



# Socio-economic gaps in HE participation: how have they changed over time?

IFS Briefing Note BN133

Claire Crawford



# Socio-economic gaps in HE participation: how have they changed over time?<sup>1</sup>

*Claire Crawford*

*Institute for Fiscal Studies*

## Executive summary

- Higher education (HE) participation has expanded dramatically in England over the last half century, with the proportion of 17- to 30-year-olds going to university increasing from just 5% in 1960 to 47% in 2010. Yet socio-economic inequality in HE participation remains of great policy concern, stoked by fears about whether the introduction (in 1998) and subsequent increases (in 2006–07 and 2012–13) in tuition fees would discourage young people from poorer backgrounds from going to university.
- This briefing note provides new evidence on what happened to HE participation overall and at high-status institutions amongst state school students in England following the increase in tuition fees (and accompanying changes to student support and other policies designed to ‘widen’ HE participation) that occurred in 2006–07. In particular, it examines whether these policy changes were coincident with changes in the trajectories of HE participation rates and whether these changes occurred differentially for young people from different socio-economic backgrounds.
- We are able to do this for the first time using linked individual-level administrative data from schools, colleges and universities. These provide us with a census of pupils taking (or eligible to take) GCSEs in state schools in England between 2001–02 and 2006–07, totalling over half a million pupils per cohort. We are able to follow each cohort through the education system, from age 11, through secondary school and further education, and on to potential HE participation anywhere in the UK at age 18 (when first eligible) or age 19 (after a single year out).
- Our results show that HE participation has been increasing over time and that it has been rising more rapidly for those from deprived backgrounds, such that the gap in HE participation – and, to a lesser extent, in participation at high-status institutions – between individuals from the most and least deprived quintile groups (fifths of the population) has fallen over time. For example, between

---

<sup>1</sup> The author gratefully acknowledges funding from the Nuffield Foundation (grant number EDU/39084) and would like to thank Ellen Greaves, Paul Johnson, John Micklewright and Anna Vignoles for helpful comments and advice. All errors remain the responsibility of the author.

2004–05 and 2009–10, the gap in HE participation between those from the top and bottom socio-economic quintile groups has fallen from 40.0 percentage points to 37.3 percentage points, while the gap in high-status participation has fallen more slowly, from 19.7 to 19.0 percentage points. These reductions are at least partly explained by the improvement in the relative performance of those from more deprived backgrounds in earlier achievement tests, especially at Key Stage 5 (taken at age 18).

- In terms of changes to the trajectories over time, it looks as if overall HE participation rates may have dipped slightly when fees were raised in 2006–07, but the dip was actually more pronounced among those from better-off backgrounds than it was among more deprived students. For example, participation was around 2 percentage points lower than might otherwise have been expected amongst individuals from the highest socio-economic quintile group, while it was no more than 0.5 percentage points lower amongst individuals from the lowest socio-economic quintile group. The trend towards a smaller socio-economic gap also accelerated somewhat in 2006–07. We cannot say for sure that this change in trend arose *as a consequence of* the new HE finance regime, but it was coincident with it and we cannot explain it using the other characteristics that we observe in our data.
- One possible reason for this observed pattern is that, contrary to the beliefs of many, the new HE finance regime introduced in 2006–07 was actually significantly more progressive than the system it replaced. Overall, it was more generous to students from poorer backgrounds and hit richer students relatively harder. Assuming students understood the financial implications of the regime and were not debt averse, the change in regime might have been expected to reduce participation rates amongst those for whom the costs of university had gone up rather than down (i.e. those from the richest families) relatively more. This is exactly what we see: participation rates were lower than might otherwise have been expected in and after 2006–07, with the negative effect significantly greater for students from the least deprived backgrounds.
- However, it must be highlighted that we cannot separate the effects of changes to the HE finance regime from the effects of other policies that were introduced around the same time and that might have been expected to produce similar results. These policies include the increased responsibility and focus of universities, and indeed schools, on increasing HE participation amongst disadvantaged students. Nonetheless, the changes in participation that we observe are at least consistent with the responses that might have been expected given the incentives provided by the new HE finance regime.

## 1. Introduction

Higher education (HE) participation has expanded dramatically in England over the last half century, with the proportion of 17- to 30-year-olds going to university increasing from just 5% in 1960<sup>2</sup> to 47% in 2010.<sup>3</sup> However, despite decades of policies designed to ‘widen’ participation – i.e. to increase the HE participation rates of pupils from lower socio-economic backgrounds and other under-represented groups – socio-economic inequality in HE participation and degree acquisition appears to have widened in England during the 1980s and early 1990s,<sup>4</sup> although some dispute this.<sup>5</sup> In any case, in 2004–05, young people from the richest fifth of families were still over four times more likely to go to university at age 18 or 19 than young people from the poorest fifth of families. Considering participation at a group of ‘high-status’ institutions – whose degrees typically earn their holders the highest returns in the labour market<sup>6</sup> – the socio-economic gap is even starker: young people from the richest fifth of families are almost 10 times more likely to attend such institutions than young people from the poorest fifth of families.<sup>7</sup>

---

<sup>2</sup> D. Finegold, ‘The roles of higher education in a knowledge economy’, Rutgers University, mimeo, 2006.

<sup>3</sup> Department for Business, Innovation and Skills (BIS), ‘Participation rates in higher education: academic years 2006/2007 – 2010/2011 (provisional)’, Statistical First Release, 2012, <http://www.bis.gov.uk/analysis/statistics/higher-education/national-statistics-releases/participation-rates-in-higher-education/HEIPR-2006-to-2011>.

<sup>4</sup> See, for example: J. Blanden and S. Machin, ‘Educational inequality and the expansion of UK higher education’, *Scottish Journal of Political Economy*, Special Issue on the Economics of Education, 2004, 51, 230–49; S. Machin and A. Vignoles, ‘Educational inequality: the widening socio-economic gap’, *Fiscal Studies*, 2004, 25, 107–28; and J. Lindley and S. Machin, ‘The quest for more and more education: implications for social mobility’, *Fiscal Studies*, 2012, 33, 265–86.

<sup>5</sup> For example, R. Erikson and J. Goldthorpe, ‘Has social mobility in Britain decreased? Reconciling divergent findings on income and class mobility’, *British Journal of Sociology*, 2010, 61, 211–30.

<sup>6</sup> A. Chevalier and G. Conlon, ‘Does it pay to attend a prestigious university?’, London School of Economics, CEE Discussion Paper 33, 2003; I. Hussain, S. McNally and S. Telhaj, ‘University quality and graduate wages in the UK’, London School of Economics, CEE Discussion Paper 99, 2009.

<sup>7</sup> Author’s calculations based on linked individual-level administrative data from schools, colleges and universities. See Section 2 for further discussion of these data, how we measure socio-economic status and which institutions constitute the ‘high-status’ group.

Concerns about the types of students who would be able to access higher education increased following the introduction of tuition fees in 1998. Although the fees were means tested, meaning that lower-income students should be less affected, there were fears that the prospect of fees would create a barrier to HE participation for poorer students.<sup>8</sup> Such concerns heightened following the increase in the cap on tuition fees that occurred in 2006–07 (to £3,000 p.a.) and again in 2012–13 (to £9,000 p.a.), despite the fact that these higher fees did not have to be paid until after graduation and were covered by a zero real interest rate loan, repayable only above an income threshold and written off after a period of time.<sup>9</sup> In fact, Dearden et al. (2007) and Chowdry et al. (2012)<sup>10</sup> concluded that poorer individuals would be *better off* under the new fee regimes introduced in 2006–07 and 2012–13 than under their predecessors. This suggests that, as long as students from poorer backgrounds understood the reforms and were not debt averse, HE participation rates should not have been reduced by these changes.

Indeed, there is no strong empirical evidence available to date that the introduction or subsequent increase of tuition fees in England reduced HE participation rates, even amongst pupils from low socio-economic status (SES) backgrounds.<sup>11</sup> However, the existing studies typically either focus on the introduction of tuition fees in 1998 or are able to consider only a very limited period following the 2006–07 policy changes. Given the recent reforms to HE finance that were introduced in 2012–13, together with the richer data on

---

<sup>8</sup> C. Callender, ‘Student financial support in higher education: access and exclusion’, in M. Tight (ed.), *Access and Exclusion: International Perspectives on Higher Education Research*, Elsevier Science, London, 2003.

