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Report

Policy options for a long-term teacher pay and financial incentives strategy

An assessment of options and their impacts and costs

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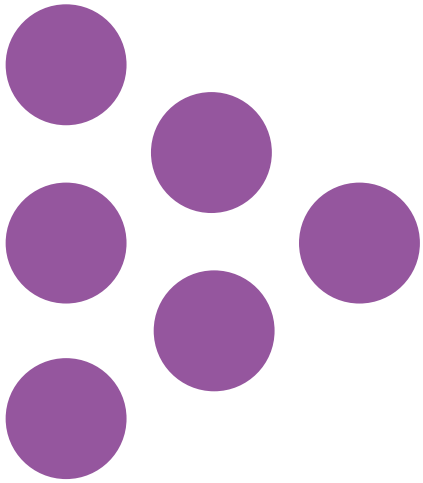

Policy options for a long-term teacher pay and financial incentive strategy: an assessment of options and their impacts and costs

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Executive Summary

England has been facing a significant teacher supply challenge, particularly in the years following the Covid-19 pandemic. The number of teachers recruited to postgraduate initial teacher training (ITT) has been lower than before the pandemic despite increased demand for teachers, and retention rates in 2022 returned to pre-pandemic levels after two years of being higher (McLean, Worth and Faulkner-Ellis, 2023a). The challenge has been particularly intense in secondary subjects, and undersupply has been particularly marked for physics, computing, maths and chemistry teachers.

The deteriorating competitiveness of teacher pay in England is likely to be one significant factor affecting supply. Teacher pay has grown more slowly than average earnings in the wider economy. The research evidence suggests that this loss of competitiveness is likely to have had a negative impact on recruitment and retention (Hansen *et al.*, 2004; DfE, 2020; Worth, Tang and Galvis, 2022a).

The intensifying teacher supply challenge, relative loss of competitiveness in teacher pay over the last decade and the research evidence showing that pay and financial incentives can be effective at improving recruitment and retention, means there is a strong case for the Government developing a long-term strategy to increase pay and incentives, and improve recruitment and retention. Non-financial factors such as teacher workload are also important for determining the relative attractiveness of teaching, but a strategy for improving teacher recruitment and retention is likely to be most effective where it includes complementary improvements to both the relative financial and non-financial attractiveness of the profession.

The analysis in this report answers the research question: what impact on recruitment and retention could different combinations of pay and financial incentive policies achieve, and how much would they cost? We use a forecast and simulation model developed by NFER to assess the overall costs and teacher supply impacts of different pay and financial incentive options. Answering these questions is important for informing a wider consideration of the role of different policy measures for addressing the attractiveness of teaching within an overall strategy.

This research aims to inform policymakers' thinking by providing detailed analysis of a range of teacher pay and financial incentive policy options, with consideration of their likely impacts on recruitment and retention, Exchequer costs and other implications. We aim to inform the key upcoming opportunities to develop and implement a long-term strategy on teacher pay and financial incentives in party political manifestos for the anticipated 2024 general election, and the subsequent Government spending review.

Key findings

On the 2023/24 teacher pay award

- In the context of an intense teacher recruitment and retention challenge, a recommendation by the School Teachers' Review Body (STRB) for teacher pay to increase by 6.5 per cent in 2023/24 (as reported in newspapers) would be a welcome first step for addressing the lost competitiveness in teachers' pay over the last decade. Our analysis suggests that it is likely to

have a more positive impact on supply compared to other proposals put forward by the Department for Education (DfE) earlier this year.

- However, over the longer-term the analysis shows that even a pay award of 6.5 per cent is unlikely to make a highly significant difference to the overall supply picture on its own. Pay awards in 2024/25 and beyond that merely match the anticipated growth in average earnings in the wider labour market are unlikely to significantly improve recruitment and retention, and address the pressing challenges. There therefore remains a need for a wider strategy for improving recruitment and retention that is based on a long-term plan to continue to improve the competitiveness of teacher pay and/or financial incentives, action to improve the non-financial attractiveness of teaching, or a combination of both.

On the policy options for 2024/25 and beyond

- An immediate correction to teacher pay in 2024/25 that closes the competitiveness gap relative to average earnings that has opened up since 2010/11 is forecasted to lead to a dramatic impact on teacher supply, but at the very considerable cost of more than £4bn per year. A more gradual restoration of the competitiveness of teacher pay over four years is forecasted to have less impact, but also cost less in the short term. Generally, more costly pay policy options are associated with greater teacher supply impacts.
- Further flattening of the main pay scale – with lower pay points increasing at higher rates than higher points on the pay scale – may be relatively cost effective because it targets resource at teachers who are more responsive to changes in pay. However, pay flattening also has implications for the incentives to progress and the balance of early career and more experienced teachers within the school system.
- Setting the pay of primary and secondary teachers separately and increasing secondary teacher pay by more than primary teacher pay may also be relatively cost effective, when comparing just the total costs and teacher supply impacts. This is because primary teacher supply is forecasted to be met under even quite modest pay increases due to the current supply level and lower demand for primary teachers in future due to falling pupil numbers. However, primary teachers are likely to regard such proposals as unfair and our analysis suggests that such a proposal would be forecasted to considerably increase the gender pay gap within the school sector.
- The end of the current funding for the ‘levelling up premium’ early career payment in 2024/25 gives an opportunity to redesign the policy. Our analysis suggests that there is a strong case for increasing the funding allocated to early career payments in the next spending review and that payments have higher cost effectiveness when targeted at early career teachers rather than all teachers. NFER analysis has shown that there is little difference between teacher supply challenges faced by schools in education investment areas compared to those that are not, while there are considerable differences by FSM quintile (Worth, 2022). The greater recruitment and retention challenges faced by schools serving disadvantaged communities would appear to be a compelling reason for targeting resource at retention in these schools, but the case for targeting EIAs seems weaker.

- Our analysis indicates that combinations of policy changes to pay, bursaries and early career payments can be powerful for developing an impactful but cost-effective long-term strategy that strikes an appropriate balance between being broad-based and targeted at areas of need. We consider the costs, impacts and implications of three packages – '**balanced**', '**bold**' and '**adventurous**' (see section 6 and Appendix B for detailed definitions) – that combine different approaches to pay and early carer payments, and with bursaries topped up to support under-recruiting subjects to reach their respective targets. The analysis suggests that all three scenarios represent high impact at a relatively modest cost. This is primarily driven by the power of bursaries, which should be treated with a degree of caution as the model implicitly assumes that additional teachers recruited due to bursaries are retained at the same rate as other trainees. As part of this research project with the Gatsby Foundation, we are currently undertaking additional analysis to provide robust evidence on whether this assumption holds.
- Comparing the '**balanced**' and '**bold**' packages, the '**bold**' package stands out as being less costly and more impactful. However, it also comes with considerable implications for the incentives to progress and the retention of experienced teachers as it is based on flattening the pay scale. The '**adventurous**' package appears to have the highest impact on teacher supply of all the scenarios considered in this report. However, the pay changes are based on splitting the pay scales for primary and secondary teachers, which has important implications in terms of fairness and increasing the gender pay gap. Therefore, policymakers considering these options would need to regard the wider implications of the options as sufficiently worth it to achieve a greater impact on teacher supply.

Conclusions

The evidence on teacher recruitment and retention makes a clear and compelling case for the need for a long-term strategy on teacher pay and financial incentives to address the currently intense teacher supply challenge. Such a strategy could effectively complement other strategies focussed on making teaching more attractive in non-financial ways, such as workload reduction, increased opportunities to work more flexibly and increased access to high-quality professional development.

The bare minimum of an effective strategy is that it goes beyond the status quo of teacher pay rising at or below the rate of pay growth in the wider economy and the set of financial incentive measures that are currently in place. An effective strategy is also likely to have:

- a combined and integrated approach that provides incentives for recruitment, retention and progression throughout the workforce
- a broad-based component that improves pay to recruit and retain teachers, while maintaining a pay structure that incentivises progression and retains experience
- subject/ phase-specific components, that address particularly acute challenges given the variation across phases and subjects
- targeted measures for schools serving disadvantaged areas, which tend to find teacher recruitment and retention more challenging.

There is no one right answer to the question of which package of pay and financial incentives is likely to be the most effective or the most cost effective. Many of the scenarios analysed in this report that appear to have relatively good cost effectiveness also have wider implications for other outcomes and factors that policymakers need to consider. Policymakers should therefore explore the options to find cost-effective approaches with the evidence in mind and also with regard to the different trade-offs and considerations required. In the next phase of this research project, we will be providing further evidence on the longer-term cost effectiveness of pay, bursaries and early career payments as policy tools for influencing teacher supply.

Finally, special and tailored consideration should be given to addressing the specific challenges in the most acutely affected subjects, such as physics and computing. Indeed, the physics teacher supply challenges are so deep that even within scenarios with ambitious pay and financial incentive packages they require long term policy focus and attention.

We recommend that:

1. The Government should develop and publish a long-term pay and financial incentives strategy that aims to improve the financial competitiveness of teaching over time. This could be as part of a wider strategy to also set out complementary actions aimed at improving the non-financial attractiveness of teaching to increase retention.
2. The Government should redesign the 'levelling up premium' early career payments by widening eligibility to all schools nationally and increasing payment generosity to enhance its impact, and targeting resource solely towards shortage subjects and schools serving disadvantaged communities.
3. The UK political parties should set out in their 2024 election manifestoes what teacher pay and financial incentive measures they intend to implement to address the teacher supply challenge.
4. As part of its future evidence to STRB, the DfE should commit to publishing the overall forecasted teacher supply impact of its pay and financial incentive proposals. Where an impact assessment suggests supply is unlikely to be met, the DfE should set out the financial and non-financial actions being taken to improve teacher supply, particularly in subjects not expected to reach their respective targets.

1 Introduction

1.1 Policy background

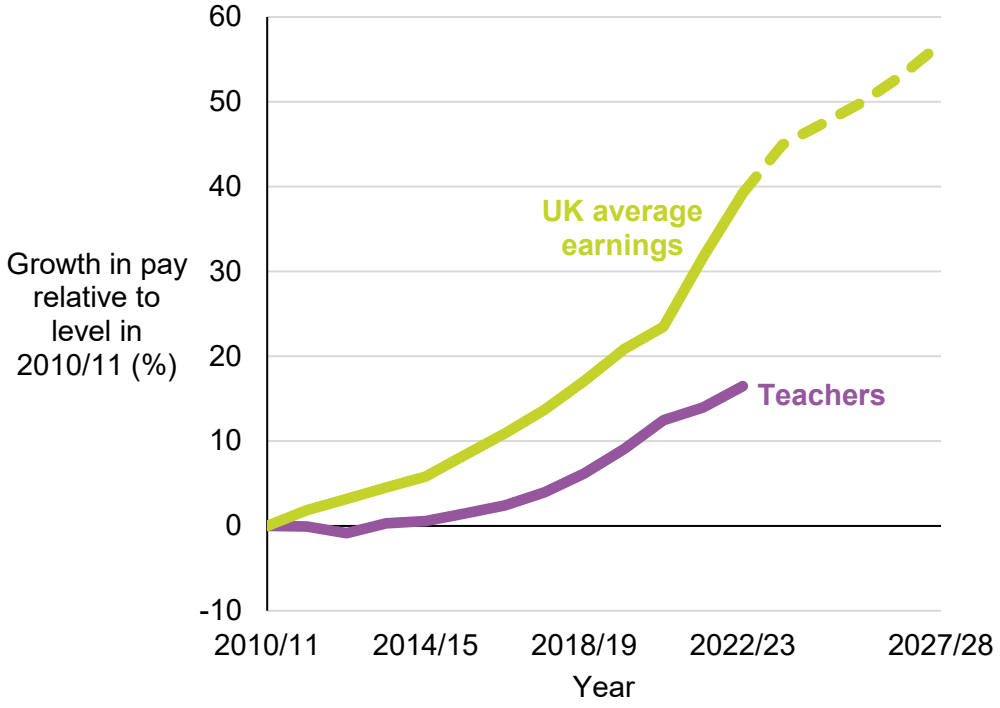
England has been facing a significant teacher supply challenge, particularly in the years following the Covid-19 pandemic (McLean, Worth and Faulkner-Ellis, 2023b). The number of teachers recruited to postgraduate initial teacher training (ITT) has been lower than before the pandemic despite increased demand for teachers, and retention rates in 2022 returned to pre-pandemic levels after two years of being higher due to the pandemic.

The challenge has been particularly intense in secondary subjects, and undersupply has been particularly marked for physics, computing, maths and chemistry teachers. Further undersupply of the specialist teachers required for a high-quality science, technology, engineering and maths (STEM) education in schools in England is a significant risk to education quality. There has been chronic under-recruitment and higher-than-average leaving rates for maths and science for many years, primarily due to STEM graduates having relatively attractive career options outside of teaching, compared to teachers of other subjects (Migration Advisory Committee, 2017; Worth and Van den Brande, 2019) .

For example, in the 2020/21 academic year, during the pandemic, the number of initial teacher training (ITT) enrolments as a percentage of the respective target was 105 per cent for computing, 85 per cent for maths, 80 per cent for chemistry and 45 per cent for physics, which all represented increases on the previous year. Overall STEM teacher recruitment to ITT was 94 per cent in 2020/21, compared to 77 per cent in the previous year. However, NFER's May forecast for ITT recruitment in the 2023/24 academic year, based on ITT applications received so far up to April, indicates that recruitment is likely to be around 30 per cent for computing, 60 per cent for maths, 70 per cent for chemistry and 20 per cent for physics.

The deteriorating competitiveness of teacher pay in England is likely to be one significant factor affecting supply. As shown in Figure 1, since 2010/11 teacher pay in nominal terms has grown more slowly than average earnings in the wider economy. Average earnings have increased by 39 per cent from 2010/11 to 2022/23 compared to average teacher salaries which have increased by only 16 per cent over the same period. The research evidence suggests that this loss of competitiveness is likely to have had a negative impact on recruitment and retention (Dolton and van der Klaauw, 1999; Hansen *et al.*, 2004; DfE, 2020; Worth, Tang and Galvis, 2022a).

Figure 1: Teacher pay in England has grown more slowly than average earnings in the UK economy since 2010/11 and has therefore lost competitiveness



Source: NFER analysis of ONS and DfE School Workforce in England data.

However, teacher pay in England is not differentiated by phase or subject, so differences in the financial attractiveness of outside options matters greatly for the health of supply in these subjects. Subject-specific bursaries, with the highest levels for maths and science subjects, have provided some level of remedy to the supply challenges, but in recent years this has not been enough to ensure sufficient teacher supply. The evidence suggests that bursaries are effective at improving recruitment to ITT (Worth, Tang and Galvis, 2022a). However, there is little robust evidence on whether those additional recruits complete their training, enter state-funded sector schools and stay in the profession. The piloting of early career payments[1] for maths and physics teachers has shown promising evidence of being effective at increasing teacher retention in specific targeted STEM subjects (Sims and Benhenda, 2022).

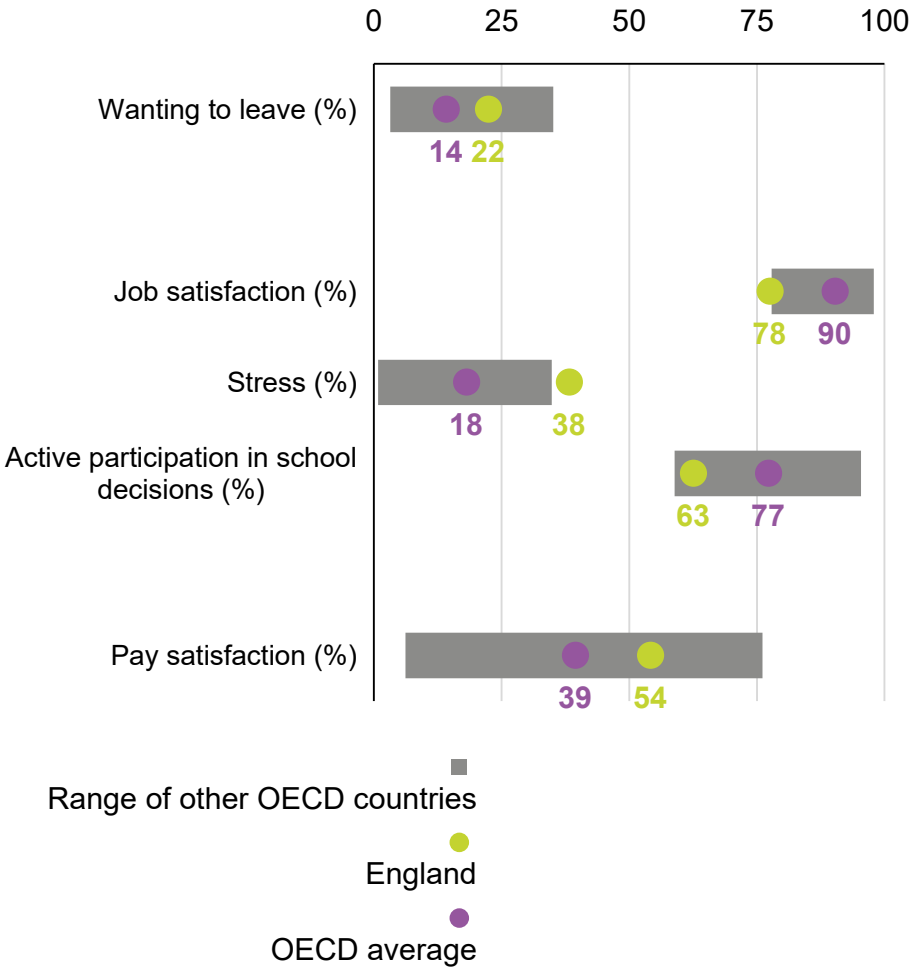
The intensifying teacher supply challenge, relative loss of competitiveness in teacher pay over the last decade and the research evidence showing that pay and financial incentives can be effective at improving recruitment and retention, means there is a strong case for the Government developing a long-term strategy to increase pay and incentives, and improve recruitment and retention.

