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# Socio-economic differences in total education spending in England: middle-class welfare no more

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Chris Belfield
David Goll
Luke Sibieta

E·S·R·C ECONOMIC & SOCIAL RESEARCH COUNCIL

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**Chris Belfield, David Goll and Luke Sibieta**

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# Executive summary

Pupils benefit from a large amount of state funding for education in the 12+ years they spend in formal education, about £73,000 on average for pupils aged 16 in Summer 2010 in England. The total amount they experience is shaped by their education choices (e.g. whether to stay on post 16 and/or go to higher education) and the nature of the funding system for each stage of education. In the 1980s, considerably more was spent on the education of those from well-off backgrounds than on those from poorer backgrounds. This was driven by the fact that poorer children were much less likely to stay in education beyond 16, let alone go to university. And funding for higher education (HE) was relatively high.

In this report, we find that these differences in funding by social class have now vanished. Changes to the distribution of school funding, increased staying-on rates and reforms to HE funding mean that there was no difference in the amount of public money spent in total on educating the poorest and richest pupils who were taking their GCSEs in 2010. This has happened despite the facts that richer pupils remain much more likely to enrol in HE and that public subsidy for HE remains substantial.

Since 2010, the funding system has become even more beneficial to lower-income students relative to the better off. This is in part because of further school funding reforms, in part because post-16 participation rates have risen and in part because funding for school sixth forms (where better-off children are more likely to study) has been cut relative to funding for colleges (which are more likely to serve poorer students).

This is a remarkable change over time. A system that was substantially skewed in funding terms towards the better off is now, if anything, skewed towards the least well off.

**Key findings**

- **Socio-economic differences in total education funding had evaporated by 2010.** Amongst pupils taking their GCSEs in Summer 2010, those in the richest and poorest socio-economic quintiles received about £73,000 in total funding across all stages of education. This represents a major reversal. Amongst pupils taking their GCSEs in Summer 2003, those in the richest quintile received about £5,900 more than those in the poorest quintile.

- **School funding has become much more targeted towards poorer pupils.** In 2003, there was already a £3,500 funding advantage in total school funding in favour of pupils from poorer families (looking over 12 years of schooling). As a result of various reforms to the school funding system, this grew to £9,500 by 2010, with pupils in the poorest quintile experiencing about £57,700 of school funding in total.

- **Participation in 16–18 education is now near universal.** In 2003, pupils from richer families were about 11 percentage points more likely to stay in post-16 education than those from poorer families. By 2010, participation was over 95% amongst all groups, reducing this gap to 2 percentage points.

- **This change in participation has more than halved the socio-economic gap in**

**post-16 funding.** In 2003, pupils from richer families ended up receiving about £2,800 more in total post-16 spending than those from poorer families. For pupils taking their GCSEs in Summer 2010, this gap had shrunk to £1,200.

- **Children from poorer families are much more likely to attend colleges rather than school sixth forms.** Amongst those taking their GCSEs in Summer 2010, about 58% of pupils from poorer families attended a further education or sixth-form college as opposed to 21% who attended a school sixth form. Amongst pupils from the least deprived quintile, about 41% attended a college and 47% attended a school sixth form. These substantial differences will have acted to increase socio-economic gaps in spending, given that school sixth forms received higher levels of funding per student until quite recently.

- **Socio-economic gaps in higher education participation narrowed over the 2000s.** Amongst pupils taking their GCSEs in 2003, children from richer families were about 33 percentage points more likely to go on to higher education. This meant that children from the richest quintile received more than three times the level of higher education spending experienced by those from the poorest quintile. The participation gap narrowed slightly to about 28 percentage points for pupils taking their GCSEs in Summer 2010. This reduced the funding gap, but children from richer families still experienced more than double the amount of HE spending received by those from poorer families.

- **Pupils from richer families benefit more from long-run public subsidies to higher education.** This is because they are more than twice as likely to go to higher education. Although pupils from richer backgrounds are likely to earn more themselves as graduates, and thus make larger student loan repayments, such differences would need to be implausibly large to cancel out the effects of differences in participation.

- **Pupils from richer families would benefit more from the abolition of tuition fees,** which again results from the fact that they are more likely to go to higher education. We find that pupils in the richest quintile would benefit by more than twice as much from such an abolition as those in the poorest quintile.

- **Reforms since 2010 are likely to have increased total funding in favour of pupils from poorer backgrounds.** The pupil premium was introduced from 2011 onwards. Reforms to post-16 funding have tended to favour colleges, which poorer pupils are more likely to attend, rather than school sixth forms. Evidence also suggests that socio-economic gaps in higher education participation have fallen slightly over time, though these remain substantial.

# 1. Introduction

Children spend a long time going through the education system. Most will start early education or nursery at the age of 3, then go through 12 years of compulsory schooling, most will stay until aged at least 18 and a growing share will go to higher education up to age 21 and beyond. In so doing, those in the state-funding system will benefit from a substantial level of public funding accumulated over their education career. We estimate that this stands at around £73,000 on average for pupils who took their GCSEs in Summer 2010. The amount young people accumulate will differ depending on their education choices (e.g. staying on post 16 and going on to higher education). It will also differ as a result of funding systems that prioritise different stages of education, institutions and specific groups of young people and that have done so differently over time.

In the 1980s, Goodin and Le Grand found that children from richer families benefited more from education spending than those from poorer families.[1] This occurred because public funding was heavily skewed towards higher education and there were strong socio-economic gradients in terms of who went to higher education, with very few children from poorer families going at that time. For example, young people from the richest fifth of families in the late 1980s were over twice as likely to stay on in full-time education after age 16 as those from the poorest fifth of families, leaving a participation gap of over 35 percentage points.[2]

Since then, participation in post-16 and higher education have both expanded on a large scale. The proportion of young people going on to full-time post-16 education has doubled from around 40% in the mid 1980s to over 80% today.[3] The proportion of young people in higher education has expanded from just under 15% in the 1980s to nearly 35% by the end of the 1990s[4] (or about 40% based on young people aged 17–30 rather than just those aged 18–21[5]). It has then risen to around 50% of young people aged 17–30 at the latest count.[6]

Funding systems have also been reformed in ways that prioritise earlier stages of education and students from more disadvantaged backgrounds. The school funding system has become more targeted towards deprived pupils.[7] Post-16 funding has become more geared towards colleges rather than school sixth forms. Higher education finance has been reformed multiple times, with increases in funding through tuition fees and reduced grants for teaching.

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1 R. E. Goodin and J. Le Grand, *Not Only the Poor: The Middle Classes and the Welfare State*, Allen and Unwin, London, 1987.

2 J. Blanden, P. Gregg and S. Machin, 'Educational inequality and intergenerational mobility', in S. Machin and A. Vignoles (eds), *What's the Good of Education? The Economics of Education in the United Kingdom*, Princeton University Press, 2005.

3 C. Belfield, C. Farquharson and L. Sibieta, *2018 Annual Report on Education Spending in England,* IFS Report R150, 2018, https://www.ifs.org.uk/publications/13306.

4 D. Finegold, 'The roles of higher education in a knowledge economy', Rutgers University, mimeo, 2006, http://www.heart-resources.org/wp-content/uploads/2015/10/The-Roles-of-Higher-Education-in-a-Knowledge-Economy.pdf?e4e997.

5 http://researchbriefings.files.parliament.uk/documents/SN02630/SN02630.pdf.

6 https://www.gov.uk/government/statistics/participation-rates-in-higher-education-2006-to-2017.

7 C. Belfield and L. Sibieta, *Long-Run Trends in School Spending in England*, IFS Report R115, 2016, https://www.ifs.org.uk/publications/8236.

In this report, we seek to answer the following questions: 'How much do pupils from different socio-economic backgrounds receive in total from the education funding system?' and 'How has this changed over the 2000s as a result of funding reforms and changes to participation?'.

Academic evidence suggests that increasing resources is a good way to improve overall levels of education and narrow socio-economic gaps in achievement, particularly amongst pupils from deprived backgrounds and even more so if they are targeted earlier in life.[8] Our estimates will illustrate the extent to which public resources for education reflect such evidence and are skewed towards different socio-economic groups. In so doing, they will also illustrate the extent to which public service funding is now being used to achieve redistributive goals. This adds to our understanding of how the shape and role of public spending have changed over time. There is clear evidence that reforms to the tax and benefit system increased the level of redistribution across most metrics over the 2000s, whilst reforms since 2010 have reduced the level of redistribution.[9] Have changes to the focus of public service spending – in this case, education – worked in tandem or in the opposite direction?

Undertaking this work requires a large volume of data across a long period of time, as we must track pupils from when they start school right through their time in education. As a direct result, we focus on pupils taking their GCSEs from Summer 2002 through to Summer 2010. Even in this relatively short space of time, we show there have been relatively dramatic changes in the extent to which total education funding is directed towards different socio-economic groups.

For these pupils, we calculate the total level of public funding each pupil receives from the state based on the schools they attend, whether they participate in post-16 education (and, if so, which type of institution) and whether they go on to higher education. Each section of the report describes how we calculate the totals for each stage of education from school to higher education. We then examine differences in total funding per student by quintiles of an index of socio-economic background. This index is based on a combination of pupil-level and area-level data.[10] It focuses on measuring parental socio-economic background, though we also examine differences by student's own earnings later in life as part of our analysis of higher education. We necessarily exclude pupils

[8] F. Cunha, J. J. Heckman and S. M. Schennach, 'Estimating the technology of cognitive and noncognitive skill formation', *Econometrica*, 2010, 78, 883–931.
C. K. Jackson, R. C. Johnson and C. Persico, 'The effects of school spending on educational and economic outcomes: evidence from school finance reforms', *Quarterly Journal of Economics*, 2016, 131, 157–218.
R. C. Johnson and C. K. Jackson, 'Reducing inequality through dynamic complementarity: evidence from Head Start and public school spending', National Bureau of Economic Research (NBER), Working Paper 23489, 2017.