<sup>9</sup> For further discussion of the changes in HE finance that have occurred in England, and their likely distributional effects, see: L. Dearden, E. Fitzsimons, A. Goodman and G. Kaplan, ‘Higher education funding reforms in England: the distributional effects and the shifting balance of costs’, *Economic Journal, Features*, 2007, 118, F110–25; G. Wyness, ‘Policy changes in UK higher education funding: 1963–2009’, University of London, Institute of Education, DoQSS Working Paper 10-15, 2010; and H. Chowdry, L. Dearden, A. Goodman and W. Jin, ‘The distributional impact of the 2012–13 higher education funding reforms in England’, *Fiscal Studies*, 2012, 33, 211–36.

<sup>10</sup> Full references are given in footnote 9.

<sup>11</sup> See, for example: C. Crawford and L. Dearden, *The Impact of the 2006–07 HE Finance Reforms on HE Participation*, BIS Research Paper 13, 2010; and L. Dearden, E. Fitzsimons and G. Wyness, ‘The impact of tuition fees and support on university participation in the UK’, Institute for Fiscal Studies, Working Paper 11/17, 2011.

participation that are now available over longer time periods, this is an opportune time to revisit what happened to HE participation overall and at high-status institutions following the increase in tuition fees (and accompanying changes to student support and other policies designed to ‘widen’ participation) that occurred in 2006–07.

To do so, we use linked individual-level administrative data from schools, colleges and universities. These provide us with a census of pupils taking (or eligible to take) GCSEs in state schools in England between 2001–02 and 2006–07, totalling over half a million pupils per cohort. We are able to follow each cohort through the education system, from age 11, through secondary school and further education, and on to potential HE participation anywhere in the UK at age 18 (when first eligible) or age 19 (after a single year out).

We start by documenting what happened to HE participation overall and at high-status institutions at age 18 or 19 for state school students who were first eligible to go to university between 2004–05 and 2009–10, and show how these patterns varied by socio-economic background.<sup>12</sup> This evidence builds on the existing literature on this topic in two ways: first, by making use of a continuous measure of socio-economic status, which combines individual eligibility for free school meals (FSMs) with a variety of aggregate information relating to an individual’s very local neighbourhood;<sup>13</sup> and second, by considering participation at high-status institutions as well as participation overall – this differentiation is particularly important given the higher returns garnered by individuals holding degrees from such institutions.

---

<sup>12</sup> Concerns about the quality of the data linkage for private school students in the early periods covered by our data mean that it is difficult to accurately document changes in HE participation for these individuals over time. See Section 2.1 for further discussion of this issue.

<sup>13</sup> Previous evidence tends to rely either on FSM eligibility or on more aggregate neighbourhood measures alone – see, for example: Higher Education Funding Council for England (HEFCE), ‘Trends in young participation in higher education: core results for England’, Issues Paper 2010/03, 2010, <http://www.hefce.ac.uk/pubs/year/2010/201003/>; Department for Business, Innovation and Skills (BIS), ‘Widening participation in higher education: analysis of progression rates for young people in England by free school meal receipt and school type’, 2011, <http://www.bis.gov.uk/assets/biscore/statistics/docs/w/11-1082-widening-participation-higher-education-aug-2011-v3.pdf>; and HEFCE, ‘POLAR3: young participation rates in higher education’, Issues Paper 2012/26, 2012, <http://www.hefce.ac.uk/pubs/year/2012/201226/>.

We then investigate whether there is any evidence of a change in the trajectory of HE participation rates in or after 2006–07 and, if so, whether these changes occurred differentially for young people from different socio-economic backgrounds. To do so, we estimate whether the HE participation rates of individuals observed in or after 2006–07 are higher or lower than we might have expected based on trend rates of participation over the period covered by our data, and whether these deviations from trend differ for individuals from different parts of the socio-economic distribution.<sup>14</sup>

This analysis will provide some insight into whether the increase in tuition fees (and accompanying changes to student support) that occurred in 2006–07 were *coincident with* any significant changes in HE participation or the socio-economic gaps in HE participation. However, these estimates should **not** be interpreted as the *causal* effect of the increase in tuition fees (and accompanying changes to student support) that occurred. The most important reason for this is that there is no unaffected (control) group in England to provide an indication of what would have happened to participation rates in the absence of the reforms; we must instead generate the relevant ‘counterfactual’ by assuming that participation would otherwise have followed the existing trend. We also cannot separate the effects of the 2006–07 changes to the HE finance regime from other changes that occurred in or after 2006–07 that could plausibly affect HE participation, particularly efforts by universities to recruit students from more deprived backgrounds. Nonetheless, it is still a useful exercise to consider whether HE participation rates appear to be on different trajectories before and after 2006–07.

This briefing note proceeds as follows: Sections 2 and 3 describe the data and methods that we use for our analysis; Section 4 discusses our results; and Section 5 concludes.

## 2. Data

We use linked individual-level administrative data from schools, colleges and universities.<sup>15</sup> These provide us with a census of pupils taking (or eligible to take) GCSEs in state schools in England between 2001–02 and 2006–07 – totalling over

---

<sup>14</sup> This assumes that supply constraints would not have been binding over this period.

<sup>15</sup> Specifically, we use linked individual-level data from the National Pupil Database (NPD), the National Information System for Vocational Qualifications (NISVQ) and the Higher Education Statistics Agency (HESA).

half a million pupils per cohort. We are able to follow them through the education system, from age 11, through secondary school and further education, and on to potential HE participation anywhere in the UK at age 18 (when first eligible) or age 19 (after a single year out). Table 1 outlines the expected progression of our cohorts through the education system.

**Table 1. Expected progression of our cohorts through the education system**

<i>Outcomes</i>	<i>Cohort 1</i>	<i>Cohort 2</i>	<i>Cohort 3</i>	<i>Cohort 4</i>	<i>Cohort 5</i>	<i>Cohort 6</i>
Born	1985–86	1986–87	1987–88	1988–89	1989–90	1990–91
Sat Key Stage 2 (KS2) (age 11)	1996–97	1997–98	1998–99	1999–2000	2000–01	2001–02
Sat GCSEs / KS4 (age 16)	2001–02	2002–03	2003–04	2004–05	2005–06	2006–07
Sat A levels / KS5 (age 18)	2003–04	2004–05	2005–06	2006–07	2007–08	2008–09
HE participation (age 18)	2004–05	2005–06	2006–07	2007–08	2008–09	2009–10
HE participation (age 19)	2005–06	2006–07	2007–08	2008–09	2009–10	2010–11

The data set includes a variety of academic outcomes in the form of national achievement test scores at age 11 and public examination results (GCSEs, A levels and equivalent vocational qualifications) at ages 16 and 18. It also includes a variety of pupil characteristics – such as gender, date of birth, ethnicity, special educational needs (SEN) status, eligibility for free school meals (FSMs) and whether English is an additional language (EAL), plus the pupil’s home postcode and a school identifier.

### *2.1 Data linkage*

The data linkage process was carried out by the Fischer Family Trust on behalf of the Department for Education, as follows: first, individual-level records from schools and colleges were linked using a unique pupil identification number. Administrative records from higher education institutions were then linked in to the school/college data using probabilistic matching on the basis of a set of identifying variables including name, gender, date of birth and postcode. Given the large number of variables – including date of birth and postcode – used in the linkage algorithm, the linking process is likely to be of high quality, although this is not verifiable.



Broecke and Hamed (2008)<sup>16</sup> report that of those English-domiciled 18-year-olds observed in HESA records in 2004–05, 19% did not have a linked school/college record. This problem is specific to the year 2004–05 (the first year in which the linkage occurred) and mainly affects pupils who were not in state schools. For this reason, our analysis only includes pupils who were attending state schools at the age of 16.<sup>17</sup>

## 2.2 Outcomes

For the purposes of this briefing note, higher education participation is defined as enrolling in a UK HE institution at age 18 or 19 to study for a Bachelors degree. (It does not, for example, include individuals studying for HE qualifications in further education colleges.)

To derive our measure of ‘high’ institution status, we linked in institution-level average Research Assessment Exercise (RAE) scores – a measure of research quality – from the 2001 exercise, and included all Russell Group institutions,<sup>18</sup> plus any UK university with an average 2001 RAE score exceeding the lowest found among the Russell Group.<sup>19</sup> This gives a total of 41 ‘high-status’ universities out of 163 institutions. Using this definition, 31% of HE participants attending state schools at age 16 attend a ‘high-status’ university in their first

---

<sup>16</sup> S. Broecke and J. Hamed, *Gender Gaps in Higher Education Participation: An Analysis of the Relationship between Prior Attainment and Young Participation by Gender, Socio-Economic Class and Ethnicity*, Department for Innovation, Universities and Skills (DIUS) Research Report 08-14, 2008.

<sup>17</sup> In previous analysis using these data (Chowdry et al., 2010 – full reference in footnote 24), our conclusions were not materially affected by the omission of private school students; thus we would hope that our results here would be similarly unaffected.

