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

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Preface

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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.
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Contents

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, over 50% higher in real terms than in 1990.

Despite this large overall increase, higher education funding has been highly erratic. There have been real-terms falls in resources provided to universities in 18 of the past 26 years, 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 though 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.

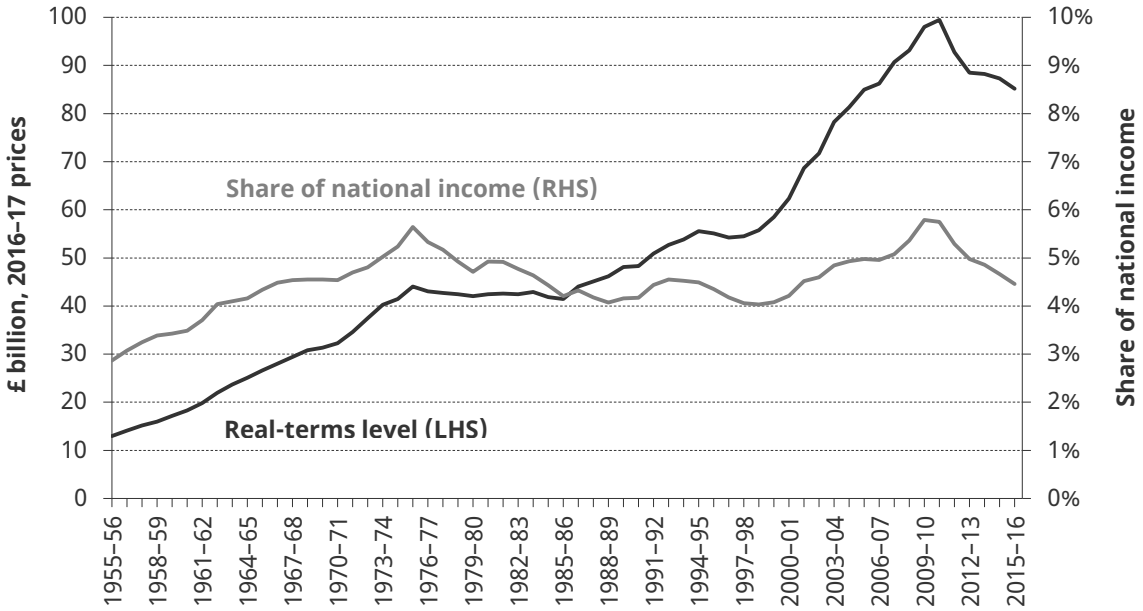
1. Introduction

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.

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.

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.[36] 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).

[36] 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

Prior to 2006–07, no loans were available to cover tuition fees, which were capped at £1,000. Therefore tuition fees represented 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. However, the fee waivers provided to students from low-income backgrounds are included in teaching grants.

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 2011–12[37] 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]

