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Education**

School Funding in England Since 2010 – What the Key Evidence Tells Us

National Foundation for Educational Research (NFER)



School Funding in England Since 2010 – What the Key Evidence Tells Us

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Introduction to the report

This report presents the findings from a rapid review of the evidence on how recent changes (2010 onwards) to the level of school funding in England have impacted on school spending and attainment. To do this the report appraises literature published from 2010 onwards that focuses on the following key questions:

- What impact has school funding had on schools in England between 2010 and 2017?
- How might the changes proposed to the National Funding Formula in 2016-17 impact schools in England?

To answer these questions, the report provides information on changes in funding levels over 2010-17, along with anticipated changes out to 2019-20. Within this, it highlights how funding levels have changed for disadvantaged pupils and schools with high proportions of disadvantaged pupils. It also examines changes in what funding has actually been spent on. The evidence on the effect funding has had on attainment since 2010 is looked at, as is how the outcomes of additional spending vary with both pupil characteristics and the specific resources funds are directed at.

Studies outside of these parameters are not covered by this review. As such, studies that assess changes in educational outcomes but don't link this back to funding are excluded. Similarly, studies that only analyse funding policies and their impacts outside of England are excluded.

While the number of studies written on the topic of school funding is vast, the number meeting our search criteria is far smaller. Filtering our initial search results of 91 papers to determine the most relevant and robust studies allowed us to identify 14 key texts to appraise. We drew on all of these 14 studies in writing our review.

Each study is summarised at the end of this report. In addition to the report and study summaries, you can find a glossary of key terms on pages 9-10 and a timeline of key school funding policy changes on page 3. Areas for further study are identified on pages 7-8.

Constraints of the literature

Our search turned up a limited number of reports that directly address certain aspects of our research questions. In particular, studies that describe how funding levels have changed over time typically focus on resource spending rather than changes to capital spending; as such our review has the same focus.

We also found that studies reporting descriptive changes in funding levels tend not be the same studies that look at the impact of spending on attainment. This means there is no direct overlap between findings of where schools have made cuts to their budgets since 2010 and the examination of the effects of spending more or less on specific resources. For example, while a number of studies indicate that schools are reducing the number of staff they employ, studies looking at the effect of spending on attainment concentrate more on the length of service and pay levels of staff, rather than the the number of staff.

Similarly, while all studies included in our review cover at least part of the period 2010-17, they do not all cover the full period, nor do all studies cover the same years. This means that the figures cited in each report don't necessarily join up with one another – one report may outline changes from 2010-15, another may look at changes over 2005-15. Our review reports on sequential years and changes where possible, focusing on changes to per-pupil spending in order to build up a picture of the main funding trends and how these have altered between 2010 and 2017.

It is also important to highlight one key methodological issue when attempting to measure the impact of funding on attainment. There are a wide range of factors that influence both attainment and school resources that need to be controlled for when determining the true impact of funding on attainment. One of the most important of these is disadvantage. In England, disadvantaged pupils tend to have lower attainment than their peers. To try and close this attainment gap, funding is targeted at pupils from disadvantaged backgrounds, such as those eligible for Free School Meals (FSM). This complicates the relationship between observed funding levels and attainment outcomes. Rich data sets and sophisticated methodologies are needed to overcome this issue.

This review includes studies that compare attainment outcomes and funding relationships over time, as well as those that match schools with similar characteristics but different levels of funding to compare outcomes at one point in time. The variation in funding levels which the studies examine varies and it is important to note that this, too, could have an impact on the results observed.

While the papers examined don't report fully consistent results in terms of the impact funding has had on attainment, it is possible to pull out some key trends. These trends are included in our review.

An overview of recent school funding policy changes

Real-terms funding per pupil for state schools in England increased substantially throughout the 1990s and 2000s, accelerating to around five per cent growth per year over 2000/01 to 2009/10 (Belfield and Sibieta, 2016). Yet the 2008 financial crisis saw the start of a period of austerity in England and while the long-term pattern remains one of significant growth, recent policy has been less generous.

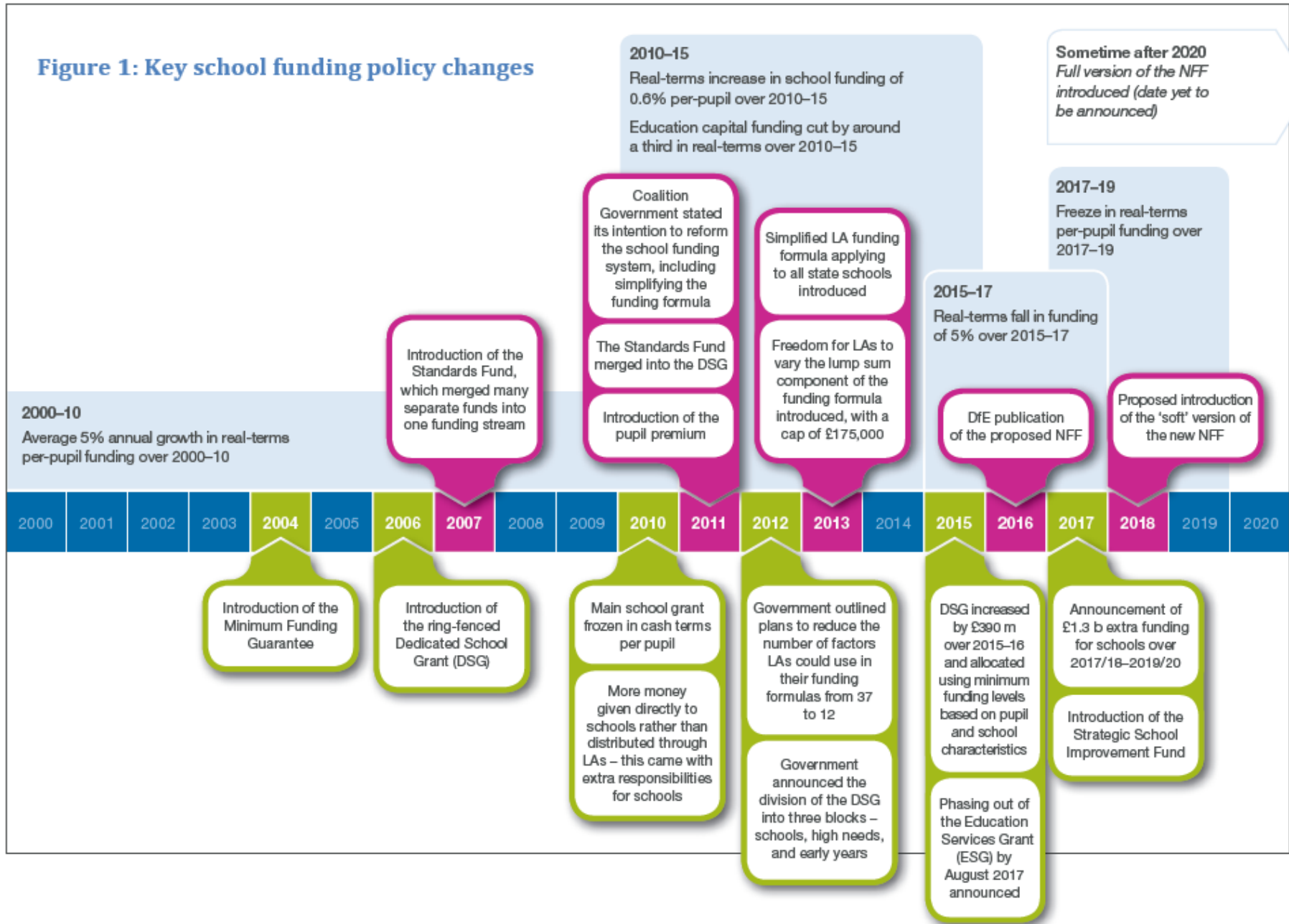
In 2010 the main schools grant was frozen in cash terms per pupil (Sibieta, 2015a). The Department for Education (DfE) also saw its capital funding budget cut by around a third in real terms over 2010-15 (*ibid*). Given that the vast majority of capital spending undertaken by the DfE represents school capital spending, this cut left less money available to expand the capacity of existing schools or to build new schools (*ibid*). Yet average school budgets continued to rise over 2010-15, increasing by approximately three per cent in real terms, or 0.6 per cent per pupil (*ibid*). This occurred mainly as a result of the introduction of the pupil premium. The pupil premium provided extra funding to the most disadvantaged pupils, resulting in schools experiencing substantial differences in funding trends, depending on the characteristics of their intake (National Audit Office, 2015; Sibieta, 2015a).