[1] Early career payments are payments made to teachers of eligible shortage subjects teaching in state-sector schools in the first five years of their teaching career. For more information see: https://www.gov.uk/guidance/early-career-payments-guidance-for-teachers-and-schools

However, non-financial factors are also important for determining the relative attractiveness of teaching and therefore influencing prospective teachers' decisions about whether to enter and existing teachers' decisions about whether to leave. For example, high workload is an often-cited reason for why teachers leave the profession (DfE, 2017; Adams *et al.*, 2023). Reducing workload has been an explicit policy objective for the Government since the 2014 Workload Challenge (DfE, 2015).

Indeed, the international comparison evidence on England's teacher workforce, summarised in Figure 2 below, suggests that it is lower job satisfaction and autonomy and higher stress compared to the OECD average that are the key issues explaining a relatively high proportion expressing a desire to leave teaching. In contrast, teachers in England express a relatively high satisfaction with their level of pay compared to other OECD countries and the OECD average.

Figure 2: England's teachers stand out internationally in terms of low retention, job satisfaction and autonomy, and high stress, but have relatively high pay satisfaction



Source: NFER analysis of OECD TALIS 2018 data.

While this could be seen as counter-evidence to the need for a long-term strategy of improving the competitiveness of teachers' pay, and evidence in favour of a strategy focusing on improving workload and working conditions, the overall picture is more complex.

Firstly, the two are not mutually exclusive. A recent literature review found that both financial incentives and strategies to improve working conditions and reduce workload play a role in improving teacher supply (EEF, 2023). The averages presented in Figure 2 mask a range of contexts such as school phase, subject, level of disadvantage of pupil group and geographical location. Findings from TALIS[2] suggest that teachers working in more disadvantaged schools have higher levels of work-related stress (OECD, 2020) and in England at least these schools are more likely to struggle to fill teacher vacancies and are considerably less likely to have subject-specialist teachers in shortage subjects (Sibieta, 2020). Since the research evidence suggests that both financial and non-financial factors matter for teacher recruitment and retention, a combination of both could have complementary impacts on improve the attractiveness of the profession. Indeed, the data above was collected in 2018 and there have been some modest improvements in teacher workload in England since then according to some measures (Adams *et al.*, 2023; McLean, Worth and Faulkner-Ellis, 2023b).

Secondly, improving working conditions is challenging, complex and may take considerable time. International evidence from TALIS suggests that the two most important elements of working conditions for improved retention are discipline and leadership/management – a measure of culture, autonomy and support – both areas at some distance from direct government influence (Sims and Jerrim, 2020). In contrast, the levers for improving pay and financial incentives are readily available to policymakers and are likely to have short-term impacts for addressing the current challenge (as well as long-term impacts if they are sustained). Pay and financial incentives are therefore appealing levers to use when the challenges need addressing quickly.

Further, the actions necessary for reducing teacher workload and stress in a transformational way may involve other trade-offs that are unattractive to policymakers. For example, significant changes to the high-stakes system of school inspection and accountability in England could potentially lead to reductions in teacher workload, but also have negative implications for other outcomes valued by policymakers (such as school standards, or the desires of parents).

In sum, despite compelling evidence that factors affecting the non-financial attractiveness of teaching need addressing to improve recruitment and retention, there also remains a strong case for the Government to develop a long-term strategy on teacher pay and financial incentives.

1.2 Aims of this research

The key overall questions for policymakers considering how to address the teacher supply challenge are: what is the best balance of financial and non-financial levers for improving recruitment and retention, and if so which measures are likely to be most effective/ cost effective?

The analysis in this report focuses on a slightly different framing of these questions: what impact on recruitment and retention could different combinations of pay and financial incentive policies

[2] TALIS is the Teaching and Learning International Survey lead by the OECD periodically (see: https://www.oecd.org/education/talis/talisfaq/).

achieve, and how much would they cost? Answering these questions is important for informing a wider consideration of the role of different policy measures for addressing the attractiveness of teaching within an overall strategy.

The Government has an upcoming opportunity to put forward a long-term strategy on teacher pay and financial incentives at the next Government spending review, covering departmental expenditure from 2025/26 onwards. Crucially, the spending review process allows Government to consider what level of funding is required to deliver that strategy, whether directly as departmental expenditure or indirectly through funding for the core schools budget.

Further, political parties have an opportunity to put forward a long-term strategy on teacher pay and financial incentives in their manifestoes for the next general election, which will take place in 2024. The manifesto pledges and commitments will inform the spending review, as the Government formed after that election will be the one to both conduct the spending review and set policy. It is therefore crucial that political parties gain a good understanding of the policy options available and consider their effectiveness, costs and other features to inform their plans.

This research aims to inform policymakers' thinking by providing detailed analysis of a range of teacher pay and financial incentive policy options, with consideration of their likely impacts on recruitment and retention, Exchequer costs and other implications.

Section 2 describes the methodology we use to estimate the impacts and costs, with a more detailed description provided in Appendix A. Section 3 provides commentary of the likely short-term impacts of the 2023/24 teacher pay award, while section 4 assesses the likely impacts and costs of a range of longer-term pay policy options and scenarios. Section 5 assesses the likely impacts of non-pay financial incentives such as early-career payments and bursaries and section 6 considers the combined impact of packages of pay and incentive measures. An overview of the different scenarios is provided in Appendix B. Section 7 concludes and makes some recommendations for policymakers.

2 Methodology

The analysis in this report is derived from a forecast and simulation model developed by NFER to assess the overall costs and teacher supply impacts of different pay and financial incentive options. The model is based on the most recent data on the recruitment of teachers to postgraduate ITT and associated targets, the salary structure of the teaching workforce and the numbers of teachers at each pay point and their respective rates of leaving the state-funded sector. The model also uses currently available policy information on bursaries and teacher retention payments. To account for the expected evolution of the wider economic environment, the model uses the most recent economic forecasts produced by the Office for Budget Responsibility (OBR), which for this report is the March 2023 forecast (Office of Budget Responsibility, 2023).

The model incorporates the above input information as well as policy scenarios defined by the model user. These inputs are combined with parameters – estimates of how responsive teacher recruitment and retention behaviour is to changes in various key factors, derived from the research literature – to calculate forecasts. The model makes four sets of calculations, as follows:

Recruitment: ITT recruitment is baselined on the number of trainees expected to start ITT courses in 2023/24, predicted using the latest data on ITT applications up to May 2023 and a combination of historic ITT enrolment and applications data. The model makes a forecast, based on the evidence-based assumption that recruitment rises with increases in the unemployment rate, rises with increases in the subject's bursary, and rises with increases in average pay on the main teacher pay scale relative to the change in average earnings (Worth, Tang and Galvis, 2022a)

Retention: Teacher leaving rates are baselined on rates of leaving the state-sector in 2018/19, the most recent available data unaffected by the pandemic, so that the model does not use the atypical retention rates seen during the Covid-19 pandemic in 2019/20 and 2020/21 as a baseline. Using a similar approach to that outlined in modelling carried out by (DfE, 2020) the model assumes that the leaving rate falls in proportion to increases in teacher pay relative to the change in average earnings. Based on (Sims and Benhenda, 2022) and (DfE, 2022), the model assumes that teachers on the first five points of the main pay scale are more responsive to pay changes than more experienced teachers. Early career payments are assumed to affect retention in the same way as pay and are included additively along with pay.

Costs: The model uses teacher salary data from the School Workforce Census in 2021/22 to calculate the total salary cost. Salaries at each pay point are uprated with the increases assumed by the policy scenario under consideration in the model. The model calculates the aggregate costs using the number of teachers at those pay points in the 2021/22 academic year. The model also includes estimates of employer national insurance and pension contributions to provide a realistic assessment of the total cost of policy changes to the Exchequer. Separately, the model also calculates the aggregate cost of bursaries and early-career payments.

Targets: the model uses the methodology set out in the DfE's 'Calculation of 2023 to 2024 PGITT targets' spreadsheet, taken from the DfE's Teacher Workforce Model, to calculate targets. The targets for the 2023/24 academic year are taken as published by DfE. The model uses the DfE methodology to make further forecasts of targets in future years, accounting for changes in pupil numbers (which affect teacher demand), future retention rates (derived from the Retention

calculations mentioned above, which affect teacher demand) and future ITT recruitment (derived from the Recruitment calculations mentioned above, which affect teacher supply). Minor adjustments have been made to the methodology, which is designed to calculate short-term targets, to be more appropriate for forecasting long-term targets.

The key teacher supply output from the model is forecasted ITT recruitment for each subject relative to its respective forecasted target. We refer to impacts on 'teacher supply' throughout the report, by which we mean recruitment to postgraduate ITT as a proportion of the ITT target. We refer to this as 'supply' rather than 'recruitment' because the measure can be influenced through the scenarios by changes to both recruitment and retention. Outputs on salaries, costs, teacher retention rates and the gender pay gap are also calculated.

2.1 Limitations

It is important to note the limitations of this forecasting model. Models are simplified representations of what happens in the real world, which allow policymakers to better understand policy options and make policy decisions based on assessments of the likely cost and impact of policy choices (HM Treasury, 2015).

A key limitation is that the model only assesses the impact of financial policy changes, and implicitly assumes that all other factors that may affect teacher recruitment and retention are not changing over time. The model does not forecast or account for the impacts of other changes or policies, for example, changes in teacher workload and flexible working opportunities over time, or the impacts of policies such as the ITT market reforms and Early Career Framework. This is by design, seeing as the impacts of these factors would be very challenging to predict the impact of.

This simplifying assumption does not substantially affect the interpretation of comparisons between scenarios, e.g. comparing between a particular scenario and the baseline scenario, since future changes are likely to affect both states-of-the-world considered by each scenario fairly similarly. These comparisons reveal an assessment of the relative impact of different policies. However, caution should be used in interpreting the predictions of each scenario in absolute terms, since other factors may also change over time and have an impact on teacher recruitment and retention.

Relatedly, there is also uncertainty inherent in the forecasts. While the parameters we use to assess the likely impact of different policies on teacher recruitment and retention are supported by the evidence, they do not give a precise and mechanistic guide to what will happen. Indeed, we have tested the levels of uncertainty associated with ITT recruitment forecasts using the same assumptions in our model and historic data. The results of this analysis, which is a ‘margin of error’ calculated using conventionally-used 95 per cent confidence intervals, suggest that the rules of thumb shown in Table 1 should be used in interpreting any differences in absolute forecast predictions.

The margins of error imply that if the model forecasts that a subject will be at 70 per cent of its target in 2024/25 under a particular scenario then, while the exact proportion in 2024/25 may be higher or lower, it is likely that the subject will be below its target. Conversely, if the model forecasts that a subject will be at 150 per cent of its target in 2024/25 under a particular scenario then, while the exact proportion in 2024/25 may be higher or lower, it is likely that the subject will be above its target. If the model forecasts that a subject will be at, for example, 90 per cent of its

target then there is a reasonable chance that the subject could be below its target, at target or above target. However, a forecast that the subject will be at 90 per cent does suggest that it is more likely to be below target than it is to be above target (and vice versa if the subject was forecast to be above target but within the margin of error, for example at 110 per cent of target). Appendix C presents the impacts of different subjects under all the scenarios in the report. In the appendix, the impacts are colour-coded using the rules of thumb in Table 1 to reflect the level of uncertainty in interpretation.

Table 1.1. Table 1 Rules of thumb for interpreting ITT recruitment forecasts compared to target with appropriate levels of forecast uncertainty

Interpretation	Range of teacher supply estimates for each forecast year			
	2024/25	2025/26	2026/27	2027/28
Likely to be below target (%)	0-78	0-74	0-70	0-70
Reasonable chance of being below, at or above target (%)	78-136	74-154	70-170	70-174
Likely to be above target (%)	136 & above	154 & above	170 & above	174 & above

Finally, while we include the salary costs of teachers in special schools in our model, we present teacher supply outcomes using the DfE reporting categories of primary plus 18 secondary subjects, which does not include a specific special school category. There are no ITT courses for specialist routes and therefore no target. Whether the specialist sector has adequate teacher supply is an important question, but one that is beyond the scope of this analysis to address.

3 Impact of the 2023/24 pay award

3.1 Background to the 2023/24 pay award

At the time of writing this report, the Government was considering the teacher pay award to make for the 2023/24 academic year, having received the recommendations from the independent pay review body, the School Teachers' Review Body (STRB). Meanwhile, teaching unions remain in dispute with the Government about the teacher pay award for the 2022/23 academic year, with members of the National Education Union having taken strike action throughout the year and other unions balloting their members on taking strike action in the next academic year.

The Department for Education (DfE) submitted evidence to the STRB that proposed that teachers' starting salaries outside of London should rise by 7.1 per cent to achieve a starting salary of £30,000. It also proposed that the pay of experienced teachers (on the M6 pay point, upper pay scale and leadership range) should rise by three per cent.

Following intensive talks with teaching unions in March 2023 in relation to the dispute over the previous year's pay, the DfE offered a pay award of 4.3 per cent for experienced teachers in 2023/24, with an increase in the starting salary outside London remaining at 7.1 per cent. This was offered alongside a one-off £1,000 payment to all teachers. However, members of each of the respective unions rejected this offer.

At the time of writing, the exact recommendations made by the STRB to the Government are not publicly known. However, the Times newspaper reported in May 2023 that the STRB had recommended an average 6.5 per cent rise in pay for teachers (Yorke, Lintern and Griffiths, 2023). There has been no confirmation by the Government or the STRB of whether this report is true. Further, there was no detail in the newspaper report of what pay increases the STRB recommended at different points in the teacher pay scale. However, we can assume that the STRB is likely to have recommended that starting salaries outside of London should rise by at least 7.1 per cent.

In this section we consider the relative costs of these different pay scenarios for the Exchequer in 2023/24 and assess the impacts of the scenarios on teacher supply in 2024/25 and beyond.

3.2 Impact of scenarios

This section presents estimated forecasts for three scenarios for the 2023/34 teacher pay award. Scenario 1 forecasts the impact of the pay increases put forward by the DfE in its evidence to the STRB in February 2023 (DfE, 2023c). Scenario 2 is the most recent pay offer made to teachers in March 2023 (Education Hub, 2023), although does not forecast the impact of the unconsolidated £1,000 payment offered. Scenario 3 uses an assumption of what the pay increases recommended by STRB, based on newspaper reports (Henshaw, 2023).

We report the forecasted cost and impacts on teacher supply of each scenario. Section 4 considers a range of pay and financial incentive policy options for years beyond 2023/24. The focus of this report is on the teacher supply impacts on physics, all sciences, mathematics and computing teachers because these subjects have presented persistent challenges in achieving adequate teacher supply.

Scenario 1 (DfE evidence to STRB – Feb 23)

As part of the usual annual pay review process, DfE published its evidence to the STRB in February 2023. The proposals were for an increase of 7.1 per cent for M1 (the lower end of the main pay scale) on 2022/23 levels. This increase follows an 8.9 per cent increase in 2022/23 and reaches the Government's 2019 election manifesto ambition for a £30,000 starting salary for teachers (DfE, 2023c), albeit a year later than initially planned due to the pandemic. The published proposals recommend the top end of the main scale (M6) – as well as other pay scales (upper pay scale, leadership scale and unqualified teachers) – increases by 3 per cent in 2023/24. Pay points in between M1 and M6 increase at rates between 8.9 per cent and 3 per cent, with lower pay points increasing at higher rates. This is consistent with the recommendation made by STRB for pay in 2023/24 in its 2022 report (Roberts, 2022; DfE, 2023c).

From 2024/25 onwards we assume a 2 per cent annual increase across all pay scales, similar to the increase in average earnings projected by the OBR. Existing policy on bursaries, levelling up premium payments and early-career payments are kept at current levels (DfE, 2023, no date; DfE, 2023a).

Scenario 2 (DfE pay offer – Mar 23)

Following intensive talks between teaching unions and Government, the Government offered a revised pay offer of an additional one-off payment of £1000 for all teachers paid in the academic year 2022/23, as well as an increase in the pay proposals for 2023/24 (Education Hub, 2023). The 2023/24 pay offer constituted an average increase in pay of 4.5 per cent in 2023/24. Under scenario 2 the lowest pay point on the main pay scale (M1) mirrors the increase in scenario 1 of 7.1 percent. The higher pay point on the main pay scale (M6) is increased to 4.3 per cent, with pay points in between increasing proportionally. All other pay scales attract a 4.3 per cent pay increase across all pay points. The £1000 non-consolidated payment proposed as part of the offer has not been included in the model. This is because it is a one-off payment to be made during the 2022/23 academic year and the timing of it and therefore its impact on recruitment and retention would have been uncertain and difficult to forecast the impact of accurately within the model.