[9] J. Browne and D. Phillips, 'Tax and benefit reforms under Labour', IFS Briefing Note 88, 2010, https://www.ifs.org.uk/publications/4807.
J. Browne and W. Elming, 'The effect of the coalition's tax and benefit changes on household incomes and work incentives', IFS Briefing Note BN159, 2015, https://www.ifs.org.uk/publications/7534.
A. Hood and T. Waters, 'The impact of tax and benefit reforms on household incomes', IFS Briefing Note BN196, 2017, https://www.ifs.org.uk/publications/9164.

[10] C. Belfield, J. Britton, F. Buscha, L. Dearden, M. Dickson, L. van der Erve, L. Sibieta, A. Vignoles, I. Walker and Y. Zhu, *The Relative Labour Market Returns to Different Degrees*, Department for Education Research Report, 2018, https://www.gov.uk/government/publications/undergraduate-degrees-relative-labour-market-returns.
H. Chowdry, C. Crawford, L. Dearden, A. Goodman and A. Vignoles, 'Widening participation in higher education: analysis using linked administrative data', *Journal of the Royal Statistical Society: Series A*, 2013, 176, 431–57.

attending private or independent schools given a lack of data. We also exclude early years funding as our last cohort of students (those taking GCSEs in Summer 2010) started school before the free entitlement began.

We make extensive use of our previous work on long-run changes in education spending to calculate total education spending by cohort.[11] In previous work, we have already examined total school spending by cohort.[12] Here we go beyond this by accounting for post-16 and higher education participation and funding.

The rest of this report proceeds as follows. We describe our estimates for schools in Section 2, for post-16 education in Section 3 and for higher education in Section 4 and then show how the estimates combine to give an overall picture of total education funding in Section 5. We conclude in Section 6.

[11] C. Belfield, C. Farquharson and L. Sibieta, *2018 Annual Report on Education Spending in England,* IFS Report R150, 2018, https://www.ifs.org.uk/publications/13306.

[12] C. Belfield and L. Sibieta, *Long-Run Trends in School Spending in England*, IFS Report R115, 2016, https://www.ifs.org.uk/publications/8236.

# 2. Schools

In 2017–18, total spending on schools in England represented about £42 billion (in 2018–19 prices) and accounted for the vast majority of education spending in England.[13] In what follows, we illustrate our estimates of the cumulative total amount of funding pupils experience over 12 years of schooling in primary and secondary state-funded schools. To do so, we use pupils taking GCSEs in state-funded schools between Summer 2003 and Summer 2010 as our base and then track back to the various schools they attended up to that point and the funding per pupil at those schools at the time they were there. We only include pupils observed in primary and secondary schools over the full course of the 12 years of compulsory schooling. As a result, we exclude pupils outside the state-funded sector or who only attend state-funded schools for part of their schooling careers. We show both the average level of total funding and how this varies by socio-economic background.

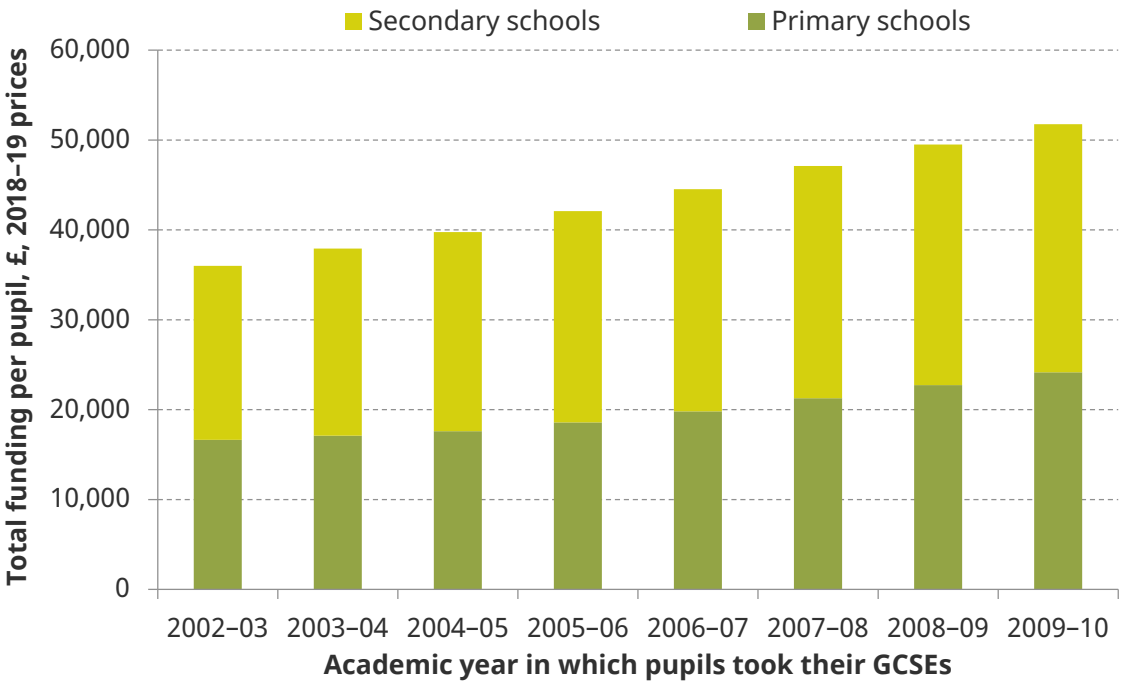
## How much in total do pupils receive in school funding?

As shown in Figure 1, the total level of funding per pupil experienced over their school careers was about £36,000 (2018–19 prices) for pupils taking their GCSEs in Summer 2003. This breaks down into about £17,000 in primary schools and £19,000 in secondary schools.

This total grew to about £52,000 for pupils taking their GCSEs in Summer 2010, about 44% higher in real terms than the 2003 total. This large growth over just seven years reflects the fact

[13] Level of Dedicated Schools Grant in 2017–18 minus the early years element (https://www.gov.uk/government/publications/dedicated-schools-grant-dsg-2017-to-2018) plus the pupil premium (https://www.gov.uk/government/publications/pupil-premium-conditions-of-grant-2017-to-2018).

**Figure 1. Total cumulative school funding per pupil by year in which pupils took GCSEs**




Note: Totals represent sum of contemporaneous funding per pupil across all years in primary and secondary schools. Pupils are only included in the average if they are observed in all years in state-funded primary and secondary schools.

Source: Authors' calculations using National Pupil Database, Section 52/251 Returns and CIPFA data.

that school funding per pupil was growing at over 5% per year, on average, in real terms over the course of the 2000s.[14]

Growth was also spread quite evenly across primary and secondary schools. Total funding per pupil received in primary schools reached about £24,000 for pupils taking their GCSEs in Summer 2010 (about 45% higher than for those who took their GCSEs in Summer 2003), whilst total funding per pupil received in secondary schools reached nearly £28,000 for the same cohort (about 43% higher than for those taking their GCSEs in Summer 2003).

## How does this vary by socio-economic background?

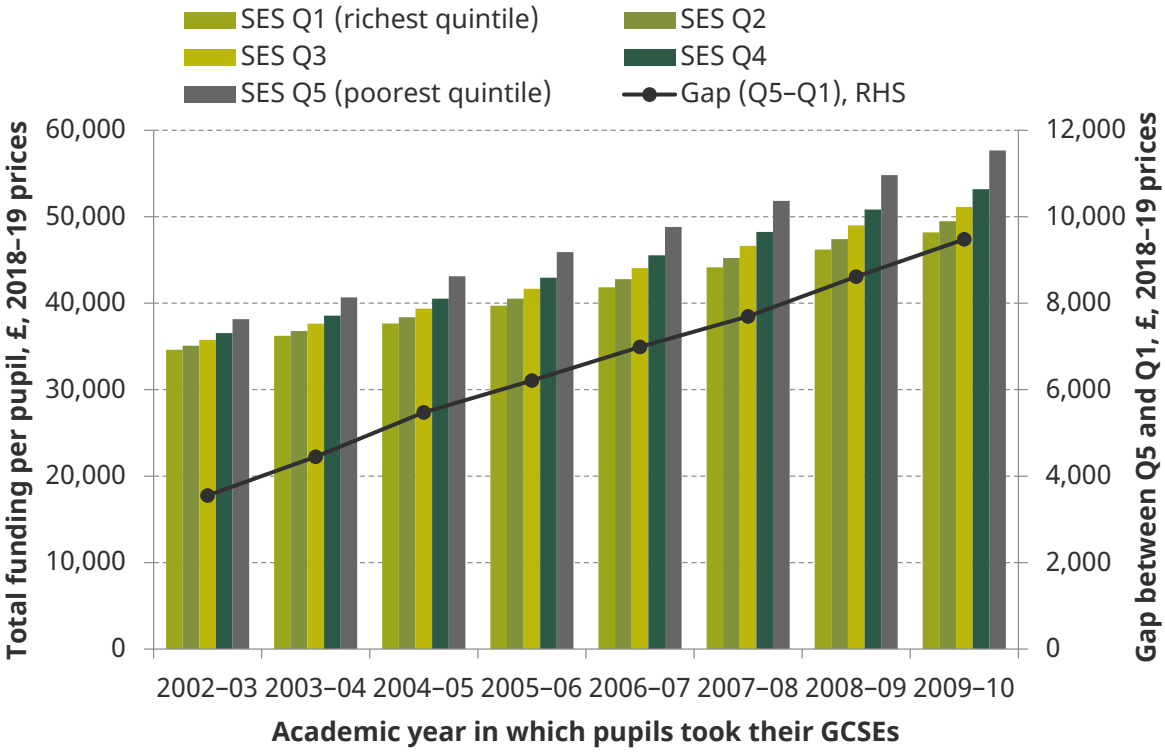
Figure 2 shows the total level of funding per pupil experienced by pupils from different socio-economic backgrounds over the full course of their schooling careers. Specifically, it shows the average level of total funding by socio-economic quintile, with quintile 1 being the richest quintile and quintile 5 being the poorest quintile. As before, this is shown by the year in which pupils took their GCSEs.

