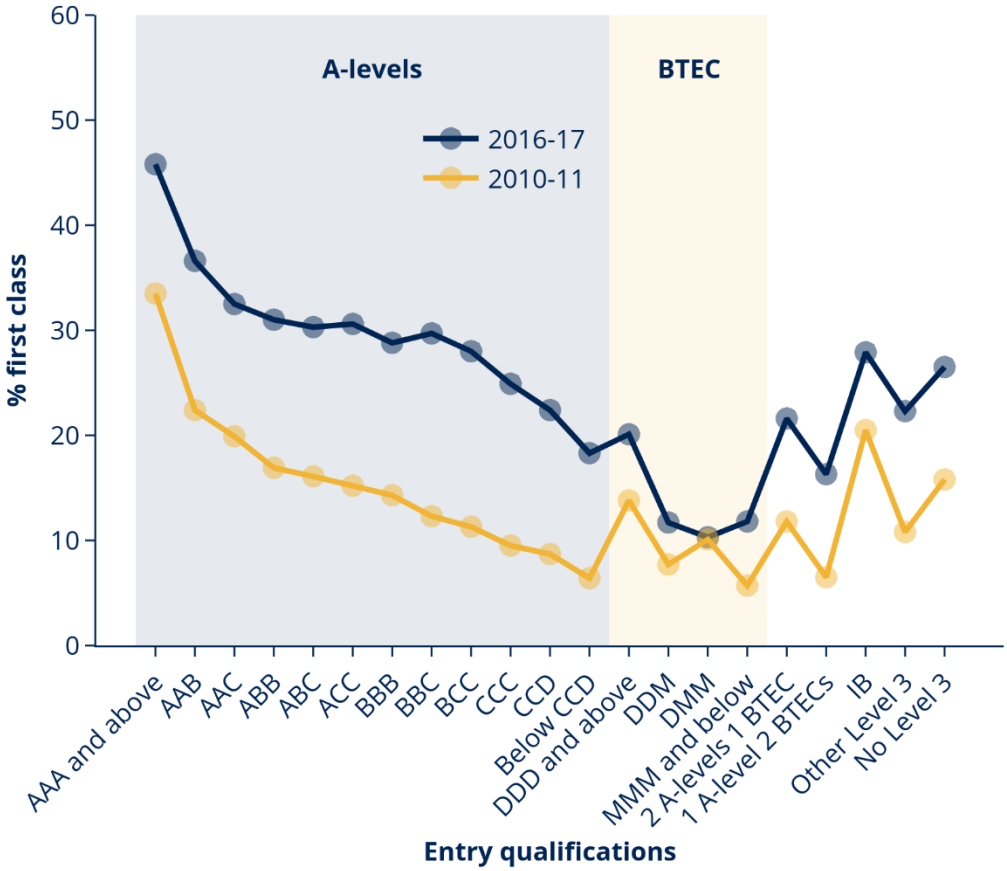
Figure 2: First and upper second class degree attainment by entry qualifications for academic years 2010-11 and 2016-17



19. In contrast with Figure 2, Figure 3 indicates a more consistent change in first class degree attainment across all A-level and equivalent entry qualifications.

20. The largest increase, of 17 percentage points, is seen among graduates who entered with BBC at A-level or equivalent. In terms of relative change, for some entry qualification categories the percentage point increases equate to more than a doubling in the proportion of graduates attaining a first class degree in 2016-17 compared with 2010-11. For example, graduates who entered with grades below CCD at A-level or equivalent were almost three times more likely to receive a first class degree in 2016-17 than they were in 2010-11. The likelihood for those entering with the following entry qualifications or equivalent at least doubled: ACC, BBB, BCC, CCC and CCD at A-level; BTEC MMM and below; one A-level and two BTECS; and other Level 3 qualifications.

Figure 3: First class degree attainment by entry qualifications for academic years 2010-11 and 2016-17



Results from statistical modelling

21. Tables 2 and 3 present sector-level changes in attainment of first and upper second class degrees combined and first class degrees alone, respectively, from 2010-11 through to 2016-17. The tables show the observed proportion of graduates attaining the respective degree classification ('Observed'), the percentage point change in the observed attainment relative to 2010-11 ('Change from 2010-11') and the percentage point ('pp') change which remains unexplained once changes in the characteristics of the graduate population included in the modelling have been accounted for ('Unexplained') (as outlined in the introduction and detailed in Annexes C and D).

22. From 2011-12 to 2015-16, the unexplained percentage point increase in attainment is higher for first and upper second class degrees combined than for first class degrees alone. In all years the majority of the observed change in percentage point increase is unexplained.

23. Table 2 shows there is an unexplained percentage point increase in attainment of 11.6 for first and upper second class degrees in 2016-17, compared with the observed change of 10.9 percentage points. This shows that our modelling predicts that the overall proportion of graduates attaining these degree classifications in 2016-17 should be lower than in 2010-11. This also applies to 2015-16, where the unexplained percentage point change of 9.6 is greater than the observed change of 9.4.

24. In 2016-17, Table 3 shows that the 11.6 percentage point increase in first class degree attainment from 2010-11 is entirely unexplained by the combined effects of the factors included in the modelling.

Table 2: Summary of observed and unexplained changes in first and upper second class degree attainment combined

Academic Year	Observed (%)	Change from 2010-11 (pp)	Unexplained change (pp)
2010-11	66.9	0	0
2011-12	69.2	2.3	2.0
2012-13	71.3	4.4	3.8
2013-14	73.8	6.9	6.1
2014-15	75.3	8.4	8.0
2015-16	76.3	9.4	9.6
2016-17	77.8	10.9	11.6

Table 3: Summary of observed and unexplained changes in first class degree attainment

Academic Year	Observed (%)	Change from 2010-11 (percentage points)	Unexplained change (percentage points)
2010-11	15.7	0	0
2011-12	17.4	1.7	1.4
2012-13	19.2	3.5	2.9
2013-14	21.1	5.4	4.7
2014-15	23.4	7.7	7.0
2015-16	24.8	9.1	8.9
2016-17	27.3	11.6	11.6

Analysis of degree classifications: Changes in attainment at the provider level

Changes in attainment at providers relative to the sector in 2010-11

25. In addition to a sector-level analysis, we have also investigated changes in graduate attainment at individual providers relative both to the average graduate attainment in the sector in 2010-11 and to the same individual provider in 2010-11, as described in Annexes C and E respectively.

26. Tables 4 and 5 present the number of providers showing unexplained changes in graduate attainment for the years 2010-11 to 2016-17 for first and upper second class degrees combined and first class degrees alone respectively, relative to the average graduate attainment in the sector in 2010-11 derived from the modelling.

27. In these tables providers are flagged ('Sector 2010-11 flag') as showing unexplained graduate attainment either significantly above, the same as or significantly below that of the average graduate attainment in the sector in 2010-11 (see Annex E).

Table 4: Provider unexplained graduate attainment significance flags relative to the average graduate attainment in the sector in 2010-11 for first and upper second class degrees

	Number of providers in academic year						
Sector 2010-11 flag	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**
Below	9	7	1	0	0	0	0
Same	125	119	113	99	76	65	47
Above	14	22	34	49	72	83	101

Table 5: Provider unexplained graduate attainment significance flags relative to the average graduate attainment in the sector in 2010-11 for first class degrees

	Number of providers in academic year						
Sector 2010-11 flag	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**
Below	9	6	5	3	0	0	0
Same	129	122	104	93	80	66	43
Above	10	20	39	52	68	82	105

28. Tables 4 and 5 demonstrate, as expected, in 2010-11 (the reference academic year) there was a broadly even split of providers flagged above or below the average graduate attainment in the sector that year.

29. In each year following 2010-11, there is a year-on-year increase in the number of providers flagged above the average graduate attainment in the sector in 2010-11.

30. Since 2013-14, no providers have been flagged below the average graduate attainment in the sector in 2010-11 for first or upper second class degrees combined or first class degrees alone.

31. By 2016-17, 101 (68 per cent) and 105 (71 per cent) of the 148 providers are flagged as showing unexplained graduate attainment significantly above that of the sector in 2010-11 for both measures.

Changes in attainment at providers relative to the provider in 2010-11

32. Tables 6 and 7 present the number of providers showing unexplained changes in graduate attainment for the years 2010-11 to 2016-17, for first and upper second class degrees combined and first class degrees alone respectively, relative to the average graduate attainment at the same provider in 2010-11 derived from the modelling.

33. In these tables providers are flagged ('Provider 2010-11 flag') as showing unexplained graduate attainment either significantly above, the same as or significantly below that of the average graduate attainment at the same provider in 2010-11 (See Annex E).

Table 6: Provider unexplained graduate attainment significance flags relative to the average graduate attainment in same provider in 2010-11 for first and upper second class degrees

	Number of providers in academic year						
Provider 2010-11 flag	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**
Below	0	0	0	0	0	0	0
Same	148	146	136	114	89	77	58
Above	0	2	12	34	59	71	90

Table 7: Provider unexplained graduate attainment significance flags relative to the average graduate attainment in same provider in 2010-11 for first class degrees

	Number of providers in academic year						
Provider 2010-11 flag	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**
Below	0	0	0	0	0	0	0
Same	148	144	137	118	100	80	52
Above	0	4	11	30	48	68	96

34. Tables 6 and 7 demonstrate that none of the 148 providers have been flagged as having an unexplained decrease in graduate attainment either of first and upper second class degrees combined, or of first class degrees alone, relative to their own levels in 2010-11.

35. Over time, there is a consistent increase in the number of providers showing unexplained graduate attainment significantly above their own levels in 2010-11.

36. The increase in providers flagged above their 2010-11 position is most pronounced in the first class degrees, with 96 (65 per cent) of the providers exhibiting an unexplained increase in graduate attainment in 2016-17 compared with attainment at the same provider in 2010-11.

