

Long-run comparisons of spending per pupil across different stages of education

Chris Belfield
Claire Crawford
Luke Sibieta

Long-run comparisons of spending per pupil across different stages of education

Chris Belfield

Claire Crawford

Luke Sibieta

Copy-edited by Judith Payne

The Institute for Fiscal Studies

Published by

The Institute for Fiscal Studies

7 Ridgmount Street
London WC1E 7AE

Tel: +44 (0) 20-7291 4800

Fax: +44 (0) 20-7323 4780

Email: mailbox@ifs.org.uk

Website: <http://www.ifs.org.uk>

© The Institute for Fiscal Studies, August 2018

Revised edition

ISBN 978-1-912805-04-4

Preface

The authors would like to thank members of the project advisory group and Paul Johnson for providing useful comments throughout the course of this work.

This research has been funded by the Nuffield Foundation. The Nuffield Foundation is an endowed charitable trust that aims to improve social well-being in the widest sense. It funds research and innovation in education and social policy and also works to build capacity in education, science and social science research. The Nuffield Foundation has funded this project, but the views expressed are those of the authors and not necessarily those of the Foundation. More information is available at www.nuffieldfoundation.org.

Most of the data used in this report are taken from national statistics or departmental reports, with specific sources listed in the notes to figures and tables. We also thank the Department for Education and the Higher Education Statistics Agency for providing linked data for analysis of higher education funding.

The data creators, depositors, copyright holders and funders bear no responsibility for the analysis, inferences, conclusions or interpretation of the data presented here. Responsibility for interpretation of the data, as well as for any errors, is the authors' alone. Correspondence to chris_b@ifs.org.uk, claire_c@ifs.org.uk or luke_s@ifs.org.uk.

Contents

Executive summary	5
1. Introduction	9
2. Early years	12
3. Schools	17
4. Further education and sixth forms	19
5. Higher education	22
6. Comparisons and conclusions	28
Appendix A. Early years: sources and methodology	33
Appendix B. Further education and sixth forms: sources and methodology	36
Appendix C. Higher education: sources and methodology	39
Appendix D. Extra figure	43
References	44

Executive summary

Education spending is the second-largest area of public service spending in the UK, representing about 4.5% of national income in 2015–16.

Government spending on education grew by around 1.7% per year in real terms over the 1980s and 1990s, before increasing sharply over the 2000s by more than 5% per year in real terms. With the exception of 16–18 education spending, most areas of education have been protected from cuts since 2010–11.

We have created measures of spending per pupil in England across the four main stages of education stretching back to the early 1990s for the first time.

These series of day-to-day spending per pupil allow us to understand how policy changes have affected resources available to students in different stages of education over the long run.

Early years

Government spending on early years education was around £1,700 per child in pre-school in 2015–16, less than half the level of spending in primary schools.

In the early 1990s, early years spending was less than £100 million in 2016–17 prices. By 2015–16, this had risen to about £2.3 billion. This large increase was the result of the introduction, and subsequent extension, of the entitlement to free part-time pre-school education for 3- and 4-year-olds in the late 1990s. In addition, the government has extended this entitlement to disadvantaged 2-year-olds, spending on which was about £520 million in 2015–16.

The total early years budget was about £5.4 billion (2016–17 prices) in 2015–16. This adds in subsidies for childcare and spending on services such as Sure Start.

Government expenditure on the childcare element of working tax credit, tax-free employer-provided childcare vouchers and Sure Start has grown rapidly from near zero in the mid 1990s to £3.3 billion combined in 2010–11 (2016–17 prices). However, since 2010–11, spending on Sure Start and support through working tax credit have each fallen by more than 30% in real terms.

Early years spending is set to increase by £1 billion over this parliament to fund the expansion of the early years entitlement to 30 hours per week.

It is not clear whether this additional funding will be sufficient to deliver a high-quality and extended level of provision. Over the last few years, spending by local authorities on the early years entitlement has fallen slightly in real terms and providers have consistently complained about 'under-funding'.

Schools

Total spending on schools in England represented just under £37 billion (2016–17 prices) in 2015–16, accounting for 11.5% of total public service spending in England.

This represents £4,900 per pupil at primary school and £6,300 per pupil at secondary school. To better understand how the level of resources available to pupils has changed over time, we focus on these figures of primary and secondary school spending per pupil. This excludes spending by local authorities on central services, as well as spending by special schools.

Primary and secondary school spending per pupil have almost doubled in real terms between 1997–98 and 2015–16.

Primary school spending per pupil has increased by 114% in real terms and secondary school spending per pupil by 90%. This is the result of successive governments prioritising school spending, with per-pupil spending rising 5% per year in real terms during the 2000s and then being protected in real terms since spending cuts took effect from 2010.

Spending per pupil is expected to fall by 6.5% in real terms between 2015–16 and 2019–20.

This will be the first time schools have seen real-terms cuts in spending per pupil since the mid 1990s.

The introduction of the National Funding Formula in 2018–19 will represent the largest shake-up in school funding in England for at least 25 years.

This single national formula will replace the 152 different formulae currently used by local authorities to allocate funding to schools. This will lead to both winners and losers. Transitional protections, however, will mean that no school will see cuts of more than 3% by 2019–20 and no school will see an increase of more than 5.6%.

Further education and sixth forms

Total spending on 16–18 education in England was about £6 billion in 2015–16.

Of this, about £3.7 billion was allocated to further education and sixth form colleges and £2.2 billion to school sixth forms.

16–18 education has been the big loser from education spending changes over the last 25 years.

In 1990–91, spending per student in further education was nearly 50% higher than spending per student in secondary schools, but in 2015–16 it was 10% lower, at around £5,600 per student. Spending on further education fell faster during the 1990s, grew more slowly in the 2000s, and has been the only major area of education spending to see cuts since 2010.

Spending per student in 16–18 education is set to fall further between 2015–16 and 2019–20, leaving spending per student at a similar level in real terms to that 30 years previously.

By comparison, total public spending is currently expected to be 93% higher in 2020 than in 1990, and national income 77% higher. This long-run, and continuing, squeeze in resources in 16–18 education poses significant challenges for the sector as a whole.

Higher education

Up-front government spending on undergraduate education was £9.7 billion for 2015–16 entrants, but the expected long-run cost is only £3.7 billion.

Up-front government spending includes teaching grants provided to universities and the total value of tuition fees (but excludes maintenance loans and research grants). The difference between up-front spending and long-run cost is due to the expected repayment of student loans by graduates.

The level of resources available per student starting university in 2015 was £28,000, about 20% higher in real terms than in 1990.

Despite this overall increase, higher education funding has been highly erratic. There was a 25% real-terms fall between 1990 and 1997, an 11% rise between 1998 and 2005, and a 10% fall between 2006 and 2011. These were offset by large increases in tuition fees in 1998, 2006 and 2012.

Over the last 30 years, higher education in England has shifted from being entirely funded through teaching grants to being almost entirely funded through tuition fees.

In 1990, higher education was entirely funded through publicly-funded teaching grants. Today, they account for only 9% of funding. The remaining 91% comes from graduate contributions through repaid tuition fee loans (51%) and public subsidies to these loans (40%). These figures are based solely on tuition fee loans and so differ from published estimates of the 'RAB charge'.

In 2017-18, some universities will be allowed to increase fees in line with inflation.

The introduction of the Teaching Excellence Framework will allow universities to increase fees in line with inflation in 2017-18 if they meet certain teaching quality requirements. This will partly correct the historical pattern of real-terms falls in resources across most years. However, the exact framework for the implementation of this increase in future years is still to be determined.

The removal of the cap on student numbers may pose a risk to government finances.

Removing the cap was expected to increase student numbers by 20%, which would increase total government expenditure on higher education considerably, particularly if the additional students are less likely to pay off their tuition fee loans.

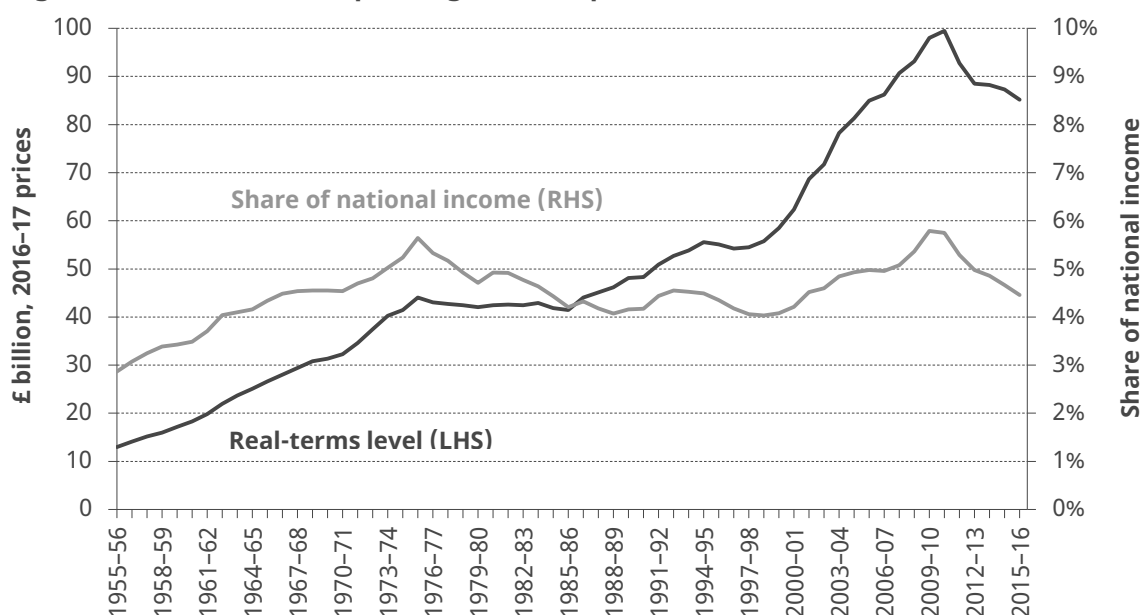
1. Introduction

Education spending is the second-largest element of public service spending in the UK behind health, representing about 4.5% of national income in 2015–16. As Figure 1.1 shows, the level of UK education spending has also risen significantly in real terms over time. Growth was particularly fast from the late 1990s through to the late 2000s, with real-terms growth averaging about 5% per year between 1998–99 and 2010–11. Education spending has since fallen in real terms as spending cuts began to take effect from 2010 onwards. Between 2010–11 and 2015–16, it has fallen by about 14% in real terms, taking it back to the same level it was in 2005–06 and a similar share of national income to that last seen through most of the 1990s.

Whilst important, trends in this headline measure of education spending beg further key questions. How is spending spread across different stages of education and how has this shifted over time? We know that policymakers have increasingly focused on the early years, that school spending has been prioritised both in years of spending increases and in years of cuts, and that there have been successive reforms to the higher education funding system. How have these reforms affected the balance of spending per pupil or student across different phases of education? These questions are a vital component of the education policy debate, particularly given the work by James Heckman and others emphasising the differential effectiveness of resources at different stages of the life course (Cunha, Heckman and Schennach, 2010).

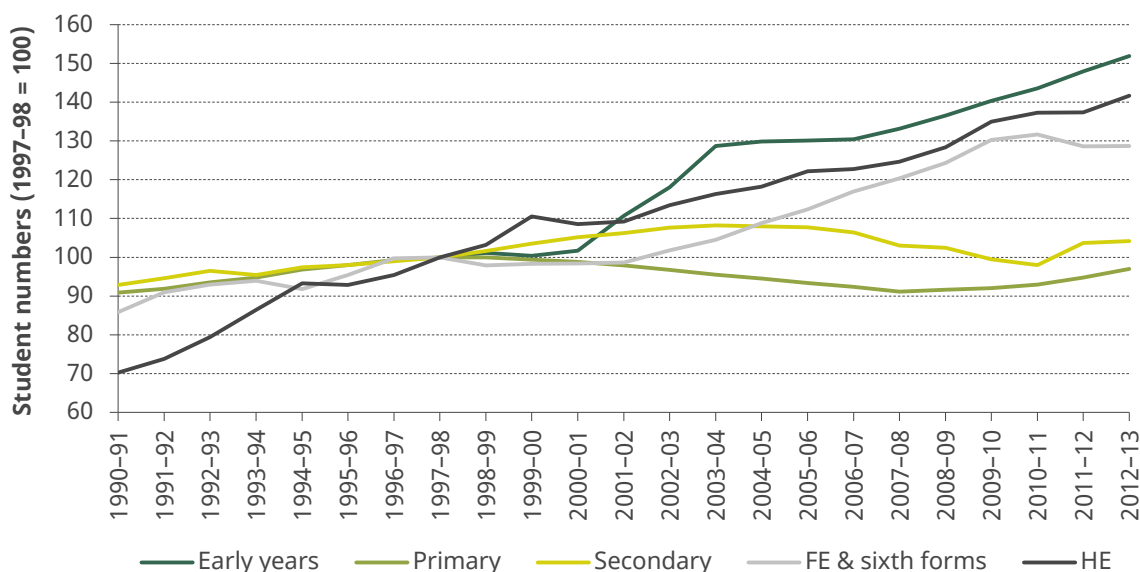
As we see from Figure 1.2, there have also been large increases in the numbers of pupils or students participating in non-compulsory stages of education (early years, further

Figure 1.1. UK education spending (2016–17 prices)



Source: HM Treasury, *Public Expenditure Statistical Analyses 2016*; previous PESAs; Office for National Statistics, *Blue Book*; authors' calculations using PESA; HM Treasury deflators, November 2016, <https://www.gov.uk/government/statistics/gdp-deflators-at-market-prices-and-money-gdp-november-2016-the-autumn-statement>.

Figure 1.2. Student numbers at different stages of education in England (1997–98 = 100)



Source: See Belfield and Sibieta (2016) and Appendix Tables A.1 and B.1 and Figure D.1 for full sets of notes, sources and numbers.

education (FE) and sixth forms,¹ and higher education (HE)). Indeed, the number of children in pre-school education has risen by over 50% between 1997–98 and 2012–13, the number of students in higher education has risen by over 40% and the number in 16–18 education has risen by 30%. Given the relative constancy in the number of pupils in state schools in England, these increases mainly represent higher levels of participation at these stages rather than increases in cohort size. Such increases in participation will have been driven by a combination of changing individual choices and government policy. To what extent have these increases in numbers of pupils or students affected spending per pupil or student at each phase of education?