Pupils from poorer backgrounds experience higher levels of funding than those from richer backgrounds and this difference grew over the course of the 2000s. Amongst pupils taking their GCSEs in Summer 2003, those in the poorest socio-economic quintile

[14] C. Belfield, C. Farquharson and L. Sibieta, *2018 Annual Report on Education Spending in England,* IFS Report R150, 2018, https://www.ifs.org.uk/publications/13306.

experienced £38,200 in funding over their schooling careers, about £3,600 or 10% more than the total level of funding experienced by pupils in the richest socio-economic quintile (£34,600).

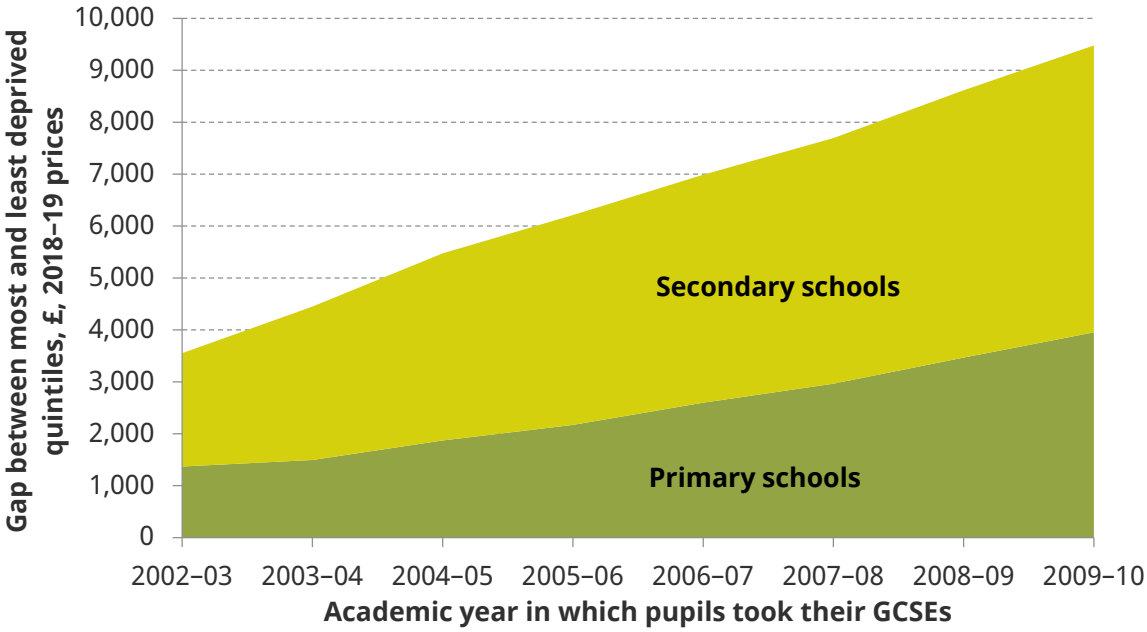
**Figure 2. Socio-economic differences in total school funding per pupil by year in which pupils took GCSEs**




Note: Totals represent sum of contemporaneous funding per pupil across all years in primary and secondary schools. Pupils are only included in the average if they are observed in all years in state-funded primary and secondary schools. SES stands for socio-economic status; Q stands for quintile.

Source: Authors' calculations using National Pupil Database, Section 52/251 Returns and CIPFA data.

**Figure 3. Socio-economic gap in total school funding per pupil by phase of education and year in which pupils took GCSEs**




Note: The areas show the difference in total primary or secondary spending per pupil between the richest and poorest quintiles. Pupils are only included in the average if they are observed in all years in state-funded primary and secondary schools.

Source: Authors' calculations using National Pupil Database, Section 52/251 Returns and CIPFA data.

The total level of funding experienced by pupils in the poorest quintile then grew to £57,700 for pupils who took their GCSEs in Summer 2010, growth of about 51% in real terms as compared with 2003. This compares with slightly slower growth of about 39% for pupils in the richest quintile. As a result, the extra funding experienced by poorer pupils grew to about 20% or almost £9,500 for pupils taking their GCSEs in Summer 2010.

Figure 3 shows that this gap in funding is similar across primary schools and secondary schools. In secondary schools, the most deprived quintile received 22% (£5,500) more than the richest quintile for pupils who took their GCSEs in Summer 2010. In primary schools, this difference is 17% or £4,000 in total.

The higher level of funding experienced by pupils from poorer backgrounds is a direct result of a school funding system that targets more funding towards schools with more deprived pupils. Such targeted funding already existed in the late 1990s and continued to grow over the 2000s, with much of the growth reflecting the introduction of additional specific grants explicitly targeted at schools with more deprived pupils. For example, Belfield and Sibieta (2016) show that the gap in funding per pupil between the most and least deprived quintiles of secondary schools was about 10% in the late 1990s and grew to about 30% by 2013–14.[15]

[15] C. Belfield and L. Sibieta, *Long-Run Trends in School Spending in England*, IFS Report R115, 2016, https://www.ifs.org.uk/publications/8236.

Our analysis here only extends to pupils taking their GCSEs in Summer 2010, matching the years of data available for other stages of education. As a result, we see that the rapid increase in total funding experienced by poorer pupils occurred well before the introduction of the pupil premium in 2011. The gradual increase in the pupil premium over the period between 2011 and 2015 will have then added to this picture and further increased the targeting of funding towards poorer pupils.

# 3. 16–18 education

At age 16, young people face a range of education and employment options.[16] They can continue in full-time education at a school sixth form, sixth-form college or further education college. They can also combine part-time work and education or training, including in an apprenticeship. Historically, many young people have also opted to move straight into paid employment, though this has become less common over time.

Historically, there has been a sharp socio-economic gradient in terms of which pupils stay in full-time education, with young people from better-off families more likely to stay in education. Children from more disadvantaged families are also more likely to attend further education and sixth-form colleges, which, until quite recently, received lower levels of funding per student than school sixth forms. As a result of socio-economic differences in participation and funding differences by institutional type, children from better-off families are likely to have received substantially more in post-16 funding than children from poorer families over much of the recent past.

There has, however, been a rapid increase in post-16 participation over the last 30 years, with the proportion in full-time education doubling from around 40% in the mid 1980s to over 80% today.[17] In this section, we illustrate the socio-economic differences in post-16 funding and how these have been shaped by the increases in post-16 participation over time.

In order to build up a comprehensive picture of total education funding across all phases, we estimate the post-16 funding experienced by the same set of young people we focused on in the previous section (i.e. those taking GCSEs between Summer 2003 and Summer 2010, and thus those completing 2–3 years of post-16 education between 2004–05 through to 2012–13).

We use both the National Pupil Database and Individual Learner Records to examine which young people are in post-16 education and, if they are, what type of institution they attend. We then estimate their funding based on the national average level of public funding per student in their institution type (school sixth form, further education college or sixth-form college).

## Socio-economic differences in post-16 participation

There have long been socio-economic differences in the proportion of young people staying on in education after the age of 16. Pupils from richer families have tended to be more likely to stay in education than those from poorer families. Some of these gaps were