Summary of changes in attainment at the provider level from 2010-11 to 2016-17

37. In each year providers can be classified as having significant unexplained graduate attainment relative to the sector or to themselves in 2010-11. By 2016-17, and in terms of graduate attainment of first or upper second class degrees combined, 76 (51 per cent) of the 148 providers are flagged as significantly above both the sector and themselves; 25 (17 per cent) were flagged as higher than the sector, but not themselves; 14 (9 per cent) showed a significant unexplained increase relative to themselves, but not the sector; and 33 (22 per cent) showed no significant unexplained change relative to the sector or themselves.

38. In terms of graduate attainment of first class degrees alone in 2016-17 compared with 2010-11: 77 (52 per cent) of the 148 providers showed a significant unexplained increase relative to both the sector and themselves in 2010-11; 28 (19 per cent) were flagged as higher than the sector, but not themselves; 19 (13 per cent) showed a significant unexplained increase relative to themselves, but not the sector; and 24 (16 per cent) showed no significant unexplained change relative to the sector or themselves.

Annex A: Provider-level results for academic years 2010-11 and 2016-17

1. This annex contains the provider-level graduate attainment modelling results for the academic years 2010-11 and 2016-17 for all 148 providers considered in this report. Complete findings for years 2010-11 to 2016-17 are available at www.officeforstudents.org.uk/publications/analysis-of-degree-classifications-over-time-changes-in-graduate-attainment/.

2. Table A1 contains the provider-level results for first and upper second class degrees combined. Table A2 contains the provider-level results for first class degrees alone.

3. The table headings are as follows for academic years 2010-11 and 2016-17:

    a. **N** – The number of graduates attaining a classified degree from the provider.

    b. **Observed (%)** – The proportion of the N graduates attaining the specified degree classifications.

    c. **Sector 2010-11 flag** – Whether attainment at the provider was statistically significantly above (1), below (-1) or not significantly different from (0) the attainment in the sector in 2010-11, with the effect of all explanatory variables accounted for (see Annex E).

    d. **Provider 2010-11 flag** – Whether attainment at the provider was statistically significantly above (1), below (-1) or not significantly different from (0) the attainment at the same provider in 2010-11, with the effect of all explanatory variables accounted for (see Annex E).

    e. **Unexplained (pp)** – The unexplained attainment at the provider relative to the attainment in the sector in 2010-11 (calculated using only the fixed effects of the mixed-effect logistic regression model presented in Annex E). A negative number of percentage points (pp) here indicates that attainment at the provider is beneath that of the average sector attainment in 2010-11 with the effect of explanatory variables accounted for.

Table A1: Provider-level results for first and upper second class degrees combined in academic years 2010-11 and 2016-17

Provider name	2010-11				2016-17				
	N	Observed (%)	Sector 2010-11 flag	Unexplained (pp)	N	Observed (%)	Sector 2010-11 flag	Provider 2010-11 flag	Unexplained (pp)
Accrington and Rossendale College*	10	63.6	0	7.8	35	52.8	0	0	-6.0
Anglia Ruskin University Higher Corporation	1,940	57.9	0	-3.0	3,220	73.9	1	1	19.2
Arts University Bournemouth, the	610	60.8	0	-7.2	735	68.9	0	0	0.2
University of the Arts, London	2,095	69.4	0	4.1	2,205	68.6	0	0	2.5
Askham Bryan College*	35	60.6	0	-2.1	45	67.4	0	0	7.7
Aston University	1,285	73.5	1	6.9	1,630	86.0	1	1	21.0
The University of Bath	1,495	84.5	0	5.8	1,945	88.4	1	0	3.9
Bath Spa University	1,195	68.6	0	1.1	1,335	78.2	1	1	10.7
University of Bedfordshire	1,475	57.4	0	2.7	1,845	68.7	1	1	19.5
The University of Birmingham	3,890	77.7	0	0.7	4,300	87.9	1	1	7.7
University College Birmingham	460	45.0	-1	-12.9	570	75.7	1	1	22.9
Birmingham City University	2,800	64.8	0	7.5	4,015	71.9	1	1	16.7
Bishop Burton College*	60	35.0	-1	-19.9	110	42.7	0	0	-16.9
Bishop Grosseteste University	430	56.2	0	-8.8	560	66.6	0	1	2.6
Blackburn College*	270	52.4	0	-6.1	345	50.0	0	0	-5.4

Provider name	2010-11				2016-17				
	N	Observed (%)	Sector 2010-11 flag	Unexplained (pp)	N	Observed (%)	Sector 2010-11 flag	Provider 2010-11 flag	Unexplained (pp)
Blackpool and the Fylde College*	245	61.7	0	-1.7	440	62.9	0	0	2.5
The University of Bolton	625	49.9	0	-8.2	700	59.4	0	1	6.7
Bournemouth University	2,230	68.2	0	1.3	2,740	81.4	1	1	14.5
The University of Bradford	1,260	47.6	0	-3.2	1,420	76.0	1	1	24.6
Bradford College*	315	43.0	0	-9.4	380	48.4	0	0	-1.6
University of Brighton	2,530	64.6	0	0.3	3,150	71.6	1	1	8.6
University of Bristol	2,490	86.1	0	0.8	3,255	92.3	1	1	5.6
Brunel University London	2,225	67.4	1	8.3	1,735	79.0	1	1	18.2
The University of Buckingham	80	53.2	0	6.4	135	74.6	1	1	20.4
Buckinghamshire New University	890	48.3	0	-8.4	1,425	56.1	0	1	2.3
University of Cambridge	2,205	87.3	0	-1.2	1,915	92.3	0	1	2.6
Canterbury Christ Church University	1,795	59.9	0	-1.4	2,565	71.8	1	1	13.4
University of Central Lancashire	3,430	57.6	0	-3.1	3,355	73.9	1	1	16.4
University of Chester	1,330	60.4	0	-4.1	1,990	69.0	0	1	5.9
The University of Chichester	890	60.3	0	-1.1	1,125	71.1	1	1	11.0
City, University of London	1,255	66.3	0	5.8	1,505	70.1	1	0	8.6
The Conservatoire for Dance and Drama*	115	87.1	1	27.6	140	92.8	1	0	30.5

Provider name	2010-11				2016-17				
	N	Observed (%)	Sector 2010-11 flag	Unexplained (pp)	N	Observed (%)	Sector 2010-11 flag	Provider 2010-11 flag	Unexplained (pp)
Courtauld Institute of Art*	45	91.5	0	6.6	45	93.5	1	0	4.7
Coventry University	2,330	68.3	1	10.6	3,425	79.1	1	1	24.4
University for the Creative Arts	1,025	47.5	-1	-15.8	1,025	74.9	1	1	16.1
The University of Cumbria	1,235	61.6	0	-1.8	1,265	60.6	0	0	2.3
De Montfort University	2,790	52.9	0	-4.0	3,325	71.2	1	1	16.4
University of Derby	2,225	53.7	0	-2.7	2,385	69.6	1	1	13.3
DN Colleges Group*	155	53.5	0	-6.4	245	63.4	0	0	4.0
University of Durham	2,675	83.6	0	-2.8	2,810	92.2	1	1	5.5
The University of East Anglia	2,235	73.3	0	-0.8	1,885	91.9	1	1	17.8
University of East London	1,920	51.7	0	2.9	2,070	68.9	1	1	21.3
Edge Hill University	1,915	54.7	0	-5.7	2,790	71.8	1	1	10.8
The University of Essex	1,650	64.7	0	0.6	1,630	83.2	1	1	21.0
University of Exeter	2,780	85.6	0	4.0	3,685	89.3	1	0	5.6
Falmouth University	730	63.1	0	-3.8	1,180	73.1	0	1	5.2
Farnborough College of Technology*	85	54.2	0	-6.5	115	57.4	0	0	-1.4
Gateshead College*	20	61.9	0	5.1	40	68.4	0	0	8.6
University of Gloucestershire	1,175	73.0	1	8.8	1,395	76.6	1	0	13.6
Goldsmiths' College	1,080	69.8	0	4.8	1,120	84.1	1	1	16.4
Greater Brighton Metropolitan College*	170	67.6	0	6.3	175	72.4	1	0	11.9

Provider name	2010-11 N	2010-11 Observed (%)	2010-11 Sector 2010-11 flag	2010-11 Unexplained (pp)	2016-17 N	2016-17 Observed (%)	2016-17 Sector 2010-11 flag	2016-17 Provider 2010-11 flag	2016-17 Unexplained (pp)
University of Greenwich	2,460	55.7	0	0.5	2,980	76.0	1	1	20.0
Grimsby Institute of Further and Higher Education*	195	52.3	0	-8.2	270	58.4	0	0	-1.9
Guildhall School of Music & Drama*	90	88.9	1	29.5	95	95.8	1	0	24.4
Harper Adams University	210	54.8	0	-11.5	345	71.2	0	1	3.0
Havering College of Further and Higher Education*	125	61.0	0	9.9	80	71.6	1	0	16.8
Hereford College of Arts*	70	61.4	0	1.2	60	72.1	0	0	14.1
University of Hertfordshire	2,915	67.3	1	10.9	3,405	69.7	1	0	14.0
Heythrop College*	115	72.4	0	2.5	80	85.2	1	1	18.5
The University of Huddersfield	2,425	57.7	0	-3.1	2,760	81.0	1	1	21.3
The University of Hull	2,540	57.3	0	-7.1	2,465	71.4	1	1	7.8
Hull College*	210	57.7	0	-3.9	215	50.7	0	0	-7.2
Imperial College of Science, Technology and Medicine	1,240	84.6	0	2.5	1,175	92.8	1	0	5.5
University of Keele	1,090	67.9	0	4.4	1,390	77.0	1	0	10.9
The University of Kent	2,900	69.7	0	3.3	3,185	79.7	1	1	12.9
King's College London	2,100	80.5	0	4.1	2,475	87.2	1	1	8.6
Kingston University	3,100	61.9	0	6.8	3,140	71.2	1	1	17.5
Kirklees College*	25	52.0	0	-7.5	45	41.3	0	0	-13.3