In this report, we present long-run series of spending per student in England across the four main stages of education (early years, schools, further education and sixth forms, and higher education). This provides policymakers and the public with a much longer and more comprehensive picture of how spending per student has been evolving across different stages of education than has previously been available. We also discuss how changes in policy and growth in participation have affected the generosity of resources at each stage of education over time.

Throughout the report, we focus on current or day-to-day public spending on education in England. Capital spending is a much smaller share of education, relatively volatile and focused mostly on the school sector (Chowdry and Sibieta, 2011; Sibieta, 2015). We focus on England primarily for data availability reasons and on pupils or students aged between 3 and 21 because attributing spending to individual pupils outside these ages becomes increasingly hard. We refer to spending per child in pre-school education for children

¹ Since 2015, participation in some form of education has been compulsory up until age 18 (<https://www.gov.uk/know-when-you-can-leave-school>).

aged 3 or 4, spending per pupil for children aged 5–16 and spending per student for young people aged over 16. This follows standard naming conventions at each stage.

Our definition of spending is given at the start of each chapter, with appendices going into further detail. In some cases, our measures of spending per pupil or student are calculated as total spending divided by the total number of pupils or students. In other cases, our calculations represent ‘bottom-up’ estimates of spending per pupil or student based on micro-data for schools and students in higher education.

The rest of this report is set out as follows: early years (Chapter 2); schools (Chapter 3); further education and sixth forms (Chapter 4); higher education (Chapter 5); and comparisons and conclusions (Chapter 6).

2. Early years

Over the past two decades, public spending and policy attention on the early years have risen significantly. This has been driven by two main policy objectives: improving child development and increasing maternal employment. Reflecting these two main aims, increases in public spending on the early years and childcare have taken many forms.² First, the government has expanded demand-side subsidies, such as support for childcare through working tax credit or employer-sponsored (tax-free) childcare vouchers. Second, the government has provided some services directly (e.g. Sure Start Children’s Centres). Third, the government provides supply-side subsidies through entitlement to free part-time pre-school education for 3- and 4-year-olds (as well as disadvantaged 2-year-olds). Here, we concentrate on the last of these: the free entitlement to part-time pre-school education. This is because spending is focused on a well-defined age group and is closer to education, rather than childcare, spending. We document levels of spending on other elements of early years spending to provide a full context.

The current offer of free nursery education stands at 15 hours a week for 38 weeks of the year for 3- and 4-year-olds, which can be used in local-authority-run nursery schools, nursery classes in schools, or private, voluntary and independent (PVI) settings (including childminders). This legal entitlement was introduced in 1998–99 for 4-year-olds and was initially set at 12.5 hours for 33 weeks of the year. This replaced the nursery voucher scheme introduced by the previous Conservative government in 1996 (West, 2015). The legal entitlement was increased over the next decade, being extended to cover 3-year-olds as well in 2004, increased from 33 to 38 weeks in 2006 and raised from 12.5 to 15 hours a week in 2010.³

Figure 2.1 shows our estimates of total spending per child aged 3–4 enrolled in pre-school provision between 1997–98 and 2015–16,⁴ together with projections for 2016–17 to 2019–20. We also show total spending per head of the population aged 3–4 to indicate how changes in participation have affected spending levels.

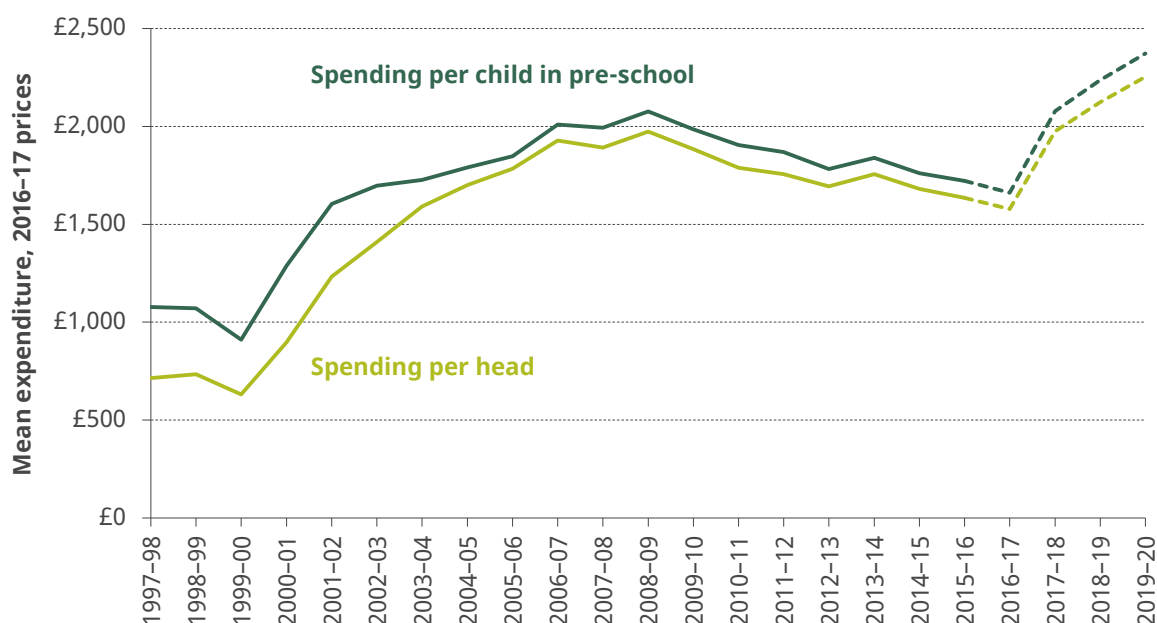
In 1997–98, spending per child in pre-school provision stood at about £1,100 per pupil in 2016–17 prices. It then increased substantially over the next decade. Interestingly, however, spending per child in pre-school provision seems to have increased in a relatively smooth manner over time. There are no sudden changes when the legal entitlement changed. This is largely because many local authorities were already providing more than the minimum when the legal entitlement was introduced. Indeed, in 1998–99, we estimate that nearly all 4-year-olds were benefiting from some kind of funded pre-school place, as were 40% of 3-year-olds (who were not covered by the free legal entitlement until 2004). Local authorities also expanded provision in anticipation of the legal entitlement changing (Brewer et al., 2016). The proportion of 3-year-olds taking up a free part-time pre-school place had already reached about 90% by the time the legal entitlement for 3-year-olds was introduced in 2004. Much of the expansion of the pre-

² For more details, see Stewart (2013), Brewer, Cattan and Crawford (2014), Stewart and Obolenskaya (2015) and West and Noden (2016).

³ For further details on the historical evolution of pre-school education policy and funding, see West and Noden (2016).

⁴ Full details and sources are provided in Appendix A.

Figure 2.1. Actual and forecast spending on early years entitlement for 3- and 4-year-olds, actual and plans (2016–17 prices)



Note: 'Spending per head' refers to total spending divided by the number of 3- and 4-year-olds in England. 'Spending per child in pre-school' refers to total spending divided by the number of 3- and 4-year-olds taking up a funded place. Dashed lines are forecasts, which are calculated based on the government's commitment to provide an extra £1 billion for the free entitlement by 2019-20 (https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/574040/Early_years_funding_government_consultation_response.pdf) and ONS population projections (<https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationprojections/data-sets/2014basednationalpopulationprojectionstableofcontents>).

Source: See Appendix Table A.1 for full set of notes, sources and numbers.

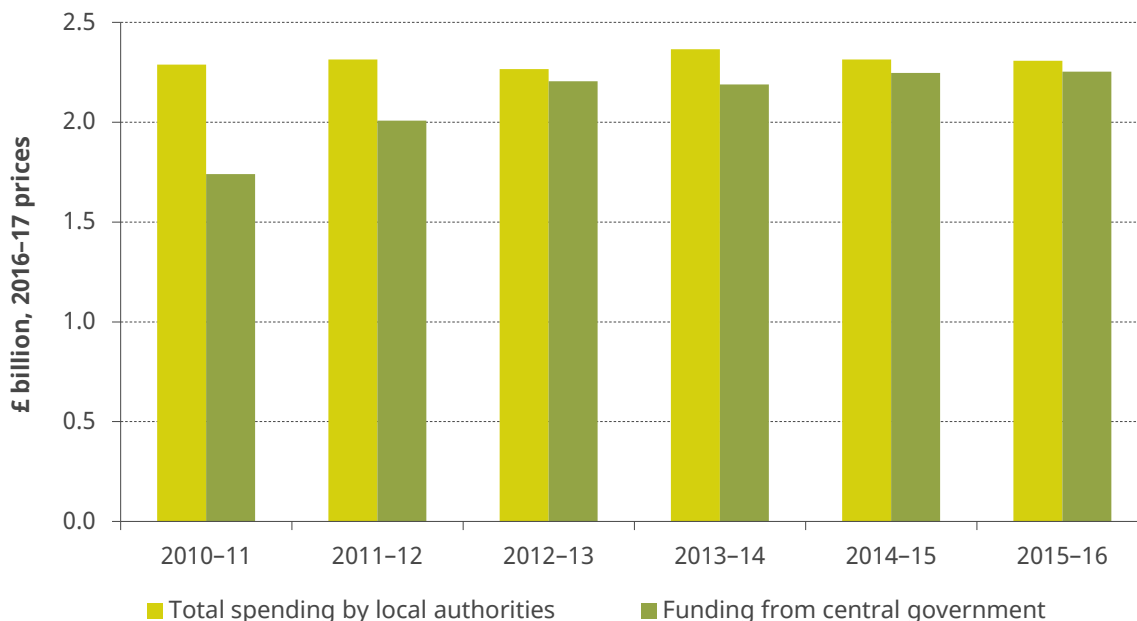
school market came from the PVI sector, rather than the maintained sector, particularly for 3-year-olds (Brewer et al., 2016; West and Noden, 2016).

The net result of these trends was a near doubling of spending per child in pre-school provision between 1998-99 and 2008-09, and a near tripling of the spending-per-head figure as more and more children took up a place.

Between 2008-09 and 2015-16, spending per child in pre-school provision and per head then fell in real terms by around 17%. These falls are somewhat surprising given the expanded entitlement to 15 hours in 2010. They appear to have been primarily driven by rising numbers of children aged 3 and 4, which were not matched by changes in total spending. Whilst child numbers rose by 17% between 2008-09 and 2015-16, total spending fell by about 3% in real terms.

To what extent do these falls reflect decisions by local authorities and central government? In Figure 2.2, we show total spending on the early years entitlement together with total levels of funding provided by central government, the difference being how much local authorities chose to supplement central government funding (e.g. by providing more free hours). Unfortunately, we can only make this comparison back to 2010-11. What we see, however, is that in 2010-11 local authorities chose to spend

Figure 2.2. Local authority spending and central government funding of early years entitlement for 3- and 4-year-olds (2016–17 prices)



Source: See Appendix Table A.1 for full set of notes, sources and numbers for local authority spending. Central government spending figures taken from National Audit Office, *Entitlement to Free Early Education and Childcare*, HC 853, Session 2015–16, <https://www.nao.org.uk/report/entitlement-to-free-early-education-and-childcare/>.

significantly more (£2.3 billion in 2016–17 prices) than the level of funding provided by central government (£1.7 billion in 2016–17 prices). Between 2010–11 and 2015–16, the level of funding provided by central government rose by 30% in real terms, but total spending by local authorities was largely constant in real terms, significantly reducing the gap between funding and spending. Indeed, in 2015–16, supplementary spending by local authorities seems to have shrunk to less than £100 million, having represented about £500 million in 2010–11 (in 2016–17 prices).

This could have happened because local authorities felt less need to supplement central government allocations as they became more generous over time and/or because they had less capacity to do so (e.g. because of the large reductions in other grants to local authorities).

By 2015–16, spending per child in pre-school provision represented about £1,720,⁵ which is very close to the level of spending per head as take-up of the free entitlement is now near universal. These levels of spending are close to those last seen in 2003–04.

Going forwards, however, spending is set to increase sharply. The government has committed to increasing entitlement to free pre-school provision from 15 to 30 hours a week for 3- and 4-year-olds whose parents are in work. In order to deliver this policy, the government has set aside an extra £1 billion of public spending by 2019–20 to cover the costs of the increased entitlement and an increase in the hourly funding rate (with the national average funding rate increasing from £4.56 in 2016–17 to £4.94 by 2019–20).⁶ This

⁵ This includes the effect of the recently-introduced early years pupil premium.

⁶ Department for Education, 2016.

is incorporated into our forecasts for spending per child in pre-school up to 2019–20 in Figure 2.1, which shows spending per child in pre-school education increasing substantially between 2015–16 and 2019–20, by 38% in real terms.

This is clearly a very large percentage increase. Up until now, however, pre-school providers have frequently claimed that funding has fallen below the cost of delivering the entitlement, with providers having to cross-subsidise the costs of the early years entitlement through other streams of funding.⁷ Cross-subsidisation becomes less feasible if entitlement is extended to 30 hours. Having supplemented central government funding in the past, local authorities have also become much less willing or able to top up early years spending in the most recent years. Whether the planned increase in spending over the current parliament will ensure sufficient numbers of providers actually do offer the 30 hours entitlement (they are not obligated to) is unclear at present.

As mentioned at the start of this chapter, spending on the early years entitlement for 3- and 4-year-olds is not the only area of government support for the early years. How have other components of early years spending changed over time?

First, the entitlement to free part-time pre-school education was extended to disadvantaged 2-year-olds in 2013–14. Spending on this group represented about £520 million in 2015–16, which equates to about £3,300 per child taking up this new offer.⁸ This is higher than the level of spending on the 3- and 4-year-olds largely because pre-school education for 2-year-olds is more expensive to deliver – e.g. due to lower required ratios of children to staff – and because take-up of these free places is much lower (West and Noden, 2016).

Stewart (2013) and Stewart and Obolenskaya (2015) detail spending on other elements of early years spending such as measures under the period of Labour government between 1997 and 2010 and under the coalition government up to 2013. Having been close to zero in 1997–98, figures from Stewart (2013) show demand-side subsidies grew to about £2.0 billion by 2010–11 (£1.5 billion on the childcare element of working tax credit and £500 million on childcare vouchers, all in 2016–17 prices). Current spending on Sure Start Children’s Centres grew from virtually zero in 1997–98 to reach over £1.3 billion in 2010–11.

Between 2010–11 and 2014–15, spending on the childcare element of working tax credit has fallen by around 31% in real terms as entitlements have become less generous,⁹ whilst day-to-day spending on Sure Start Children’s Centres has fallen by around 35% in real terms between 2010–11 and 2015–16.¹⁰ In contrast, estimated spending on employer

⁷ See West and Noden (2016) and Public Accounts Committee (2016) on cross-subsidising within early years settings and NAHT (2015) on cross-subsidisation by schools with early years provision.