<sup>18</sup> See <http://www.russellgroup.ac.uk/> for more details. There were 20 Russell Group institutions over the period covered by our data: Birmingham, Bristol, Cambridge, Cardiff, Edinburgh, Glasgow, Imperial College London, King’s College London, Leeds, Liverpool, London School of Economics, Manchester, Newcastle, Nottingham, Oxford, Queen’s University Belfast, Sheffield, Southampton, University College London and Warwick. A further four universities – Durham, Exeter, Queen Mary University of London and York – were added to the Russell Group in March 2012. These institutions are all included in the broader definition of ‘high-status’ institutions on which we focus in this briefing note.

<sup>19</sup> These additional institutions are Aston, Bath, Birkbeck College, Courtauld Institute of Art, Durham, East Anglia, Essex, Exeter, Homerton College, Lancaster, Queen Mary and Westfield College, Reading, Royal Holloway and Bedford New College, Royal Veterinary College, School of Oriental and African Studies, School of Pharmacy, Surrey, Sussex, University of the Arts London, University of London and York.

year, which equates to 9.8% of the sample as a whole (including both participants and non-participants).

We recognise that such definitions of institution status are, by their very nature, contentious and somewhat arbitrary. However, obtaining a degree from a Russell Group institution and attending a university that scored highly in the RAE exercise are both associated with higher wage returns.<sup>20</sup> We would thus argue that our indicator of status is an important proxy for the nature of higher education being accessed, which in turn will have long-run economic implications for the individuals concerned.

### *2.3 Measuring socio-economic background*

To classify each pupil's socio-economic position, we ideally require rich individual-level data such as parental education, income and social class. The administrative data are relatively weak in this respect, however: pupils' eligibility for free school meals at age 16 (an indicator of being in receipt of state benefits) and home postcode at the same age are the only individual-level information we observe for all cohorts.

The FSM indicator is a feasible measure of socio-economic status (SES) but, as it is dichotomous, it would only allow investigation of differences in participation for those who are eligible (approximately 16% of the school population) and those who are not; it would not allow us to differentiate between individuals at the middle and top of the SES distribution. In order to create a more continuous (and informative) measure of SES, we therefore linked in detailed information about the area in which pupils lived using their home postcode at age 16; individual socio-economic status is therefore partially proxied by aggregate information relating to very small numbers of households around where they live.

Our index combines, using principal components analysis, the pupil's eligibility for free school meals (measured at age 16) with the following neighbourhood-based measures of socio-economic circumstances (linked in on the basis of home postcode at age 16):

- their 2004 Index of Multiple Deprivation (IMD) score (designed to capture lack of access to jobs or services in seven domains, including health and

---

<sup>20</sup> See, for example, Chevalier and Conlon (2003) and Hussain et al. (2009) – full references in footnote 6.

education, and available for neighbourhoods containing approximately 700 households);<sup>21</sup>

- their ACORN type (constructed using information on socio-economic characteristics, financial holdings and property details, and available for neighbourhoods containing approximately 15 households);<sup>22</sup>
- three very local area-based measures from the 2001 Census – specifically, the proportion of individuals in each area: (a) who work in higher or lower managerial/professional occupations; (b) whose highest educational qualification is NQF<sup>23</sup> Level 3 or above; and (c) who own (either outright or through a mortgage) their home; available for neighbourhoods containing approximately 150 households.

Our previous work based on the same measure of socio-economic status demonstrated its validity compared with the richer individual-level information available in the Longitudinal Study of Young People in England.<sup>24</sup> We showed that 40% of mothers in the top fifth of our index were educated to degree level compared with just 8% of mothers in the bottom fifth. Similarly, 60% of fathers in the top fifth of our index worked in a professional or managerial occupation, compared with just 11% of fathers in the bottom fifth.

Our sample here is restricted not only to pupils who were in state schools at age 16, but also to individuals for whom we observe this SES measure (i.e. for whom FSM eligibility is non-missing and for whom we observe a valid home postcode that can be matched to the relevant local area information). This is not a very stringent restriction for state school students, with just 3.5% of our potential state school sample excluded as a result. We split our final sample into five evenly-sized groups (quintile groups) on the basis of this index in order to compare HE participation rates overall and at high-status institutions across socio-economic groups.

---

<sup>21</sup> For more information about the Index of Multiple Deprivation, see <http://www.communities.gov.uk/communities/research/indicesdeprivation/deprivation10/>.

<sup>22</sup> For more information about ACORN data, see <http://www.caci.co.uk/acorn-classification.aspx>.

<sup>23</sup> National Qualifications Framework.

<sup>24</sup> For further details, see H. Chowdry, C. Crawford, L. Dearden, A. Goodman and A. Vignoles, 'Widening participation in higher education: analysis using linked administrative data', Institute for Fiscal Studies, Working Paper 10/04, 2010; forthcoming in *Journal of the Royal Statistical Society: Series A*.

## *2.4 Other individual characteristics*

In addition to SES quintile groups, our later models also account for other individual characteristics: gender, month of birth, ethnicity, whether English is an additional language and whether the pupil has stated (more severe) or non-stated (less severe) special educational needs – all recorded at age 16. Pupils for whom some or all of this information is missing are still included in our analysis through the use of dummy (binary) variables that indicate missing values.

We also account for test scores from national achievement tests at ages 11, 16 and 18, and we include an indicator for whether the individual met the government's 'expected' level of five GCSEs or equivalents at grades A\*–C (the Level 2 threshold) at age 16. At each age and in each year, we divide the sample into quintiles according to their total point score on the relevant test or examination. At age 11, this score is calculated across tests in English, maths and science. At ages 16 and 18, it is calculated across the full range of examinations (GCSEs or equivalents at age 16 and A levels or equivalents at age 18) that pupils take. Again, we include missing dummies to account for cases in which some or all of these test scores are missing. In particular, this approach means that we are not forced to drop from our analysis individuals who do not stay in education beyond age 16.

Universities often emphasise the importance of GCSE and A-level subject choice for students.<sup>25</sup> We additionally include an indicator for whether the individual achieved five GCSEs at grades A\*–C including English and maths at age 16. At age 18, we add indicators for whether the individual achieved passes in certain A-level subjects (including biology, chemistry, economics, English, maths, modern languages and physics) and also make use of information identifying whether individuals had achieved the Level 2 or Level 3 thresholds (the latter being equivalent to two A-level passes) via any route by age 18.

We take account of the school each individual attended at age 16 through the use of school fixed effects. (See Section 3 for further discussion of this important issue.)

---

<sup>25</sup> See, for example, <http://russellgroup.ac.uk/russell-group-latest-news/137-2011/4746-new-guidance-on-post16-study-choices/>.

### 3. Methods

As described above, this briefing note explores the determinants of participation at (a) any HE institution in the UK and (b) a group of ‘high-status’ HE institutions,<sup>26</sup> with a particular focus on understanding whether and how the trajectories of HE participation changed in or after 2006–07.

We start by estimating the ‘raw’ socio-economic differences in HE participation (or participation at a high-status institution) and whether these patterns differed before and after 2006–07. To do so, we model HE participation as a function of an individual’s socio-economic status, a linear time/cohort trend (defined according to the year in which the pupil was first eligible to start university) and an indicator for whether they were first eligible to start in or after 2006–07. This last variable should capture any change in HE participation rates that occurred in or after 2006–07, over and above the trend in participation over time / across cohorts that might otherwise have been expected to occur (in the absence of supply constraints).

To further understand whether any changes in trajectory that might have occurred in or after 2006–07 may have differentially affected pupils from different socio-economic backgrounds, our ‘post 2006–07’ indicator is additionally interacted with the pupil’s socio-economic status. These variables should enable us to capture the extent to which any change in participation rates in or after 2006–07 varied by socio-economic background.

We then examine the extent to which these differences in HE participation rates by socio-economic background and over time can be explained by differences in other observable characteristics, by successively adding individual covariates, school fixed effects and rich measures of prior attainment to our model. In each case, we view these characteristics as either directly affecting HE participation decisions or being correlated with underlying unobserved factors that are likely to affect such decisions. For example, we include controls for ethnicity to account for the fact that pupils from different ethnic backgrounds often have very different educational values and a higher or lower propensity to go to university than white British students, even conditional on their exam results.

Prior attainment is also likely to be a key determinant of an individual’s choice of whether or not to go to university, not least because they may only be able to tackle the challenges and fully reap the benefits of a university education if they

---

<sup>26</sup> We discussed our measure of ‘high-status’ institutions in Section 2.2.

have acquired a certain amount of knowledge and skills beforehand. We add rich measures of prior attainment to our models in order to better understand whether socio-economic status affects HE participation directly or through its impact on prior attainment, and whether differences in the composition of our socio-economic groups over time can help to explain any differences in HE participation rates in or after 2006–07 that we might observe.