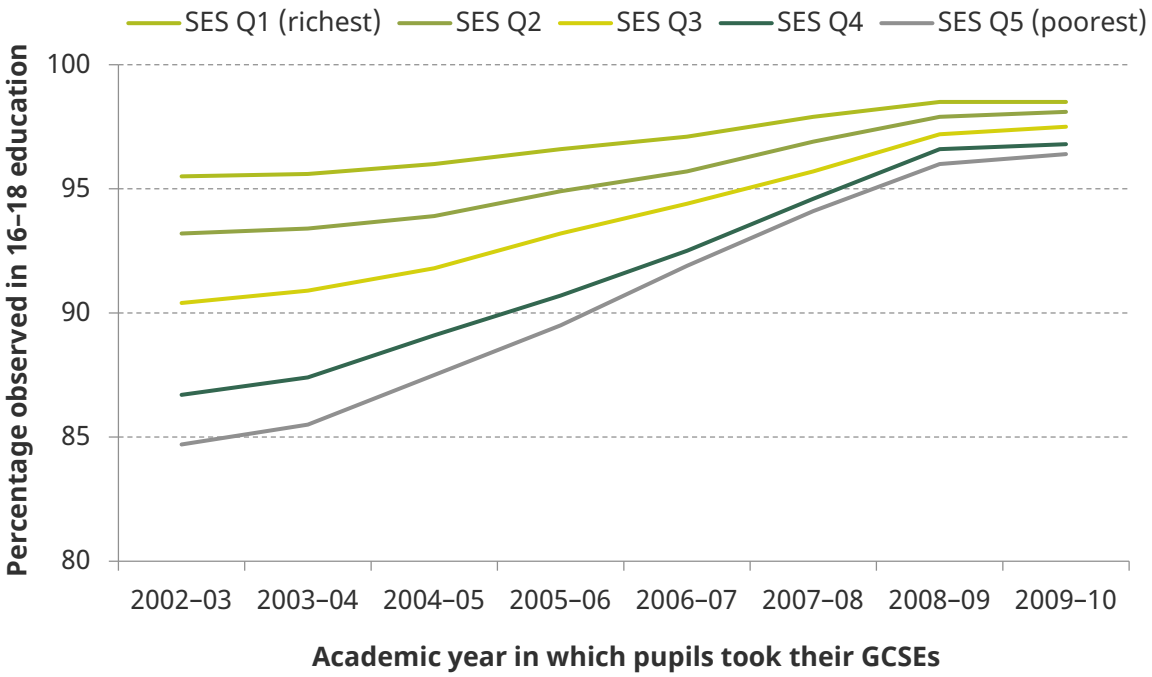
[16] C. Hupkau, S. McNally, J. Ruiz-Valenzuela and G. Ventura, 'Post-compulsory education in England: choices and implications', *National Institute Economic Review*, 2017, 240, R42–57, https://doi.org/10.1177/002795011724000113.

[17] C. Belfield, C. Farquharson and L. Sibieta, *2018 Annual Report on Education Spending in England,* IFS Report R150, 2018, https://www.ifs.org.uk/publications/13306.

reduced as a result of successive increases in the school-leaving age to 15 in 1947 and 16 in 1972. However, they remained substantial in the late 1980s.[18]

Figure 4 shows the socio-economic differences in the proportion of pupils who participated in some form of post-16 education for those who took GCSEs between Summer 2003 and Summer 2010. At the start of the series, participation was already high across all groups, reflecting the large increases in post-16 education seen from the mid 1980s through to the early 2000s. However, there were still clear socio-economic differences, with 96% of pupils in the richest quintile going on to some form of post-16 education as compared with 85% in the poorest quintile. By 2009–10, this gap has closed substantially, with 99% of pupils in the richest quintile and 96% in the poorest quintile going to post-16 education. This is a remarkable

**Figure 4. Socio-economic differences in post-16 participation by year in which pupils took GCSEs**




Note: Individuals are classed as participating in 16–18 education if they are observed as having completed a Key Stage 5 qualification or have been recorded as having a learning aim in the Individual Learner Records in one of the three years after they take their GCSEs. This includes individuals in independent schools, private training providers and other forms of post-16 education.

Source: Authors' calculations using National Pupil Database and Individual Learner Records.

change. Over the 2000s, participation in post-16 education moved from being socio-economically graded to near universal amongst all quintiles.

There are also clear socio-economic differences in the type of institution that pupils attend after the age of 16. Figure 5 shows the proportion of young people in each socio-economic quintile attending a further education or sixth-form college as compared with a school

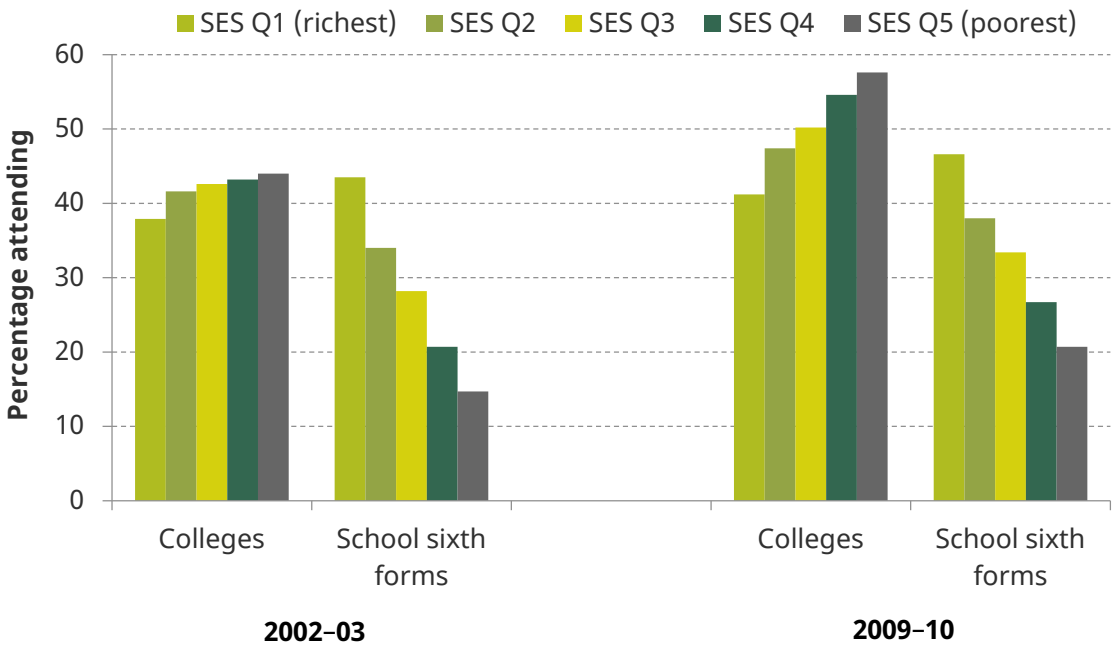
[18] R. E. Goodin and J. Le Grand, *Not Only the Poor: The Middle Classes and the Welfare State*, Allen and Unwin, London, 1987.

sixth form (for 2002–03 and 2009–10 only).[19] Amongst those taking their GCSEs in Summer 2003, pupils in the poorest quintile were about 29 percentage points more likely to go on to a college (44%) rather than school sixth form (15%). In very sharp contrast, pupils in the richest quintile were about 6 percentage points more likely to attend a school sixth form, with about 38% attending a college as compared with about 44% going to a school sixth form.

Over time, we see that a large part of the increase in post-16 participation can be accounted for by a greater share of pupils from poorer backgrounds attending colleges. As a result, the socio-economic differences have actually grown over time. Amongst pupils taking their GCSEs in Summer 2010, those in the poorest quintile were about 37 percentage points more likely to attend a college than a school sixth form, whilst pupils in the richest quintile were about 5 percentage points more likely to attend a school sixth form. Amongst the poorest quintile, about 58% attended a college and 21% attended a school sixth form, which compares with 41% attending a college and 47% attending a school sixth form in the richest quintile.

Whilst the precise drivers of these socio-economic differences in post-16 institutions are not clear, historical and geographical differences in the availability of such institutions seem the

**Figure 5. Socio-economic differences in proportion of young people attending further education and sixth-form colleges versus school sixth forms, by year in which pupils took GCSEs**




Note: Individuals are classed as participating in school sixth forms, further education or sixth-form colleges if they are observed as having completed a Key Stage 5 qualification in one these institutions or have been recorded as having a learning aim in the Individual Learner Records and attending one of these institutions in one of the three years after they take their GCSEs.

[19] Note that these numbers do not sum to the total participation figures shown in Figure 4 as those figures include other forms of post-16 participation).

Source: Authors' calculations using National Pupil Database and Individual Learner Records.

most obvious explanation. Whatever their cause, such differences will clearly have an impact on the sorts of qualification routes available to young people from different backgrounds, given that further education colleges have become more focused on vocational qualifications over time.[20] They will also affect the level of funding and resources available to young people from different backgrounds over time. Historically, school sixth forms have had higher levels of funding per student than colleges. Indeed, between 2002–03 and 2008–09, spending per student was about £600 higher in school sixth forms than in colleges. This will have led to higher levels of funding per student for pupils from richer families. However, changes to the funding system meant that this gap then closed to near zero by about 2011, which will have reduced socio-economic differences in funding per student. Since 2011, colleges have seen smaller falls in funding per student than school sixth forms. As a result, colleges now receive about £700 more in funding per student than school sixth forms.[21] This latter trend comes too late to affect the figures we present in this report, but will have affected the level of total funding for more recent cohorts.

We now turn to the question of socio-economic differences in post-16 funding.