Provider name	2010-11				2016-17				
	N	Observed (%)	Sector 2010-11 flag	Unexplained (pp)	N	Observed (%)	Sector 2010-11 flag	Provider 2010-11 flag	Unexplained (pp)
The University of Lancaster	2,035	76.7	0	-0.2	1,705	81.7	0	0	2.8
The University of Leeds	5,010	80.4	0	0.3	4,775	88.6	1	1	6.6
Leeds Arts University*	290	66.7	0	1.2	320	74.5	1	0	7.8
Leeds Beckett University	4,145	55.8	0	-6.9	4,020	67.7	1	1	7.7
Leeds College of Music*	195	88.3	1	19.1	235	78.9	1	0	17.2
Leeds Trinity University	535	44.7	-1	-18.0	715	78.8	1	1	18.6
The University of Leicester	1,975	74.1	0	3.5	2,090	83.1	1	1	11.2
University of Lincoln	2,120	58.1	0	-5.9	2,500	78.3	1	1	12.9
The University of Liverpool	2,525	75.0	0	0.4	2,855	87.3	1	1	11.6
Liverpool Hope University	990	65.3	0	3.5	830	65.9	0	0	5.4
The Liverpool Institute for Performing Arts*	160	85.4	1	16.9	140	83.5	1	0	17.1
Liverpool John Moores University	3,395	61.6	0	0.4	3,690	78.0	1	1	15.1
University College London	2,195	84.1	1	5.7	2,500	92.8	1	1	9.2
London Metropolitan University	1,825	55.1	0	1.8	1,610	53.9	0	0	5.6
The London School of Economics and Political Science	645	83.3	0	-0.5	755	90.7	0	1	4.5
London South Bank University	1,535	53.7	0	3.8	1,920	69.5	1	1	19.0
Loughborough College*	110	52.3	0	-7.6	165	49.4	0	0	-7.0
Loughborough University	2,690	73.0	0	0.8	2,640	86.1	1	1	8.5

Provider name	2010-11 N	2010-11 Observed (%)	2010-11 Sector 2010-11 flag	2010-11 Unexplained (pp)	2016-17 N	2016-17 Observed (%)	2016-17 Sector 2010-11 flag	2016-17 Provider 2010-11 flag	2016-17 Unexplained (pp)
The University of Manchester	5,210	75.5	0	-3.9	4,640	85.6	1	1	5.9
Manchester Metropolitan University	5,060	59.4	0	-1.4	5,845	71.2	1	1	10.2
Middlesex University	2,215	56.8	0	4.4	2,525	69.5	1	1	19.5
Moulton College*	35	62.9	0	8.3	55	69.6	0	0	14.6
New College Durham*	105	42.3	-1	-20.2	110	57.7	0	0	-5.4
University of Newcastle upon Tyne	2,855	77.8	0	-1.8	3,285	85.9	1	1	4.8
Newman University	490	48.2	0	-8.7	520	66.4	1	1	11.4
North East Surrey College of Technology (NESCOT)*	25	77.8	0	19.6	25	56.5	0	0	-4.0
University of Northampton, The	1,695	65.4	0	6.2	2,005	73.3	1	1	17.4
The Northern School of Art*	115	54.9	0	-7.3	165	63.2	0	0	4.2
University of Northumbria at Newcastle	3,435	64.7	0	-1.5	4,455	80.7	1	1	14.8
Norwich University of the Arts	400	62.8	0	-1.8	540	72.9	0	1	7.9
Nottingham Trent University	4,160	57.6	0	-4.4	5,345	74.0	1	1	11.3
University of Nottingham, The	4,025	78.7	0	-0.3	4,550	89.1	1	1	7.9
The School of Oriental and African Studies*	455	81.1	0	8.1	425	82.4	1	0	10.2
University of Oxford	2,535	92.3	1	5.0	2,370	94.6	1	0	5.5
Oxford Brookes University	1,990	73.0	0	3.2	2,240	78.9	1	1	10.7

Provider name	2010-11				2016-17				
	N	Observed (%)	Sector 2010-11 flag	Unexplained (pp)	N	Observed (%)	Sector 2010-11 flag	Provider 2010-11 flag	Unexplained (pp)
University of Plymouth	3,620	63.2	0	0.0	3,625	76.7	1	1	12.9
Plymouth College of Art*	155	59.2	0	-2.3	255	57.6	0	0	-2.6
University of Portsmouth	3,515	58.4	0	-3.8	3,600	80.1	1	1	19.6
Queen Mary University of London	2,050	63.3	0	-0.5	2,240	82.4	1	1	9.6
Ravensbourne University London*	280	60.9	0	1.0	490	66.1	1	0	8.9
The University of Reading	2,005	76.0	0	2.7	2,045	82.2	1	1	8.4
Roehampton University	1,475	55.5	0	-2.2	1,485	69.0	1	1	14.4
Rose Bruford College of Theatre and Performance*	170	76.3	0	12.1	145	85.0	1	0	18.7
The Royal Academy of Music*	40	90.0	1	31.9	45	93.3	1	0	14.7
The Royal Agricultural University	195	42.3	-1	-23.4	250	67.3	0	1	3.8
The Royal Central School of Speech and Drama	145	85.7	1	15.8	160	88.8	1	0	20.2
Royal College of Music	35	80.0	0	7.6	45	86.4	1	0	9.8
Royal Holloway and Bedford New College	1,460	76.4	0	1.6	1,435	84.5	1	1	11.1
Royal Northern College of Music	55	71.9	0	13.1	105	86.4	1	0	13.9
The Royal Veterinary College	70	75.0	0	-1.1	90	74.2	0	0	-1.2
University of Salford, The	2,540	58.2	0	-1.8	2,990	69.8	1	1	11.8

Provider name	2010-11				2016-17				
	N	Observed (%)	Sector 2010-11 flag	Unexplained (pp)	N	Observed (%)	Sector 2010-11 flag	Provider 2010-11 flag	Unexplained (pp)
The University of Sheffield	3,450	78.5	0	0.0	3,560	86.9	1	1	5.1
Sheffield Hallam University	4,450	67.8	0	5.2	5,435	78.0	1	1	16.3
Solent University	2,030	50.5	-1	-9.6	1,980	71.6	1	1	15.5
University of Southampton	2,970	80.4	0	2.3	3,195	85.9	1	1	8.6
Sparsholt College*	60	58.3	0	-0.6	65	68.8	0	0	8.1
University of St Mark & St John	550	50.5	0	-9.2	485	64.9	0	1	7.4
St Mary's University, Twickenham	715	54.3	0	-6.2	965	72.7	1	1	15.4
St. George's Hospital Medical School	290	59.9	0	-3.8	395	78.4	1	1	9.4
Staffordshire University	1,800	54.2	0	-6.4	2,015	65.8	1	1	11.2
University of Suffolk*	560	46.3	-1	-16.4	755	66.7	0	1	5.1
University of Sunderland	1,630	56.4	0	-4.3	1,845	70.2	1	1	10.0
The University of Surrey	1,510	75.1	0	5.7	1,855	90.3	1	1	16.2
University of Sussex	1,845	81.8	1	6.5	1,890	86.3	1	0	10.8
Teesside University	1,615	55.4	0	-4.9	2,210	69.0	1	1	10.6
The Trafford College Group*	120	53.4	0	-7.6	90	56.2	0	0	-2.4
Trinity Laban Conservatoire of Music and Dance*	135	80.6	0	12.9	130	88.5	1	0	17.1
The University of Warwick	2,315	83.6	0	0.1	2,380	87.3	0	0	3.3
Warwickshire College*	40	68.3	0	2.0	100	53.9	0	0	-5.4

Provider name	2010-11				2016-17				
	N	Observed (%)	Sector 2010-11 flag	Unexplained (pp)	N	Observed (%)	Sector 2010-11 flag	Provider 2010-11 flag	Unexplained (pp)
The University of West London	1,025	51.8	0	-3.7	1,525	72.6	1	1	21.6
University of the West of England, Bristol	3,770	67.9	0	3.9	3,820	80.5	1	1	16.9
The University of Westminster	2,140	62.9	0	6.1	2,560	77.5	1	1	20.4
Wiltshire College and University Centre*	15	46.2	0	-16.3	45	65.9	0	0	5.8
University of Winchester	1,085	65.0	0	-0.9	1,590	78.1	1	1	13.0
University of Wolverhampton	2,070	55.6	0	1.6	2,555	68.7	1	1	17.8
University of Worcester	1,085	59.2	0	-3.4	1,530	70.2	1	1	8.2
Writtle University College*	125	48.0	-1	-12.3	150	54.4	0	0	-4.1
University of York	2,065	77.2	0	-2.8	2,770	82.8	0	1	2.6
York College*	30	56.3	0	-5.7	65	74.2	0	0	13.8
York St John University	1,030	59.1	0	-7.1	1,350	68.7	0	1	3.0

Note: * indicates the provider did not have degree awarding powers in 2010.