Scenario 3 (Reports of STRB – Jun 23)

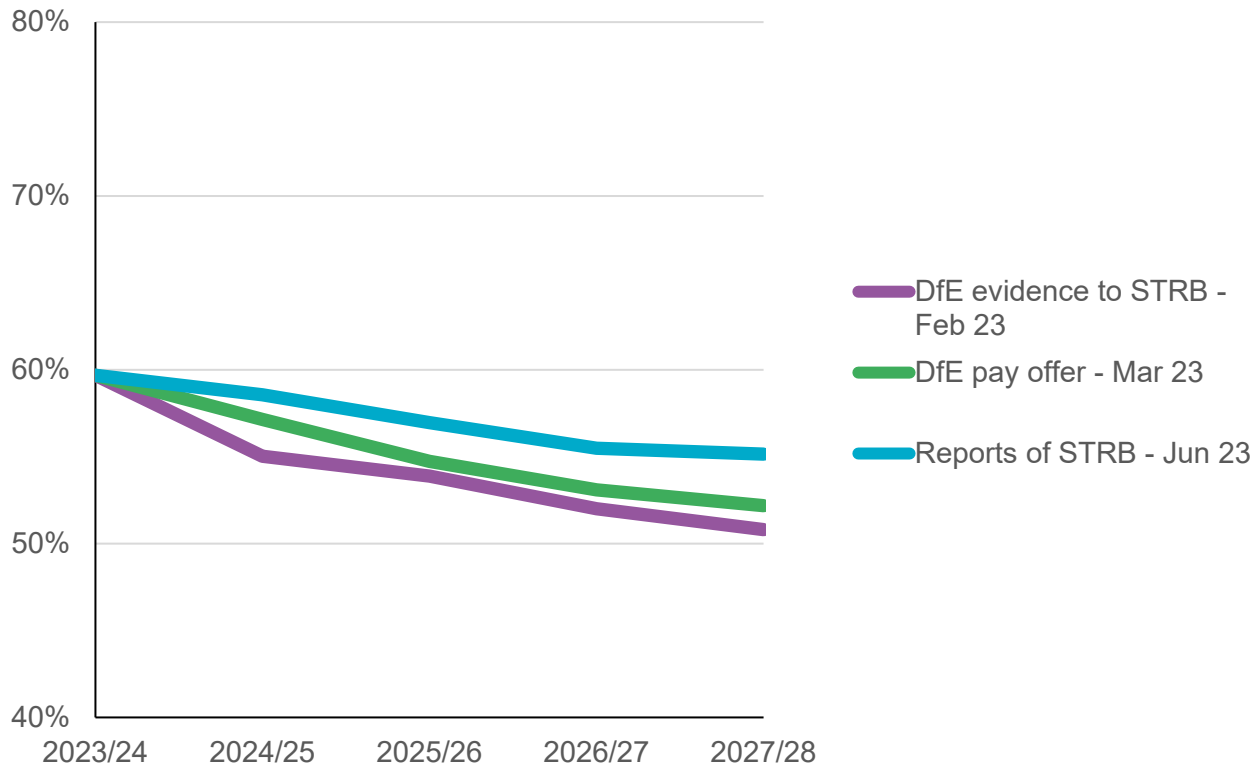
Teachers rejected the Government's pay offer outlined in scenario 2 and continued with strike action across England over the summer term 2023 (Education Hub, 2023). The STRB reported its recommendations to Government for the 2023/24 pay award in May 2023. Leaked newspaper reports published in May 2023 suggested that the STRB recommended a 6.5 per cent increase in pay for 2023/24 (Henshaw, 2023). This is the basis for scenario 3 and establishes the baseline used in all following scenarios in section 4. In the model the average increase in pay of 6.5 per cent has been modelled as a 2 per cent uplift across all pay points in scenario 2. This results in a 9.1 per cent increase for M1 and a 6.3 per cent increase for M6 and all other pay scales.

Comparison of 2023/24 pay award scenarios

Figure 3 compares the impact of the three scenarios modelling different outcomes of the 2023/24 pay award. The impact measure used is the predicted recruitment as a percentage of the recruitment target for individual subjects (or phase when considering primary). The 'capped measure of overall supply' provides a measure of ITT recruitment against target for all subjects, but

does not allow over-recruitment (i.e. greater than 100 per cent) in some subjects to be counted against under-recruitment (i.e. less than 100 per cent) in other subjects. The capped measure of overall recruitment has a maximum value of 100 per cent, which would represent every subject meeting or exceeding its target.

Figure 3: Impact of scenarios on capped measure of overall supply

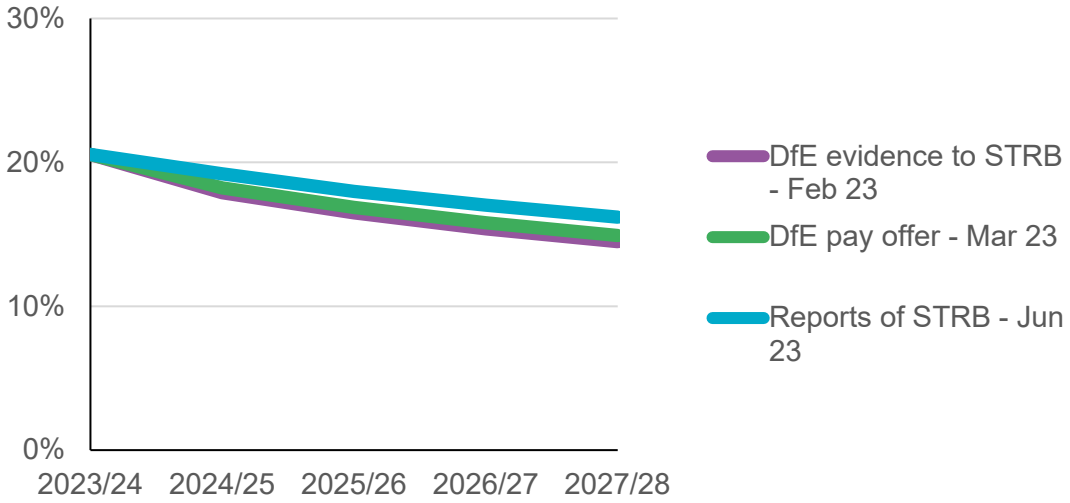


The model forecasts a fall in overall teacher supply from 2023/24 for all scenarios. This is primarily driven by ITT targets in some subjects increasing over time, due to the adjustments for under-recruitment that are a part of the DfE's new methodology for calculating the targets. For example, the physics target has risen from 2,530 in 2021/22 to 2,820 in 2023/24, and under scenario 3 keeps rising to 3,180 in 2024/25 and 3,715 by 2027/28.

Unsurprisingly the pay offer with the largest increases in pay (scenario 3) shows the smallest fall in teacher supply over time. The estimated cost of scenario 3 is around £800 million more than for scenario 1 (DfE's original recommendations in evidence to STRB) in 2023/24.

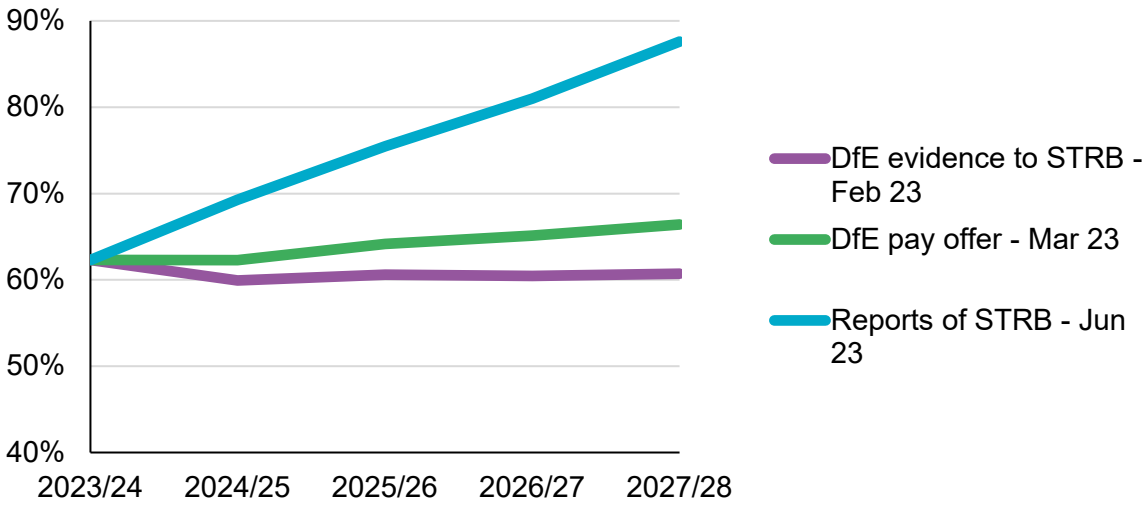
There is a similar downward supply trajectory for the model's physics forecast under all three scenarios, shown in Figure 4, for the reason outlined above that the target keeps rising due to compounding under-recruitment. Again, it is scenario 3 that shows the highest physics teacher supply figures out of the three scenarios. Similarly, supply for computing and all three sciences combined falls slightly over time due to the under-recruitment adjustment in the target calculations, but are each highest in scenario 3 compared to the others.

Figure 4: Impact of scenarios on physics teacher supply



However, the downward supply trajectory is not the case for all subjects. Figure 5 shows mathematics teacher supply improves slightly under scenario 2 and sees even more improvement under scenario 3. Under scenario 3 by 2027/28, 88 per cent of the required number of mathematics trainees are forecasted to be recruited, compared to 61 per cent under scenario 1. As Figures 4 and 5 show, mathematics appears more responsive than other subjects under scenario 3. This is in part due to its relatively higher teacher supply starting position, as well as the payments from the previous maths phased bursary policy (substantial payments of between £5,000 and £7,500 for the entire 2018/19 ITT cohort in their third and fifth year of teaching) feeding through in all scenarios to increase retention and thereby reduce the targets.

Figure 5: Impact of scenarios on mathematics teacher supply



It is important to note that the primary supply forecast under scenario 3 is that it exceeds its target in each year 2024/25 to 2027/28 by around 20 per cent. This is due in part to higher recruitment and retention due to pay increasing faster than average earnings in 2023/24, but also assisted considerably by falls in pupil numbers over time. Fewer pupils in future means fewer teachers are likely to be required, reducing the target for new trainees needed to come into the system.

Several secondary subjects are also forecasted to meet or exceed their targets under scenario 3, such as history, PE, classics and biology. This is primarily due to a healthy starting position with teacher supply that is sustained through pay at least keeping pace with average earnings. Subject-level forecasts for each scenario are in Appendix C.

3.3 Conclusions

In the context of an intense teacher recruitment and retention challenge, an STRB recommendation of 6.5 per cent in 2023/24 (if the newspaper reports are correct) would be a welcome first step for addressing the lost competitiveness in teachers' pay over the last decade. Our forecast analysis suggests that it is likely to have a more positive impact on supply compared to other proposals put forward by the DfE earlier this year. It is crucial for the Government to ensure that schools have the funds to pay for the pay increase awarded.

However, over the longer-term the analysis shows that even a pay award of 6.5 per cent is unlikely to make a highly significant difference to the overall supply picture on its own. Pay awards in 2024/25 and beyond that merely match the anticipated growth in average earnings in the wider labour market are unlikely to significantly address the pressing recruitment and retention challenges. There therefore remains a need for a wider strategy for improving recruitment and retention that is based on a long-term plan to continue to improve the competitiveness of teacher pay and/or financial incentives, action to improve the non-financial attractiveness of teaching, or a combination of both.

The next sections analyse some policy options for such a long-term strategy on teacher pay and financial incentives.

4 Longer-term pay policy options

4.1 Background to pay awards in 2024/25 and beyond

Beyond the 2023/24 pay award decision, the Government has several opportunities to make policy changes to teachers' pay and financial incentives over the coming year. In October, the DfE will set bursary rates for each subject for the ITT recruitment cohort that will commence courses in September 2024. The Department will also set the STRB's remit for making recommendations on teacher pay for the 2024/25 academic year, thereby beginning the annual pay review process.

The Government will have further opportunities to consider what pay awards could be made to teachers in years beyond 2024 and what bursary amounts may be offered. Crucially, the Government will have the opportunity to consider the DfE's departmental funding settlement in a Government spending review, which is likely to cover the period 2025/26-2027/28, and thereby allocate the resources needed to fund the expected teacher pay awards and financial incentives.

The spending review is also an opportunity to review the levelling up premium, a payment made to teachers in their first five years' teaching in priority areas and disadvantaged schools. The current policy runs to 2024/25 and could be revised as part of the spending review.

More widely, the spending review priorities are likely to be influenced by the election manifesto of, and policy decisions made by, the political party that wins the next general election, which is very likely to be held in 2024. Therefore, the assessment of the policy options we offer here are likely to be of interest to all political parties and not just the current Government.

This section assesses the costs, impacts on teacher supply and wider implications of a range of teacher pay policy options that could be enacted between 2024/25 and 2027/28. The choice to include an assessment of policy changes made in 2024/25, even though opposition political parties would be highly unlikely to be able to enact or influence them, is a pragmatic one. First, it is important to consider actions that can be taken quickly, given the scale of the teacher supply challenge, and these options are available to the Government to enact next year. However, the changes would likely require funding from the Treasury in addition to the departmental funding made available in the 2022 autumn statement. Second, the spirit of the assessed policies could be enacted by policymakers in the post-election period from 2025/26 onwards, and the scale of the forecasted impacts would likely be similar, but realised a year later than presented here.

Section 5 assesses the costs and impacts of longer-term non-pay financial incentive policy options available to policymakers, while section 6 considers the overall costs and impacts of a range of policy packages that combine pay and financial incentive changes.

4.2 Impact of scenarios

In this section we model longer-term pay policy options beyond the 2023/24 award to set out the possible impacts and costs of a range of options. All five scenarios involve improving the competitiveness of teacher salaries relative to the average earnings growth across either part (scenario 8) or all of the pay scale, by increasing teacher pay at a higher rate than estimated average earnings growth to different extents and within different timeframes.

- Scenario 4 (**full correction**) considers what percentage increase in teacher pay in 2024/25 would be needed to immediately restore teacher earnings to the growth rate of average earnings since 2010/11.
- Scenario 5 (**gradual restoration**) achieves the same goal but at a slower rate, with incremental increases over a four-year period.
- Scenario 6 (**steady improvement**) improves teacher pay competitiveness but at a slower rate to scenario 5, making incremental progress to increasing teacher pay above average earnings growth.
- Scenario 7 (**more flattening**) includes an increase in the 'flattening' of the main pay scale structure by increasing the lower pay points at a faster rate than the higher pay points within the main pay scale, within the same total expenditure envelope set by scenario 6.
- Scenario 8 (**split pay scales**) explores the impact and implications of differentiating the primary and secondary pay scales, setting them on different growth trajectories.

Under all these scenarios the pay award predicted under scenario 3 for 2023/24 is modelled as it was considered a reasonable estimate of likely outcomes for the next academic year. Bursaries, early-career payments and levelling up premium payments also remain at their current level in all scenarios. A more detailed overview of the scenarios can be found in Appendix B.

We compare the teacher supply impacts and costs of all scenarios to the outcomes of a common baseline scenario, which is scenario 3 from the previous section.

4.2.1 Full pay correction/ Houghton report redux

The teaching unions have called for an increase in pay that addresses the reduction in competitiveness relative to the growth in outside earnings and/or inflation that has opened up since 2010. NEU have called for a "correction on teacher pay" (NEU, 2023). Other unions have also called for similar action and explicitly acknowledged that a longer time frame will be needed to implement it. For example, NASUWT have called for a "programme of pay restoration" (NASUWT, 2022) and NAHT have called for "pay restoration over the life of a parliament" (NAHT, 2023) (see section 4.2.2 for consideration of the costs and impacts of a gradual restoration proposal).

First, we explore a scenario in which the gap in competitiveness that has opened up between teacher pay and average earnings since 2010/11 is closed in one single pay award in 2024/25. Under scenario 4 (**full correction**) we model an increase in all pay points of 16.5 per cent in 2024/25, as this is the percentage increase required to restore parity in the growth rate of median teacher pay with the growth rate of average earnings, both relative to their levels in 2010/11. From 2025/26 onwards, the percentage pay increases we model return to two per cent per year to match subsequent expected growth in average earnings. This scenario may seem an extreme one to consider, but is similar to the approach taken by the incoming Labour Government after the 1974 general election (see Box 1), so is not without historical precedent.

Table 2 shows the dramatic impact on teacher supply the step-change increase in teacher pay in 2024/25 is forecasted to lead to. The model forecasts increases in the recruitment and retention of maths, computing and all sciences teachers, leading to these subjects each meeting their targets in 2027/28. More generally, the number of secondary subjects meeting their targets in 2027/28 rises from five out of 18 under the baseline scenario to 13 out of 18[3]. Further, primary teacher supply is forecasted to vastly exceed the target under this scenario.