Given school funding was reasonably well protected up until 2015, the average financial position of schools was fairly stable up until 2014-2015 (NAO, 2016). However, signs that secondary schools were beginning to struggle had emerged. Between 2010-11 and 2014-15, the proportion of maintained secondary schools spending more than their income rose from 34 per cent to 59 per cent, while for secondary academies, the proportion rose from 39 per cent to 61 per cent over 2012-13 to 2014-15 (NAO, 2016).

Following the 2015 Spending Review, schools entered a period of reduced real-terms funding per pupil (NAO, 2016). Over 2015-17, total school funding fell by just under five per cent in real-terms.¹

In 2016, the National Audit Office (NAO) reported that the Government expected schools to make savings of approximately £3billion by 2019-20 to counteract cost pressures (NAO, 2016). This was followed by the Government's proposals for a new National

Figure 1: Key school funding policy changes



Funding Formula (NFF). This new formula would see local authorities (LAs) allocate funding based on one set formula, replacing the current system of each LA determining their own formula within stated government guidelines. If fully implemented, this formula could see some schools face cuts of more than ten per cent of their budget (Perera *et al.*, 2017). Both of these proposed changes were met with grave concern from schools and representative bodies, who stated that such cuts could have a detrimental effect on education outcomes.ⁱⁱ Responding to these concerns, the Government committed an additional £1.3 billion of funding over 2017-19.ⁱⁱⁱ It also announced that while the new NFF would go ahead, floors of three per cent cuts and ceilings of three per cent gains per year will be in place up to at least 2019-20,^{iv} limiting changes seen as a direct result of the formula.

The Government also intends to only implement a ‘soft’ version of the formula, whereby rather than setting every school’s individual budget, the formula will only be used to determine the total budget for each LA. As such, LAs will still have a role to play in deciding how these funds are then divided between schools. These current funding plans are expected to result in a real-terms freeze in per-pupil funding over 2017-19.^v It remains unclear what the government’s plans are following 2019-20, which has left the debate on the future of school funding wide open.

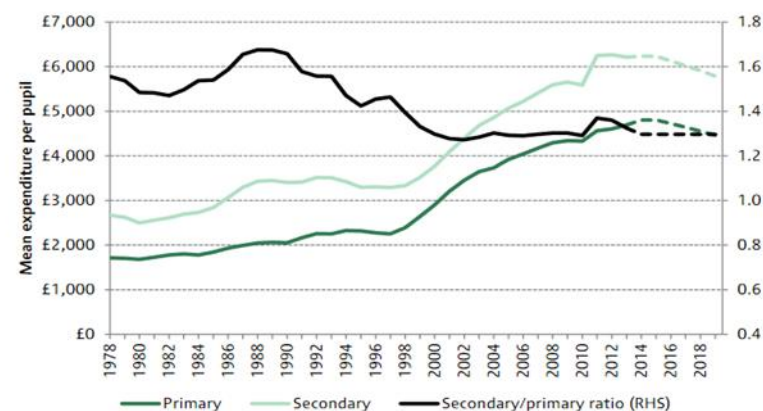
These key changes are depicted in the timeline in Figure 1, above.

Despite recent funding freezes and cuts, real-terms per-pupil funding is still expected to be over 50 per cent higher in 2019-20 than in 2000-01

The large increase in real-terms school funding seen over the 1990s and up to 2009-10 means that while average school spending has been largely frozen in real terms since 2011, real terms spending per

pupil is still expected to be over 50 per cent higher in 2019–20 than it was in 2000–01, as shown in Figure 2 (Belfield and Sibieta, 2016).

Figure 2: School funding increased substantially over the 1990s and 2000s



Note: Years refer to financial years (e.g. 1978 = 1978–79). Expenditure adjusted for inflation using GDP deflator.

Source: Belfield, C. and Sibieta, L. (2016). *Long-Run Trends in School Spending in England* (IFS Report R115). Expenditure is given in 2015-16 prices. NB: Figures for 2018 onwards exclude the £1.3 billion increase in school funding announced in 2017.

Schools face significant cost increases moving forward, especially in terms of staffing

In addition to cost increases related to inflation, schools face significant cost pressures from recent policy changes that will increase staffing costs (House of Commons 2017; NAO, 2016). These include the introduction of the national living wage, higher employer contributions to national insurance and the teachers’ pension scheme, and the apprenticeship levy. The NAO estimated in 2016 that in order to counteract these cost pressures, mainstream schools will have to find savings of around £3 billion by 2019-20. As part of the oral evidence taken by the Public Accounts Committee

(2017), DfE stated that its own analysis had concluded it would be difficult but 'doable' for schools to make this saving without undermining educational quality. Yet investigations by both the NAO (2016) and the House of Commons (2017) into how realistic this judgement is, concluded that DfE has not provided clear enough advice and support to schools on how to make these cuts, so DfE can't be sure that these savings will be achieved in practice, or of how they will be achieved. Surveys and interviews undertaken by both of these organisations indicate that schools are already undertaking changes to make savings, including those that could potentially affect outcomes. This includes narrowing the curriculum, reducing maintenance spending, not upgrading IT equipment, replacing more experienced teachers with younger recruits and relying more heavily on unqualified staff (House of Commons 2017; NAO, 2016).

The same surveys also suggest that increases in staff costs are one of schools' biggest financial pressures. This appears to be one of the first areas schools are making cuts to, with spending on teaching staff, teaching assistants (TAs) and support staff all being reduced (NAO, 2016). NFER's own Teacher Voice survey indicates that in primary schools, TAs may be taking the brunt of this fall in spending, with more than 50 per cent of schools cutting back on the number of TAs employed.^{vi} This is in stark contrast to the 2000s, where spending on teaching assistants rose substantially, due to a large increase in recruitment (Sibieta, 2015b). This growth occurred at the same time as a government push for schools to recruit more TAs. Yet the fact that the use of teaching assistants appears to both rise and fall in line with funding levels could also reflect the fact that other elements of school spending are more rigid and so hard to alter in the short-term. If this is the case, it highlights the need for policy makers to consider the rigidity of school budgets when planning funding changes and the impact this might have on resource decisions (Sibieta, 2015b).

Similarly, given that the total spent throughout a particular year group's entire education career - from their first year in primary school to their last year in secondary school - adjusts slowly to changes in the annual growth rate of school spending, policy makers need to consider what impact changes will have on particular year groups. Indeed, due to the time it takes for policy changes to feed through, while annual spending per pupil is anticipated to fall from 2016 onwards, cumulative spending per pupil is expected to continue rising until at least 2020. The 2020 GCSE cohort will be the first in 30 years to have received more funding in primary than in secondary school and it will be interesting to study what effect this change has on attainment (Belfield and Sibieta, 2016).

Additional school resources may have a modest positive influence on attainment

While a number of studies provide a description of how funding levels have changed in England, few studies looking at England provide robust estimates of the impact of spending changes on attainment; fewer still look at the impact since 2010. Those that do suggest that additional school resources have a modest positive influence on attainment (DfE, 2017; Gibbons *et al.*, 2017; Nicoletti and Rabe, 2014). However, in the main the effects are only found to be significant in studies examining data at the primary school level (DfE, 2017; Gibbons *et al.*, 2017).

The observed benefits of higher spending are typically greater for pupils from disadvantaged backgrounds

While in the main it appears that schools in the most disadvantaged areas have seen the largest funding gains over 2010-15, in part due to the introduction of the pupil premium (NAO, 2015; Sibieta, 2015a), it is not the case that all schools with very disadvantaged intakes

have seen their budgets increase. Some of these schools actually had less money per pupil in 2014-15 in real terms than in 2010, due to differences that currently exist in the weight that LAs' funding formulas attach to disadvantage and freezes to the main school funding grant (NAO, 2015).