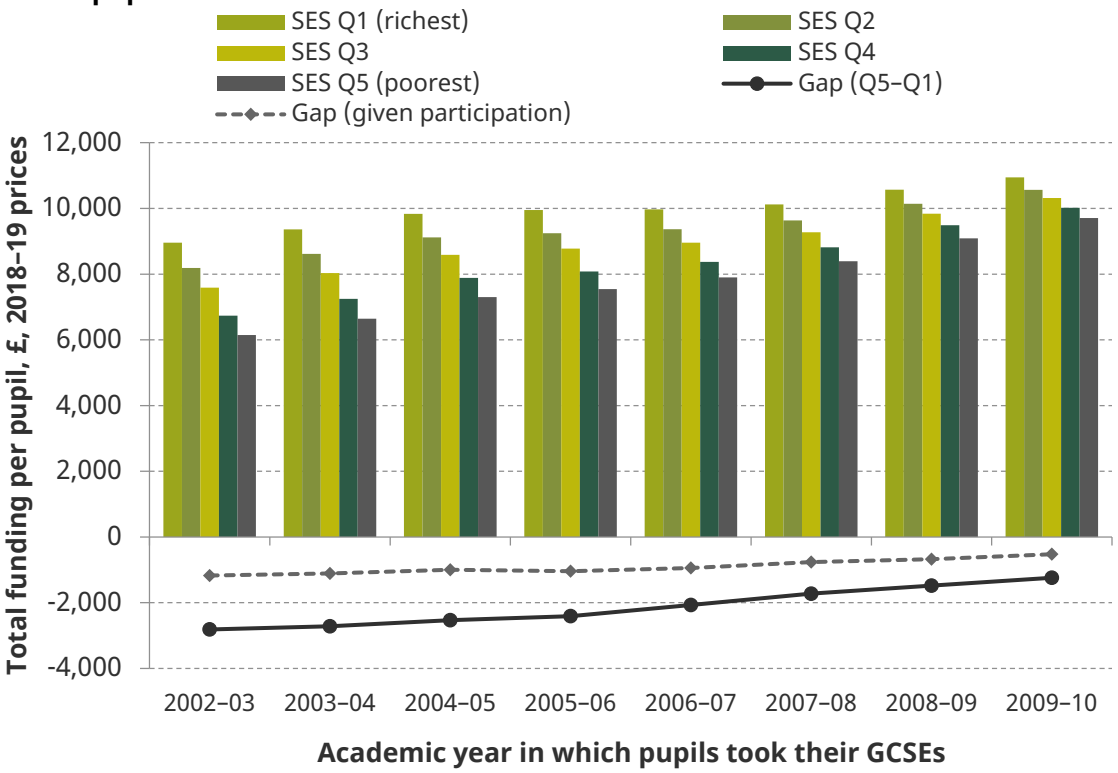
## Socio-economic differences in post-16 funding

Figure 6 shows our estimates of the total level of post-16 funding experienced by pupils taking their GCSEs between Summer 2003 and Summer 2010 by socio-economic quintile. For schools, we saw that pupils from poorer backgrounds tend to experience higher levels of total funding over their time in schools. We see the opposite picture for post-16 funding. For pupils

[20] C. Belfield, C. Farquharson and L. Sibieta, *2018 Annual Report on Education Spending in England,* IFS Report R150, 2018, https://www.ifs.org.uk/publications/13306.

[21] Ibid.

**Figure 6. Socio-economic differences in total post-16 funding per pupil by year in which pupils took GCSEs**




Note: Individuals are classed as receiving post-16 funding if they are attending a school sixth form, further education or sixth-form college (for up to a maximum of three years).

Source: Authors' calculations using National Pupil Database, Individual Learner Records and C. Belfield, C. Farquharson and L. Sibieta, *2018 Annual Report on Education Spending in England,* IFS Report R150, 2018, https://www.ifs.org.uk/publications/13306.

taking their GCSEs in Summer 2010, those from the richest quintile experienced about £10,900 in total funding, compared with around £9,700 for pupils in the poorest quintile. This gap of £1,200 has narrowed substantially since 2002–03, when it stood at £2,800 per student.

The narrowing of the gap will reflect a number of factors. The narrowing of differences in post-16 participation will clearly reduce differences in total funding. Indeed, if we estimate the gap in funding conditional on participation in post-16 education, we find a smaller gap in 2009–10 (£500) and a smaller narrowing as compared with 2002–03 (when it was £1,200). However, differences in participation still accounted for nearly 60% of the difference in total funding in both 2003 and 2010.

The rest of the differences in funding per student will reflect two main factors. First, pupils in poorer quintiles are likely to spend fewer years in post-16 education than those from richer families (e.g. leaving at 17). Second, poorer pupils are more likely to attend colleges rather than school sixth forms. Up to 2011–12, which covers all but one of the years under consideration here, colleges received lower levels of funding per student.

How are these differences likely to have evolved for more recent cohorts? Our expectation is that socio-economic differences are likely to have narrowed further. Given that

participation was already close to universal and much less socio-economically graded by 2010, there was little scope for further increases in post-16 participation. However, since 2010, further education and sixth-form colleges have experienced a slower pace of cuts than school sixth forms. Between 2010–11 and 2017–18, spending per student fell by 8% in real terms in 16–18 further education and by over 20% in school sixth forms. This means that funding levels per student are now about £700 higher in colleges than in school sixth forms. This reflects the implementation of a new national funding formula from 2013, which sought to provide higher levels of funding for more complex vocational programmes and explicitly provide extra funding for pupils from deprived backgrounds. The difference in funding levels is also a big reversal since the mid 2000s, when colleges had £600 lower levels of funding per student.[22]

Whatever the reason, the stark differences in funding trends by institution since the late 2000s will clearly have favoured poorer pupils as they are more likely to attend colleges. This is likely to have further reduced the socio-economic differences in post-16 funding, which had already decreased substantially from £2,800 down to £1,200 over the course of the 2000s.

[22] Ibid.

# 4. Higher education

The way higher education is financed has been a source of major political controversy in England in recent years. Tuition fees have gradually replaced teaching grants as a source of funding for teaching undergraduates. Fees were first introduced in 1998, with teaching grants cut in equal measure to leave the overall level of resources largely unchanged. Fees were then increased to £3,000 in 2006, with this representing a genuine increase in resources as teaching grants were left largely unchanged. In 2012, the cap on fees was raised to £9,000 and teaching grants were cut. However, the cut in teaching grants was less than the increase in tuition fees, meaning that resources available for teaching again rose.[23]

Who ultimately pays the cost of these resources, and when they pay, is complicated. Up-front grants for teaching are clearly borne by the public purse. The cost of tuition fees is the complex part. Since 2006, the government has provided loans to cover tuition fees (as well as maintenance loans) and supplies this money up front to higher education institutions. The cost of these loans is then split between graduates and government based on how much graduates earn over their working lives. The repayment terms have been subject to significant change over time, but graduates are currently expected to pay 9% of annual earnings over £25,000 and are charged an interest rate that increases with their earnings. Student loans not repaid after 30 years are written off. As a result of this system, graduates are currently expected to repay about 47% of the total value of student loans, with the government ultimately paying the rest of the cost.[24]

In what follows, we seek to measure the total funding for teaching in higher education experienced by students from different socio-economic backgrounds. To complete our comparisons, we focus on pupils taking their GCSEs in state-funded schools between Summer 2003 and Summer 2010, and thus potentially entering higher education between 2005 and 2013 (which will include the new system for those starting in 2012). We then use Higher Education Statistics Agency (HESA) administrative data to examine which pupils are participating in higher education four years after they complete their GCSEs, i.e. at age 19 or 20. Most will be in their second year by this stage, but this method allows us to account for gap years and other breaks in studying.[25]

Our measure of funding is the sum of teaching grants and tuition fees[26] as this represents the resources for teaching available to students. All figures are based on average funding levels per student and take no account of differences in subject selection. We then undertake additional analysis to estimate the long-run public subsidy for different groups (which is the combination of teaching grants and the expected long-run subsidy for loans).

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[23] C. Belfield, C. Farquharson and L. Sibieta, *2018 Annual Report on Education Spending in England,* IFS Report R150, 2018, https://www.ifs.org.uk/publications/13306.

[24] Ibid.

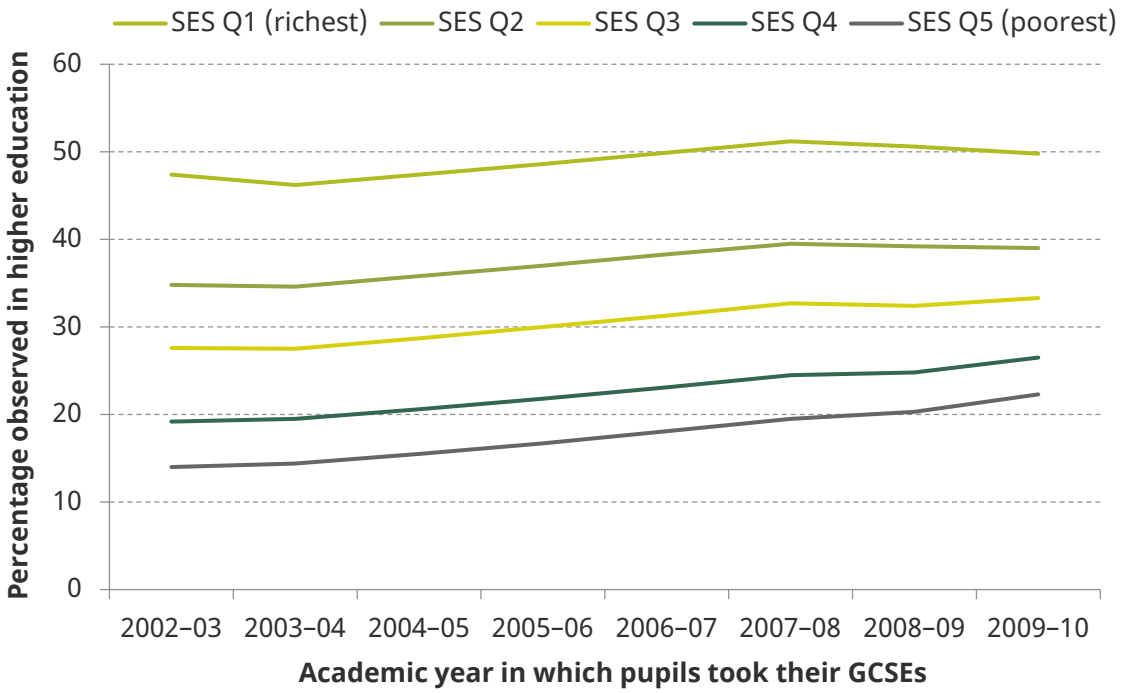
[25] We only currently have access to HESA data for this work for 2005–06, 2006–07, 2011–12, 2012–13 and 2013–14. For intervening years, we interpolate trends by socio-economic group assuming a constant trend over time for each group.