⁸ See <https://www.gov.uk/government/statistics/planned-expenditure-by-local-authorities-in-england-2015-to-2016> and <https://www.gov.uk/government/statistics/provision-for-children-under-5-years-of-age-january-2015>.

⁹ Figure for 2014–15 taken from <https://www.gov.uk/government/statistics/child-and-working-tax-credits-statistics-finalised-annual-awards-2014-to-2015>.

¹⁰ Figure for 2015–16 taken from <https://www.gov.uk/government/statistics/la-and-school-expenditure-2015-to-2016-financial-year>.

childcare vouchers has increased significantly in real terms (from around £500 million in 2010–11 to £750 million in 2015–16, a near 50% increase¹¹).

Adding all elements of early years spending together, this means that spending on the early years went from just under £1 billion (2016–17 prices) in 1997–98 (when it mostly comprised subsidies to early years providers) up to around £5.5 billion in 2010–11 (comprising a combination of demand-side subsidies, supply-side subsidies and direct provision) and then down to about £5.4 billion by 2015–16 (with cuts to demand-side subsidies and Sure Start spending, and increases in total spending on the free entitlement driven by extending it to disadvantaged 2-year-olds).¹²

In summary, spending per child in pre-school provision grew significantly between the late 1990s and late 2000s as the entitlement gradually expanded over time. Spending per head grew by even more as take-up became near universal over time. Since the late 2000s, spending per head and per child in pre-school provision have fallen in real terms. This pattern is matched in other areas of early years spending, with very significant increases between 1997 and 2010, followed by falls in spending thereafter.

¹¹ Figure for 2015–16 based on HMRC estimated cost of tax reliefs and assuming a population share of 83% for England (as per Stewart and Obolenskaya (2015)); see https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/579720/Dec_16_Main_Reliefs_Final.pdf.

¹² This figure assumes spending on the childcare element of working tax credit is the same in real terms in 2015–16 as it was in 2014–15.

3. Schools

School spending covers pupils aged 5–16 and has been relatively protected in recent years. In 2015–16, total spending on schools in England represented just under £37 billion (in 2016–17 prices), accounting for 11.5% of total public service spending in England.¹³ Day-to-day or current spending per pupil was largely frozen in real terms between 2010–11 and 2015–16. Over the following four years, however, school spending per pupil is expected to fall by about 6.5% in real terms.

At the moment, it is local authorities that are responsible for determining the level of funding for state-funded schools. Each local authority receives a grant from central government, which it then distributes to schools in its area using its own funding formula. These funding formulae differ across local authorities and weight different factors to different degrees. For example, there is substantial variation in the weights given to primary and secondary pupils between different local authorities. Importantly, these funding formulae apply to local authority maintained schools, academies and free schools in the same way.¹⁴ Further details on how the school funding system has changed over time can be found in Belfield and Sibieta (2016).

The government has announced plans to reform the school funding system over this parliament by introducing a national funding formula for all schools in England, replacing all 152 local funding formulae with one single national formula.¹⁵ The transition to this new formula was due to begin in April 2017, but has now been postponed until April 2018.

Figure 3.1 shows our estimates for the level of primary and secondary school spending per pupil in England over time (in 2016–17 prices), together with projections for the level of spending per pupil implied by current policy up to 2019–20. Our definition of school spending represents the sum of the amount of government spending undertaken by individual schools, excluding spending undertaken directly by local authorities, spending on special schools and spending in independent fee-charging schools. For more details on the measure of school spending, see Belfield and Sibieta (2016).

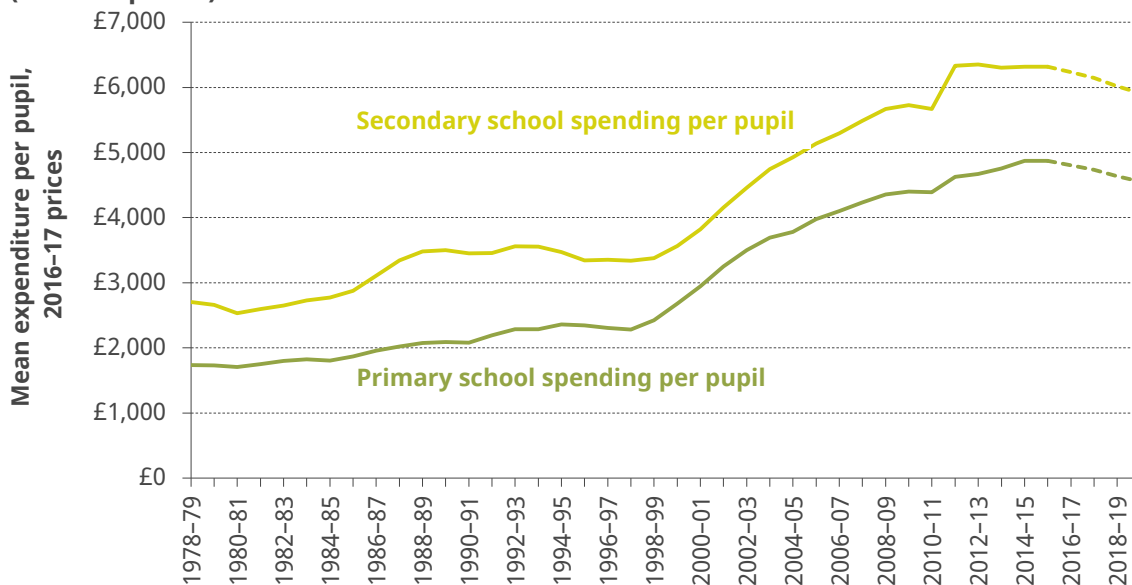
As can be seen, over the course of the 1980s and 1990s, there was relatively modest year-on-year growth in primary school spending per pupil, averaging around 2% per year in real terms. Secondary school spending per pupil grew by less over the same period (around 1.5% per year, on average), with some real-terms falls seen over the mid 1990s. From 1999 onwards, spending per pupil grew rapidly, with growth more than doubling to around 5% per year in real terms for primary and secondary schools over the 2000s. This led primary school spending per pupil to rise from £2,700 per pupil in 1999–2000 to reach £4,400 by 2009–10, with secondary school spending per pupil growing from £3,600 to £5,700 per pupil over the same period.

¹³ Level of Dedicated Schools Grant in 2015–16 minus the early years element (<https://www.gov.uk/government/publications/dedicated-schools-grant-dsg-2015-to-2016>) as a proportion of total resource departmental expenditure limits for 2015–16 (excluding Wales, Scotland and Northern Ireland) as recorded in PESA 2016 (<https://www.gov.uk/government/statistics/public-expenditure-statistical-analyses-2016>).

¹⁴ See operational guidance from the Education Funding Agency for further specific details (<https://www.gov.uk/government/publications/schools-funding-arrangements-2017-to-2018>).

¹⁵ <https://www.gov.uk/government/consultations/schools-national-funding-formula-stage-2>.

Figure 3.1. Spending per pupil in primary and secondary schools, actual and plans (2016–17 prices)



Note: Dashed lines are projections based on actual policy and spending announcements for 2015–16 to 2019–20.

Source: See Belfield and Sibieta (2016) for full details. HM Treasury deflators, November 2016, <https://www.gov.uk/government/statistics/gdp-deflators-at-market-prices-and-money-gdp-november-2016-the-autumn-statement>.

Since 2010–11, school spending per pupil has been largely maintained in real terms (with the exception of large apparent increases in 2011–12, which are likely to result from definitional changes; see Belfield and Sibieta (2016) for more details). From 2015–16 onwards, school spending per pupil has been frozen in cash terms, which is likely to translate into a real-terms reduction of around 6.5% between 2015–16 and 2019–20. This figure is largely unchanged when we consider the specific cost increases schools are likely to face over the next few years. Increases in employer pension contributions and National Insurance contributions will add to schools’ costs, but these are largely balanced out by the fact that teacher salary increases are currently expected to be held at 1% per year.

A 6.5% real-terms cut would be the biggest real-terms fall in school spending per pupil for at least the last 30 years. These falls, however, follow on from very significant growth over the 2000s. Primary and secondary school spending per pupil are expected to fall by around £300 and £400 per pupil, respectively, between 2015–16 and 2019–20. This is only around one-fifth of the growth in spending per pupil that occurred over the 2000s.

These falls will also come at a time when the government is embarking on the largest reform of the school funding system in England for at least the last 25 years: the introduction of a national funding formula for schools in England. If implemented, this will replace all 152 funding formulae currently used by local authorities with one single national formula. This reform will generate both winners and losers. However, to smooth the transition to the new formula, there will be a cap on gains and losses as a result of the formula. Gains will be capped at a 3% increase in funding per pupil in the first year of transition (2018–19) and at 2.5% in 2019–20. Total losses will be capped at 3% between 2017–18 and 2019–20, with no school losing more than 1.5% in funding per pupil in a single year.

4. Further education and sixth forms

The proportion of young people aged 16–18 staying on in full- or part-time education has grown substantially over time, from under 50% in the mid 1980s to about 75% of young people at the end of 2015. About 430,000 young people aged 16–18 in England attended a school sixth form in 2015 (accounting for 22% of the population aged 16–18), whilst 720,000 attended a further education or sixth form college (about 37%).¹⁶ Young people not in education were in training, in paid employment or not in education, employment or training.¹⁷

The Education Funding Agency is responsible for providing funding to school sixth forms, sixth form colleges and further education colleges. It does so by using a national formula, which depends largely on the type of qualification young people take. The organisation of the sector has, however, been subject to frequent reforms over time. Indeed, over the last 20 years, there have been four different bodies responsible for funding and overseeing the sector.¹⁸ The most substantial recent reform came in the wake of the Wolf Review of Vocational Education (Wolf, 2011), which recommended scrapping some ‘low-value’ vocational education and simplifying the funding system.

Alongside many policy changes, 16–18 education has been the only area of education spending to see reductions in resources as a result of recent Spending Reviews. Under the coalition government, spending on further education and sixth forms fell by 14% in real terms (Sibieta, 2015) and core funding is only protected in cash terms up to 2019–20. Having been introduced in 2004 to encourage more young people from disadvantaged backgrounds into post-16 education, the Education Maintenance Allowance (EMA) was replaced in 2011 with the 16–19 bursary scheme¹⁹ (funding for which is less than one-third of the value of previous spending on the EMA, which stood at £550 million in 2010–11).

Total spending on 16–18 education in England represented about £6 billion in 2015–16. Of this, about £3.7 billion was allocated to further education and sixth form colleges and £2.2 billion to school sixth forms

Figure 4.1 shows our estimates of the level of spending per (full-time-equivalent) student in further education (including sixth form colleges) and school sixth forms over time.²⁰ In addition, we show the average level of spending per head of the population in England aged 16–18. The latter is naturally lower because not all young people go into further education or a school sixth form.

¹⁶ In addition, about 10% of young people aged 16–18 were already in higher education and 6% were in other types of education, e.g. special schools or independent schools.

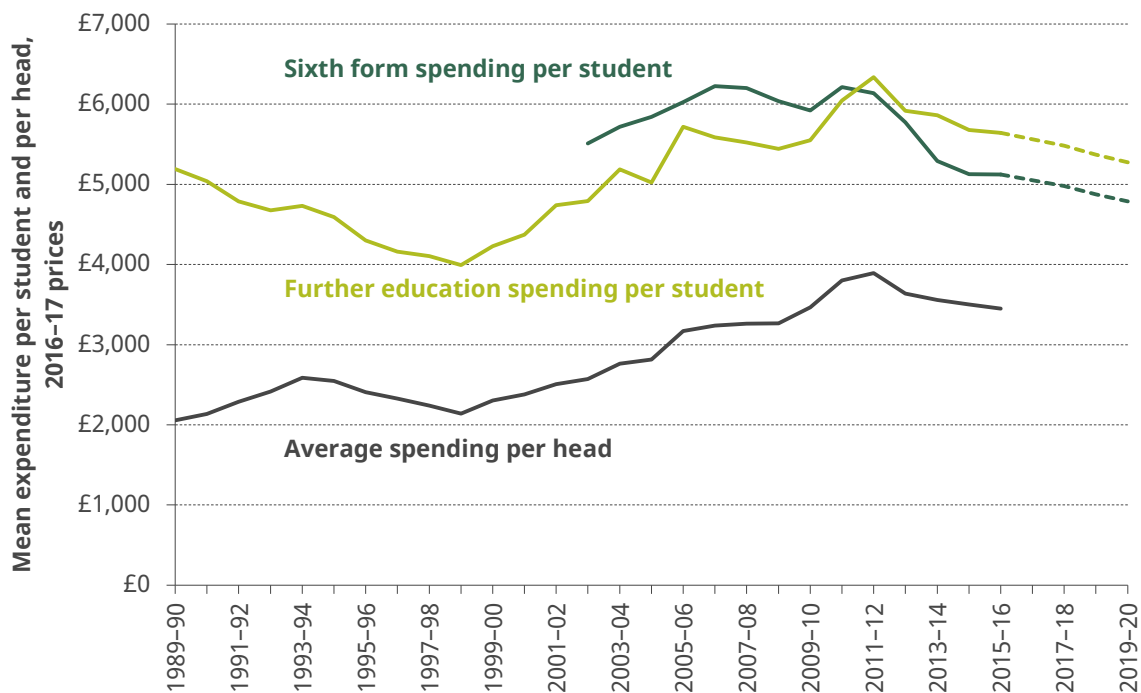
¹⁷ From 2015–16, all young people in England must stay in some form of education or training until the age of 18, which can include employment combined with training or work-based learning. In practice, there remain around 6.5% of 16- to 18-year-olds not in education, employment or training at the end of 2015 (<https://www.gov.uk/government/statistics/participation-in-education-training-and-employment-2015>).

¹⁸ The Further Education Funding Council from 1992 to 2001, the Learning and Skills Council from 2001 to 2010, the Young People’s Learning Agency from 2010 to 2012 and the Education Funding Agency from 2012 onward.

¹⁹ <https://www.gov.uk/guidance/16-to-19-bursary-fund-guide-for-2016-to-2017#allocations-methodology>.

²⁰ Full details and sources are provided in Appendix B.

Figure 4.1. Spending per student in school sixth forms and further education colleges, actual and plans (2016–17 prices)



Note: Dashed lines are projections with spending per student frozen in cash terms, based on the Chancellor’s commitment in the 2015 Spending Review to freeze the national base rate for 16–18 education in cash terms.