However, we recognise the potential ‘endogeneity’ of attainment to HE participation decisions: for instance, if an individual has, by the age of 15, decided that university is ‘not for them’, then they may not try so hard in their exams; this would induce a correlation between exam results at age 16 and HE participation, but the direction of causality would run from the HE participation decision to the age 16 exam results, rather than the other way around. For this reason, we add our measures of prior attainment sequentially, starting with age 11, followed by age 16 and finally age 18, the idea being that earlier measures of prior attainment are less likely to suffer from such potential endogeneity issues.

We implement this framework using a linear probability model. While the dependent variable is binary – taking a value of 1 if the person participates and 0 otherwise, whether that participation is at any UK HE institution or at a high-status institution – we choose to use a linear probability model rather than a non-linear binary choice model for practical reasons. In particular, the achievements of pupils in the same school, including whether or not they participate in higher education, are likely to be correlated due to the influence of schools, peers and teachers, but we have only limited information on such factors. The inclusion of fixed school effects thus seems most appropriate.<sup>27</sup>

Whilst it is theoretically possible to estimate a fixed effects logistic model, such models did not converge in our sample, most likely because there are over 4,000

---

<sup>27</sup> The use of a random effects model requires that the school effects are uncorrelated with all the individual and school covariates included in the model. Given the relatively limited information we have on schools (and the non-existent information on teachers), this assumption is unlikely to hold in practice. In fact, a global Hausman test rejected the random effects model at the 1% level of significance for each of our specifications. (There has been some criticism of this test – see, for example, A. Fielding, ‘The role of the Hausman test and whether higher level effects should be treated as random or fixed’, *Multilevel Modelling Newsletter*, 2004, 16(2) – but, in the absence of alternatives, we were guided by these results.) For a full account of these issues, see P. Clarke, C. Crawford, F. Steele and A. Vignoles, ‘The choice between fixed and random effects models: some considerations for educational research’, University of London, Institute of Education, DoQSS Working Paper 10-10, 2010.

school fixed effects to estimate. We thus adopt a linear probability model with school fixed effects instead.

Our model can be thought of as a two-level nested structure with pupils at level 1 grouped within schools at level 2. If we denote by  $y_{ij}$  the outcome of individual  $i$  in school  $j$  ( $i = 1, \dots, n_j; j = 1, \dots, J$ ), then the two-level linear model can be written

$$(1) \quad y_{ij} = \beta_0 + x_{1ij}\beta_1 + \dots + x_{pij}\beta_p + \mathbf{u}_j + e_{ij} = \mathbf{x}'_{ij}\boldsymbol{\beta} + \mathbf{u}_j + e_{ij}.$$

Here,  $y_{ij}$  is a binary variable indicating whether the person enrolled in higher education (or whether they enrolled at a high-status institution). The parameter  $\beta_0$  is the regression intercept;  $\mathbf{x}_{ij}$  represents a vector of individual-level covariates;  $\boldsymbol{\beta}$  represents the vector of regression coefficients for these covariates;  $\mathbf{u}_j$  is a vector of the fixed effects of school  $j$ ; and  $e_{ij}$  is an independently distributed individual-level error term. We assume  $\text{cov}(e_{ij}, x_{kij}) = 0$  for  $k = 1, \dots, p$  and  $\text{var}(e_{ij}) = \sigma_e^2$ .

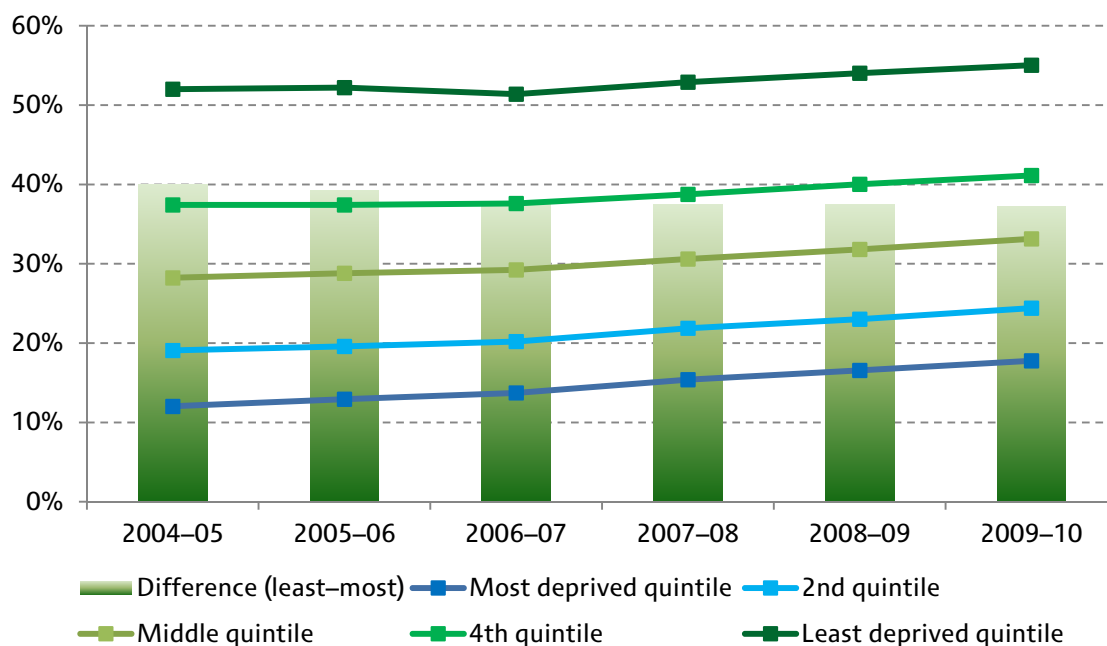
The individual covariates included in  $\mathbf{x}_{ij}$  are added sequentially. As described above, we start by including the four highest quintile groups of socio-economic status (meaning that the reference group is individuals in the most deprived quintile group), a linear time/cohort trend (interacted with the quintile groups of socio-economic status) and an indicator for whether the pupil was first eligible to go to university in or after 2006–07. Our second specification adds controls for gender, ethnicity, month of birth, whether English is an additional language for the pupil and whether they have more or less severe special educational needs. (It is at this point that we add a set of school fixed effects,  $\mathbf{u}_j$ , as well.) Our third, fourth and fifth specifications add, respectively, controls for attainment at Key Stage 2 (age 11), Key Stage 4 (age 16) and Key Stage 5 (age 18).

## 4. Results

### 4.1 HE participation overall

Figure 1 plots HE participation rates for state school students in England at age 18 or 19. It does so separately for individuals from different socio-economic backgrounds, and shows how these rates have changed over time. These figures are based on the year in which individuals were first eligible to go to university (i.e. 2004–05 shows participation in either 2004–05 or 2005–06 for the cohort who took their GCSEs in 2001–02, and so on).

**Figure 1. HE participation at age 18/19 amongst state school students by deprivation quintile group**



Notes: Author’s calculations based on linked individual-level administrative data from schools, colleges and universities. In each year, participation in each socio-economic group is significantly different from that in each of the other groups at the 1% level.