However, boosting the competitiveness of teacher pay in this way comes with a large increase in expenditure. Scenario 4 is associated with an additional £4bn total cost compared to the baseline scenario in each year from 2024/25 to 2027/28. This represents a 15 per cent increase in the size of the teacher pay bill compared to the baseline scenario.

Table 2: Impact of scenario 4 on teacher supply

	2023/24	2024/25	2025/26	2026/27	2027/28
Mathematics	62%	120%	221%	222%	225%
percentage point change from baseline	0	+51	+146	+141	+137
Physics	21%	25%	30%	33%	37%
percentage point change from baseline	0	+6	+12	+16	+21
Computing	33%	42%	56%	76%	112%
percentage point change from baseline	0	+11	+27	+48	+86
All science	44%	65%	86%	93%	100%
percentage point change from baseline	0	+19	+40	+48	+57
Capped measure of overall secondary recruitment	46%	55%	57%	63%	67%
percentage point change from baseline	0	+8	+12	+19	+24
Total cost increase from baseline (£, m)	0	4,208	4,319	4,404	4,491

[3] Only physics, design and technology, music, business studies and other are forecasted to be below target.

Box 1: The 1974 Houghton Report

Inflation was in double digits due to an energy price shock, a UK general election was expected and teachers' pay had fallen compared to earnings in other jobs over the previous decade. There are parallels with 2024, but this was the situation fifty years before that in 1974.

The then Secretary of State for Education in the incoming Labour Government, Reg Prentice, set up an independent inquiry on teacher pay in June 1974, declaring that: "The Government are well aware of the depth of feeling among teachers that the relative position of their pay in recent years has suffered a particularly serious decline. Teachers and others in the education service are concerned that there should be adequate incentives to make the teaching profession attractive."

The inquiry was chaired by Lord Houghton, and the Committee's report was published in December 1974. The report noted that a shortfall in primary and secondary teacher pay of 17 per cent relative to an age-adjusted index of average earnings had opened up between 1965 and 1974. As a result, the Committee recommended extensive changes to the teacher salary structure and for substantial and immediate increases in pay of between 23 and 25 per cent.

Source: (Gillard, 2018)

4.2.2 Gradual pay restoration

In line with NASUWT and NAHT's suggestions of a restoration of the relative position of teacher pay compared to average earnings in 2010/11 but at a slower rate, scenario 5 (**gradual restoration**) increases teacher pay across all pay points at a rate of 5.5 per cent per year for four years from 2024/25 – 2027/28. By 2027/28 the growth rate in median teacher pay since 2010/11 'catches up' with the growth rate of average earnings since 2010/11.

Table 3 shows that the model forecasts improvements in teacher supply across all subjects relative to the baseline scenario. However, there are considerably lower increases in teacher supply forecasted for the subjects reported compared to the 'full restoration' shown in scenario 4, apart from mathematics. Of the STEM subjects, mathematics, biology and chemistry are forecasted to meet their targets by 2025/26 and supply across all three sciences to reach 81 per cent by 2027/28.

However, slower progress is made in physics with 28 per cent of the recruitment target forecasted to be met in 2027/28, up from 21 per cent in 2023/24. In total, the model forecasts that nine subjects are likely to meet their targets in 2027/28 under this scenario. As in scenario 4, primary teacher supply is forecasted to vastly exceed the target under this scenario.

Scenario 5 is associated with a considerably lower total cost in the short term than scenario 4, but is higher than the baseline scenario by around £1bn in 2024/25. The cost rises to more than £4bn by 2027/28, as in scenario 4.

Table 3: Impact of scenario 5 on teacher supply

	2023/24	2024/25	2025/26	2026/27	2027/28
Mathematics	62%	87%	138%	208%	223%
percentage point change from baseline	+0	+18	+63	+127	+135
Physics	21%	21%	22%	25%	28%
percentage point change from baseline	+0	+2	+4	+8	+12
Computing	33%	34%	38%	46%	58%
percentage point change from baseline	+0	+4	+10	+19	+31
All science	44%	52%	62%	73%	81%
percentage point change from baseline	+0	+7	+17	+29	+37
Capped measure of overall secondary recruitment	46%	51%	50%	50%	55%
percentage point change from baseline	+0	+4	+5	+6	+12
Total cost increase from baseline (£, m)	0	1,016	2,115	3,294	4,557

4.2.3 Steady improvement in relative pay

Under scenario 6 (**steady improvement**) we model the impact of a slower increase in teacher pay competitiveness than in the previous two scenarios. We forecast the impact of teacher salaries increasing by 1.5 percentage points more than the projected increase in average earnings growth in the period 2024/25 – 2027/28. For example, the OBR projects that average earnings in the wider economy will grow by 1.7 per cent in 2024/25, so under this scenario we assess the impact of teacher pay increasing by 3.2 per cent in 2024/25. This is a similar increase in competitiveness to the reported STRB recommendations for 2023/24, but we model the impact of sustaining that over the next four years.

Table 4 shows that the model forecasts improvements in teacher supply across all subjects relative to the baseline scenario, but the improvements are more modest than under scenario 5. For example, maths teacher supply rises over time, reaching its target from 2026/27, while teacher supply in computing and all sciences are forecasted to increase slightly over time but remain below target. Physics teacher supply under scenario 6 is stable, rather than falling under the baseline scenario.

Because of the more modest increases in pay over time, scenario 6 is associated with a lower total cost over time relative to scenarios 4 and 5. Scenario 6 is associated with an additional £350m relative to the baseline in 2024/25, rising to an additional £1.9bn relative to the baseline in 2027/28.

Table 4: Impact of scenario 6 on teacher supply

	2023/24	2024/25	2025/26	2026/27	2027/28
Mathematics	62%	75%	92%	124%	141%
percentage point change from baseline	+0	+5	+16	+43	+53
Physics	21%	20%	19%	20%	20%
percentage point change from baseline	+0	+1	+1	+3	+4
Computing	33%	32%	32%	33%	36%
percentage point change from baseline	+0	+1	+3	+6	+9
All science	44%	48%	51%	54%	58%
percentage point change from baseline	+0	+2	+5	+10	+14
Capped measure of overall secondary recruitment	46%	48%	48%	47%	46%
percentage point change from baseline	+0	+2	+3	+3	+3
Total cost increase from baseline (£, m)	0	348	717	1,228	1,896

4.2.4 Further pay scale flattening

Achieving a £30,000 starting salary for teachers was a key Conservative Party manifesto pledge at the 2019 general election (Conservative Party, 2019). In order to achieve this within the available affordability envelope, the DfE proposed that the main pay scale structure be 'flattened', with lower pay points increasing at higher rates than higher points on the pay scale for three consecutive years (DfE, 2020). A £30,000 starting salary is expected to be achieved in 2023/24, but there has been less flattening of the pay scale since 2019 than was originally envisaged. Scenario 7 (**more flattening**) models the impact of taking the idea of pay scale flattening further into future pay awards.

In this scenario we model the impact of increasing the starting salary by two percentage points more than M6 (and unqualified teachers, leadership scale teachers and upper pay scale teachers)[4], while keeping the total cost below that of scenario 6.

The Government's evidence to the STRB in 2020 presents the argument for their approach (DfE, 2020), highlighting research that showed starting salaries for teachers did not compare favourably with other graduate careers and that economic theory suggested graduates would put more value on short-term financial rewards versus longer-term benefits when considering career options. Other arguments presented include improving conversion rates from the end of ITT to starting teaching as well as attracting more career changers where financial barriers are often cited. The DfE also put forward tentative evidence that early career teachers would be more responsive to

[4] Main scale pay points between M1 and M2 will have proportional increases.

pay changes than more experienced teachers, therefore increasing the cost effectiveness of pay spending within a 'flattened' pay structure compared to a similar-cost uniform award.

Table 5 shows that the model forecasts improvements in teacher supply across all subjects relative to the baseline scenario, and also that forecasts of teacher supply in scenario 7 compare favourably to scenario 6. In contrast, the total costs of scenario 7 are slightly lower than those of scenario 6 in all years. This therefore suggests that scenario 7 may be more cost effective than scenario 6.

Table 5: Impact of scenario 7 on recruitment targets

	2023/24	2024/25	2025/26	2026/27	2027/28
Mathematics	62%	76%	97%	134%	158%
percentage point change from baseline	+0	+7	+22	+53	+70
Physics	21%	20%	20%	20%	22%
percentage point change from baseline	+0	+1	+2	+3	+5
Computing	33%	32%	33%	35%	39%
percentage point change from baseline	+0	+2	+4	+7	+13
All science	44%	48%	52%	57%	62%
percentage point change from baseline	+0	+3	+7	+13	+18
Capped measure of overall secondary recruitment	46%	49%	49%	47%	47%
percentage point change from baseline	+0	+2	+4	+4	+4
Total cost increase from baseline (£, m)	0	285	588	1,030	1,624

However, pay flattening has several other implications that are worth considering. One potential outcome of reducing the gradient between pay points could be a reduced incentive to progress. Progression to the next pay point in the main pay scale (where the gradient is reduced) happens each academic year subject to satisfactory performance and teachers may consider their likely salary progression in decisions about whether to move from the main pay scale to the upper pay scale or aspire to school leadership. Pay flattening would mean the ratio between starting salary and higher pay points would reduce, perhaps blunting the financial incentive to progress somewhat. However, there is little research evidence on the extent to which this is a significant factor in teachers' progression decisions.

Teacher retention rates improve (compared to baseline) across all groups of classroom teachers (early-career, main pay scale and upper pay scale) in scenarios 6 and 7, which act to reduce targets relative to the baseline scenario. However, flattening of the pay scale in scenario 7 improves retention rates for early career teachers and main pay scale teachers more than in scenario 6 (with no flattening), while retention rates are slightly lower for upper pay scale teachers

under scenario 7 compared to scenario 6. This implies that, compared to cost-neutral but uniform-increase alternative scenarios, pay flattening is associated with fewer experienced teachers being retained. This is an important implication to consider, given that experienced teachers tend to be more effective than inexperienced teachers (Podolsky, Kini and Darling-Hammond, 2019) and experienced teachers represent important in-school capacity for support and mentoring of early career colleagues.

4.2.5 Differential primary and secondary pay

In all of the previous scenarios, including the baseline scenario, the primary phase recruitment target is forecasted to be consistently met. This is partly due to the reduced numbers of teachers required in primary schools over the time frame in question due to falling pupil numbers (Julius, 2022). In terms of directing scarce resources more effectively, one option to consider would be to separate the primary and secondary pay scales. While in England teachers across phases have followed the same main pay scale, this is not the case in some other countries. In Germany for example, in 2020 secondary teachers had a 15 per cent higher starting salary compared to primary teachers[5] (see also Worth, Tang and Galvis, 2022).

Under scenario 8 (**split pay scales**), we model the impact of primary teacher pay rising by the same as the baseline scenario (2 per cent per year) but secondary teacher pay increases at the higher rate of 5.5 per cent per year from 2024/25 onwards (as in scenario 5). This results in secondary pay being, on average, 16 per cent higher than primary pay in 2027/28.

Table 6 shows the forecasted impact of setting these separate primary and secondary pay rates on teacher supply for different secondary subjects. As in the baseline scenario, primary teacher supply is forecasted to be met in all years from 2024/25 onwards. There are significant improvements in mathematics teacher supply under this scenario as the target is met the year after the policy is introduced. Improvements are made in all secondary subjects, with computing forecasted to reach 62 per cent of its target by 2027/28 and all science forecasted to reach 88 per cent. Progress is slower in physics, although increasing teacher supply means that by 2027/28 physics supply is 13 percentage points higher than under the baseline scenario.

The impacts shown for scenario 8 in the table are identical to those for scenario 5, because only secondary subjects are shown and the rate of pay increase for secondary teachers is identical. As mentioned above, the target for primary is also met. However, due to the differential pay increases for primary teachers, the total cost associated with the scenario is considerably lower. Scenario 5 is associated with a total additional cost relative to the baseline of around £1bn in 2024/25, rising to more than £4bn by 2027/28. In contrast, scenario 8 is associated with a total additional cost of around £500m in 2024/25 and rising to £2.4bn by 2027/28.

[5] Calculated with latest available data from OECD (https://stats.oecd.org/) and taking the average of lower secondary and upper secondary starting salaries as the secondary starting salary.

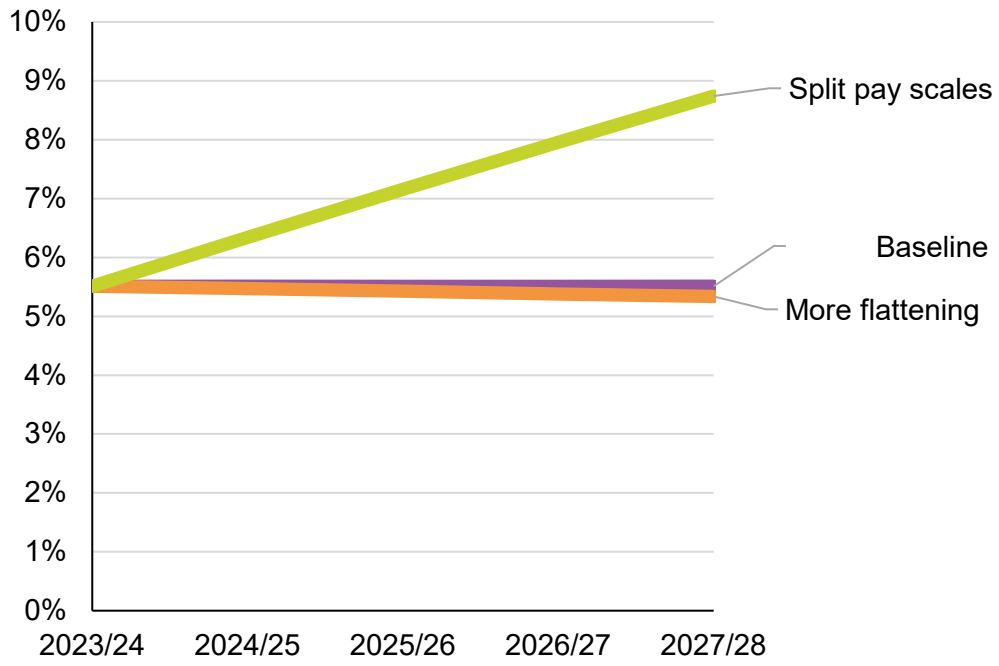
Table 6: Impact of scenario 8 on recruitment targets

	2023/24	2024/25	2025/26	2026/27	2027/28
Mathematics	62%	87%	138%	208%	292%
percentage point change from baseline	+0	+18	+63	+127	+204
Physics	21%	21%	22%	25%	29%
percentage point change from baseline	+0	+2	+4	+8	+13
Computing	33%	34%	38%	46%	62%
percentage point change from baseline	+0	+4	+10	+19	+36
All science	44%	52%	62%	73%	88%
percentage point change from baseline	+0	+7	+17	+29	+44
Capped measure of overall secondary recruitment	46%	51%	50%	50%	54%
percentage point change from baseline	+0	+4	+5	+6	+11
Total cost increase from baseline (£, m)	0	533	1,112	1,733	2,399

However, there are broader implications to consider when discussing the policy option of separating the primary and secondary pay scales. A key consideration is fairness: primary teachers would likely object to be being paid less than equivalent secondary teachers. Related to this is the question of quality. The model forecasts that the overall need for primary teachers is likely to be met but it makes no predictions on how the quality of the primary teachers entering teaching may change in response to changes in the relative pay between primary and secondary teachers.

Another salient factor is the impact of such a change on the gender pay gap within the school sector. The primary sector has a greater proportion of female teaching staff compared to the secondary sector and there is already a five per cent gap between the average base salary of men and women across the state-funded school system in 2021/22. Figure 6 shows the model's estimate of the gender pay gap over time for scenario 8, compared to the baseline (scenario 3) and scenario 7 (**more flattening**). The gender pay gap increases over time under scenario 8 due to lower pay increases in the predominantly-female primary sector, rising to around nine per cent in 2027/28. It is worth noting that there is no discernible change in the gender pay gap in our analysis when considered separately by phase. Furthermore, this analysis only captures the gender pay gap among teachers and is not comparable to statutory gender pay gap reporting, which includes all staff.

Figure 6: Gender pay gap across different scenarios



4.3 Comparisons across scenarios

In this section we compare the impacts and costs of each of the pay scenarios modelled in the previous section across the different scenarios and in the round. Appendix C provides details of impacts and costs for each scenario. Given that primary teacher supply is met in all scenarios, we measure the impact as the capped measure of secondary teacher supply (the percentage of the target estimated to be achieved). It is 'capped' because over-recruitment in one secondary subject cannot be used to supplement under-recruitment in another subject, and the overall measure therefore has a maximum of 100 per cent (i.e. all subjects meeting or exceeding their respective targets).

Figures 7 and 8 plot the cost and impact of each scenario for years 2025/26 and 2027/28 respectively. A somewhat similar picture is seen across both years, differing mainly as the costs increase in the later years for all scenarios other than the '**full correction**' scenario where the main cost increase is upfront due to the large increase in pay in 2025/26.