Source: See Appendix Table B.1 for full set of notes, sources and numbers.

Starting with further education, spending per student has evolved in three distinct phases. In 1990, spending per student stood at just over £5,000 (in 2016–17 prices). It then fell by over 20% in real terms over the course of the 1990s to reach a low of £4,000 per student in 1998–99. Over the 2000s, spending per student rose significantly, by around 50% in real terms to reach a level of around £6,000 in 2010–11. Since then, further education spending per student has again fallen in real terms as cuts to public spending gradually took hold. Between 2010–11 and 2015–16, we estimate that spending per student has fallen by just under 7% in real terms. On the basis of current plans, these cuts are expected to continue up to 2019–20, meaning that the total expected cut between 2010–11 and 2019–20 is likely to amount to around 13% in real terms.

If delivered, this cut will leave spending per student in further education at around £5,270 per student in 2019–20. This is well above its low point in 1998–99 but only just above the level seen 30 years earlier in 1989–90. The cuts will also leave spending per student in further education about 10% lower than spending per pupil in secondary school, having been about 45% greater at the start of the 1990s. It may well be that spending in further education was relatively generous in the early 1990s. However, the change compared with secondary schools is clearly dramatic.

Trends in school sixth form spending per student are only available back to 2002–03. We see from Figure 4.1 that annual spending per student was over £500 higher in school sixth forms than in further education colleges over the course of the 2000s. Both grew in the late 2000s, but faster growth in further education meant that the picture had reversed by 2011–12 and spending per student is now around £500 higher in further education than in

school sixth forms. This largely results from a faster pace of cuts to school sixth form spending per student, which has fallen by around 18% in real terms between 2010–11 and 2015–16, compared with only 7% for further education. That said, it is important to acknowledge that schools with sixth forms could have benefited from the real-terms protection to primary and secondary school spending per pupil and may have been partly able to offset cuts to sixth form spending over the last five years.

The black line in Figure 4.1 shows average spending per head of the population aged 16–18. This is lower than spending per student as not all young people participate in education after the age of 16. Spending per head has, however, risen by more than spending per student over time as more and more young people have stayed on in post-16 education. Cuts in spending per head since 2010 have also been smaller, as greater numbers of young people have continued to stay in education, with a cut in real-terms spending per head of only around 9% between 2010–11 and 2015–16.

In summary, 16–18 education spending has clearly been the relative loser from education spending changes over the last 25 years. It experienced larger cuts in the 1990s than other sectors, smaller increases during the 2000s and is currently experiencing the largest cuts. This long-term squeeze in resources is a major challenge for the sector as a whole.

5. Higher education

The proportion of young people going into higher education has risen significantly over the last 30 years (Finegold, 2006; Wyness, 2010). During the 1980s, only about 15% of people aged 18–21 went on to higher education (Finegold, 2006). Over the next eight years, the sector underwent ‘massification’ with gradual year-on-year increases in participation in addition to the conversion of polytechnics to university status. By the time the landmark Dearing Report into Higher Education was published in 1997, participation had risen to around 33% of people aged 18–21 (Finegold, 2006) or about 39% of people aged 17–30 by 1999–2000.²¹

Up until this point, the cost of higher education teaching was funded by grants from central government via the main funding body, the Higher Education Funding Council for England (HEFCE), and fees paid by local authorities on behalf of students. However, real resources per student had been declining over the 1990s due to the substantial increases in numbers. In response to concerns about this, the government commissioned the Dearing Report and then introduced up-front tuition fees of £1,000 per year for students starting university in 1998–99 (with fees for lower-income students either partly or wholly subsidised). These fees replaced existing funding for students, without any overall increase in resources. However, the introduction of fees did create a new income source, which was then increased further over time.

Participation continued to increase, reaching 40% amongst people aged 17–30 in 2004–05. At this point, the government chose to increase fees to £3,000 per year for students starting in 2006–07 to again supplement teaching grants. However, fees were not paid up front any more. Students received loans to cover the full costs of them. These loans had a zero real rate of interest and are paid back at a rate of 9% of income over £15,000 per year, and are forgiven entirely after 25 years. There were also institution-specific fee waivers, scholarships and bursaries for a number of students from lower-income families (West et al., 2009).

Continuing a historical pattern, higher education participation further increased to 46% in 2009–10 and the government commissioned another review into higher education finance (Lord Browne of Madingley, 2010). Following on from the recommendations in the Browne Review, the government introduced the present system of fees and loans for students starting in 2012–13. Under this system, universities are able to charge up to £9,000 fees per year (this cap has been frozen in nominal terms ever since). These are again covered by tuition fee loans, with institution-specific fee waivers and bursaries for low-income students. These fee loans are paid back at a rate of 9% of income over the higher threshold of £21,000 (again frozen in nominal terms), with these loans written off after 30 years. However, a higher rate of interest applies to these loans and the real interest rate is linked to the graduate’s income, varying between 0% and 3%. As part of the reform package, teaching grants were heavily scaled back, shifting the focus of funding from teaching grants to tuition fees.

Widespread changes to the higher education funding system in England pose severe problems in constructing a consistent measure of higher education spending per student over time. Our preferred measure of higher education spending includes grants to higher

²¹ <http://researchbriefings.files.parliament.uk/documents/SN02630/SN02630.pdf>.

education institutions for teaching, but not research, fees paid on behalf of students by local authorities in the 1990s and the long-run cost of providing student loans for tuition fees, but excludes the cost of maintenance loans. We also estimate the level of funding at the cohort level for a full higher education course, typically three years in length, to accurately record the level of spending that affects each cohort of students.²² The expected cost of providing tuition fee loans is calculated by projecting graduates' earnings and modelling how much of their tuition fee loan they are likely to repay. We assume that maintenance loans are paid off before tuition fee loans. This is an arbitrary assumption and figures based on alternative assumptions are included in Appendix C.

We estimate that for the 2015–16 cohort, the long-run cost to government of funding full courses of higher education will be around £3.7 billion; however, the level of up-front government outlay is substantially higher, at £9.7 billion.²³ This translates to a government subsidy of £10,600 per student, or £28,000 of up-front resources available to universities per student. These estimates differ from other reported figures. For example, the Public Expenditure Statistical Analyses (PESA) estimate for government spending on higher education in 2015–16 is £5.9 billion.²⁴ This difference occurs because the PESA estimate includes payments for research and excludes all government expenditure relating to student loans, both tuition fee loans and maintenance loans. Further, this measure of public spending includes expenditure relating to multiple cohorts of students, which may face starkly different student finance systems.

Figure 5.1 shows how the level of government spending per full-time undergraduate student by the year of entry into higher education has changed over time. Specifically, up to 2005–06, government spending includes teaching grants and any fees paid by local authorities in the 1990s.²⁵ For the period since 2006–07, when government loans for tuition fees were first made available, public spending is broken down into the impact on the deficit (teaching grants) and total government subsidy (which adds fee loan subsidies). In addition, the total level of resources per student available to universities is shown; this includes teaching grants and the full value of the up-front fees they receive.

It is immediately clear the trends in higher education finance over the last 25 years are dominated by the three tuition fee reforms in 1998, 2006 and 2012. This is in stark contrast to the previous three chapters, which showed that, in general, the level of education spending evolves slowly over time in response to changing pupil numbers and incremental policy changes.

Prior to the introduction of tuition fees in 1998–99 and government-backed fee loans in 2006–07, teaching grants constituted the entirety of public spending on higher education. These teaching grants amounted to an average of £23,300 per student over the course of their studies in 1990–91; however, this had declined to £17,400 per student by 1997–98. As

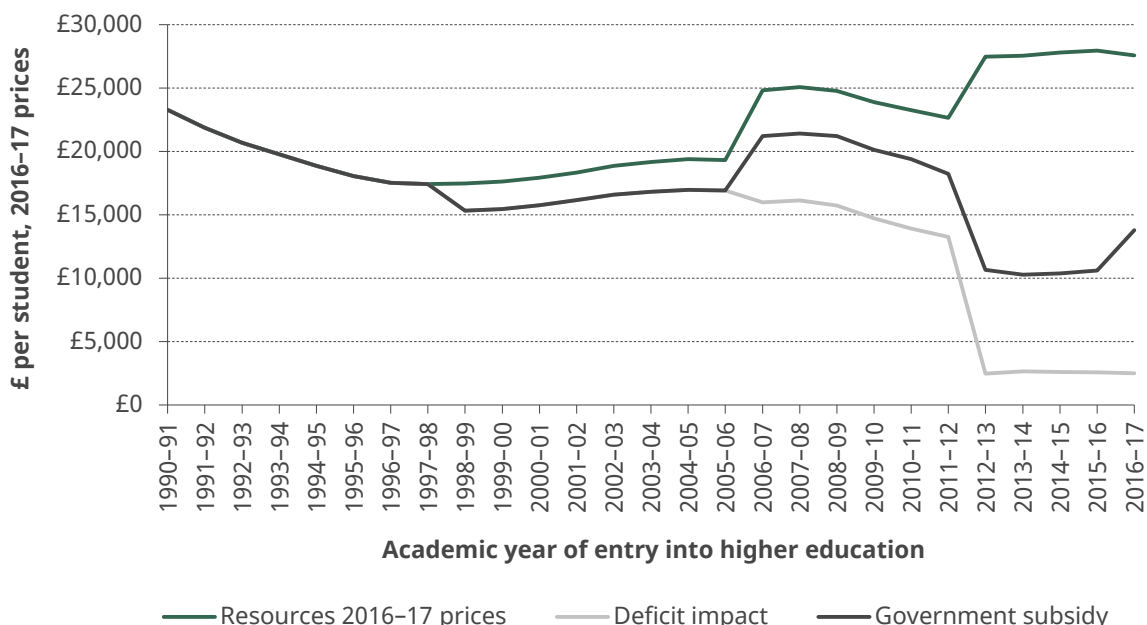
²² Note that this is distinct from the figures in previous chapters, which instead present annual contemporaneous spending. The cohort-based full-course figures are used here as tuition fee reforms apply to successive cohorts of students rather than to the entire student number contemporaneously; therefore different cohorts of students can experience different levels of teaching grants and government subsidies despite being in higher education at the same time.

²³ This assumes a cohort size of 350,000 students.

²⁴ <https://www.gov.uk/government/statistics/public-expenditure-statistical-analyses-2016>.

²⁵ We are effectively assuming this is funded through grants from central government and so counts towards the deficit.

Figure 5.1. Public spending per student in higher education for students starting between 1990–91 and 2016–17 (2016–17 prices)



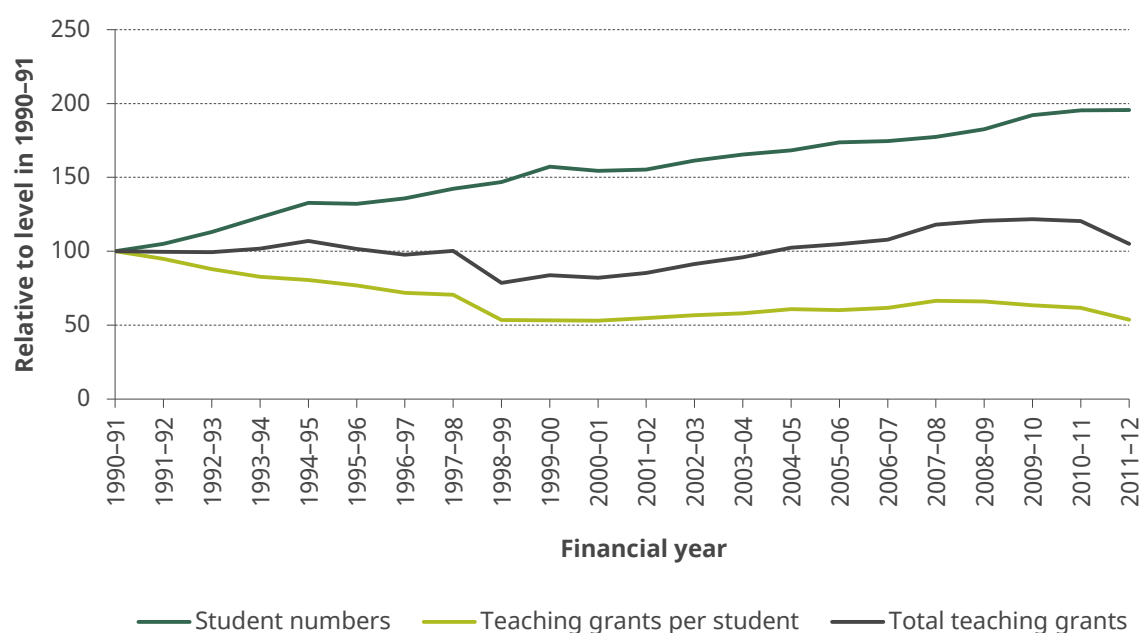
Note: Deficit impact includes all spending on higher education that counts towards the deficit, including teaching grants and fees paid by local authorities prior to their removal from 1998–99. Government subsidy adds the expected fee loan subsidy for the average cost of non-repayment of student loans for fees (assuming maintenance loans are repaid first). The up-front fees included in total resources and teaching grants prior to 2012–13 assume all courses are three years, so they represent a slight underestimate. The fee loan subsidy and teaching grants from 2012–13 onwards account for the actual course length. Fee waivers are included in the deficit impact for 1998–99 to 2005–06; total resources then include the additional income from fees. For 2006–07 to 2016–17, institution-specific bursaries and fee waivers (when appropriate) are deducted from total resources. For 2012–13 to 2014–15, National Scholarship Programme funding is included in teaching grants and in total resources. See Appendix C for sources.

shown in Figure 5.2, the total real expenditure on teaching grants was virtually unchanged over this period and increasing student numbers resulted in falling spending per student.

In 1998–99, up-front tuition fees of £1,000 per year were introduced (with fee waivers for students from low-income households). These replaced existing government funding, with the abolition of fees paid by local authorities, and so the level of total resources devoted to higher education remained largely unchanged at around £17,500 per student over the course of their studies. However, no government loans were available to cover these fees and so the level of the government subsidy fell. It fell by less than the overall level of fees, though, as fee waivers were offered to low-income students. Over the next seven years, spending and resources grew by around 10% in real terms, with overall resources reaching about £19,300 per student in 2005–06.