In the limited number of studies that directly estimate the impact of additional expenditure on attainment since 2010, the observed benefits are typically greater for pupils eligible for Free School Meals (DfE, 2017; Gibbons *et al.*, 2011 and 2017). The effects of expenditure are found to be higher and more significant in schools with more disadvantaged students, and all types of students in the most disadvantaged schools appear to benefit from additional funding, not just the disadvantaged students (*ibid*).

However, Masi's 2016 study highlights the importance of thinking about the potential indirect incentives policies may have, along with the barriers that may limit their success. Rather than enabling disadvantaged children to attend better quality schools, a policy in which school travel was subsidised for disadvantaged children actually resulted in them attending a lower quality school on average.

There are encouraging signs that the pupil premium is being put to good use, but funding cuts may undermine its future success

The pupil premium appears to have helped focus more attention on the performance of disadvantaged pupils. In 2014, 94 per cent of schools targeted support at disadvantaged pupils, compared with 57 per cent before 2011 (NAO, 2015). It is important to note, however, that rather than a change in direction, the pupil premium forms part of a long-term trend towards focusing spending on disadvantaged pupils and thereby schools (NAO, 2015; Sibieta, 2015a).

Currently, it is thought to be too early to determine the full impact of the pupil premium. There are, however, encouraging signs that the

funding is being put to good use, with money increasingly been spent on evidence based interventions (NAO, 2015). In addition, the size of the attainment gap between disadvantaged and other pupils in primary schools has decreased (*ibid*). While the NAO don't attempt to directly link this change to the pupil premium, they do highlight a positive correlation. Unfortunately, the attainment gap starts to open up again at secondary school (NAO, 2015).

The analysis of the pupil premium highlights that it is not just the amount of funding that can impact on attainment; what funds are actually spent on is equally, if not more, important. For example, employing extra teaching assistants to support disadvantaged pupils has not been shown to be cost-effective in the main,^{vii} while peer-to-peer tutoring is believed to be both low cost and effective (NAO, 2015).

Concerns are beginning to grow that further cuts to funding may impact on the future success of the pupil premium. As illustrated by NFER's own survey, schools are increasingly using the funding to cover day-to-day costs for all pupils, diluting its impact.^{viii}

The new NFF could significantly reduce differences in funding between schools with very similar characteristics

The new NFF, if fully implemented, would significantly reduce differences in funding between schools with very similar characteristics (Belfield and Sibieta, 2017). However, the government decision in September 2017 to only implement a 'soft' version of the formula until further notice, reduces its impact (Belfield and Sibieta, 2017; Perera *et al.*, 2017). Along with the decision to limit the amount of funding a school will lose or gain as a direct result of the NFF until at least 2019, this means that less than 60 per cent of schools will receive the funding level dictated by the proposed formula by this date (Belfield and Sibieta, 2017). As such, much of

the variation in the system will remain and considerable funding changes will be necessary to move the remaining schools onto the NFF. A great deal of uncertainty remains around exactly how schools will make this transition after 2019.

Whether fully implemented or not, the proposed changes will see some schools lose funding and others gain. There is no clear overall geographical pattern to losses and gains, and no LA in which no schools lose funding (Belfield and Sibieta, 2017; Perera *et al.*, 2017). In general, LAs with the highest current levels of per-pupil funding will lose, and those with the lowest will gain, although this pattern is not perfect (*ibid*). Nearly all inner-London LAs will lose funding as a direct result of reductions to the Area Cost Adjustment (ACA) element in the new formula. Currently London is allocated 28 per cent more funding to account for higher wage costs due to higher standard of living costs. This is set to fall to 18 per cent under the new formula (*ibid*).

The fact that the new NFF is more heavily linked to pupil characteristics may also introduce more uncertainty as to the level of funding a school gets each year, as this will be affected by their intake (Belfield and Sibieta, 2017). It also removes some of the discretion LAs had over targeting school funding at certain characteristics, thereby reducing their flexibility to incorporate local knowledge into policy-making (*ibid*).

It is pupils living in the least deprived areas who will experience the highest relative gains in overall funding as a direct result of the NFF

The new formula increases the emphasis placed on prior attainment, and as a result increases funding for schools with a high proportion of pupils not meeting expected standards at the end of their reception year or at the end of Key Stage 2 (Belfield and Sibieta, 2017; Perera *et al.*, 2017). The formula also places increased emphasis on area-

based measures of deprivation, with this particular part of the formula allocating more funding to pupils who live in the most deprived areas as measured by the Income Deprivation Affecting Children Index.

However, when looking at the changes that the formula as a whole will bring about, it is pupils living in the least deprived areas who will experience the highest relative gains in overall funding. This is because whether a LA experiences gains or losses from the NFF depends on how close their existing formula is to the new formula. The end result of the changes in funding brought about by the new formula is to shift funding from the most disadvantaged pupils and schools to the so-called 'just about managing' group (Belfield and Sibieta, 2017; Perera *et al.*, 2017).

Recommendations for future research

Lessons for future policy could be gained through further research into school funding, including:

Investigating the direct impact of specific government funding policies on outcomes for disadvantaged pupils. Few studies look at the direct impact of specific policies on attainment, moving beyond correlation to look at causation. In some cases this is because it's too early to tell the full impact. More time and evaluation is needed to see if initiatives such as the pupil premium are achieving their goals and to add to the evidence base of where spending generates the greatest value for money. This would help reduce the possibility that schools might not possess sufficient information and empirical evidence in order to make efficient decisions, which in itself may be an important element of the often reported findings of an inconsistent relationship between resources and attainment. While organisations such as the Education Endowment Foundation (EFF) are adding to the evidence base, there is still more to be done, both in terms of

establishing a strong evidence base and in communicating this to schools and policy professionals.

Investigating school spending decisions and outcomes. Few studies look at the direct effect of recent school spending decisions (from 2010 onwards) on outcomes. Issues such as where schools make cuts following government announcements of real-terms funding reductions, the effect of these cuts on educational attainment, and if cuts have particularly detrimental effects on the attainment of specific pupil groups need to be further explored. This includes examining how different cohorts have been affected by funding decisions throughout their school career, as well as how different types of schools are responding to funding challenges. As Sibieta (2015b) suggests, given that academies have more flexibility on pay and conditions of teachers than maintained schools do, it would be interesting to see if these extra flexibilities have led academies to make different resource decisions. Similarly, it is important to look at the impact in different parts of England, to see if the size of the impact varies by geography and to understand why this is.

Evaluation of the impact of financial sustainability/deficit and educational outcomes. Evaluations of the effect that being in deficit has on a school in terms of educational outcomes are required. Evaluation of the formal interventions intended to move schools out of debt are also required to determine how successful such interventions are, which have the largest and fastest impact, and at what point formal interventions are actually needed.

Endnotes

ⁱ Sibieta, L. (2017). 'How and when money matters in education', Schools Week, 11 October, 2017. Available: <https://schoolsweek.co.uk/how-and-when-money-matters-in-education/> [26 October, 2017].

ⁱⁱ For example, see the statement from the NAHT (2016). 'NAO confirms school budgets being pushed beyond breaking point, says NAHT', NAHT News, 13 December [online]. Available: <http://www.naht.org.uk/welcome/news-and-media/key-topics/funding/nao-confirms-school-budgets-being-pushed-beyond-breaking-point/> [19 December, 2017].

ⁱⁱⁱ Department for Education and Greening, J. (2017). 'Justine Greening statement on national funding formula.' Oral statement to Parliament, 14 September. Available: <https://www.gov.uk/government/speeches/justine-greening-statement-on-national-funding-formula> [30 October, 2017].

^{iv} *ibid*

^v Sibieta, L. (2017). *How and when money matters in education*, Schools Week, 11 October, 2017. Available: <https://schoolsweek.co.uk/how-and-when-money-matters-in-education/> [26 October, 2017].

^{vi} Sutton Trust (2017). 'A third of heads "using funding for poorer pupils to plug gaps" in their school's budget. New Sutton Trust polling of teachers'. Sutton Trust Press Releases [online]. Available: <https://www.suttontrust.com/newsarchive/a-third-of-heads-using-funding-for-poorer-pupils-to-plug-gaps-in-their-schools-budget-new-sutton-trust-polling-of-teachers/> [19 December, 2017]

^{vii} Work done by the EEF has shown that how TAs are used impacts on how effective they are. As such, TAs can potentially be a much more effective resource than previous studies have suggested.

