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Research Report

The longer-term costs and benefits of different initial teacher training routes

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The Longer-Term Costs and Benefits of Different Initial Teacher Training Routes

IFS Report 118

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Foreword

Since the 1960s, when the push began to make teaching an all-graduate profession, the roles of higher education institutions and schools in initial teacher training (ITT) have been the focus for debate and significant variation in practice, in both undergraduate teaching degrees (BEd) and post-graduate (PGCE) courses. Further policy-making has resulted in a proliferation of training routes, as well as incentives for aspirant teachers. This has been accompanied by sporadic debate about theory and ideology versus practice and 'craft', and an associated reduction in the role of universities in teacher training.

In 1992 Ken Clarke made it a requirement for all ITT to involve partnerships between HEIs and schools. From then, new routes into teaching were introduced (building on the Articled and Licensed Teacher schemes), including SCITT (school-centred), the Graduate Teacher Programme (GTP) – an employment-based and immediately-salaried route ostensibly aimed at older entrants, and Teach First – an employment-based route aimed at 'high-flying' new graduates. The Coalition Government introduced Teaching Schools (which gives well-performing schools a wider professional development role), and School Direct, a school-led route where participating schools contract accredited training providers and then recruit, select and employ their own trainees. Underlying the development of these new routes is a trend towards giving schools ever-increasing responsibility for the development and accreditation of newly-qualified teachers, which looks set to grow if the aims of the recent 'Educational excellence everywhere' White Paper are realised.

Despite the recognition of teaching quality as having prime importance, the new routes appear to have been developed with little or no consideration of evidence pertaining to their relative costs and benefits. In response to this, the Nuffield Foundation funded a group of researchers – led by the Institute for Fiscal Studies – to explore the topic in more detail. As the project has progressed, concern about teacher supply has increased. Historically the 24,000 or so state schools in England have required an influx of around 35,000 new teachers each year to maintain staffing levels, and although this demand fluctuates from year to year, it is likely to increase over the coming years as pupil numbers rise.

Against this backdrop of growing demand, teacher supply and retention in England has moved from a centrally managed, university-led system, to a devolved and more locally responsive model, which in recent years has included greater local decision-making on the number of teachers needed in each area. This new, supply-side model appears to be out of step with those of countries frequently cited as 'high-performing', and there are concerns – not least from some schools – that it is not yet delivering sufficient supply, retention, and quality assurance of teachers. Careful consideration of the costs (and associated benefits) of the current training routes is required in order to address these concerns.

This report provides the first step in that direction and is essential reading for all those involved in teacher supply and retention strategies in England. It also demonstrates how vital it is to have coherent, reliable, and accessible training and employment data for teachers, something that the researchers have used in their work to great effect. Without this evidence, there is a danger that reforms are a set of costly leaps in the dark which may have an adverse effect on outcomes for children and young people.

Josh Hillman
Acting Director
The Nuffield Foundation

Preface

As collaborators for this project, the Fischer Family Trust, the Institute for Fiscal Studies (IFS) and the National Foundation for Educational Research would like to sincerely thank the Nuffield Foundation for funding and supporting this research (grant number EDU/41313). The Nuffield Foundation is an endowed charitable trust that aims to improve social well-being in the widest sense. It funds research and innovation in education and social policy and also works to build capacity in education, science and social science research. The Nuffield Foundation has funded this project, but the views expressed are those of the authors and not necessarily those of the Foundation. More information is available at <http://www.nuffieldfoundation.org>. We also appreciate the Economic and Social Research Council, whose support through the Centre for the Microeconomic Analysis of Public Policy (grant number ES/H021221/1) at the IFS underpins much of IFS's research. This project would not have been possible without the time taken by schools to complete the survey, and to participate in case studies that informed our survey design, for which we are extremely grateful. We hope that schools find the findings informative and valuable. The advisory group for this project has been extremely valuable and has greatly informed our analysis. Estimates of the central costs for government were informed by information provided by the National College for Teaching and Leadership, in particular Michelle Moore, to whom we are very grateful. We acknowledge the Department for Education for providing the data relating to pupil attainment and staff composition of schools in England, and retention.

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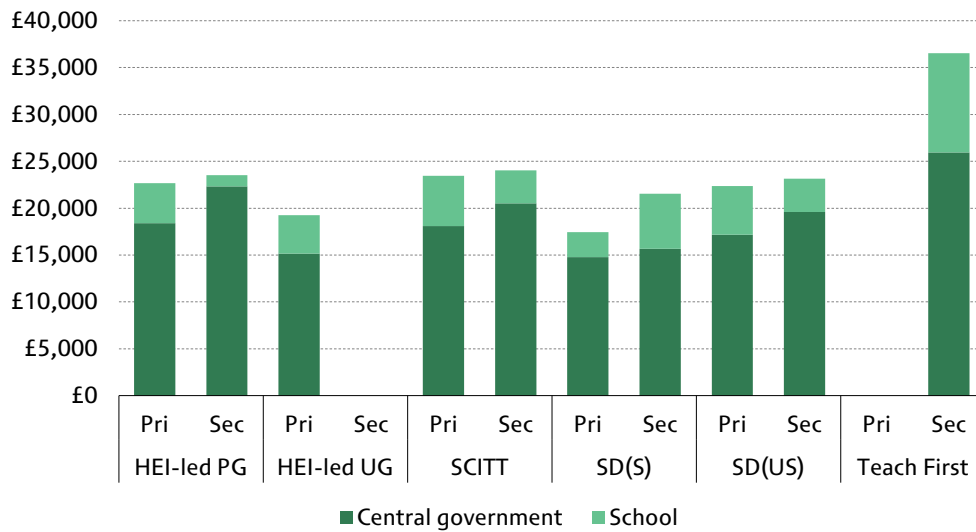
Executive Summary

- There are various routes to achieving qualified teacher status (QTS) in England. They cost the taxpayer different amounts and, potentially, have different consequences for trainees, schools and pupils. There is currently a policy shift towards school-led initial teacher training (ITT) – away from traditional higher education institution (HEI)-led training – and this highlights the need for an independent assessment of the financial costs of each route in comparison to the benefit it brings.
- This report makes a large contribution to this aim, calculating the average cost per trainee per route for central government and schools, in the context of the benefits reported by schools. In addition, this report provides the most recent evidence on the retention of teachers trained through different routes, and a summary of the longer-term cost-effectiveness of each route in England.
- Around 35,000 individuals train to become teachers each year, through six main routes. Some features of routes vary, particularly in how they are funded, but all lead to QTS, and all except undergraduate (UG) training can lead to a Postgraduate Certificate of Education (PGCE). The main distinctions between routes are whether they are school-led or HEI-led, and whether the trainee is employed by a school during training. School-led routes have grown in recent years, with School Direct (salaried and unsalaried) accounting for around one-third of trainees in 2015–16, although over 40% of trainees still trained through HEI-led postgraduate (PG) courses. Teach First, where trainees work in a relatively disadvantaged school while working towards QTS (and commit to one year after QTS), accounts for around 5% of trainees, although this route has also grown over time.

Costs and benefits to central government and schools

- The average cost to central government and schools (here referred to as the total average cost) for secondary school trainees is similar across all routes, with the exception of Teach First. The average cost of non-Teach First secondary routes varies between £18,200 and £23,500. The average total cost of a Teach First trainee is £38,200, which is £14,000 higher than for any other route. This variation in total average costs is less evident for primary school trainees.
- The total average costs for primary school trainee teachers are slightly lower than for secondary school trainees across all routes, and there is less overall variation. They range between £17,000 for School Direct salaried and £23,000 for HEI-led PG routes.

Average cost per trainee per route (2013–14)



Note: See Appendix C for a full description of the data and assumptions underlying these figures.
Source: Survey of primary and secondary schools and ITT performance profiles.

- The total average cost per trainee is largely made up of costs to central government, but the average costs to schools are sizeable, particularly for some routes. For example, the average cost to schools per Teach First trainee is around £11,000 (accounting for the offsetting contribution trainees make to teaching).
- The costs to central government across routes are from direct funding to ITT providers, grants to schools, provision of student finance and provision of student bursaries. There is scope for rationalising this system of funding. Our research suggests that: removing tuition fees for PG teaching training routes could remove a potential deterrent to train at relatively low cost; justification is required for the substantial difference in funding from central government between routes, most notably for Teach First; further research is required to measure whether the relatively expensive policy of tax-free bursaries for trainees in high-priority subjects increases the long-term supply of high-quality teachers 'in service'.
- The benefits of being involved with ITT, such as trainees' contribution to teaching, staff capacity and fresh teaching ideas, outweigh the costs for most schools. This is true for routes with larger net costs for schools, such as Teach First, which suggests that these routes also have larger benefits for the schools. A non-negligible proportion of school leaders in our survey believe that the benefits of involvement with ITT are *lower* than the costs, however, particularly for some routes. For example, around 30% of primary school head teachers involved with School Direct salaried reported that the benefits were less than the costs, in comparison with 6% for its predecessor, the Graduate Teacher Programme (GTP).

Retention and mobility

- The cost-effectiveness of ITT depends on the retention rate of teachers (defined from those who begin training). Lower retention implies that the average cost of training a teacher who remains (or starts) in teaching increases. There could also be negative consequences for pupil outcomes due to a lower number of experienced teachers. The mobility of teachers across schools and regions informs the design of the whole ITT system. For example, low regional mobility implies that the allocation of training places across regions should depend in part on the local demand for teachers. Low mobility across schools implies that school-led training has potentially large consequences for unequal access to newly qualified teachers (NQTs) in England across schools that have or do not have the capacity to support school-led trainees to become effective teachers.
- Between 58% and 68% of primary school trainees from each route are 'in service' in the state-funded education sector five years after their expected date of qualification. The retention rate is highest for the GTP (which was replaced by School Direct; i.e., 65–68%) and lowest for HEI-led PG routes (i.e., 58–61%).
- The five-year retention rates for secondary school trainees are lower than for primary school trainees on average and more variable across routes, ranging from 37–44% for Teach First to 59–62% for the GTP.
- The variation in retention rates across routes implies a variation in the average cost to central government per trainee 'in service' five years after expected date of qualification, between £59,000 and £70,000 for Teach First, and between £25,000 and £44,000 for all other routes.
- As expected, trainees from Teach First are disproportionately likely to teach in schools with the most disadvantaged population of pupils, conditional on being 'in service' after three years. Trainees from other routes are roughly equally distributed across school types. Disadvantaged schools are a particular focus for government and this may provide some justification for the larger costs of training for this route.
- In general, trainees from school-led routes are typically less mobile across schools and regions, although trainees from Teach First are the most mobile. Conditional on being 'in service', 41% of teachers trained through Teach First are in the same school three years after qualification, compared to 72% trained through GTP and 64% for the HEI-led UG route, the next lowest. Teachers trained through the HEI-led UG route are most likely to move regions between training and starting to teach, suggesting that there is less need to focus training place allocations for this route to particular regions.
- Our research suggests that retention may be affected by the relative pay of teachers and other local workers. This is especially relevant given the current public sector pay restraint. Higher local wages are associated with lower retention rates of teachers. The probability of remaining 'in service' the

following year decreases by around 1 percentage point for a 10 percent increase in local wages. This effect is cumulative, so is equivalent to a 5 percentage point decrease over five years for a 10 percent increase in local wages. Teachers trained through different routes vary in responsiveness to the local labour market, perhaps suggesting that alternative options are more or less salient for trainees from some routes.

Wider considerations for an optimal system of ITT

- The National College for Teaching and Leadership (NCTL) allocates teacher training places to HEI and non-HEI providers. The distribution of places has historically been 'quality led' on the basis of Ofsted ratings. There is some evidence that the allocation responds in part to the demand for teachers at the regional level, although the North West and North East regions are outliers with disproportionately many trainees. The allocation of School Direct training places is unrelated to the demand for teachers at the regional level, or the presence of alternative routes.
- There is some evidence that a disproportionate allocation of teacher training places relative to the demand for teachers is related to a lower retention rate, and therefore to a higher average cost of training for each teacher who remains 'in service'. Future allocation of training places should therefore take into account the regional demand for teachers, given that most teachers do not subsequently move regions.
- Future allocation of training places should be transparent and provide longer-term certainty for providers, who should make appropriate long-term decisions based on the best available information. As suggested in the government's 2016 White Paper, this should involve allocations for each provider, rather than national allocations taken on a 'first-come first-served' basis, which may lead to reductions in the quality of trainee accepted.

In the context of the substantial recent reforms to the ITT system, this has addressed a number of important issues. However, it also raises significant questions, which should be the focus of future research, including the following. How should the quality of training be monitored and assured as providers become more dispersed? How are the costs of teacher training affected by economies of scale? How effective are bursaries at increasing the number or quality of teachers in the medium term? What is the long-term effectiveness of teachers trained through each route?

1. Introduction

The Department for Education (DfE) 2016 White Paper recognises the widely held view that teacher recruitment and retention are increasingly challenging for schools, with recruitment becoming more difficult as the economy grows, the pools of graduates in key subjects decline and pupil numbers grow.¹ The National Audit Office (NAO) also concludes that indicators point to growing teacher shortages.² Between 2016 and 2020, the number of teachers will need to increase by 30,000 (around 7% of the current school workforce) if pupil:teacher ratios are to be maintained (Belfield and Sibieta, 2015).

In addition to increasing the number of teachers, the government is also seeking to improve the *quality* of the teacher workforce, following the consensus in the research community that being taught by a good teacher can have a dramatic impact on pupils' academic attainment and later outcomes (Rockoff, 2004; Rivkin et al., 2005; Aaronson et al., 2007; Sutton Trust, 2011; Slater et al., 2012). For example, Hanushek (2011) calculates that replacing the least effective 5–8% of teachers with teachers of average effectiveness would move the US from a mid to upper position in international league tables of educational performance.

To address these challenges, the DfE has introduced reforms to the provision of initial teacher training (ITT) and large financial incentives to train for applicants with high previous academic attainment.³ These reforms have sought to increase the role schools themselves take in training new teachers, with the introduction of the School Direct (school-led) training routes and the expansion of teaching schools.⁴ The transition to a school-led system, from a traditionally Higher Education Institution (HEI)-led system, is reaffirmed in the 2016 White Paper, which states that the government will continue to move to an 'increasingly school-led ITT system which recruits enough great teachers in every part of the country, so that the best schools and leaders control which teachers are recruited and how they are trained'. The number of School Direct trainees has increased from 350 in its introduction in 2012–13 to over 10,000 (around one-third of the total number of trainees) in 2015–16.

¹ Educational Excellence Everywhere, March 2016, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/508447/Educational_Excellence_Everywhere.pdf.

² Training new teachers, February 2016, <https://www.nao.org.uk/wp-content/uploads/2016/02/Training-new-teachers.pdf>.

³ The Importance of Teaching: The Schools White Paper 2010, November 2010, <http://www.education.gov.uk/schools/toolsandinitiatives/schoolswhitepaper/b0068570/the-importance-of-teaching>.

⁴ Teaching schools: a guide for potential applicants, March 2014, <https://www.gov.uk/teaching-schools-a-guide-for-potential-applicants>.

Despite the keen policy interest and reform in this area, there is little existing evidence on the costs and benefits of different teacher training routes and how they relate to longer-term teacher effectiveness and retention. This is especially important in a system that is changing dramatically.

Previous work by this research team provided the first evidence on the short-term costs and benefits of each of the ITT routes in England, to both schools and central government. Our research was based on a survey of schools, which captured information about specific costs and benefits of engaging in ITT (such as teacher time spent mentoring or payments to/from ITT providers), the overall cost or benefit to the school and subjective measures of trainee quality. The survey was sent to schools with and without experience of school-led ITT and combined with administrative data sources to investigate the characteristics of schools that take each type of trainee and the short-term impact of these trainees on pupil attainment. This report summarises these findings and assesses the longer-term implications of such costs by analysing the early career retention rate and mobility across schools for teachers trained through different routes. The data required for this work were provided by the National College for Teaching and Leadership (NCTL) under contract with the DfE, and are described in full in Allen et al. (2016a).

This report comprehensively demonstrates the costs and benefits to central government and schools involved with different teacher training routes, calculating the marginal cost of training an additional teacher through each route. This is timely and valuable information for policymakers and schools involved, or considering involvement, with ITT.

Our first contribution is to document the most recent retention rates across different ITT routes. A number of studies have estimated the retention rates of different groups of teachers, at different points in their career using different datasets. These all lead to different estimates as each dataset has its idiosyncratic issues that affect the estimates (for more details on previous studies, see Appendix F). Our study uses the first linkage of the data required to estimate retention rates on a consistent basis for each of the ITT routes, for each of the first five years post-QTS. We define retention as the proportion of those that begin ITT who are still in teaching each year after QTS. We use the number of individuals who begin ITT as a base to best approximate the cost associated with teacher training (this is different from the methodology used by the DfE, where the base is the number of trainees who achieve QTS). The estimates of the retention rate presented here are likely to be at the lower end of the probable range due to missing records in the teacher data (discussed in more detail in Appendix A, this additional uncertainty is reflected in the error bars and ranges given). However, all relevant sources of data in this area are likely to suffer from similar problems. We provide the most reliable estimates to date of the early retention rate for teachers trained through the current range of ITT routes.

We document the distribution of teachers trained through different routes across school types (defined by the level of disadvantage in the pupil population and attainment). Work by Smithers and Robson (2005) and Allen et al. (2012) examines the movement of teachers across schools and how this relates to the

level of disadvantage in the school. Our work extends this and, for the first time, provides evidence of how the relationship between school characteristics and the movement of teachers depends on the route through which they trained, using a national administrative source. We show that there are few differences across those trained through different routes in the distribution and mobility across school types, although teachers trained through Teach First are more likely to teach in disadvantaged schools, and to move to schools with lower levels of pupil disadvantage and higher levels of attainment.

We consider how regional differences in the allocation of training places relate to regional differences in the demand for teachers and how this interacts with the geographical mobility of teachers to affect the retention rate of those trained in different regions. This has implications for the governments' teacher supply model and allocation of training places across regions.

Next, we analyse the relationship between wages in the local labour market and retention. This is of particular relevance given the recent government announcements constraining average teacher pay to grow by 1% per year until 2019–20. Our analysis suggests that teachers' decisions are at least in part affected by the external labour market and that the government pay policy has the potential to reduce the retention rate of teachers.

Finally, we combine these findings with evidence of the short-term costs and benefits for an overall assessment of each route into teaching, building on the findings of Allen et al. (2014). There are remaining questions to be answered, however, before it can be determined whether the current system of ITT (including the allocation of training places between school-led and HEI-led providers) offers value for money and best meets the priorities for government.

Analysis of the wider costs and benefits to teacher training routes, such as differences in teacher quality, requires access to information on applications made to each route, more detailed information on the prior attainment and potential quality of each applicant, and the ability to measure longer-term retention and the effectiveness of successful applicants in raising pupil attainment. These research questions should be factored in to the government's ambitious reforms to ITT and teacher development in England.

Teacher training routes in England

Around 35,000 individuals train to become teachers each year, through six main routes. Some features of routes vary, particularly in their funding, but all lead to QTS and, with the exception of the HEI-led undergraduate (UG) route, all can lead to a Postgraduate Certificate of Education (PGCE). The main distinctions between routes are whether they are school-led or HEI-led, and whether the trainee is employed by a school during training. School-led routes have grown in recent years, with School Direct (salaried and unsalaried) accounting for around one-third of trainees in 2015–16, although over 40% of trainees still trained through HEI-led postgraduate (PG) courses. Teach First, where trainees work in a relatively disadvantaged school while working towards QTS (and commit to one year after QTS), accounts for around 5% of trainees, although this route has also

Longer-term costs and benefits of different initial teacher training routes

grown over time. The key features for each route considered in this report are shown in Table 1.1.

Table 1.1. Main initial teacher training in England.

	Route						
	UG	PG	SCITT	SD(US)	SD(S)	GTP	Teach First
Number starting training (2013–14) ¹	5,725		20,378 ⁴	4,203	2,473	N/A	1,261 ⁵
Number starting training (2014–15) ²	5,936	14,695	1,988	6,311	2,759	N/A	1,426 ⁶
Number starting training (2015–16) ^{2,3}	5,440	13,561	2,372	7,086	3,166	N/A	1,584
Who leads recruitment and training?	HEI	HEI	School-centred provider	School	School	School	Teach First
HEI involvement in training	✓	✓		Some/ varying	Some/ varying	Some/ varying	✓
Trainees employed by a school					✓	✓	✓
Need not be supernumerary					✓		✓
Years to QTS	3(4)	1	1	1	1	1	1
Graduate		✓	✓	✓	✓	✓	✓
Prior work experience					✓	✓ (typically)	
Qualification	BA, BSc or BEd with QTS	QTS and PGCE	QTS, usually with PGCE	QTS, usually with PGCE	QTS, usually with PGCE	QTS	QTS and PGCE

Note:

¹ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/438698/Main_tables_SFR48_2014.xls.

² https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/477891/Main_tables_SFR_46_2015_to_2016.xls.

³ Data for 2015–16 are provisional.

⁴ Numbers for PG and SCITT are not reported separately for 2013–14.

⁵ <https://www.teachfirst.org.uk/news/prime-minister-pupils-and-teachers-celebrate-our-success-top-graduate-employer>.

⁶ <https://graduates.teachfirst.org.uk/sites/graduates.teachfirst.org.uk/files/2014%20cohort%20profile.pdf>. Two routes are excluded from this report due to small numbers of trainees: Troops to Teachers and Researchers in Schools.

2. Data

In this chapter, we describe the sources of data used to produce the findings presented in this report. The purpose of these sources of data is to produce the most up-to-date figures on the retention of individuals that begin ITT (see Sections 2.1 and 2.2); to measure the responsiveness of retention to local labour market conditions (Section 2.3); to measure the costs and benefits of involvement with ITT to schools and the characteristics of trainees (Section 2.4).

2.1 School Workforce Census

The School Workforce Census (SWFC) is an annual record of the school workforce in state-funded schools in England, maintained by the DfE.⁵ The SWFC was introduced in November 2010, replacing multiple previous data collections (e.g. the local authority focused 618g survey and the Secondary Schools Curriculum and Staffing Survey). We use the annual census between 2010 and 2014, inclusive, primarily as a record of the presence of an early career trainee in the state-funded sector, from which we calculate the retention rate of trainee teachers. The SWFC also contains a range of individual-level characteristics, such as gender, age, ethnic group, pay grade and type of contract, which are useful to our analysis.

The SWFC should contain data on all staff in regular employment, defined by a contract of 28 days or longer. This includes contracts that were open on the census date and also those that were open but ended during the previous academic year. Supply teachers, unless centrally employed by the local authority, are therefore less likely to be recorded in the SWFC, and therefore counted in the number of ‘in service’ teachers from each cohort.

There are some concerns about the completeness and accuracy of the SWFC, particularly in its first years, as schools adjusted to the new data collection. We consider this in more detail in Appendix A.

These data are also used to construct school- and department-level characteristics for use in the school-level analysis, such as the proportion of teachers with short tenure at the school, and to calculate the average pay of staff members at different pay grades to inform the overall costs of training for schools. We also calculate typical career and wage progression to inform the likely repayment of student loans for ITT.

⁵ The definition of ‘state-funded schools’ includes local authority maintained schools, academy schools, free schools, City Technology Colleges and Pupil Referral Units (PRUs). Information about centrally employed teachers is collected from local authorities. The SWFC does not collect data from independent schools, sixth forms and other further education colleges.

2.2 Initial Teacher Training Performance Profiles

The Initial Teacher Training Performance Profiles (ITTPP), maintained by the NCTL, are designed to provide information on the characteristics and outcomes of ITT providers, with the aim of helping potential trainee teachers make informed choices, to monitor the performance of providers and to support evaluation.

We use the ITTPP as the complete record of trainees who began training through each route, for the academic years 2009–10 to 2013–14, inclusive. (We refer to trainees who are expected to achieve or achieve QTS in the academic year 2009–10 as the 2010 cohort, and so on.) The ITTPP is essential to measure the retention rate of trainees from different routes, as route of training is not routinely collected in the SWFC.

The ITTPP contains individual-level data for each trainee registered with an ITT provider. These include name, date of birth and teacher reference number, which are solely used to link the data to the SWFC to calculate retention rates (described above). Relevant to our research are age, gender, degree class, subject, and date achieved QTS. Information at the provider level, such as provider ID and region, is also available. The data exclude information on whether the trainee was in service six months after QTS, which would be useful to compare to published statistics, but this is not central to our study. The data also exclude QTS grade (an indicator for trainee quality). This may have provided an interesting additional comparison across routes, as another factor that may affect the retention and mobility of trainees, and it is a potential area for further research.

2.3 Annual Survey of Hours and Earnings

The Annual Survey of Hours and Earnings (ASHE) is based on a 1% sample of employee jobs taken from HM Revenue and Customs PAYE records. Information on earnings and hours is obtained from employers and treated confidentially.⁶ We use publicly available local-authority-level data (for full-time workers) from ASHE to create a measure of local wages around each school. Our primary measure of local wages is a weighted average of all local authorities where the boundary is within 30 km of the school. This measure is similar to that used by Britton and Propper (2016) but uses male and female full-time wages (rather than male full-time wages) and the 70th percentile of wages in each local authority (rather than the wage for non-manual workers), and it is a weighted average of all local authorities within 30 km (rather than a simple average of all local authorities where the headquarters is in within 30 km of the school).⁷

⁶ <https://www.nomisweb.co.uk/articles/793.aspx>.

⁷ We choose the 70th percentile of local authority wages based on the relative salaries of early career teachers: an NQT teacher in England (M1) would be around the 50th percentile in the income distribution, around the 60th percentile in their third year (M3), and around the 70th in their fifth year (M5). If we assume that pay in the outside option must be greater or equal to current pay (assuming that non-pecuniary aspects of the job are not worse), then we should make

2.4 Survey of primary and secondary schools

The survey of primary and secondary schools used to inform the costs and benefits to schools involved with ITT throughout this report is described fully in Section 2.1 of Allen et al. (2014). The survey collected information about the school's central costs and the benefits to the school of participating in a given teacher training route (such as the cost of advertising and recruitment for school-led trainees), as well as information about the costs and benefits related to specific trainee teachers (such as whether the trainee contributed fresh teaching ideas and provided extra capacity). For secondary schools, the survey was split: we asked the person responsible for coordinating ITT activities (the 'ITT coordinator') questions about the central costs and benefits for the school, and we asked six subject leaders questions relating to specific trainees.⁸ In primary schools, the entire survey was sent to the head teacher, who would be expected to have detailed knowledge of both central school costs and the costs and benefits associated with specific trainees.

Response rates were lower than predicted at the beginning of the project, particularly for primary schools. However, the achieved samples are of similar sizes across routes, and the responding schools are broadly representative of schools involved with each route. This suggests that results from the survey can be generalised to the set of schools involved with ITT.

use of higher percentiles in our analysis. In practice, the percentiles are highly correlated, and we repeat our analysis using alternative measures for robustness.

⁸ The subjects specified for priority were English, mathematics, science, humanities, physical education, languages and arts (or separate subjects in these areas, such as geography and history).

3. The Costs and Benefits to Schools and Central Government

Training of teachers comes with a cost, and this cost is borne to a greater or lesser extent by central government, schools that are involved with training, ITT providers and the trainees themselves. Given the government's rapid expansion of school-led routes, it is vital to understand how these costs vary between the different ITT routes, and how they are shared across the stakeholders. In this chapter, we present the average cost of each main ITT route per trainee, to central government and schools, summarising and extending findings from Allen et al. (2014), which are the first comprehensive figures for England.