In 2006–07, the level of fees was increased to £3,000 per year and government-backed tuition fee loans were introduced to help students finance the cost. This time, the level of teaching grants was unchanged and so the level of total resources available to universities increased by almost £5,500 per student, even after accounting for the additional bursaries universities had to provide to students from low-income backgrounds. This brought resources per student up to £24,800, above their level in 1990–91. The government subsidy also increased due to the provision, and expected non-repayment, of tuition fee loans. We

Figure 5.2. Teaching grants (2016–17 prices) and student numbers (both indexed to 100 in 1990–91)



Source: HEFCE Teaching Grant Letters, various years, <http://www.hefce.ac.uk/funding/annalocns/>. Data on student numbers are from HESA statistics (<https://www.hesa.ac.uk/>) and the 'Historical Statistics on the Funding and Development of the UK University System' data available through the UK Data Archive (<http://www.data-archive.ac.uk/>). HM Treasury deflators, November 2016, <https://www.gov.uk/government/statistics/gdp-deflators-at-market-prices-and-money-gdp-november-2016-the-autumn-statement>.

estimate that tuition fee loans provided to students starting courses in 2006–07 will end up costing the government on average £4,000 per student in 2016–17 prices.²⁶

Tuition fees did increase in nominal terms over the next five years but by less than the rate of inflation, ultimately reducing the resources available to universities in real terms by an average of £2,200 per student between 2006–07 and 2011–12.²⁷ At the same time, the total level of teaching grants grew more slowly in real terms than student numbers, causing the overall resources per student to fall in real terms from £24,800 in 2006–07 to £22,600 in 2011–12 (all figures in 2016–17 prices).

The reforms for students starting courses in 2012–13 radically changed the way the government finances higher education. The cap on fees was raised to £9,000 per year, while average teaching grants were cut from £11,500 per student in 2011–12 to £2,300 in 2012–13.²⁸ The government subsidy shifted from being primarily provided through teaching grants to being primarily provided through the fee loan subsidy. Overall, the

²⁶ The long-run cost of tuition fee loans is £3,400 if we instead assume tuition fee loans and maintenance loans are paid off simultaneously. See Appendix C for more details.

²⁷ The cost of providing loans for these tuition fees did not fall, primarily due to falling graduate earnings projections in the recession.

²⁸ Before September 2012, teaching grants were paid by the government to universities in respect of all eligible students. The amount paid depended on the subject, ranging from £2,325 for classroom-based subjects to £13,335 for clinical years of study in medicine, dentistry and veterinary science. However, since September 2012, only students in clinical years of study and 'laboratory-based science, engineering and technology' have attracted teaching grants.

government subsidy per student fell from £18,200 to £10,700.²⁹ However, the level of resources available to universities increased by around £5,000 per student over the course of their studies, as the increase in the graduate contribution more than offset the reduction in the government subsidy. Our estimated fee loan subsidy increases in 2016–17, but this is purely the result of higher projected levels of student debt because of the replacement of maintenance grants by loans (see Appendix C for further details).

Since 2012–13, the cap on fees has remained fixed at £9,000 in nominal terms, a cut in real terms of almost 6% between 2012–13 and 2016–17. As tuition fees now make up around 90% of universities' teaching income, this represents a significant cut in funding. Over this period, universities prevented a cut in overall resources by increasing the actual average fee levels charged (from £8,527 in 2012, to almost every university charging fees at the £9,000 cap) and reducing the amount of money paid to students in bursaries and fee waivers. It is clear that universities have no more room to manoeuvre in either dimension to offset a continued nominal-terms freeze.

Over the course of the period 1990–2016, resources per student have risen by 19% in real terms. However, the level of real resources has been very erratic. For example, up to 1997–98, resources per student fell by 25% in real terms as teaching grants failed to keep pace with student numbers. Resources per student then rose by 11% between 1997–98 and 2005–06, before jumping up with the introduction of £3,000 top-up fees in 2006–07. They then fell by almost 10% between 2006–07 and 2011–12, before jumping again in 2012 with the raising of the fee cap to £9,000. Universities have to make expenditure decisions, which typically affect outgoings over many years; constantly declining income, corrected by periodic but irregular reforms, is likely to lead to significant inefficiencies in how these decisions are made.

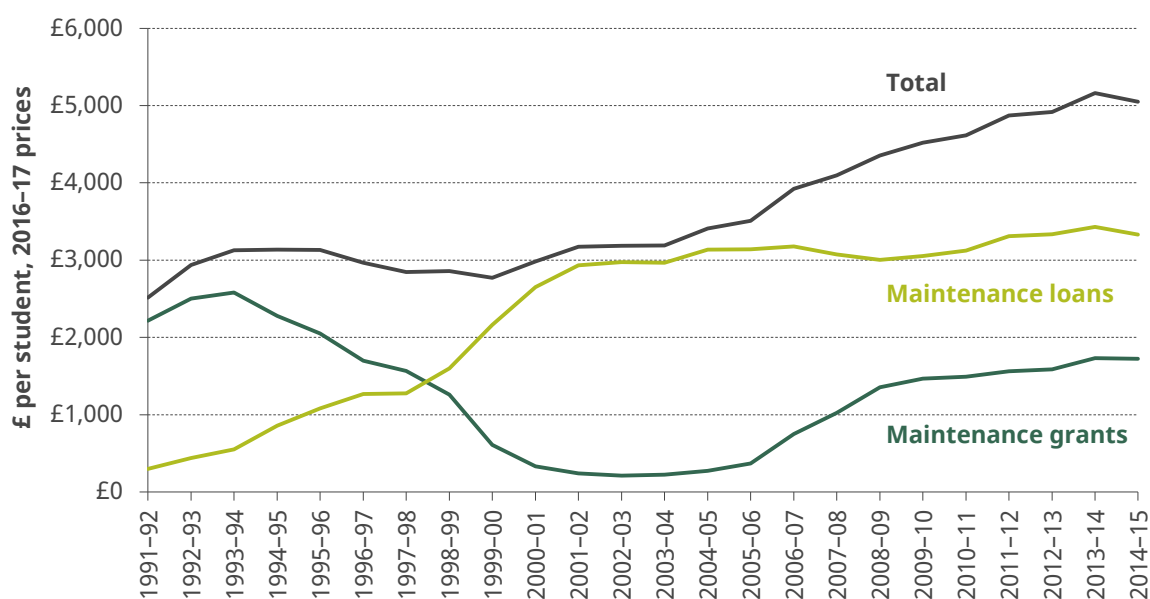
While not included in our measure of government spending on higher education, funding support for students' living costs may have important implications for access to higher education and the living standards of students. This area of funding has also changed its nature and generosity over time (Dearden, Fitzsimons and Wyness, 2014). Figure 5.3 shows the average level of support for living costs per student each year from 1991–92 up to 2014–15, and how this is broken down between loans and grants.

Up until 1990–91, students only received means-tested grants to fund their living costs. The first student loans were introduced in 1990 and were 'mortgage-style' in the sense that they were repaid at a flat rate once graduate earnings were over 85% of average earnings. Loans were extended through the 1990s; this did not change the overall levels of student support, which were roughly constant throughout the 1990s, but did change the form in which it was provided.

The first means-tested income-contingent maintenance loans were introduced in 1998–99 and grants were largely abolished the following year.³⁰ Maintenance loans attracted a zero real rate of interest and were paid off at a rate of 9% for earnings over £10,000 (later increased to £15,000). Again, these reforms did not change the average level of student

²⁹ Previous IFS research (Chowdry et al., 2012; Crawford, Crawford and Jin, 2014) estimated a significantly smaller government saving. The saving estimated here is larger because the government has reduced the discount rate it uses from 2.2% to 0.7%. This increases the value of future repayments, and hence reduces the cost of providing loans, while the cost of teaching grants is unaffected.

³⁰ 'Opportunity bursaries' were also available for the 2000–01 and 2001–02 cohorts (West et al., 2009).

Figure 5.3. Average maintenance grants and loans per student (2016–17 prices)

Note: All figures are for England only, apart from maintenance grants in 1991–92 to 2003–04, which are for England and Wales.

Source: Student Loans Company, <http://www.slc.co.uk/official-statistics/full-catalogue-of-official-statistics/student-support-for-higher-education-in-england.aspx>. HM Treasury deflators, November 2016, <https://www.gov.uk/government/statistics/gdp-deflators-at-market-prices-and-money-gdp-november-2016-the-autumn-statement>.

support, but did continue the shift from grants to loans. As a result of these changes over time, average levels of student support hardly increased in real terms between the early 1990s and the mid 2000s.

Loans were then expanded as part of the 2006 reforms and means-tested grants were also reintroduced. The threshold for repayments was raised to £21,000 as part of the 2012 reforms, but the overall level of maintenance loans was left largely unchanged. This combination of reforms meant that average levels of student support rose by about 25% in real terms between 2006–07 and 2012–13.

In 2016–17, maintenance grants were abolished once again. Although not shown on Figure 5.3, the value of grants is to be more than made up by increases in maintenance loans, meaning that average student support levels will be unchanged, but there will have been a shift in the mix back towards loans.

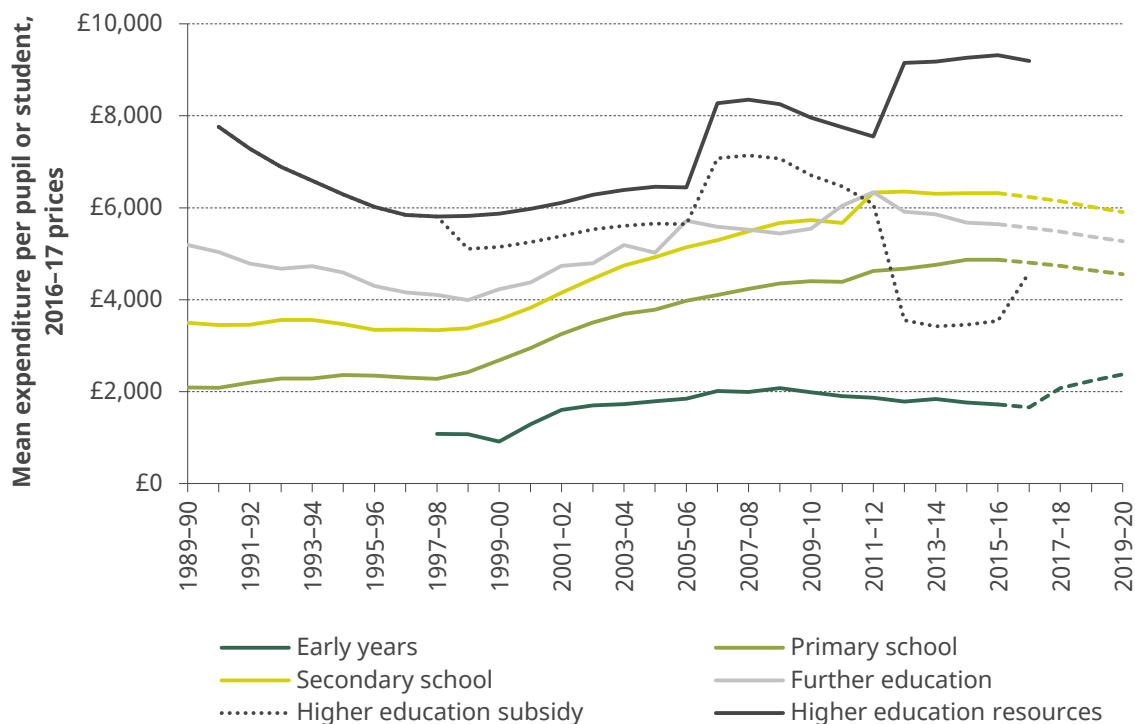
In summary, total teaching resources per student available to universities in 2016–17 are nearly 20% higher in real terms than in 1990–91. This is largely the result of sequential increases in tuition fees, which provide up-front funding to universities on a per-student basis. Over the same period, the level of teaching grants has been substantially cut; this means the long-run government subsidy to higher education is lower in real terms in 2016–17 than it was 25 years previously.

6. Comparisons and conclusions

The shape of public spending on education has changed significantly over the last 25 years. In 1990–91, there was a very clear gradient across education stages: the older the pupils being taught, the higher the level of public spending (or resources) per pupil per year. However, this was much less strongly the case in 2015–16 than back in 1990–91. Figure 6.1a compares these trends in public spending per student (or resources) on various stages of education over time in England, whilst Figure 6.1b shows the levels relative to primary school spending per pupil.

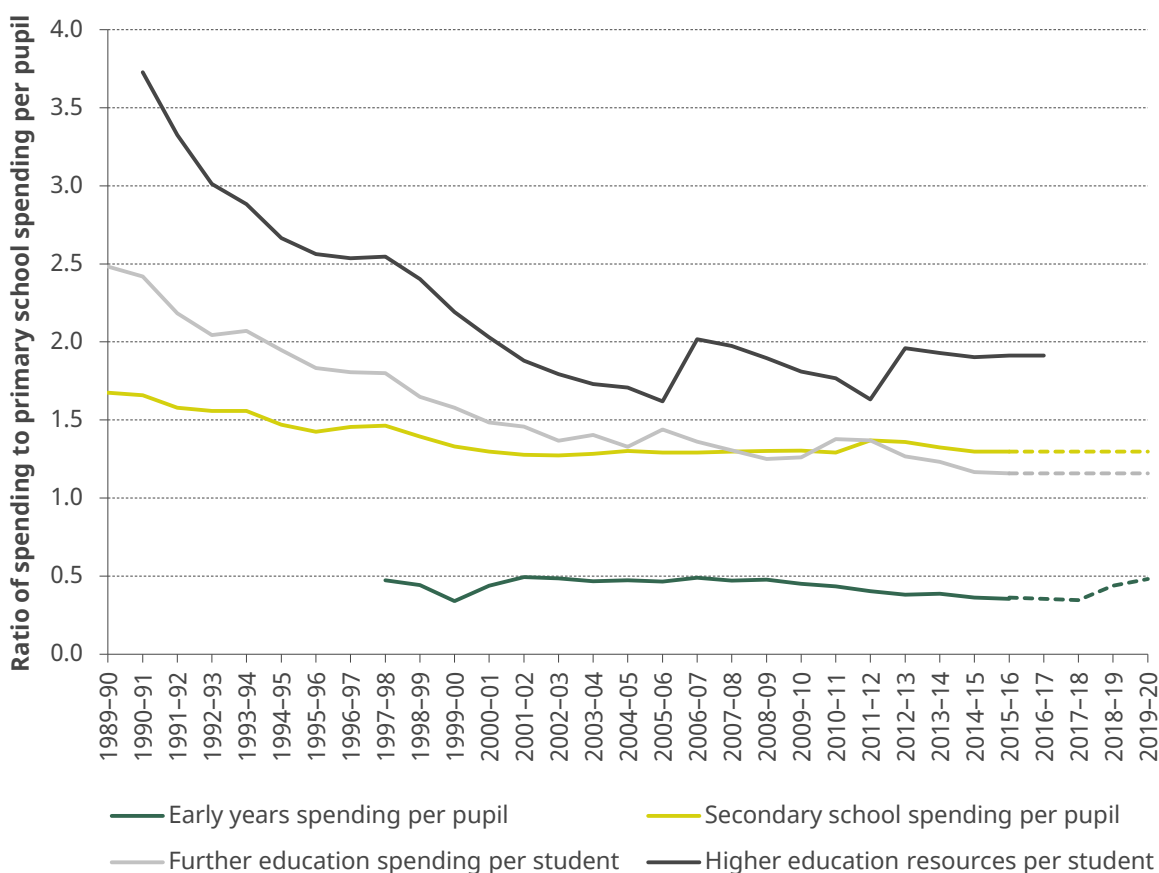
For higher education, we focus on total resources per student, rather than the long-run government subsidy, e.g. for the present day it is total fees plus teaching grant before accounting for any graduate repayment. We use this figure as we feel it best reflects the up-front resources going into higher education from government. However, Figure 6.1a does also show the long-run government subsidy. For other stages of education, we focus on just the level of public subsidy as all other private spending comes directly from households and there is no evidence to suggest this has changed differentially over time.