In general, scenarios associated with higher cost are generally more impactful on teacher supply. This is not necessarily surprising and illustrates the importance of teacher pay for improving recruitment and retention and addressing the teacher supply challenges.

However, there are comparisons that provide exceptions to this general rule, which are revealing in terms of potentially cost-effective ways to improve pay competitiveness and teacher supply. However, such examples also come with other important considerations and implications.

For example, the scenario that involves splitting the primary and secondary pay scales has a very similar impact to the '**gradual restoration**' scenario, but at considerably lower cost. However, splitting the primary and secondary pay scales also has important implications for fairness and its impact on the gender pay gap. Likewise, the '**more flattening**' scenario is forecasted to achieve more impact than the '**steady improvement**' scenario at a lower cost. However, pay flattening also has implications for the incentives to progress and the balance of early career and more experienced teachers within the school system.

Considering the overall forecasted impact in absolute terms, none of the scenarios achieve full teacher supply. However, this is disproportionately driven by a small number of subjects remaining considerably below target, even under the highest impact '**full correction**' scenario. For example, under the '**full correction**' scenario, physics, business studies and 'other' subjects remain at less than half of their respective targets in 2027/28, while almost all other subjects at least meet their targets. In that scenario, teacher supply across all three sciences is 100 per cent, meaning that while there may not be the ideal number of physics specialists in schools, there are enough teachers of science once biology and chemistry are considered alongside.

Therefore, policymakers considering the above scenarios and their respective advantages, disadvantages and trade-offs should also carefully consider their preferences over the overall priority goals to be achieved within the next spending review period, and consider how other actions and longer-term approaches could address further goals (for example, ensuring a sufficient supply of physics specialists). In the next two sections we present analysis of further policy options involving measures that are targeted at specific shortage subjects, and we offer further thoughts on these considerations in section 7.

Figure 7: Impact versus cost of different pay policy scenarios in 2025/26

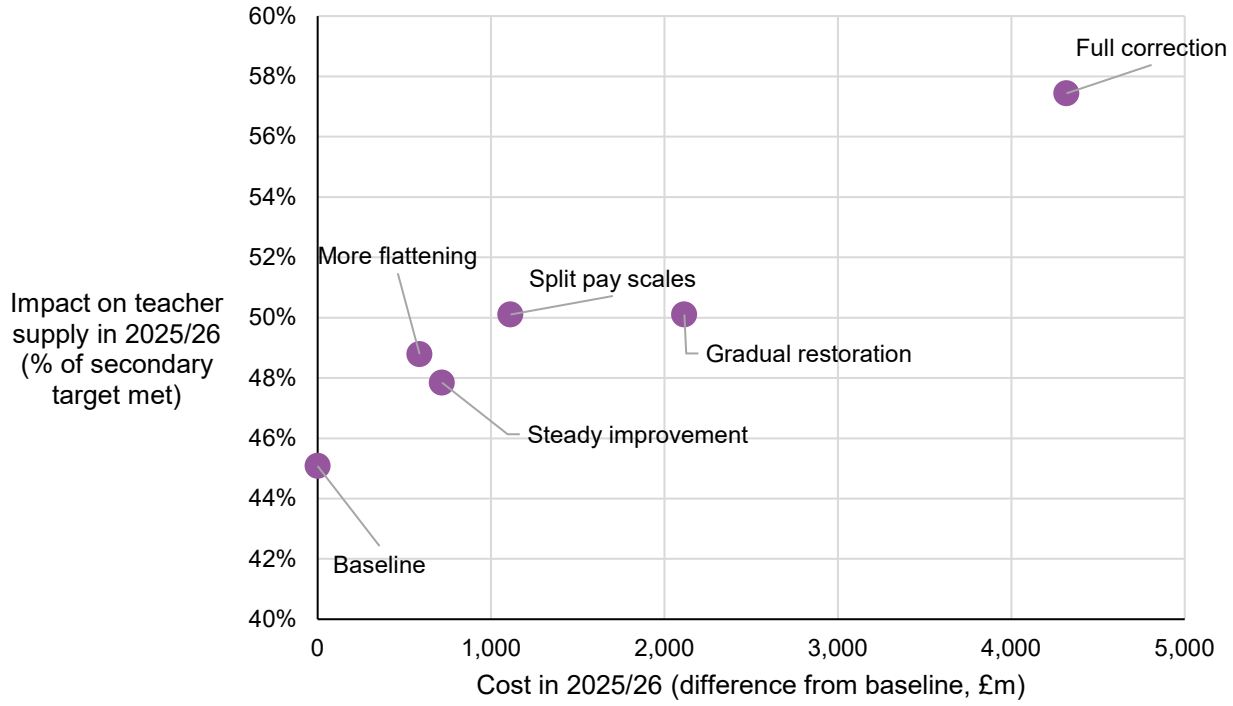
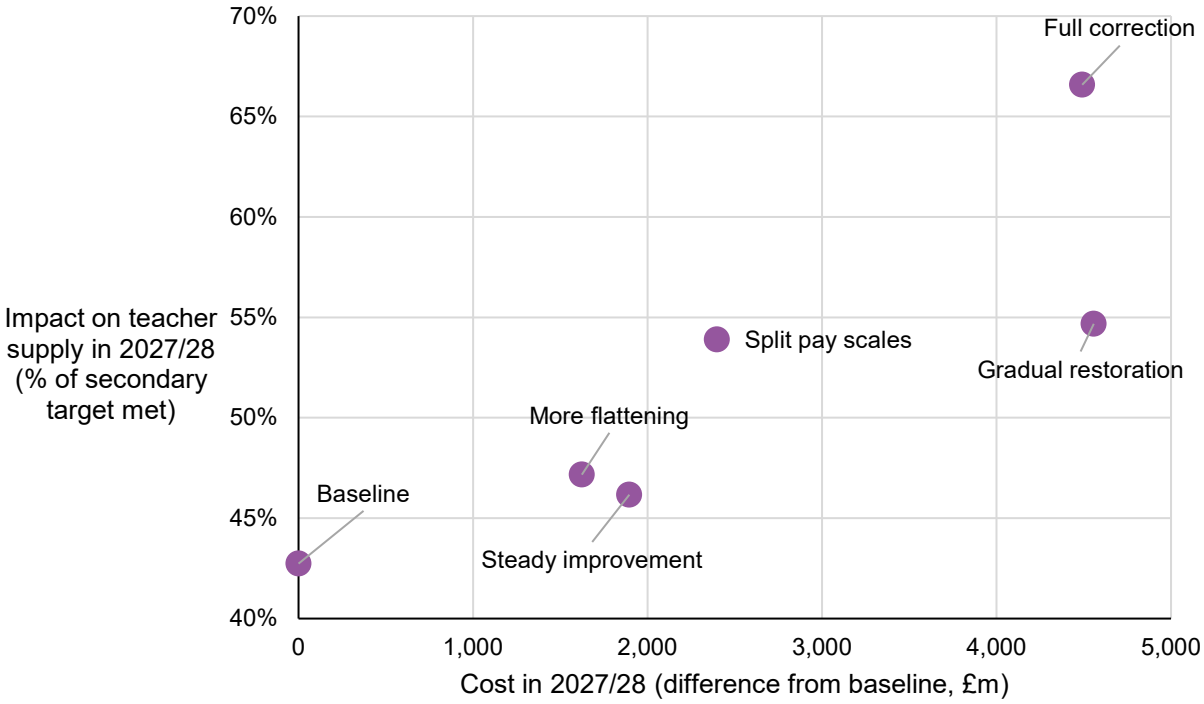


Figure 8: Impact versus cost of different pay policy scenarios in 2027/28



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5 Longer-term financial incentive options

5.1 Redesigning early career payments

In addition to pay, the research evidence shows that financial incentives such as early career payments can be effective in boosting teacher supply. These payments are additional payments paid to teachers of specific subjects during the first five years of their career directly by central Government to teachers. The system for early career payments has had various incarnations and designs, including the maths and physics retention payment and early career payment schemes.

At his 2021 party conference speech, Boris Johnson announced plans for a 'levelling up premium payment' for early career teachers (Dickens, 2021; DfE and The Rt Hon Nadhim Zahawi MP, 2022). These additional payments are for secondary teachers in the first five years of their career and who are teaching subjects where there have been historical challenges in supply, namely mathematics, physics, chemistry and computing. They also need to be teaching in an eligible school. A school is eligible if it is in the top half of the most deprived schools in England (as measured by the proportion of the pupil body who are eligible for pupil premium) or the school is in the top 70 per cent of deprivation levels and in an Education Investment Area (EIA) (DfE, 2023b). These pay premiums are an additional £1,500 to £3,000 per year for three of the first five years of a teacher's career, depending on the level of deprivation of the school and whether it is in an EIA .

Government funding for the levelling up premium runs to the 2024/25 academic year. Policymakers therefore have an opportunity to consider revising the policy design and allocating sufficient funding as part of the next spending review. We model the impact of four scenarios, showing the impact of a range of revised designs for early career payments from 2025/26 to 2027-28. Prior to 2025/26, the model includes the estimated impact of the current levelling up premium payment.

Under the first scenario (scenario 9), all early-career teachers teaching mathematics, physics, chemistry and computing are eligible for early-career payments. We model the impact of expanding eligibility to all schools and making the payment amount contingent on the FSM decile of the school they teach in, but not contingent on whether the school is in an EIA. Analysis using the NFER data dashboard[6] shows that there is little difference between teacher supply challenges faced by schools in EIA areas versus those that are not (Worth, 2022), while there are considerable differences by FSM quintile. In scenario 10, teachers teaching in schools in the top three deciles of FSM eligibility (schools serving more deprived catchment areas) would be eligible for £3,000 a year, those in schools in the fourth or fifth decile would be eligible for £2,500 a year and the remaining teachers would qualify for an annual payment of £2,000.

Scenario 10 builds on scenario 9 and opens up eligibility in terms of subjects. Any additional subjects that are below their respective targets in 2024/25 are eligible under this scenario. As a result, all subjects are added except for biology, history, classics and PE.

[6] https://www.nfer.ac.uk/teacher-recruitment-and-retention-in-england-data-dashboard/

We then explore in scenario 11 the impact of all classroom teachers of mathematics, physics, chemistry and computing receiving an additional payment, not just teachers in the first five years of their careers. The payment schedule is the same as described in scenario 10.

Finally, we explore in scenario 12 the impact of increasing the value of the payments. We follow the subject and school eligibility criteria laid out in scenario 10, with those teaching in schools in the top 30 per cent in terms of deprivation qualifying for a payment of £5,000 a year, those in schools with intakes in the fourth or fifth deciles in terms of FSM receiving £4,000 a year, and those in the remaining schools receiving £3,000 a year.

There are many other possible designs for this policy, which policymakers should consider carefully. Our model focuses on the overall impact of these policy designs on national supply, but the impact on teacher supply in different types of area and school should be considered alongside the total impact. In particular, as noted above, the greater recruitment and retention challenges faced by schools serving disadvantaged communities would appear to be a compelling reason for targeting resource at retention in these schools.

The results of the scenarios are presented in Table 7, showing the additional cost of each design compared to the baseline (scenario 3 – i.e. the current levelling up premium policy design) and the impact as measure by the overall capped measure of secondary recruitment. While the changes are relatively small in terms of impact compared to some of the scenarios in section 4, they also come at a considerably lower cost.

Table 7: Impact and cost of different designs of early-career payments

	Cost in 2027/28 (difference from baseline, £m)	Capped measure of secondary teacher supply, 2027/28	Impact on teacher supply in 2027/28 (difference from baseline, pp)
Scenario 3 (baseline)	0	43%	0
Scenario 9 (ECP: all schools with FSM uplift)	+32	43%	+1
Scenario 10 (ECP: more subjects)	+104	46%	+3
Scenario 11 (ECP: all teachers)	+165	44%	+1
Scenario 12 (ECP: more generous)	+71	44%	+1

There are three key general insights from this analysis on early career payment policy design.

First, as with the pay analysis presented in section 4, in general, more spending on these payments leads to greater overall impact on teacher supply. Given the context of an intense teacher supply challenge, there is a strong case for increasing the funding allocated to early career payments in the next spending review, as part of an overall pay and financial incentives package (see section 6 for a consideration of combined packages).

Second, payments have higher cost effectiveness when targeted at early career teachers rather than all teachers. This is because early career teachers tend to be more responsive to financial incentives than more experienced teachers. However, as noted above in discussion of the '**more flattening**' scenario 7 above, retaining experienced teachers is also of value, given the additional effectiveness they may provide from their experience and the role of experienced teachers as mentors and support for early career colleagues.

Finally, the spending on these payments can be directed to subjects that tend to under-recruit, meaning expenditure on subjects that are likely to over-recruit can be minimised, maximising the overall cost effectiveness relative to across-the-board pay increases. The payments being administered by the DfE rather than schools also minimises the fairness concerns that could arise from differentiated base pay.

5.2 Optimising bursaries

Training bursaries are another form of non-pay financial incentive with evidence of effectiveness at improving recruitment (Morse, 2016; Worth and Hollis, 2021). Bursaries are paid to ITT entrants in shortage subjects to boost recruitment. In scenario 13, we follow the baseline (scenario 3) in terms of pay increases and early-career payments but bursaries beyond 2023/24 are increased in each subject until the recruitment target is met. We cap the maximum bursary at the starting salary for the year in which the cohort are due to start teaching (e.g., £31,000 in 2024/25, rising to £33,000 in 2027/28), which means that some subjects at the maximum may still not be met.

Table 8 shows the impact of the '**optimising bursaries**' scenario. In 2024/25, the majority of subjects (including all those shown in the table) require a bursary of the maximum value available (£31,000). Among the subjects shown, all continue to require the highest level of bursary other than maths from 2026/27 onwards, as the recruitment target is met with a slightly lower bursary than the maximum.

The cost of these bursary changes is relatively modest compared to many of the pay scenarios considered in section 4. The total additional cost of the bursary changes compared to the baseline scenario, including both higher bursary values and the extra expenditure due to the additional trainees to whom bursaries are paid, amounts to less than £200m per year. However, the overall impact of the bursary changes on capped secondary recruitment is considerable, rising to 58 per cent in 2027/28. This is similar to the impact achieved in pay scenario 5 ('**gradual restoration**') relative to the baseline, while being associated with a much smaller additional cost (£200m for bursaries in scenario 9 vs £4.4bn for pay in scenario 5).

However, considerable caution should be exercised in assuming that this therefore implies a very high level of cost effectiveness of bursaries. In the absence of robust evidence to the contrary, the model assumes that all the additional teachers attracted into teaching as a result of bursary increases are retained at the same rate as all teachers. This may not be the case, as the additional teachers recruited may be less likely to stay than all those who would have been recruited even under a lower bursary. As part of this research project with the Gatsby Foundation, we are currently undertaking additional analysis to provide robust evidence on this point. Once completed, we will use this evidence to update future iterations of our modelling, which will enable more

confident statements to be made about the overall cost effectiveness of bursaries relative to other policy measures.

Table 8: Impact of optimising bursaries

	2023/24	2024/25	2025/26	2026/27	2027/28
Mathematics	62%	77%	91%	100%	100%
percentage point change from baseline	+0	+8	+15	+19	+12
Physics	21%	21%	20%	20%	20%
percentage point change from baseline	+0	+2	+2	+3	+4
Computing	33%	34%	33%	33%	34%
percentage point change from baseline	+0	+3	+4	+6	+7
All science	44%	54%	55%	54%	54%
percentage point change from baseline	+0	+8	+10	+10	+10
Capped measure of overall secondary recruitment	46%	56%	57%	58%	58%
percentage point change from baseline	+0	+10	+12	+14	+15
Total cost increase from baseline (£, m)	0	189	162	128	131

6 Combined approaches for a long-term strategy

6.1 Policy packages

In sections 4 and 5, we modelled the impact of a series of separate pay and financial incentive policy measures to tease out the costs and impacts of these different financial levers. An integrated long-term pay and financial incentives strategy can combine a range of policy measures simultaneously, including elements of pay, bursaries and additional teacher payments. In this section we model the costs and impacts of two scenarios with combinations of changes to pay structures, bursary levels and early career payments (both policy design and payment amounts).

We consider and compare the impacts and costs of three scenarios with combined approaches of different forms.

- Scenario 14 ('**balanced**' package) is based on all pay points increasing at 1.5 percentage points more than the projected growth in average earnings (from the '**steady improvement**' scenario 6). This is combined with the early career payment structure from scenario 10 whereby payments are received for teachers in currently eligible subjects in all schools with no differential in payment between EIAs and non-EIAs. Early career teachers in schools with an intake comprising higher proportions of pupils with FSM would receive the highest value of payment but even schools with less deprived catchments would also receive payments of £2,000 in the first five years of their career.
- Scenario 15 ('**bold**' package) takes a slightly bolder approach. The pay scale modelling is based on scenario 7 ('**more flattening**') where there is further flattening of the main pay scale. The early career payment structure is retained from the previous scenario but the with higher values, as modelled in scenario 13.
- Scenario 16 ('**adventurous**' package) takes an even bolder approach still. The pay scale modelling is based on scenario 8 where the pay scales for primary and secondary are split, with secondary pay rising by more over time than primary pay. Early career payments beyond 2024/25 remain focused on maths, physics, chemistry and computing, but are increased to £5,000 per year and eligibility is extended to all schools (regardless of FSM decile/ EIA) and all teachers on the main and upper pay scales (not just early career teachers).