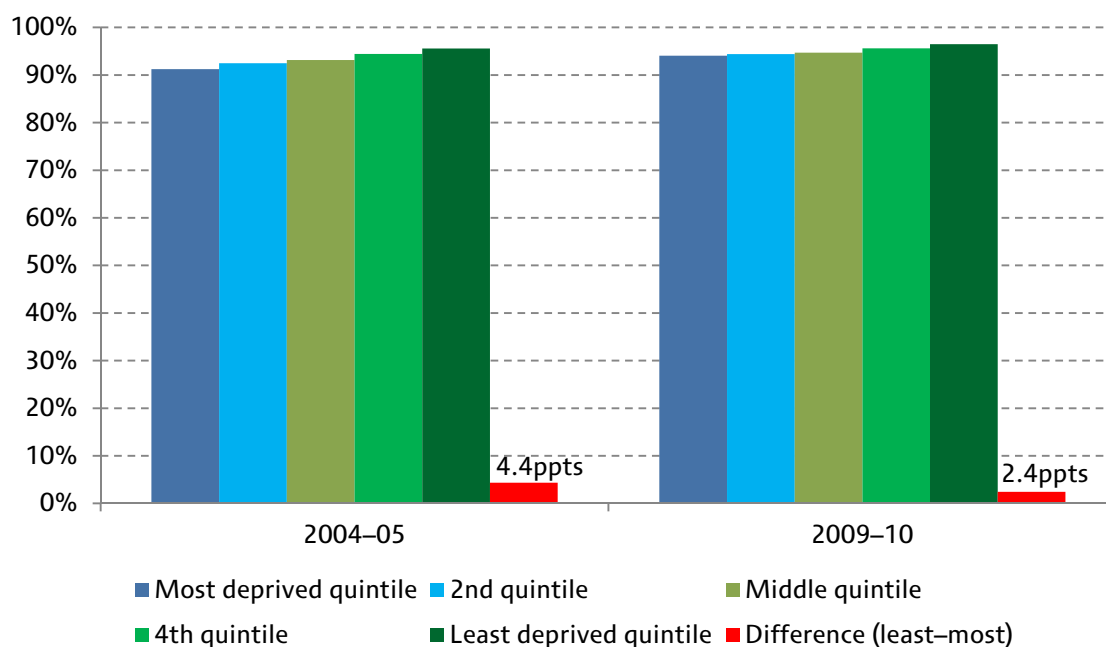
Figure 1 shows that participation rates have been increasing over time. The overall figures (not shown) indicate that the proportion of state school students going to university at age 18 or 19 has risen from 29.7% in 2004–05 to 34.4% in 2009–10. Figure 1 also shows that participation rates have risen more rapidly for those from deprived backgrounds, such that the gap in HE participation between individuals from the top and bottom quintile groups has fallen over time. For example, participation amongst young people in the most deprived quintile group has increased from 12% in 2004–05 to 17.8% in 2009–10, a 5.8 percentage point (48%) increase in just six years. Meanwhile, participation amongst young people in the least deprived quintile group has increased from 52% in 2004–05 to 55% in 2009–10, a 3 percentage point (6%) increase. This means that the gap in participation between those from the most and least deprived quintile groups has fallen from 40 percentage points in 2004–05 to 37.3 percentage points in 2009–10.

This modest closing of the gap is at least partially explained by more rapid improvements in earlier measures of attainment for those from more deprived backgrounds, which – as has been well established by previous research,



including Chowdry et al. (2010)<sup>28</sup> – is a key determinant of HE participation. For example, acquisition of a Level 3 qualification by the age of 18 has increased faster amongst those from the lowest socio-economic quintile group (by 6.4 percentage points, from 14.6% to 21.0%) than amongst those from the highest socio-economic quintile group (by 3.1 percentage points, from 62.3% to 65.4%). Focusing on individuals with similarly high test scores at Key Stage 5, Figure 2 shows (in red) the gap in HE participation between those from the most and least deprived quintile groups. This is already small for individuals first eligible to start university in 2004–05 (at 4.4 percentage points) and has closed further since then, falling to just 2.4 percentage points for those eligible to start in 2009–10.

**Figure 2. HE participation at age 18/19 amongst state school students by deprivation quintile group amongst those scoring in the top quintile group at Key Stage 5**



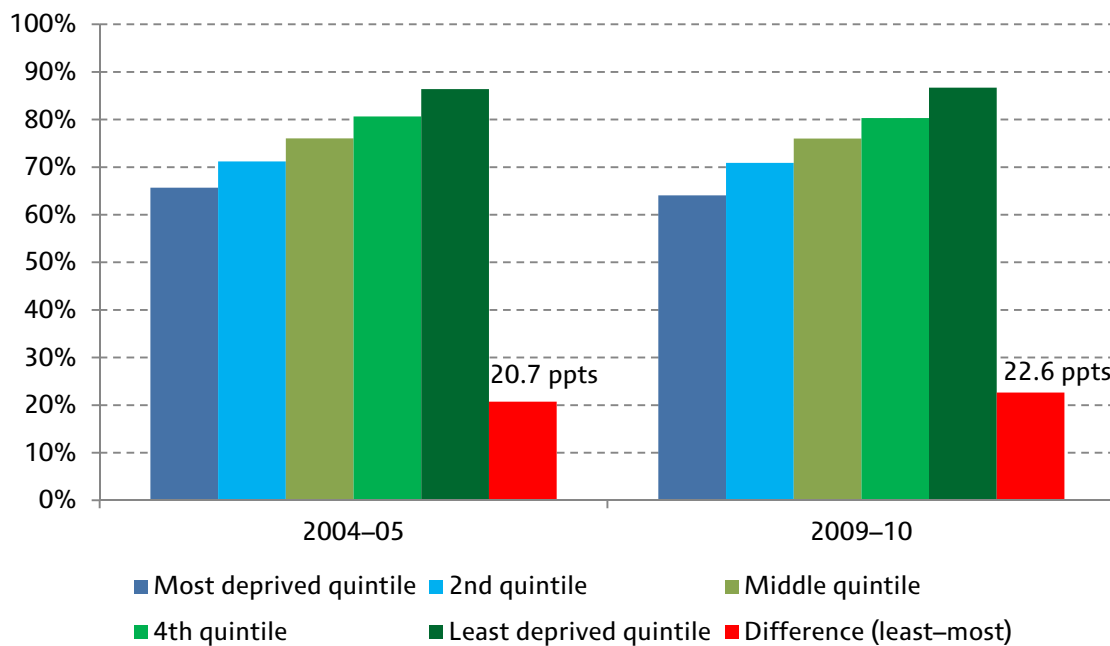
Notes: Author’s calculations based on linked individual-level administrative data from schools, colleges and universities. In both years, the difference in participation between the most and least deprived groups is significantly different from zero at the 1% level.

It is worth noting, however, that while the socio-economic gaps in HE participation for those scoring in the top fifth at Key Stage 5 are very small, the gaps amongst those scoring in the top fifth at Key Stage 4 are still sizeable and, moreover, have increased rather than decreased over time. For example, Figure 3 shows that, amongst those scoring in the top fifth at Key Stage 4, pupils in the top

<sup>28</sup> Full reference is given in footnote 24.

socio-economic quintile group are 20.7 percentage points more likely to go to university in 2004–05 and 22.6 percentage points more likely to do so in 2009–10 than pupils from the bottom socio-economic quintile. One might speculate that this pattern of increasing socio-economic gaps amongst those with similar scores at Key Stage 4 may be at least partly explained by the advent and rapid growth of GCSE equivalents, which are often taken by pupils from more deprived backgrounds.<sup>29</sup> We plan to investigate these patterns further in future research.

**Figure 3. HE participation at age 18/19 amongst state school students by deprivation quintile group amongst those scoring in the top quintile group at Key Stage 4**



Notes: Author’s calculations based on linked individual-level administrative data from schools, colleges and universities. In both years, the difference in participation between the most and least deprived groups is significantly different from zero at the 1% level.

Is there any descriptive evidence of a change in participation rates coincident with the introduction of the new HE finance regime in 2006–07? Figure 1 suggests that while there appears to have been a small dip in participation amongst those who were first eligible to go to university in 2006–07, this was only apparent in aggregate amongst individuals from the least deprived fifth of

<sup>29</sup> W. Jin, A. Muriel and L. Sibieta, *Subject and Course Choices at Ages 14 and 16 amongst Young People in England: Insights from Behavioural Economics*, Department for Education (DfE) Research Report 160, 2011.

the population and seems to have been temporary.<sup>30</sup> Based on this descriptive evidence alone, therefore, one might be tempted to conclude that, if anything, the introduction of tuition fees reduced rather than widened the gap in HE participation rates between individuals from the most and least deprived backgrounds (which would be consistent with the financial incentives provided<sup>31</sup>).

However, we do not know what would have happened to HE participation rates in the absence of the policy change; perhaps they would have increased even more rapidly amongst students from deprived backgrounds. To investigate this possibility in more detail, we add a set of controls to our model: a linear time/cohort trend ('Cohort'), an indicator for being eligible to start university in or after 2006–07 ('Post fees') and a set of interactions between this indicator and our SES quintile groups. Our aim in doing so is to understand whether participation rates in and after 2006–07 are higher or lower than we might otherwise have expected on the basis of prior trends, and whether this differs by socio-economic status. It is worth highlighting again, however, that this should not be interpreted as the causal effect of the policy change on HE participation rates.

Column 1 of Table 2 presents the results of this analysis. The coefficients on our deprivation quintile groups indicate how much more likely someone in each of these groups is to participate in higher education, on average, than someone in the most deprived quintile group. The coefficient on our 'Cohort' variable indicates by how much participation rates increase, on average, per year (and thus by how much we might have expected HE participation rates to increase over the whole period, in the absence of supply constraints). The coefficient on our 'Post fees' variable indicates how participation rates compare before and after 2006–07 for the most deprived quintile group, while the coefficients on each of the interactions between 'Post fees' and deprivation quintile groups show the same associations for other quintile groups.