Figure 6.1a. Spending per pupil or student per year at different stages of education, actual and plans (2016–17 prices)



Source: Higher education figures are the cohort-based numbers shown in Figure 5.1, divided by 3 – an approximate course length. The HE subsidy includes fees paid by local authorities prior to their removal from 1998–99, teaching grants and the average cost of non-repayment of student loans for fees (assuming maintenance loans are repaid first), while HE resources include the up-front fees. See Belfield and Sibieta (2016) and Appendix Tables A.1 and B.1 and Figure D.1 for full sets of notes, sources and numbers.

Figure 6.1b. Relative spending per pupil or student per year at different stages of education, actual and plans (primary school spending per pupil = 1)



Source: Higher education figures are the cohort-based numbers shown in Figure 5.1 divided by 3 – an approximate course length. The HE subsidy includes fees paid by local authorities prior to their removal from 1998-99, teaching grants and the average cost of non-repayment of student loans for fees (assuming maintenance loans are repaid first), while HE resources include the up-front fees. See Belfield and Sibieta (2016) and Appendix Tables A.1 and B.1 and Figure D.1 for full sets of notes, sources and numbers.

At the start of the period, in 1990-91, higher education spending was £7,800 per student per year (this and all figures here are in 2016-17 prices), more than 3.5 times the level of primary school spending per pupil, and all came directly from government spending. Further education spending was £5,000 per student and nearly 2.5 times the level of primary school spending (and nearly 1.5 times the level of secondary school spending per pupil). Secondary school spending was £3,500 per pupil, about 1.5 times the level of primary school spending per pupil (£2,100). Early years spending was very low (less than £100 million in total) and is not shown on this graph as a result.

Over the next 25 years, there were then significant changes in this balance of spending, with three distinct phases of change: falls in spending (1990-91 to 1997-98); rapid growth (1997-98 to 2010-11); and differential protections from spending cuts (2010-11 onwards).

During the period of falls in spending in the 1990s, 16-18 education and higher education spending per student both fell significantly in real terms, by around 20% and 25% respectively between 1990-91 and 1997-98. In contrast, primary and secondary school spending per pupil were largely frozen in real terms, shrinking the gap between school spending per pupil and post-compulsory education spending per student.

From 1997–98 to 2010–11, spending and resources increased across all stages of education. The early years entitlement was introduced and then extended over time. There were some very significant increases in school spending per pupil, with primary school spending per pupil growing by around 5% per year, and secondary school spending per pupil by 4% per year, on average, in real terms between 1997–98 and 2010–11. Further education spending per student also grew significantly over the period, but by a slightly slower rate, at around 3% per year on average in real terms. As a result, by the late 2000s, the level of spending per pupil in secondary school was similar to that in 16–18 education, a dramatic turnaround compared with the picture in the early 1990s.

Resources for and public spending on higher education also increased. The real value of teaching grants per student increased between 1997–98 and 2005–06, and the increase in the tuition fee cap to £3,000 further increased resources. However, these increases were not enough to keep pace with the growth in primary school spending over this period. In 1997–98, higher education received more than 2.5 times as much funding per pupil as primary schools, but by 2011–12 this had fallen to a little over 1.5 times as much. This is a dramatic shift in the relative priorities of these spending areas.

From 2011–12 onwards, school spending per pupil was largely frozen and early years spending by local authorities fell slightly in real terms. There were larger falls in further education spending per student, which fell by nearly 7% in real terms between 2010–11 and 2015–16, leading spending on 16–18 education to fall behind spending on secondary schools for the first time in at least 25 years and probably a lot longer. Higher education saw a large increase in resources per student as a result of the increase in tuition fees in 2012. However, this reform actually reduced the public subsidy significantly, with an increase in graduate repayments funding the additional resources.

By 2015–16, we see a much more complex picture than we saw in 1990. Higher education resources per student continue to be higher than resources at all other stages, but only due to graduate contributions, and the changes over time have been far from smooth. School spending has been prioritised by successive governments, whilst 16–18 education has been the big loser from changes over the last 25 years, with spending per student in further education now below that in secondary schools. Early years spending has been a focus of successive governments too, though spending per pupil is still less than half that in primary schools. This provides an important context for the challenges each stage of education faces in the years to come.

The main challenge in early years education is implementing the expansion of the free entitlement from 15 to 30 hours per week for working parents in September 2017 and ensuring high-quality provision, given the level of resources available to early years settings. The level of spending per child in pre-school education was below 40% of that per pupil in primary school in 2015–16, partly as a result of fewer hours being covered. Early years spending is forecast to rise by 38% in real terms by 2019–20, reflecting £1 billion of public spending that has been set aside for the free entitlement. If delivered, this will bring early years spending to just over 50% of primary school spending per pupil. However, providers have frequently claimed that funding has generally fallen below the cost of delivering the entitlement, with providers having to cross-subsidise the costs of the early years entitlement by charging higher fees elsewhere.³¹ Cross-subsidisation becomes

³¹ For example, see West and Noden (2016).

less feasible if the entitlement is extended to 30 hours. The planned £1 billion increase in public spending on the early years is large, but whether it will be sufficient to address perceptions of under-funding to date is far from clear.

The main challenge for the school sector will be implementing substantial reforms to school funding at the same time as schools face real-terms cuts for the first time in 20 years. The proposed National Funding Formula (NFF) for schools in England will replace all 152 separate funding formulae across local authorities with one single national formula. This will lead to redistribution in funding across local authorities, but perhaps even more within local authorities, as formula factors are harmonised across local authorities. Recognising this, the government has already planned for the transition to happen gradually over time, though the start has now been delayed from April 2017 to April 2018.

The transition is likely to be further complicated by the expected real-terms fall in school spending per pupil. Adjustments will have to be implemented through real-terms cuts to at least some schools rather than larger increases to 'under-funded' schools. This will be the first time in two decades that school spending per pupil has declined in real terms across the country. It also comes at a time when schools need to recruit more teachers to accommodate a growing pupil population (expected to grow by around 7% between 2015–16 and 2019–20³²). An increasing focus on academic subjects is also likely to pose a challenge for secondary schools as these include subjects that are already experiencing teacher shortages³³ (e.g. modern foreign languages), further increasing recruitment costs.

The overriding challenge for the 16–18 sector concerns the long-run stagnation in the level of resources available. By the end of the current Spending Review period in 2019–20, we expect that spending per student in further education will only be just above the level seen 30 years ago at the end of the 1980s. To date, school sixth forms have probably been better able to manage real-terms cuts in funding given that school funding per pupil was protected in real terms between 2010–11 and 2015–16. This clearly will not be possible indefinitely, especially as school funding per pupil is now expected to fall in real terms up to 2019–20.

The higher education system faces two important challenges in the coming years: increasing student numbers and the creation of a funding system that provides institutions with certainty about the future levels of funding. The cap on the number of students entering higher education was abolished in 2015–16, which is expected to lead to a 20% increase in the number of students entering higher education each year (Hillman, 2014). This is not likely to have a significant impact on the level of higher education funding per student as the vast majority of university income is fee income, which is already determined on a per-student basis. The challenge instead comes from the risk to the public finances. An increase in the number of students taking up tuition fee loans increases the government's exposure to non-repayment. This might be particularly severe if the additional students have lower expected future earnings, and so repay less of their student loans, than the average graduate so far.

The second challenge facing the higher education system is the uncertainty institutions face about future levels of funding. Figure 6.1 shows that the path of the real value of

³² <https://www.gov.uk/government/statistics/national-pupil-projections-july-2016>.

³³ See National Audit Office (2016).

resources available per student has been far from smooth, with large irregular increases caused by reforms to the tuition fee cap. The maximum cap on fees remained fixed in nominal terms between 2012–13 and 2016–17, and the real value of resources per student has only been maintained by increases in average fee levels (up to the cap) and cuts to fee waivers and bursaries provided to students. It is clear that these trends cannot continue and if the fee cap remains frozen in nominal terms then the real value of resources will fall. The White Paper published in May 2016 (Department for Business, Innovation and Skills, 2016) goes some way to addressing it, announcing that universities will be allowed to increase fees in line with inflation from 2017–18 if they meet the requirements of a Teaching Excellence Framework (TEF). However, the exact formulation of the TEF, and how many universities are likely to meet the requirements, remain uncertain.

Overall, the picture of government spending on education has changed significantly over the last 25 years, with the focus of spending shifting towards earlier in youngsters' lives. Most stages of education have seen significant real-terms increases in spending per pupil over this period, with 16–18 education a notable exception. However, the spending cuts expected in the coming years present a challenge to continuing to provide high-quality education at every stage. To inform the public debate, we plan to update our estimates of spending per pupil at each education stage on an annual basis.

Appendix A. Early years: sources and methodology

In this appendix, we provide a summary of how we constructed our series for spending on the early years per child taking up a place and per head. Table A.1 gives full details of the numbers and sources used.

In the most recent year (2015–16), spending by local authorities on the early years entitlement represented £2.3 billion (2016–17 prices). This is the most complete measure of spending on the early years entitlement for 3- and 4-year-olds as it covers funding provided by local authorities to all settings eligible for such funding (nursery classes, nursery schools, and private, voluntary and independent settings).

Spending on the entitlement for disadvantaged 2-year-olds represented just over £500 million in 2015–16. We do not include this spending in our main measure of spending per head or per child taking up a place as it is relatively recent and specifically targeted at one group.

A complete measure of spending by local authorities on the early years entitlement is available back to 2012–13. Between 1999–2000 and 2011–12, we are only able to observe an incomplete measure, which excludes funding provided for nursery classes in primary schools (which covers around 35% of 4-year-olds not in primary school yet and 30% of 3-year-olds in 2015–16). Therefore, to provide a consistent series over time, we impute spending going back in time based on the growth in the incomplete series over time and relative difference between the complete and incomplete measures in 2012–13. These imputations are detailed and shown in Appendix Table A.1.

For 1997–98 and 1998–99, we are able to measure central government spending on the nursery voucher scheme. Reassuringly, this is relatively close to our imputed measure for 1999–2000, suggesting our imputation methodology is relatively robust.

Before 1997–98, little data on nursery or early years education are available, though those that are suggest spending was relatively modest. There is currently no information for nursery or early years spending between 1987–88 and 1996–97. The only information that is available represents spending on the under-5s, which is likely to be dominated by spending on pupils in Reception. Data are available from the Chartered Institute of Public Finance and Accountancy (CIPFA) for spending on nursery schools by local authorities between 1979–80 and 1986–87. This was relatively small as local authorities got no explicit funding for such provision. In 1986–87, such spending represented about £100 million in 2016–17 prices, covering about 50,000 nursery pupils. It was thus relatively generous for the small number of pupils who received it. However, given the lack of information on spending between 1987–88 and 1996–97, we start our series in 1997–98.

The numbers of children aged 3 and 4 are taken from annual Office for National Statistics (ONS) population statistics, with figures for the number of children taking up the entitlement based on take-up rates published by the Department for Education.

Table A.1. Spending on and numbers of children receiving the early years entitlement

	Total spending (£ billion, 2016-17 prices)		Population in England		Take-up rate		Spending per head (£, 2016-17 prices)	Spending per child taking up a place (£, 2016-17 prices)
	Calculated	Imputed	3-year-olds	4-year-olds	3-year-olds	4-year-olds		
1997-98	0.90	-	628,601	629,929	38%	95%	715	1,077
1998-99	0.91	-	610,147	627,373	39%	97%	734	1,071
1999-2000	<i>0.47</i>	0.77	605,025	610,444	41%	97%	632	911
2000-01	<i>0.67</i>	1.09	612,703	606,288	43%	97%	898	1,288
2001-02	<i>0.91</i>	1.49	596,281	611,406	56%	97%	1,233	1,604
2002-03		1.67	589,440	599,405	69%	97%	1,409	1,697
2003-04	<i>1.12</i>	1.86	577,061	592,909	84%	100%	1,590	1,726
2004-05	<i>1.18</i>	1.94	563,931	579,825	90%	100%	1,700	1,791
2005-06	<i>1.22</i>	2.01	561,503	566,945	93%	100%	1,783	1,848
2006-07	<i>1.34</i>	2.19	576,028	562,083	93%	99%	1,928	2,010
2007-08	<i>1.35</i>	2.22	596,871	577,110	92%	98%	1,892	1,993
2008-09	<i>1.44</i>	2.37	607,109	596,758	92%	98%	1,972	2,077
2009-10		2.33	630,621	607,221	92%	98%	1,884	1,984
2010-11	<i>1.37</i>	2.29	645,584	633,562	91%	97%	1,789	1,904
2011-12	<i>1.41</i>	2.31	669,484	648,411	92%	96%	1,756	1,869
2012-13	2.27	-	665,744	672,759	93%	97%	1,694	1,782
2013-14	2.37	-	678,113	669,428	93%	98%	1,756	1,839
2014-15	2.31	-	694,107	682,940	93%	98%	1,680	1,760
2015-16	2.31	-	712,587	699,191	93%	97%	1,635	1,721

Note: Spending on 2-year-olds is completely excluded from these figures. 'Spending per child taking up a place' is calculated as total spending divided by number of 3- and 4-year-olds taking up a place, estimated using take-up rates and population numbers shown. 'Spending per head' is calculated as total spending divided by total number of children aged 3 and 4.