^{viii} Sutton Trust (2017). 'A third of heads "using funding for poorer pupils to plug gaps" in their school's budget. New Sutton Trust polling of teachers'. Sutton Trust Press Releases [online]. Available: <https://www.suttontrust.com/newsarchive/a-third-of-heads-using-funding-for-poorer-pupils-to-plug-gaps-in-their-schools-budget-new-sutton-trust-polling-of-teachers/> [19 December, 2017]

Methodology

A literature review was conducted using a consistent, best-evidence approach to the selection of literature. The parameters for the review are work published in English between 2010 to present, about school funding in England over this period. Study types included empirical research and/or evaluation, published literature and policy documents outlining how past, current and future school funding has been and will be allocated. The literature search involved using a number of electronic databases, relevant websites and reference lists of previous reviews to search for key words and phrases related to school funding. Following our initial search which identified 91 pieces of literature, we devised a short list of 14 items. These 14 were identified by checking both the relevance and robustness of items in the initial search. The majority of studies were eliminated based on relevance. In particular, a number commented on changes in attainment of pupils but did not link this to school funding. Similarly, a number outlined policy changes relating to school funding but did not examine the impact of these changes. Studies eliminated on the grounds of robustness included opinion pieces, studies where the methodology used was not clearly outlined, and studies based on surveys that were not weighted to ensure they were representative.

Glossary

Area Cost Adjustment (ACA) The ACA is designed to adjust for the differences between LAs in the costs of inputs they face. It acts as a multiplier to the majority of funding schools receive and is determined by two main methods. Firstly, an average for four regional teacher pay bands (Inner London, Outer London, the

London fringe and the rest of England) is calculated and used to uplift the average amount of funding spent on teacher salaries. Secondly, a General Labour Market (GLM) method is used, which compares the relative cost of labour in local areas. Historically, the ACA has benefited London, because the pay of teachers is compared with a relatively highly paid workforce, including the finance sector.

Dedicated School Grant (DSG) This is a core ring-fenced fund that gives LAs money to fund the schools that they manage. It is set out in three spending blocks: a schools block, a high needs block and an early years' block. The NFF affects how the schools block element is allocated.

Education Services Grant (ESG) A non-ring-fenced revenue funding stream, allocated on a simple flat rate per pupil, that is distributed to LAs and academies based on the number of children they are responsible for. It provides money to fund education support services, such as behaviour support, school improvement and assessment management. The levels and types of education services funded vary between local authorities, reflecting the differing needs of schools and pupils. The Government announced in 2015 that it would be phasing out this fund by August 2017.

Income Deprivation Affecting Children Index (IDACI) An index of deprivation used in the United Kingdom. The index measures the proportion of children under the age of 16 in a local area that live in low income households.

Lump sum component of the funding formula An amount of funding allocated to schools to cover some of the fixed costs they face. The NFF proposes a set value of £110,000 for all schools.

Minimum Funding Guarantee Introduced in 2004-5, this guarantees each school a minimum increase in per-pupil funding each year.

National Funding Formula (NFF) This is the formula that the Government proposed in its 2016 publication that will be used to calculate and distribute core revenue funding for mainstream schools in England. It consists of nine formula factors and an area cost adjustment.

Pupil Premium Additional funding for publicly funded schools in England to raise the attainment of disadvantaged pupils of all abilities and to close the gaps between them and their peers. It is targeted at children who have been looked after by the local authority for six months or more, children who are eligible for Free School Meals (FSM) or have been eligible for FSM at any point in the last six years (also known as Ever 6 FSM), and children whose parents are serving in the armed forces. Primary and secondary schools each receive a set per-pupil amount of funding for eligible pupils.

Strategic School Improvement Fund Introduced in 2017, this fund supports a range of school improvement activities including improving leadership, governance, teaching methods and approaches, and financial health and efficiency. It is intended to support medium to long-term activities across groups of schools. Designated teaching schools, multi-academy trusts and LAs can apply for the fund.

Soft version of the National Funding Formula Rather than the NFF being used to determine the funding of each individual school, this version of the formula is used to determine the funding each LA will be given. LAs will then be able to use their own formula to decide how this funding is divided between individual schools in their authority.

The Standards Fund This was formed of a number of separate grants, many of which were targeted at deprived areas, those with large proportions of black, asian and minority ethnic pupils, and pupils with English as an additional language. In 2011-12 the fund was merged into the Dedicated School Grant.

Report	Coverage of evidence	
	Impact of school funding policy	Impact of proposed changes to the NFF
Schools Spending Sibieta (2015a)	✓	
The Distribution of School Funding and Inputs in England: 1993-2013 Sibieta (2015b)	✓	
Long-Run Trends in School Spending in England Belfield and Sibieta (2016)	✓	✓
Financial sustainability of schools NAO (2016)	✓	
The Short- and Long-run Impact of the National Funding Formula for Schools in England Belfield and Sibieta (2017)		✓
Funding for disadvantaged pupils NAO (2015)	✓	
Financial Sustainability of Schools House of Commons Committee of Public Accounts (2017)	✓	
The Implications of the National Funding Formula for Schools Perera <i>et al.</i> (2017)		✓
Spending it wisely : How Can Schools Use Their Resources To Help Poorer Pupils? Nicoletti and Rabe (2014)	✓	
School Funding and Pupil Outcomes: A Literature Review and Regression Analysis DfE (2017)	✓	
Does Additional Spending Help Urban Schools? An Evaluation using Boundary Discontinuities Gibbons <i>et al.</i> (2011)	✓	
Does Additional Spending Help Urban Schools? An Evaluation using Boundary Discontinuities Gibbons <i>et al.</i> (2017)	✓	
Estimating the effect of teacher pay on pupil attainment using boundary discontinuities Greaves and Sibieta (2014)	✓	
On the Way Down: The Unintended Consequences of School Transport Subsidies Masi (2016)	✓	

Title:	<i>Schools Spending</i>	Author(s): Sibieta, L. (2015a)
Aims:	IFS analysis of changes in schools spending in England over time, how these compare with other areas of education spending, and how different groups of schools have been affected.	
Coverage of evidence		
✓	What impact has school funding had on schools in England over 2010-17?	How might the government-proposed changes to the NFF impact on schools in England?
Key findings	<p>School spending in England was relatively protected over 2010-15, with total spending rising by three per cent in real terms and by 0.6 per cent per pupil (as pupil numbers grew by 2.4 per cent). As the main schools grant was frozen in cash terms per pupil, these real-terms increases are a result of more funding going to the most disadvantaged pupils via the pupil premium, leading to substantial differences in funding trends for schools depending on their pupil intake. Over 2010-15, DfE's capital funding budget was cut by around a third in real terms, leaving less money available to expand the capacity of existing schools or build new schools. Funding allocated to individual schools has grown faster than the overall schools budget, as a higher proportion of total funding is now passed directly to individual schools, rather than being spent through the Local Authority (LA).</p> <p>Due to squeezes on public sector pay, the costs faced by schools are likely to have increased by less than inflation, potentially explaining why the school workforce has not fallen over 2010-15. Looking forward, rising pupil numbers together with reforms that will increase the cost of employing staff (higher employer pensions, higher national insurance contributions and expected increases in public sector pay), will contribute to increasing school costs.</p> <p>Prior to the introduction of the pupil premium, school funding was heavily targeted at the most disadvantaged, with funding per pupil 35 per cent higher amongst the most deprived primary schools than amongst the least deprived. As a result of the pupil premium, this figure rose to 42 per cent by 2014–15.</p>	
Methodology	<p>Use of secondary data to examine changes to funding per pupil across schools between 2010–11 and 2014–15, and changes to LA funding between 2014–15 and 2015–16. Data used includes the Dedicated Schools Grant allocation tables and Section 251 data. Calculations for 2014–15 are estimated based on known policy changes. Academies are excluded from the analysis, as data was only available for 2012-13. As over half of secondary schools converted to academies over 2010-15, this is, as noted by the author, a potential cause for concern. For example, if the least deprived schools are more likely to convert (and therefore not be captured in the dataset in later years), the estimates of funding per pupil presented here may be biased upwards. This bias would occur because the observed increase in funding has arisen through extra money going to pupils eligible for FSM via the pupil premium, and the proportion eligible for FSM may be higher in the dataset, than it is in reality.</p>	
Full reference	Sibieta, L.(2015a). <i>Schools Spending</i> (IFS Briefing Note BN168) [online]. Available: https://www.ifs.org.uk/publications/7669 [6 September, 2017].	