Table A2: Provider-level results for first class degrees in academic years 2010-11 and 2016-17

Provider name	2010-11				2016-17				
	N	Observed (%)	Sector 2010-11 flag	Unexplained (pp)	N	Observed (%)	Sector 2010-11 flag	Provider 2010-11 flag	Unexplained (pp)
Accrington and Rossendale College*	10	18.2	0	7.9	35	27.8	1	0	12.1
Anglia Ruskin University Higher Corporation	1,940	14.4	0	1.2	3,220	32.0	1	1	20.9
Arts University Bournemouth, the	610	11.8	0	-3.9	735	21.3	0	1	6.2
University of the Arts, London	2,095	17.8	0	2.9	2,205	23.6	1	1	8.9
Askham Bryan College*	35	9.1	0	-7.3	45	19.6	0	0	5.0
Aston University	1,285	17.8	0	0.6	1,630	32.4	1	1	17.2
The University of Bath	1,495	27.3	0	-3.5	1,945	34.6	0	0	-2.2
Bath Spa University	1,195	9.9	0	-4.0	1,335	15.2	0	1	2.1
University of Bedfordshire	1,475	8.9	0	-1.8	1,845	22.5	1	1	13.5
The University of Birmingham	3,890	16.9	0	-4.7	4,300	32.0	1	1	7.3
University College Birmingham	460	11.3	0	-1.6	570	36.8	1	1	26.9
Birmingham City University	2,800	18.5	1	6.6	4,015	27.6	1	1	16.8
Bishop Burton College*	60	8.3	0	-1.4	110	10.0	0	0	-2.9
Bishop Grosseteste University	430	8.6	0	-4.3	560	15.5	0	1	3.9
Blackburn College*	270	14.0	0	1.5	345	13.6	0	0	2.4

Provider name	2010-11				2016-17				
	N	Observed (%)	Sector 2010-11 flag	Unexplained (pp)	N	Observed (%)	Sector 2010-11 flag	Provider 2010-11 flag	Unexplained (pp)
Blackpool and the Fylde College*	245	19.8	0	4.8	440	23.5	1	0	10.6
The University of Bolton	625	11.6	0	-2.3	700	17.9	1	1	6.4
Bournemouth University	2,230	11.0	0	-4.3	2,740	22.7	1	1	7.3
The University of Bradford	1,260	10.6	0	-0.3	1,420	30.9	1	1	20.6
Bradford College*	315	10.5	0	-0.1	380	14.6	1	0	4.9
University of Brighton	2,530	15.1	0	0.9	3,150	21.6	1	1	8.0
University of Bristol	2,490	23.9	-1	-9.6	3,255	32.2	0	1	-2.1
Brunel University London	2,225	17.5	1	5.6	1,735	26.4	1	1	13.5
The University of Buckingham	80	16.5	0	9.1	135	26.9	1	0	18.0
Buckinghamshire New University	890	12.4	0	0.2	1,425	16.6	1	1	5.8
University of Cambridge	2,205	26.0	-1	-10.9	1,915	34.2	0	1	-3.3
Canterbury Christ Church University	1,795	14.9	0	2.6	2,565	20.1	1	1	9.3
University of Central Lancashire	3,430	10.5	0	-2.6	3,355	29.9	1	1	18.2
University of Chester	1,330	11.1	0	-1.5	1,990	20.9	1	1	8.9
The University of Chichester	890	7.9	0	-3.1	1,125	15.6	1	1	5.4
City, University of London	1,255	14.3	0	0.4	1,505	18.8	1	0	5.0
The Conservatoire for Dance and Drama*	115	31.0	1	19.0	140	39.9	1	0	26.1

Provider name	2010-11 N	2010-11 Observed (%)	2010-11 Sector 2010-11 flag	2010-11 Unexplained (pp)	2016-17 N	2016-17 Observed (%)	2016-17 Sector 2010-11 flag	2016-17 Provider 2010-11 flag	2016-17 Unexplained (pp)
Courtauld Institute of Art*	45	17.0	0	-6.2	45	32.6	0	0	8.3
Coventry University	2,330	18.9	1	7.2	3,425	30.6	1	1	19.9
University for the Creative Arts	1,025	9.3	0	-3.8	1,025	29.0	1	1	18.7
The University of Cumbria	1,235	13.4	0	0.0	1,265	16.0	1	0	4.5
De Montfort University	2,790	11.6	0	0.8	3,325	25.8	1	1	15.8
University of Derby	2,225	10.0	0	-2.2	2,385	26.0	1	1	14.8
DN Colleges Group*	155	14.0	0	2.8	245	17.5	0	0	5.2
University of Durham	2,675	18.3	-1	-14.8	2,810	32.4	0	1	-2.1
The University of East Anglia	2,235	13.4	0	-5.2	1,885	38.9	1	1	19.3
University of East London	1,920	11.8	0	2.0	2,070	24.2	1	1	16.2
Edge Hill University	1,915	14.9	0	2.7	2,790	28.1	1	1	16.0
The University of Essex	1,650	14.3	0	1.8	1,630	31.1	1	1	19.9
University of Exeter	2,780	20.0	0	-4.5	3,685	27.9	0	0	0.3
Falmouth University	730	14.8	0	0.8	1,180	21.0	1	0	6.4
Farnborough College of Technology*	85	20.5	0	5.3	115	12.2	0	0	0.4
Gateshead College*	20	28.6	0	17.1	40	23.7	1	0	12.7
University of Gloucestershire	1,175	18.2	1	5.8	1,395	25.8	1	1	13.6
Goldsmiths' College	1,080	12.9	0	0.0	1,120	23.3	1	1	9.5
Greater Brighton Metropolitan College*	170	21.8	0	9.3	175	21.8	1	0	9.3

Provider name	2010-11 N	2010-11 Observed (%)	2010-11 Sector 2010-11 flag	2010-11 Unexplained (pp)	2016-17 N	2016-17 Observed (%)	2016-17 Sector 2010-11 flag	2016-17 Provider 2010-11 flag	2016-17 Unexplained (pp)
University of Greenwich	2,460	15.4	0	3.3	2,980	33.8	1	1	22.1
Grimsby Institute of Further and Higher Education*	195	8.3	0	-5.8	270	18.2	0	1	3.9
Guildhall School of Music & Drama*	90	25.6	0	13.5	95	38.9	1	0	21.3
Harper Adams University	210	12.9	0	-4.0	345	19.9	0	1	3.0
Havering College of Further and Higher Education*	125	25.2	1	15.5	80	19.8	1	0	9.3
Hereford College of Arts*	70	24.3	0	12.5	60	21.3	1	0	10.3
University of Hertfordshire	2,915	18.8	1	7.7	3,405	24.3	1	0	13.4
Heythrop College*	115	7.8	0	-3.1	80	18.5	1	1	9.5
The University of Huddersfield	2,425	15.0	0	2.0	2,760	37.9	1	1	25.9
The University of Hull	2,540	9.7	0	-3.2	2,465	21.8	1	1	8.9
Hull College*	210	14.9	0	1.8	215	18.3	0	0	7.0
Imperial College of Science, Technology and Medicine	1,240	30.4	0	-7.6	1,175	42.8	0	0	-0.5
University of Keele	1,090	16.8	0	4.2	1,390	24.6	1	0	10.1
The University of Kent	2,900	16.1	0	3.0	3,185	26.3	1	1	12.8
King's College London	2,100	24.3	0	0.9	2,475	32.9	1	0	7.2
Kingston University	3,100	14.6	0	3.6	3,140	27.0	1	1	16.5
Kirklees College*	25	12.0	0	-2.5	45	19.6	1	0	10.3

Provider name	2010-11				2016-17				
	N	Observed (%)	Sector 2010-11 flag	Unexplained (pp)	N	Observed (%)	Sector 2010-11 flag	Provider 2010-11 flag	Unexplained (pp)
The University of Lancaster	2,035	16.8	0	-3.5	1,705	29.2	0	1	4.5
The University of Leeds	5,010	17.7	0	-5.6	4,775	31.8	0	1	5.1
Leeds Arts University*	290	19.1	0	5.7	320	27.1	1	0	13.3
Leeds Beckett University	4,145	10.2	0	-2.9	4,020	19.3	1	1	8.3
Leeds College of Music*	195	27.0	1	11.6	235	16.5	1	0	4.9
Leeds Trinity University	535	7.7	0	-3.0	715	24.7	1	1	15.1
The University of Leicester	1,975	15.2	0	0.4	2,090	25.3	1	1	9.0
University of Lincoln	2,120	11.3	0	-1.1	2,500	22.9	1	1	10.2
The University of Liverpool	2,525	14.8	0	-4.2	2,855	31.5	1	1	11.8
Liverpool Hope University	990	16.4	0	5.2	830	17.4	1	0	7.3
The Liverpool Institute for Performing Arts*	160	14.6	0	-2.2	140	32.4	1	1	17.0
Liverpool John Moores University	3,395	13.3	0	1.4	3,690	26.5	1	1	13.9
University College London	2,195	24.4	0	-2.0	2,500	38.5	0	1	6.5
London Metropolitan University	1,825	13.3	0	2.2	1,610	18.0	1	1	9.0
The London School of Economics and Political Science	645	18.6	-1	-9.3	755	26.2	0	0	-3.1
London South Bank University	1,535	12.0	0	1.1	1,920	27.9	1	1	17.7
Loughborough College*	110	8.3	-1	-6.2	165	9.8	0	0	-3.5
Loughborough University	2,690	17.1	0	-4.0	2,640	27.4	0	1	2.8

Provider name	2010-11 N	2010-11 Observed (%)	2010-11 Sector 2010-11 flag	2010-11 Unexplained (pp)	2016-17 N	2016-17 Observed (%)	2016-17 Sector 2010-11 flag	2016-17 Provider 2010-11 flag	2016-17 Unexplained (pp)
The University of Manchester	5,210	17.9	-1	-7.0	4,640	31.9	0	1	6.8
Manchester Metropolitan University	5,060	14.5	0	2.0	5,845	27.7	1	1	15.7
Middlesex University	2,215	14.5	1	4.1	2,525	24.4	1	1	15.3
Moulton College*	35	11.4	0	-1.1	55	23.2	1	0	9.9
New College Durham*	105	9.6	0	-6.4	110	22.5	0	1	7.1
University of Newcastle upon Tyne	2,855	18.8	0	-5.2	3,285	25.7	0	0	0.5
Newman University	490	7.2	0	-2.7	520	19.0	1	1	10.3
North East Surrey College of Technology (NESCOT)*	25	29.6	0	12.5	25	26.1	0	0	7.9
University of Northampton, The	1,695	16.7	0	4.4	2,005	24.2	1	1	13.6
The Northern School of Art*	115	24.8	0	12.9	165	23.9	1	0	13.9
University of Northumbria at Newcastle	3,435	16.0	0	2.2	4,455	31.5	1	1	17.0
Norwich University of the Arts	400	18.6	0	3.8	540	33.0	1	1	19.9
Nottingham Trent University	4,160	9.7	0	-2.3	5,345	22.9	1	1	11.3
University of Nottingham, The	4,025	17.9	-1	-6.2	4,550	33.2	0	1	6.9
The School of Oriental and African Studies*	455	16.3	0	1.9	425	22.8	1	1	9.1
University of Oxford	2,535	28.6	-1	-7.8	2,370	33.9	0	0	-3.1
Oxford Brookes University	1,990	16.5	0	0.9	2,240	23.9	1	1	8.8