In addition, under all three scenarios the bursaries are increased up to a maximum of the starting salary or until the recruitment target is reached (see Appendix B for an overview of scenarios). The impacts of these combined scenarios are summarised in Figure 9 in green, alongside the pay-only scenarios from section 4 in purple.

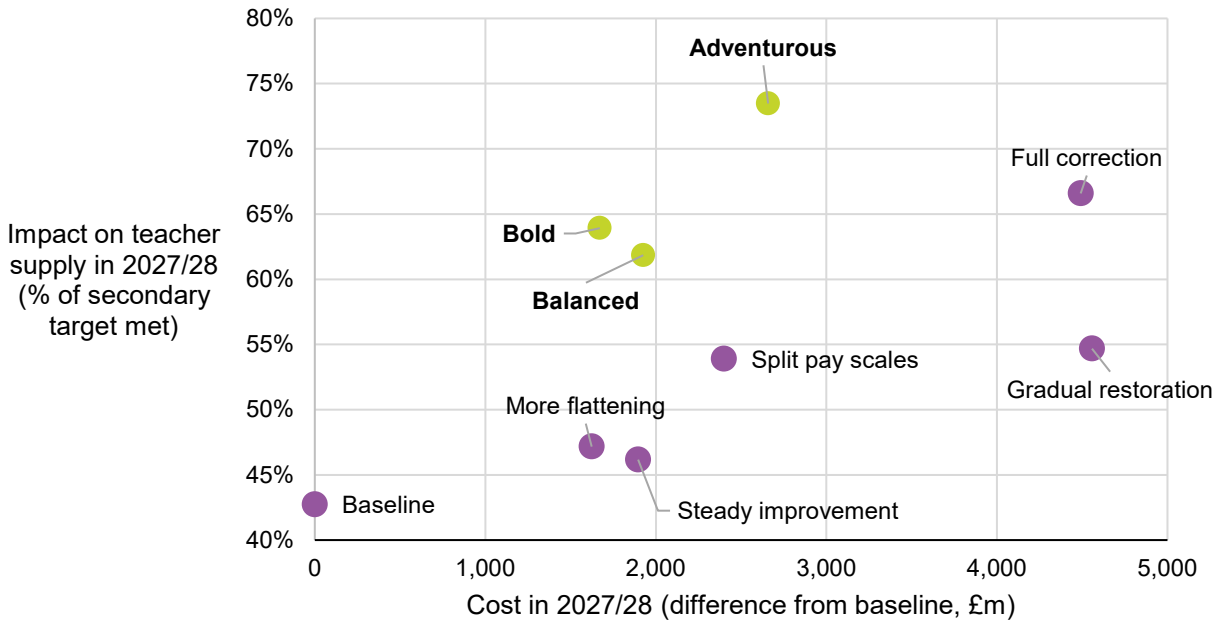
All three scenarios are generally more towards the left-top corner than the pay scenarios, suggesting they represent a relatively good level of cost effectiveness, i.e. high impact at a relatively modest cost. This is primarily driven by the power of bursaries. As explained in section 5.2 above, this impact should be treated with a degree of caution as the model implicitly assumes that additional teachers recruited due to bursaries are retained at the same rate as other trainees, which may not be true. Nonetheless, it suggests that the combination of pay and financial incentives can be powerful for developing an impactful but cost effective long-term strategy that strikes an appropriate balance between being broad-based and targeted at areas of need.

Comparing the '**balanced**' and '**bold**' scenarios, 14 and 15, the '**bold**' scenario stands out as being less costly and more impactful, suggesting it is more cost effective overall. However, as with the comparisons between the '**steady improvement**' scenario 6 and '**more flattening**' scenario 7 explained in section 4, the latter comes with considerable implications for the incentives to progress and the retention of experienced teachers. Therefore the boldness comes to some extent from needing to regard the wider implications as sufficiently worth it to achieve a greater impact on teacher supply.

The '**adventurous**' scenario 16 appears to have the highest impact on teacher supply of all the scenarios considered in this report. For example, teacher supply for 14 out of 18 secondary subjects is enough to reach the targets in scenario 16, and the primary target is met, compared to 12 under both scenarios 14 and 15.

Further, compared to some other scenarios, scenario 16 also has a relatively modest cost to achieve that impact, suggesting a high degree of cost effectiveness. However, the pay changes are based on scenario 8 where the pay scales for primary and secondary are split, which has important implications in terms of fairness and increasing the gender pay gap. Even more so than the '**bold**' scenario above, the adventurousness of this scenario comes to some extent from needing to regard the wider implications as sufficiently worth it to achieve a greater impact on teacher supply.

Figure 9: Impact versus cost of different scenarios 2027/28



6.2 Shortage subjects

It is also important to consider some key individual subjects within these combination scenarios. Specifically, physics and computing are two subjects that do not meet their respective recruitment targets under any scenarios, including the '**full correction**' scenario 4. Indeed, despite the combined impact of pay, bursary and early career payment impacts, neither subject meets its target under scenarios 14 or 15 either.

Table 9 below shows the costs of scenario 16 and the impact on teacher supply in these two subjects. It suggests that under the '**adventurous**' scenario 16 computing teacher supply reaches the target in 2027/28, while physics teacher supply reaches half of the target by 2027/28. This highlights the extent of the financial resource that might be required to meet teacher supply in computing using financial incentives.

Table 9: Impact of scenario 16 on recruitment targets for physics and computing

	2023/24	2024/25	2025/26	2026/27	2027/28
Physics	21%	26%	28%	35%	50%
percentage point change from baseline	+0	+7	+10	+18	+33
Computing	33%	44%	50%	82%	100%
percentage point change from baseline	+0	+13	+22	+54	+73
Total cost increase (£, m)	0	646	1,491	2,061	2,658

Further, the analysis highlights the extremely high degree of challenge for meeting the teacher supply target in physics, even with an adventurous package of pay and financial incentives. Nonetheless, the analysis shows the progress that could be made on physics teachers with a long-term pay and financial incentives strategy. An increase in teacher supply from less than 20 per cent of target under the baseline scenario to half the target shown in Table 9 would represent a hugely significant increase in the number of physics specialists in school science departments in schools across the country over time.

Measures that are very specific to physics to address the undersupply of physics specialists should also be considered alongside. These could include considering the range of ITT courses offered, offering additional subject specialism training in physics for trainees and teachers in the classroom, ensuring physics teachers are deployed to teach physics rather than other subjects in order to increase retention, targeting recruitment of graduates with engineering degrees into physics teaching, and addressing the relatively low numbers of students studying physics at A level and as an undergraduate degree.

Indeed, increasing physics teacher supply even if not all the way to the target level may have a positive impact on the quality of physics teaching, which itself has an impact on the numbers of

students studying physics to higher levels, increasing future supply. More generally, the financial and non-financial measures required to address the acute teacher supply challenge in physics should also focus on the very long term, focusing beyond individual spending review periods (as in this report) to consider measures that could improve physics teacher supply over a decade or more. Addressing the teacher supply challenge in physics requires sustained policy focus and attention.

7 Conclusions and recommendations

The evidence on teacher recruitment and retention makes a clear and compelling case for the need for a long-term strategy on teacher pay and financial incentives to address the currently intense teacher supply challenge. Such a strategy could effectively complement other strategies focussed on making teaching more attractive in non-financial ways, such as workload reduction, increased opportunities to work more flexibly and increased access to high-quality professional development.

The bare minimum of an effective strategy is that it goes beyond the status quo of teacher pay rising at or below the rate of pay growth in the wider economy and the set of financial incentive measures that are currently in place. An effective strategy is also likely to have:

- a combined an integrated approach that provides incentives for recruitment, retention and progression throughout the workforce
- a broad-based component that improves pay to recruit and retain teachers, while maintaining a pay structure that incentivises progression and retains experience
- subject/ phase-specific components, that address particularly acute challenges given the variation across phases and subjects
- targeted measures for schools serving disadvantaged areas, which tend to find teacher recruitment and retention more challenging.

There is no one right answer to the question of which package of pay and financial incentives is likely to be the most effective or the most cost effective. Many of the scenarios analysed in this report that appear to have relatively good cost effectiveness also have wider implications for other outcomes and factors that policymakers need to consider. Policymakers should therefore explore the options to find cost-effective approaches with the evidence in mind and also with regard to the different trade-offs and considerations required. Our analysis indicates that combinations of policy changes to pay, bursaries and early career payments can be powerful for developing an impactful but cost-effective long-term strategy that strikes an appropriate balance between being broad-based and targeted at areas of need. The '**adventurous**' package appears to have the highest impact on teacher supply of all the scenarios considered in this report. However, the pay changes are based on splitting the pay scales for primary and secondary teachers, which has important implications in terms of fairness and increasing the gender pay gap.

Finally, special and tailored consideration should be given to addressing the specific challenges in the most acutely affected subjects, such as physics and computing. Indeed, the physics teacher supply challenges are so deep even within scenarios with ambitious pay and financial incentive packages that they require long term policy focus and attention.

We recommend that:

1. The Government should develop and publish a long-term pay and financial incentives strategy that aims to improve the financial competitiveness of teaching over time. This could be as part of a wider strategy to also set out complementary actions aimed at improving the non-financial attractiveness of teaching to increase retention.
2. The Government should redesign the 'levelling up premium' early career payments by widening eligibility to all schools nationally and increasing payment generosity to enhance its impact, and targeting resource solely towards shortage subjects and schools serving disadvantaged communities.
3. The UK political parties should set out in their 2024 election manifestoes what teacher pay and financial incentive measures they intend to implement to address the teacher supply challenge.
4. As part of its future evidence to STRB, the DfE should commit to publishing full impact assessments of the overall forecasted teacher supply impact of its pay and financial incentive proposals. Where an impact assessment suggests supply is unlikely to be met, the DfE should set out the financial and non-financial actions being taken to improve teacher supply, particularly in subjects not expected to reach their respective targets.

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Appendix A: Methodology appendix

The analysis in this report is derived from a forecast and simulation model developed by NFER to assess the overall costs and teacher supply impacts of different pay and financial incentive options. This methodology appendix provides more details about the method and assumptions that underpin the analysis.

The model is based on the most recent data on the recruitment of teachers to postgraduate ITT and associated targets, the salary structure of the teaching workforce and the numbers of teachers at each pay point and their respective rates of leaving the state-funded sector. The model also uses currently available policy information on bursaries and teacher retention payments. To account for the expected evolution of the wider economic environment, the model uses the most recent economic forecasts produced by the Office for Budget Responsibility (OBR), which for this report is the March 2023 forecast (Office of Budget Responsibility, 2023).

The model incorporates the above input information as well as policy scenarios defined by the model user. These inputs are combined with parameters – estimates of how responsive teacher recruitment and retention behaviour is to changes in various key factors, derived from the research literature – to calculate forecasts. The model makes four sets of calculations, as follows:

7.1 Recruitment

Following the DfE's reporting of ITT statistics, ITT recruitment is modelled for primary and each of 18 secondary subjects, including an 'other' category that includes media and communication studies, social studies, and psychology. Recruitment numbers are baselined on the number of trainees expected to start ITT courses in 2023/24, predicted using the latest data on ITT applications up to May 2023 and a combination of historic ITT enrolment and applications data.

The model makes a forecast, based on the evidence-based assumptions that:

- Recruitment rises with increases in the unemployment rate (Worth, Tang and Galvis, 2022a). We assume that recruitment to all subjects rises by six per cent for every one percentage point rise in the unemployment rate (and vice versa for falls). We use the OBR forecast of the unemployment rate to project the future path of the unemployment rate.
- Recruitment rises with increases in the subject's bursary (Worth, Tang and Galvis, 2022a). We assume that recruitment to a subject rises by 2.9 per cent for every £1,000 rise in the bursary (and vice versa for falls).
- Recruitment rises with increases in average pay on the main teacher pay scale relative to the change in average earnings. We assume that recruitment to all subjects rises by two per cent for every one percentage point rise in average salary on the main pay scale that is over and above changes in average earnings (and vice versa for falls). We use the OBR forecast of average earnings growth by fiscal year to project the future path of outside earnings. We also assume that ITT recruitment responds partly to teacher pay relative to outside pay in the current year and partly to teacher pay relative to outside pay in the previous year.

7.2 Retention

Teacher leaving rates are baselined on rates of leaving the state-sector in 2018/19, the most recent available data unaffected by the pandemic, so that the model does not use the atypical retention rates seen during the Covid-19 pandemic in 2019/20 and 2020/21 as a baseline. Using a similar approach to that outlined in modelling carried out by DfE (2020), the model assumes that the leaving rate falls in proportion to increases in teacher pay relative to the change in average earnings. Based on Sims and Benhenda (2022) and DfE (2022), the model also assumes that teachers on the first five points of the main pay scale are more responsive to pay changes than more experienced teachers. Specifically, we assume that the leaving rates of teachers on pay scales M1 to M5 decrease by 2.5 per cent for every one percentage point rise in pay that is over and above changes in average earnings (and vice versa for falls). We assume that the leaving rates of teachers on pay scales M6 and above decrease by one per cent for every one percentage point rise in pay that is over and above changes in average earnings. We use the OBR forecast of average earnings growth by fiscal year to project the future path of outside earnings.

Pay is modelled separately by phase (primary and secondary, but not special schools as there is no ITT target for specialist routes), by pay point (M1-M6, U1-U3 and leadership) and by pay region (Inner London, Outer London, London Fringe and Rest of England). Early career payments are assumed to affect retention in the same way as pay and are included additively along with pay. We do not separately model the impact of early career payments for eligible and non-eligible teachers, but take a weighted average of eligibility multiplied by the payment amount within each pay region and subject. Due to the early carer payments we model each subject separately and then aggregate the overall leaving rate estimates across subjects using the number of teachers.

Using additional data from the 2021/22 SWC on gender composition at each pay point and average salaries of male and female senior leaders, we calculate the gender pay gap for each year by measuring the average male and female salary. We also use additional SWC data on staff composition by levels of disadvantage (quintiles of schools based on the proportion of pupils eligible for free school meals) to calculate the average year-on-year change in salary by level of school disadvantage. Both these analyses assume that the respective staff compositions do not change over time.

7.3 Costs

The model uses teacher salary data from the School Teachers Pay and Conditions Documents and teacher numbers and supplementary teacher average salary data from the School Workforce Census in 2021/22 to calculate the total salary costs.

Pay is modelled separately by phase (primary, secondary and special), by pay point (unqualified, M1-M6, U1-U3 and leadership) and by pay region (Inner London, Outer London, London Fringe and Rest of England). Salaries at each pay point for 2023/24 and beyond are uprated with the increases assumed by the policy scenario under consideration in the model. The model calculates the aggregate costs using the number of teachers at each pay point in the 2021/22 academic year. The model also includes estimates of employer national insurance and pension contributions to provide a realistic assessment of the total cost of policy changes to the Exchequer.

Separately, the model also calculates the aggregate cost of bursaries and early career payments. We multiply the bursary amount by the number of trainees entering ITT in a particular year. This approximates, although likely overstates slightly, the cost of bursaries given that some trainees get scholarships rather than bursaries (although the cost to the Exchequer is similar) while others are ineligible for bursaries. Early career payments are aggregated using the weighted average of eligibility and non-eligibility explained above for each subject, and aggregated using the proportion of total hours taught in that subject and the overall number of secondary teachers.

7.4 Targets

The forecasts for ITT targets in the model are based on the methodology set out in the DfE's 'Calculation of 2023 to 2024 PGITT targets' spreadsheet, taken from the DfE's Teacher Workforce Model. The targets for the 2023/24 academic year are taken as published by DfE. The model uses the DfE methodology to make further forecasts of targets in future years, accounting for changes in pupil numbers (which affect teacher demand), future retention rates (derived from the Retention calculations mentioned above, which affect teacher demand) and future ITT recruitment (derived from the Recruitment calculations mentioned above, which affect teacher supply).

Minor adjustments have been made to the methodology, which is designed to calculate short-term targets, to be more appropriate for forecasting long-term targets. Specifically, where there is an increase in supply from ITT, the DfE's calculations assume that schools hire those additional teachers, even if the demand for teachers is likely to fall over time. This is a reasonable assumption to make for a model that only calculates targets for the 2023/24 academic year, as the DfE model does. However, it seems unreasonable to assume that schools will continue doing this indefinitely, and therefore as a basis for forecasting targets beyond 2023/24. This was particularly the case for primary, where demand is expected to fall over time due to falling pupil numbers, but supply was expected to rise under some modelled scenarios. We therefore cap the number of teachers that schools employ in the 'supply met' scenario to be equal to the number of teachers from the 'demand met' scenario wherever the former exceeds the latter. Intuitively, it means that schools employ the teachers that they need for the pupils they are teaching (based on pupil-teacher ratios that are similar to the current ones) rather than continuing to expand staffing despite falling rolls.