[26] C. Belfield, C. Farquharson and L. Sibieta, *2018 Annual Report on Education Spending in England,* IFS Report R150, 2018, https://www.ifs.org.uk/publications/13306.

## Socio-economic differences in higher education participation

Figure 7 shows differences in participation in higher education by socio-economic quintile over time. Among pupils taking their GCSEs in Summer 2003, around 47% in the richest quintile went on to higher education compared with 14% in the poorest quintile. The proportion going to higher education then increased over time amongst all socio-economic groups. For those in the richest quintile taking their GCSEs in Summer 2010, participation increased to 50%, whilst it increased slightly faster to around 22% for young people in the poorest quintile. This left a socio-economic gap of around 28 percentage points by 2010, compared with 33 percentage

**Figure 7. Socio-economic differences in higher education participation by year in which pupils took GCSEs**




Note: Individuals are classed as participating in higher education if they are recorded as a full-time or part-time undergraduate in a higher education institution by age 19 (i.e. three years after they complete their GCSEs).

Source: Authors' calculations using National Pupil Database, HESA census data and Individual Learner Records.

points for those taking their GCSEs in Summer 2003. This represents a slight narrowing of the socio-economic gap over time and comes in spite of the reforms to higher education finance in 2012, which the last cohort in our analysis would have experienced.[27]

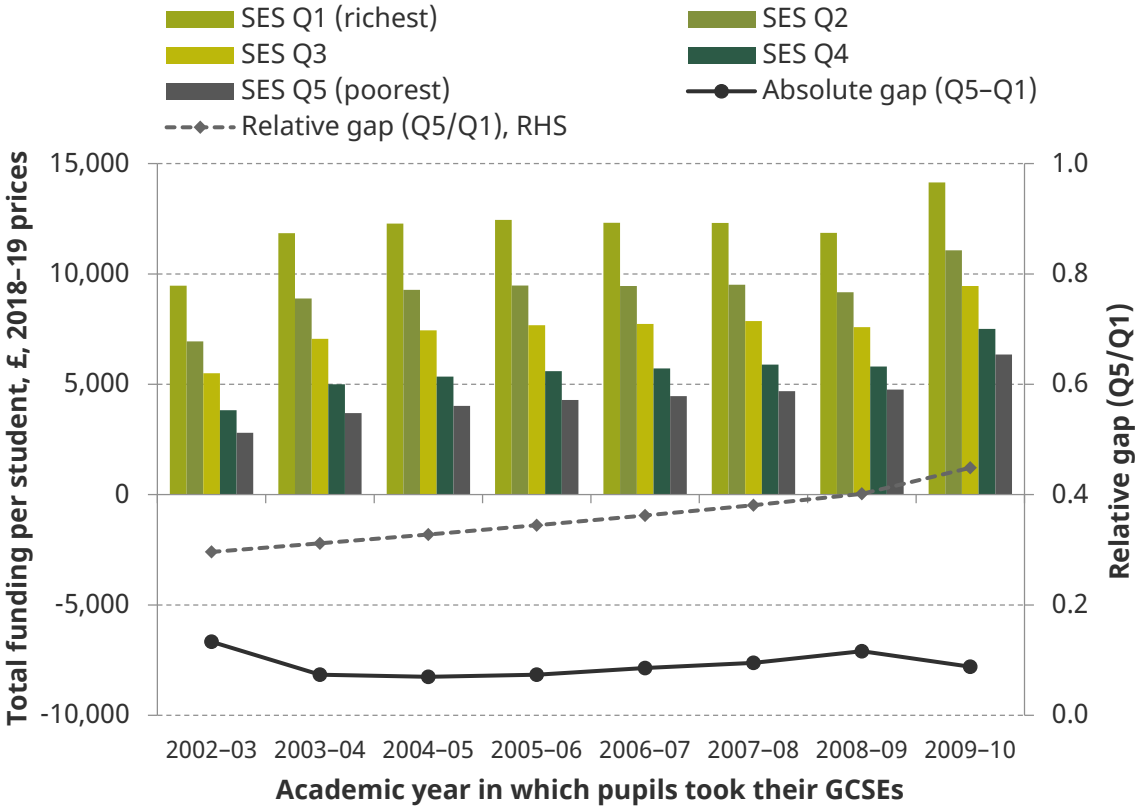
[27] Note that these figures are slightly lower than those presented in other sources, such as Chowdry et al. (2013) and Crawford et al. (2016). This difference results from two slight differences in methodology. First, our figures are based on a selected sample of pupils for whom we observed school funding for all years. Second, we base participation on whether individuals are observed in higher education at age 19, rather than at 18 or 19 as in the other sources listed here. This means we are excluding individuals who dropped out after one year of university. We do this as we do not have access to HESA data for all required years. This means we are very slightly underestimating higher education funding per student. As the dropout rate tends to be slightly higher amongst students from more deprived backgrounds (Crawford et al., 2016), we are also probably slightly underestimating the socio-economic gap in funding. (H. Chowdry, C. Crawford, L. Dearden, A.

## Socio-economic differences in higher education funding

The large socio-economic differences in higher education participation naturally lead those from richer families to benefit more, on average, from higher education funding than those from poorer families. Figure 8 shows the extent of these differences and how they have evolved over time.

Amongst pupils taking their GCSEs in Summer 2003, those from the richest quintile experienced about £9,500 in higher education funding over three years of studying, whilst the poorest quintile experienced about £2,800, creating a gap of about £6,700. It should be noted that any pupil not going to higher education automatically receives zero funding in these calculations, which is why the average figures seem so low.

**Figure 8. Socio-economic differences in total higher education funding for teaching per student by year in which pupils took GCSEs**




Note: Individuals are classed as receiving higher education funding if they are observed in a higher education institution at age 19. They are assumed to participate for three years in total.

Source: Authors' calculations using National Pupil Database, HESA census data, Individual Learner Records and C. Belfield, C. Farquharson and L. Sibieta, *2018 Annual Report on Education Spending in England,* IFS Report R150, 2018, https://www.ifs.org.uk/publications/13306.

Goodman and A. Vignoles, 'Widening participation in higher education: analysis using linked administrative data', *Journal of the Royal Statistical Society: Series A*, 2013, 176, 431–57; C. Crawford, L. Dearden, J. Micklewright and A. Vignoles, *Family Background and University Success: Differences in Higher Education Access and Outcomes in England*, Oxford University Press, 2016.)

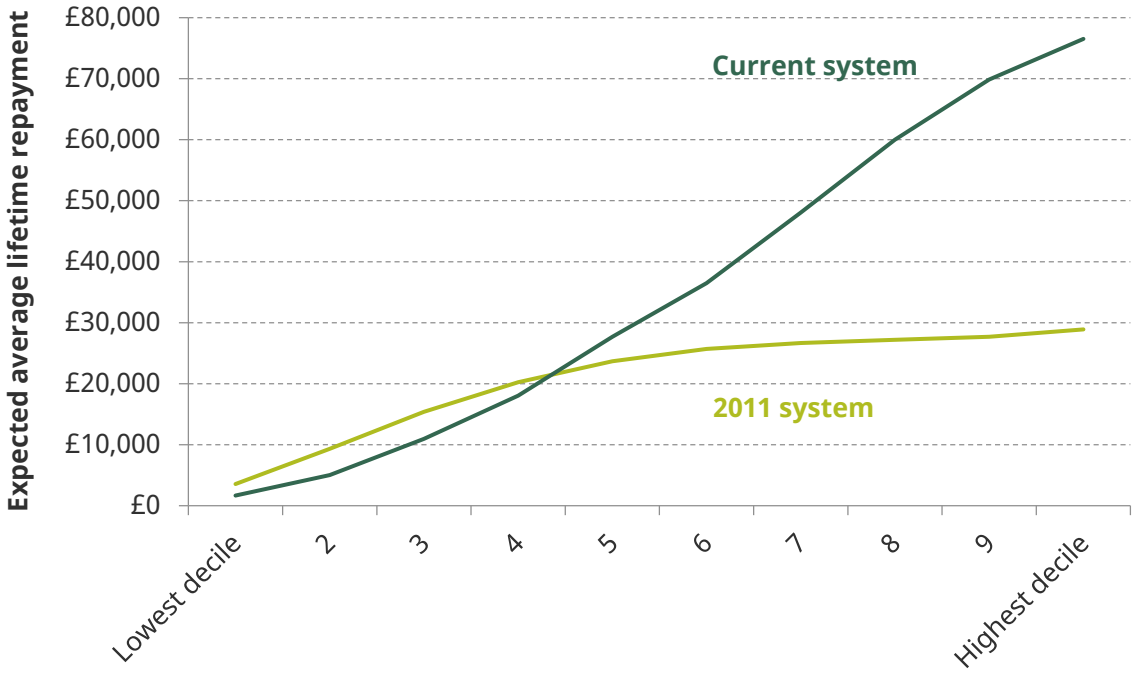
Reflecting increases in resources per student and increases in participation, the total funding experienced by all socio-economic groups then increased over time. Amongst the cohort taking their GCSEs in Summer 2010, the richest quintile experienced funding of £14,100. In contrast, the poorest quintile received less than half this amount, about £6,300 in total.