Provider name	2010-11				2016-17				
	N	Observed (%)	Sector 2010-11 flag	Unexplained (pp)	N	Observed (%)	Sector 2010-11 flag	Provider 2010-11 flag	Unexplained (pp)
University of Plymouth	3,620	13.4	0	-1.0	3,625	27.1	1	1	12.8
Plymouth College of Art*	155	22.3	0	7.5	255	19.2	1	0	7.5
University of Portsmouth	3,515	10.6	0	-2.3	3,600	28.1	1	1	16.2
Queen Mary University of London	2,050	15.3	0	1.2	2,240	30.9	1	1	12.0
Ravensbourne University London*	280	16.5	0	2.7	490	19.1	1	1	8.8
The University of Reading	2,005	17.8	0	-0.5	2,045	27.4	1	1	9.2
Roehampton University	1,475	7.9	0	-2.2	1,485	15.0	1	1	6.5
Rose Bruford College of Theatre and Performance*	170	17.2	0	3.7	145	29.3	1	1	14.9
The Royal Academy of Music*	40	57.5	1	45.9	45	73.3	1	0	49.8
The Royal Agricultural University	195	7.7	0	-7.3	250	16.7	0	1	2.4
The Royal Central School of Speech and Drama	145	17.0	0	-0.4	160	31.3	1	1	14.5
Royal College of Music	35	31.4	0	12.1	45	45.5	1	0	24.2
Royal Holloway and Bedford New College	1,460	17.3	0	-1.4	1,435	24.8	1	1	8.3
Royal Northern College of Music	55	28.1	0	16.3	105	37.9	1	0	21.4
The Royal Veterinary College	70	26.5	0	1.9	90	22.5	0	0	-2.1
University of Salford, The	2,540	16.7	0	3.9	2,990	30.0	1	1	17.7

Provider name	2010-11				2016-17				
	N	Observed (%)	Sector 2010-11 flag	Unexplained (pp)	N	Observed (%)	Sector 2010-11 flag	Provider 2010-11 flag	Unexplained (pp)
The University of Sheffield	3,450	18.2	0	-4.8	3,560	26.5	0	0	0.4
Sheffield Hallam University	4,450	15.5	0	3.1	5,435	29.4	1	1	16.8
Solent University	2,030	8.3	0	-3.1	1,980	25.2	1	1	15.3
University of Southampton	2,970	19.8	0	-4.6	3,195	28.8	0	1	4.9
Sparsholt College*	60	15.0	0	1.5	65	17.2	0	0	3.2
University of St Mark & St John	550	11.1	0	-0.6	485	17.5	1	1	7.4
St Mary's University, Twickenham	715	9.9	0	-0.5	965	21.8	1	1	12.4
St. George's Hospital Medical School	290	9.6	-1	-8.3	395	22.6	0	1	2.9
Staffordshire University	1,800	13.7	0	-0.3	2,015	27.0	1	1	15.4
University of Suffolk*	560	8.0	0	-5.5	755	18.6	0	1	5.2
University of Sunderland	1,630	13.2	0	1.5	1,845	21.3	1	1	10.1
The University of Surrey	1,510	22.9	0	4.9	1,855	50.1	1	1	27.3
University of Sussex	1,845	17.9	0	-0.3	1,890	31.1	1	1	12.4
Teesside University	1,615	14.5	0	0.9	2,210	25.9	1	1	12.8
The Trafford College Group*	120	13.6	0	1.1	90	19.1	0	0	7.5
Trinity Laban Conservatoire of Music and Dance*	135	29.9	0	13.5	130	32.3	1	0	15.1
The University of Warwick	2,315	27.3	0	-4.0	2,380	30.6	0	0	-0.4
Warwickshire College*	40	4.9	0	-9.1	100	12.7	0	0	-0.9

Provider name	2010-11				2016-17				
	N	Observed (%)	Sector 2010-11 flag	Unexplained (pp)	N	Observed (%)	Sector 2010-11 flag	Provider 2010-11 flag	Unexplained (pp)
The University of West London	1,025	12.4	0	0.5	1,525	31.3	1	1	21.5
University of the West of England, Bristol	3,770	18.2	0	4.3	3,820	26.1	1	1	12.4
The University of Westminster	2,140	12.1	0	1.4	2,560	25.0	1	1	15.2
Wiltshire College and University Centre*	15	15.4	0	3.1	45	18.2	0	0	2.7
University of Winchester	1,085	8.4	0	-2.9	1,590	18.3	1	1	7.1
University of Wolverhampton	2,070	10.8	0	0.3	2,555	29.0	1	1	19.9
University of Worcester	1,085	12.8	0	-0.1	1,530	20.5	1	1	7.7
Writtle University College*	125	15.2	0	0.9	150	10.1	0	0	-2.4
University of York	2,065	20.5	0	-4.0	2,770	26.6	0	0	2.0
York College*	30	25.0	0	11.8	65	39.4	1	0	26.2
York St John University	1,030	10.9	0	-1.8	1,350	18.5	1	1	7.0

Note: * indicates the provider did not have degree awarding powers in 2010.

Annex B: Graduate population change between 2010-11 and 2016-17

1. This annex provides details of how the composition of the graduate population registered at higher education providers considered in this report and the population registered at all providers has changed between 2010-11 and 2016-17, broken down in terms of the graduate characteristics included in the statistical modelling.

2. Table B1 presents a breakdown of the graduate population registered at the providers considered in this report, meaning those providers awarding at least 10 classified honours degrees to the specified graduate population in each of the seven years considered in this analysis.

3. Table B2 presents a breakdown of the graduate population registered at all providers, meaning those providers awarding any number of classified honours degrees to the specified graduate population in any year. This demonstrates that the graduate population registered at the providers considered in this report is broadly representative of the overall graduate population.

Table B1: Changes in characteristics of the graduate population registered at providers considered in this report for academic years from 2010-11 to 2016-17 inclusive

Characteristic		2010-11		2011-12		2012-13		2013-14		2014-15		2015-16		2016-17	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
Subject	Agriculture and related subjects	1,740	1	1,905	1	2,025	1	2,205	1	1,945	1	2,020	1	2,025	1
	Architecture, building and planning	4,940	2	4,805	2	4,705	2	4,540	2	3,695	2	3,590	2	3,530	1
	Biological sciences	23,090	11	24,795	11	26,725	11	29,505	12	26,225	12	28,030	12	29,070	12
	Business and administrative studies	25,690	12	27,800	12	28,560	12	29,700	12	25,830	11	26,610	11	28,855	12
	Combined	690	0	995	0	860	0	745	0	485	0	420	0	465	0
	Computer science	7,965	4	8,505	4	9,035	4	9,355	4	8,780	4	8,710	4	9,720	4
	Creative arts and design	29,765	14	31,365	14	31,590	13	33,160	13	28,285	12	28,560	12	29,585	12
	Education	10,790	5	11,735	5	11,815	5	12,535	5	12,410	5	12,530	5	12,540	5
	Engineering and technology	9,905	5	10,215	4	10,640	4	11,225	4	10,790	5	10,670	5	11,280	5
	Historical and philosophical studies	11,605	5	12,100	5	12,290	5	12,840	5	10,920	5	11,715	5	11,730	5
	Languages	15,460	7	16,390	7	16,410	7	16,900	7	15,425	7	14,610	6	14,640	6
	Law	10,020	5	10,075	4	9,915	4	9,955	4	8,945	4	9,315	4	9,275	4
	Mass communications and documentation	7,880	4	8,460	4	8,315	4	8,665	3	7,140	3	7,315	3	7,390	3
	Mathematical sciences	4,380	2	4,630	2	5,280	2	5,365	2	5,065	2	5,100	2	5,315	2
	Medicine and dentistry	1,135	1	1,025	0	1,105	0	720	0	1,145	1	1,065	0	1,315	1
	Physical sciences	9,905	5	10,340	5	10,890	5	11,640	5	11,055	5	11,140	5	11,685	5
	Social studies	23,390	11	24,780	11	25,965	11	28,230	11	23,690	10	25,620	11	26,580	11

Characteristic		2010-11		2011-12		2012-13		2013-14		2014-15		2015-16		2016-17	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
	Subjects allied to medicine	17,150	8	18,925	8	21,225	9	23,615	9	25,540	11	27,010	12	29,490	12
Entry qualifications	AAA and above	21,875	10	24,205	11	26,645	11	28,505	11	26,955	12	25,580	11	25,450	10
	AAB	13,510	6	14,905	7	16,745	7	18,720	7	16,795	7	16,825	7	16,890	7
	AAC	2,375	1	2,535	1	2,800	1	3,065	1	2,645	1	2,680	1	2,815	1
	ABB	11,810	5	13,005	6	14,625	6	16,230	6	14,615	6	15,135	6	15,295	6
	ABC	7,775	4	8,450	4	9,195	4	10,155	4	8,835	4	9,240	4	9,660	4
	ACC	3,700	2	4,050	2	4,390	2	4,770	2	4,090	2	4,240	2	4,340	2
	BBB	6,510	3	7,060	3	7,920	3	8,665	3	7,995	4	8,230	4	8,190	3
	BBC	9,975	5	10,645	5	11,420	5	12,670	5	11,135	5	11,840	5	11,975	5
	BCC	12,830	6	13,845	6	14,795	6	16,600	7	14,085	6	14,865	6	14,900	6
	CCC	11,225	5	12,255	5	13,090	6	14,620	6	12,420	5	12,760	5	13,115	5
	CCD	8,900	4	9,800	4	10,245	4	10,715	4	9,385	4	9,625	4	9,795	4
	Below CCD	14,705	7	15,875	7	14,885	6	14,625	6	12,540	6	12,705	5	13,670	6
	DDD and above	1,015	0	2,215	1	5,455	2	9,780	4	12,250	5	14,715	6	17,265	7
	DDM	685	0	940	0	1,915	1	2,955	1	3,405	1	3,770	2	4,125	2
	DMM	310	0	720	0	1,645	1	2,680	1	3,010	1	3,290	1	3,510	1
	MMM and below	1,345	1	1,950	1	3,380	1	4,405	2	4,825	2	5,330	2	5,595	2
	2 A-levels 1 BTEC	230	0	445	0	1,050	0	2,000	1	3,470	2	4,945	2	6,235	3
	1 A-level 2 BTECs	170	0	350	0	765	0	1,370	1	2,180	1	2,635	1	3,430	1
	International Baccalaureate	1,715	1	2,045	1	2,160	1	2,490	1	2,430	1	2,300	1	2,360	1
	Other Level 3	26,345	12	28,835	13	30,235	13	31,475	13	27,950	12	31,195	13	35,080	14