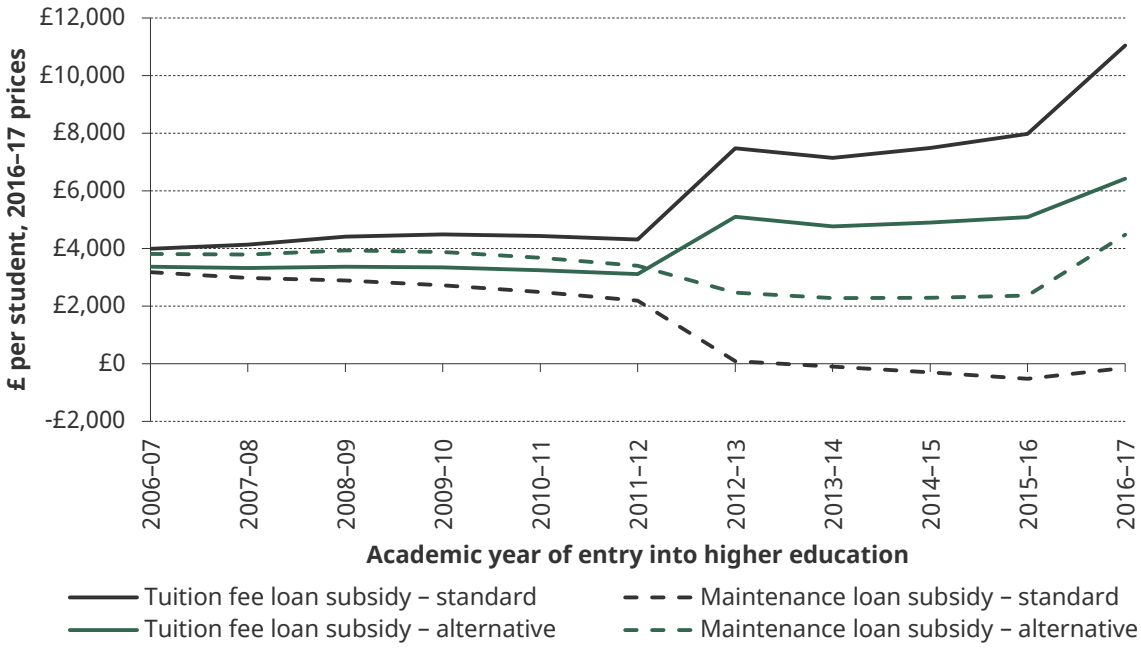
From 2012–13 onwards, tuition fees have been £9,000 per year. We use the same methodology discussed above to calculate the government fee subsidy. The only difference is that we reweight the population of students based on actual demand for different types of courses from 2012–13 onwards.

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

[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).

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.

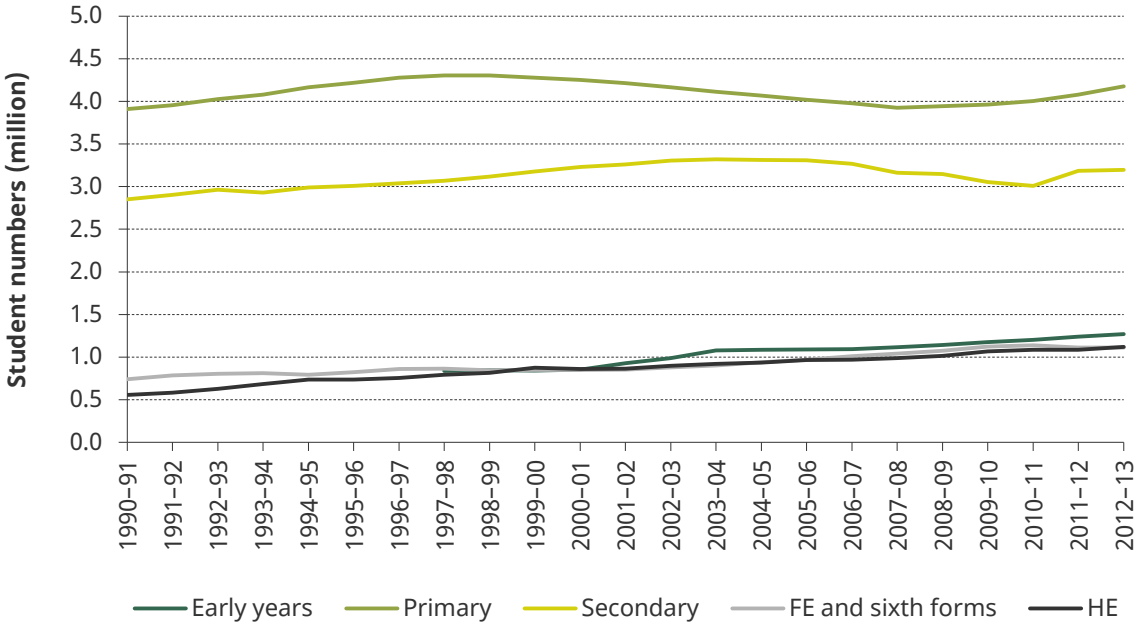
loans are paid off first, on the basis that changes in tuition fees and associated loans represent the incremental policy changes over time; however, in this appendix, we also consider the alternative assumption that both loans are paid off simultaneously, proportional to the size of each loan. The impact 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 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).

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