Title:	<i>The Distribution of School Funding and Inputs in England: 1993-2013</i>		Author(s):	Sibieta, L. (2015b)
Aims:	IFS examination of the effect higher funding levels have had on school staffing over 1993-2013.			
Coverage of evidence				
✓	What impact has school funding had on schools in England over 2010-17?		How might the government-proposed changes to the NFF impact on schools in England?	
Key findings	<p>School funding per pupil increased substantially between 1999-00 and 2012-13 in England. In real-terms, per pupil funding for primary schools rose by 69 per cent between 1999-00 and 2012-13; in secondary schools it rose by 72 per cent. This paper argues that a large part of this extra funding has been spent on staffing.</p> <p>The number of teachers per pupil has increased, as has the real-terms cost per teacher. These increases account for approximately 20-30 per cent of the total increase in funding per pupil. Teaching assistants (TAs) and other non-teaching staff account for an even larger share. Amongst primary schools, the number of teaching assistants has risen from around one per 100 pupils in the late 1990s to 3.4 per 100 pupils in 2012-13. While secondary schools have seen a smaller growth in the number of TAs (from 0.4 to 1.8 per 100 pupils) they have experienced a larger growth in the use of other staff, from one per 100 pupils to just over three per 100 pupils, accounting for approximately 20-29 per cent of the increase seen in funding per pupil. Given the lack of empirical evidence on the benefit of TAs, the author suggests it is likely that these shifts reflected the relative flexibility of contracts for TAs, other budget rigidities, and uncertainty over future funding allocations. This highlights the need for policy makers to consider how schools can and will respond to short-run and long-run changes to their budgets.</p> <p>The increased expenditure on non-teaching staff is strongly related to ‘school deprivation’ (the proportion of pupils eligible for FSM). The author’s analysis suggests that it is this factor that account for the majority of the increased funding. One potential effect of this rise in funds directed at FSM pupils may be to create additional uncertainty over funding, as the proportion of these pupils may change each year.</p>			
Methodology	<p>The author links together various secondary datasets on state primary and secondary schools, including DfE data on pupils, schools and their characteristics, the School Workforce Census (SWC), financial data from Section 251, and earnings data from the Annual Survey of Hours and Earnings. Primary and secondary schools are divided into quintiles of school-level deprivation based on the proportion of children eligible for free school meals each year. As data from the SWC was experimental in 2010-11, any large changes shown over this year that do not continue into other years are assumed to be due to limitations in the dataset. Three categories of teachers are defined in the analysis – teachers, TAs, and other staff. Due to changes in the way the data is collected and recorded in the datasets used, there are changes to the definitions of staff over time, but these don't lead to major discontinuities in trends.</p>			
Full reference	<p>Sibieta, L. (2015b). <i>The Distribution of School Funding and Inputs in England: 1993-2013</i> (IFS Working Paper W15/10) [online]. Available: https://www.ifs.org.uk/publications/7645 [8 September, 2017].</p>			

Title:	<i>Long-Run Trends in School Spending in England</i>	Author(s):	Belfield, C. and Sibieta, L. (2016)
Aims:	IFS analysis reviewing primary and secondary school spending per pupil between 1978–79 and 2019-20.		
Coverage of evidence			
✓	What impact has school funding had on schools in England over 2010-17?	✓	How might the government-proposed changes to the NFF impact on schools in England?
Key findings	<p>The significant growth in average spending per pupil over the last 30 years was largely concentrated in the 2000s, when it was around five per cent per year in real terms. This large growth means that despite average school spending being largely frozen in real terms over 2011–16, spending per pupil will still be over 50 per cent higher in 2019–20 than in 2000–01.</p> <p>While there is variation in per pupil spending across Local Authorities (LAs), it has fallen over time and spending is now much more strongly linked to area characteristics. For example, in the early 1980's, the gap between the ten per cent richest and ten per cent poorest primary schools was over 30 per cent. By 2013-14 this had narrowed to 26 per cent.</p> <p>However, variations within LAs has become more significant over time. The ratio of primary to secondary school per pupil spending also still varies significantly across LAs, although the variance has fallen over time. There is large variation in spending among the quintile of schools with the most deprived intake; ten per cent spent more than £9,000 per pupil, while ten per cent spent less than £6,200. The authors note that public spending on education is increasingly being used as a tool to redistribute resources, yet 'there is a subtle distinction between targeting spending at pupils from disadvantaged backgrounds and targeting spending at pupils who attend schools with a high proportion of their intake from disadvantaged backgrounds'. The authors conclude that whilst their analysis shows the Government has achieved the latter; further research is required to determine the extent to which the former has been achieved.</p> <p>Due to the time it takes for policy changes to feed through into spending per cohort (i.e. the total spending over a pupil's school career) although annual spending per pupil is anticipated to fall from 2016 onwards, cumulative spending is expected to continue rising until at least 2020. The 2020 GCSE cohort will be the first in 30 years to have received more funding in primary than in secondary school.</p>		
Methodology	<p>Secondary data analysis using data from the Schools Section 52/251 returns, data on academies' financial returns, and The Chartered Institute of Public Finance and Accountancy (CIPFA) Education Statistics. The analysis includes academies where data is available but excludes special schools, as their funding arrangements are more complex and driven more by the needs of individual pupils. As data on eligibility for FSM is only available back to 1993, the researchers estimate deprivation by looking at differences in spending per pupil by quintile of the proportion of people in social housing as recorded in census data. Cumulative expenditure on each cohort is calculated for pupils taking GCSEs between 2002 and 2013 where there is school-level data for the schools that individual pupils attend, and prior to that by 'backcasting' using LA-level trends.</p>		
Full reference	<p>Belfield, C. and Sibieta, L. (2016). <i>Long-Run Trends in School Spending in England</i> (IFS Report R115). London: IFS [online]. Available: https://www.ifs.org.uk/publications/8236 [5 September, 2017].</p>		

Title:	<i>Financial sustainability of schools</i>	Author(s): National Audit Office (2016)
Aims:	NAO report examining DfE support for state-funded schools as real-terms funding per pupil falls.	
Coverage of evidence		
✓		What impact has school funding had on schools in England over 2010-17?
		How might the government-proposed changes to the NFF impact on schools in England?
Key findings	<p>The NAO assert that the financial position of primary schools was reasonably stable in 2015. However, they identify the emergence of financial challenges in secondary schools. Between 2010-11 and 2014-15, the proportion of maintained secondary schools spending more than their income rose from 34 per cent to 60 per cent. The proportion in deficit was 15 per cent in 2014-15 and the average size of deficit for those schools in deficit increased in real terms from £246,000 to £326,000. Between 2012-13 and 2014-15, the proportion of secondary academies spending more than their income rose from 39 per cent to 61 per cent. The DfE does not know exactly why schools are overspending or underspending, or how long these patterns are sustainable for.</p> <p>In addition, schools' budgets will face further pressure from pay rises, the introduction of the national living wage, higher employer contributions to national insurance and the teachers' pension scheme, non-pay inflation and the apprenticeship levy. DfE estimated that mainstream schools will be able to make savings of around £3 billion by 2019-20 without negatively affecting educational outcomes.</p> <p>While DfE is aiming to support schools to do this, the NAO finds that DfE has not clearly communicated to schools how they should make these savings, so can't be sure that educational outcomes won't be compromised. Indeed, the small sample of schools NAO surveyed indicates that in order to reduce costs, some schools are planning to replace more experienced teachers with younger recruits and to rely more heavily on unqualified staff. To avoid a fall in educational standards the NAO recommend that DfE intervene more often and earlier when financial concerns about schools arise.</p>	
Methodology	<p>Audit report assessing the value for money of DfE's approach to managing risks to schools' financial sustainability in light of increasing cost pressures. This is done through interviews with DfE and the Education Funding Agency (EFA), a review of analysis and literature produced by DfE, the EFA and stakeholders, analysis of schools' income and expenditure data, interviews with a small representative sample of schools, interviews with key stakeholders, a call for evidence issued to teachers' unions, and analysis of EFA's records of oversight and intervention.</p>	
Full reference	<p>National Audit Office (2016). <i>Financial Sustainability of Schools</i> (HC 850). London: NAO [online]. Available: https://www.nao.org.uk/wp-content/uploads/2016/12/Financial-sustainability-of-schools.pdf [5 September, 2017].</p>	