7.5 Outputs

The key teacher supply output from the model is forecasted ITT recruitment for each subject relative to its respective forecasted target. We refer to impacts on 'teacher supply' throughout the report, by which we mean recruitment to postgraduate ITT as a proportion of the ITT target. We refer to this as 'supply' rather than 'recruitment' because the measure can be influenced through the scenarios by changes to both recruitment and retention.

Other outputs include the total salary costs per annum for primary, secondary and special sector – including and excluding employer NI and pensions contributions – bursaries and early career payments. The average gender pay gap is calculated for each year and the year-on-year change in pay costs for schools by quintile of pupil disadvantage.

Appendix B: Overview of scenarios

Scenario number	Scenario name	Changes to pay rate increases (2023/24)	Changes to pay rate increases (2024/25 – 2027/28)	Changes to financial incentives (ECP and bursaries)
1	**DfE evidence to STRB – Feb 23**	M1:7.1% M6/ other scales: 3.0 %	2 % per year for all scales	Current levels and subjects
2	**DfE pay offer – Mar 23**	M1: 7.1 % M6/ other scales: 4.3 %	2 % per year for all scales	Current levels and subjects
3	**Reports of STRB – Jun 23/ Baseline**	M1: 9.1 % M6/ other scales: 6.3 %	2 % per year for all scales	Current levels and subjects
4	**Full correction**	As scenario 3 (**baseline**)	16.5 % in 2024/25 for all scales 2 % per year from 2025/26	Current levels and subjects
5	**Gradual restoration**	As scenario 3 (**baseline**)	5.5 % per year for all scales	Current levels and subjects
6	**Steady improvement**	As scenario 3 (**baseline**)	3.2 % in 2024/25 and 2025/26 for all scales 3.6 % in 2026/27 for all scales	Current levels and subjects

			4.0 % in 2027/28 for all scales	
7	**More flattening**	As scenario 3 (**baseline**)	4.7 % in 2024/25 and 2025/26 for M1, 2.7 % for remaining scales 5.1 % in 2026/27 for M1, 3.1 % for remaining scales 5.5 % in 2027/28 for M1, 3.5 % for remaining scales	Current levels and subjects
8	**Split pay scales**	As scenario 3 (**baseline**)	For primary pay scales: as scenario 3 (**baseline**) For secondary pay scales: 5.5 % for all years	Current levels and subjects
9	**ECP: all schools with FSM uplift**	As scenario 3 (**baseline**)	As scenario 3 (**baseline**)	ECTs teaching mathematics, physics, chemistry or computing receive payments in first 5 years. Schools in different FSM deciles attract different levels of payment: Deciles 1-3: £3,000 Deciles 4-5: £2,500 Deciles 6-10: £2,000 Bursaries at current levels and subjects
10	**ECP: more subjects**	As scenario 3 (**baseline**)	As scenario 3 (**baseline**)	ECPs as in scenario 9 but expanded to all subjects other than biology, classics, history

				and PE (these subjects meet their recruitment targets). Bursaries at current levels and subjects
11	**ECP: all teachers**	As scenario 3 (**baseline**)	As scenario 3 (**baseline**)	ECPs as in scenario 9 but eligibility expanded to all teachers on main and upper pay scales. Bursaries at current levels and subjects
12	**ECP: more generous**	As scenario 3 (**baseline**)	As scenario 3 (**baseline**)	ECPs as in scenario 9 but at higher payment levels: Deciles 1-3: £5,000 Deciles 4-5: £4,000 Deciles 6-10: £3,000 Bursaries at current levels and subjects
13	**Optimise bursaries**	As scenario 3 (**baseline**)	As scenario 3 (**baseline**)	Bursaries increased until target met (up to a maximum of starting salary)
14	**Balanced**	As scenario 3 (**baseline**)	3.2 % in 2024/25 and 2025/26 for all scales 3.6 % in 2026/27 for all scales 4.0 % in 2027/28 for all scales	ECPs as in scenario 9 Bursaries increased until target met (up to a maximum of starting salary)

15	**Bold**	As scenario 3 (**baseline**)	4.7 % in 2024/25 and 2025/26 for M1, 2.7 % for remaining scales 5.1 % in 2026/27 for M1, 3.1 % for remaining scales 5.5 % in 2027/28 for M1, 3.5 % for remaining scales	ECPs as in scenario 12 Bursaries increased until target met (up to a maximum of starting salary)
16	**Adventurous**	As scenario 3 (**baseline**)	For primary pay scales: as scenario 3 (**baseline**) For secondary pay scales: 5.5 % for all years	ECPs of £5,000 for all teachers on the main and upper pay scales teaching mathematics, physics, chemistry or computing Bursaries increased until target met (up to a maximum of starting salary)

Appendix C: Impact of each scenario on different subjects

Scenario 1 - DfE evidence to STRB – Feb 23					
Teacher supply - forecasted ITT recruitment as a proportion of forecasted target					
	2023/24	**2024/25**	**2025/26**	**2026/27**	**2027/28**
Mathematics	62%	60%	61%	60%	61%
English	71%	75%	82%	91%	96%
Physics	21%	18%	16%	15%	14%
Chemistry	68%	64%	65%	66%	67%
Biology	81%	88%	105%	106%	107%
MFL	33%	30%	29%	28%	27%
History	111%	107%	109%	110%	110%
Geography	55%	55%	57%	60%	63%
Computing	33%	28%	26%	24%	23%
Art & Design	49%	38%	33%	29%	27%
Drama	79%	68%	58%	52%	48%
Classics	178%	183%	183%	183%	180%
Design & Technology	26%	24%	22%	21%	20%
Music	33%	28%	25%	23%	21%
Business Studies	18%	15%	13%	12%	11%
Physical Education	180%	171%	176%	179%	182%
Religious Education	42%	35%	31%	28%	26%
Other	14%	11%	9%	8%	8%
Primary	98%	92%	97%	105%	99%
All science	44%	41%	40%	39%	37%
All secondary	49%	44%	42%	40%	39%
Capped secondary supply	46%	43%	41%	39%	37%
Capped overall supply	60%	55%	54%	52%	51%
Cost, compared to baseline (scenario 3)					
Primary teacher pay (£m)	-293	-299	-305	-311	-317
Secondary teacher pay (£m)	-286	-291	-297	-303	-309
Total teacher pay (£m)	-614	-626	-639	-652	-665
Bursaries (£m)	0	-5	-5	-5	-5
Early career payments (£m)	0	0	0	0	0
Grand total (£m)	-614	-631	-644	-657	-670
Grand total (including on-costs, £m)	-844	-866	-883	-901	-919
Key					
Likely below target					
Leaning below target					
Leaning above target					
Likely above target					

Scenario 2 - DfE pay offer – Mar 23					
Teacher supply - forecasted ITT recruitment as a proportion of forecasted target					
	2023/24	**2024/25**	**2025/26**	**2026/27**	**2027/28**
Mathematics	62%	62%	64%	65%	66%
English	71%	78%	88%	99%	99%
Physics	21%	18%	17%	16%	15%
Chemistry	68%	66%	68%	70%	73%
Biology	81%	92%	109%	109%	109%
MFL	33%	31%	30%	29%	28%
History	111%	110%	113%	113%	114%
Geography	55%	56%	60%	63%	68%
Computing	33%	28%	26%	25%	24%
Art & Design	49%	39%	34%	31%	28%
Drama	79%	71%	61%	56%	51%
Classics	178%	184%	184%	184%	182%
Design & Technology	26%	24%	23%	22%	21%
Music	33%	28%	26%	23%	22%
Business Studies	18%	15%	14%	13%	12%
Physical Education	180%	176%	182%	185%	189%
Religious Education	42%	36%	32%	30%	28%
Other	14%	11%	10%	9%	8%
Primary	98%	100%	108%	110%	103%
All science	44%	42%	42%	40%	39%
All secondary	49%	45%	43%	42%	41%
Capped secondary supply	46%	44%	42%	40%	39%
Capped overall supply	60%	57%	55%	53%	52%
Cost, compared to baseline (scenario 3)					
Primary teacher pay (£m)	-188	-192	-196	-200	-204
Secondary teacher pay (£m)	-183	-186	-190	-194	-198
Total teacher pay (£m)	-393	-401	-409	-417	-426
Bursaries (£m)	0	-4	-4	-4	-4
Early career payments (£m)	0	0	0	0	0
Grand total (£m)	-393	-405	-413	-421	-429
Grand total (including on-costs, £m)	-541	-555	-566	-577	-589
Key					
Likely below target					
Leaning below target					
Leaning above target					
Likely above target					

Scenario 3 - Reports of STRB – Jun 23 (baseline scenario)					
Teacher supply - forecasted ITT recruitment as a proportion of forecasted target					
	2023/24	**2024/25**	**2025/26**	**2026/27**	**2027/28**
Mathematics	62%	69%	75%	81%	88%
English	71%	87%	105%	106%	107%
Physics	21%	19%	18%	17%	16%
Chemistry	68%	73%	79%	86%	94%
Biology	81%	103%	118%	119%	120%
MFL	33%	33%	32%	32%	32%
History	111%	118%	121%	122%	122%
Geography	55%	61%	67%	75%	85%
Computing	33%	30%	29%	28%	27%
Art & Design	49%	42%	37%	34%	32%
Drama	79%	82%	73%	68%	65%
Classics	178%	188%	188%	187%	185%
Design & Technology	26%	25%	24%	24%	23%
Music	33%	30%	28%	26%	24%
Business Studies	18%	16%	15%	13%	13%
Physical Education	180%	193%	>200%	>200%	>200%
Religious Education	42%	39%	36%	34%	32%
Other	14%	12%	10%	9%	8%
Primary	98%	117%	123%	126%	117%
All science	44%	45%	45%	44%	44%
All secondary	49%	48%	48%	47%	46%
Capped secondary supply	46%	46%	45%	44%	43%
Capped overall supply	60%	59%	57%	55%	55%
Cost, compared to baseline (scenario 3)					
Primary teacher pay (£m)	0	0	0	0	0
Secondary teacher pay (£m)	0	0	0	0	0
Total teacher pay (£m)	0	0	0	0	0
Bursaries (£m)	0	0	0	0	0
Early career payments (£m)	0	0	0	0	0
Grand total (£m)	0	0	0	0	0
Grand total (including on-costs, £m)	0	0	0	0	0
Key					
Likely below target					
Leaning below target					
Leaning above target					
Likely above target					

Scenario 4 - Full correction					
Teacher supply - forecasted ITT recruitment as a proportion of forecasted target					
	2023/24	**2024/25**	**2025/26**	**2026/27**	**2027/28**
Mathematics	62%	120%	>200%	>200%	>200%
English	71%	150%	>200%	>200%	>200%
Physics	21%	25%	30%	33%	37%
Chemistry	68%	116%	>200%	>200%	>200%
Biology	81%	197%	>200%	>200%	>200%
MFL	33%	44%	61%	87%	142%
History	111%	>200%	>200%	>200%	>200%
Geography	55%	89%	193%	>200%	>200%
Computing	33%	42%	56%	76%	112%
Art & Design	49%	61%	82%	114%	150%
Drama	79%	170%	>200%	>200%	>200%
Classics	178%	>200%	>200%	>200%	>200%
Design & Technology	26%	33%	43%	52%	66%
Music	33%	42%	54%	66%	87%
Business Studies	18%	21%	25%	26%	28%
Physical Education	180%	>200%	>200%	>200%	>200%
Religious Education	42%	60%	91%	169%	176%
Other	14%	15%	17%	17%	17%
Primary	98%	>200%	>200%	>200%	>200%
All science	44%	65%	86%	93%	100%
All secondary	49%	71%	96%	109%	123%
Capped secondary supply	46%	55%	57%	63%	67%
Capped overall supply	60%	57%	60%	65%	70%
Cost, compared to baseline (scenario 3)					
Primary teacher pay (£m)	0	1,456	1,485	1,514	1,545
Secondary teacher pay (£m)	0	1,414	1,442	1,471	1,500
Total teacher pay (£m)	0	3,041	3,102	3,164	3,227
Bursaries (£m)	0	27	54	54	54
Early career payments (£m)	0	0	0	0	0
Grand total (£m)	0	3,068	3,156	3,218	3,281
Grand total (including on-costs, £m)	0	4,208	4,319	4,404	4,491
Key					
Likely below target					
Leaning below target					
Leaning above target					
Likely above target					

Scenario 5 - Gradual restoration					
Teacher supply - forecasted ITT recruitment as a proportion of forecasted target					
	2023/24	2024/25	2025/26	2026/27	2027/28
Mathematics	62%	87%	138%	>200%	>200%
English	71%	109%	174%	>200%	>200%
Physics	21%	21%	22%	25%	28%
Chemistry	68%	88%	131%	197%	>200%
Biology	81%	135%	>200%	>200%	>200%
MFL	33%	37%	42%	53%	70%
History	111%	153%	191%	>200%	>200%
Geography	55%	71%	101%	>200%	>200%
Computing	33%	34%	38%	46%	58%
Art & Design	49%	49%	52%	61%	75%
Drama	79%	110%	144%	>200%	>200%
Classics	178%	>200%	>200%	>200%	>200%
Design & Technology	26%	28%	31%	36%	43%
Music	33%	35%	37%	42%	50%
Business Studies	18%	18%	18%	20%	21%
Physical Education	180%	>200%	>200%	>200%	>200%
Religious Education	42%	47%	53%	69%	99%
Other	14%	13%	13%	13%	13%
Primary	98%	>200%	>200%	>200%	>200%
All science	44%	52%	62%	73%	81%
All secondary	49%	57%	68%	82%	93%
Capped secondary supply	46%	51%	50%	50%	55%
Capped overall supply	60%	59%	56%	52%	58%
Cost, compared to baseline (scenario 3)					
Primary teacher pay (£m)	0	351	729	1,135	1,570
Secondary teacher pay (£m)	0	341	708	1,102	1,525
Total teacher pay (£m)	0	734	1,523	2,371	3,280
Bursaries (£m)	0	7	21	35	48
Early career payments (£m)	0	0	0	0	0
Grand total (£m)	0	741	1,544	2,405	3,328
Grand total (including on-costs, £m)	0	1,016	2,115	3,294	4,557

Key	
Likely below target	
Leaning below target	
Leaning above target	
Likely above target	

Scenario 6 - Steady improvement					
Teacher supply - forecasted ITT recruitment as a proportion of forecasted target					
	2023/24	2024/25	2025/26	2026/27	2027/28
Mathematics	62%	75%	92%	124%	141%
English	71%	93%	126%	139%	157%
Physics	21%	20%	19%	20%	20%
Chemistry	68%	78%	94%	124%	143%
Biology	81%	113%	142%	160%	181%
MFL	33%	34%	36%	38%	43%
History	111%	129%	142%	157%	177%
Geography	55%	64%	78%	102%	149%
Computing	33%	32%	32%	33%	36%
Art & Design	49%	44%	42%	42%	44%
Drama	79%	90%	91%	101%	131%
Classics	178%	190%	>200%	>200%	>200%
Design & Technology	26%	26%	27%	28%	29%
Music	33%	32%	31%	31%	32%
Business Studies	18%	17%	16%	16%	16%
Physical Education	180%	>200%	>200%	>200%	>200%
Religious Education	42%	42%	41%	43%	48%
Other	14%	12%	11%	10%	10%
Primary	98%	138%	170%	>200%	>200%
All science	44%	48%	51%	54%	58%
All secondary	49%	51%	54%	58%	63%
Capped secondary supply	46%	48%	48%	47%	46%
Capped overall supply	60%	59%	57%	56%	54%
Cost, compared to baseline (scenario 3)					
Primary teacher pay (£m)	0	120	247	423	653
Secondary teacher pay (£m)	0	117	240	411	634
Total teacher pay (£m)	0	252	516	884	1,365
Bursaries (£m)	0	2	7	13	20
Early career payments (£m)	0	0	0	0	0
Grand total (£m)	0	254	524	897	1,384
Grand total (including on-costs, £m)	0	348	717	1,228	1,896

Key	
Likely below target	
Leaning below target	
Leaning above target	
Likely above target	

Scenario 7 - More flattening					
Teacher supply - forecasted ITT recruitment as a proportion of forecasted target					
	2023/24	**2024/25**	**2025/26**	**2026/27**	**2027/28**
Mathematics	62%	76%	97%	134%	158%
English	71%	96%	132%	150%	174%
Physics	21%	20%	20%	20%	22%
Chemistry	68%	79%	98%	137%	157%
Biology	81%	116%	151%	173%	>200%
MFL	33%	34%	37%	40%	47%
History	111%	132%	148%	167%	193%
Geography	55%	65%	81%	113%	163%
Computing	33%	32%	33%	35%	39%
Art & Design	49%	45%	44%	45%	48%
Drama	79%	92%	97%	117%	158%
Classics	178%	>200%	>200%	>200%	>200%
Design & Technology	26%	27%	27%	29%	32%
Music	33%	32%	32%	32%	35%
Business Studies	18%	17%	16%	16%	17%
Physical Education	180%	>200%	>200%	>200%	>200%
Religious Education	42%	42%	43%	46%	54%
Other	14%	12%	11%	11%	11%
Primary	98%	145%	187%	>200%	>200%
All science	44%	48%	52%	57%	62%
All secondary	49%	52%	56%	61%	68%
Capped secondary supply	46%	49%	49%	47%	47%
Capped overall supply	60%	59%	58%	55%	54%
Cost, compared to baseline (scenario 3)					
Primary teacher pay (£m)	0	99	203	356	561
Secondary teacher pay (£m)	0	95	195	341	538
Total teacher pay (£m)	0	205	421	737	1,162
Bursaries (£m)	0	3	10	17	26
Early career payments (£m)	0	0	0	0	0
Grand total (£m)	0	208	430	754	1,188
Grand total (including on-costs, £m)	0	285	588	1,030	1,624
Key					
Likely below target					
Leaning below target					
Leaning above target					
Likely above target					