3.1 Average cost per route

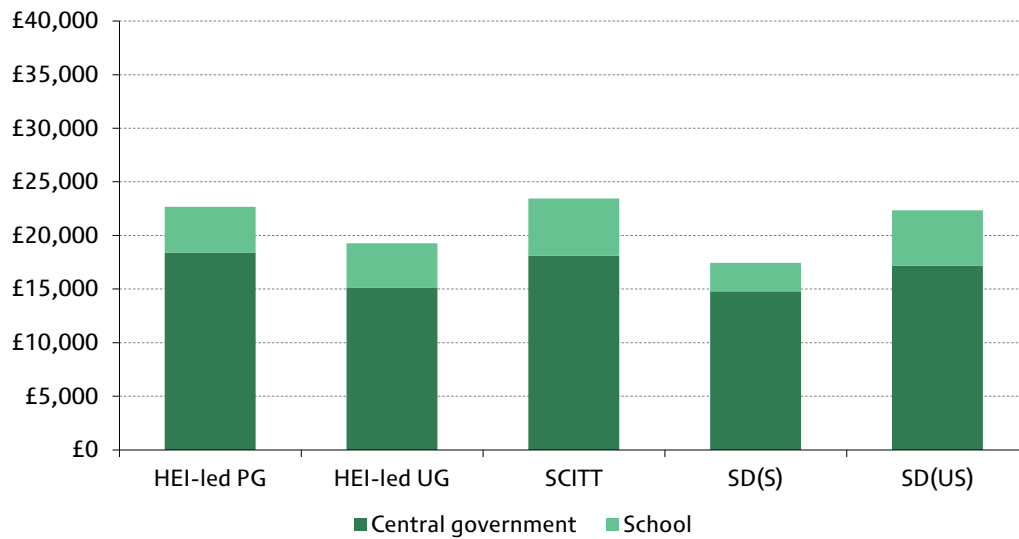
Figures 3.1 and 3.2 show the average cost for central government and schools, for each route, for primary and secondary schools, respectively. These figures are based on calculations reported in detail in Allen et al. (2014) (and summarised below). Average figures per route are calculated using the breakdown of trainee numbers in 2013–14 by route and relevant characteristics (such as subject, region and degree class).⁹ These figures do not take account of any indirect benefits to the school, such as expectation to hire, which may be particularly valuable for school-led routes. A detailed breakdown of these costs can be found in the online appendix to our interim report (Allen et al., 2014). Because of a lack of data about the allocation of bursaries and the take-up of student finance, these figures make a number of assumptions to calculate the average central costs these, outlined in Appendix C.

The average cost to central government is similar across tuition-fee routes for primary school trainees, varying from around £15,200 for HEI-led UG to £18,400 for HEI-led PG routes. This variation is primarily due to the structure of Higher Education finance. Undergraduate courses are longer and so have larger overall tuition fees and maintenance costs for trainees. However, the average cost to central government is lower, as most postgraduate trainees have already acquired student loans from their undergraduate degrees. Our previous report (Allen et al., 2014) showed that an individual following an average teacher career would not even begin to pay off the additional loan.¹⁰ As a result, the loan subsidy (the cost to the government of providing the loan) associated with the smaller

⁹ These calculations are now possible due to new data provided by the NCTL.

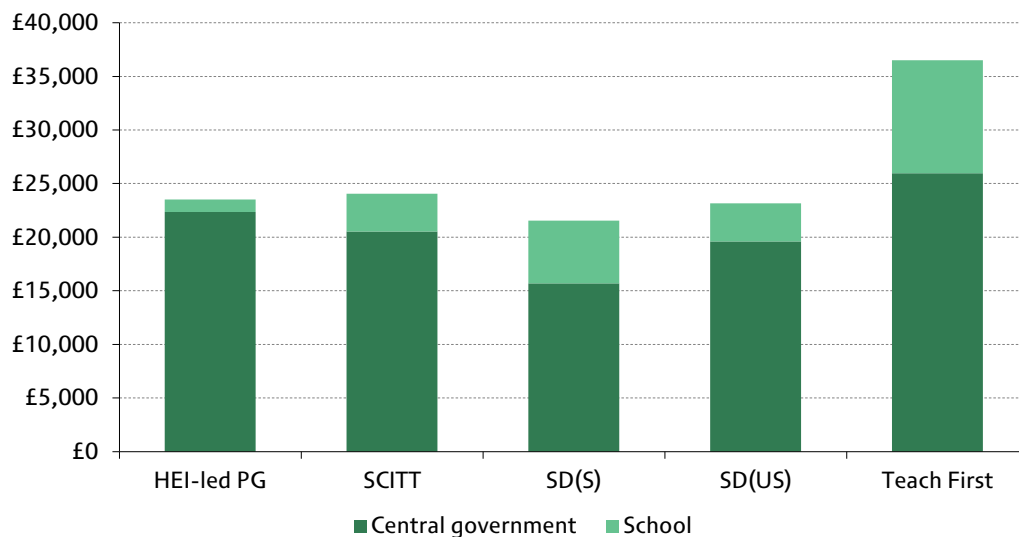
¹⁰ In reality, there is no distinction between student loans acquired through undergraduate and PGCE courses. However, we are considering the cost to government of ITT courses and so it is sensible to consider the PGCE debt as the marginal loan and hence paid off last. Doing so, we essentially compare the cost to central government of providing the undergraduate loan and PGCE loan with only providing the undergraduate loan.

Figure 3.1. Average cost per route: primary



Note: See Appendix C for a full description of the data and assumptions underlying these figures. Source: Survey of primary schools and ITTPP.

Figure 3.2. Average cost per route: secondary



Note: See Appendix C for a full description of the data and assumptions underlying these figures. Source: Survey of secondary schools and ITTPP.

HEI-led PG loan is larger than the loan subsidy associated with the larger HEI-led UG loan. In this context, the description of the available support as a loan, whilst factually accurate, is in practice rather similar to the previous bursary arrangements, but the terminology may be off-putting for already indebted graduates.

The School Direct salaried route has a slightly lower average central cost at £14,800 entirely made up from a direct grant from the NCTL to schools, ranging between £14,000 and £19,000.

The average cost accruing to the individual schools is around £4,000–£5,000 for all primary school routes except School Direct salaried. The lower average cost for School Direct salaried is a result of the average NCTL grant and the

contribution School Direct salaried trainees provide (in the place of a newly qualified teacher (NQT)) more than outweighs the cost to schools of the trainee's salary.

The costs to central government are generally higher and more variable for secondary school trainees, ranging from £15,700 for School Direct salaried to £26,500 for Teach First. The higher cost is due to the additional cost of the higher grants provided to secondary school trainees in priority subjects with a higher degree classification.

When the school costs are included, the average total cost is similar across routes for secondary school trainees, with the exception of Teach First, which has a significantly larger average total cost. This is a result of schools paying Teach First trainees a salary at least equal to the minimum of the NQT pay scale, in addition to the fees schools pay Teach First and the grant NCTL pays for Teach First teacher training. It is worth noting that these figures include the contribution to teaching provided by both School Direct salaried and Teach First trainees, valued at the amount it would cost to employ the equivalent proportion of an NQT in their place.¹¹ However, it may be that schools value this contribution differently (potentially due to recruitment difficulties) and there are additional omitted benefits that may help to explain why schools *choose* to engage in the School Direct salaried and Teach First routes despite the high costs to the school.

The focus of this report is on the costs and benefits to schools and central government; however, it is worth considering the variation in the amount of funding ITT providers receive for trainees on the different training routes. Most notably, Teach First receives net funding of £28,700 per trainee (this includes direct grants from the NCTL, fees paid by schools and voluntary contributions, and this is net of the payment to schools to cover mentoring). This compares with the £9,000 HEI providers receive in tuition fees for HEI-led PG courses. It should be noted that ITT providers cover a different range of services on different routes. For example, Teach First cover all the recruitment costs for their training route; however, justification is required for whether the higher direct funding represents value for money.

Costs to central government

Table 3.1 summarises the funding that is available to each route, and whether this funding varies according to characteristics of trainees or schools involved in training. Types of central costs are summarised more fully in Table 3.2. Teach First is the only route that receives a fixed amount of central funding per trainee, independent of the trainee's subject, degree class and region of training.

¹¹ We only include the contribution to teaching for School Direct salaried and Teach First trainees as these trainees are allowed to be supernumerary. It is possible that trainees from other routes provide additional capacity, which potentially offsets some of the time teachers spend with the trainees; however, as they are required to be supernumerary, schools could not have used the trainee to avoid employing an NQT and therefore the benefit cannot be valued in the same way. These benefits are included in the summary measure of costs and benefits reported in Table 3.3 and details on the contribution to teaching of all trainees can be found in Appendix F of Allen et al. (2014).

Table 3.1. Central costs relevant to each route

Central cost	HEI-led UG	HEI-led PG	SCITT	School Direct unsalaried	School Direct salaried	Teach First
Scholarship		✓ [†]	✓ [†]	✓ ^{†*}		
Bursary		✓ [†]	✓ [†]	✓ ^{†*}		
Tuition fee and maintenance loan	✓ ^{*†}	✓ ^{*†}	✓ ^{*†}	✓ ^{*†}		
Maintenance grant	✓ [†]	✓ [†]	✓ [†]	✓ [†]		
NCTL grant					✓ ^{†*}	✓

Note: [†] denotes whether funding is received and, if so, its amount varies with one or more trainee characteristics (degree class, subject or household income). ^{*} denotes whether funding is received and, if so, its amount varies with one or more school characteristics (region and pupil composition). Scholarship and bursary awards depend on school characteristics for School Direct unsalaried only by whether the ‘free school meals’ uplift is applied, if the award is granted.

Source: See notes to Table 3.2.

School Direct salaried funding depends on region,¹² subject (with higher funding for high-priority subjects)¹³ and school characteristics (with higher funding for trainees in schools where more than 35% of pupils are eligible for free school meals).

Funding for postgraduate tuition fee routes (School Direct unsalaried, HEI-led PGCE and SCITT) depends on eligibility for maintenance grants (and therefore the maximum available maintenance loan), degree class and subject (and consequently eligibility for a tax-free bursary), and award of a tax-free scholarship through a competitive process in high-priority subjects (excluding modern languages and including one other-priority subject – computer science). For School Direct unsalaried, there is also an uplift for trainees in schools where more than 35% of pupils are eligible for free school meals.¹⁴ Note that trainees on these routes cannot be awarded both a scholarship and a bursary, although all other aspects of student finance (tuition fee loans to cover the cost of tuition fees, maintenance grants and maintenance loans) are unaffected by these sources of funding. Funding for the HEI-led UG route is solely through tuition fees paid to the ITT provider. The central costs of these routes per trainee therefore vary according to the timing and total repayment of the loan, and eligibility for a maintenance grant (the size of which determines the maximum possible maintenance loan).

For Teach First and School Direct salaried, the trainee is paid a salary, a proportion of which is then paid in tax. To calculate the overall net cost to central government, this tax revenue must be deducted from the central costs. However,

¹² Wherever funding varies by region, there is higher funding for schools in Inner London, followed by Outer London, followed by Fringe London, followed by outside London.

¹³ High-priority subjects are defined by the DfE as physics, mathematics, chemistry and modern languages. Other-priority subjects are English, geography, history, computer science, classics, Greek, Latin, music, biology, physical education and primary.

¹⁴ This uplift was removed from the 2015–16 academic year.

Table 3.2. Central costs of ITT

Source of central cost	Description (academic year 2013–14)
Scholarship ^a	Scholarships are awarded through a competitive process by the Institute of Physics (IOP), the Royal Society of Chemistry (RSC), BCS (the Chartered Institute for IT) and the Institute of Mathematics and Its Application (IMA), primarily for trainees with at least a 2:1 degree class. The scholarship funding is £20,000 (tax free) per trainee, independent of region, ^b with a 25% uplift for School Direct unsalaried trainees whose training is based in a school (more than 60 days) where more than 35% of pupils are eligible for free school meals. ^c Trainees are not eligible for both scholarships and bursaries. Trainees on salaried routes are not eligible for scholarships or bursaries.
Bursary ^a	Bursaries are awarded by the NCTL and are tax free. The amount depends on subject and degree class, in general with higher amounts for high-priority subjects and higher degree classes. The lowest bursary amount is £4,000 for trainees for primary school (non-maths specialists) with a 2:1 and for trainees for secondary school in an other-priority subject. The highest bursary amount is £20,000 for trainees for secondary school in a high-priority subject with a first-class degree. ^d Bursaries are not available for: non-graduates; secondary school trainees with a third or lower in any subject; secondary school trainees with a 2:2 or lower in an other-priority subject or non-priority subject; and primary school trainees with a 2:2 or lower. There is a 25% uplift for School Direct unsalaried trainees whose training is based in a school (more than 60 days) where more than 35% of pupils are eligible for free school meals. ^c ITT providers will be able to award higher bursary awards than a trainee’s degree class would allow if they have outstanding potential, where trainees are not currently eligible for the highest bursary award. ^e Trainees are not eligible for both scholarships and bursaries. Trainees on salaried routes are not eligible for scholarships or bursaries.
Tuition fee and maintenance loan ^f	Tuition fee and maintenance loans are available to all trainees on non-salaried routes (including those eligible for a bursary or scholarship). The maximum tuition fee loan is £9,000 per annum. The maximum maintenance fee loan is £7,675 for those living away from home and training in London. Entitlement for the maintenance loan declines as the amount of maintenance grant increases (£0.50 for every pound). The cost of providing these tuition fee and maintenance loans to central government includes the long-term cost of non-repayment and the opportunity cost of the provision of loans.
Maintenance grant ^f	£3,354 per year for trainees on non-salaried ITT routes with household income less than £25,000; declining at a rate of £0.1876 per pound of household income to £50 at £42,611 and zero above this. Each pound of maintenance grant leads to a decline in entitlement to a maintenance loan of £0.50.
NCTL grant to schools ^g	No direct grant for HEI-led routes and School Direct unsalaried, which are funded through trainee’s tuition fees.

	Range between £14,000 and £26,000 for School Direct salaried depending on subject and area (zero for non-priority subjects at secondary level) and whether the school is eligible for a 10% uplift (where more than 35% of pupils are eligible for free school meals and the trainee is based in the school (more than 60 days)). ^c
NCTL contract	£25,958 for Teach First (£17,652 per trainee for ITT; £8,306 per trainee for expansion grant).

Note: All figures refer to the 2013–14 academic year (for trainees beginning their training in September 2013).

^a <http://webarchive.nationalarchives.gov.uk/20130423140808/http://education.gov.uk/get-into-teaching/funding/postgraduate-funding>.

^b The value of a scholarship has increased since 2013–14, to £25,000 (£30,000 for physics).

^c The ‘free school meals’ uplift was removed from the academic year 2015–16.

^d This maximum value has increased since 2013–14, to £30,000.

^e https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/193849/130430_Training_Bursary_Guide_AY_2013-14_V2.1.pdf.

^f <http://webarchive.nationalarchives.gov.uk/20130423140808/https://www.gov.uk/student-finance/loans-and-grants>.

^g Annex D of

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/237266/School_Direct_Manual_V6_0.pdf. Email correspondence with NCTL.

this requires contemplation of the counterfactual: another teacher would have been teaching, earning and paying tax in the place of the trainee.

To estimate the central cost of providing student finance for ITT, we model the timing and total repayment of tuition fee and maintenance loans, under the assumption that each trainee borrows the maximum possible amount.

For further details of how central funding varies within and across routes, and of how we have modelled the cost to central government of providing student finance for teachers, see Chapter 4 of Allen et al. (2014).

Direct costs to schools

There are four types of direct costs for schools involved with ITT.

First, secondary schools hosting School Direct salaried trainees pay ITT providers an average of £4,200 to provide elements of the course. This number is £3,300 for primary schools. In contrast, schools hosting trainees on the HEI-led PG, HEI-led UG, SCITT and School Direct unsalaried routes receive payments from ITT providers. These vary depending on the route and the length of placement; see Allen et al. (2014) for more details.

Second, School Direct salaried and unsalaried routes may face recruitment costs associated with attracting trainees to their school. Estimates from our survey suggest these vary between £100 and £400 in primary schools and between £300 and £700 in secondary schools.¹⁵

¹⁵ Note that these costs may have changed since application for all routes moved to UCAS.

Third, in order to have a Teach First trainee/teacher, schools pay Teach First an upfront recruitment cost of between £3,800 and £4,100 (depending on the subject and region).¹⁶

Finally, the school must pay the trainee's salary for the salaried routes (Teach First and School Direct salaried). For School Direct salaried, this is at least the minimum of the unqualified teacher pay scale, and for Teach First at least the minimum of the NQT pay scale. Schools receive a direct grant from the NCTL to offset the salary cost for School Direct salaried trainees, although the size of this grant depends on the subject, with no grant for trainees in non-priority subjects. However, for both these routes, the teacher is not required to be supernumerary – this cost may be in the place of hiring another teacher. To account for this, we take the difference between the salary paid to the trainee and a typical NQT, adjusting for the average contribution to teaching the trainees provide (as reported in our survey).

Indirect costs to schools

In addition to direct costs, schools also incur costs in the form of teacher time. Our survey captured the amount of time teachers spend with trainees performing a variety of tasks including observations (including feedback), mentoring, lesson planning support and written assessment. We then use the average wage of the teacher engaged in the task (according to their broad pay grade) to calculate a monetary measure of the opportunity cost incurred by the school hosting the trainee.

Table 3.3 shows how the average indirect cost per week of placement incurred by the school varies across routes, and provides some indication of how the costs associated with each trainee vary within each route. In both primary and secondary schools, the total indirect cost associated with specific trainees varies more within a route than between routes: the mean values are similar across routes, while the variation within a route is large – the 25th and 75th percentiles are around £100 and £250 per week for HEI-led PG trainees, for example.¹⁷ The exception is Teach First trainees, who have significantly lower indirect costs, on average, than HEI-led PG trainees in secondary schools. The cost per week is typically higher from primary schools, which is in part due to the higher pay grade of the typical staff member involved with training.

¹⁶ Schools are also required to contribute if a Teach First trainee chooses to take a Masters course in their second year. However, this cost is excluded from this report as it is not incurred during training. It is in effect an additional cost associated with employing a Teach First trainee the following year.

¹⁷ The 25th percentile is the point where one-quarter of respondents have a value below this level. The 75th percentile is the point where one-quarter of respondents have a value above this level.

Table 3.3. Total cost per route (pounds per week): primary and secondary

Route	Primary				Secondary			
	N	Mean	25 th	75 th	N	Mean	25 th	75 th
HEI-led PG	40	194.1	102.7	254.3	198	185.6	96.8	227.9
HEI-led UG	23	195.9	75.2	162.3				
SCITT	28	191.7	117.3	231.2	26	161.8	90.7	209.6
GTP	16	184.3	108.6	271.1	52	147.9	77.8	184.5
School Direct salaried	34	190.9	108.3	203.2	54	187.6	73.4	228.1
School Direct unsalaried	18	213.6	109.2	287.5	58	178.0	96.4	233.7
Teach First					27	138.0	54.4	198.2

Source: Survey of primary schools and secondary schools.

Benefits to schools

The discussion thus far has focused solely on the costs associated with teacher training, putting aside potential benefits. The obvious benefit to the overall teaching profession is the creation of an additional qualified teacher. We consider this benefit in the remainder of this report, for example showing the retention rate for these additional qualified teachers, their propensity to work in disadvantaged schools and their geographical mobility. Before this discussion, this section focuses on the benefit to the individual school of participating in ITT, rather than the benefit to the teaching system as a whole.

There are a wide variety of ways schools could benefit from either hosting a trainee teacher – ranging from increased continuing professional development (CPD) opportunities and fresh teaching ideas to the trainee contributing to teaching – or expecting to hire the trainee. These benefits are summarised in Chapter 8, and in detail in Allen et al. (2014).

This section focuses on the overall benefits for schools involved with ITT. Tables 3.4 and 3.5 report the proportion of schools who engaged in each training route that felt the benefits outweighed, were roughly equal to or were less than the costs associated with being involved with the particular training route.

The main finding is that for every route, other than HEI-led PG in primary schools, the majority of schools felt the benefits outweighed the costs. This is not necessarily surprising, as all schools make some active decision to participate in ITT, presumably based on reasonable information. Schools are equally likely to say the benefits outweigh the costs for the Teach First and School Direct salaried routes, which have considerably higher school costs associated with them, implying that these routes also provide large benefits to the school.

We also find that, in both primary and secondary schools, the GTP route was the most likely to have the benefits reported as outweighing the costs, while School Direct salaried, the replacement of GTP, was amongst the least likely. This is a reflection of the earlier finding that School Direct salaried was reported to have higher indirect costs than GTP.

These findings are based on the sample of schools that chose to engage in each of the particular training routes and we cannot extrapolate to schools that do not participate. Below we discuss findings that suggest schools that engage in ITT are not representative of all schools, and this may be more true of certain training routes than others. We cannot rule out that schools that have chosen not engage in ITT are doing so because they know that, in their circumstances, the costs would outweigh the benefits. Indeed, a pertinent question is the type of school that could be encouraged to participate in ITT, and the quality of training these schools would provide.

Table 3.4. Net benefit for school: the perceived costs and benefits to schools (primary)

Route	Benefit > Cost (%)	Benefit = Cost (%)	Benefit < Cost (%)	N
HEI-led UG	58	19	22	38
HEI-led PG	40	31	29	58
GTP	72	22	6	18
School Direct salaried	54	17	29	41
School Direct unsalaried	63	22	15	27
SCITT	68	16	16	39

Source: Survey of primary schools.

Table 3.5. Net benefit for departments: the perceived costs and benefits to departments (secondary subject leaders)

Route	Benefit > Cost (%)	Benefit = Cost (%)	Benefit < Cost (%)	N
HEI-led PG	50	30	20	283
Teach First	61	19	19	34
GTP	65	22	13	63
School Direct salaried	48	22	29	60
School Direct unsalaried	52	21	27	76
SCITT	46	32	22	39

Source: Survey of secondary schools (subject leaders in up to six departments per school).

3.2 Characteristics of trainees and schools

Trainees

The characteristics of trainees in primary and secondary schools are largely similar across routes. This indicates that there is not a significant degree of sorting across routes according to trainee 'quality', as captured subjectively

through the responses to our survey.¹⁸ The limitations of this conclusion are the relatively small sample size of our survey and the potentially non-representative sample for some routes, although the results are robust to accounting for school characteristics.

A high percentage of survey respondents believe the trainee has ‘very good’ or ‘good’ potential to be a good teacher – at least 82% across all routes in primary schools and at least 79% in secondary schools. Although there are small differences in this percentage between routes, these are not statistically significant, suggesting that trainees from each route are perceived as equally capable in their future careers. This is also true for ratings of the trainee’s commitment to teaching, resilience, social skills and confidence in the classroom.

The percentage perceived to have ‘very good’ or ‘good’ subject knowledge is lower and more variable across routes than other characteristics. Between 53% and 71% of trainees are perceived to have ‘very good’ or ‘good’ subject knowledge across routes in primary schools, and 66% and 89% across routes in secondary schools.

The variation in trainee characteristics is predictive of the variation in costs and benefits for the school. Further research should investigate whether early assessments of trainees’ potential and ‘quality’ are also related to the qualification rate and longer-term effectiveness.

Schools

Schools may become involved with ITT in a number of ways. For HEI-led routes, ITT providers may approach schools to host trainees, or have established relationships with schools. Involvement with a school-led route is likely to be a more pro-active decision – for example, joining or leading a school partnership (as for SCITT), registering with the NCTL to be part of School Direct or participating in Teach First. Eligibility criteria also determine involvement with some routes: for the academic year 2013–14, schools were eligible for Teach First if more than half of pupils were from the poorest 30% of families in England, according to the Income Deprivation Affecting Children Index (IDACI);^{19,20} for the academic year 2013–14, the lead school in a School Direct partnership could not be in special measures, classified by Ofsted.²¹ A school’s participation in HEI-led

¹⁸ These characteristics relate to the initial perception of a specific trainee at the start of the placement, in order to distinguish the characteristics of trainees who choose each route from any influence of training at the school.

¹⁹ Note that the eligibility criteria for Teach First will change for the academic year 2015–16, so that the income deprivation threshold will be lower for schools in local authorities with poor performance.

²⁰ <http://webarchive.nationalarchives.gov.uk/20120601152500/http://www.communities.gov.uk/communities/research/indicesdeprivation/deprivation10/>;
<http://www.teachfirst.org.uk/about/our-history>.

²¹ School Direct Operations Manual academic year 2013 to 2014, Version 6: September 2013, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/237266/School_Direct_Manual_V6_0.pdf.

or school-led ITT therefore depends in part on proximity to an ITT provider (either for placement of a HEI-led trainee or for partnership under School Direct), school characteristics, and in part on the perceived costs and benefits associated with each ITT route.

Overall, our survey finds that schools become involved with ITT if they have the capacity and ability to support trainees. This is consistent with evidence from the survey that the most commonly cited barrier to involvement with ITT is a lack of staff capacity, for both primary and secondary schools. Schools are also concerned about the potential negative impact of the presence of trainees on pupil attainment, which may be a greater risk in schools that have worse Ofsted grades and poorer existing pupil attainment and progress, on average. Involvement with ITT is therefore unlikely to be chosen at random by schools; rather it appears to be clearly related to the schools' circumstances.

For example, schools involved with any ITT route have significantly better Ofsted grades, on average, than the overall population of schools. Schools involved with School Direct (salaried and unsalaried routes) and GTP also have significantly better Ofsted grades, on average, than schools involved with HEI-led UG and PG routes. This suggests that schools involved with these new school-led routes have better capacity to recruit trainees and deliver ITT in partnership with ITT providers. In contrast, amongst schools that are involved with any ITT, there are few differences in measures of pupil performance and progress between those involved with different routes,²² although all routes (except School Direct salaried) have significantly higher pupil performance and progress, on average, than the population of schools.

It is also difficult to generalise results from schools involved with Teach First, as schools currently involved with this route have distinct characteristics, such as a higher proportion of pupils eligible for free school meals, on average, than schools involved with all other routes. This is because the correlation between Teach First's eligibility criteria and the percentage of pupils eligible for free school meals is high (Crawford and Greaves, 2013). Pupil attainment and Ofsted grades are also significantly lower for schools involved with Teach First, on average, than for schools in the general population. This is again unsurprising as there is an established relationship between pupil disadvantage and school attainment, on average, in England (Lupton, 2004).

3.3 Summary

This section provides clear evidence of the costs and benefits associated with each of the main ITT routes in England. Average costs are highest for Teach First by some margin. Schools involved with Teach First are equally likely to say that the benefits of being involved outweigh the costs compared with other less costly routes, which implies that the benefits to schools involved are larger. The benefits to central government should also be outlined in order to justify the

²² The exception is that schools involved with School Direct Fee have higher measures of pupil progress, on average, than schools involved with HEI-led UG and PG routes.

substantially larger direct funding Teach First receives in comparison with HEI-led and school-led providers.

This analysis is based on a sample of schools who have *chosen* to engage in ITT and questions remain as to whether the results can be generalised to the set of schools that have *chosen not* to engage in ITT, as they have different characteristics. This limits the potential for the research to conclude whether particular routes should be expanded or contracted, as the benefits and costs may be different for a less select group of schools or for schools with different characteristics.

Such a recommendation would also depend on the wider system costs and benefits of different ITT routes, such as economies of scale in recruitment, which should be an important priority for future research.

4. The Retention of Teachers Trained Through Different Routes

In this chapter, we present the retention rate of teachers who achieved (or were expected to achieve) QTS between 2010 and 2014. We define retention from the sample of trainees that begin training to best reflect the whole costs of ITT, in contrast to the DfE, which defines retention based on the number of trainees who achieve QTS (or those who begin teaching in state-funded schools in England). Our analysis presented here uses the first link of the relevant sources of data required to estimate retention by routes (the ITTPP and SWFC), which makes it possible to update the only existing evidence from cohorts of trainees that qualified in 2010. Only short-term retention rates are available for School Direct routes, as the first cohort of trainees only began in September 2012 and September 2013 for School Direct (unsalaried) and School Direct (salaried), respectively. It is plausible that the retention rate for GTP is likely to be a reasonable indicator of longer-term retention for School Direct (salaried), given the similarity of structure of the target population of the routes, and we discuss this further in what follows.