---

<sup>30</sup> A similar pattern is found for university applications using a different measure of socio-economic status – see figure 18 of UCAS, 'How have applications for full-time undergraduate higher education in the UK changed in 2012?', July 2012.

<sup>31</sup> For further discussion of these issues, see Dearden et al. (2007) and Chowdry et al. (2012) – full references in footnote 9.

**Table 2. HE participation at age 18/19 amongst state school students**

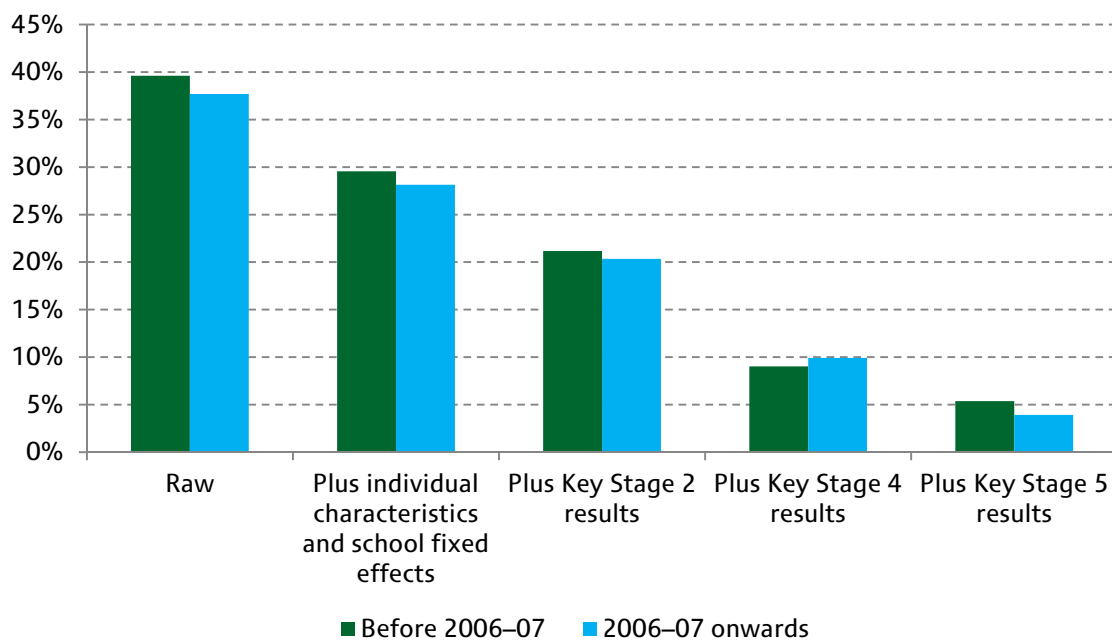
	(1) <i>Raw differences</i>	(2) <i>Plus individual characteristics and school fixed effects</i>	(3) <i>Plus Key Stage 2 results</i>	(4) <i>Plus Key Stage 4 results</i>	(5) <i>Plus Key Stage 5 results</i>
2 <sup>nd</sup> deprivation quintile group	0.068** [0.002]	0.046** [0.001]	0.027** [0.001]	0.004** [0.001]	0.007** [0.001]
Middle deprivation quintile group	0.160** [0.003]	0.118** [0.002]	0.077** [0.001]	0.020** [0.001]	0.016** [0.001]
4 <sup>th</sup> deprivation quintile group	0.249** [0.003]	0.187** [0.002]	0.127** [0.002]	0.042** [0.001]	0.028** [0.001]
Least deprived quintile group	0.396** [0.004]	0.296** [0.002]	0.212** [0.002]	0.090** [0.002]	0.054** [0.001]
Eligible to start university after fee change (Post fees)	-0.002 [0.001]	-0.006** [0.001]	-0.007** [0.001]	-0.010** [0.001]	-0.005** [0.001]
2 <sup>nd</sup> deprivation quintile × Post fees	-0.003* [0.002]	-0.002 [0.001]	0.000 [0.001]	0.002 [0.001]	-0.005** [0.001]
Middle deprivation quintile × Post fees	-0.007** [0.002]	-0.006** [0.002]	-0.005** [0.002]	0.002 [0.001]	-0.009** [0.001]
4 <sup>th</sup> deprivation quintile × Post fees	-0.014** [0.002]	-0.013** [0.002]	-0.010** [0.002]	0.001 [0.002]	-0.015** [0.001]
Least deprived quintile × Post fees	-0.021** [0.002]	-0.020** [0.002]	-0.016** [0.002]	-0.001 [0.002]	-0.019** [0.001]
Cohort	0.012** [0.000]	0.013** [0.000]	0.012** [0.000]	0.006** [0.000]	0.004** [0.000]
Observations	3,461,994	3,461,994	3,461,994	3,461,994	3,461,994
R-squared	0.084	0.151	0.268	0.414	0.557
Number of clusters		4,228	4,228	4,228	4,228
F-test of additional controls		0.000	0.000	0.000	0.000

Notes: \*\* indicates significance at the 1% level and \* at the 5% level. Standard errors, shown in brackets, are robust and clustered at the school level. Column 2 adds controls for gender, ethnicity, month of birth, whether English is an additional language for the pupil and whether they have more or less severe special educational needs, as well as school fixed effects. Column 3 adds controls for quintile group of attainment at Key Stage 2 (age 11). Column 4 adds controls for quintile group of attainment at Key Stage 4 (age 16), plus whether the pupil achieved five A\*-C grades in GCSEs or equivalents including and excluding English and maths at age 16, and whether they had achieved this threshold by age 18. Column 5 adds controls for quintile group of attainment at Key Stage 5 (age 18), plus whether the individual had reached the Level 3 threshold (equivalent to two A-level passes) and whether they had passed certain A-level subjects.

These results show that participation is increasing, on average, by 1.2 percentage points per year. From 2006–07 onwards, participation increases in line with this trend for young people from the most deprived quintile group, but by less than this trend for individuals from the remaining quintile groups: for example, participation rates amongst individuals in the least deprived quintile group were 2.1 percentage points lower than we might otherwise have expected (in the absence of capacity constraints) in 2006–07 and beyond, thus supporting a reduction in the socio-economic gap in HE participation.

This difference is depicted graphically in the first pair of bars in Figure 4, which illustrates the difference between the HE participation rates of individuals in the most and least deprived quintile groups before (green bar) and after (blue bar) 2006–07. It clearly shows that the ‘raw’ socio-economic gap in HE participation rates was smaller from 2006–07 onwards than before.

**Figure 4. Difference between HE participation rates at age 18/19 amongst state school pupils in the most and least deprived quintile groups before and after 2006–07, and after controlling for different characteristics**



Notes: See notes to Table 2 for full details of the controls included in each specification. Each estimate is significantly different from zero at the 1% level.

The remaining columns of Table 2 (and the remaining bars in Figure 4) investigate the extent to which these results can be explained by changes in the composition of the state school population over time, by sequentially adding controls for a variety of individual characteristics and school fixed effects. Column 2 adds controls for gender, ethnicity, month of birth, whether English is

an additional language for the pupil and whether they have more or less severe special educational needs, plus a set of school fixed effects. Column 3 adds controls for Key Stage 2 (age 11) test results. Column 4 adds controls for Key Stage 4 (age 16) exam results, including indicators for whether the pupil achieved five A\*–C grades in GCSEs or equivalents by age 16 or 18. Column 5 adds controls for Key Stage 5 (age 18) exam results (for those who took them), including whether the individual had reached the Level 3 threshold (equivalent to two A-level passes).

These columns show that the extent to which participation was higher or lower than expected in and after 2006–07 changes very little with the addition of other characteristics to our models, suggesting that these results are not being driven by changes in the composition of state school students over time. Interestingly, however, the time/cohort effect decreases markedly once we add Key Stage 4 and Key Stage 5 results to our model. This is driven by the marked increase in the proportion of pupils achieving the Level 2 (five GCSEs at grades A\*–C) and Level 3 thresholds over time. For example, there was a 5 percentage point increase in the proportions of pupils achieving the Level 2 threshold by age 16 (from 51.3% to 56.2%) and the Level 3 threshold by age 18 (from 36.9% to 42.1%), and a 12 percentage point increase in the proportion of pupils achieving the Level 2 threshold by age 18 (from 63.6% to 75.5%).