Characteristic		2010-11		2011-12		2012-13		2013-14		2014-15		2015-16		2016-17	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
	No Level 3 equivalent	58,510	27	54,715	24	43,975	19	34,420	14	26,355	12	22,105	9	20,805	9
Age	Mature	42,855	20	46,305	20	46,510	20	47,320	19	43,615	19	44,470	19	46,760	19
	Young	172,650	80	182,540	80	190,835	80	203,580	81	183,755	81	189,550	81	197,735	81
Disability	Disability	22,355	10	24,615	11	27,685	12	31,630	13	30,615	13	33,055	14	36,300	15
	No disability	193,150	90	204,230	89	209,660	88	219,275	87	196,760	87	200,965	86	208,195	85
Gender	Female	122,930	57	130,345	57	134,275	57	142,895	57	131,065	58	136,100	58	141,915	58
	Male	92,575	43	98,500	43	103,045	43	107,990	43	96,285	42	97,890	42	102,530	42
	Other	-	-	-	-	25	0	20	0	25	0	35	0	50	0
Ethnicity	Asian	23,405	11	24,475	11	25,870	11	27,225	11	26,015	11	27,610	12	29,375	12
	Black	12,290	6	13,775	6	14,995	6	16,045	6	16,040	7	16,950	7	17,770	7
	Other	9,365	4	10,385	5	11,100	5	12,235	5	11,560	5	12,685	5	13,630	6
	Unknown	5,185	2	4,740	2	4,680	2	4,430	2	4,430	2	3,505	1	3,760	2
	White	165,260	77	175,470	77	180,700	76	190,970	76	169,335	74	173,275	74	179,960	74
POLAR	Quintile 1	21,745	10	23,540	10	24,670	10	26,755	11	25,260	11	26,670	11	28,400	12
	Quintile 2	32,020	15	34,410	15	35,755	15	37,750	15	34,890	15	36,335	16	38,330	16
	Quintile 3	39,840	18	42,755	19	44,275	19	46,855	19	42,625	19	44,370	19	46,170	19
	Quintile 4	50,250	23	53,585	23	55,475	23	58,405	23	52,550	23	54,010	23	56,230	23
	Quintile 5	70,445	33	73,615	32	76,315	32	80,490	32	71,550	31	72,210	31	74,840	31
	Unknown	1,200	1	940	0	855	0	645	0	500	0	425	0	535	0

Note: 'POLAR' = the Participation of Local Areas measure.

Table B2: Changes in characteristics of the graduate population attending all providers for academic years from 2010-11 to 2016-17 inclusive

Characteristic		2010-11		2011-12		2012-13		2013-14		2014-15		2015-16		2016-17	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
Subject	Agriculture and related subjects	1,740	1	1,910	1	2,035	1	2,250	1	1,975	1	2,070	1	2,190	1
	Architecture, building and planning	4,940	2	4,820	2	4,735	2	4,570	2	3,720	2	3,595	1	3,540	1
	Biological sciences	23,125	11	24,835	11	26,800	11	29,615	12	26,415	11	28,340	12	29,535	12
	Business and administrative studies	25,770	12	27,935	12	29,005	12	30,450	12	27,065	12	28,615	12	31,020	12
	Combined	690	0	1,005	0	860	0	745	0	495	0	425	0	465	0
	Computer science	7,975	4	8,515	4	9,115	4	9,455	4	8,970	4	8,985	4	10,020	4
	Creative arts and design	30,060	14	31,535	14	31,835	13	33,600	13	29,950	13	30,690	13	32,040	13
	Education	10,825	5	11,735	5	11,820	5	12,590	5	12,610	5	12,815	5	12,900	5
	Engineering and technology	9,905	5	10,225	4	10,660	4	11,265	4	10,865	5	10,840	4	11,530	5
	Historical and philosophical studies	11,605	5	12,100	5	12,300	5	12,895	5	11,185	5	12,110	5	12,155	5
	Languages	15,460	7	16,390	7	16,410	7	16,905	7	15,465	7	14,685	6	14,720	6
	Law	10,030	5	10,075	4	9,925	4	10,210	4	9,345	4	9,775	4	9,735	4
	Mass communications and documentation	7,890	4	8,470	4	8,320	3	8,675	3	7,185	3	7,395	3	7,525	3
	Mathematical sciences	4,380	2	4,630	2	5,280	2	5,365	2	5,065	2	5,100	2	5,315	2
	Medicine and dentistry	1,135	1	1,025	0	1,105	0	720	0	1,145	0	1,065	0	1,320	1
	Physical sciences	9,910	5	10,340	5	10,890	5	11,645	5	11,065	5	11,155	5	11,705	5
	Social studies	23,440	11	24,835	11	26,070	11	28,340	11	23,965	10	26,100	11	27,160	11

Characteristic		2010-11		2011-12		2012-13		2013-14		2014-15		2015-16		2016-17	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
	Subjects allied to medicine	17,180	8	18,940	8	21,260	9	23,715	9	25,770	11	27,430	11	29,885	12
Entry	AAA and above	21,875	10	24,205	11	26,645	11	28,525	11	27,005	12	25,620	11	25,495	10
Qualifications	AAB	13,515	6	14,905	6	16,745	7	18,745	7	16,855	7	16,890	7	16,945	7
	AAC	2,380	1	2,535	1	2,800	1	3,070	1	2,660	1	2,695	1	2,830	1
	ABB	11,815	5	13,005	6	14,630	6	16,270	6	14,680	6	15,215	6	15,385	6
	ABC	7,775	4	8,450	4	9,205	4	10,170	4	8,900	4	9,315	4	9,745	4
	ACC	3,705	2	4,055	2	4,390	2	4,785	2	4,115	2	4,275	2	4,385	2
	BBB	6,515	3	7,065	3	7,925	3	8,695	3	8,035	3	8,280	3	8,260	3
	BBC	9,980	5	10,645	5	11,425	5	12,695	5	11,200	5	11,945	5	12,080	5
	BCC	12,840	6	13,850	6	14,805	6	16,635	7	14,190	6	15,005	6	15,090	6
	CCC	11,235	5	12,265	5	13,100	5	14,665	6	12,520	5	12,905	5	13,325	5
	CCD	8,915	4	9,815	4	10,265	4	10,760	4	9,475	4	9,770	4	9,995	4
	Below CCD	14,725	7	15,915	7	14,940	6	14,715	6	12,740	5	12,990	5	14,000	6
	DDD and above	1,045	0	2,235	1	5,525	2	9,880	4	12,530	5	15,190	6	17,885	7
	DDM	710	0	955	0	1,945	1	3,000	1	3,490	2	3,925	2	4,295	2
	DMM	315	0	730	0	1,665	1	2,720	1	3,095	1	3,435	1	3,675	1
	MMM and below	1,380	1	1,975	1	3,445	1	4,525	2	5,075	2	5,770	2	6,185	2
	2 A-levels 1 BTEC	230	0	450	0	1,060	0	2,020	1	3,520	2	5,005	2	6,370	3
	1 A-level 2 BTECs	170	0	355	0	770	0	1,390	1	2,205	1	2,665	1	3,495	1
	IB	1,715	1	2,045	1	2,165	1	2,495	1	2,450	1	2,330	1	2,400	1
	Other Level 3	26,550	12	29,000	13	30,520	13	31,835	13	29,040	13	33,115	14	37,260	15
	No level 3 equivalent	58,660	27	54,855	24	44,455	19	35,420	14	28,480	12	24,855	10	23,660	9
Age	Mature	43,210	20	46,635	20	47,315	20	48,580	19	46,320	20	48,725	20	51,680	20

Characteristic		2010-11		2011-12		2012-13		2013-14		2014-15		2015-16		2016-17	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
	Young	172,840	80	182,675	80	191,115	80	204,415	81	185,930	80	192,470	80	201,080	80
Disability	Disability	22,440	10	24,655	11	27,780	12	31,870	13	31,230	13	34,015	14	37,510	15
	No disability	193,610	90	204,655	89	210,650	88	221,140	87	201,020	87	207,180	86	215,250	85
Gender	Female	123,285	57	130,630	57	134,855	57	144,060	57	133,585	58	139,850	58	146,405	58
	Male	92,765	43	98,685	43	103,550	43	108,935	43	98,640	42	101,275	42	106,280	42
	Other	-	-	-	-	25	0	20	0	25	0	70	0	80	0
Ethnicity	Asian	23,425	11	24,490	11	25,895	11	27,315	11	26,370	11	28,200	12	30,040	12
	Black	12,360	6	13,785	6	15,040	6	16,180	6	16,680	7	18,165	8	19,240	8
	Other	9,400	4	10,400	5	11,120	5	12,295	5	11,820	5	13,135	5	14,165	6
	Unknown	5,195	2	4,745	2	4,970	2	5,340	2	5,150	2	4,005	2	4,075	2
	White	165,675	77	175,895	77	181,400	76	191,880	76	172,230	74	177,690	74	185,245	73
POLAR	Quintile 1	21,830	10	23,625	10	24,835	10	26,995	11	25,820	11	27,480	11	29,475	12
	Quintile 2	32,120	15	34,510	15	35,925	15	37,985	15	35,600	15	37,380	15	39,620	16
	Quintile 3	39,940	18	42,870	19	44,440	19	47,100	19	43,595	19	45,720	19	47,765	19
	Quintile 4	50,380	23	53,660	23	55,615	23	58,680	23	53,815	23	55,915	23	58,330	23
	Quintile 5	70,575	33	73,695	32	76,475	32	80,740	32	72,905	31	74,220	31	77,010	30
	Unknown	1,205	1	945	0	1,140	0	1,510	1	520	0	480	0	565	0

Note: ‘POLAR’ = the Participation of Local Areas measure.