Throughout this chapter, error bars represent the extent to which our estimates of retention might be downward biased due to measurement error (up to around 3 percentage points for all routes except for Teach First, which is around 7 percentage points) in addition to statistical confidence intervals. Downward bias occurs where individuals are ‘in service’ but not observed in the SWFC (e.g., if a school fails to record a member of staff, or records a member of staff with some error). There are also cases where an individual may be ‘in service’ at some point in the academic year, but in a period not relevant to the SWFC (e.g., supply teachers with short-term contracts).²³ The size of the potential downward bias is derived from a comparison of the one-year retention rate between our source and an alternative source – the General Teaching Council for England (GTCE) database – in 2011, across all routes. This calculation is described in Box 4.1. We believe that the GTCE database is likely to contain the vast majority of teachers, as registration was a legal requirement for all qualified teachers in maintained schools, pupil referral units and non-maintained special schools prior to 2012.²⁴ Each source of data is likely to be imperfect, however, so this range is indicative only. We use an alternative figure of 7 percentage points for Teach First, derived

²³ The SWFC guidance says that teachers and support staff are included in the census ‘if they are in regular service on census reference day’, or were in regular service at any point during the previous academic year. Regular service is defined as ‘continuous service of twenty eight days or more, already undertaken or planned, either under a specific contract or under a service agreement’. See https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/508805/2016_School_Workforce_Census_Specification_v1-0_web.pdf.

²⁴ <http://www.gtce.org.uk/registration/index.html>.

from comparison of the SWFC and a Teach First internal database, which is used in Allen et al. (2016b) and is described in detail in Appendix A. We apply this larger range for Teach First to make use of the route-specific information available, but caution that Teach First's internal database may also contain some measurement error. There may also be variation across other routes that the GTCE database does not capture.

Box 4.1. Comparison of GTCE and SWFC estimates

From the ITTPP data, there were 39,103 trainees registered in 2009–10, of whom 34,796 were awarded QTS in 2010.

The GTCE on 30 September 2011²⁵ registered 24,099 registered of these teachers in schools covered by the SWFC:²⁶ a one-year retention rate of 61.6%.

The SWFC from 3 November 2011 registered 22,494 of these teachers as 'in service': a one-year retention rate of 57.5%.

This implies a difference of 3.1 percentage points in the retention rate for those who achieved (or were expected to achieve) QTS in 2010.

4.1 Retention of primary school teachers

Figure 4.1 shows that around 90% of primary school trainees on most routes achieve QTS, with the exception of HEI-led UG routes where around 80% of trainees achieve QTS. The year one retention rate across routes is variable (between 50% and 53% for HEI-led UG and between 77% and 80% for GTP) but largely similar for the five-year retention rate (between 58% and 61% for HEI-led PG and between 65% and 68% for GTP). The early retention rate for School Direct routes closely follows the retention rate for SCITT trainees, which converges to the (initially slightly higher) rate for GTP trainees by five years post-QTS. Teach First is excluded due to the small sample size over the period of our data.

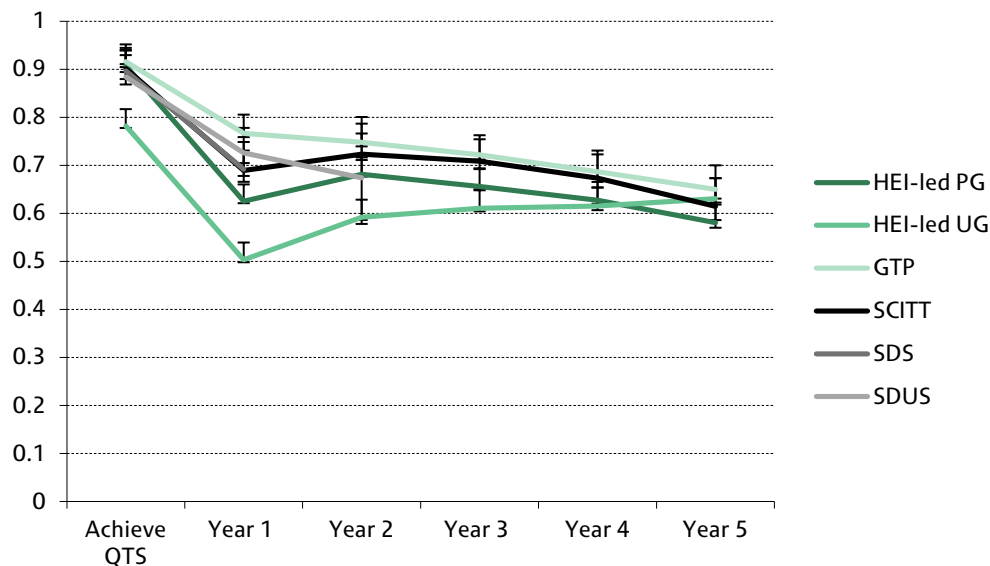
There is an increase in retention between year one and year two for trainees from HEI-led UG and PG routes, and SCITT. This feature has been noted in previous research (Smithers et al., 2012). The retention rate across routes converges to around 60% five years after expected QTS date. Appendix D shows that there is generally convergence in retention across cohorts, with the 'dip' in retention one year following QTS less pronounced for later cohorts. This suggests that either the data quality of the SWFC is improving over time, or that trainees'

²⁵ General Teaching Council for England (2012), *Registered Teachers in England, September 2011* [data collection] UK Data Service SN: 6995 (<https://discover.ukdataservice.ac.uk/catalogue/?sn=6995&type=Data%20catalogue>).

²⁶ See Section 4.1 of School Workforce Census 2015 DfE Guidance (https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/448625/School_Workforce_Guide_2015_v1_school_return.pdf). Returns should not be made from early years, independent schools, non-maintained special schools, sixth form colleges, overseas and offshore establishments, FE establishments, service children's education schools, secure units and hospital schools.

preferences or ability to start teaching immediately after qualification is increasing.

Figure 4.1. Retention rate of primary school trainees expected to achieve QTS between 2010 and 2014



Note: Cohorts of trainees that are expected to achieve QTS between 2010 and 2014 are included in this figure. Error bars represent the likely range of plausible retention rates, reflecting known measurement error and statistical uncertainty.

Source: Authors' calculations based on the ITTPP linked to the SWFC.

4.2 Retention of secondary school teachers

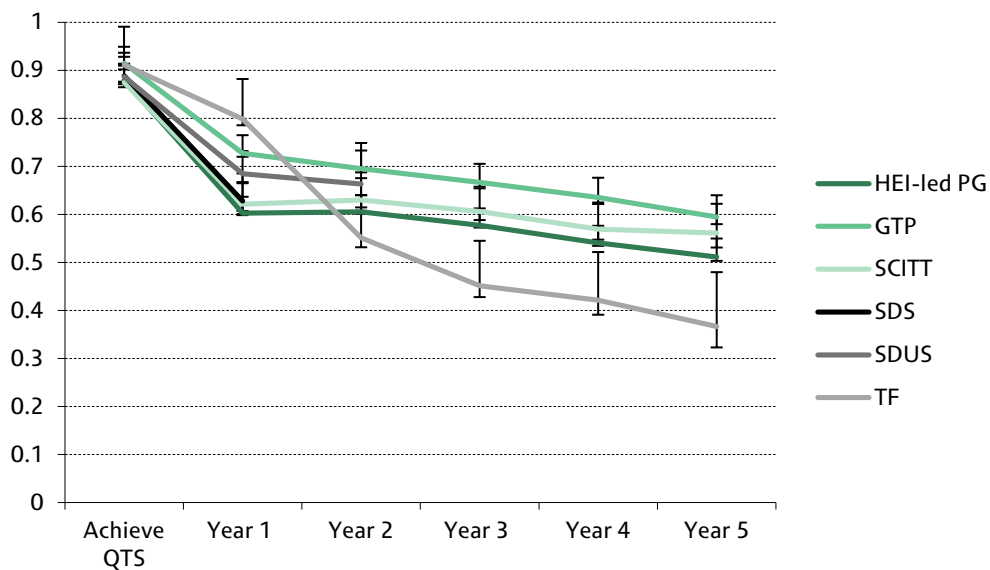
Figure 4.2 shows the retention rate of secondary school teachers trained through each route. Here, the HEI-led UG route is excluded due to the small sample size. Again, around 90% of trainees from each route achieve QTS.

The year one retention rate is highest for Teach First (80–87%) and lowest for HEI-led PG, SCITT and School Direct salaried (around 60–66%). This reflects the expectation that Teach First participants commit to teaching in the same school one year pre- and one year post-QTS. GTP has a noticeably higher retention rate than School Direct salaried, and to a lesser extent School Direct unsalaried, which suggests that GTP may not be a reasonable proxy for the short-term retention of trainees from these routes. Although School Direct was a direct replacement of GTP, these figures suggest that something about the training route, trainees recruited or school environment has led to a lower early retention rate.

The five-year retention rate is broadly similar for GTP and SCITT (between 56% and 62%), slightly lower for HEI-led PG (51–54%) and lower for Teach First (37–44%), a reversal from the one-year retention rate.

Comparing these results to those for primary trainees in Figure 4.1, there is more divergence across routes and a lower level of retention after five years. There is less evidence of a 'recovery' in retention between year one and year two, but the decline in retention is less steep between these two years (aside from Teach First who reach the end of their commitment to the programme, and have the steepest

Figure 4.2. Retention rate of secondary school trainees expected to achieve QTS between 2010 and 2014



Note: Cohorts of trainees that are expected to achieve QTS between 2010 and 2014 are included in this figure. Error bars represent the likely range of plausible retention rates, reflecting known measurement error and statistical uncertainty.

Source: Authors' calculations based on the ITTPP linked to the SWFC.

fall in retention, from between 80% and 87% to between 55% and 62% across these two years).

Retention rates are similar across cohorts for each route, as for primary schools, which is presented in Appendix D. Note that the pattern across cohorts is consistent with the recent NAO analysis of Teach First internal data, where there is reasonable similarity in retention between the most recent Teach First cohorts. The NAO report is most comparable with the upper bound of the retention rate presented in Figure D.9, as both our upper bound and NAO figures are based on Teach First's internal data. The upper bound presented here and NAO figures are not completely consistent as we had access to two years of internal data only.

Some variation in the five-year retention rate across routes may be due to differences in teachers' characteristics rather than their training route. Appendix E shows that five-year retention rates are higher for females, for example, and lower for those from high-priority subjects. There are also differences in the characteristics of teachers that are more difficult to observe in administrative data, such as preferences for location and alternative career, which may also affect the retention rate across routes. These factors are explored in Chapters 6 and 7, respectively.

4.3 Where do they teach?

Figures 4.3 and 4.4 show the types of schools that trainees from each route are likely to teach in, three years after QTS, conditional on being in service. This gives some indication of the presence of teachers from each route in schools of particular interest to the DfE – schools with higher levels of disadvantage, and

schools with lower levels of pupil attainment. Figures after three years are presented as NQTs may struggle to find a job in their preferred location (Hobson et al., 2009).

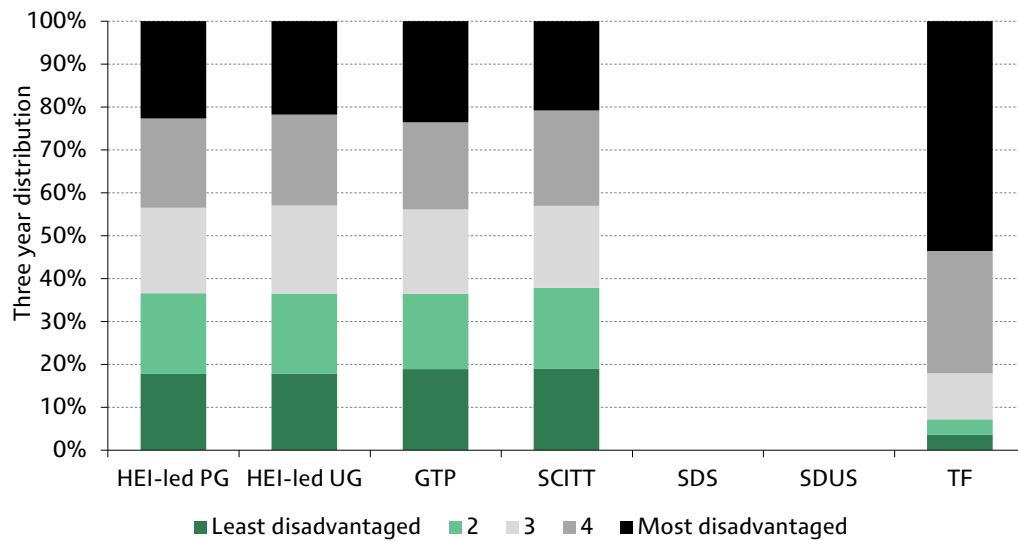
Figure 4.3 focuses on the level of disadvantage in the pupil population (proxied by the proportion of pupils eligible for free school meals). Schools are grouped into five groups according to this measure weighted by overall teacher numbers.²⁷ This ranges from the most disadvantaged quintile (the fifth of teachers in schools with the most disadvantaged intake) to the least disadvantaged quintile.

Three years after QTS, conditional on being in service, those from HEI-led UG and PG routes, SCITT and GTP are roughly equally spread across schools with high and low levels of pupil disadvantage. Teach First trainees who remain in service are disproportionately likely to teach in disadvantaged schools three years after QTS: 54% teach in schools in the most disadvantaged quintile (compared with under 24% for each other route), and 82% teach in schools in the highest and second highest disadvantage quintiles (compared with under 44% for each other route). This suggests that although Teach First has a lower retention rate than other routes, trainees from this route may be more likely to teach in schools that are a focus for the government. Whether this is due to the characteristics of the trainees (who may have a preference for teaching in this type of school before involvement with Teach First) or due to the training route itself is a question for further research.

Figure 4.4 shows the equivalent distribution of teachers trained through different routes across schools with different levels of attainment. Again, schools are split into five groups, ranging from the group with the lowest attainment to the group with the highest attainment. Teachers trained through most routes are evenly distributed across schools with high/low attainment, apart from teachers trained through Teach First, who, conditional on remaining in service, are disproportionately likely to teach in schools in the highest two fifths of school attainment. As discussed in the following section, this is a result of Teach First trainees moving to higher attaining schools, or more likely to remain in teaching in high attaining schools. In the first year after QTS, 30% of Teach First trainees were teaching in schools in the top two quintiles of academic attainment; by the third year after QTS, this was 48%. Drawing on Figures 4.3 and 4.4, it seems as though teachers trained through Teach First sort into schools with relatively high levels of disadvantage and academic attainment, while teachers from other routes are roughly evenly distributed after three years. This may be due to the characteristics and motivation of the trainees who choose to train through Teach First, or a particular feature of this route into teaching.

²⁷ These groups are organised such that if we were looking at the whole population of teachers, rather than early career teachers, there would be 20% in each group.

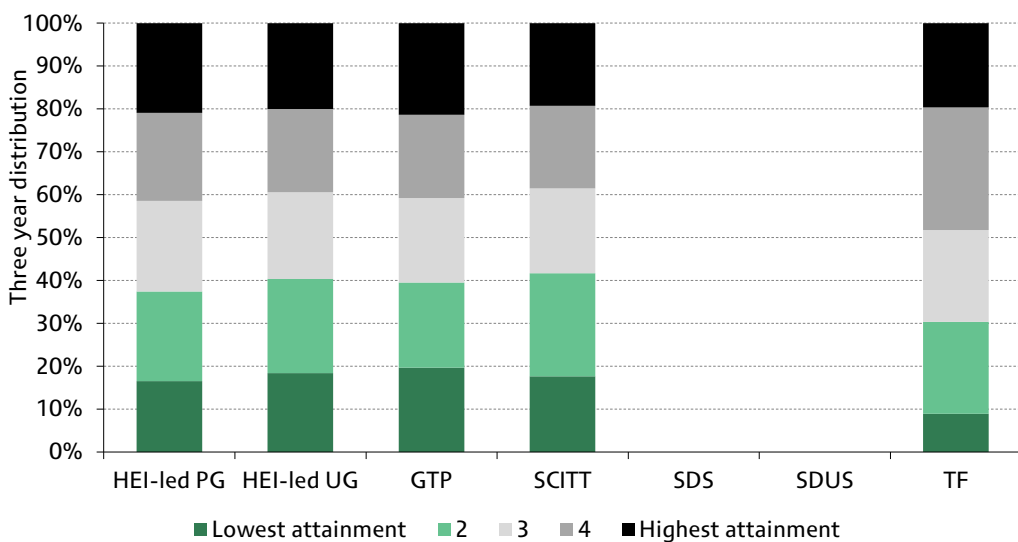
Figure 4.3. Distribution of primary and secondary school teachers trained through different routes across schools with higher/lower levels of disadvantage three years after QTS, conditional on presence



Note: Figures are weighted by the number of teachers in each school to account for different requirements for teachers across less/more disadvantaged schools.

Source: Authors' calculations based on the ITTPP linked to the SWFC.

Figure 4.4. Distribution of primary and secondary school teachers trained through different routes across schools with higher/lower levels of attainment three years after QTS, conditional on presence



Note: Figures are weighted by the number of teachers in each school to account for different requirements for teachers across less/more disadvantaged schools.

Source: Authors' calculations based on the ITTPP linked to the SWFC.

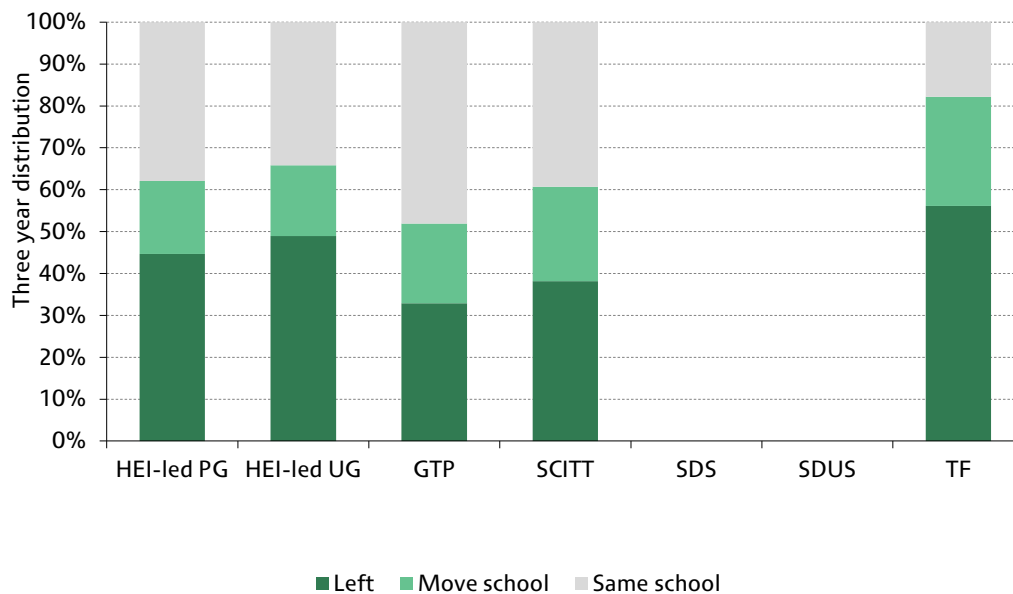
5. The Mobility of Teachers Trained Through Different Routes

The National Teaching Service has recently been proposed as a scheme to increase the regional mobility of teachers, particularly to schools which otherwise would have recruitment difficulties. Mobility across schools, and indeed regions, is therefore seen as beneficial in some circumstances, providing flexibility in the system. Public criticism of school-led training includes the possibility that teachers trained predominantly in one school are less mobile across schools and less effective teachers in schools in different circumstances. It is worth noting, however, that higher mobility across schools can have negative implications for pupil attainment (Ronfeldt et al., 2013). This section therefore gives the first nationally representative picture of mobility of teachers across schools, with a particular focus on those trained through different routes.

This section explores whether teachers trained through particular routes are more mobile, but differences may be due to the characteristics of the trainees or characteristics of the route. For example, trainees on school-led routes may have stronger preferences for working in the local area, which influenced their choice of route, and therefore may be less likely to find alternative employment in another school. Alternatively, school-led routes may be more likely to prepare teachers for teaching in a particular school context, which limits mobility.

Figure 5.1 shows the proportion of teachers trained through each route that are in the same school, in a different school, and have left service three years after achieving QTS. Conditional on being in service, teachers trained through school-led or school-centred routes are roughly equally likely to move school by their first three years of teaching (28% for GTP and 36% for SCITT compared to 31% and 33% for HEI-led UG and PG routes). This is counter to the recent concerns raised for School Direct, although of course the picture may emerge differently for this route. Teachers trained through Teach First are most likely to move schools by their third year after QTS, conditional on being in service: 59% of teachers trained through this route leave their first school. This may have positive implications for pupil attainment, on average, for example if Teach First trainees go on to be effective teachers and/or leaders in other schools, but may be disruptive for the schools they leave.

Figure 5.1. Mobility of primary and secondary school teachers trained through different routes across schools three years after QTS



Note: School Direct salaried and unsalaried routes are excluded due to the recent introduction of these routes. The sample excludes those that entered teaching after their first year post-QTS. Source: Authors' calculations based on the ITTPP linked to the SWFC.

Figures 5.2 and 5.3 explore the mobility of early career teachers across school types, conditional on moving schools by the third year after QTS. In general, the pattern of moves across schools is consistent with teachers' preferences being for schools with higher attainment and lower disadvantage, as more teachers move towards schools of these types.

Figure 5.2 shows the pattern of movement across schools with higher/lower levels of pupil disadvantage, for those that move schools. There are few differences across routes, with the exception of Teach First, where almost 50% move to a school with lower levels of pupil disadvantage, compared to 11% who move to schools with higher levels of disadvantage.²⁸ This is primarily a function of where the trainees start teaching; 53% of teachers trained through Teach First are in the most deprived quintile of schools in their first year after QTS, from where they cannot possibly move to a more deprived school by our measure. Movement across school types is most similar for teachers trained through the HEI-led UG route, with around 35% moving to a school with higher and lower levels of disadvantage.

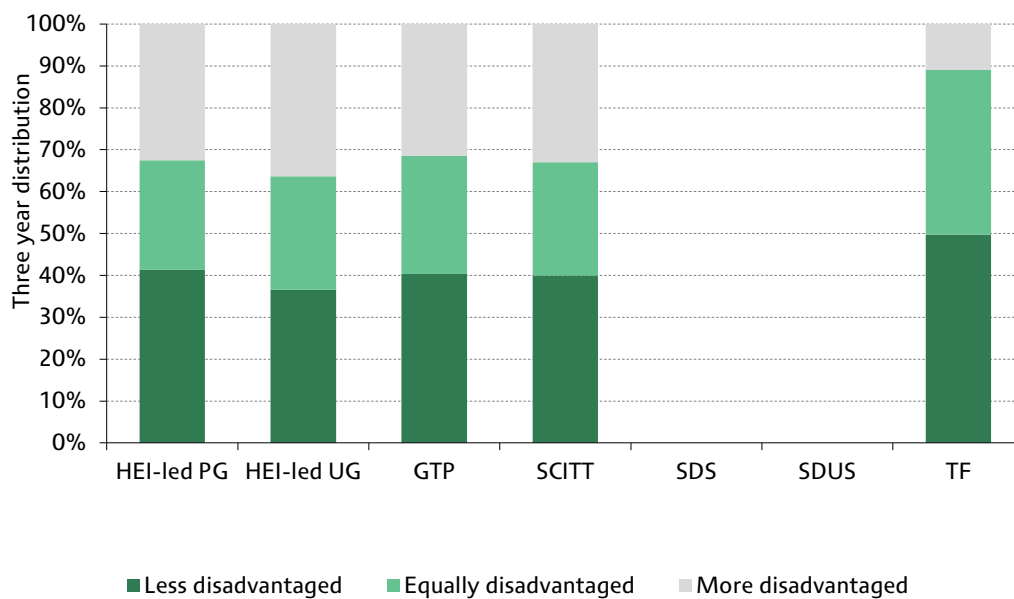
Figure 5.3 shows a similar picture for movements across schools with higher/equal/lower levels of attainment. Teach First trainees are much more likely to move to a school with higher attainment, conditional on moving, than

²⁸ These proportions (and those that follow) exclude those who move to a school of unknown disadvantage. This makes the assumption that, for each route, the set of schools teachers move to with unknown deprivation look like the set of schools teachers move to with known deprivation.

other routes: 63% of those who move go to a school with higher attainment,²⁹ compared to 43% for HEI-led PG – the next most common route – and 38% for HEI-led UG.

These findings suggest that teachers across all routes have preferences for schools with higher levels of pupil attainment and lower levels of disadvantage, although a definite conclusion would require consideration of the interaction between school and teacher decisions (i.e., the movements of teachers across schools may be determined by demand from schools rather than teachers' preferences). There are few differences across routes, particularly for GTP and HEI-led routes, which is relevant to current concerns about mobility of those trained through school-led routes. Those trained through Teach First seem to have distinct preferences (more likely to move to higher attaining and less disadvantaged schools) but this is partly a function of the type of school in which they begin their career.

Figure 5.2. Mobility of primary and secondary school teachers trained through different routes across schools with higher/lower levels of disadvantage three years after QTS

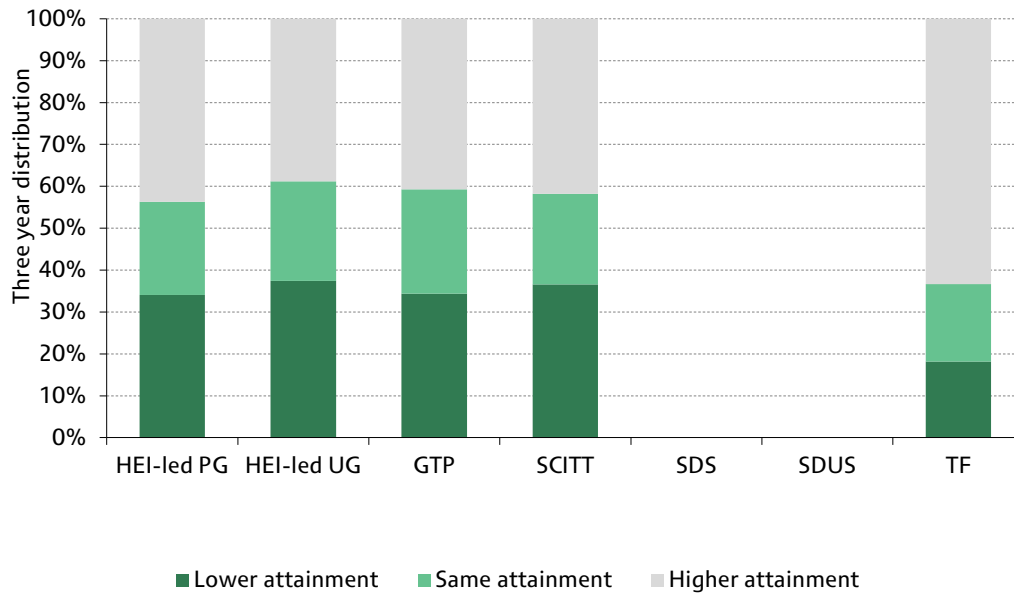


Note: A school's level of disadvantage is defined by the weighted deprivation quintile as defined above. Teachers defined as moving to a more/less/equally deprived school move to a school with a higher/lower/equal deprivation quintile. The sample excludes those who entered teaching after their first year post-QTS and those who teach in schools of unknown deprivation level.

Source: Authors' calculations based on the ITTPP linked to the SWFC.

²⁹ By contrast to the deprivation figures, this result can only be slightly affected by the initial allocation of Teach First trainees – Teach First trainees are only marginally likely to be initially placed in low attaining schools in their first year (27% in the bottom quintile, and 24% in the second bottom quintile).

Figure 5.3. Mobility of primary and secondary school teachers trained through different routes across schools with higher/lower levels of attainment three years after QTS



Note: A school's level of attainment is defined by the weighted deprivation quintile as defined above. Teachers defined as moving to a higher/lower/same attainment school move to a school with a higher/lower/equal attainment quintile. The sample excludes those who entered teaching after their first year post-QTS and those who teach in schools of unknown attainment.
 Source: Authors' calculations based on the ITTPP linked to the SWFC.