Figure 4 uses the results from Table 1 to illustrate the extent to which the socio-economic gap in HE participation between pupils in the most and least deprived quintile groups can be explained by differences in observable characteristics, and the extent to which this gap varies before and after 2006–07. The second set of bars in Figure 4 corresponds to column 2 in Table 1 and shows what happens to the socio-economic gap in HE participation when we add controls for individual characteristics (in addition to socio-economic status) and school fixed effects to our model. The third set of bars corresponds to column 3 in Table 1 and shows what happens when we additionally control for Key Stage 2 (age 11) test scores, and so on. The height differences between each of these sets of bars tell us the extent to which differences in the characteristics we have added can help to explain why HE participation rates differ between individuals from different socio-economic backgrounds. The height difference between the green and blue bar for each specification tells us the extent to which the characteristics we have added explain different amounts of the socio-economic gap in HE participation before and after 2006–07.

As highlighted in our previous work on this topic,<sup>32</sup> the vast majority of the difference in HE participation rates between individuals from the top and bottom quintile groups is explained by differences in observable characteristics, particularly prior attainment at Key Stage 4 (age 16) and Key Stage 5 (age 18): after controlling for the full set of individual characteristics and school fixed effects, young people from the least deprived quintile group are just 5 percentage points more likely to go to university than young people from the most deprived quintile group (i.e. this is the gap that cannot be explained by differences in the other characteristics included in our model). In line with the results of Table 1, however, the relative difference between the green and blue bars (before and after 2006–07) does not change markedly as we add these characteristics, highlighting that differences in the composition of cohorts over time are not fully explaining the differences in HE participation rates that we observe before and after 2006–07.<sup>33</sup>

Overall, these results show that, while HE participation rates were lower than might otherwise have been expected (in the absence of capacity constraints) in and after 2006–07, this reduction appears to have been greater amongst individuals from less deprived backgrounds, thus supporting a fall in the socio-economic gap in HE participation between those from the most and least deprived backgrounds. Moreover, we cannot explain these changes using the observable characteristics – including rich measures of prior attainment – that we add to our model. While not conclusive, our results thus provide some suggestive evidence that the increase in tuition fees and student support (and other relevant policies implemented over the same period) may have contributed to the reduction in the socio-economic gap in HE participation rates that we observe during the 2000s. It is certainly true to say that such a reduction occurred, that it was coincident with these policy changes and that we cannot account for it using the observable characteristics included in our model.

---

<sup>32</sup> Chowdry et al., 2010 – full reference in footnote 24.

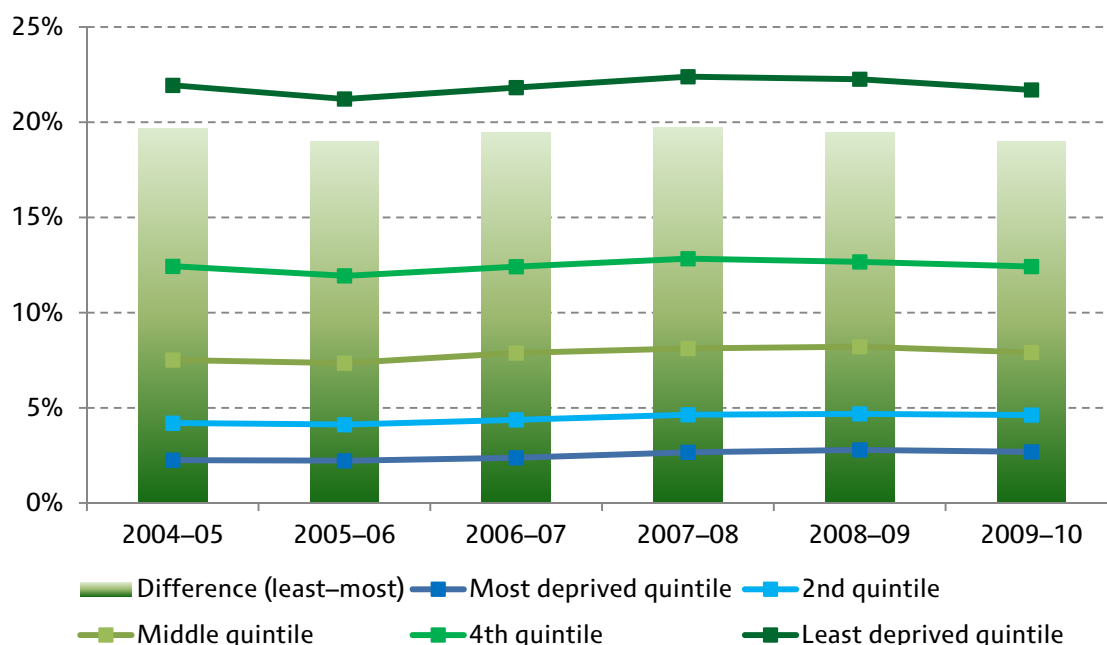
<sup>33</sup> Further investigation did not provide any insight into why the pattern is temporarily reversed once we add controls for attainment at Key Stage 4 (GCSEs and equivalents) to our model, although one might speculate that it is because of the marked increase in the proportion of pupils obtaining GCSE equivalents over time (see A. Wolf, *Review of Vocational Education: The Wolf Report*, Department for Education, 2011).

## 4.2. HE participation at high-status institutions

This section investigates participation at high-status HE institutions (rather than all HE institutions) using the same methodology as above. Figure 5 starts by plotting participation rates at high-status institutions at age 18 or 19 amongst state school students in England, separately by deprivation quintile group, and shows how these rates have changed over time.

In contrast to the results for HE participation overall (shown in Figure 1), the trends in high-status participation are rather less clear. Overall, there has been a very small increase in the proportion of state school students attending a high-status institution at age 18 or 19, from 9.6% in 2004–05 to 9.9% in 2009–10 (figures not shown). Participation at such institutions has increased marginally amongst those from more deprived backgrounds (from 2.3% to 2.7% for the most deprived quintile group), while it has decreased marginally amongst those from less deprived backgrounds (from 21.9% to 21.7% for the least deprived quintile group). This suggests that there has been a small reduction (of 0.7 percentage points) in the socio-economic gap in high-status participation over time.

**Figure 5. HE participation at a high-status institution at age 18/19 amongst state school students by deprivation quintile group**



Notes: Author's calculations based on linked individual-level administrative data from schools, colleges and universities. In each year, participation at a high-status institution in each socio-economic group is significantly different from that in other groups at the 1% level.



This pattern is reversed amongst individuals of high ability, however, with – if anything – an increase in the socio-economic gap in participation at high-status institutions amongst individuals of similarly high ability. For example, amongst those who score in the top quintile group at Key Stage 5 (A levels and equivalents), the difference in high-status participation rates between pupils in the most and least deprived socio-economic quintile groups increases from 10 percentage points amongst those first eligible to go to university in 2004–05 to 15 percentage points amongst those first eligible to go in 2009–10. We plan to investigate these patterns further in future research.

In terms of any potential changes around the time of the HE finance reforms in 2006–07, Figure 5 provides some evidence of a small decrease in the proportion of young people from less deprived backgrounds attending high-status institutions, although, interestingly, this occurs in 2005–06 rather than in 2006–07. One potential explanation for this trend – also highlighted in Crawford and Dearden (2010)<sup>34</sup> – is that some individuals who would have attended high-status institutions in 2006–07 decided to shift their participation forwards (i.e. not take a gap year), but were unable to secure places at high-status institutions in 2005–06, presumably because of capacity constraints. This provides some suggestive evidence that the change in the HE finance regime may have led some individuals in the affected cohort to attend lower-status institutions than they otherwise would have done in the absence of the reforms.

Table 3 illustrates the extent to which these differences remain after accounting for a linear cohort/time trend and how these differences change as more characteristics are added to our model. Table 3 and Figure 6 additionally illustrate the extent to which these differences vary by socio-economic background.

Column 1 of Table 3 presents the ‘raw’ results. In contrast to the results for participation overall, there is no evidence of a change in high-status participation over time (i.e. the cohort effect is effectively zero) – presumably due to capacity constraints – and participation does not differ markedly from this trend in and after 2006–07 (the coefficients on our post 2006–07 indicator and its interactions with pupils’ socio-economic status are small and often not significantly different from zero). Where significant results do exist, they tend to be for individuals from the most deprived backgrounds and are *positive*, i.e. there is some evidence that pupils from deprived backgrounds are marginally *more*

---

<sup>34</sup> Full reference is given in footnote 11.

likely to go to high-status universities in or after 2006–07 than before 2006–07 (although these differences are small – less than 0.5 percentage points).