Source: Calculated spending for 2013-14 to 2015-16 is based on early years budget for 3- and 4-year-olds shown in Department for Education, SFR33 tables, 2013 to 2015, <https://www.gov.uk/government/collections/statistics-local-authority-school-finance-data>. Calculated spending for 2012-13 is based on planned early years budget for 3- and 4-year-olds shown in Department for Education, SFR20 tables, <https://www.gov.uk/government/statistics/planned-expenditure-of-local-authorities-on-education-and-childrens-social-care-functions-section-251-data>. Calculated spending for 1999-2000 to 2011-12 is an incomplete measure of total spending taken from annual Section 251 returns, <http://webarchive.nationalarchives.gov.uk/20130903115029/http://education.gov.uk/schools/adminandfinance/financialmanagement/schoolsrevenuefunding/section251/archive/b0068383/section-251-data-archive/budget-data---summary-level>, combining spending on nursery schools, central nursery spending and fees for private/voluntary/independent education for under-5s, but excluding spending on nursery classes in primary

schools; imputed figures are back-cast based on growth in the incomplete measure of spending between 1999–2000 and 2011–12, and the difference between the complete and incomplete figure in 2012–13. Figures for 2002–03 and 2009–10 are not available and are therefore linearly interpolated. Spending in 1997–98 and 1998–99 represents reported central government spending on nursery vouchers through the Nursery Education Grant listed in Department for Education and Employment, Statistical Bulletin 10/99, ‘Education and training expenditure since 1989–90’, <http://dera.ioe.ac.uk/13586/>. Populations of 3- and 4-year-olds are taken from Office for National Statistics mid-year population estimates by age downloaded from <https://www.nomisweb.co.uk/>. Actual take-up rates for 2008–09 to 2015–16 are taken from Department for Education, ‘Education provision: children under 5 years of age’, January 2010–2016, <https://www.gov.uk/government/collections/statistics-childcare-and-early-years>; figures for 2000–01 to 2007–08 are imputed based on growth in the proportion of children taking up places from 2000 to 2009 (<http://webarchive.nationalarchives.gov.uk/20130401151655/http://education.gov.uk/researchandstatistics/statistics/statistics-by-topic/earlyyearsandchildcare?page=4>) and figures for 1997–98 to 1999–2000 are imputed based on growth in the proportion of 3- and 4-year-olds in maintained nursery and primary schools (<http://webarchive.nationalarchives.gov.uk/20130401151655/http://media.education.gov.uk/assets/files/pdf/b012001pdf.pdf>). HM Treasury deflators, November 2016, <https://www.gov.uk/government/statistics/gdp-deflators-at-market-prices-and-money-gdp-november-2016-the-autumn-statement>.

Appendix B. Further education and sixth forms: sources and methodology

In this appendix, we provide a summary of how we constructed our series for spending per student in further education colleges (including sixth form colleges) and school sixth forms. Table B.1 gives full details of the numbers and sources used.

From 2002–03 to 2015–16, we are able to calculate both sets of figures as total reported spending on further education or on school sixth forms for students aged 16–18 divided by the full-time-equivalent numbers of students attending each sector. Beyond 2015–16, we project spending per student as being frozen in cash terms, based on the Chancellor’s commitment in the 2015 Spending Review to freeze the national base rate for 16–18 education in cash terms.

Before 2003–04, figures for spending per student in further education are available from various departmental and national statistics publications. These give slightly different levels for spending per student in 2003–04 than the more recent source. We therefore take the more reliable 2003–04 figure and back-cast imputed figures based on past changes in spending per student in further education. Figures for spending per student in school sixth forms are not readily available before 2002–03.

We then calculate total spending in school sixth forms and further education colleges by multiplying spending per student by the number of full-time-equivalent students for each and adding these products together.³⁴ Finally, we calculate spending per head by dividing this total by the total number of young people aged 16–18 (excluding those already attending higher education, who are covered in Chapter 5 and Appendix C).

³⁴ Before 2002–03, this is back-cast based on trends in spending per student in further education only.

Table B.1. Spending on and numbers of students in further education and sixth forms in England

	Further education			School sixth forms		All	
	Calculated spending per student (2016–17 prices)	Imputed spending per student (2016–17 prices)	16- to 18-year-olds (FTE)	Calculated spending per student (2016–17 prices)	16- to 18-year-olds (FTE)	16- to 18-year-olds	Education participation rate
1989–90	£5,268	£5,190	488,570		248,400	2,023,400	53.6%
1990–91	£5,113	£5,037	487,155		254,700	1,911,500	55.6%
1991–92	£4,858	£4,787	515,445		270,600	1,807,700	59.9%
1992–93	£4,745	£4,675	526,525		276,300	1,719,900	62.6%
1993–94	£4,802	£4,731	537,315		274,300	1,650,500	65.1%
1994–95	£4,661	£4,592	517,690		274,900	1,624,500	65.9%
1995–96	£4,364	£4,300	533,835		290,100	1,668,400	66.8%
1996–97	£4,223	£4,160	553,545		308,100	1,748,700	66.6%
1997–98	£4,445	£4,105	546,500		317,200	1,806,300	65.4%
1998–99	£4,414	£3,994	527,820		318,100	1,804,200	63.8%
1999–2000	£4,675	£4,229	524,640		324,200	1,786,400	63.6%
2000–01	£4,831	£4,371	520,300		329,700	1,790,300	63.2%
2001–02	£5,238	£4,739	528,390		323,600	1,845,100	62.4%
2002–03	£5,297	£4,792	546,065	£5,508	333,035	1,880,400	63.1%
2003–04	£5,186	-	560,180	£5,716	342,235	1,912,800	63.4%
2004–05	£5,024	-	585,760	£5,840	354,000	1,936,900	64.6%
2005–06	£5,718	-	610,175	£6,023	360,235	1,957,500	66.2%
2006–07	£5,583	-	641,685	£6,223	368,935	1,986,100	67.0%
2007–08	£5,523	-	660,025	£6,199	379,235	2,009,800	67.6%
2008–09	£5,440	-	680,730	£6,035	393,100	2,033,600	68.8%
2009–10	£5,547	-	713,200	£5,922	411,535	2,025,100	71.8%
2010–11	£6,046	-	715,530	£6,212	421,935	2,009,200	73.3%
2011–12	£6,336	-	688,885	£6,135	422,135	1,981,400	74.3%
2012–13	£5,916	-	683,525	£5,774	427,835	1,967,800	73.9%
2013–14	£5,859	-	679,965	£5,289	438,135	1,955,100	75.4%
2014–15	£5,679	-	681,795	£5,127	442,035	1,942,800	75.8%
2015–16	£5,639	-	670,500	£5,121	433,270	1,933,100	75.2%

Note: Full-time-equivalent (FTE) students calculated as number of full-time students plus 0.35 times number of part-time students. Education participation rate calculated as number of 16- to 18-year-olds in some form of formal education (part-time or full-time) divided by number of 16- to 18-year-olds in the population.

Source: Spending per student for 2002–03 to 2015–16 calculated as spending on further education for 16- to 19-year-olds and sixth form spending (maintained schools and academies), as reported in Education Funding Agency Annual Report and Accounts for 2012–13 to 2015–16 (<https://www.gov.uk/government/publications/efa-annual-report-and-accounts-for-the-year-ended-31-march-2016>, <https://www.gov.uk/government/publications/efa-annual-report-and-accounts-for-the-year-ended-31-march-2015>, <https://www.gov.uk/government/publications/efa-annual-report-and-accounts-1-april-2013-to-31-march-2014>, <https://www.gov.uk/government/publications/efa-annual-report-and-financial-statements-for-april-2012-to-march-2013>), Young People’s Learning Agency Annual Report and Accounts for 2011–12 (<https://www.gov.uk/government/publications/the-young-peoples-learning-agencys-annual-report-and-accounts-for-2011-to-2012>) and Learning and Skills Council Annual Report and Accounts for 2004–05 to 2009–10 (<https://www.gov.uk/government/publications?departments%5B%5D=learning-and-skills-council>), divided by number of full-time-equivalent students aged 16–18 in further education colleges and school sixth forms. Number of students taken from Department for Education, *Participation in Education, Training and Employment*, various years, <https://www.gov.uk/government/collections/statistics-neet>. Figures for spending per student in further education from 1990–91 to 2003–04 taken from Department for Children, Schools and Families Departmental Report for 2009, <http://webarchive.nationalarchives.gov.uk/20130401151715/http://www.education.gov.uk/publications/eOrderingDownload/DCSF-Annual%20Report%202009-BKMK.PDF> and Department for Education and Employment, Statistical Bulletin 10/99, ‘Education and training expenditure since 1989–90’, http://dera.ioe.ac.uk/13586/1/Education_and_training_expenditure_since_1989-90_%28Statistics_Bulletin_10_99%29.pdf. Imputed figures are calculated by back-rating the calculated figure in 2003–04 by the real-terms growth in the calculated series (figures for overlapping years are not shown here). HM Treasury deflators, November 2016, <https://www.gov.uk/government/statistics/gdp-deflators-at-market-prices-and-money-gdp-november-2016-the-autumn-statement>.

Appendix C. Higher education: sources and methodology

There are two main components to our calculations for public spending on higher education and resources per student: teaching grants (including fees paid by local authorities in the 1990s) and income from tuition fees. Here, we detail our methods for calculating each of these components. Our goal throughout is to measure the total level of public funding and resources per full-time undergraduate student. Due to the incomplete and changing nature of the data over time, various assumptions are made to ensure the most consistent time series.

Teaching grants

Between 2001–02 and 2011–12, we record teaching grant allocations from allocations reported in HEFCE recurrent grant allocations 2001–02 to 2011–12.³⁵ These include allocations for rewarding and developing staff in higher education (which were folded into the main teaching grant allocation in 2004–05) but exclude special funding and research funding. To get funding per full-time student, we divide by the total number of full-time-equivalent students covered by teaching grants over time (as reported in the recurrent grants document), which includes postgraduate students.

Before 2001–02, we back-cast teaching grants per student based on two different sources. Between 1998–99 and 2001–02, we back-cast fees plus teaching grant based on figures for resources per student reported in Department for Children, Schools and Families (2008). We then net off known fee levels to get teaching grant per student. Between 1990–91 and 1997–98, we back-cast teaching grants based on changes in resources per student reported in Department for Education and Employment (1999). This includes the level of and changes in fees paid by local education authorities on behalf of students.

For the years 2012–13 onwards, we calculate teaching grants using a bottom-up approach. This is partly to identify the teaching grants that accrue to the specific cohorts of students (rather than incorporating the much higher pre-2012 teaching grants). We retrieve the

³⁵ HEFCE, 'Recurrent grants for 2001–02: final allocations', http://webarchive.nationalarchives.gov.uk/20081203021504/http://www.hefce.ac.uk/pubs/hefce/2001/01_57.htm;
 HEFCE, 'Recurrent grants for 2002–03', http://webarchive.nationalarchives.gov.uk/20081203021411/http://www.hefce.ac.uk/pubs/hefce/2002/02_11.htm;
 HEFCE, 'Recurrent grants for 2003–04', http://webarchive.nationalarchives.gov.uk/20081203021233/http://www.hefce.ac.uk/pubs/hefce/2003/03_10.htm;
 HEFCE, 'Recurrent grants for 2004–05', http://dera.ioe.ac.uk/14382/1/04_12.pdf;
 HEFCE, 'Recurrent grants for 2005–06', http://dera.ioe.ac.uk/14381/1/05_13.pdf;
 HEFCE, 'Recurrent grants for 2006–07', http://webarchive.nationalarchives.gov.uk/20081203020906/http://www.hefce.ac.uk/pubs/hefce/2006/06_08/;
 HEFCE, 'Recurrent grants for 2007–08', http://webarchive.nationalarchives.gov.uk/20081203020038/http://www.hefce.ac.uk/pubs/hefce/2007/07_06/;
 HEFCE, 'Recurrent grants for 2008–09', http://webarchive.nationalarchives.gov.uk/20081203000848/http://www.hefce.ac.uk/pubs/hefce/2008/08_12/;
 HEFCE, 'Recurrent grants for 2009–10', <http://www.hefce.ac.uk/data/year/2009/Recurrent,grants,for,2009-10/>;
 HEFCE, 'Recurrent grants for 2010–11', <http://www.hefce.ac.uk/pubs/year/2010/201008/>;
 HEFCE, 'Recurrent grants for 2011–12', <http://www.hefce.ac.uk/pubs/year/2011/201107/>.

teaching grant levels by subject cost band adjusted for Inner and Outer London weightings scaling factors from HEFCE publications³⁶ and gross up to the overall average teaching grant using the distribution of students across cost bands in the 2011 cohort of entrants (from HESA student numbers data). We assume these are frozen in nominal terms for years not yet announced.

Tuition fees

Prior to 2006–07, no loans were available to cover tuition fees, which were capped at £1,000. Means-tested subsidies were available between 1998–99 and 2005–06, spending on which we include as part of teaching grant. The rest of the expenditure on fees in those years we count as private rather than public spending on education. As such, we include them in total resources but not in the government subsidy in Figure 5.1.

For graduates who began, but had not graduated from, university before 2006–07, loans became available from 2006–07 to cover these £1,000 tuition fees up-front. In our analysis, we assume that these loans were either not taken up or were fully repaid. To the extent that there is non-repayment of fees, this will result in an underestimate of the government subsidy.

In 2006–07, fees increased to £3,000 per year, rising gradually to £3,375 in 2011–12. As tuition fees, and the loans to cover them, now constituted a significant part of the higher education finance system, we explicitly model the cost to government of providing these loans.

To do this, we simulate the lifetime earnings of graduates using the British Household Panel Survey (BHPS) to estimate the dynamics of individuals' earnings over time, which are matched to the cross-sectional distribution of earnings in the Labour Force Survey (LFS). Earnings are uprated over time using actual or forecast average earnings growth as published in the Office for Budget Responsibility (OBR)'s *Economic and Fiscal Outlook November 2016*. These graduate earnings profiles are matched to the population of students that entered higher education in 2011–12³⁷ and are then uprated or downrated with average earnings growth according to the cohort that is being simulated. Using these profiles and information on the level of tuition and maintenance loans provided, we can calculate the value of future repayments according to the loan system in place and, therefore, the level of the government subsidy.³⁸

From 2012–13 onwards, tuition fees have been £9,000 per year. We use the same methodology discussed above to calculate the government fee subsidy. The only

³⁶ <http://www.bbk.ac.uk/committees/governors/HEFCEguide.pdf>;
<http://www.hefce.ac.uk/media/hefce/content/pubs/2014/201406/Guide%20to%20funding%20and%20SNCs%202013-14%20and%202014-15.pdf>;
http://www.hefce.ac.uk/media/HEFCE,2014/Content/Pubs/2015/201504/2015_04.pdf;
http://www.hefce.ac.uk/media/HEFCE,2014/Content/Pubs/2016/201607/HEFCE2016_07.pdf.