6. Demand-Led Provision?

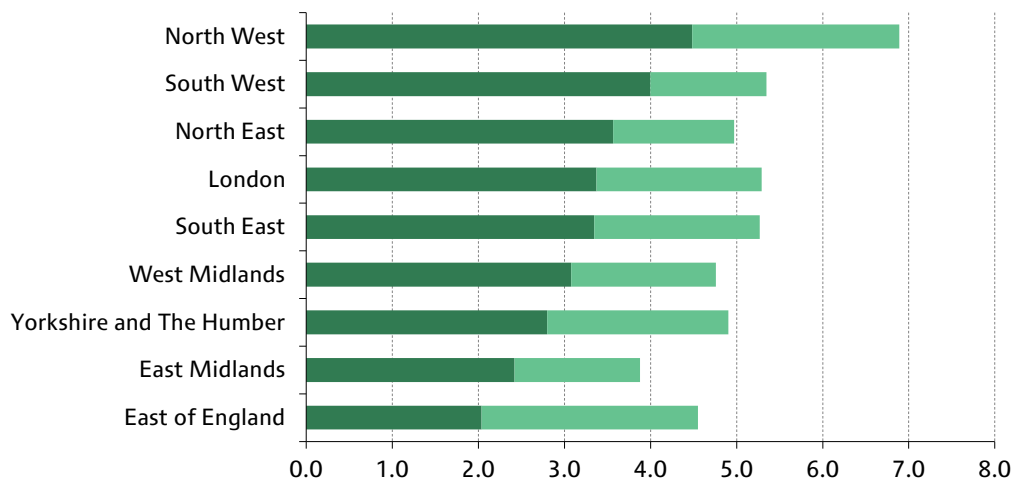
Some indicators (although imperfect) suggest that teacher shortages are growing, while an increasing proportion of training places remain unfilled (NAO, 2016). In the context of increasing demand for teachers, especially in particular subjects with shortages, it has been suggested that school-led ITT can help meet local demand (DfE, 2016). This may be an advantage for some schools that are in a position to become involved with school-led provision, but it has the potential to create shortages elsewhere if the supply of training places does not meet overall demand for teachers and/or teachers are not perfectly mobile. Geographical location is an important determinant of choice of route and provider for trainees (Hobson et al., 2009), and may also influence choice of school following qualification. In Chapter 4, we showed that around 30% of teachers still in service in the third year after QTS have changed schools by this time, suggesting that teachers are reasonably mobile. By documenting the mobility of teachers across regions, in this chapter we give some indication of whether the DfE's regional allocation of training places has implications for the employment and retention of teachers trained in each region, and future regional vacancy rates.

To inform whether increasing school-led provision is likely to meet schools' demand for teachers, in this chapter we also present some descriptive evidence for the relationship between local demand for teachers (using a proxy of vacancy rates and the proportion of posts temporarily filled) and school-led provision of ITT. Evidence is presented at the Government Office Region level, which may mask more local variation in teacher vacancy rates and the response of individual schools.

As a context for this discussion, Figure 6.1 shows the allocation of training places across regions for the 2014–15 academic year, split by whether the allocation is to a provider (HEI or SCITT) or School Direct lead school. There is variation across the country in the number of teacher training places per 100 pupils, from around 4 per 100 pupils in the East Midlands to around 7 per 100 pupils in the North West. There is also variation in the proportion of places allocated to School Direct across regions, from around 25% of the total allocation in the South West, to around 55% in the East of England.

Questions that arise from this are whether the variation in the total number of allocated places is in part driven by school demand (e.g., due to higher vacancy rates), whether the proportion of places allocated to School Direct is driven by school demand (e.g., due to high vacancy rates or proximity to alternative providers), and whether the mobility of teachers has been or is enough to offset regional discrepancies in the allocation of training places per 100 pupils and the level of demand for NQTs. A broader question is whether NCTL's system of allocating places to HEI- and school-led providers is driven by demand, with a larger proportion of places unfilled on school-led routes, and unfilled places not transferred across sectors (Universities UK, 2013).

Figure 6.1. Provider-led and School Direct training places per pupil (2014–15)



Note: Teach First trainees are not included.
Source: Authors' calculations from NCTL data.

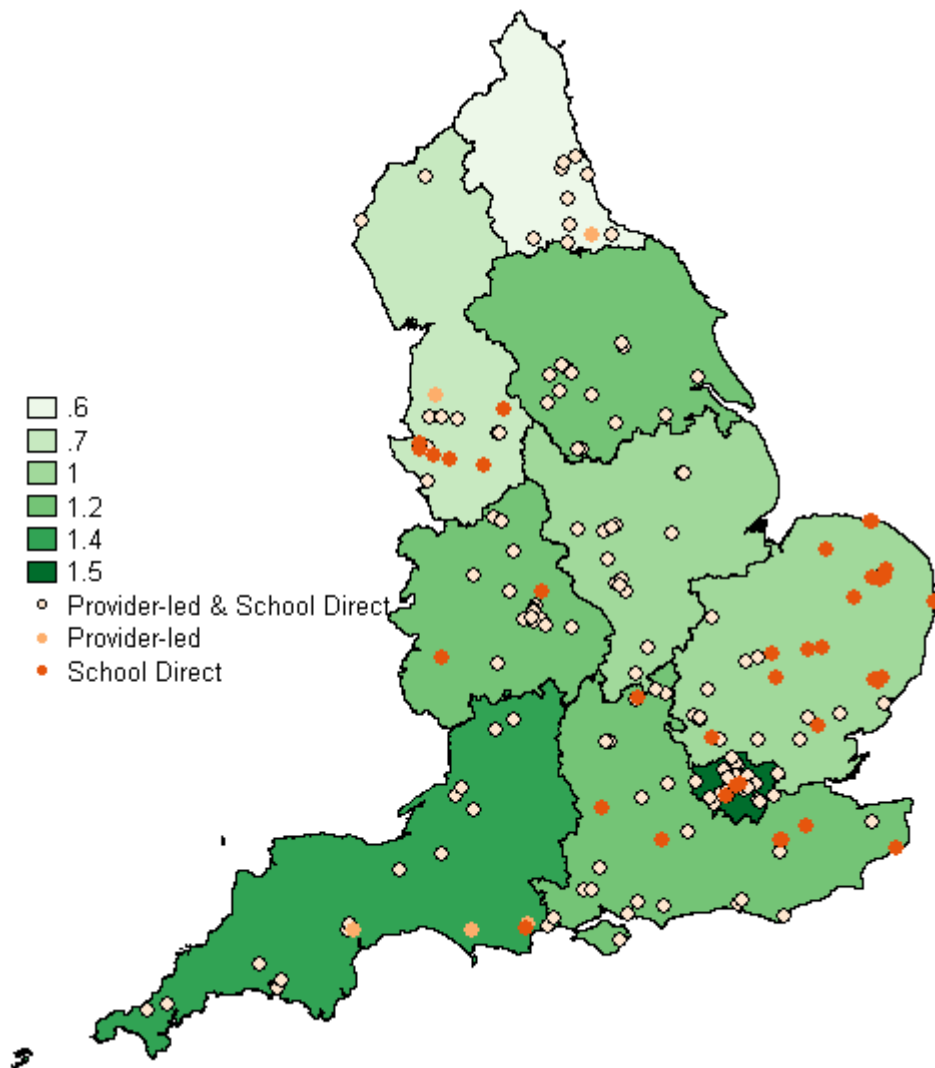
Turning first to the relationship between the demand for NQTs and the location of ITT providers, Figure 6.2 maps the regional vacancy rate (the proportion of positions vacant or temporarily filled) recorded by the SWFC in November 2014, and the position of ITT providers and School Direct lead schools. The vacancy rate is lowest in the North East (0.6%) and North West (0.7%) and highest in the South West (1.4%) and London (1.5%).³⁰

ITT providers involved with provider-led and School Direct are generally well spread across England, but there is some scarcity, for example, in the East of England and parts of the South West and North West. There is some suggestion that the allocation of training places responds to demand from schools, as there is a high concentration of providers in London where there is the highest vacancy rate. Figure 6.3 explores the correlation in more detail, showing the relationship between regional vacancy rates and total training place allocations and School Direct allocations. Excluding the North West and North East, there is a positive correlation between the allocation of training places and the vacancy rate. (The correlation is 0.82, which is significant at the 5% level.) There is less evidence that the allocation of School Direct places has responded to school demand, however: the correlation is negative (although not significant) whether or not the North East and North West are included. This could be because vacancy rates are an imperfect proxy for school demand,³¹ or because School Direct allocations are determined by other factors.

³⁰ Note that there are limitations with this, and alternative indicators for demand for teachers. Gorard et al. (2006) suggest developing reliable indicators for teacher shortages. Vacancy rates collected in the SWFC in November of each academic year may understate teacher shortages as vacancies early in the school year are relatively low (NAO, 2016).

³¹ Alternatives include the proportion of unqualified teachers, and the proportion of lessons taught by a teacher without a relevant degree (NAO, 2016). Unfortunately, these indicators are not readily available for this purpose. Gorard et al. (2006) suggest developing such indicators.

Figure 6.2. Map of teacher vacancies and temporarily filled posts by region and location of provider-led and School Direct training places

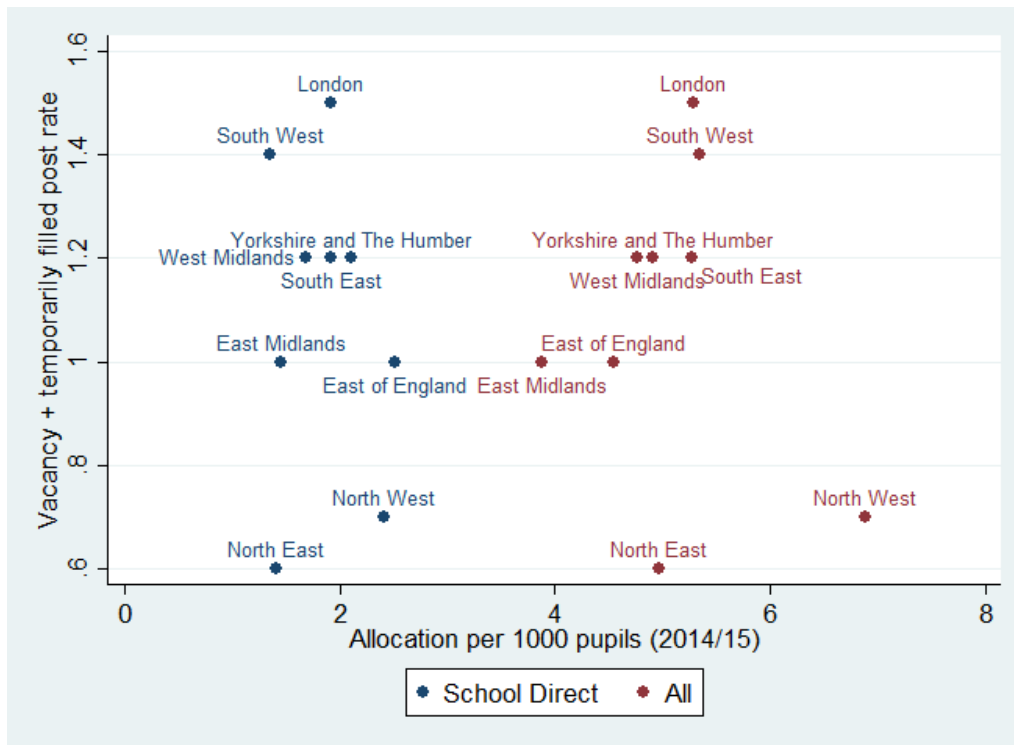


Note: The map shows the percentage of teaching posts declared vacant or temporarily filled in November 2014. Each dot shows the location of provider-led (HEI and SCITT) and School Direct lead schools in 2014–15.

Source: DfE and NCTL.

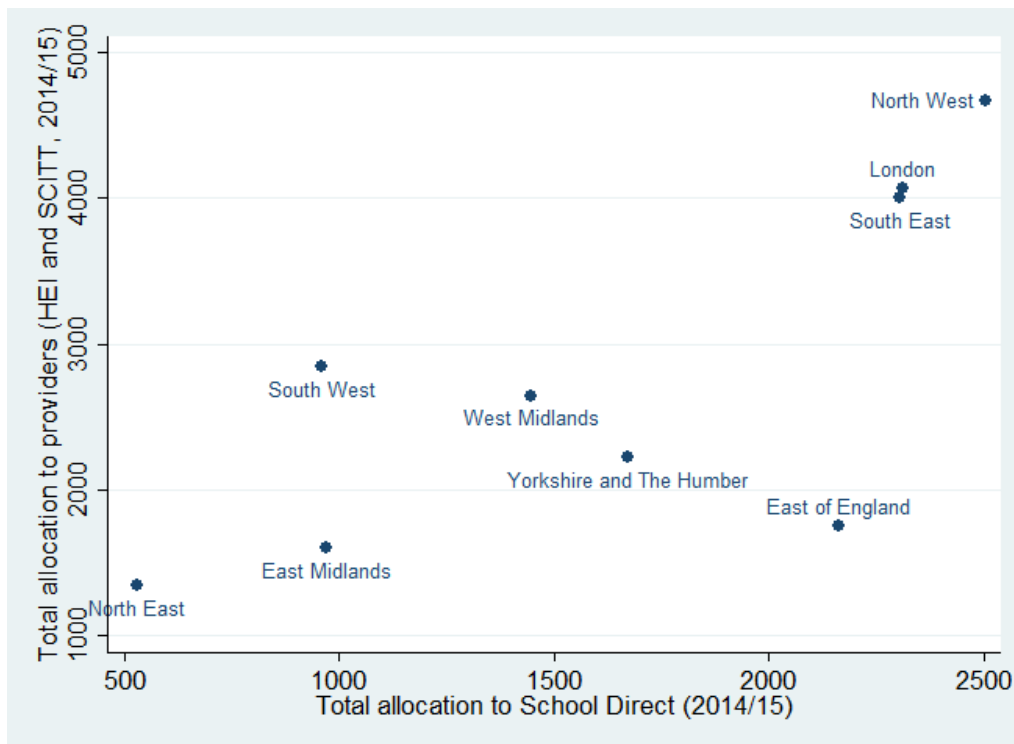
Figure 6.3 shows that the allocation of School Direct training places does not respond to contemporaneous regional vacancy rates, although this may mask more local variation. Figure 6.4 considers whether School Direct provision has instead responded to scarcity of alternative providers, showing the correlation between training allocations to providers and School Direct lead schools across regions. There is a strong positive correlation (0.75, which is significant at the 5% level) between the allocation of provider-led and School Direct places. This suggests that School Direct has in fact grown *more* in areas with alternative provision, mirroring the historical pattern of allocations. This may be because School Direct typically involves collaboration with providers in some way, which limits the feasibility of establishing School Direct in isolated areas. An alternative hypothesis is that NQTs are sufficiently mobile that schools in areas with scarce provider provision have sufficient recruitment. One exception is the East of

Figure 6.3. Vacancy rates and School Direct training places (2014–15)



Note: The percentage of teaching posts declared vacant or temporarily filled is taken from summary statistics from the SWFC in November 2014.
Source: DfE and NCTL.

Figure 6.4. Provider and School Direct training places (2014–15)



Note: The percentage of teaching posts declared vacant or temporarily filled is taken from summary statistics from the SWFC in November 2014.
Source: DfE and NCTL.

England, where School Direct has a large allocation despite a low allocation to alternative providers, and large distances between lead schools and HEI providers (as shown in Figure 6.2). This region may give an example of where School Direct has met schools' demand for involvement with ITT, perhaps to meet schools' demand for NQTs (although the regional vacancy rate is relatively low).

To summarise the evidence in this chapter so far, there is some suggestion that the allocation of training places across regions is correlated with vacancy rates, although the North West and North East are exceptions to this. However, the allocation of School Direct places is not correlated with regional vacancy rates, which suggests that increasing school recruitment of NQTs is not the primary motivation for schools to establish this route (although regional vacancy rates may mask more local variation). School Direct has also not typically grown more in areas with reduced access to alternative providers, except for in the East of England.

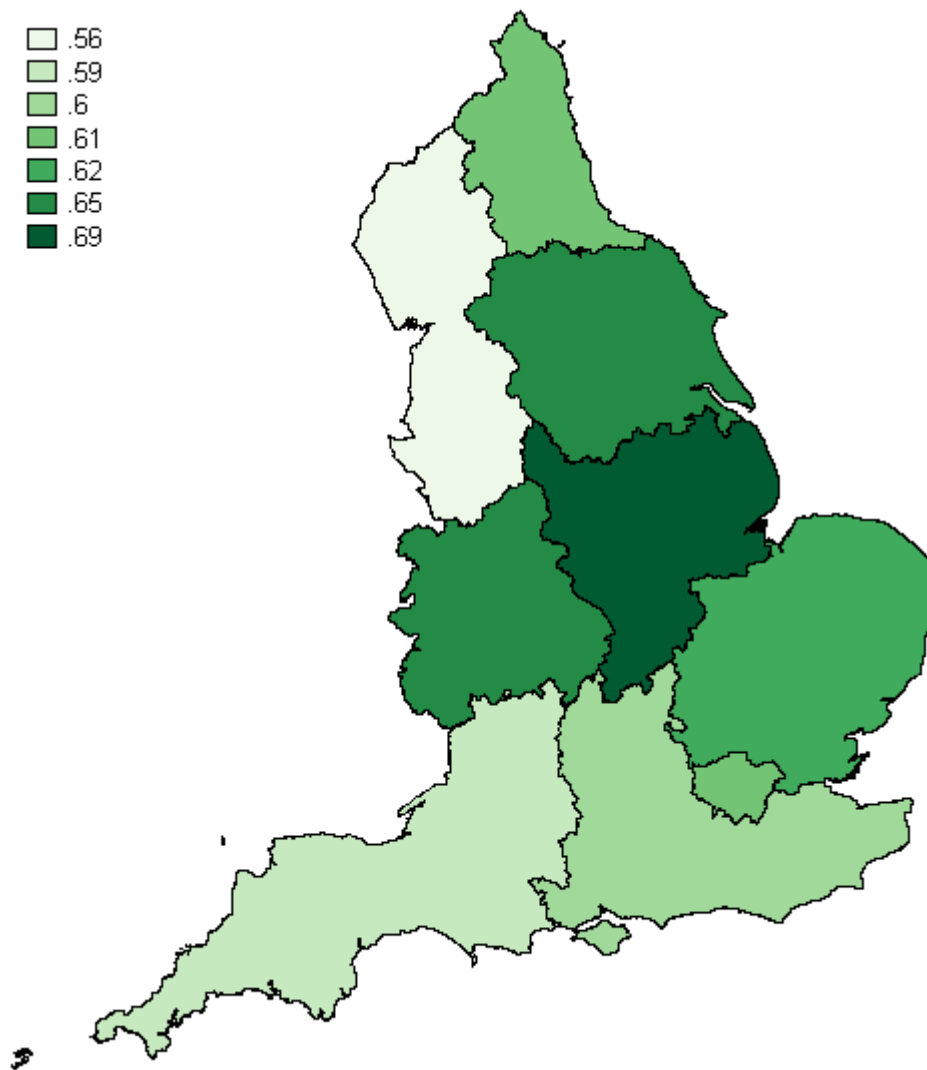
We now consider whether the regional imbalances in training allocations have implications for teacher employment and retention. This will be affected by the regional demand for NQTs and the mobility of teachers across regions.

Figure 6.5 shows the three-year retention rate by region of ITT provider, where trainees are counted as in service if recorded in a school in any region (not just the region of training). The retention of teachers trained through all routes in the North West is lowest (56–59%) and highest in the East of England (69–72%). The retention rate for teachers trained in London is relatively low (60–63%) although similar to surrounding regions. The implications for future ITT allocations depend on the causes of the variation in retention across regions. If lower retention is driven by fewer vacancies in the region of training (and low mobility of teachers), then ITT allocations should in future take into account the regional demand for teachers. If, however, regional variation in retention is caused by underlying characteristics of the region (such as pupil composition, attainment, the quality of life, or outside options), then compensating differentials may be required.

Referring to previous evidence in this section, the retention rate is lowest for teachers trained in the region with the highest allocation of trainees per pupil (the North West), which also has a relatively low vacancy rate (see Figure 6.2), suggesting that there may be an excess supply of teachers in this region.

Figure 6.6 shows the three-year retention rate by region of the trainee's first school. The retention rate is higher across the regions here, as the figures are conditional on the trainee starting teaching. The retention rate across the regions of the first school is more even, with a 6 percentage point difference between the highest and lowest regional retention rates, compared to a 13 percentage point difference for the region of training provider. The retention rate of those that start teaching in the North West is 84–87%, which is in the middle of the range. This suggests that the low retention rate of teachers trained in this region is due to a lower qualification rate, those who move regions to begin their teaching career, or those who do not enter the profession after qualification.

Figure 6.5. Three-year retention rate by region of ITT provider (lower bounds)



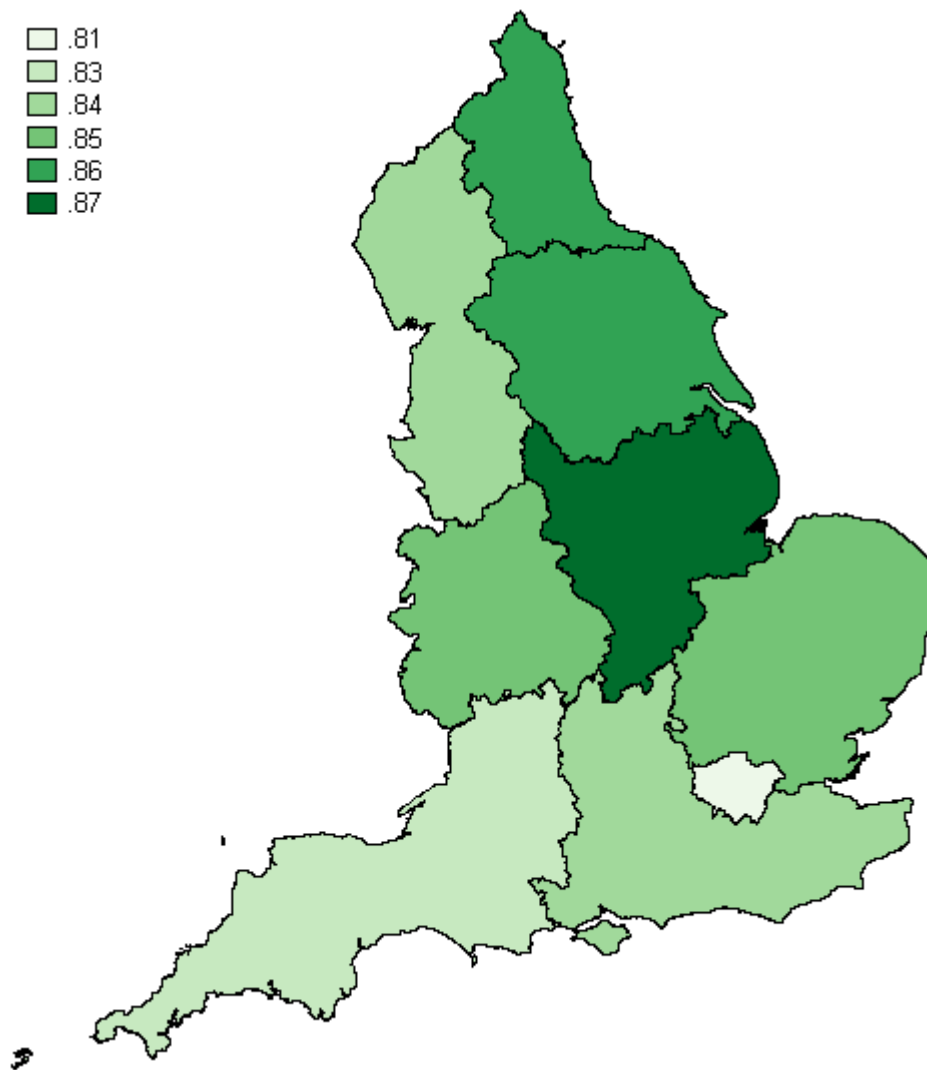
Note: Legend shows lower bound estimates.

Source: Authors' calculations based on the ITTPP linked to the SWFC.

In contrast to Figure 6.5, teachers who start teaching in London have the lowest retention rate (81–84%). In Chapter 7, we explore in more depth whether the higher wage outside options in London contribute to the lower retention rate, conditional on starting teaching in the region.

Retention for those trained in different regions may be affected by the local availability of jobs, but there is some evidence that teachers are relatively mobile. Around half of the teachers surveyed by Menzies et al. (2015) reported that being able to commute from their current home would be an important determinant of where to teach, suggesting that location is not fixed, but around a third of NQTs surveyed by Hobson et al. (2009) secured a post in a school in which they had undertaken a placement during their ITT.

Figure 6.6. Three-year retention rate by region of first school (conditional on teaching first year after QTS)

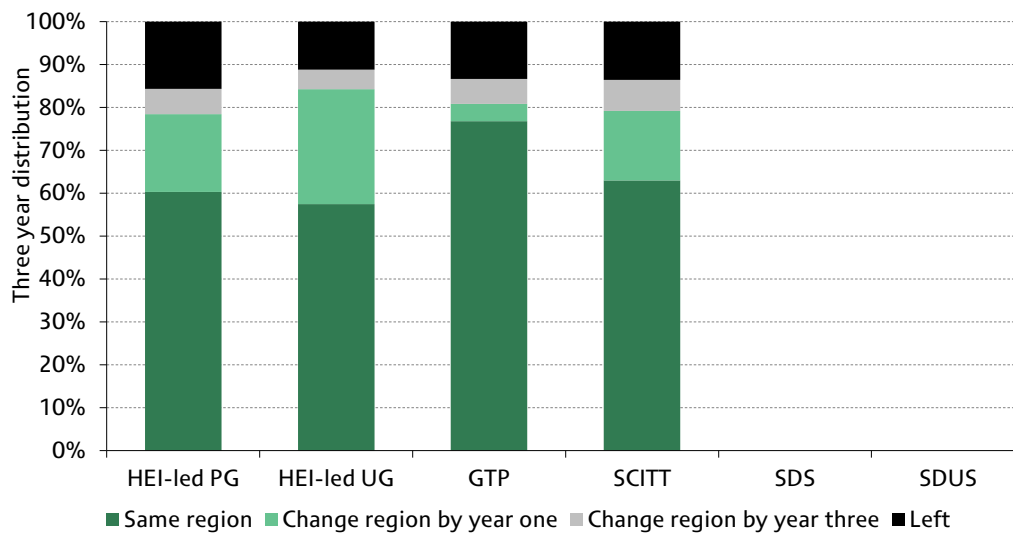


Note: Legend shows lower bound estimates.

Source: Authors' calculations based on the ITTPP linked to the SWFC.

Figure 6.7 shows the mobility of primary school teachers trained through different routes across regions, three years after QTS, conditional on being in a school one year after QTS. 'Same region' means that the teacher is in the same region as their ITT provider three years after achieving QTS. Teachers trained through GTP are most likely to be teaching in the same region as their training provider after three years (76% compared to 63% for SCITT, 60% for HEI-led PG and 57% for HEI-led UG). This perhaps reflects the selection of trainees on to this route, who are on average older and may have a preference for teaching and training in the local area. Teachers trained through HEI-led UG routes are most mobile across regions, with 27% changing region between training and the first year of teaching, and an additional 5% changing region between the first and third years of teaching. Teachers trained through HEI-led PG and SCITT routes have similar levels of mobility across regions.

Figure 6.7. Mobility of primary school teachers trained through different routes three years after QTS across regions



Note: These proportions are conditional on being observed in a school in year one – hence giving higher retention rates than previous figures.