Annex C: Methodology for the statistical modelling of graduate degree attainment

1. This annex outlines the methodology used in modelling first or upper second class degree and first class degree attainment.

2. Fixed effects and mixed effects logistic regression modelling were employed to investigate whether or not the observed changes in graduate attainment at the sector-level and provider-level with time can be explained by changes in characteristics of the graduate population.

3. The model used to investigate degree attainment changes with time at the sector level includes explanatory variables relating to the provider at which the graduate was registered, graduation year and various key graduate characteristics. The effects of the following were included as explanatory variables in the modelling:

    - provider at which the graduate was registered
    - academic year of graduation
    - subject studied
    - age on entry into higher education
    - entry qualifications of graduate held at time of entry into higher education
    - disability status
    - ethnicity
    - gender
    - Participation of Local Areas (POLAR) quintile.

4. The model allows us to predict the proportion of graduates awarded a first or an upper second class degree, or a first class degree, based on the effect of these explanatory variables.

5. To investigate and isolate the effect of graduation year on degree attainment the following methodology was applied:

    a. The logistic regression model, constructed and optimised using the variables outlined in paragraph 3, provides the probability of an individual with given characteristics attaining an first or upper second class degree, or a first class degree.

    b. The predicted probability of a given group of individuals (e.g. white women graduating in 2011-12) may then be determined by taking the mean of the predicted probabilities of the individuals in that group.

    c. To investigate the effect of graduation year on degree classification attainment, the model is applied to the entire reported graduate population, but with the academic year of graduation for all graduates in the population changed to 2010-11.

d. The observed value for the proportion of graduates attaining a first or upper second class degree, or a first class degree, in each academic year is then compared with the model's predicted value for the same graduates had they graduated in 2010-11.

e. Any differences between the predicted and observed values is said to be 'unexplained', and a result of unobserved effects between academic years not directly accounted for in the model.

6. In summary, we are interested in the **unexplained difference** in the proportion of graduates attaining a first or upper second class degree, or a first class degree, had they graduated in 2010-11, compared with the actual year of their graduation.

Annex D: Details of the modelling of graduate attainment at the sector level

1. This annex details the technique used in modelling the attainment of first or upper second class degrees and first class degrees at the sector-level.

2. Fixed effects logistic regression has been used to model the probability of a graduate attaining a first or an upper second class degree, or a first class degree, while accounting for the effect of the factors outlined in Annex C.

3. The model is represented by Equation D1.

Equation D1: Fixed effects logistic regression model for modelling graduate degree attainment at the sector-level.

$$\boldsymbol{first\ or\ upper\ second\ class\ OR\ first\ class} \sim \boldsymbol{Binomial}(\boldsymbol{const_i}, \boldsymbol{\pi_i})$$

$$\begin{aligned}\boldsymbol{logit}(\boldsymbol{\pi_i}) = {} & \boldsymbol{\beta_0} + \boldsymbol{\beta_1 Provider} + \boldsymbol{\beta_2 Year} + \boldsymbol{\beta_3 Provider} * \boldsymbol{Year} + \boldsymbol{\beta_4 Subject} + \boldsymbol{\beta_5 EntryQuals} \\ & + \boldsymbol{\beta_6 Age} + \boldsymbol{\beta_7 EntryQuals} * \boldsymbol{Age} + \boldsymbol{\beta_8 Disability} + \boldsymbol{\beta_9 Gender} + \boldsymbol{\beta_{10} Ethnicity} \\ & + \boldsymbol{\beta_{11} POLAR}\end{aligned}$$

The variables used in the model are given in Table D1, and the variable coefficients ($\boldsymbol{\beta}$s) are presented in Table D2.

Table D1: Variables used in the graduate degree attainment modelling (excluding providers)

Type of variable	Model variable name	Description
Dummy or categorical	Year	Academic year of graduation: 2010-11 (ref) 2011-12 2012-13 2013-14 2014-15 2015-16 2016-17
	Subject	Subject studied: Creative arts and design (ref) Medicine, dentistry and veterinary science Subjects allied to medicine Agriculture and related subjects Physical sciences Mathematical sciences Computer science Engineering and technology

Type of variable	Model variable name	Description
		Architecture, building and planning Social studies Law Business and administrative studies Mass communication and documentation Languages Historical and philosophical studies Biological sciences Education Combined subjects
	Entry qualifications	Entry qualifications of the graduate: AAA and above (ref) AAB ABB BBB BBC BCC CCC CCD Below CCD DDD and above DDM DMM MMM and below 2 A-levels and 1 BTEC 1 A-levels and 2 BTEC International Baccalaureate Other Level 3 No Level 3 Equivalent
	Age	Age on entry Under 21 (Young) (ref) Over 21 (Mature)
	Disability	Disability status of graduate No disability specified (ref) Disability
	Gender	Gender of graduate: Male (ref) Female Other
	Ethnicity	Ethnicity of graduate: White (ref) Black Asian

Type of variable	Model variable name	Description
		Other Unknown
	Participation of Local Areas (POLAR)	Young participation quintile of graduate: Quintile 1 (ref) Quintile 2 Quintile 3 Quintile 4 Quintile 5 Unknown

Note: Those categories marked with '(ref)' are the reference categories for each categorical or dummy variable and are not formally included in the model structure.

Table D2: Variable coefficient estimates of the model for first and upper second class degree attainment at the sector level (excluding provider-related coefficients)

Effect		Estimate	Standard error	p-value
Intercept		2.26	0.04	<0.0001
Year	2010-11 (ref)	-	-	-
	2011-12	0.01	0.05	0.84
	2012-13	0.08	0.05	0.1
	2013-14	0.23	0.05	<0.0001
	2014-15	0.3	0.05	<0.0001
	2015-16	0.47	0.05	<0.0001
	2016-17	0.71	0.06	<0.0001
Subject	Creative arts and design (ref)	-	-	-
	Medicine and dentistry	0.02	0.04	0.57
	Subjects allied to medicine	-0.2	0.01	<0.0001
	Biological sciences	-0.27	0.01	<0.0001
	Agriculture and related subjects	-0.2	0.02	<0.0001
	Physical sciences	-0.5	0.01	<0.0001
	Mathematical sciences	-0.81	0.01	<0.0001
	Computer science	0.12	0.01	<0.0001
	Engineering and technology	0.04	0.01	<0.001
	Architecture, building and planning	-0.13	0.01	<0.0001
	Social studies	-0.24	0.01	<0.0001
	Law	-0.46	0.01	<0.0001
	Business and administrative studies	0.03	0.01	<0.0001

Effect		Estimate	Standard error	p-value
	Mass communications and documentation	0.06	0.01	<0.0001
	Languages	-0.02	0.01	0.11
	Historical and philosophical studies	0.07	0.01	<0.0001
	Education	-0.17	0.01	<0.0001
	Combined	-0.45	0.04	<0.0001
Entry qualifications	AAA and above (ref)	-	-	-
	AAB	-0.56	0.01	<0.0001
	AAC	-0.91	0.02	<0.0001
	ABB	-0.92	0.01	<0.0001
	ABC	-1.17	0.02	<0.0001
	ACC	-1.41	0.02	<0.0001
	BBB	-1.2	0.02	<0.0001
	BBC	-1.42	0.02	<0.0001
	BCC	-1.63	0.01	<0.0001
	CCC	-1.86	0.01	<0.0001
	CCD	-2.08	0.02	<0.0001
	Below CCD	-2.44	0.01	<0.0001
	DDD and above	-2.33	0.02	<0.0001
	DDM	-2.73	0.02	<0.0001
	DMM	-2.94	0.02	<0.0001
	MMM and below	-3.14	0.02	<0.0001
	2 A-levels 1 BTEC	-2.04	0.02	<0.0001
	1 A-level 2 BTECs	-2.43	0.02	<0.0001
	International Baccalaureate	-0.98	0.03	<0.0001
	Other Level 3	-2.34	0.01	<0.0001
	No Level 3 equivalent	-2.3	0.01	<0.0001
Age	Young (ref)	-	-	-
	Mature	-0.04	0.07	0.51
Age*Entry qualifications	Young (ref) and AAA and above (ref)	-	-	-
	Mature*AAB	-0.09	0.09	0.32
	Mature*AAC	0.12	0.14	0.39
	Mature*ABB	0.02	0.09	0.79
	Mature*ABC	0.19	0.09	0.04
	Mature*ACC	0.24	0.1	0.02
	Mature*BBB	0.18	0.1	0.07

Effect		Estimate	Standard error	p-value
	Mature*BBC	0.2	0.08	0.02
	Mature*BCC	0.34	0.08	<0.0001
	Mature*CCC	0.45	0.08	<0.0001
	Mature*CCD	0.46	0.08	<0.0001
	Mature*Below CCD	0.6	0.07	<0.0001
	Mature*DDD and above	0.29	0.07	<0.0001
	Mature*DDM	0.33	0.08	<0.0001
	Mature*DMM	0.39	0.08	<0.0001
	Mature*MMM and below	0.45	0.07	<0.0001
	Mature*2 A-levels 1 BTEC	0.17	0.11	0.12
	Mature*1 A-level 2 BTECs	0.12	0.11	0.3
	Mature*IB	-0.54	0.1	<0.0001
	Mature*Other Level 3	0.3	0.07	<0.0001
	Mature*No Level 3 equivalent	0.35	0.07	<0.0001
Disability	No disability (ref)			
	Disability	-0.16	0.01	<0.0001
Gender	Male (ref)	-	-	-
	Female	0.26	0	<0.0001
	Other	0.57	0.24	0.02
Ethnicity	White (ref)	-	-	-
	Asian	-0.7	0.01	<0.0001
	Black	-1.01	0.01	<0.0001
	Other	-0.46	0.01	<0.0001
	Unknown	-1.12	0.01	<0.0001
POLAR	Quintile 1 (ref)	-	-	-
	Quintile 2	0.08	0.01	<0.0001
	Quintile 3	0.12	0.01	<0.0001
	Quintile 4	0.14	0.01	<0.0001
	Quintile 5	0.16	0.01	<0.0001
	Unknown	-0.06	0.03	0.06