Title:	<i>The Short- and Long-run Impact of the National Funding Formula for Schools in England</i>	Author(s):	Belfield, C. and Sibieta, L. (2017)
Aims:	IFS analysis of DfE's proposed school funding reforms and their likely effects on different schools and areas.		
Coverage of evidence			
	What impact has school funding had on schools in England over 2010-17?	✓	How might the government-proposed changes to the NFF impact on schools in England?
Key findings	<p>The authors calculate that if the proposed NFF was fully implemented with no floors to cuts, schools would lose 3.1 per cent of funding in real terms by 2019–20. In general, Local Authorities (LAs) with the highest current levels of per-pupil funding will lose, and those with the lowest will gain, although this pattern is not perfect.</p> <p>Funding for the most deprived decile of primary schools will grow slightly, by 0.3 per cent in cash terms. For secondary schools in the most deprived decile it will fall slightly, by 0.2 per cent. Overall, the most deprived schools can expect to see funding increases below the national average after 2019–20.</p> <p>There are two main reasons for this. The first is that many of the most deprived schools are in inner London and the proposed formula will reduce the Area Cost Adjustment (ACA) that London currently benefits from down from 28 per cent to 18 per cent. The second reason is that the new NFF will use a broader range of factors to allocate funding for deprivation than the existing formula, which focuses on pupils eligible for Free School Meals (FSM). These broader measures include allocating more funding on the basis of area deprivation. Effectively, this change in focus diverts funding away from the most deprived to the averagely deprived schools, meaning that the schools which benefit most are those with middling proportions of students from disadvantaged backgrounds. The new formula will, however, increase the funding of schools whose intakes have low prior attainment.</p> <p>By 2019-20, due to the floor the Government is putting in place to ensure no school loses more than three per cent of its funding as a direct result of the new NFF, only 60 per cent of schools will receive the funding level dictated by the proposed formula. A great deal of uncertainty remains around exactly how remaining schools will make this transition. While the NFF will correct funding inequities between LAs, it will also remove LAs' discretion over targeting school funding at certain characteristics, thereby reducing their flexibility to incorporate local knowledge into policy-making.</p>		
Methodology	Secondary analysis of a range of data, including DfE and EFA dedicated schools grant allocations, DfE data on schools, pupils and their characteristics, and school-level data provided to IFS direct from DfE. Estimates relate to spending plans as of March 2017.		
Full reference	Belfield, C. and Sibieta, L. (2017). <i>The Short- and Long-run Impact of the National Funding Formula for Schools in England</i> (IFS Briefing Note BN 195) [online]. Available: https://www.ifs.org.uk/publications/9075 [4 September, 2017].		

Title:	<i>Funding for disadvantaged pupils</i>	Author(s):	National Audit Office (2015)
Aims:	NAO evaluation of DfE's implementation of the pupil premium policy.		
Coverage of evidence			
✓	What impact has school funding had on schools in England over 2010-17?		How might the government-proposed changes to the NFF impact on schools in England?
Key findings	<p>Despite the additional funding schools now receive via the pupil premium, schools have not unanimously seen increases in their overall budgets. Over 2010-11 to 2014-15, DfE gave £6 billion to schools under the pupil premium policy but reduced other school funding in real-terms at the same time. As a result total per-pupil funding has increased in only 55 per cent of schools in real-terms.</p> <p>The NAO report that the introduction of the pupil premium has increased school leaders focus on improving outcomes for disadvantaged pupils. However, while 64 per cent of school leaders now report using the Education Endowment Foundation's (EEF's) Teaching and Learning toolkit to inform decisions, the NAO found that many schools spend a proportion of their pupil premium funding on approaches that may not be cost-effective based on current evidence, reducing the funding's impact. Furthermore, while recognising that the freedom schools have to make different choices about which pupils to target pupil premium activities on can be beneficial, the NAO highlighted the risk that some disadvantaged pupils miss out on the full benefit of the funding. For example, 77 per cent of schools use some of their pupil premium funding for activities that are designed to support all pupils rather than just those who are disadvantaged. The report authors argue that this risks diluting the funding's impact, particularly in the 15 per cent of schools with fewer than one in five disadvantaged pupils who mainly use funding in this way.</p> <p>The DfE estimate the full impact of the pupil premium will not be felt until 2018 for primary schools and 2023 for secondary schools – the years when eligible pupils will have been funded for their entire education. Since its introduction the size of the attainment gap between disadvantaged and other pupils in primary schools decreased by 4.7 percentage points as of 2014, while the gap in attainment in secondary school fell by 1.6 percentage points over the same period. While this is promising, the significance of these improvements is unclear and the gap remains wide.</p>		
Methodology	Audit report assessing the performance of DfE and oversight bodies using a self-assessment by DfE, followed by interviews and document review, interviews with schools and LAs, surveys of school leaders and parents, a review of the EEF, analysis of funding, spending and attainment data, a review of Ofsted inspections, schools' published statements about their use of the pupil premium, and third-party literature.		
Full reference	National Audit Office (2015). <i>Funding for Disadvantaged Pupils</i> (HC 90). London: NAO [online]. Available: https://www.nao.org.uk/wp-content/uploads/2015/06/Funding-for-disadvantaged-pupils.pdf [4 September, 2017].		

Title:	<i>Financial Sustainability of Schools</i>	Author(s): House of Commons. Committee of Public Accounts (2017)
Aims:	Public Accounts Committee examination of the financial sustainability of the school system.	
Coverage of evidence		
✓		What impact has school funding had on schools in England over 2010-17?
		How might the government-proposed changes to the NFF impact on schools in England?
Key findings	<p>The Committee set out that as well as the cut in real-terms funding per pupil, schools face significant cost pressures from: pay rises, the introduction of the national living wage, higher employer contributions to national insurance and the teachers’ pension scheme, non-pay inflation and the apprenticeship levy. The Committee highlights the specific risk that the DfE has not set out the financial impact of the Apprenticeship Levy on schools and suggests that this is among the reasons why school leaders do not feel that the DfE understands the funding pressures they are under.</p> <p>The report notes, that as reported by the NAO, the DfE has concluded from its own internal statistical benchmarking exercise that it will be difficult but ‘doable’ for schools to make savings of around £3 billion (eight per cent of the total budget in 2017) by 2019–20 without undermining outcomes. However, the Committee warn’s that there is a ‘real risk’ that cuts will lead to declining standards, noting that schools are already narrowing their curriculum, reducing maintenance spending and not upgrading IT equipment. The Committee expresses a concern that while DfE intends to monitor the impact of funding changes via Ofsted inspections, Key Stage tests and exam results, these indicators involve a time lag. The Committee suggest that a plan is needed to monitor in real time the impact on educational quality by analysing indicators such as curriculum breadth, class sizes and pupil-teacher ratios.</p>	
Methodology	<p>The Public Accounts Committee took oral and written evidence from interested parties, including the DfE, the then EFA and the NAHT and individual headteachers.</p>	
Full reference	<p>Great Britain.Parliament. House of Commons. Committee of Public Accounts (2017). <i>Financial Sustainability of Schools, Forty-ninth Report of Session 2016–17</i> (HC 890) [online]. Available: https://publications.parliament.uk/pa/cm201617/cmselect/cmpublicacc/890/890.pdf [4 September, 2017].</p>	