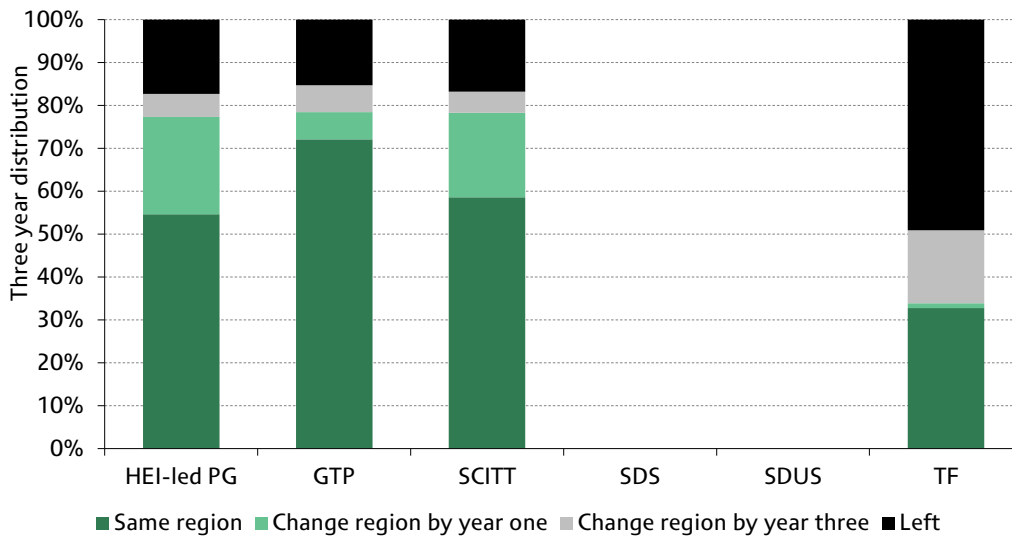
Source: Authors' calculations based on the ITTPP linked to the SWFC.

Figure 6.8 shows a similar picture, that teachers trained through GTP are less likely to move across regions. The proportion of teachers trained through Teach First that move region by year one (the first year after QTS) is, unsurprisingly, very low, as teachers are committed to the same school for this year. The proportion of teachers trained through Teach First that change region by year three is large, however, around one-third of those that remain in service. Across primary and secondary teachers, those trained through HEI-led routes, particularly UG, are more mobile across regions than school-led routes, particularly GTP. While it is not possible to conclude whether this is due to supply or demand, it is likely that the system as a whole requires some geographically mobile teachers and, as such, a mix of training routes.

In this chapter, we have shown that the allocation of training places is only in part related to schools' demand for NQTs (as measured by vacancy rates), and that School Direct does not seem to respond to schools' demand for NQTs or the proximity of alternative providers. There is some suggestion that the discrepancy between the number of teachers trained (per pupil) per region has implications for the retention rate of teachers trained from that region, as not all teachers are willing/able to be geographically mobile.

In line with the NAO (2016) recommendations, it seems sensible for the government to consider the regional demand for teachers when allocating ITT places.

Figure 6.8. Mobility of secondary school teachers trained through different routes across schools three years after QTS across regions



Note: These proportions are conditional on being observed in a school in year one – hence giving higher retention rates than previous figures.

Source: Authors' calculations based on the ITTPP linked to the SWFC.

7. The Responsiveness of Retention to Local Wages

In May 2015, the government announced that the minima and maxima of teacher pay bands would be limited to rise by 1% per year until 2019–20, while average non-teacher earnings are expected to rise more than this.³² To explore the implications of future teacher pay restraint on the retention of early career teachers, we explore whether teachers' decisions are affected by pecuniary considerations, by examining whether the retention rate is affected by the level of local wages. We focus on the differences between ITT routes, providing evidence on whether alternative wage options are more pertinent, or available, for teachers trained through some routes.

Previous evidence suggests that pay is an important factor in a teacher's decision to remain in service, among others. For example, in a survey of teachers in their fourth year, Hobson et al. (2009) found that 60% gave a 'great deal' or 'fair amount' of weight to salary in their decision to continue teaching. Dolton and van der Klaauw (1995, 1999) find that higher relative earnings for teachers reduce attrition, although this finding is not universal (Dolton et al., 2003). A number of studies have examined the effect of teacher pay on school performance and the evidence is mixed (Hanushek, 1997, 2003), although recent work has shown relative pay to be important for school performance. For example, Britton and Propper (2016) found that a 10% shock to the teacher wage gap (the difference between teacher pay and the local labour market) is associated with a 2% fall in average school performance as measured by test scores in the UK. Evidence from the US shows that one of the channels through which increasing local wages relative to teacher pay adversely affects student performance is through increasing teacher turnover (Marchand and Weber, 2015).

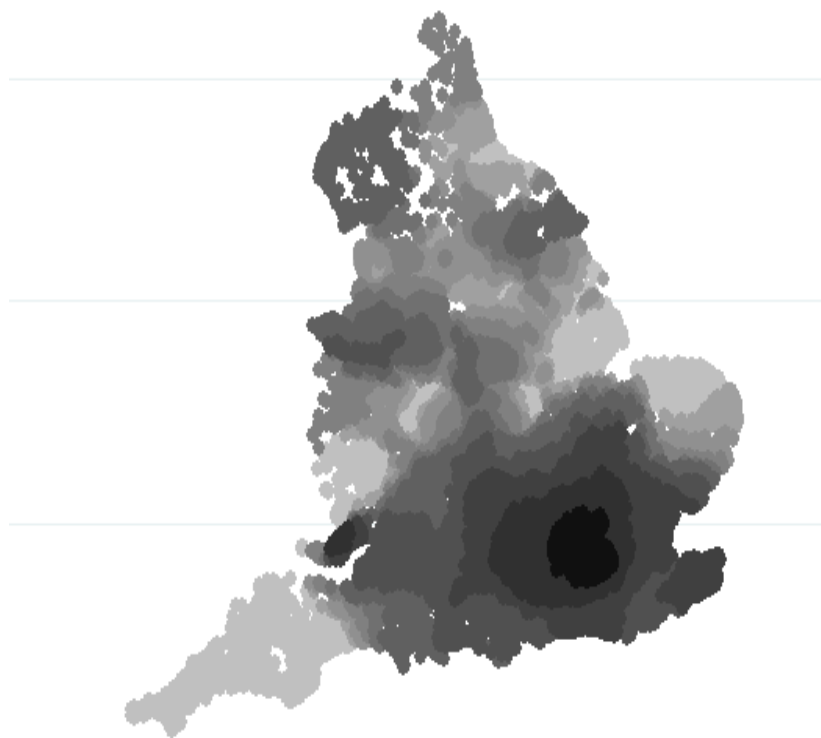
In what follows, we examine how teacher retention rates in England vary according to the wages in the local labour market. This exploits the fact that local non-teacher wages vary between areas, but teacher pay bands are set nationally according to four large pay regions (Inner London, Outer London, Fringe London and the rest of England). This requires defining a relevant outside option for teachers. Worth et al. (2015) show that more than half of teachers leaving the profession take jobs inside the education sector. Our data do not allow us to control for occupation type but we account for the fact that teachers are, on average, more educated than the general population by defining their outside option as the 70th percentile of local wages, where local wages are defined as the weighted average of local authority level wages within a 30 km radius of the

³² This is according to the forecast published by the Office for Budget Responsibility (OBR) in March 2016, before the result of the UK referendum on membership of the European Union.

school where the teacher works.³³ To reduce the measurement error in wages, we take the five-year average of this wage.

Deciles of this wage measure are shown in Figure 7.1, with darker shades indicating higher wage areas. This shows there is significant variation across the country; 10% of schools have local wages below £16, while 10% have local wages above £22.

Figure 7.1. Map of local wages



Note: Darker points represent schools in areas with higher local wages (average of 2010–14).
Source: Authors' calculations based on the ASHE.

Use of the 70th percentile of wages is justified by comparing the main teacher pay scales with local wages; however, Worth et al. (2015) find that, on average, teachers move to lower paying jobs when they first leave teaching. Our definition of relevant local wages also assumes that teachers look for alternative jobs within a 30 km radius of their current school. Earlier in this report, we have shown that some teachers are regionally mobile, however, and some teachers may only consider more local alternatives.³⁴ To address these concerns, we provide

³³ Specifically, our measure of wages is an average of the 70th percentile of wages in all local authorities that fall within a 30 km radius of the school, weighted by the area of the local authority that lies within that 30 km radius.

³⁴ For some individuals, this assumption is clearly problematic. We showed in Chapter 4 that 23% of teachers move region by their third year of teaching, providing evidence that they are willing to move more than 30 km for work. However, our model is still valid if there is a subset of teachers who are less geographically mobile, or who use the local labour market as an indication of outside options further afield.

robustness checks of our estimates using alternative specifications of wages with different percentiles of the wage distribution and different areas.

By exploiting the regional variation in non-teacher wages, we are also assuming that there are no unobserved confounding factors that are correlated with both the wage rate and a propensity to leave teaching. For example, consider that a certain (unobservable) type of teacher is attracted to teaching in a high wage area (e.g., London) and that this type of teacher is also more likely to leave teaching than average. We mitigate this risk of these confounding factors affecting our results by controlling for a rich array of teacher and school characteristics. We also perform additional robustness checks excluding London, where we believe these confounding factors are likely to have the strongest effect.

7.1 Descriptive statistics

Tables 7.1 and 7.2 present some descriptive statistics about how primary and secondary school retention rates vary across quintiles of local wages.³⁵ The first observation to note is that a significantly higher proportion of teachers work in schools in the highest quintile of local wages. This result is likely to be driven by urban areas typically having higher pupil density and larger schools, and therefore requiring more teachers, but it could also reflect a disproportionate number of early career teachers in these areas.

These descriptive statistics indicate that there is a relationship between wages and retention. In both primary and secondary schools, the retention rate is higher in the lowest wage quintile than the highest wage quintile. The difference is small but statistically significant, 1.2 and 1.8 percentage points for primary and secondary schools, respectively.

Table 7.1. Local wage quintiles and retention: primary school teachers

Quintile of local wages	Proportion of schools	Proportion of early career teachers	Retention rate (following year)
Lowest quintile	19%	16%	90.6%
2 nd lowest quintile	21%	19%	91.1%
3 rd lowest quintile	19%	16%	90.9%
2 nd highest quintile	19%	17%	90.5%
Highest quintile	23%	33%	89.4%

Note: Retention rate (following year) refers to the proportion of teachers at a school in year t in a particular quintile of local wages that remain in the state education sector in the following year $t+1$. The proportions of schools and teachers are based on the 2014–15 academic year data.

Source: Authors' calculations based on the ASHE and ITTPP linked to the SWFC.

³⁵ These quintiles are defined such that there is an equal proportion (20%) of *all* schools in each group; the discrepancy between this and the first column is due to schools that close and those that do not have any early career teachers.

Table 7.2. Local wage quintiles and retention: secondary school teachers

Quintile of local wages	Proportion of schools	Proportion of early career teachers	Retention rate (following year)
Lowest quintile	17%	15%	89.3%
2 nd lowest quintile	22%	19%	89.2%
3 rd lowest quintile	19%	16%	88.1%
2 nd highest quintile	18%	18%	88.5%
Highest quintile	24%	32%	87.5%

Note: Retention rate (following year) refers to the proportion of teachers at a school in year t in a particular quintile of local wages that remain in the state education sector in the following year $t+1$. The proportions of schools and teachers are based on the 2014–15 academic year data. Source: Authors' calculations based on the ASHE and ITTPP linked to the SWFC.

7.2 Estimates of responsiveness

To estimate this relationship formally, we model the retention behaviour of teachers using a logit regression controlling for other observable characteristics of the teachers and schools, reducing the confounding factors they might play. Throughout this section, we define retention as remaining in teaching the following year. For more details on this model, see Appendix B.

Table 7.3 reports the results on our data from estimating this model, sequentially adding in the cohort-, teacher- and school-level controls. The table reports the average marginal effects calculated from the coefficients estimated in our logit model. Before controlling for teacher or school characteristics, the result implies that a 10% increase in local wages is associated with a 1.1 percentage point fall in the retention rate (statistically significant at the 5% level). Controlling for teacher and school characteristics does not significantly affect the size of our estimates (although the teacher controls specification is not significant at the 5% level). This effect size is small, but it is important to consider that this is an annual effect and will compound across years. Using estimates from our preferred specification, which controls for teacher and school characteristics, a teacher in an area with 10% higher wages is 1.0 percentage point more likely to leave teaching, *each year*.

Figure 7.2 examines how this responsiveness to local wages varies by the ITT route through which the teacher trained. A striking finding here is that teachers who train through the HEI-led UG route do not appear to respond to local wages at all, with a marginal effect close to zero. This could be because teachers from UG routes have an education-specific qualification, which may be less transferable to the wider labour market.

It is also noticeable that the marginal effect of local wages on retention rate is similar for both the HEI-led PG and the GTP, indicating that the location of training, school-led or HEI-led, does not significantly affect the responsiveness of

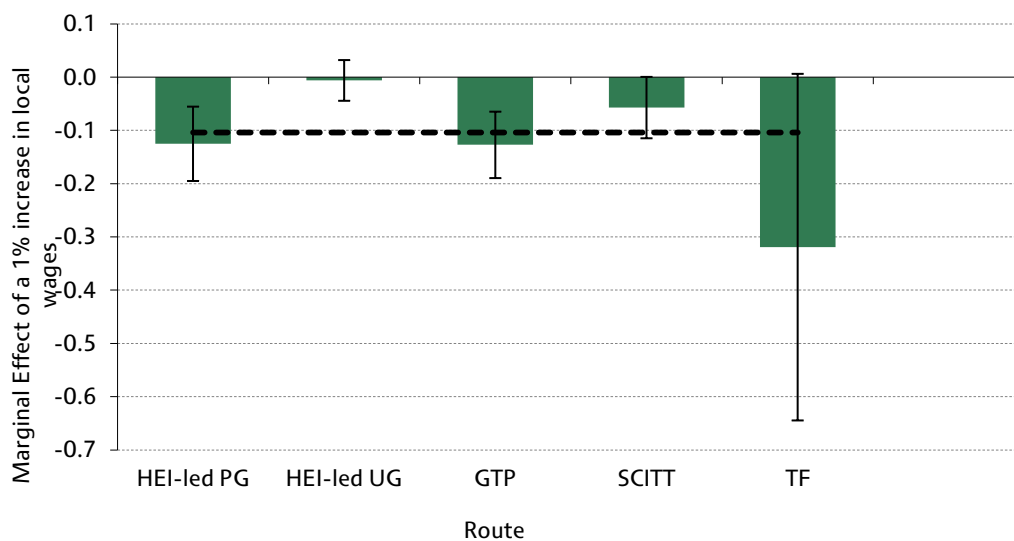
Table 7.3. Estimated responsiveness of retention to local wages

	Retention rate (1)	Retention rate (2)	Retention rate (3)
Effect of a 1% increase in local wages	-0.114*	-0.0948	-0.104*
Standard error	(0.0486)	(0.0501)	(0.0509)
Cohort controls	Y	Y	Y
Teacher controls	N	Y	Y
School controls	N	N	Y
<i>N</i> (teacher-years)	222,018	222,018	222,018
<i>N</i> schools	20,789	20,789	20,789

Note: Cohort controls include year and cohort fixed effects. Teacher controls include age, gender, ITT route and phase of education taught. School controls include attainment and deprivation quintile of the previous school. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Source: Authors' calculations based on the ASHE and ITTPP linked to the SWFC.

Figure 7.2. Estimated responsiveness of retention to local wages across routes



Note: Dashed line represents the average effect across all routes. Primary and secondary trainees are combined.

Source: Authors' calculations based on the ASHE and ITTPP linked to the SWFC.

teachers to local wage conditions. We do find a large marginal effect for Teach First, but this is statistically insignificant (likely due to the smaller sample size preventing a more precise estimate). It is worth reiterating at this point that we cannot distinguish between differences caused by the training route itself and those due to differences in the type of trainees each route attracts.

We can also examine how the responsiveness of the teacher to outside wages varies by other characteristics of the teacher. Table 7.4 gives the marginal effect of local wages on retention rate separately for primary and secondary school teachers, and then splits secondary school teachers according to the subject they teach.

Table 7.4. Estimated responsiveness of retention to local wages: by phase and subject

	Phase		Subject (secondary only)		
	Retention rate (primary) (1)	Retention rate (secondary) (2)	Retention rate (high-priority) (3)	Retention rate (other priority) (4)	Retention rate (no priority) (4)
Effect of a 1% increase in local wages	-0.0745	-0.134	-0.268*	-0.111	0.00887
Standard error	(0.0729)	(0.0693)	(0.126)	(0.0921)	(0.155)
Cohort controls	Y	Y	Y	Y	Y
Teacher controls	Y	Y	Y	Y	Y
School controls	Y	Y	Y	Y	Y
<i>N</i> (teacher-years)	109,330	112,688	33,488	54,531	24,669
<i>N</i> schools	16,470	5,729	4,359	5,085	3,963

Note: Cohort controls include year and cohort fixed effects. Teacher controls include age, gender, ITT route and phase of education taught. School controls include attainment and deprivation quintile of the previous school. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Source: Authors' calculations based on the ASHE and ITTPP linked to the SWFC.

We find that secondary school teachers appear to be more responsive than primary school teachers, although neither effect is statistically significant at the 5% level (likely due to the fact the sample is smaller). At least some of this difference will be due to the fact that a higher proportion of primary school teachers train through the HEI-led UG route, a group that we have already seen is less responsive to outside wages.

We also find that amongst secondary school teachers, those who teach high-priority subjects are the most responsive to outside wages. A 10% increase in local wages reduces the retention rate of high-priority subject teachers by 2.7 percentage points for this group. This is of particular importance to the DfE. Demand for high-priority subject teachers is likely to rise with the increasing focus on English Baccalaureate (EBacc) subjects, at a time when retention of

these teachers may become harder as average earnings are expected to rise faster than teacher pay in coming years (Office for Budget Responsibility, 2016).³⁶ Earlier in this report we have shown that the retention rate is lower for high-priority subjects (which include maths, chemistry, physics and modern languages). Teachers with degrees in these subjects seem to be most in demand, and these are the teachers who are most responsive to outside options, and most likely to change careers.

7.3 Robustness checks

The evidence presented in this chapter so far indicates that higher local wages are associated with lower teacher retention rates, and that the size of the effect varies by the ITT route, phase of education and the type of subject taught. In what follows, we test the robustness of these results, by altering some of the assumptions we have made about the outside option teachers might consider.

First, we relax the assumptions about the level of outside wages relevant to teachers. In the previous analysis, we assumed that the relevant measure of wages was the 70th percentile of the overall local wage distribution. Table 7.5 presents the results from re-estimating our model instead using the mean or the median of local wages. Using the mean of local wages gives a similar, but insignificant, marginal effect, while using the median gives a substantially larger estimate. This may indicate that some teachers are more responsive to changes lower down the wage distribution.

Second, we examine the robustness of our estimates to the area of local wages we consider. The objective is to choose the local area that represents the labour market teachers consider when deciding whether or not to remain in teaching. Our original specification assumed that this is the area within 30 km of the school where the teacher works, but in reality little is known about how far teachers are willing to travel for work. It is possible that using an area that is too small could bias results, as high-earning families may choose to live close to good schools to ensure they fall within the catchment area (and the quality of the school is also likely to affect the retention rate of the teachers). However, using a very large area would include jobs and labour markets irrelevant to teachers. Table 7.5 presents results from re-estimating the model instead using a 10 km and a 50 km radius. Using a 10 km radius gives a substantially smaller, but statistically significant, marginal effect, while using a 50 km radius gives a similar effect size to our baseline specification, although no longer statistically significant.

Third, we consider the effect of using the current local wages rather than the average over five years as in the baseline model. In this specification, we achieve slightly larger and highly significant estimates. The five-year average of local wages is chosen as the main specification to reduce measurement error in yearly estimates, but it is reassuring that using yearly wages gives similar results.

³⁶ This is according to the forecast published by the Office for Budget Responsibility (OBR) in March 2016, before the result of the UK referendum on membership of the European Union.

These robustness checks reliably show there is a negative effect of local wages on retention (i.e., higher local wages lead to lower retention rates), but the size of these estimates is very sensitive to the exact specification. The results presented

Table 7.5. Estimated responsiveness of retention to local wages: Robustness checks

	Retention rate (baseline) (1)	Retention rate (mean) (2)	Retention rate (median) (3)	Retention rate (10 km) (4)	Retention rate (50 km) (5)	Retention rate (current wages) (6)
Effect of a 1% increase in local wages	-0.104*	-0.0816	-0.173*	-0.033***	-0.104	-0.134***
Standard error	(0.0509)	(0.0439)	(0.0692)	(0.00977)	(0.0597)	(0.0319)
Cohort controls	Y	Y	Y	Y	Y	Y
Teacher controls	Y	Y	Y	Y	Y	Y
School controls	Y	Y	Y	Y	Y	Y
<i>N</i> (teacher-years)	222,018	222,018	222,018	222,018	222,021	222,018
<i>N</i> schools	20,789	20,789	20,789	20,789	20,790	20,789

Note: Cohort controls include year and cohort fixed effects. Teacher controls include age, gender, ITT route and phase of education taught. School controls include attainment and deprivation quintile of the previous school. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Source: Authors' calculations based on the ASHE and ITTPP linked to the SWFC.

here indicate that a 10% increase in local wages reduces the year-on-year retention rate by between 0.3 and 1.7 percentage points.

Another potential concern is that teachers with a higher propensity to leave teaching may choose to teach in high wage areas, which would introduce spurious correlation between high outside wages and the propensity to leave teaching. This could bias estimates if it is not possible to control for the characteristics of the teacher that are associated with the higher propensity to leave, or the characteristics of the high wage areas to which the teacher was attracted.

We mitigate such a risk by controlling for an array of background characteristics of the teachers and the schools they teach in, including the age, gender, degree class, ITT training route and subject of the teacher and the level of deprivation and attainment of the school. However this does not rule out the possibility of unobservable selection entirely. If our estimates still suffer from selection bias it is reasonable to expect its presence might be strongest in the selection in to or out of London, an area which we also know has high wages and lower than average retention rates. To remove any bias resulting from the selection of certain types of teachers into London, Table 7.6 re-estimates our model excluding London.

Table 7.6. Estimated responsiveness of retention to local wages: non-London

	Retention rate (baseline) (1)	Retention rate (non-London) (2)
Effect of a 1% increase in local wages	-0.104*	-0.0220*
Standard error	(0.0509)	(0.0112)
Cohort controls	Y	Y
Teacher controls	Y	Y
School controls	Y	Y
<i>N</i> (teacher-years)	222,018	175,797
<i>N</i> schools	20,789	18,238

Note: Cohort controls include year and cohort fixed effects. Teacher controls include age, gender, ITT route and phase of education taught. School controls include attainment and deprivation quintile of the previous school. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Source: Authors' calculations based on the ASHE and ITTPP linked to the SWFC.

The exclusion of London results in a substantially smaller marginal effect than our main specification, but it remains negative and statistically significant. The difference between this estimate and the main specification can be interpreted in two ways.

It is possible that the higher wages in London could be driving the lower retention rate there. This would imply that the higher responsiveness estimates based on the whole country represent the true response of teachers to local wages. Alternatively, London may attract teachers with a higher propensity to leave teaching, regardless of the higher wages, in which case the higher estimates when including London are biased by this unobserved selection. In reality, it is likely to be a combination of both factors which drives the result.

7.4 Summary

Teachers' decisions to leave teaching appear to be affected by alternative local wages, with a 10% increase in local wages associated with a 1 percentage point fall in the year-on-year retention rate. This finding implies that retention rates are likely to fall in coming years as teacher pay is expected to grow more slowly than average wages.³⁷ We have found evidence that this effect is smaller amongst those teachers who train through the HEI-led UG route, perhaps because their qualification is more education-specific. Secondary school teachers, particularly those in high-priority subjects, are substantially more responsive to local wages. This should be of particular concern to the DfE given the imperative need to retain and attract teachers in high-priority subjects.

Our robustness checks have reliably shown the negative effect of local wages on retention rates but the size of this effect is sensitive to the exact definition of local wages; our estimates range between a 10% increase in local wages causing a 0.3 percentage point fall in retention and a 1.7 percentage point fall in retention. More definitive estimates require research into the outside options that teachers consider when deciding whether or not to leave teaching. We have reduced the potential for selection bias to affect our estimates by controlling for detailed background characteristics of the teachers and schools, and we have shown that increased local wages are associated with lower retention rates even when we exclude London, albeit with a smaller effect size.

Overall, we can conclude that an increase in local wages is very likely to be associated with a reduction in the retention rate of early career teachers, but the precise magnitude of the effect is uncertain.

³⁷ This is according to the forecast published by the Office for Budget Responsibility (OBR) in March 2016, before the result of the UK referendum on membership of the European Union.

8. Comparison across Routes

In this chapter, we draw on the previous chapters to provide a comparison of the short- and longer-term costs and benefits of the different ITT routes. There are important aspects of the current system not covered here, and this highlights areas where further research is needed.

We provide a summary for each route, rather than calculating a single measure of cost-effectiveness. This is because in addition to aspects discussed below, the overall cost-effectiveness depends on the quality of teachers trained through each route (defined by their impact on pupil attainment and long-term outcomes), the longer-term retention of teachers trained through each route, costs and benefits to ITT providers and the system as a whole. In addition, a number of features summarised below are also difficult to monetise, such as the proportion of teachers from each route that teach in schools with more disadvantaged or lower attaining pupils.

8.1 Features of cost-effectiveness

The features of cost-effectiveness we are able to consider are those measured in our survey of schools, and the retention and mobility of teachers trained through each route. These are shown in Table 8.1, and are described briefly in turn.

- **Selection of trainees:** this is the extent to which different routes attract trainees of better or worse quality as measured by the initial perception of characteristics of trainees, as reported by survey respondents. This is described in full in Chapter 3 of our interim report (Allen et al., 2014). In general, there is more variation in the perceived quality of trainees within routes than is evident between routes. Table 8.1 summarises one perceived characteristic only: the proportion of trainees thought to have ‘good’ or ‘very good’ potential to be a good teacher.
- **Central costs:** average costs to central government, in 2013–14. These include the cost of direct grants paid to schools, providers and trainees, the cost of providing student finance, and the cost of bursaries for trainees in priority subjects. The average cost is calculated using the number of trainees with particular characteristics that affect funding (such as degree class for bursary funding).
- **School costs:** the indirect and direct monetary costs reported by schools, and calculated from external sources. Indirect costs are the opportunity cost of time spent on training: mentoring; observations by a qualified teacher, including feedback; lesson planning support; written assessment of the trainee; liaising with the ITT provider; liaising with schools; arranging training and observations; administration and paperwork (other than that involved with recruitment, which was asked about elsewhere in the survey);

and 'other'. Direct costs include the school recruitment fee per Teach First trainee; payment to or from ITT providers; recruitment cost for School Direct routes; salary for trainees employed by the school; associated payroll costs for trainees employed by the school (minus the contribution that would otherwise have been made for an NQT).³⁸

- School benefits: benefits reported by survey respondents, described in full in Chapter 4 of our interim report (Allen et al. 2014). Table 8.1 summarises two specific reported benefits: the proportion of respondents that 'agree' or 'strongly agree' that a specific trainee provided fresh teaching ideas and the proportion that expect to hire the trainee on qualification. Table 8.1 also summarises the proportion of school survey respondents who report that the benefits of hosting the trainee are greater than, and less than, the costs to their school (everything considered).
- Achieve QTS: the proportion of trainees that achieve QTS, derived from the ITTPP. This gives some indication of initial wastage from ITT, but may be a combination of the quality of the trainee and quality of the training.
- Retention rate (one year): the proportion of trainees that are 'in service' the year following expected QTS date. This shows the percentage of trainees that teach in state-maintained schools in England one year after expected QTS date. As discussed in Chapter 4, this may not perfectly reflect early career retention, as some routes have higher retention in the second year following expected QTS date.
- Retention rate (five year): the proportion of trainees that are 'in service' the fifth year following expected QTS date. This is the latest possible retention rate it is possible to calculate using the data available to us. It is not possible to observe longer-run retention rates for School Direct, given the timing of the introduction of these routes.
- Presence in disadvantaged schools: the proportion of trainees that are 'in service' in the most disadvantaged quintile of schools three years after achieving QTS. This provides some information on the presence of trainees from different routes in schools that are of particular focus for government.
- Mobility: the proportion of trainees that move schools up to three years after achieving QTS, conditional on becoming a teacher. The proportion of trainees that change region between training to become a teacher and three years following QTS. This relates to the hypothesis that trainees from school-led routes are less mobile across schools. Regionally, mobility is of interest in a system where training places are allocated to providers without accounting for regional demand for NQTs.
- Response to local labour market: the estimated impact of a 10% increase on local wages on the retention rate for teachers in the following academic year.