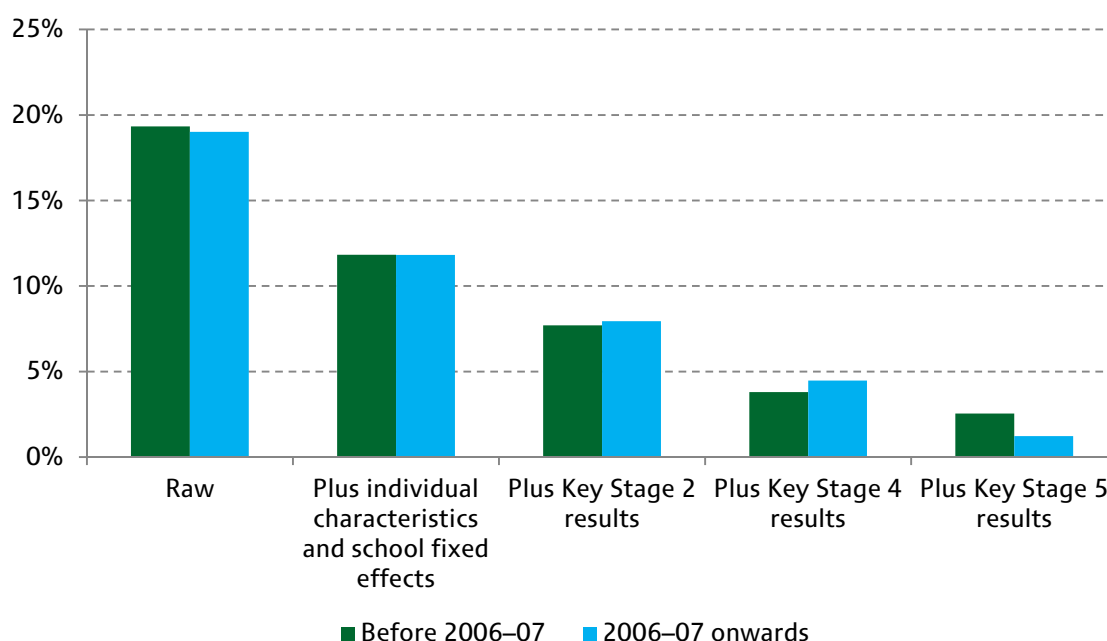
These results are strengthened once we account for the other ways in which students from different socio-economic backgrounds differ from one another. The final column of Table 3 shows that, once we control for everything up to and including attainment at Key Stage 5, those from the least deprived backgrounds

**Table 3. HE participation at a high-status institution at age 18/19 amongst state school students**

	(1) <i>Raw differences</i>	(2) <i>Plus individual characteristics and school fixed effects</i>	(3) <i>Plus Key Stage 2 results</i>	(4) <i>Plus Key Stage 4 results</i>	(5) <i>Plus Key Stage 5 results</i>
2 <sup>nd</sup> deprivation quintile group	0.019** [0.001]	0.008** [0.001]	0.000 [0.001]	-0.004** [0.001]	-0.001 [0.000]
Middle deprivation quintile group	0.052** [0.001]	0.028** [0.001]	0.010** [0.001]	-0.003** [0.001]	0.000 [0.001]
4 <sup>th</sup> deprivation quintile group	0.099** [0.002]	0.057** [0.001]	0.030** [0.001]	0.007** [0.001]	0.007** [0.001]
Least deprived quintile group	0.193** [0.004]	0.118** [0.002]	0.077** [0.001]	0.038** [0.001]	0.025** [0.001]
Eligible to start university after fee change (Post fees)	0.004** [0.001]	0.003** [0.001]	0.002** [0.001]	0.001 [0.001]	0.005** [0.001]
2 <sup>nd</sup> deprivation quintile × Post fees	0.000 [0.001]	0.000 [0.001]	0.001 [0.001]	0.001 [0.001]	-0.002** [0.001]
Middle deprivation quintile × Post fees	0.002* [0.001]	0.002** [0.001]	0.002** [0.001]	0.003** [0.001]	-0.002** [0.001]
4 <sup>th</sup> deprivation quintile × Post fees	0.000 [0.001]	0.001 [0.001]	0.002* [0.001]	0.004** [0.001]	-0.006** [0.001]
Least deprived quintile × Post fees	0.001 [0.001]	0.003* [0.001]	0.005** [0.001]	0.008** [0.001]	-0.008** [0.001]
Cohort	0.000 [0.000]	0.000* [0.000]	0.000 [0.000]	-0.001** [0.000]	-0.002** [0.000]
Observations	3,461,994	3,461,994	3,461,994	3,461,994	3,461,994
R-squared	0.054	0.071	0.177	0.278	0.449
Number of clusters		4,228	4,228	4,228	4,228
F-test of additional controls		0.000	0.000	0.000	0.000

Notes: See notes to Table 2.

**Figure 6. Difference between HE participation rates at high-status institutions at age 18/19 amongst state school pupils in the most and least deprived quintile groups before and after 2006–07, and after controlling for different characteristics**



Notes: See notes to Table 2 for full details of the controls included in each specification. Each estimate is significantly different from zero at the 1% level.

are now significantly *less* likely to attend a high-status institution in or after 2006–07 than before 2006–07 (the coefficient on the interaction between our post 2006–07 indicator and the least deprived socio-economic quintile group is negative and significant, albeit small); meanwhile, those from the most deprived backgrounds are still slightly more likely to go to a high-status institution in or after 2006–07 than before, thus confirming the findings documented in Figure 5 that the socio-economic gap in high-status participation has closed slightly over time.

The fact that this result is strengthened after including controls for attainment at Key Stage 5 can also be clearly seen in the final two bars of Figure 6: they show that the remaining unexplained difference in high-status participation between individuals from the top and bottom socio-economic quintile groups is smaller in and after 2006–07 (the blue bar) than before (the green bar), suggesting that the observable characteristics included in our model are able to explain a greater proportion of the difference in high-status participation over time.<sup>35</sup> This finding also confirms the results, discussed above in the context of overall HE

<sup>35</sup> Again, it is unclear why this pattern differs after adding Key Stage 4 results.

participation, that at least part of the reason for the closing of the socio-economic gap in high-status participation is that pupils from the most deprived backgrounds have improved their attainment at Key Stage 5 relative to those from less deprived backgrounds.

## 5. Conclusions

This briefing note has documented what happened to participation in higher education overall and at high-status institutions at age 18 or 19 amongst state school students who were first eligible to start university between 2004–05 and 2009–10. In particular, it has investigated whether there is any evidence of a change in the trajectory of HE participation rates in or after 2006–07 (when the system of HE finance changed) and, if so, whether these changes occurred differentially for young people from different socio-economic backgrounds.

Our results show that HE participation has been increasing over time and that it has been rising more rapidly for those from deprived backgrounds, such that the gap in HE participation – and, to a lesser extent, in participation at high-status institutions – between individuals from the most and least deprived quintile groups has fallen over time. For example, between 2004–05 and 2009–10, the gap in HE participation between those from the top and bottom socio-economic quintile groups has fallen from 40.0 percentage points to 37.3 percentage points, while the gap in high-status participation has fallen more slowly, from 19.7 to 19.0 percentage points. These reductions are at least partly explained by the improvement in the relative performance of those from more deprived backgrounds in earlier achievement tests, especially at Key Stage 5 (taken at age 18).

In terms of changes in the trajectories over time, it looks as if overall HE participation rates may have dipped slightly when fees were raised in 2006–07, but the dip was actually more pronounced among those from better-off backgrounds than it was among more deprived students. For example, participation was around 2 percentage points lower than might otherwise have been expected amongst individuals from the highest socio-economic quintile group, while it was no more than 0.5 percentage points lower amongst individuals from the lowest socio-economic quintile group. The trend towards a smaller socio-economic gap also accelerated somewhat in 2006–07. We cannot say for sure that this change in trend arose *as a consequence of* the new HE finance regime, but it was coincident with it and we cannot explain it using the other characteristics that we observe in our data.

One possible reason for this observed pattern is that, contrary to the beliefs of many, the new HE finance regime introduced in 2006–07 was actually significantly more progressive than the system that it replaced. Overall, it was more generous to students from poorer backgrounds and hit richer students relatively harder. Assuming students understood the financial implications of the regime and were not debt averse, the change in regime might have been expected to decrease participation rates amongst those for whom the costs of university had gone up rather than down (i.e. those from the richest families) relatively more. This is exactly what we see: participation rates were lower than might otherwise have been expected in and after 2006–07, with the negative effect significantly greater for students from the least deprived backgrounds.

Again, however, it must be highlighted that we cannot separate the effects of changes to the HE finance regime from the effects of other policies that were introduced around the same time and that might have been expected to produce similar results. These policies include the increased responsibility and focus of universities, and indeed schools, on increasing HE participation amongst disadvantaged students. Nonetheless, the changes in participation that we observe are at least consistent with the responses that might have been expected given the incentives provided by the new HE finance regime.