These figures represent a slight increase in the absolute socio-economic gap to about £7,800. This rise reflects the increase in resources going to higher education for teaching undergraduates over time, particularly for students entering higher education in 2012, and the fact that students from richer families remain much more likely to go on to higher education. The amount received by poorer students as a percentage of the amount received by richer ones has risen from 30% for pupils taking their GCSEs in Summer 2003 to 45% for those taking them in Summer 2010. Thus the *relative* socio-economic gap has declined over time, reflecting the slight reduction in socio-economic inequalities in higher education participation.

## Socio-economic differences in long-run public subsidies

In the previous subsection, we showed socio-economic differences in up-front resources for undergraduate teaching provided by government. In the long run, the cost of these resources will be split between government and graduates, with graduates who earn more over their working lives paying a greater share of the costs through student loan repayments. This is one of the hallmarks of the current higher education finance system in England.

**Figure 9. Expected average lifetime repayments by decile of graduate lifetime income for 2017–18 cohort (2018 prices, not discounted)**




Note: Figures are in 2018 prices, deflated using Consumer Prices Index (CPI) inflation, not discounted. These figures apply to young full-time England-domiciled students studying at the 90 largest universities in England

starting in 2017–18. We assume that all students take out the full loans to which they are entitled, that there is no dropout from university, that graduates repay according to the repayment schedule and that they have low unearned income.

Source: C. Belfield, C. Farquharson and L. Sibieta, *2018 Annual Report on Education Spending in England,* IFS Report R150, 2018, https://www.ifs.org.uk/publications/13306.

Figure 9 illustrates the extent of differences in repayments by showing total expected graduate contributions by decile of graduate earnings (this includes contributions to both tuition fee and maintenance loans; the previous subsection only considered fees). Under the current system, the highest-earning 20% of graduates are expected to repay more than £70,000, on average, as compared with less than £10,000 amongst the lowest-earning 30% of graduates. This figure also shows that reforms to the system since 2011 have generally increased expected contributions amongst higher-earning graduates, but the lowest-earning 30% of graduates are expected to pay less, which is primarily due to increases in the loan repayment threshold.

What are the likely socio-economic differences in the long-run public subsidy to higher education once you deduct expected graduate contributions? This will depend both on differences in participation and on differences in expected lifetime earnings for people who do go to university. There are, however, strong reasons to believe that students from richer families benefit more from the long-run public subsidy. Given that young people from the richest quintile are more than twice as likely to go to higher education as those from the poorest quintile, they would have to contribute twice as much towards the cost of their degree in order to equalise the expenditure. Whilst graduates from poorer families do seem to earn less than those from richer families, these differences are in the order of about 15–20% by seven years after graduation.[28] Such differences are nowhere near large enough to produce such radical differences in expected graduate contributions.

These calculations also imply that children from richer backgrounds would be more likely to benefit from any abolition of tuition fees. Assuming that tuition fees were replaced one-for-one with teaching grants, then such a policy would be equivalent to the government effectively forgoing expected graduate contributions in the form of student loan repayments. Children from richer families are more than twice as likely to go to higher education and are likely to make higher graduate contributions if they do go (given the evidence linking parental background to graduate earnings). As a result, children from the richest quintile would benefit at least twice as much from the abolition of tuition fees as those from the poorest quintile, and probably by quite a bit more.

## Changes since 2012

Our analysis currently extends to young people starting higher education in 2012 or 2013. How are changes in higher education finance and participation since then likely to have affected socio-economic differences in total higher education funding?

[28] Based on C. Belfield, J. Britton, F. Buscha, L. Dearden, M. Dickson, L. van der Erve, L. Sibieta, A. Vignoles, I. Walker and Y. Zhu, *The Relative Labour Market Returns to Different Degrees*, Department for Education Research Report, 2018, https://www.gov.uk/government/publications/undergraduate-degrees-relative-labour-market-returns.

IFS's first annual report on education spending shows that total resources provided by government for teaching undergraduates have remained relatively constant since the cap on fees was first raised to £9,000 in 2012.[29] Higher education participation, however, has continued to rise amongst all socio-economic groups, with slightly faster increases in applications from students living in poorer areas.[30] For example, applications from pupils living in poorer areas increased from 21% to 26% for cohorts entering higher education between 2012–13 and 2016–17, and from 57% to 59% amongst pupils in richer areas. These increases have come in spite of the increase in tuition fees.

Considering these factors together, there might have been a slight reduction in the socio-economic gap in resources per pupil for higher education. However, given that the changes in socio-economic differences in participation have been small and resources per student have remained largely constant, this reduction is unlikely to have been dramatic.

[29] C. Belfield, C. Farquharson and L. Sibieta, *2018 Annual Report on Education Spending in England,* IFS Report R150, 2018, https://www.ifs.org.uk/publications/13306.

[30] Department for Education, 'Widening participation in higher education, England, 2014/15 age cohort', SFR 39/2017, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/635103/SFR39-2017-MainText.pdf.

# 5. Total funding

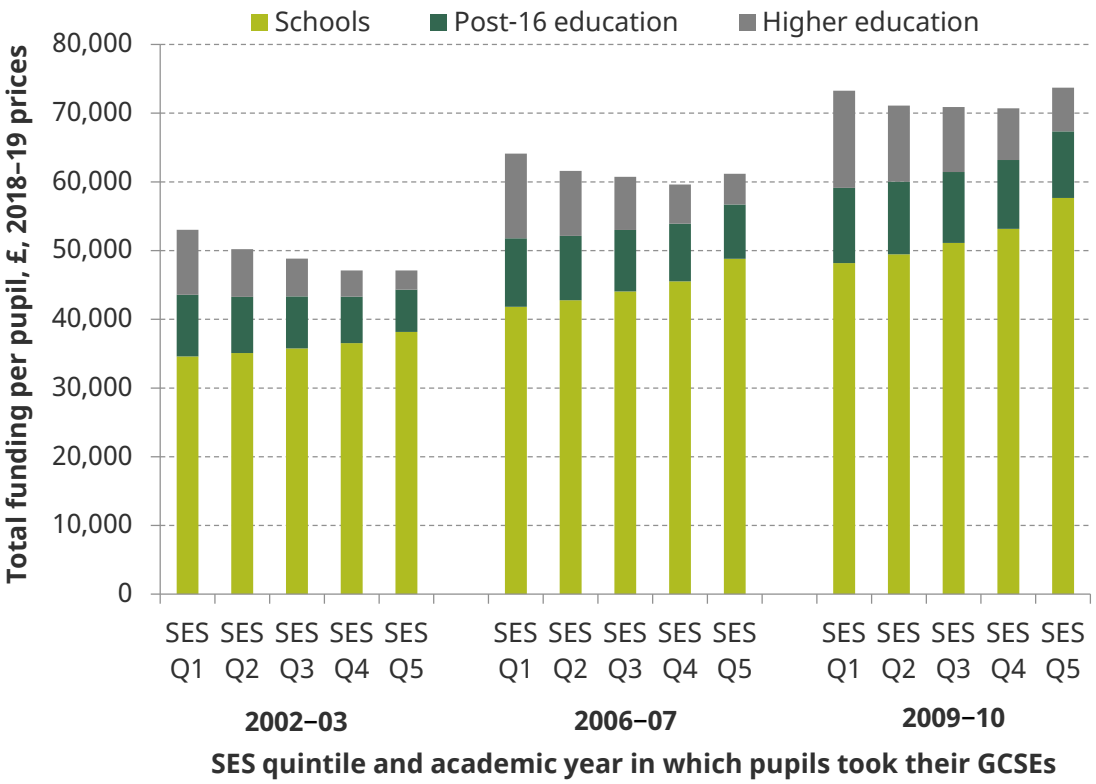
We now bring all the different components together to show the total level of education funding experienced by different socio-economic groups and how this breaks down by phase of education. For purely illustrative purposes, we only show this for three years in Figure 10 (for pupils taking their GCSEs in the summers of 2003, 2007 and 2010). The last year includes those who will have experienced the new system of higher education from 2012 onwards. Figure 11 then shows the gap in total funding between the most deprived and least deprived quintiles and how this gap breaks down by phase of education.

The picture that emerges is remarkable. Over a period of just seven years, the system has changed from one where the richest quintile received the most to one that is largely proportional, with similar levels of total funding across all quintiles.

Amongst pupils taking their GCSEs in Summer 2003, those from the least deprived quintile experienced a total of £53,000 in education funding over their education careers, compared with £47,100 amongst those in the most deprived quintile. Although pupils from more deprived quintiles experienced about £3,500 more in terms of school funding, this was more than cancelled out by lower levels of spending at later stages of education. These deficits later on are primarily due to socio-economic gaps in participation in post-16 and higher education.