³⁸ Any grants schools receive from central government (e.g., for School Direct salaried trainees) are deducted from the schools' direct costs.

One interpretation of the effect of the local labour market on teacher retention is the extent to which teachers are making marginal decisions between teaching and alternative careers. Trainees with a high

Table 8.1. Costs and benefits of ITT routes

Cost/benefit	HEI-led PG	HEI-led UG	GTP	SCITT	SD(S)	SD(US)	Teach First
Selection of trainees: 'good' or 'very good' potential to be a good teacher	82% pri. 79% sec.	93% pri.	89% pri. 83% sec.	88% pri. 79% sec.	86% pri. 81% sec.	90% pri. 83% sec.	83% sec.
Central costs (average) [minimum, maximum]	Primary: £18,408 [£13,287, £24,281] Secondary: £22,354 [£13,287, £35,281]	Primary: £15,158 [£14,352, £20,658]	N/A	Primary: £18,101 [£13,287, £24,281] Secondary: £20,526 [£13,287, £35,281]	Primary: £14,811 [£14,000, £19,360] Secondary: £15,699 [£0, £26,290]	Primary: £17,201 [£11,751, £26,531] Secondary: £19,597 [£11,751, £40,281]	Secondary: £25,958
School costs (average) 2013–14	Primary: £4,286 Secondary: £1,173	Primary: £4,123	N/A	Primary: £5,355 Secondary: £3,531	Primary: £2,631 Secondary: £14,566	Primary: £5,166 Secondary: £3,554	Secondary: £10,567
School benefits: fresh teaching ideas	63% pri. 77% sec.	74% pri.	94% pri. 80% sec.	80% pri. 69% sec.	70% pri. 56% sec.	78% pri. 70% sec.	69% sec.
School benefits: expect to hire	23% pri. 28% sec.	18% pri.	71% pri. 56% sec.	62% pri. 34% sec.	71% pri. 52% sec.	63% pri. 35% sec.	59% sec.
School benefit > cost	40% pri. 50% sec.	58% pri.	72% pri. 65% sec.	68% pri. 46% sec.	54% pri. 48% sec.	63% pri. 52% sec.	61% sec.
School benefit < cost	29% pri. 20% sec.	22% pri.	6% pri. 13% sec.	16% pri. 22% sec.	29% pri. 29% sec.	15% pri. 27% sec.	19% sec.
Achieve QTS	91% pri. 88% sec.	78% pri.	92% pri. 91% sec.	90% pri. 87% sec.	90% pri. 89% sec.	88% pri. 89% sec.	91% sec.

Retention rate (one year)	63–66% pri. 60–63% sec.	50–53% pri.	77–80% pri. 73–76% sec.	69–72% pri. 62–65% sec.	69–72% pri. 63–66% sec.	73–76% pri. 68–71% sec.	80–87% sec.
Retention rate (five year)	58–61% pri. 51–54% sec.	63–66% pri.	65–68% pri. 59–62% sec.	61–64% pri. 56–59% sec.	N/A	N/A	37–44% sec.
Percentage in disadvantaged schools (if in service after three years)	23%	22%	24%	21%	N/A	N/A	54%
Mobility (if in service)	31%	33%	28%	36%	N/A	N/A	59%
Regional mobility (if in service)	29% pri. 34% sec.	35% pri.	11% pri. 15% sec.	27% pri. 30% sec.	N/A	N/A	36% sec.
Response to local labour market (10% increase in outside wages)	1.3 ppt decrease in retention	No effect on retention	1.3 ppt decrease in retention	0.6 ppt decrease in retention	N/A	N/A	3.2 ppt decrease in retention

Note: ppt denotes percentage point.

Source: Authors' calculations based on the ITTPP linked to the SWFC and survey of primary and secondary schools, described in our interim report (Allen et al., 2014), ITTPP (NCTL), and DfE.

responsiveness to the local labour market may be more likely to leave at times when average non-teacher graduate wages grow faster than average teacher wages, as is forecast to happen in coming years.

- Impact of training placement on pupil attainment: further research is required, as calculating the short-term impact of the presence of a trainee was not possible for each route separately. The general finding across routes was that the presence of the trainee did not affect contemporaneous pupil attainment at the end of primary and secondary school, but this may be because trainees are allocated to other year groups, or because only schools that are confident that pupil attainment will not be compromised are involved with ITT.
- Teacher effectiveness: further research is required. Measuring teacher effectiveness in England across a representative sample of teachers across routes is currently not possible with existing data in England. The new Ofsted two-stage inspection process for ITT providers should provide some useful, if short-term, information in this area.³⁹

Caveats

The costs and benefits to schools involved with ITT were drawn from a survey of schools currently involved. On average, these schools have higher Ofsted ratings than those not currently involved, and have other characteristics associated with better circumstances. This highlights the limitation, true of any research of this type, that the costs and benefits may be different for those schools that are unable to, or choose not to, currently participate in ITT. There is also selection into particular routes, which means that the costs and benefits for schools currently involved with one route may not be applicable to those currently involved with another. This is most relevant to school-led routes, where some schools may not have the capacity to run and deliver effective training.

Particular characteristics of trainee teachers that choose each route may influence the findings presented here. That is, it is sometimes not possible to separate the effect of preferences of the trainee (that influenced their choice of route and subsequent choices) from the influence of the training route.

8.2 Summary of features of cost-effectiveness

There are no significant differences in the proportion of trainees from each route that are perceived to have 'good' or 'very good' potential to become good teachers. This is an early indication of the effectiveness of trainees as they entered their training placement. More research (and information) is required to understand whether these initial perceptions translate into longer-term teacher quality. The Ofsted inspection of ITT providers is moving in this direction, with an inspection of teaching now required in the Autumn term following QTS (for those that enter the profession). While useful, longer-term information about

³⁹ <https://www.gov.uk/government/news/new-approach-to-teacher-training-inspection>.

teacher quality is essential before any conclusions regarding the cost-effectiveness of each route can be made.

Central costs for each route (on average) vary across routes and stages of education, from £15,700 for School Direct salaried secondary trainees, to £26,000 for Teach First trainees. There is also variation within each route, driven by the funding system for trainees with different characteristics, subjects, and in different areas. For example, School Direct salaried trainees in non-priority subjects receive no funding from central government, while the maximum cost is £26,000. The maximum cost to central government is for School Direct unsalaried (£40,000)⁴⁰ although the average cost is similar to that for other routes. The central cost is largest for Teach First (£26,000), and this is constant across all trainee types.

School costs are lower than central government costs for each route and stage of education (with the exception of School Direct salaried in secondary schools for reasons discussed at length in Chapter 2). Costs to schools are lower for HEI-led routes (PG and UG) than for SCITT, School Direct and Teach First. The school cost for School Direct salaried and Teach First is partly offset by the salary that would otherwise have been paid to a NQT, however.

Trainees from school-led routes are more likely to have the expectation of being hired following QTS. In part, this reflects the expectation that schools involved with these routes have the capacity to hire the trainee. This may bring a benefit to the individual school, but the system as a whole is likely to benefit from teachers who are mobile across schools and areas as teacher demand fluctuates. There are few significant differences in the contribution of fresh teaching ideas, or other stated benefits, across routes, although there is some variation in the perception of benefits in relation to costs (everything considered). Only 40% of primary school respondents feel that the benefit of hosting PG trainees outweighs the cost, compared to 72% of GTP trainees and 68% of SCITT trainees. There are similar patterns among secondary school respondents, where GTP and Teach First had the highest percentage of respondents stating that the benefits outweighed the costs (65% and 61%, respectively) compared to around half for other routes. Experiences of training routes vary across schools, however, with around one fifth of school respondents reporting benefits less than costs for most routes. Exceptions are GTP, where fewer schools reported benefits less than costs, and School Direct (salaried), where around one third felt that benefits were less than costs.

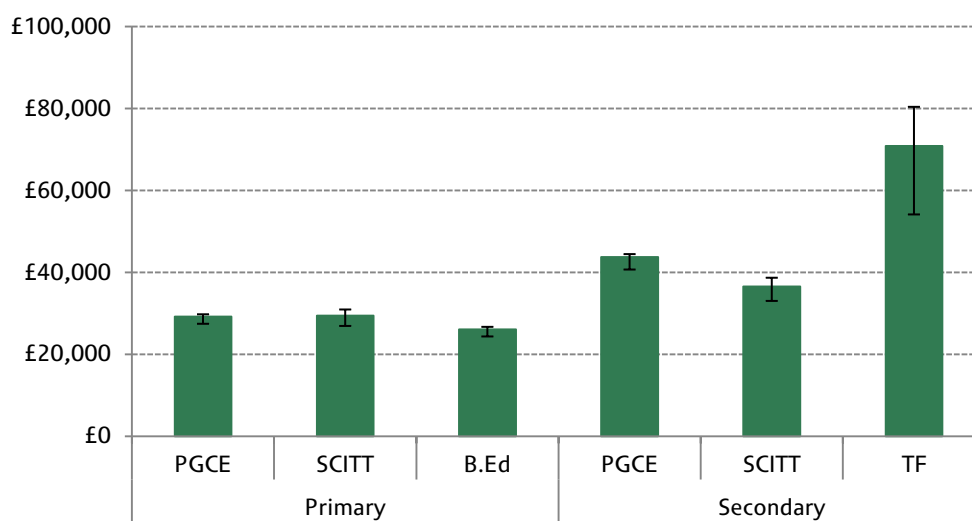
The proportion of trainees that achieve QTS across PG routes is similar, and around 10 percentage points lower for the HEI-led UG route. Including those that do not achieve QTS, the retention rate one year after the expected QTS date is highest for Teach First (80–87%). This reflects the expectation that Teach First participants commit to a school for one year pre- and post-QTS. The lowest one-year retention rate is for HEI-led UG, where only around 50–53% of trainees are

⁴⁰ This is for a trainee in a high-priority subject with a first-class degree who receives an uplifted bursary.

in service (although this is not representative of the true retention rate of HEI-led UG trainees as the proportion of teachers in service increases to 63–66% after five years). The one-year retention rate for School Direct salaried trainees is roughly similar to SCITT trainees, slightly lower than School Direct unsalaried and slightly higher than for HEI-led PG.

Figure 8.1 combines the five-year retention rate estimates with the central costs associated with ITT to show an average central cost per teacher ‘in service’ after five years for each of the routes for which we have data available.⁴¹ Teach First has both the lowest five-year retention rate (37–44%) and the highest average central cost. This means that the average central cost per Teach First trainee who remains in service five years after QTS is therefore between £59,000 and £70,000.⁴² For other secondary school routes, the five-year retention rates are higher and the central costs lower, resulting in a lower implied average central cost per trainee ‘in service’ after five years of between £35,000 and £44,000.⁴³ For primary school teachers, the central costs are lower still, and the retention rates even higher, resulting in average central costs between £25,000 and £29,000 per trainee.

Figure 8.1. Average central costs per teacher ‘in service’ after five years



Note: Error bars represent the likely range of plausible retention rates, reflecting known measurement error and statistical uncertainty.

Source: Authors’ calculations based on the ITTPP linked to the SWFC and survey of primary and secondary schools.

⁴¹ We do not have estimates of the five-year retention rate for School Direct and we do not have central cost estimates for the now discontinued GTP route.

⁴² The figures differ from the width of the error bars in Figure 8.1 as the figure also includes statistical uncertainty from estimating the retention rate.

⁴³ This excludes the School Direct salaried figures, which have very low average central costs due to the high number of non-priority trainees.

Of those that are in service three years after QTS, with the exception of those that trained through Teach First, a roughly proportionate number teach in disadvantaged schools. Of those who trained with Teach First that are still in service three years after QTS, over half teach in the fifth most disadvantaged schools (defined by pupil intake). Depending on the focus and priorities of government, this may offset some of the negative implications of the lower retention rate for this route. Teachers from Teach First are also the most mobile across schools, with around 60% of those in service having changed schools within three years after QTS. It is worth noting that mobility across schools can be thought of as positive if it reflects flexibility in the system (and indeed is a recent focus for government), but it can have negative implications for pupil attainment (Ronfeldt et al., 2013). Around one-third of teachers trained through other routes change school in their early career, conditional on starting teaching.

Although mobility across schools is similar, regional mobility is much lower for GTP than other routes. This may reflect the preferences of trainees that select this route, but it is interesting that these preferences do not limit mobility across schools. As discussed in Chapter 6, regional mobility is helpful to the system where the allocation of training places does not meet demand for teachers and in circumstances where the demand for teachers fluctuates (perhaps in response to pupil numbers). This suggests that some mobility is desirable. Unfortunately, we cannot conclude whether GTP (or its replacement School Direct) led to teachers with lower regional mobility, or whether trainees with lower regionally mobility were attracted to this route. More research is needed to study the routes that are considered, and applied to, by potential teachers with different sets of characteristics.

Teachers trained through most routes show some responsiveness to the local labour market, which suggests that the decision to remain in teaching is affected by outside options. This is strongest for Teach First trainees, who are most likely to leave the profession if teaching in a high-wage area. Retention for teachers from HEI-led UG routes is not affected by local wages, which may reflect lower outside options for individuals with an education-specific degree.

This summary shows the key differences and similarities between routes into teaching in England. This is not sufficient to conclude whether one route is more cost effective than another, as this depends crucially on the long-term effectiveness of teachers trained through each route. There are also judgements for policy makers, such as the value placed on teaching in disadvantaged schools. The following section considers what would be required for such a conclusion, and factors that should inform the design of the optimal ITT system.

8.3 Areas for future research

This research has not been able to consider the costs and benefits for ITT providers, and how these respond to changes in the allocation of training places. It is reasonable to assume there are economies of scale in the provision of ITT, but uncovering the nature of this would require a detailed survey of providers that is beyond the scope of this project. Recent evidence suggests that it is

possible for providers to absorb reductions in allocations. For example, the NAO reported that the DfE has grown school-led training, in line with policy, without university providers leaving the market in large numbers (NAO, 2016) but this finding is limited to the short run, perhaps before providers have fully adjusted to the new system. The complementarity of school-led and HEI-led provision is also an area of interest that affects the overall cost-effectiveness of the system.

Designing an optimal initial teacher training system

The content and precise structure of ITT courses is the subject of dedicated research and policy, which is not within the remit of our research or expertise. There are some general principles for the efficient functioning of any system which are related to our research, however, which are helpful to consider.

First, certainty allows agents in the market to make rational long-term decisions. Uncertainty leads to suboptimal allocations of resources and effort. This is related to the current system of allocating training places to providers, which has varied from year to year, moving in September 2015 from provider-level to national allocations. Information can also change at short notice. For example, as reported by NAO (2016), the NCTL halted university recruitment for physical education ITT in 2015–16 only two days after warning providers that 75% of places had been filled. This does not allow for long-term planning in staff recruitment or the allocation of resources across school and HEI-led routes (for providers involved with both, and for schools considering involvement in ITT). The proposal in the recent White Paper from the DfE to ‘provide greater certainty to the best school and HEI providers by exploring ways to offer multi-year allocations’ (a return to an approach used between 2007 and 2010) is welcome.

Second, availability of information is important for long- and short-term decisions. This is relevant for central government, who decide the number of training places across subjects without sufficient information on the regional demand for teachers (in total and in each subject). Our results suggest that teachers are not perfectly mobile across regions, so an over-supply of NQTs in one region may lead to a lower retention rate for these teachers, and therefore misallocated resources.

More information is also required on the factors that affect the decision to enter teacher training. For example, whether the distance to ITT provider is an important determinant of deciding to train for many teachers (which would favour decentralised, typically school-led ITT) or whether a centralised, uniform system would be feasible. Gorard et al. (2006) suggest this would be a cost-efficient method of training, in contrast to the current move to school-led provision. The cost-effectiveness of providing financial incentives to train as a teacher must also be rigorously evaluated, against the alternative policy choices, such as reducing the pupil:teacher ratio, which may reduce teacher workload and therefore wastage rates.

The optimal design for ITT therefore depends not only on the structure and content of the course, but also on the correct incentives to attract (and retain) trainees, an efficient allocation of places across local areas, and sufficient stability

and accurate information for providers to make long-term decisions. The current distinction is between school-led and HEI-led provision, with some suggesting that school-led provision is necessary for school recruitment. Whether all schools should, and could, be involved with school-led teacher training is an important question for future research.

9. Conclusion

The overall cost-effectiveness of ITT depends on the priorities for central government, for example the weight placed on teachers' presence in disadvantaged schools. There are also features of cost-effectiveness that are impossible to measure using current sources of data, such as longer-term teacher quality. This report has provided evidence on some key features of cost-effectiveness for different routes into teaching, most importantly the retention rate and average net costs for schools and central government.

The five-year retention rate across routes is largely similar for primary school trainees, but variable across routes (and lower) for secondary school trainees. This implies large differences in the average cost of a teacher in school five years after their expected qualification date.

The average cost of a teacher is also affected by the average cost to central government, and to the schools involved with the training. The average cost to central government varies across routes, particularly for secondary school trainees, which is driven by the alternative systems of funding across routes. The average net cost to schools is much smaller than the average cost to central government, but it is still an important component of the overall cost of ITT. Average school costs are particularly variable across routes for secondary school trainees, partly because costs for some routes are offset by direct funding from central government.

Total average costs are markedly larger for Teach First (more than £14,000 higher than for any other route). This is partly due to higher average central grant funding; Teach First receives around £10,000 more per trainee than the average for School Direct salaried trainees, but this difference is less pronounced for high-priority subjects. Average costs to schools are also highest for Teach First, but schools involved are equally likely to say the benefits of this training route outweigh the costs, suggesting that the benefits are also large.

The overall cost-effectiveness of each route cannot be considered in isolation, as all routes are in part collaborative. School-led routes typically partner with HEIs for some elements of the training, for example. An important feature of the system as a whole is therefore the costs and benefits to ITT providers, and how these are affected by changing allocations. Large economies of scale in ITT would suggest that fewer, centralised providers would be more efficient, although there may be competing considerations, such as meeting local demand for teachers. This is an area of research we have been unable to cover, but it is especially relevant at a time with dramatic changes in the allocation of training places from HEI- to school-led provision. Longer-term changes to allocations should be clear and transparent, however, to allow providers to make effective long-term plans.

As noted in the recent DfE White Paper (DfE, 2016), there is widespread concern about a shortage of teachers, especially in priority subjects. A number of our

findings relate directly to this concern. First, there are differences in retention rates across training routes, particularly at secondary level. The government may therefore be able to influence longer-term retention rates by changing the allocation of training places across routes. However, these differences in retention may reflect differences in the underlying preferences or characteristics of trainees across routes rather than a product of the training routes. Second, there is some suggestion that an oversupply of training places relative to demand for teachers in the local area leads to a lower retention rate, and therefore higher average cost per teacher in service. This suggests that the government should take into account the regional demand for teachers when allocating training places. Third, there is evidence suggesting that high local wages, relative to teacher pay, are associated with lower retention rates. The government cannot directly influence the local labour market; however, this finding suggests that retention is in part determined by the relative level of teacher pay. The policy of fixing annual growth in teacher pay to 1%, below the forecast growth in average wages, is therefore likely to reduce the retention rate of teachers.⁴⁴

Of course, retention is also affected by teachers' wider well-being, such as workload and pupil behaviour, which should inform broader discussions about teacher retention. In recent years, generous bursaries have been introduced in priority subjects with the aim of increasing recruitment to address the shortage. Future research should consider whether these bursaries have been effective at raising recruitment, both to training and subsequently to state schools in England, in comparison with alternative methods of increasing teacher numbers. Our research has found that the cost of training an additional teacher who will remain in teaching five years after achieving QTS can be as high as £70,000. This cost may be higher than alternative policies that could retain an existing teacher for an additional five years, such as higher pay, better support, or continued professional development.

The role of increasing school-led ITT in affecting recruitment and retention must also be considered. The longer-run retention of those trained through school-led routes is typically equal to or greater than retention for HEI-led routes, which is most noticeable for the GTP. From the early retention rates available to date, it is unclear whether its replacement, School Direct salaried, will replicate this higher retention rate. If the longer-run retention rate is lower, the reasons for this should be explored and addressed. Recruitment for School Direct salaried has been lower than anticipated by government, leading some to suggest that increasing the role of school-led routes could exacerbate any shortage of teachers (Universities UK, 2013). This may be because schools are more discerning when selecting trainees, but reports from our survey suggest that the perceived quality of trainees on each route is largely similar. Further research should explore whether the increasing role of school-led ITT will increase teacher shortages and the reasons for this.

⁴⁴ This is according to the forecast published by the Office for Budget Responsibility (OBR) in March 2016, before the result of the UK referendum on membership of the European Union.

Finally, the cost-effectiveness of ITT, and different routes, depends on the effectiveness of teachers in improving pupil attainment. We found no evidence that the presence of trainees affected department- or school-level effectiveness at the end of secondary and primary schools, respectively, but this could be because schools make a calculated decision about involvement with ITT based on the possible effects on pupil attainment. Trainees from each route were roughly equally likely to be rated as having 'good' or 'very good' potential to be a good teacher, but further research is needed to establish what this implies for the qualification rate and long-term effectiveness for teachers training through each route.

While further research is needed, there are a number of concrete suggestions to improve the system of ITT in England based on research presented here. First, funding across routes could be rationalised, with direct grants available for each route (in the place of current tuition fees). This would remove any potential disincentive to train as a result of student fees, while being largely cost neutral for government because a teacher with typical career progression would not begin to pay back the additional student loan to achieve QTS. Evidence should inform the status quo where some routes receive substantially more funding from central government if this is to be maintained. Second, allocations to ITT providers and School Direct lead schools should take into account regional (and perhaps more local) demand for teachers. This is likely to increase retention rates and therefore to reduce the average cost of training per teacher in service. Third, the allocations to providers should be clear and transparent in advance of applications so that the candidates with the best potential to be good teachers are selected, as suggested in the recent White Paper. As mentioned previously, whether candidates are less likely to be selected for school-led routes, and the resulting implications for teacher quality and teacher shortages, are important questions for future research to determine whether the current system of ITT meets the needs of schools and central government.

Appendix A. Matching the SWFC and ITTPP

Consistently identifying teachers across datasets

To estimate the retention in the profession of those training to be teachers, we need to do the following.

1. We need to consistently identify individuals where they appear on multiple occasions in the ITTPP. For our analysis in this report, we wish to record their first registration on a course leading to QTS and to calculate the earliest date at which QTS was achievable. Individuals will have multiple records if:
 - they registered on a course lasting more than one year;
 - they registered on a one-year course, but took longer than a year to complete it;
 - they registered on multiple courses (in this case we take the route and timing details from the first registration but look across all courses to see whether QTS was ever achieved);
 - if a provider recorded them in a year by error (for example, not removing them after completion or withdrawal);
 - if two different providers registered the same individual (for example, a school-centred ITT provider and a higher education institution who are both involved in their training).
2. We need to consistently identify individuals within the five years of SWFC data available.
3. We need to successfully identify teachers from the ITTPP who go on to teach in state-maintained schools in England, finding them in the SWFC.

Using the teacher reference number as an identifier across datasets

The teacher reference number (TRN) is a seven-digit identifier allocated by the Qualified Teacher Status and Induction (QTS-I) team within the DfE. It is used as a unique teacher identifier for many purposes; for example, a TRN is allocated to all trainees on state-funded ITT programmes, it is used for identification for pensions purposes, and it is assigned to overseas teachers who are awarded QTS by virtue either of their existing teaching qualifications (EU and Schengen countries plus Canada, USA, Australia and New Zealand) or following assessment for QTS in the UK.

It should, in theory, be a unique identifier for teachers, but is occasionally not; for example, a teacher who is unqualified and opts out of the Teachers' Pension Scheme will not have a TRN, a teacher may be allocated two different TRNs for rare administrative reasons, and a TRN can be recorded with error by a school.

The TRN is present on almost all records in the ITTPP (missing on just 323 records or 0.09%). TRNs appear just once in 74% of cases, twice in 13% of cases, three times in 10% of cases and four or more times in 3% of cases. (These multiple entries are mostly correct repeat entries of the same teacher in multiple years of ITTPP.)

In the version of the SWFC that we use here, TRNs are missing at the rate of about 1% in years 2010–13 and at a rate of 2% in 2014. The missing TRNs in the SWFC are more prevalent among the youngest teachers. This may be because they are unqualified teachers who are choosing not to contribute to the Teachers' Pension Scheme and so do not possess a TRN. However, we think this is relatively rare. More likely, we believe it is because they are new to the school and the school has not entered their TRN into their management information system by the time of the November census.

Data availability for fuzzy matching of teachers

Fuzzy matching is a technique used to link records within and between databases where a unique identifier cannot be used to match perfectly. For that reason, matches may be less than a hundred per cent perfect. We use it here to consistently identify individuals within each of our databases and between our databases.

The TRN remains a key identifier, but we now assume it may be coded with error or that individuals may hold several TRNs simultaneously. In addition, we draw on personal identifiers across the databases. In the ITTPP, the fields available to us are date of birth, first name, surname, gender and ethnicity. It does not include an alternative surname field. Where training route precedes employment in schools, this is not a problem for linking to the SWFC post-QTS award; it may lead to under-matching if an individual changes their surname between working as an unqualified teacher and taking a training course, or if they take multiple courses and change their surname during the process.

The SWFC has the same personal identifiers as the ITTPP, but we additionally have a former family name field. Unfortunately, the data are incomplete in other respects. First, the name fields are missing for about half the records in the 2010 census, leading to significant risk of under-matching for individuals joining the profession in this year. Second, personal identifiers are missing where the SWFC has been patched with additional records from the Database of Teacher Records, which is compiled from pension records. This has happened where a school has entirely failed to make a census return (23,164 records in total across 2010–13; the 2014 SWFC has not yet been imputed).

Fuzzy matching procedure and performance

We draw records from all our databases and implement a fuzzy match to create an alternative consistent teacher identifier that we call the FFT ID. At the start of this process, we clean the name text fields to remove errant characters, prefixes, suffixes, and so on, to improve the chances of consistency across databases. We implement a typical fuzzy matching procedure that prioritises exact matches on fields such as TRN and date of birth, and attempts matches on common variants of names. We attempt to avoid over-matching by ensuring that our procedure does not result in teachers working in multiple schools in one year. At the end of this procedure, we perform a standard set of under-matching and over-matching checks, and we manually adjust a small number of the FFT IDs accordingly.

We evaluate the performance of the FFT IDs created by our fuzzy matching procedure by comparing them to the TRNs in the databases. Overall, they are in considerable agreement. According to the FFT ID, there are slightly more trainees in the dataset overall but there are also notably more individuals with multiple records (245,842 FFT IDs in the ITTPP versus 243,838 TRNs). Conflicts occur in only 5,880 FFT ID individuals (i.e., 2.4% of all the individuals identified using the fuzzy matching procedure).

The creation of the FFT IDs identifies a slightly different set of teachers achieving QTS in the ITTPP compared to the records identified by the DfE. The DfE subset of NQTs contains 193,434 records for teachers achieving QTS; we think this includes a small number of duplicates and we can identify only 193,389 unique teachers in this subset who were awarded QTS. However, we find 199,419 teachers with unique FFT IDs who achieve QTS in the full ITTPP database.⁴⁵

The linked 2010–14 SWFC database that we are using in our analysis has been set up to contain one record per individual per year, with the main contract being selected where teachers work at multiple schools. Our FFT ID identifies small additional numbers of occasions where a teacher is present in multiple schools in a year, but with different (or missing) TRNs (see Table A.1). On the whole, this indicates that the quality and consistency of the DfE matching work is good.

Table A.2 shows patterns of presence across the five years of the SWFC for teachers using the FFT ID and the TRN as alternative identifiers. The FFT ID has fewer occasions where an individual is identified as present for only one of the years of the census. In the majority of cases where the TRN identifies an individual in one year only and the FFT ID does not, this is because the TRN is missing or invalid (i.e., 9,999,999 or 0). In these cases, the FFT ID identifies the individual in question anywhere between two and five times.