Table D3: Variable coefficient estimates of the model for first class degree attainment at the sector level (excluding provider-related coefficients)

Effect		Estimate	Standard error	p-value
Intercept		-0.66	0.04	<0.0001
Year	2010-11 (ref)	-	-	-
	2011-12	0.12	0.05	0.03
	2012-13	0.25	0.05	<0.0001
	2013-14	0.27	0.05	<0.0001
	2014-15	0.53	0.05	<0.0001
	2015-16	0.61	0.05	<0.0001
	2016-17	0.84	0.05	<0.0001
Subject	Creative arts and design (ref)	-	-	-
	Medicine and dentistry	0.06	0.03	0.03
	Subjects allied to medicine	0.16	0.01	<0.0001
	Biological sciences	-0.19	0.01	<0.0001
	Agriculture and related subjects	0.13	0.03	<0.0001
	Physical sciences	0.09	0.01	<0.0001
	Mathematical sciences	0.42	0.01	<0.0001
	Computer science	0.79	0.01	<0.0001
	Engineering and technology	0.55	0.01	<0.0001
	Architecture, building and planning	-0.03	0.02	0.06
	Social studies	-0.38	0.01	<0.0001
	Law	-0.84	0.01	<0.0001
	Business and administrative studies	0.2	0.01	<0.0001
	Mass communications and documentation	-0.25	0.01	<0.0001
	Languages	-0.47	0.01	<0.0001
	Historical and philosophical studies	-0.47	0.01	<0.0001
	Education	-0.15	0.01	<0.0001
	Combined	-0.41	0.04	<0.0001
Entry qualifications	AAA and above (ref)	-	-	-
	AAB	-0.7	0.01	<0.0001
	AAC	-0.98	0.02	<0.0001
	ABB	-1.07	0.01	<0.0001
	ABC	-1.26	0.01	<0.0001

Effect		Estimate	Standard error	p-value
	ACC	-1.44	0.02	<0.0001
	BBB	-1.33	0.01	<0.0001
	BBC	-1.52	0.01	<0.0001
	BCC	-1.72	0.01	<0.0001
	CCC	-1.93	0.01	<0.0001
	CCD	-2.14	0.01	<0.0001
	Below CCD	-2.44	0.01	<0.0001
	DDD and above	-2.13	0.01	<0.0001
	DDM	-2.78	0.03	<0.0001
	DMM	-3.01	0.03	<0.0001
	MMM and below	-3.15	0.03	<0.0001
	2 A-levels 1 BTEC	-2.02	0.02	<0.0001
	1 A-level 2 BTECs	-2.41	0.03	<0.0001
	International Baccalaureate	-0.83	0.02	<0.0001
	Other Level 3	-2.14	0.01	<0.0001
	No Level 3 equivalent	-1.86	0.01	<0.0001
Age	Young (ref)	-	-	-
	Mature	0.26	0.04	<0.0001
Age*Entry qualifications	Young (ref) and AAA and above (ref)	-	-	-
	Mature*AAB	0.12	0.05	0.03
	Mature*AAC	0.23	0.1	0.02
	Mature*ABB	0.34	0.06	<0.0001
	Mature*ABC	0.36	0.06	<0.0001
	Mature*ACC	0.5	0.07	<0.0001
	Mature*BBB	0.32	0.07	<0.0001
	Mature*BBC	0.44	0.05	<0.0001
	Mature*BCC	0.45	0.05	<0.0001
	Mature*CCC	0.59	0.05	<0.0001
	Mature*CCD	0.55	0.05	<0.0001
	Mature*Below CCD	0.63	0.04	<0.0001
	Mature*DDD and above	0.11	0.05	0.02
	Mature*DDM	0.37	0.07	<0.0001
	Mature*DMM	0.34	0.08	<0.0001
	Mature*MMM and below	0.53	0.06	<0.0001
	Mature*2 A-levels 1 BTEC	0.24	0.1	0.02
	Mature*1 A-level 2 BTECs	0.28	0.12	0.02

Effect		Estimate	Standard error	p-value
	Mature*IB	-0.41	0.09	<0.0001
	Mature*Other Level 3	0.27	0.04	<0.0001
	Mature*No Level 3 equivalent	0.17	0.04	<0.0001
Disability	No disability (ref)	-	-	-
	Disability	-0.15	0.01	<0.0001
Gender	Male (ref)	-	-	-
	Female	0.08	0	<0.0001
	Other	0.37	0.19	0.05
Ethnicity	White (ref)	-	-	-
	Asian	-0.65	0.01	<0.0001
	Black	-1.16	0.01	<0.0001
	Other	-0.4	0.01	<0.0001
	Unknown	-0.7	0.02	<0.0001
POLAR	Quintile 1 (ref)	-	-	-
	Quintile 2	0.07	0.01	<0.0001
	Quintile 3	0.09	0.01	<0.0001
	Quintile 4	0.1	0.01	<0.0001
	Quintile 5	0.08	0.01	<0.0001
	Unknown	-0.08	0.04	0.05

Annex E: Details of the modelling of graduate attainment at the provider level

1. This annex details the technique used in modelling graduate attainment of first or upper second class degrees and first class degrees at the provider level, and outlines the methodology used to flag providers where graduate attainment was statistically significantly different from the sector or from themselves in the academic year 2010-11.

2. To investigate changes in the proportion of graduates attaining an upper second or first class degree over the academic years 2010-11 to 2016-17 at the provider level, a modified version of the fixed effects logistic regression model presented in Annex D was used. In this modified model, the effects of individual providers across years are modelled as random effects rather than fixed effects. This allows the statistical significance of the behaviour of a provider relative to that of the sector and itself in 2010-11 to be directly determined.

3. The modified model is presented in Equation E1.

Equation E1: Mixed-effects logistic regression model for modelling graduate degree attainment at the provider level

$$\boldsymbol{first\ or\ upper\ second\ class\ OR\ first\ class} \sim \boldsymbol{Binomial}\left(\boldsymbol{const}_{ij}, \boldsymbol{\pi}_{ij}\right)$$

$$\boldsymbol{logit}\left(\boldsymbol{\pi}_{ij}\right) = \boldsymbol{\beta}_{0,j} + \boldsymbol{\beta}_{1,j}\boldsymbol{Year} + \boldsymbol{\beta}_{2}\boldsymbol{Subject} + \boldsymbol{\beta}_{3}\boldsymbol{EntryQuals} + \boldsymbol{\beta}_{4}\boldsymbol{Age} + \boldsymbol{\beta}_{5}\boldsymbol{EntryQuals} * \boldsymbol{Age} + \boldsymbol{\beta}_{6}\boldsymbol{Disability} + \boldsymbol{\beta}_{7}\boldsymbol{Gender} + \boldsymbol{\beta}_{8}\boldsymbol{Ethnicity} + \boldsymbol{\beta}_{9}\boldsymbol{POLAR}$$

$$\boldsymbol{\beta}_{0,j} = \boldsymbol{\beta}_{0} + \boldsymbol{u}_{0,j}, \boldsymbol{\beta}_{1,j} = \boldsymbol{\beta}_{1} + \boldsymbol{u}_{1,j}$$

4. Where the βs represent the fixed effects for the entire sector, $u_{0,j}$ is the random intercept for provider j (the effect of the provider across all years), and $u_{1,j}$ represents the random year coefficients for provider j (the effect of the provider in a specific year).

5. Two statistical significance flags for each provider included in the modelling have been presented to address the following questions:

   a. **Sector 2010-11 flag** – Is graduate attainment of first or upper second class degrees or of first class degrees at a provider statistically significantly higher than (1, above), lower than (-1, below) or not significantly different from (0, same as) the average graduate attainment of the sector in 2010-11, with the effect of all explanatory variables accounted for?

   b. **Provider 2010-11 flag** – Is graduate attainment of first or upper second class degrees or of first class degrees at a provider statistically significantly higher than (1, above), lower than (-1, below) or not significantly different from (0, same as) the average graduate attainment of the same provider in 2010-11, with the effect of all explanatory variables accounted for?

6. The above flags are created for a provider where the following Z-scores are deemed significant at the $\alpha < 0.05$ level, or lie outside the limits -3.5844 (flag = -1) ≤ Z ≤ 3.5844 (flag = 1) (determined using the Bonferroni correction for multiple comparisons of 148 providers). The Z-scores for the sector and provider flags are calculated using equations E2 and E3, respectively.

Equation E2: Sector in 2010-11 flag

$$Z_{Sector,2010} = \begin{cases} \dfrac{u_{0,j} + u_{year,j}}{\sqrt{s.e.(u_{0,j})^2 + s.e.(u_{year,j})^2}}, year = 2010 \\ \dfrac{u_{0,j} + \beta_{year} + u_{year,j}}{\sqrt{s.e.(u_{0,j})^2 + s.e.(\beta_{year})^2 + s.e.(u_{year,j})^2}}, year \neq 2010 \end{cases}$$

Equation E3: Provider in 2010-11 flag

$$Z_{provider,2010} = \begin{cases} 0, year = 2010 \\ \dfrac{\beta_{year} + u_{year,j} - u_{2010,j}}{\sqrt{s.e.(\beta_{year})^2 + s.e.(u_{year,j})^2 + s.e.(u_{2010,j})^2}}, year \neq 2010 \end{cases}$$

Where, for provider j: $u_{0,j}$ is the random intercept; $u_{year,j}$ is the provider random year effect; β_{year} is the sector fixed year effect; and the $s.e.(x)$ is the standard error of coefficient x.