Title:	<i>The Implications of the National Funding Formula for Schools</i>	Author(s): Perera, N., Andrews, J. and Sellen, P. (2017)
Aims:	Exploration of the implications of the proposed NFF for different areas, types of schools, and pupils up to 2019-20. The paper also considers the wider funding pressures that are estimated to emerge by 2019-20.	
Coverage of evidence		
✓	What impact has school funding had on schools in England over 2010-17?	✓ How might the government-proposed changes to the NFF impact on schools in England?
Key findings	<p>The authors argue that there are clear disparities within the existing school funding system in England that result in money being allocated inconsistently across schools. As such, they report the Government is right to proceed with its plan to introduce a new NFF, but argue that the Government need to fully implement it to ensure that a consistent and transparent system is achieved.</p> <p>The analysis shows that while the proposed changes will see some schools lose funding and others gain, overall there is no clear geographical pattern, and no Local Authority (LA) in which no schools lose funding. LAs experiencing the largest changes are those whose current formula is the furthest away from the proposed NFF. The authors note that when looking at how the formula will affect different groups of pupils, funding will shift from the most disadvantaged pupils and schools towards the so called ‘just about managing’ group. They link this back to changes that occur due to the use of wider area-based measures of deprivation, the increased emphasis on funding for pupils with low prior attainment and the redistribution of the basic per pupil amounts. The research also finds that overall, pupils who live in the least deprived areas (as measured by the Income Deprivation Affecting Children Index) experience the highest relative gains.</p> <p>The researchers estimate implementing the formula in full would mean that by 2020 8,000 schools would lose up to ten per cent of their budgets. Another 800 would lose between 10–20 per cent, and 90 would lose over 20 per cent. Once inflation and other pressures are taken into account, all schools in England are likely to see real-terms cuts in funding per pupil by 2019-20. However, an increased emphasis on prior attainment means that the lowest performing schools in the country are set to gain £78.5m more, overall, than the top performing schools.</p>	
Methodology	Secondary data analysis of a range of data, including Dedicated Schools Grant (DSG) allocations, School Census, Edubase, School performance tables and additional data provided by DfE to the researchers. This data was fed into DfE’s 2016 publication outlining how the proposed NFF would operate. Estimates relate to spending plans as of March 2017 and their impact on the Schools block element of the DSG.	
Full reference	Perera, N., Andrews, J. and Sellen, P. (2017). <i>The Implications of the National Funding Formula for Schools</i> . London: EPI [online]. Available: https://epi.org.uk/report/national-funding-formula/ [1 September, 2017].	

Title:	<i>Spending it wisely: How Can Schools Use Their Resources To Help Poorer Pupils?</i>		Author(s): Nicoletti, C and Rabe, B. (2014)
Aims:	To determine what happens if a secondary school increases per pupil spending by £1,000, including which pupils benefit, and which pupils benefit the most.		
Coverage of evidence			
✓	What impact has school funding had on schools in England over 2010-17?	How might the government-proposed changes to the NFF impact on schools in England?	
Key findings	<p>This research finds that most pupils benefit from more money being spent on learning resources such as books, software and computers, but the gain appears to be less for pupils whose first language is not English. Spending in secondary schools is most productive for those pupils who perform well in primary school, with the top ten per cent of pupils making far more progress than the bottom ten per cent. The authors note that this implies early investment is needed to bridge the attainment gap.</p> <p>The research investigates different pupil characteristics and finds special educational needs (SEN) pupils in mainstream schools in particular benefit from additional spending, especially spending on teachers. Spending on teaching assistants improves outcomes for the least able, along with those who are eligible for Free School Meals (FSM) and those whose first language is not English. The authors note that this, in turn, helps to narrow the achievement gap between these pupils and their peers. Among pupils with low test scores at the end of primary school, those of black, Indian, Pakistani and Bangladeshi origin benefit more from additional school spending than white British, mixed and other ethnicities with similarly low test results. Among the most able pupils eligible for FSM, black pupils tend to make less progress between the end of primary school and GCSE examinations than any other group. High levels of spending on supply teachers has a detrimental effect on the progress of all pupils. Highly able boys appear to benefit more from an increase in spending per pupil than girls of similar ability.</p>		
Methodology	<p>Secondary data analysis and modelling. The researchers link National Pupil Database information with DfE school spending data. Only the performance of pupils in Maths, English and Science is examined. The authors devise a statistical model whereby the test scores at the end of compulsory schooling depend on test scores attained at the end of primary school, school expenditure, and school, individual and family factors. To control for the impact of family background on attainment, the authors compare the performance of siblings. The authors make a number of assumptions when interpreting their findings and the cause of these, which could lead to over/under estimation of the effects they report. Although a limited amount of detail is given on the statistical model used in this particular report, the report is the third in a series of three by the authors. The two earlier papers provide a detailed description of the underlying model.</p>		
Full reference	<p>Nicoletti, C. and Rabe, B. (2014) <i>Spending it Wisely: How Can Schools Use Their Resources To Help Poorer Pupils?</i> Colchester: Institute for Social and Economic Research, University of Essex [online]. Available: https://www.iser.essex.ac.uk/files/news/2014/spending-it-wisely.pdf [10 October, 2017]. The full series of papers is available via https://www.iser.essex.ac.uk/research/projects/school-inputs-and-educational-attainments [19 December, 2017].</p>		

Title:	<i>School Funding and Pupil Outcomes: A Literature Review and Regression Analysis</i>	Author(s):	Department for Education (2017)
Aims:	A DfE study exploring the impact of school spending and financial resources on pupil attainment at Key Stage 2 and Key Stage 4.		
Coverage of evidence			
✓	What impact has school funding had on schools in England over 2010-17?		How might the government-proposed changes to the NFF impact on schools in England?
Key findings	<p>The review finds only a few research studies using English data that provide robust estimates of the impact of school funding on attainment; those that do suggest additional school resources have a modest positive influence on attainment at all key stages. The impact of additional expenditure appears to have greater benefits for Free School Meal (FSM) pupils. However, the estimated impact varies according to the methodologies used. At Key Stage 2 estimates range from a few weeks' progress to a term's worth. At GCSE an extra £1,000 of expenditure per pupil can, over time, raise attainment at GCSE by 'a fraction of a grade'. The effects for larger amounts of expenditure are non-linear, so scaling up should not be attempted.</p> <p>The review suggests that spending more on learning resources positively affects attainment. Spending on education support staff positively affected the attainment of pupils with English as an Additional Language, FSM and gifted and talented pupils, with an extra £1,000 increasing test scores by 12 per cent, 7 per cent and 11 per cent respectively at the secondary school level. A small but statistically significant positive relationship is found between capital investment and pupil attainment, in which raising the condition of buildings up to 'adequate' has the greatest impact. Increased pupil-teacher ratios were found to have a small negative impact at Key Stage 2 and GCSE level.</p> <p>The researchers' own regression analysis finds no consistent link between funding levels and outcomes over 2010-15. A small statistically significant correlation between per-pupil funding and attainment is found at primary level, but analysis at the secondary school level finds no statistically significant relationship.</p>		
Methodology	<p>A literature review, focusing on studies the authors identify as 'high quality'. The authors also undertake their own fixed-effects regression analysis, examining the effect of reduced real-terms funding per pupil on Local Authority-maintained schools between 2010 and 2015. Modelling using lagged per-pupil funding variables is used to capture effects one and two years after the initial funding change. The authors note the problem of simultaneity in many of the studies reviewed and in their own work: disadvantaged pupils tend to do less well in tests and examinations and receive higher funding in an effort to close this attainment gap.</p>		
Full reference	<p>Department for Education (2017). <i>School Funding and Pupil Outcomes: a Literature Review and Regression Analysis</i>. London: DfE [online]. Available: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/634758/School_funding_and_pupil_outcomes.pdf [25 August, 2017].</p>		