Scenario 8 - Split pay scales					
Teacher supply - forecasted ITT recruitment as a proportion of forecasted target					
	2023/24	2024/25	2025/26	2026/27	2027/28
Mathematics	62%	87%	138%	>200%	>200%
English	71%	109%	174%	>200%	>200%
Physics	21%	21%	22%	25%	29%
Chemistry	68%	88%	131%	197%	>200%
Biology	81%	135%	>200%	>200%	>200%
MFL	33%	37%	42%	53%	75%
History	111%	153%	191%	>200%	>200%
Geography	55%	71%	101%	>200%	>200%
Computing	33%	34%	38%	46%	62%
Art & Design	49%	49%	52%	61%	82%
Drama	79%	110%	144%	>200%	>200%
Classics	178%	>200%	>200%	>200%	>200%
Design & Technology	26%	28%	31%	36%	45%
Music	33%	35%	37%	42%	53%
Business Studies	18%	18%	18%	20%	22%
Physical Education	180%	>200%	>200%	>200%	>200%
Religious Education	42%	47%	53%	69%	116%
Other	14%	13%	13%	13%	14%
Primary	98%	117%	123%	126%	117%
All science	44%	52%	62%	73%	88%
All secondary	49%	57%	68%	82%	102%
Capped secondary supply	46%	51%	50%	50%	54%
Capped overall supply	60%	63%	63%	64%	69%
Cost, compared to baseline (scenario 3)					
Primary teacher pay (£m)	0	0	0	0	0
Secondary teacher pay (£m)	0	341	708	1,102	1,525
Total teacher pay (£m)	0	383	794	1,236	1,710
Bursaries (£m)	0	7	21	35	48
Early career payments (£m)	0	0	0	0	0
Grand total (£m)	0	390	815	1,270	1,758
Grand total (including on-costs, £m)	0	533	1,112	1,733	2,399

Key	
Likely below target	
Leaning below target	
Leaning above target	
Likely above target	

Scenario 9 - ECP: all schools with FSM uplift					
Teacher supply - forecasted ITT recruitment as a proportion of forecasted target					
	2023/24	2024/25	2025/26	2026/27	2027/28
Mathematics	62%	73%	80%	91%	99%
English	71%	87%	105%	106%	107%
Physics	21%	20%	18%	18%	17%
Chemistry	68%	76%	83%	95%	105%
Biology	81%	103%	118%	119%	120%
MFL	33%	33%	32%	32%	32%
History	111%	118%	121%	122%	122%
Geography	55%	61%	67%	75%	85%
Computing	33%	31%	29%	29%	28%
Art & Design	49%	42%	37%	34%	32%
Drama	79%	82%	73%	68%	65%
Classics	178%	188%	188%	187%	185%
Design & Technology	26%	25%	24%	24%	23%
Music	33%	30%	28%	26%	24%
Business Studies	18%	16%	15%	13%	13%
Physical Education	180%	193%	>200%	>200%	>200%
Religious Education	42%	39%	36%	34%	32%
Other	14%	12%	10%	9%	8%
Primary	98%	117%	123%	126%	117%
All science	44%	46%	46%	46%	46%
All secondary	49%	49%	48%	48%	47%
Capped secondary supply	46%	47%	46%	45%	43%
Capped overall supply	60%	59%	57%	56%	56%
Cost, compared to baseline (scenario 3)					
Primary teacher pay (£m)	0	0	0	0	0
Secondary teacher pay (£m)	0	0	0	0	0
Total teacher pay (£m)	0	0	0	0	0
Bursaries (£m)	0	0	0	0	0
Early career payments (£m)	0	0	32	32	32
Grand total (£m)	0	0	32	32	32
Grand total (including on-costs, £m)	0	0	32	32	32

Key	
Likely below target	
Leaning below target	
Leaning above target	
Likely above target	

Scenario 10 - ECP: more subjects					
Teacher supply - forecasted ITT recruitment as a proportion of forecasted target					
	2023/24	2024/25	2025/26	2026/27	2027/28
Mathematics	62%	73%	80%	91%	99%
English	71%	97%	120%	122%	122%
Physics	21%	20%	18%	18%	17%
Chemistry	68%	76%	83%	95%	105%
Biology	81%	103%	118%	119%	120%
MFL	33%	34%	34%	35%	36%
History	111%	118%	121%	122%	122%
Geography	55%	65%	73%	90%	115%
Computing	33%	31%	29%	29%	28%
Art & Design	49%	45%	40%	38%	37%
Drama	79%	94%	83%	87%	93%
Classics	178%	188%	188%	187%	185%
Design & Technology	26%	27%	25%	25%	25%
Music	33%	32%	29%	28%	27%
Business Studies	18%	17%	15%	14%	14%
Physical Education	180%	193%	>200%	>200%	>200%
Religious Education	42%	43%	39%	39%	39%
Other	14%	12%	11%	10%	9%
Primary	98%	117%	123%	126%	117%
All science	44%	46%	46%	46%	46%
All secondary	49%	51%	50%	51%	51%
Capped secondary supply	46%	49%	46%	46%	46%
Capped overall supply	60%	61%	58%	58%	58%
Cost, compared to baseline (scenario 3)					
Primary teacher pay (£m)	0	0	0	0	0
Secondary teacher pay (£m)	0	0	0	0	0
Total teacher pay (£m)	0	0	0	0	0
Bursaries (£m)	0	0	0	0	0
Early career payments (£m)	0	0	104	104	104
Grand total (£m)	0	0	104	104	104
Grand total (including on-costs, £m)	0	0	104	104	104

Key	
Likely below target	
Leaning below target	
Leaning above target	
Likely above target	

Scenario 11 - ECP: all teachers					
Teacher supply - forecasted ITT recruitment as a proportion of forecasted target					
	2023/24	**2024/25**	**2025/26**	**2026/27**	**2027/28**
Mathematics	62%	76%	84%	102%	106%
English	71%	87%	105%	106%	107%
Physics	21%	20%	19%	18%	17%
Chemistry	68%	79%	87%	104%	111%
Biology	81%	103%	118%	119%	120%
MFL	33%	33%	32%	32%	32%
History	111%	118%	121%	122%	122%
Geography	55%	61%	67%	75%	85%
Computing	33%	32%	30%	30%	30%
Art & Design	49%	42%	37%	34%	32%
Drama	79%	82%	73%	68%	65%
Classics	178%	188%	188%	187%	185%
Design & Technology	26%	25%	24%	24%	23%
Music	33%	30%	28%	26%	24%
Business Studies	18%	16%	15%	13%	13%
Physical Education	180%	193%	>200%	>200%	>200%
Religious Education	42%	39%	36%	34%	32%
Other	14%	12%	10%	9%	8%
Primary	98%	117%	123%	126%	117%
All science	44%	47%	47%	48%	47%
All secondary	49%	49%	49%	48%	47%
Capped secondary supply	46%	47%	46%	45%	44%
Capped overall supply	60%	59%	58%	57%	56%
Cost, compared to baseline (scenario 3)					
Primary teacher pay (£m)	0	0	0	0	0
Secondary teacher pay (£m)	0	0	0	0	0
Total teacher pay (£m)	0	0	0	0	0
Bursaries (£m)	0	0	0	0	0
Early career payments (£m)	0	0	165	165	165
Grand total (£m)	0	0	165	165	165
Grand total (including on-costs, £m)	0	0	165	165	165

Key	
Likely below target	
Leaning below target	
Leaning above target	
Likely above target	

Scenario 12 - ECP: more generous					
Teacher supply - forecasted ITT recruitment as a proportion of forecasted target					
	2023/24	**2024/25**	**2025/26**	**2026/27**	**2027/28**
Mathematics	62%	78%	86%	107%	108%
English	71%	87%	105%	106%	107%
Physics	21%	20%	19%	18%	18%
Chemistry	68%	80%	88%	108%	113%
Biology	81%	103%	118%	119%	120%
MFL	33%	33%	32%	32%	32%
History	111%	118%	121%	122%	122%
Geography	55%	61%	67%	75%	85%
Computing	33%	32%	30%	30%	31%
Art & Design	49%	42%	37%	34%	32%
Drama	79%	82%	73%	68%	65%
Classics	178%	188%	188%	187%	185%
Design & Technology	26%	25%	24%	24%	23%
Music	33%	30%	28%	26%	24%
Business Studies	18%	16%	15%	13%	13%
Physical Education	180%	193%	>200%	>200%	>200%
Religious Education	42%	39%	36%	34%	32%
Other	14%	12%	10%	9%	8%
Primary	98%	117%	123%	126%	117%
All science	44%	47%	47%	48%	48%
All secondary	49%	49%	49%	49%	48%
Capped secondary supply	46%	47%	46%	45%	44%
Capped overall supply	60%	60%	58%	57%	56%
Cost, compared to baseline (scenario 3)					
Primary teacher pay (£m)	0	0	0	0	0
Secondary teacher pay (£m)	0	0	0	0	0
Total teacher pay (£m)	0	0	0	0	0
Bursaries (£m)	0	0	0	0	0
Early career payments (£m)	0	0	71	71	71
Grand total (£m)	0	0	71	71	71
Grand total (including on-costs, £m)	0	0	71	71	71

Key	
Likely below target	
Leaning below target	
Leaning above target	
Likely above target	

Scenario 13 - Optimise bursaries					
Teacher supply - forecasted ITT recruitment as a proportion of forecasted target					
	2023/24	**2024/25**	**2025/26**	**2026/27**	**2027/28**
Mathematics	62%	77%	91%	100%	100%
English	71%	100%	100%	100%	100%
Physics	21%	21%	20%	20%	20%
Chemistry	68%	81%	95%	100%	100%
Biology	81%	135%	154%	158%	163%
MFL	33%	38%	39%	42%	44%
History	111%	118%	121%	122%	122%
Geography	55%	71%	87%	100%	100%
Computing	33%	34%	33%	33%	34%
Art & Design	49%	78%	98%	100%	100%
Drama	79%	100%	100%	100%	100%
Classics	178%	100%	100%	100%	100%
Design & Technology	26%	33%	34%	36%	38%
Music	33%	56%	65%	77%	95%
Business Studies	18%	30%	31%	31%	33%
Physical Education	180%	193%	>200%	>200%	>200%
Religious Education	42%	73%	93%	100%	100%
Other	14%	22%	21%	20%	19%
Primary	98%	117%	123%	126%	117%
All science	44%	54%	55%	54%	54%
All secondary	49%	58%	60%	61%	61%
Capped secondary supply	46%	56%	57%	58%	58%
Capped overall supply	60%	66%	67%	68%	69%
Cost, compared to baseline (scenario 3)					
Primary teacher pay (£m)	0	0	0	0	0
Secondary teacher pay (£m)	0	0	0	0	0
Total teacher pay (£m)	0	0	0	0	0
Bursaries (£m)	0	189	162	128	131
Early career payments (£m)	0	0	0	0	0
Grand total (£m)	0	189	162	128	131
Grand total (including on-costs, £m)	0	189	162	128	131

Key	
Likely below target	
Leaning below target	
Leaning above target	
Likely above target	

Scenario 14 - Balanced package					
Teacher supply - forecasted ITT recruitment as a proportion of forecasted target					
	2023/24	2024/25	2025/26	2026/27	2027/28
Mathematics	62%	87%	100%	100%	100%
English	71%	100%	100%	100%	100%
Physics	21%	22%	22%	24%	26%
Chemistry	68%	90%	100%	100%	100%
Biology	81%	147%	184%	>200%	>200%
MFL	33%	39%	43%	50%	62%
History	111%	129%	142%	157%	177%
Geography	55%	75%	100%	100%	100%
Computing	33%	36%	37%	42%	50%
Art & Design	49%	82%	100%	100%	100%
Drama	79%	100%	100%	112%	138%
Classics	178%	100%	100%	100%	100%
Design & Technology	26%	34%	37%	42%	49%
Music	33%	59%	72%	98%	100%
Business Studies	18%	31%	33%	36%	41%
Physical Education	180%	>200%	>200%	>200%	>200%
Religious Education	42%	77%	100%	100%	108%
Other	14%	22%	22%	22%	23%
Primary	98%	138%	170%	>200%	>200%
All science	44%	58%	59%	61%	65%
All secondary	49%	61%	64%	66%	71%
Capped secondary supply	46%	58%	59%	60%	62%
Capped overall supply	60%	67%	67%	67%	69%
Cost, compared to baseline (scenario 3)					
Primary teacher pay (£m)	0	120	247	423	653
Secondary teacher pay (£m)	0	117	240	411	634
Total teacher pay (£m)	0	252	516	884	1,365
Bursaries (£m)	0	181	107	41	18
Early career payments (£m)	0	0	32	32	32
Grand total (£m)	0	432	656	957	1,415
Grand total (including on-costs, £m)	0	526	850	1,289	1,926

Key	
Likely below target	
Leaning below target	
Leaning above target	
Likely above target	

Scenario 15 - Bold package					
Teacher supply - forecasted ITT recruitment as a proportion of forecasted target					
	2023/24	**2024/25**	**2025/26**	**2026/27**	**2027/28**
Mathematics	62%	95%	100%	100%	100%
English	71%	100%	100%	100%	109%
Physics	21%	23%	23%	26%	29%
Chemistry	68%	97%	100%	100%	100%
Biology	81%	150%	194%	>200%	>200%
MFL	33%	40%	45%	53%	69%
History	111%	132%	148%	167%	193%
Geography	55%	76%	100%	100%	100%
Computing	33%	38%	40%	48%	61%
Art & Design	49%	83%	100%	100%	104%
Drama	79%	100%	104%	125%	158%
Classics	178%	100%	100%	100%	131%
Design & Technology	26%	35%	38%	44%	54%
Music	33%	59%	75%	100%	100%
Business Studies	18%	31%	34%	38%	44%
Physical Education	180%	>200%	>200%	>200%	>200%
Religious Education	42%	78%	100%	103%	122%
Other	14%	23%	22%	23%	25%
Primary	98%	145%	187%	>200%	>200%
All science	44%	60%	60%	64%	71%
All secondary	49%	62%	65%	68%	76%
Capped secondary supply	46%	59%	59%	60%	64%
Capped overall supply	60%	67%	67%	67%	70%
Cost, compared to baseline (scenario 3)					
Primary teacher pay (£m)	0	99	203	356	561
Secondary teacher pay (£m)	0	95	195	341	538
Total teacher pay (£m)	0	205	421	737	1,162
Bursaries (£m)	0	178	79	18	2
Early career payments (£m)	0	0	71	71	71
Grand total (£m)	0	383	571	826	1,236
Grand total (including on-costs, £m)	0	460	728	1,102	1,671

Key	
Likely below target	
Leaning below target	
Leaning above target	
Likely above target	

Scenario 16 - Adventurous package					
Teacher supply - forecasted ITT recruitment as a proportion of forecasted target					
	2023/24	2024/25	2025/26	2026/27	2027/28
Mathematics	62%	100%	100%	164%	>200%
English	71%	100%	108%	142%	194%
Physics	21%	26%	28%	35%	50%
Chemistry	68%	100%	100%	121%	191%
Biology	81%	174%	>200%	>200%	>200%
MFL	33%	42%	52%	71%	100%
History	111%	153%	191%	>200%	>200%
Geography	55%	82%	100%	100%	112%
Computing	33%	44%	50%	82%	100%
Art & Design	49%	90%	100%	120%	177%
Drama	79%	110%	144%	>200%	>200%
Classics	178%	100%	128%	147%	>200%
Design & Technology	26%	37%	43%	56%	83%
Music	33%	63%	88%	100%	146%
Business Studies	18%	33%	38%	46%	63%
Physical Education	180%	>200%	>200%	>200%	>200%
Religious Education	42%	85%	100%	147%	>200%
Other	14%	24%	25%	27%	32%
Primary	98%	117%	123%	126%	117%
All science	44%	64%	69%	85%	100%
All secondary	49%	65%	71%	88%	119%
Capped secondary supply	46%	60%	61%	65%	73%
Capped overall supply	60%	70%	72%	77%	85%
Cost, compared to baseline (scenario 3)					
Primary teacher pay (£m)	0	0	0	0	0
Secondary teacher pay (£m)	0	341	708	1,102	1,525
Total teacher pay (£m)	0	383	794	1,236	1,710
Bursaries (£m)	0	120	19	-18	-72
Early career payments (£m)	0	0	380	380	380
Grand total (£m)	0	503	1,194	1,598	2,017
Grand total (including on-costs, £m)	0	646	1,491	2,061	2,658

Key	
Likely below target	
Leaning below target	
Leaning above target	
Likely above target	

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