³⁷ The 2011–12 cohort of students is used for all years due to data constraints. We require the Higher Education Statistics Agency (HESA) data on higher education students to be linked to the National Pupil Database (NPD) for background characteristics and to the Destination of Leavers from Higher Education (DLHE) data for future earnings; we only have these data sources available for the 2011–12 cohort. Prior to 2011–12, we also impose the 2011–12 distribution of institution-specific fee waivers, as this information is not readily available for previous years.

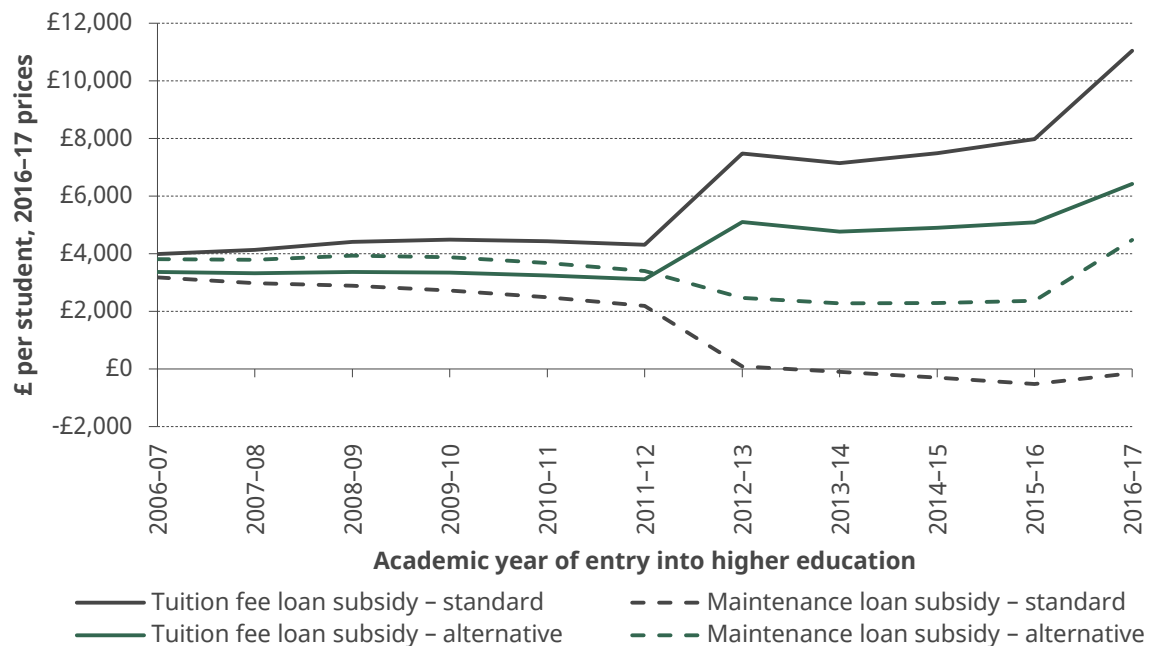
³⁸ Full details of this model are explained in Dearden et al. (2008).

difference is that we reweight the population of students based on actual demand for different types of courses from 2012–13 onwards.

To calculate the tuition fee loan subsidy separately from the maintenance loan subsidy, it is necessary to make an assumption about the order in which these loans are repaid. In reality, the loans are combined into a single loan, so they have the same repayment schedule; however, for our purposes, it is conceptually important which is paid off first, as this affects the breakdown of the subsidy. In Chapter 5, we assume that maintenance loans are paid off first, on the basis that changes in tuition fees and associated loans represent the incremental policy changes over time; however, in this appendix, we also consider the alternative assumption that both loans are paid off simultaneously, proportional to the size of each loan. The impact of the tuition fee and maintenance loan subsidies is shown in Figure C.1.

This figure shows two important facts. First, as expected, assuming that the loans are paid off simultaneously rather than that the maintenance loan is paid off first reduces the tuition fee loan subsidy and increases the maintenance loan subsidy. Second, the 2012 reform significantly reduces the maintenance fee subsidy when it is assumed to be paid off first. This is because of the introduction of a positive real interest rate, which, depending on the graduate's earnings, can be greater than the discount rate. This means that people who finish paying off their maintenance loans, which they are likely to do if

Figure C.1. Tuition fee and maintenance loan subsidies under alternative assumptions



Note: 'Standard' assumes that maintenance loans are paid off first. 'Alternative' assumes that tuition fee and maintenance loans are paid off simultaneously, proportional to the size of each loan. Fee loan subsidy is the average cost of non-repayment of student loans for fees. Maintenance loan subsidy is the non-repayment of maintenance loans.

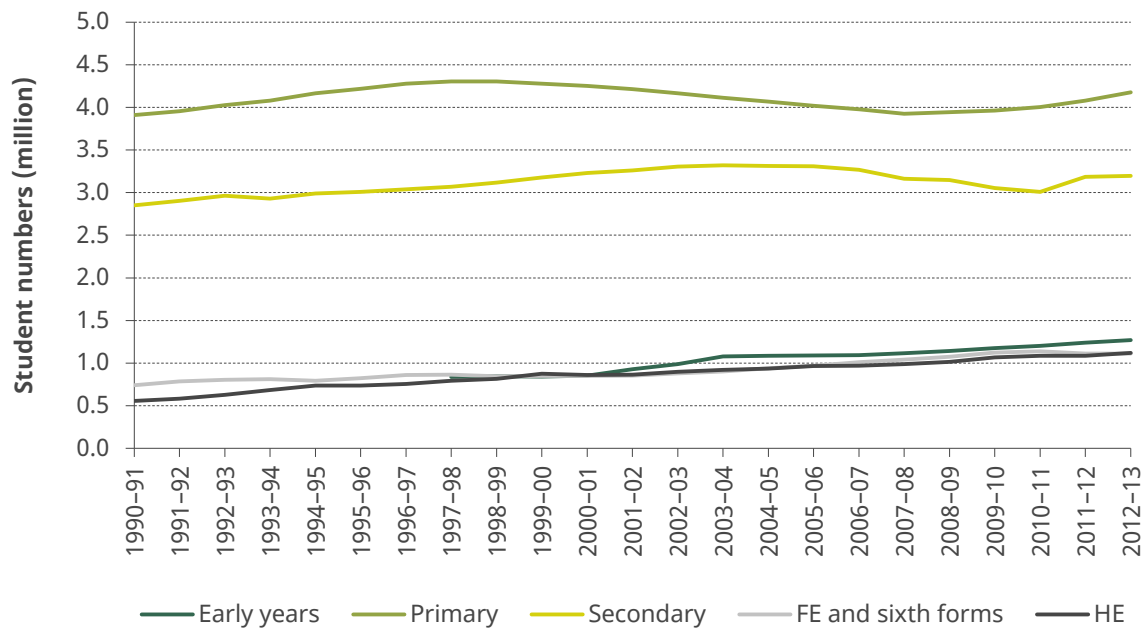
Source: Authors' calculations using the British Household Panel Survey, Labour Force Survey and Family Resources Survey. HM Treasury deflators, November 2016, <https://www.gov.uk/government/statistics/gdp-deflators-at-market-prices-and-money-gdp-november-2016-the-autumn-statement>.

paying them off first, can have a negative subsidy. These negative subsidies more than outweigh the non-repayment of maintenance loans by the rest of the graduates.

The increases in the tuition fee and maintenance loan subsidies in 2016–17 are due to the replacement of maintenance grants by loans. This increases the overall size of the debt and therefore the level of non-repayments. This affects the tuition fee loan subsidy in both scenarios, but more so when it is assumed that maintenance loans are paid off first.

Appendix D. Extra figure

Figure D.1. Student numbers at different stages of education in England



Note: HE student numbers figures are based on the HESA full-time English domicile student numbers. Data from the 'Historical statistics on the funding and development of the UK university system, 1920-2002' on UK student numbers are used to impute student numbers before 2001. Data in HEFCE grant allocation letters on maximum student numbers are used to impute the growth rate in 1995 when many polytechnic universities were converted to university status.

Source: See Belfield and Sibieta (2016) and Appendix Tables A.1 and B.1 for full sets of notes, sources and numbers. Higher Education Statistical Authority, 'Historical statistics on the funding and development of the UK university system, 1920-2002'. HEFCE final allocation grant letters (various years).

References

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

Brewer, M., Cattan, S. and Crawford, C. (2014), 'State support for early childhood education and care in England', in C. Emmerson, P. Johnson and H. Miller (eds), *The IFS Green Budget: February 2014*, https://www.ifs.org.uk/budgets/gb2014/gb2014_ch8.pdf.

Brewer, M., Cattan, S., Crawford, C. and Rabe, B. (2016), 'Free childcare and parents' labour supply: is more better?', IFS Working Paper W16/22, <https://www.ifs.org.uk/publications/8728>.

Chowdry, H., Dearden, L., Goodman, A. and Jin, W. (2012), 'The distributional impact of the 2012–13 higher education funding reforms in England', *Fiscal Studies*, 33, 211–36.

Chowdry, H. and Sibieta, L. (2011), 'Trends in education and schools spending', IFS Briefing Note 121, <https://www.ifs.org.uk/publications/5732>.

Crawford, C., Crawford, R. and Jin, W. (2014), *Estimating the Public Cost of Student Loans*, IFS Report R94, <https://www.ifs.org.uk/publications/7175>.

Cunha, F., Heckman, J. J. and Schennach, S. M. (2010), 'Estimating the technology of cognitive and noncognitive skill formation', *Econometrica*, 78, 883–931, <https://doi.org/10.3982/ECTA6551>.

Dearden, L., Fitzsimons, E., Goodman, A. and Kaplan, G. (2008), 'Higher education funding reforms in England: the distributional effects and the shifting balance of costs', *Economic Journal*, 118, F100–25.

Dearden, L., Fitzsimons, E. and Wyness, G. (2014), 'Money for nothing: estimating the impact of student aid on participation in higher education', *Economics of Education Review*, 43(C), 66–78, <https://doi.org/10.1016/j.econedurev.2014.09.005>.

Dearing, R. (1997), *Higher Education in the Learning Society: The Dearing Report*, HMSO, <http://www.educationengland.org.uk/documents/dearing1997/dearing1997.html>.

Department for Business, Innovation and Skills (2016), *Success as a Knowledge Economy: Teaching Excellence, Social Mobility and Student Choice*, Cm 9258, <https://www.gov.uk/government/publications/higher-education-success-as-a-knowledge-economy-white-paper>.

Department for Children, Schools and Families (2008), *Departmental Report 2008*, <https://www.gov.uk/government/publications/department-for-children-schools-and-families-departmental-report-2008>.

Department for Education (2016), *Early Years Funding: Changes to Funding for Three- and Four-Year Olds – Government Consultation Response*,

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/574040/Early_years_funding_government_consultation_response.pdf.

Department for Education and Employment (1999), 'Education and training expenditure since 1989–90', <http://dera.ioe.ac.uk/13586/>.

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

Hillman, N. (2014), *A Guide to the Removal of Student Number Controls*, Higher Education Policy Institute (HEPI) Report 69, <http://www.hepi.ac.uk/wp-content/uploads/2014/09/Clean-copy-of-SNC-paper.pdf>.

Lord Browne of Madingley (2010), *Securing a Sustainable Future for Higher Education: The Browne Report*, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/422565/bis-10-1208-securing-sustainable-higher-education-browne-report.pdf.

NAHT (2015), *An Early Years Place for All: NAHT Survey on Extending Childcare Provision in Schools*, http://www.naht.org.uk/_resources/assets/attachment/full/0/47298.pdf.

National Audit Office (2016), *Training New Teachers*, <https://www.nao.org.uk/report/training-new-teachers/>.

Public Accounts Committee (2016), *Entitlement to Free Early Years Education and Childcare*, <https://www.parliament.uk/business/committees/committees-a-z/commons-select/public-accounts-committee/inquiries/parliament-2015/free-entitlement-early-years-education-15-16/>.

Sibieta, L. (2015), 'School spending in England 2010–15', *Fiscal Studies*, 36, 283–302, <https://doi.org/10.1111/j.1475-5890.2015.12057>.

Stewart, K. (2013), 'Labour's record on the under fives: policy, spending and outcomes 1997–2010', LSE, CASE, Social Policy in a Cold Climate, Working Paper 4, <http://sticerd.lse.ac.uk/dps/case/spcc/wp04.pdf>.

Stewart, K. and Obolenskaya, P. (2015), 'The coalition's record on the under fives: policy, spending and outcomes 2010–2015', LSE, CASE, Social Policy in a Cold Climate, Working Paper 12, <http://sticerd.lse.ac.uk/dps/case/spcc/WP12.pdf>.

West, A. (2015), 'Education policy and governance in England under the coalition government (2010–15): academies, the pupil premium, and free early education', *London Review of Education*, 13, 2, 21–36, <https://doi.org/10.18546/LRE.13.2.03>.

West, A., Emmerson, C., Frayne, C. and Hind, A. (2009), 'Examining the impact of opportunity bursaries on the financial circumstances and attitudes of undergraduate students in England', *Higher Education Quarterly*, 63, 119–40, <https://doi.org/10.1111/j.1468-2273.2008.00414.x>.

West, A. and Noden, P. (2016), 'Public funding of early years education in England: an historical perspective', LSE, Department of Social Policy, Clare Market Paper 21, <http://www.nuffieldfoundation.org/sites/default/files/files/Nuffield%20Final%20Report%20historical%2027%20September%202016.pdf>.

Wolf, A. (2011), *Review of Vocational Education: The Wolf Report*, Department for Education and Department for Business, Innovation & Skills, <https://www.gov.uk/government/publications/review-of-vocational-education-the-wolf-report>.

Wyness, G. (2010), 'Policy changes in UK higher education funding, 1963–2009', UCL Institute of Education, Department of Quantitative Social Science (DoQSS), Working Paper10-15, <http://repec.ioe.ac.uk/REPEc/pdf/qsswp1015.pdf>.