⁴⁵ It is important to note that the ITTPP is not the main record of whether QTS is awarded. The DfE have an independent record in the form of the Database of Qualified Teachers (DQT) for this purpose.

Table A.1. The FFT ID in the SWFC

	2010	2011	2012	2013	2014
Total number of observations	485,445	483,023	488,768	492,631	497,484
Number with missing FFT IDs	0	0	0	0	0
Number of distinct FFT IDs within a year	485,418	482,985	488,731	492,601	497,430
FFT ID appears once in a year	485,391	482,947	488,694	492,571	497,376
FFT ID appears twice in a year	54	76	74	60	108

Table A.2. Patterns of presence across years of the SWFC

Years present in:					FFT ID		TRN ID	
2010	2011	2012	2013	2014	N	%	N	%
No	No	No	No	Yes	46,116	7%	48,529	7%
No	No	No	Yes	No	9,523	1%	12,156	2%
No	No	No	Yes	Yes	34,855	5%	34,180	5%
No	No	Yes	No	No	7,272	1%	9,438	1%
No	No	Yes	No	Yes	2,320	0%	2,304	0%
No	No	Yes	Yes	No	5,208	1%	5,104	1%
No	No	Yes	Yes	Yes	31,278	5%	30,983	5%
No	Yes	No	No	No	7,493	1%	9,415	1%
No	Yes	No	No	Yes	928	0%	922	0%
No	Yes	No	Yes	No	622	0%	606	0%
No	Yes	No	Yes	Yes	2,280	0%	2,266	0%
No	Yes	Yes	No	No	4,515	1%	4,299	1%
No	Yes	Yes	No	Yes	1,296	0%	1,267	0%
No	Yes	Yes	Yes	No	4,294	1%	4,155	1%
No	Yes	Yes	Yes	Yes	31,374	5%	30,884	5%
Yes	No	No	No	No	39,218	6%	40,153	6%
Yes	No	No	No	Yes	2,106	0%	2,118	0%
Yes	No	No	Yes	No	945	0%	943	0%
Yes	No	No	Yes	Yes	2,661	0%	2,663	0%
Yes	No	Yes	No	No	1,660	0%	1,677	0%
Yes	No	Yes	No	Yes	517	0%	519	0%
Yes	No	Yes	Yes	No	1,092	0%	1,093	0%
Yes	No	Yes	Yes	Yes	7,036	1%	7,070	1%
Yes	Yes	No	No	No	30,086	4%	30,011	4%
Yes	Yes	No	No	Yes	2,603	0%	2,606	0%
Yes	Yes	No	Yes	No	1,388	0%	1,391	0%
Yes	Yes	No	Yes	Yes	5,237	1%	5,226	1%
Yes	Yes	Yes	No	No	29,785	4%	29,790	4%
Yes	Yes	Yes	No	Yes	6,276	1%	6,274	1%
Yes	Yes	Yes	Yes	No	34,261	5%	34,238	5%
Yes	Yes	Yes	Yes	Yes	320,547	48%	319,673	47%

The FFT ID also identifies a larger number of individuals who are present across all five years of the census (48% of all teachers). It is worth noting that both the TRN as an ID and the FFT ID identify relatively large numbers who are missing in 2010 and present in 2011–14, or vice versa. If the missing name fields for the 2010 census could be recovered, then it is possible that some of these individuals could be correctly matched across all years.

Missing records in SWFC

A teacher may be teaching in a school and yet not be recorded in the November SWFC for a number of reasons, as follows.

1. The school may have entirely failed to make a SWFC return. Where this happened in 2010, 2011, 2012 and 2013, the Database of Teacher Records has been used to impute the missing information from Teachers' Pensions Scheme records. However, there is considerable lag between a teacher's arrival at a school and their appearance in the Database of Teacher Records, so – particularly for new teachers – this will not always be possible.
2. The school may have inadvertently failed to record an individual teacher. This may be more likely where that teacher is new to the school payroll and was not included in the previous year's census return
3. The school may have decided not to provide a return for teachers currently training in their school if they did not consider them to be 'full' employees, against the completion guidance provided by the DfE.

If the missing record problem is significant, particularly in relation to those who are new to the profession or to the school, then we risk seriously understating teacher retention as there will appear to be more cases of a teacher being in the school system, then disappearing.

Known missing records for employment-based ITT teachers

Teach First placements in years one and two

Teach First participants are employed by schools in the first two years of their programme and so should appear in the SWFC. Teach First maintain their own records of participant location and drop-out. From these records, we can see that across the cohorts starting the programme in 2010, 2011 and 2012:

- only 81% can be identified in the SWFC in the November of year one, whereas Teach First's own records suggest that 96% are teaching in schools;
- 78% can be identified in the SWFC in the November of year two, whereas Teach First's own records suggest 87% are teaching in schools.

School Direct Salaried

School Direct is a new programme and the salaried route was first available from 2013–14. These School Direct salaried trainees are employed while training and should appear in the SWFC during their training year. NCTL's initial analysis of the School Direct salaried route showed very significant numbers of missing

records for the 2,185 trainees in the 2015 ITTPP achieving QTS at the end of their course. Of these:

- 2,183 were allocated a TRN;
- 1,581 were found in the SWFC during their training year (2013);
- 1,768 were found during their first year of qualified employment in SWFC 2014 (1,405 appear in both training and first post-QTS year).

Finding missing records using the date of arrival in school

The SWFC contains a field recording the date of arrival in school of the teacher. So, for example, if a teacher appears in SWFC 2012 with a date of arrival in school of 01/09/2010, then we should find the same teacher in the same school in SWFC 2011 and SWFC 2010. Assuming the date of arrival in school is accurate, if we cannot find them in earlier years, then we know the records are missing and can write the records back into the SWFC. We can do this for two different types of SWFC records: those for teachers who are still teaching at the school (open records) and those for teachers who left the school within the past 12 months (closed records). Table A.3 shows that the number of records found via open contracts varies a little by SWFC year; very few additional records are identified through analysis of the arrival date on closed contracts.

There are two possible difficulties with the approach. The first is that teachers may be incorrectly written back for years where they were not actually *employed* teachers in the school:

- this might happen where students are on PGCE training placements;
- the date of arrival in school may simply be incorrect;
- there may be breaks in service within the period bounded by the date of arrival and current date.

The second possible difficulty is that the probability of recovering the record may be a function of the characteristics of the teacher or the school. In particular, it seems less likely that we would manage to write back a missing record for high-turnover teachers than we would for those with a tendency to remain in schools for longer. It is also possible that an academy resets the date of arrival in school at the point of academy conversion (although our inspection of the data suggests they are only resetting the contract start date and not the arrival date). Thus, all of these adjustments to write back missing records may or may not further distort the presence of records in the SWFC.

Overall, this approach to recovering missing records materially affects estimates of early career retention as it disproportionately writes back records for teachers who are young and who are recently qualified.

Table A.3. Identifying missing records using date of arrival in school

	Found in main SWFC		Found via arrival date on open contract		Found via arrival date on closed contract	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
2010 SWFC	485,416	94%	25,422	5%	4,590	1%
2011 SWFC	482,978	96%	21,267	4%	1,252	0%
2012 SWFC	488,728	96%	17,154	3%	1,815	0%
2013 SWFC	492,596	97%	12,704	2%	3,916	1%

Table A.4. Success rate in identification of Teach First records in the SWFC

	Cohort starting the programme in:		
	2010	2011	2012
% of starting cohort found in the SWFC	81%	79%	82%
% found using open contract start dates	7%	8%	6%
% found using closed contract start dates	1%	1%	2%
% found somewhere in the SWFC	89%	88%	90%
% of starting cohort that Teach First record as still teaching	96%	96%	96%
% of starting cohort found in the SWFC	81%	76%	77%
% found using open contract start dates	2%	1%	1%
% found using closed contract start dates	0%	1%	3%
% found somewhere in the SWFC	83%	78%	81%
% of starting cohort that Teach First record as still teaching	90%	85%	86%

Table A.4. summarises the success of the use of arrival date to recover Teach First participant records that are known to be missing. It shows the importance of this write-back approach for participants in the first year of the programme, with fewer records written back in year 2. There are still some records missing for each cohort and year.

Appendix B. Accounting for Variation in Teacher Pay

In this appendix, we discuss how the specification we use measures the impact of local wages relative to the average level of teacher pay.

Our main specification is given by

$$y_{i,t} = \alpha + \beta \ln W_{i,t-1} + \rho X_i + \delta' X_{i,t-1} + \gamma_t + \theta_i + \epsilon_{i,t}.$$

Until 2013, teacher pay bands were set nationally according to the four pay regions: Inner London, Outer London, Fringe Area and rest of England. By including fixed effects for pay region, we control for the average level of pay in each region. This means that our estimate β measures the effect of the local wage gap (i.e., the difference between local wages and average teacher wage in the pay region). Consider

$$y_{i,t} = \alpha + \beta (\ln W_{i,t-1} - \ln \bar{W}_i^*) + \rho X_i + \delta' X_{s,t} + \gamma_t + \epsilon_{i,t,s},$$

where \bar{W}_i^* is the average teacher pay in the pay region where teacher i works and changes in national pay teacher pay levels are captured by γ_t .

This is equivalent to

$$y_{i,t} = \alpha + \beta \ln W_{s-1,t-1} - \beta \ln \bar{W}_i^* + \gamma' X_t + \rho X_i + \delta' X_{s,t} + \epsilon_{i,t,s}$$

$$y_{i,t} = \alpha + \beta \ln W_{s-1,t-1} + \theta_i + \gamma' X_t + \rho X_i + \delta' X_{s,t} + \epsilon_{i,t,s}$$

where

$$\theta_i = -\beta \ln \bar{W}_i^*.$$

We chose to control for the pay region average pay rather than the actual pay the teacher earns because, prior to 2013, teacher pay could only vary by the spine point of the teacher. In this specification, we want to analyse the effect of the difference between a teacher's inside option, what they could earn in teaching, and their outside option, local wages. Average teacher pay gives a closer approximation to a teacher's potential future earnings than their current pay grade. Post-2013 schools had more flexibility to vary pay in line with performance; we chose to exclude this additional variation as it is likely to be endogenous. The level of performance-related pay a teacher earns will vary with unobserved individual teacher characteristics, which may also affect propensity to leave. Instead, we only exploit the variation between the nationally set pay regions and pay in the local labour markets.

Appendix C. Assumptions for Average Costs

The average costs are calculated using the examples of central and school costs per teacher in the online appendix to this report (with additional figures for Outer London and Fringe London⁴⁶). The calculation of these costs is described in detail in the interim report (Allen et al., 2014). To create average figures for each route, we combined these examples with the breakdown of trainee characteristics from the ITTPP SWFC linked data in 2013–14. However, this requires making a number of additional assumptions, which are outlined below.

We do not observe whether primary teachers are ‘maths specialists’. These trainees receive £2,000 higher bursaries if they have a first-class or 2:1 degree and are on a tuition-fee route. We assume that there are no primary maths specialists. This will cause our figures to slightly underestimate the central cost for these routes; however, this is a relatively innocuous assumption.

We do not observe whether a trainee takes out student finance and/or is eligible for a maintenance grant. We assume that all trainees on tuition-fee routes take out the full tuition fee and maintenance loan (which will lead us to slightly overestimate costs) but do not receive a maintenance grant (leading to a slight underestimate of costs).

We do not observe which trainees are awarded scholarships and therefore we assume that no trainees receive scholarships. This will lead us to underestimate central costs for the routes offering scholarships; however, the effect is small especially if the majority of those awarded scholarships have first-class or 2:1 degrees, as the scholarships are awarded instead of the bursary.

The ITTPP data do not distinguish between upper and lower second-class degrees. This is problematic as degree class determines the size of the bursary for some subjects. We assume all second-class degrees are 2:1 degrees (in 2013–14, 68% of full-time second-class degrees were 2:1).⁴⁷ This will lead us to slightly overestimate the costs.

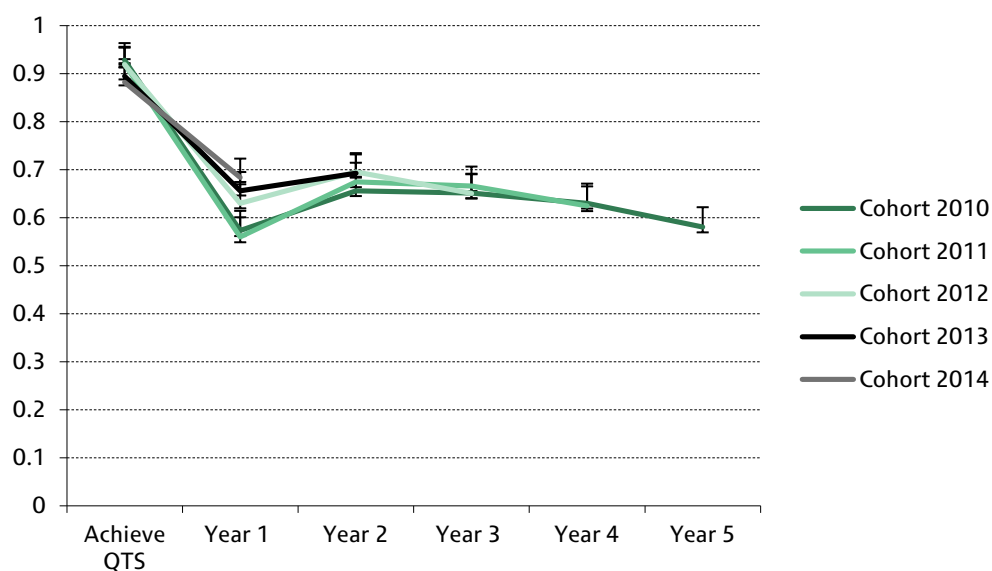
⁴⁶ Available from authors on request.

⁴⁷ Higher Education Statistics Agency (HESA), Statistical First Release (SFR) 210, Higher Education Student Enrolments and Qualifications Obtained at Higher Education Providers in the United Kingdom 2013/14, <https://www.hesa.ac.uk/sfr210>.

Appendix D. Retention Rate by Cohort

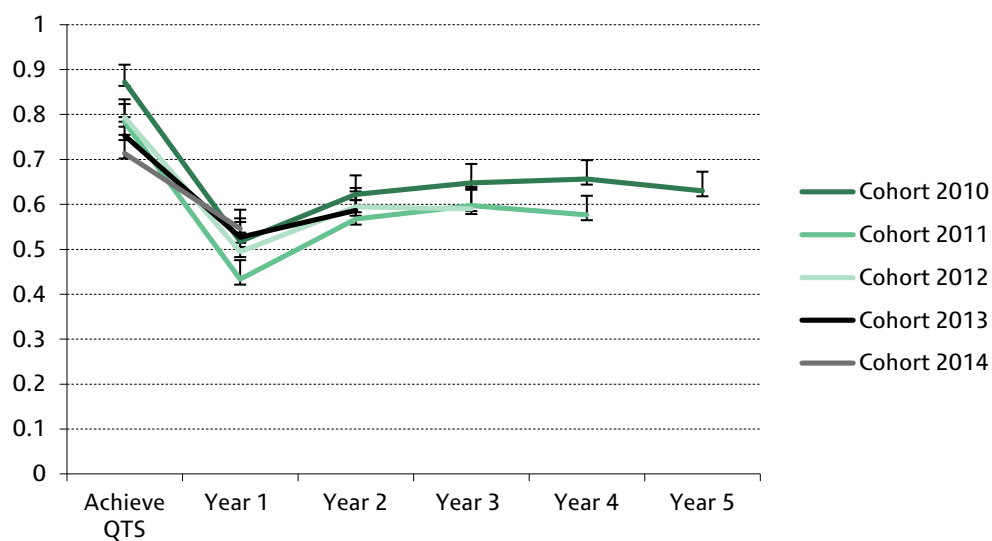
Primary trainees

Figure D.1. Retention rate of primary school HEI-led PG trainees expected to achieve QTS between 2010 and 2014, by cohort



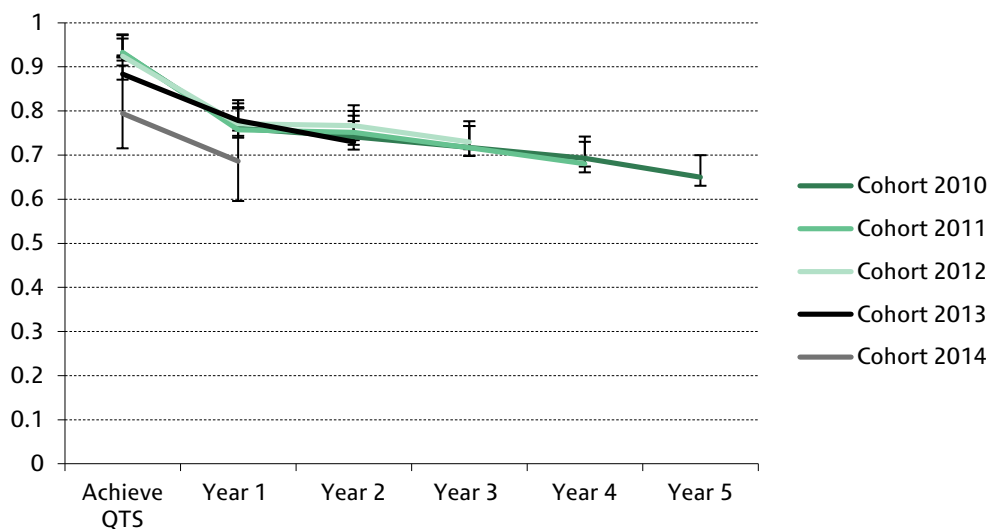
Note: 'Cohort 2010' refers to the cohort that was expected to achieve QTS in 2010, 'Cohort 2011' to the cohort that was expected to achieve QTS in 2011, and so on. Error bars represent the likely range of plausible retention rates, reflecting known measurement error and statistical uncertainty. Source: Authors' calculations based on the ITTPP linked to the SWFC.

Figure D.2. Retention rate of primary school HEI-led UG trainees expected to achieve QTS between 2010 and 2014, by cohort



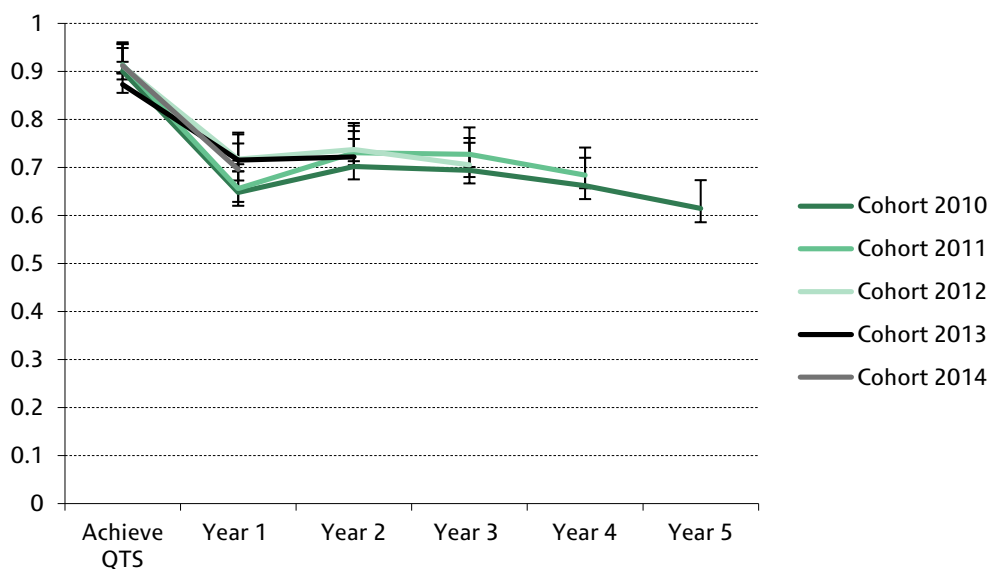
Note: 'Cohort 2010' refers to the cohort that was expected to achieve QTS in 2010, 'Cohort 2011' to the cohort that was expected to achieve QTS in 2011, and so on. Error bars represent the likely range of plausible retention rates, reflecting known measurement error and statistical uncertainty. Source: Authors' calculations based on the ITTPP linked to the SWFC.

Figure D.3. Retention rate of primary school GTP trainees expected to achieve QTS between 2010 and 2014, by cohort



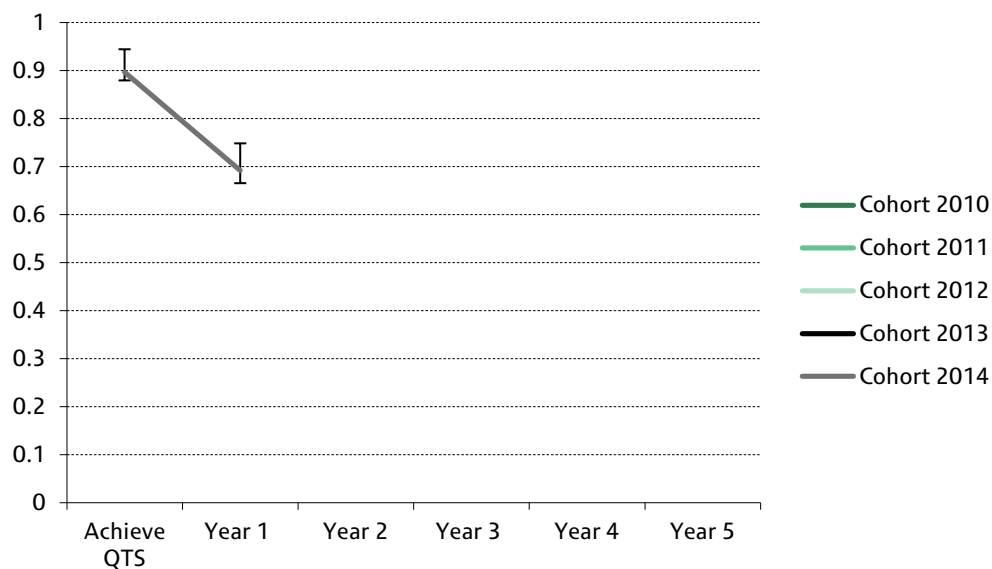
Note: 'Cohort 2010' refers to the cohort that was expected to achieve QTS in 2010, 'Cohort 2011' to the cohort that was expected to achieve QTS in 2011, and so on. Error bars represent the likely range of plausible retention rates, reflecting known measurement error and statistical uncertainty. Source: Authors' calculations based on the ITTPP linked to the SWFC.

Figure D.4. Retention rate of primary school SCITT trainees expected to achieve QTS between 2010 and 2014, by cohort



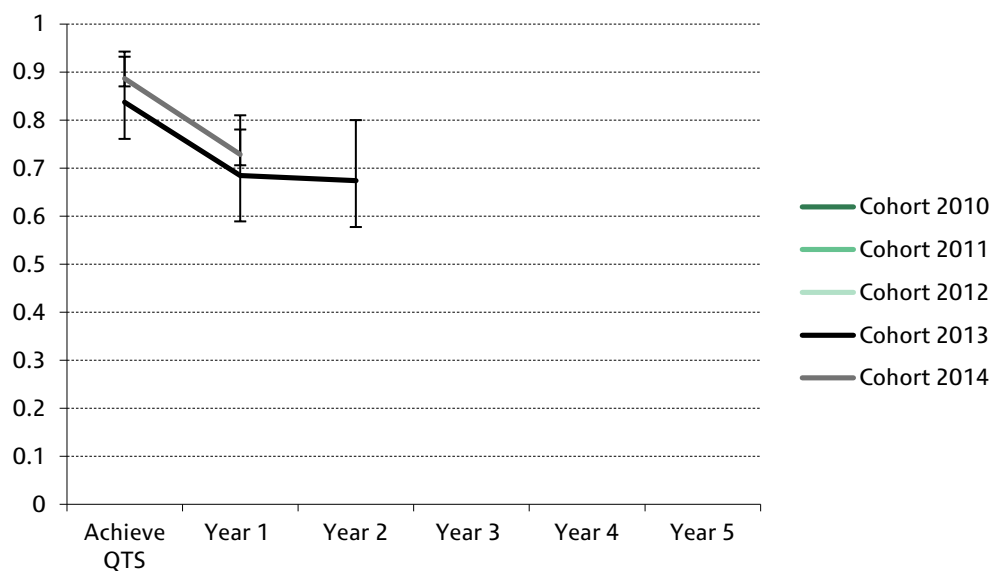
Note: 'Cohort 2010' refers to the cohort that was expected to achieve QTS in 2010, 'Cohort 2011' to the cohort that was expected to achieve QTS in 2011, and so on. Error bars represent the likely range of plausible retention rates, reflecting known measurement error and statistical uncertainty. Source: Authors' calculations based on the ITTPP linked to the SWFC.

Figure D.5. Retention rate of primary school School Direct salaried trainees expected to achieve QTS between 2010 and 2014, by cohort



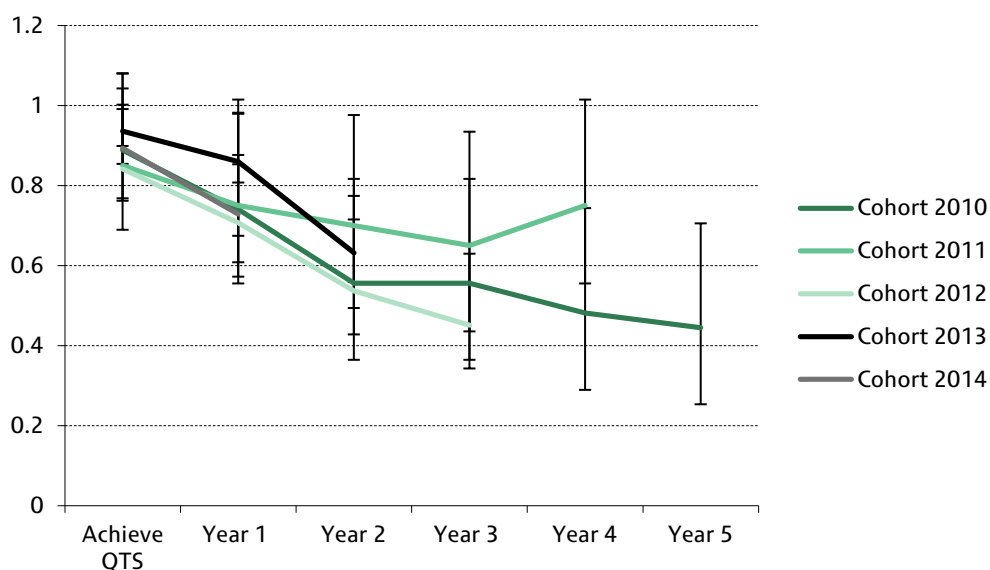
Note: 'Cohort 2010' refers to the cohort that was expected to achieve QTS in 2010, 'Cohort 2011' to the cohort that was expected to achieve QTS in 2011, and so on. Error bars represent the likely range of plausible retention rates, reflecting known measurement error and statistical uncertainty. Source: Authors' calculations based on the ITTPP linked to the SWFC.

Figure D.6. Retention rate of primary school School Direct unsalaried trainees expected to achieve QTS between 2010 and 2014, by cohort



Note: 'Cohort 2010' refers to the cohort that was expected to achieve QTS in 2010, 'Cohort 2011' to the cohort that was expected to achieve QTS in 2011, and so on. Error bars represent the likely range of plausible retention rates, reflecting known measurement error and statistical uncertainty. Source: Authors' calculations based on the ITTPP linked to the SWFC.