Title:	<i>Does Additional Spending Help Urban Schools? An Evaluation using Boundary Discontinuities</i>	Author(s): Gibbons, S., McNally, S. and Viarengo, M. (2011)
Aims:	Academic analyses of the relationship between additional school resources and student achievement with a particular focus on low-income, low achieving children in urban schools.	
Coverage of evidence		
✓	What impact has school funding had on schools in England over 2010-17?	How might the government-proposed changes to the NFF impact on schools in England?
Key findings	<p>The authors found that on average an additional £1,000 per student paid to schools in urban local authority (LA) boundary settings raised student test scores at Key Stage 2 by around 0.25 standard deviations. Additionally, the effects of expenditure are considerably higher in schools with more disadvantaged students.</p> <p>All students in such schools benefit from additional funding, not just the disadvantaged students. These findings indicate that if each Free School Meal (FSM) student received an additional £2,000 in resources, FSM student achievement could rise by enough to offset the gap that exists between FSM and non-FSM students at Key Stage 2.</p> <p>The authors find no association between different LA incomes and Area Cost Adjustments (ACAs) and early school achievements (at age seven), age, gender, English as first language, ethnicity, or residential deprivation in the student-level or school-level regressions, nor with school size or the average of residential neighbourhood house prices in the school-level regression.</p>	
Methodology	<p>Secondary data analysis and modelling using the National Pupil Database, Annual School Census, Consistent Financial Reporting data, house price data from the Land Registry and details on the funding formula published each year by DfE. As these funding formulas resulted in schools with very similar characteristics and pupils receiving very different levels of funding per pupil, the authors are able to compare how different levels of funding impact on outcomes. Concerns that any estimated statistical association between resources and achievement is not causal is limited through the use of matching, regression discontinuity and instrumental variables.</p>	
Full reference	<p>Gibbons, S., McNally, S. and Viarengo, M. (2011). <i>Does Additional Spending Help Urban Schools? An Evaluation Using Boundary Discontinuities</i> (SERC Discussion Paper 90). London: Spatial Economics Research Centre [online]. Available: http://www.spatial-economics.ac.uk/textonly/serc/publications/download/sercdp0090.pdf [30 August, 2017].</p>	

Title:	<i>Does Additional Spending Help Urban Schools? An Evaluation using Boundary Discontinuities</i>		Author(s):	Gibbons, S., McNally, S. and Viarengo, M. (2017)
Aims:	Academic analyses of the relationship between additional school resources and student achievement with a particular focus on low-income, low achieving children in urban schools.			
Coverage of evidence				
✓	What impact has school funding had on schools in England over 2010-17?	How might the government-proposed changes to the NFF impact on schools in England?		
Key findings	<p>Overall, the authors find that a £1,000 increase in per pupil expenditure per year throughout primary school increases test scores at the end of primary school by around 0.30 standard deviations. It is noted that higher spending significantly increases attainment in all subjects that the authors look at - Maths, English and Science - although the results appear to be largest in Science.</p> <p>As in their earlier 2011 paper, the authors note that the effects of expenditure on attainment are found to be higher in schools with a more 'demographically disadvantaged' intake. This includes schools with high proportions of students eligible for FSM, above average proportions of non-white students, lower than average mean prior achievement, and those with a high proportion of pupils from deprived neighbourhoods. In these schools an increase in expenditure of £1,000 leads to a gain of 0.43–0.5 standard deviations in test scores.</p> <p>Schools with higher levels of funding appear to spread this additional income across a wide range of inputs, including but not limited to teachers, training, premises, professional services and supplies. On average, the authors note that a rise in funding is actually associated with a small reduction in the share of total funding spent on teachers; an increase of £1,000 per student per year reduces the share spent of teachers by approximately four percentage points.</p>			
Methodology	<p>Secondary data analysis and modelling using the National Pupil Database, Annual School Census, Consistent Financial Reporting data, house price data from the Land Registry and details on the schools' funding formula published each year by DfE. As previous funding formulas have resulted in schools with very similar characteristics and pupils receiving very different levels of funding per pupil, the authors are able to compare how different levels of funding impact on attainment. Concerns that any estimated statistical association between resources and achievement is not causal is limited through the use of matching, regression discontinuity and instrumental variables.</p>			
Full reference	<p>Gibbons, S., McNally, S. and Viarengo, M. (2017). 'Does additional spending help urban schools? An evaluation using boundary discontinuities', <i>Journal of the European Economic Association</i>, 1-51 (DOI: 10.1093/jeea/jvx038) [online]. Available: https://academic.oup.com/jeea/advance-article/doi/10.1093/jeea/jvx038/4670863 [19 December, 2017]</p>			

Title:	<i>Estimating the effect of teacher pay on pupil attainment using boundary discontinuities</i>	Author(s): Greaves, E. and Sibieta, L. (2014)
Aims:	IFS investigation of the impact of higher teacher salaries on pupil attainment by exploiting discontinuities at the London border.	
Coverage of evidence		
✓	What impact has school funding had on schools in England over 2010-17?	How might the government-proposed changes to the NFF impact on schools in England?
Key findings	<p>The authors find that differences in salary scales do translate into differences into actual teacher pay levels in primary schools, yet there is little evidence that higher teacher salary scales increase pupil attainment in national assessments at age 11. In particular, the authors rule out that salary scales have a positive impact on English and Maths attainment at this age. Possible reasons for these findings include the idea that potential teacher quality is not fully observable at the recruitment stage, or that teachers do not weight monetary rewards particularly highly when choosing jobs. Further research is needed to test out these theories.</p> <p>The authors note that these results imply that variations in teacher pay of the magnitude observed (around five per cent) are unlikely to be effective for attracting and retaining higher quality teachers. More effective strategies could include changing the structure of rewards by introducing performance-related pay, improving information provided to schools about applicants or greater firing of existing teachers deemed to be low quality.</p>	
Methodology	Secondary data analysis of the National Pupil Database and Spring Census from 2006 to 2011 to provide causal estimates of the effect of teacher pay on pupil attainment, using a sharp geographical discontinuity in teacher salaries. The authors compare schools in close proximity to a pay zone boundary to estimate the effect of teacher salary differentials on pupil attainment.	
Full reference	Greaves, E. and Sibieta, L. (2014) <i>Estimating the effect of teacher pay on pupil attainment using boundary discontinuities</i> (IFS Working Paper W14/03). Available: https://www.ifs.org.uk/wps/wp1403.pdf [13 October, 2017].	

Title:	<i>On the Way Down: The Unintended Consequences of School Transport Subsidies</i>	Author(s): Masi, B. (2016)
Aims:	Determine the impact of increasing funding for school transport for FSM pupils, to enable them to attend schools further from their home and therefore potentially attend better quality schools.	
Coverage of evidence		
✓	What impact has school funding had on schools in England over 2010-17?	How might the government-proposed changes to the NFF impact on schools in England?
Key findings	<p>The authors find that providing free transport to Free School Meal (FSM) pupils to enable them to attend one of three schools located at least two miles from their home did increase enrolment into more distant schools. However, the quality of the school attended falls on average. Possible reasons for this are</p> <ol style="list-style-type: none"> 1. parents might be enrolling children into more distant but lower quality schools in order to benefit from the subsidy 2. despite the subsidy, parental choice may still be limited by over-subscription of the best performing schools and distance-based admission criteria. <p>The author notes that while the policy appears not to have succeeded in its prime objective of improving the quality of school attended by disadvantaged pupils, it may have brought about other benefits. These could include benefits arising from giving families more choice over the school they send their child to, the chance for a child to escape from the poor environment where they are living, and the child benefiting from having peers from less disadvantaged backgrounds. Each of these could potentially increase attainment on average of children taking advantage of the subsidy. However, the author does not test for the existence and impact of these effects.</p>	
Methodology	Secondary data analysis of the Pupil Level Annual Census, containing information on the postcodes of both schools and pupils. A difference-in-difference approach is used to analyse the effect of a subsidy paid to FSM pupils on school choice under the Free Transport Policy. Data on students' test scores at Key Stage 4 is taken from the National Pupil Database and used as a measure of the quality of the school attended. The model uses data for the academic years 2004-05 to 2010-11. Only students who do not live in London are included. To determine eligibility for free transport, walking distance from the pupil's postcode to each school is calculated using mapping software.	
Full reference	Masi, B. (2016) 'On the way down: the unintended consequences of school transport subsidies.' Seminar presentation at Universitat Autònoma de Barcelona, Department of Applied Economics, Barcelona, 3 November. Version available: http://www.uab.cat/web?blobcol=urldocument&blobheader=application%2Fpdf&blobkey=id&blobnocache=true&blobtable=Document&blobwhere=1345710426607 [13th October, 2017].	

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