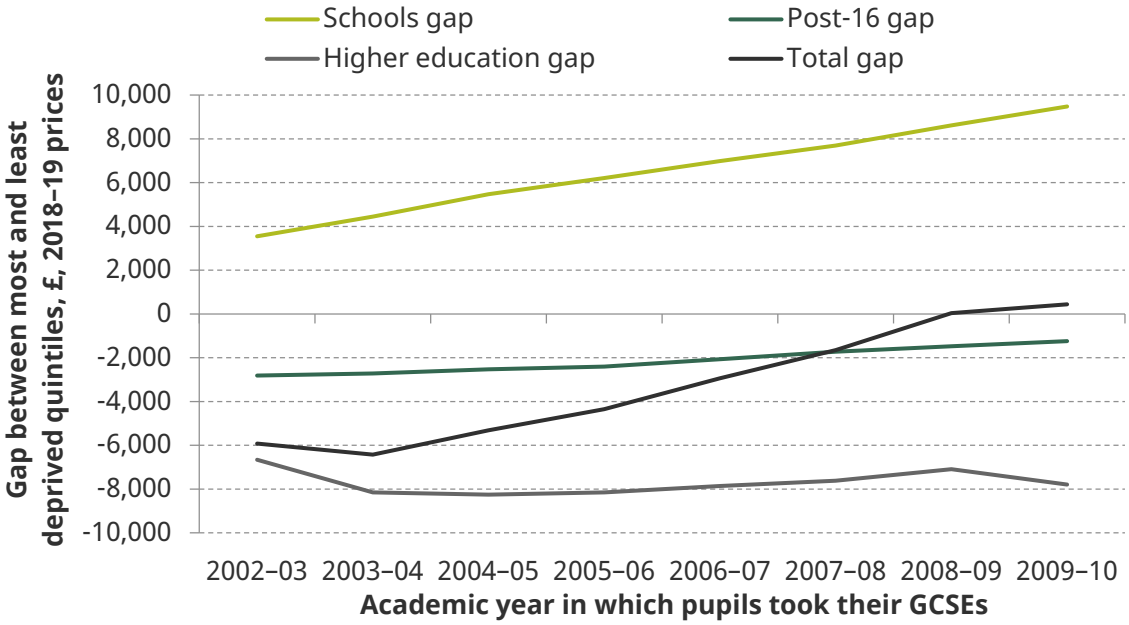
The deficit in funding for those from more deprived backgrounds gradually evaporated over the course of the 2000s. Amongst pupils taking their GCSEs in Summer 2010, total education funding per pupil was similar across all SES quintiles. Total funding was about £73,300 for the richest quintile and £73,700 for the poorest quintile.

**Figure 10. Socio-economic differences in total education funding for teaching per pupil by year in which pupils took GCSEs**




Source: See Figures 2, 6 and 8.

**Figure 11. Socio-economic gap (SES Q5 – SES Q1) in total funding by phase of education and year in which pupils took their GCSEs**




Source: See Figures 2, 6 and 8.

This reversal of the picture seen in the early 2000s is primarily the result of further targeting of school funding towards more deprived quintiles. The extra funding

experienced by the most deprived quintile relative to the least deprived one increased from £3,600 in 2002–03 to £9,500 in 2009–10. There remained a deficit in post-16 funding of around £1,200 by 2009–10, but this was reduced from £2,800 in 2002–03 largely as a result of faster increases in post-16 participation amongst more deprived pupils.

There also remained a deficit in total higher education funding of around £7,800 for pupils taking their GCSEs in Summer 2010, which is actually slightly larger than for those taking their GCSEs in Summer 2003, when the gap was around £6,700. This larger gap more recently is primarily the result of increases in resources for teaching as part of the 2012 higher education finance reform, which accrue disproportionately to children from richer families as they are more likely to participate. Other things being equal, the slightly faster increases in higher education participation amongst more deprived pupils over the 2000s would have acted to close the socio-economic deficit in higher education funding.

Given the size of the socio-economic differences in the total resources for undergraduate teaching per student, these are highly likely to translate into higher total long-run subsidies for pupils from richer families. This is notwithstanding the fact that students from poorer socio-economic backgrounds tend to earn less themselves as graduates and so repay less of their student loans than graduates from richer backgrounds. Socio-economic differences in graduate repayments would need to be implausibly large in order to cancel out the effects of differences in higher education participation.

## More recent changes are likely to have increased the level of funding targeted at pupils from poorer backgrounds

Owing to data availability, we are currently only able to show patterns in total funding by socio-economic group up to those taking their GCSEs in Summer 2010. However, there are strong reasons to believe the system has become even more focused on pupils from poorer households since then. It is probably now the case that pupils from poorer households receive *more* than those from richer households.

The introduction of the pupil premium will have targeted the school funding system even more towards pupils from more deprived backgrounds. Adding to the already existing system of deprivation funding, the pupil premium now equates to £1,320 for pupils in primary school who have been registered as eligible for free school meals at any point in the last six years and £935 for such pupils in secondary school.

Participation in post-16 education was already near universal amongst most groups by around 2012, so there was little scope for further changes in participation to affect socio-economic patterns in total funding. There have been cuts to post-16 funding since 2010; indeed, they have been larger than at any other stage of education for young people. However, the cuts have been larger in school sixth forms than in further education and sixth-form colleges.[31] Given that poorer pupils are more likely to attend colleges, this differential change would likely have further reduced the socio-economic deficit in post-16 funding for poorer pupils.

[31] C. Belfield, C. Farquharson and L. Sibieta, *2018 Annual Report on Education Spending in England,* IFS Report R150, 2018, https://www.ifs.org.uk/publications/13306.

There is also evidence to suggest that, despite the increases in tuition fees, higher education participation has increased slightly faster amongst pupils from more deprived backgrounds since 2012, though the size of the socio-economic gaps remains substantial. Given that total levels of funding per student for teaching in higher education have remained approximately constant since 2012, socio-economic gaps in total higher education funding are likely to have closed further.

Throughout this report, we have excluded early years funding. This is because most of the pupils under consideration would have been too old to benefit from the introduction of free entitlement. Our youngest cohort took GCSEs in Summer 2010 and would have started school in September 1998. Over the course of the late 1990s and 2000s, the entitlement to free part-time early years education and childcare gradually expanded.[32] This is now near universal in terms of take-up, so is unlikely to lead to any socio-economic differences in total funding. The recent introduction of the early years pupil premium and additional free early education and childcare for disadvantaged 2-year-olds will have acted to increase the total level of funding targeted at poorer pupils. However, children benefiting from these policies are still going through the school system and will not be taking their GCSEs until at least midway through the 2020s.

[32] M. Brewer, S. Cattan, C. Crawford and B. Rabe, 'Does more free childcare help parents work more?', IFS Working Paper W16/22, 2016, https://www.ifs.org.uk/publications/8728.

# 6. Conclusion

There has been a dramatic change in the socio-economic pattern of education spending over the last 30 years. In the 1980s, pupils from richer families experienced higher levels of total education spending. Funding was skewed towards post-16 and higher education, and only a small share of pupils from poorer families stayed on after age 16, with even fewer going to higher education. By the early 2000s, pupils from richer families still experienced higher levels of education spending. Although school funding had become more focused on pupils from deprived backgrounds, the effects of socio-economic gaps in post-16 and higher education participation more than cancelled this out.

By 2010, however, total education spending per pupil was similar across individuals from different socio-economic backgrounds. This turnaround was the direct result of continued increases in school funding targeted at poorer pupils and reduced socio-economic gaps in post-16 and higher education participation. These results indicate a substantial shift in how redistribution happens in the UK, with more occurring through public service spending rather than through the tax and benefit system. Although we cannot yet extend our analysis to more recent years, policy and participation trends suggest the current system probably provides more to pupils from poorer families.

This shift in the pattern of total education spending by socio-economic group and phase of education fits well with the recommendations from the latest academic work on the effects of education resources. The best available evidence suggests that higher levels of resources can have a positive effect on the formation of human capital, and that these positive effects are larger for more disadvantaged pupils,[33] particularly if high investment in schooling is combined with high-quality early years provision.[34] Additional spending on early years education and greater targeting of school funding towards deprived pupils over the last 20 years are fully in keeping with these recommendations.

It is therefore disappointing that these seemingly positive changes in the distribution of education funding do not seem to have translated into big reductions in the attainment gap between richer and poorer pupils.[35] However, the last 10 years have also seen a raft of changes to qualifications and assessments for pupils at ages 16 and 18. It is difficult to disentangle these from the underlying changes in the human capital and skills formed by pupils from different backgrounds. Indeed, the recent work on the effects of school resources has tended to downplay measures of educational attainment as useful indicators of human capital and instead focused on later-life earnings. It may therefore be a bit early to judge whether changes in education funding have been a success or not.

The continued reductions in socio-economic differences in higher education participation are perhaps one concrete reason for optimism. However, these differences in participation remain substantial, at over 25 percentage points between pupils from richer

[33] C. K. Jackson, R. C. Johnson and C. Persico, 'The effects of school spending on educational and economic outcomes: evidence from school finance reforms', *Quarterly Journal of Economics*, 2016, 131, 157–218.

[34] R. C. Johnson and C. K. Jackson, 'Reducing inequality through dynamic complementarity: evidence from Head Start and public school spending', National Bureau of Economic Research (NBER), Working Paper 23489, 2017.

[35] Education Endowment Foundation, *The Attainment Gap*, 2018, https://educationendowmentfoundation.org.uk/public/files/Annual_Reports/EEF_Attainment_Gap_Report_2018.pdf.

and poorer backgrounds. Were it not for these differences, education spending would be even more targeted towards poorer pupils. Most research suggests that the sources of these differences lie earlier in the school system, with differences in GCSE results largely sufficient to explain socio-economic differences in higher education participation.[36]

[36] C. Crawford, L. Dearden, J. Micklewright and A. Vignoles, *Family Background and University Success: Differences in Higher Education Access and Outcomes in England*, Oxford University Press, 2016.