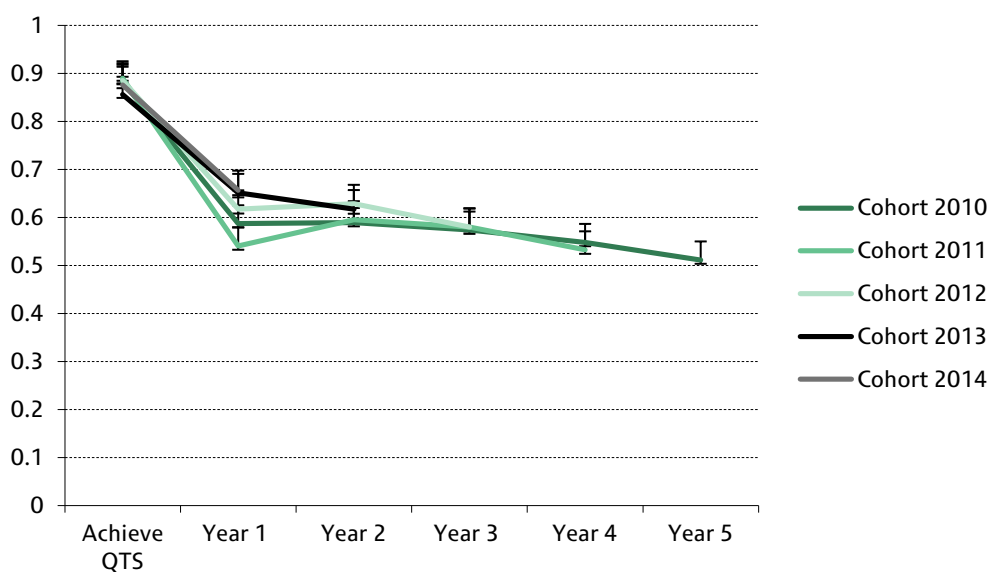
Figure D.7. Retention rate of primary school Teach First trainees expected to achieve QTS between 2010 and 2014, by cohort



Note: 'Cohort 2010' refers to the cohort that was expected to achieve QTS in 2010, 'Cohort 2011' to the cohort that was expected to achieve QTS in 2011, and so on. Error bars represent the likely range of plausible retention rates, reflecting known measurement error and statistical uncertainty. Source: Authors' calculations based on the ITTPP linked to the SWFC.

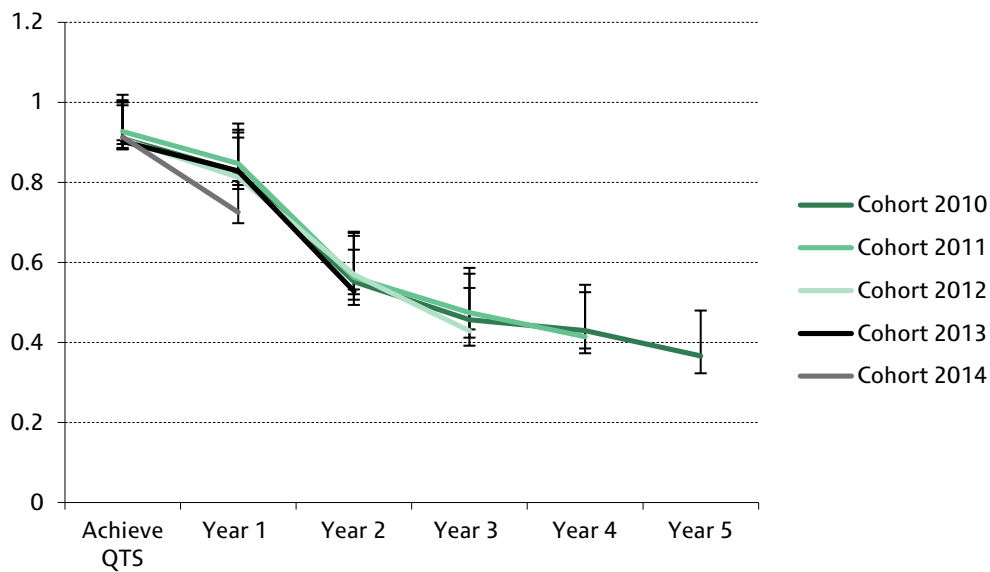
Secondary trainees

Figure D.8. Retention rate of secondary school HEI-led PG trainees expected to achieve QTS between 2010 and 2014, by cohort



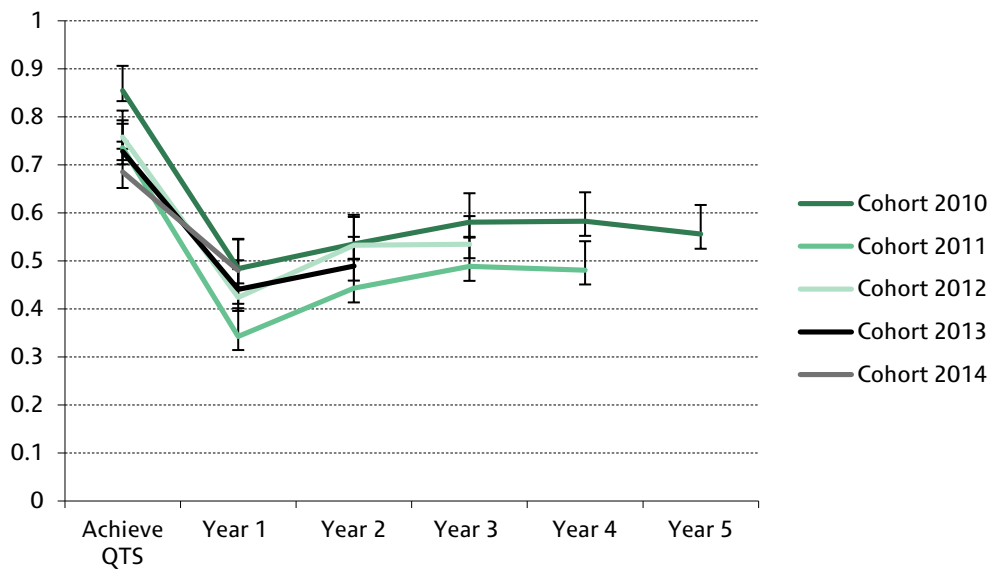
Note: 'Cohort 2010' refers to the cohort that was expected to achieve QTS in 2010, 'Cohort 2011' to the cohort that was expected to achieve QTS in 2011, and so on. Error bars represent the likely range of plausible retention rates, reflecting known measurement error and statistical uncertainty. Source: Authors' calculations based on the ITTPP linked to the SWFC.

Figure D.9. Retention rate of secondary school Teach First trainees expected to achieve QTS between 2010 and 2014, by cohort



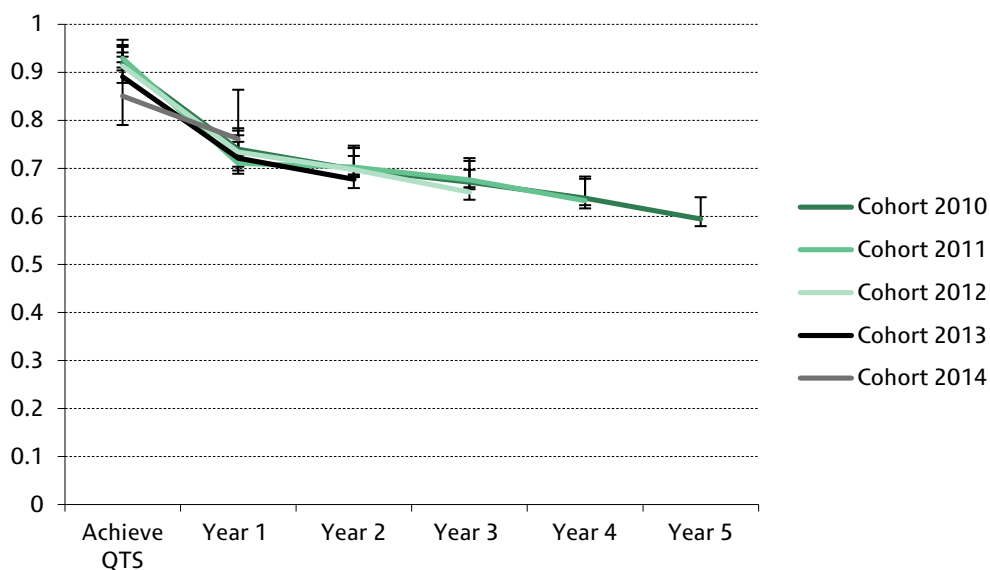
Note: 'Cohort 2010' refers to the cohort that was expected to achieve QTS in 2010, 'Cohort 2011' to the cohort that was expected to achieve QTS in 2011, and so on. Error bars represent the likely range of plausible retention rates, reflecting known measurement error and statistical uncertainty. Source: Authors' calculations based on the ITTPP linked to the SWFC.

Figure D.10. Retention rate of secondary school HEI-led UG trainees expected to achieve QTS between 2010 and 2014, by cohort



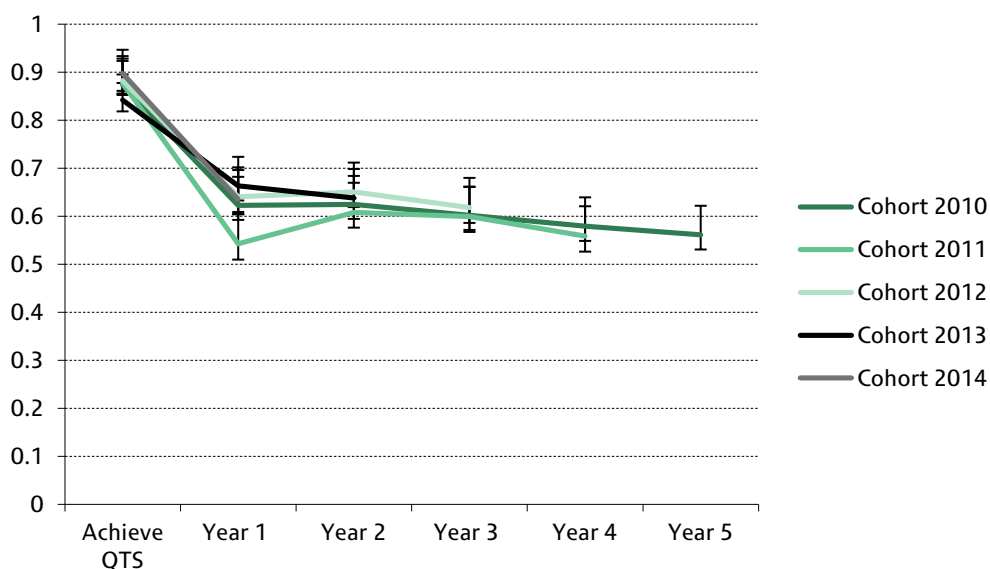
Note: 'Cohort 2010' refers to the cohort that was expected to achieve QTS in 2010, 'Cohort 2011' to the cohort that was expected to achieve QTS in 2011, and so on. Error bars represent the likely range of plausible retention rates, reflecting known measurement error and statistical uncertainty. Source: Authors' calculations based on the ITTPP linked to the SWFC.

Figure D.11. Retention rate of secondary school GTP trainees expected to achieve QTS between 2010 and 2014, by cohort



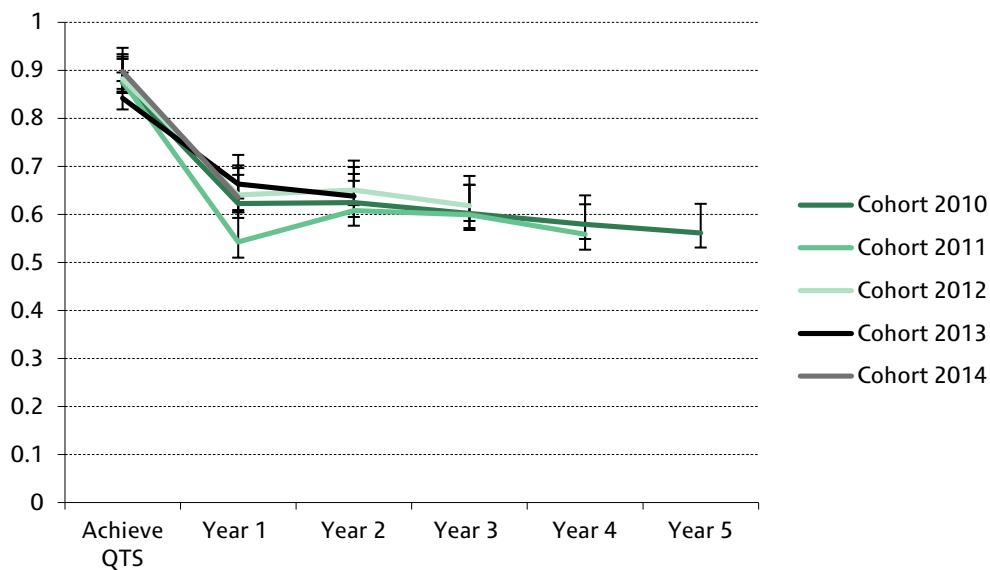
Note: 'Cohort 2010' refers to the cohort that was expected to achieve QTS in 2010, 'Cohort 2011' to the cohort that was expected to achieve QTS in 2011, and so on. Error bars represent the likely range of plausible retention rates, reflecting known measurement error and statistical uncertainty. Source: Authors' calculations based on the ITTPP linked to the SWFC.

Figure D.12. Retention rate of secondary school SCITT trainees expected to achieve QTS between 2010 and 2014, by cohort



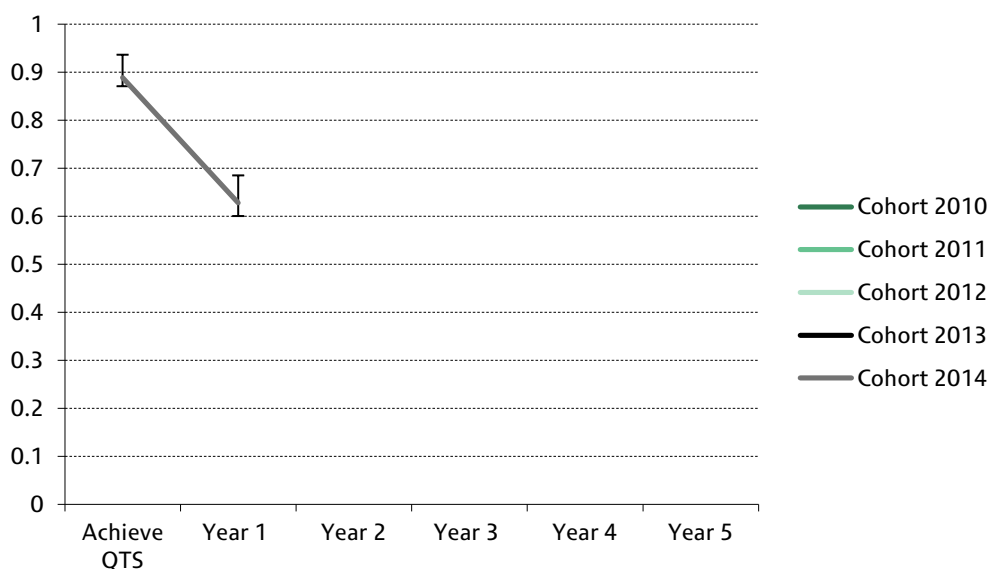
Note: 'Cohort 2010' refers to the cohort that was expected to achieve QTS in 2010, 'Cohort 2011' to the cohort that was expected to achieve QTS in 2011, and so on. Error bars represent the likely range of plausible retention rates, reflecting known measurement error and statistical uncertainty. Source: Authors' calculations based on the ITTPP linked to the SWFC.

Figure D.13. Retention rate of secondary school SCITT trainees expected to achieve QTS between 2010 and 2014, by cohort



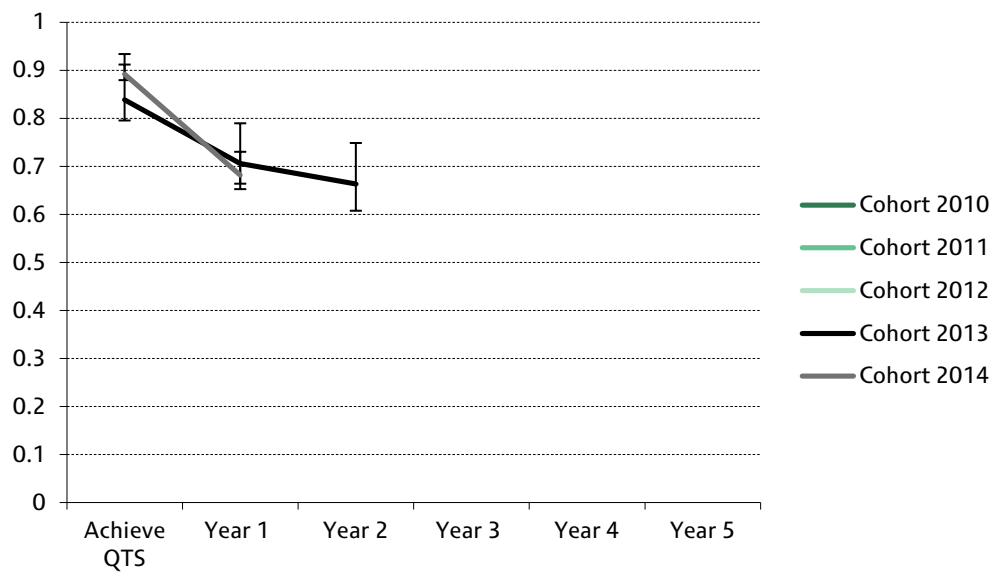
Note: 'Cohort 2010' refers to the cohort that was expected to achieve QTS in 2010, 'Cohort 2011' to the cohort that was expected to achieve QTS in 2011, and so on. Error bars represent the likely range of plausible retention rates, reflecting known measurement error and statistical uncertainty. Source: Authors' calculations based on the ITTPP linked to the SWFC.

Figure D.14. Retention rate of secondary school School Direct salaried trainees expected to achieve QTS between 2010 and 2014, by cohort



Note: 'Cohort 2010' refers to the cohort that was expected to achieve QTS in 2010, 'Cohort 2011' to the cohort that was expected to achieve QTS in 2011, and so on. Error bars represent the likely range of plausible retention rates, reflecting known measurement error and statistical uncertainty. Source: Authors' calculations based on the ITTPP linked to the SWFC.

Figure D.15. Retention rate of secondary school School Direct salaried trainees expected to achieve QTS between 2010 and 2014, by cohort



Note: 'Cohort 2010' refers to the cohort that was expected to achieve QTS in 2010, 'Cohort 2011' to the cohort that was expected to achieve QTS in 2011, and so on. Error bars represent the likely range of plausible retention rates, reflecting known measurement error and statistical uncertainty. Source: Authors' calculations based on the ITTPP linked to the SWFC.

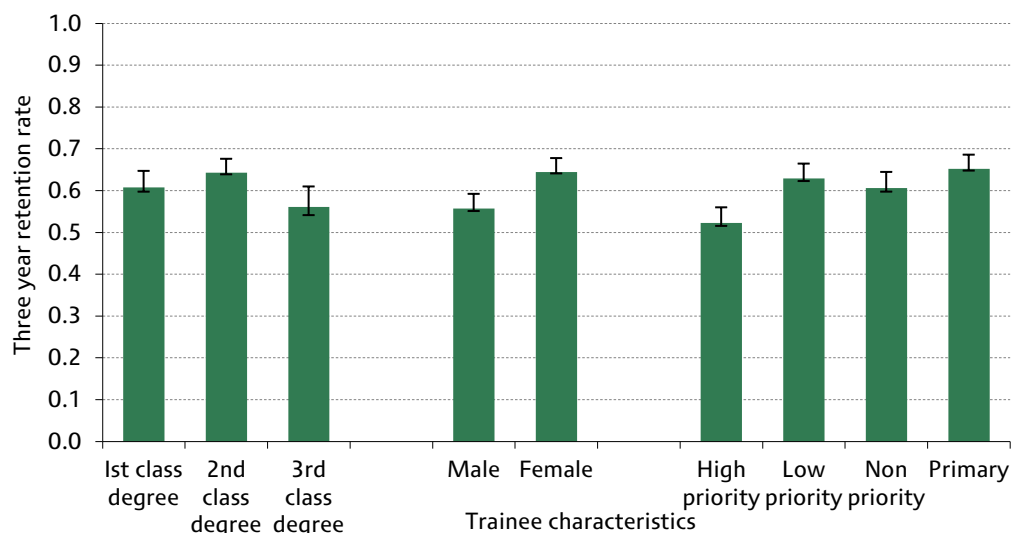
Appendix E. Retention Rate by Trainee Characteristics

Figure E.1 shows that the three-year retention rate for trainees with different degree classes is largely similar, although slightly lower for trainees with a third-class degree. Females are more likely to be in service after three years than males (64–67% to 56–59%). Primary teachers are more likely to be in service after three years than secondary teachers, where the retention rate is similar across subject groups.

Figure E.2 shows that there is more variation in five-year retention rates. The difference between male and female retention rates remains at around 8 percentage points, but differences across teacher types increase. Trainees from high-priority subjects are less likely to be in service after five years than those from low or no priority subjects. This is perhaps unsurprising as high-priority subjects are classified as such due to shortages of teachers. Although financial incentives are available to train as a teacher, there are less explicit financial incentives to remain in teaching.⁴⁸ Those with a second-class degree are more likely to be in service after five years than those with a first-class or third-class degree.

⁴⁸ School leaders do have flexibility in pay awards, particularly after the teacher pay reform introduced in 2013. Decisions to introduce financial incentives for retention would have to be made from within a fixed budget, however, so are likely to be as generous as the tax-free bursary available to train.

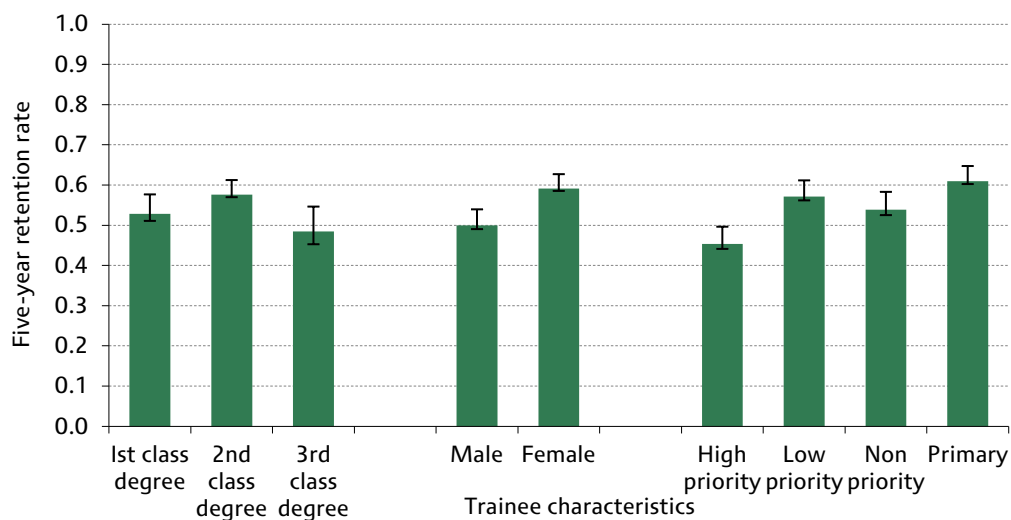
Figure E.1. Retention rate for trainees with particular characteristics after three years



Note: The dashed line represents the average across all groups. Primary and secondary trainees are combined, except bars for 'high priority' to 'non priority', which refer to secondary only, and 'primary'. Error bars represent the likely range of plausible retention rates, reflecting known measurement error and statistical uncertainty.

Source: Authors' calculations based on the ITTPP linked to the SWFC.

Figure E.2. Retention rate for trainees with particular characteristics after five years



Note: Dashed line represents the average across all groups. School Direct salaried and unsalaried trainees are excluded from this figure. Primary and secondary trainees are combined, except bars for 'high priority' to 'non priority' which refer to secondary only, and 'primary'. Error bars represent the likely range of plausible retention rates, reflecting known measurement error and statistical uncertainty.

Source: Authors' calculations based on the ITTPP linked to the SWFC.

Appendix F. Previous Evidence on Retention

Existing evidence on the retention teachers in England comes from various sources of data, which makes comparison across estimates difficult. In addition, all sources of data have some measurement error, so all estimates must be treated as approximate (Gorard et al., 2006). The most recent sources of data are described more fully in Chapter 2.

Retention

The DfE produces annual statistics on the retention of NQTs in the state-funded sector in England who were ‘in service’ the year following qualification.⁴⁹ (Those who do not enter the state-funded sector the academic year after QTS are not included in any figures.) These statistics are based on the SWFC from 2010 onwards, and the Database of Teacher Records before then. In 2010, 24,100 newly qualified entrants entered the service. This corresponds to a retention rate in the first academic year after QTS of 62%.⁵⁰ Of these teachers who start teaching the year following QTS, 87–88% of recent cohorts are in service the following year (second year after QTS). For the 2010 cohort, this corresponds to an overall retention rate of 54%, but excludes those that may enter teaching in later years following QTS. Figures for three years after qualification are 81–83% (around 51% overall), and 77% four years after qualification (around 47% overall).

These data also suggest that the early career retention rate for teachers entering the state-funded sector has remained roughly constant over time (from 1996 when records begin). For example, between 87% and 91% of those entering teaching in the year following QTS remain in teaching the following year across all years.

Previous estimates from the DfE are based on the GTCE database, in combination with the Database of Teacher Records and Pensioner Statistical System.⁵¹ For a sample of ‘college-based’ teacher trainees, the five-year retention rate in the state-funded sector for those completing ITT is 56%. The one-year retention rate is 59%. Note that this estimate does not include those who do not achieve QTS, or trainees not on ‘college-based’ routes.

⁴⁹ <https://www.gov.uk/government/statistics/school-workforce-in-england-november-2014>.

⁵⁰ The total number of final year trainees in the academic year 2009–10 was 39,103. Source: <http://dataprotection.education.gov.uk/external-file/public/profiles/pp2011.xls>.

⁵¹ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/182407/DFE-RR151.pdf.

A small number of previous estimates give the variation in retention rates between those trained through different ITT routes. Smithers et al. (2012) report the retention rate, by route, for those who achieved QTS between 2005 and 2010. These estimates are based on registration data of the GTCE, linked to those who successfully completed their training. This found that the five-year retention rate for those achieving QTS (averaging across the cohorts and conditional on qualification) was, approximately:

- 90% for GTP primary;
- 77% for university-led PGCE primary;
- 72% for SCITT-led PGCE primary;
- 75% for university-led PGCE secondary;
- 68% for SCITT-led PGCE secondary;
- 40% for Teach First secondary.

The submission of the Training and Development Agency for Schools to the Education Select Committee reported the qualification rate and retention rate (conditional on qualification) for the following five routes: 'mainstream UG', 'mainstream PG', SCITT, GTP and Teach First.⁵² Averaging across the years 2006–10, and presumably primary and secondary sectors, completion rates were highest for Teach First (95%) and lowest for mainstream PG (86%). The four-year retention rate for the cohort that achieved QTS in 2005 is between 42% for Teach First and 82% for mainstream UG and GTP. Assuming the completion rate was similar across cohorts in the years 2006–10, the implied retention rate for all trainees rather than those who achieve QTS is between 40% for Teach First and 75% for GTP.

An alternative source of data is the Destination of Leavers from Higher Education (DLHE), which surveys trainees around six months after graduation. These data are then submitted by ITT providers. The response rate is relatively high (around 78%) although not necessarily representative. This is reported annually by Smithers and Robinson in the Good Teacher Training Guide. In 2013, the broad finding was that 'more trainees on school-led programmes (80.9%) entered teaching than those on university-led courses (76.1%)'.⁵³ A higher proportion of NQTs from postgraduate courses entered teaching than from undergraduate courses (71.1% compared to 75.6%).

Recent analysis of internal Teach First data by the NAO gives retention rate estimates for this route from this alternative source. The retention rate decreases markedly in the second year after achieving QTS (beyond the end of expected participation in the programme), but there is significant variation across cohorts. Between approximately 38% and 56% of trainees are recorded as 'in service' five years after the expected QTS date, with retention typically higher for more recent cohorts. Estimates from this source of data are compared with estimates from the

⁵² For the full report from the Education Select Committee, see <http://www.publications.parliament.uk/pa/cm201012/cmselect/cmeduc/1515/1515ii.pdf>.

⁵³ Smithers, A., Robinson, P. and Coughlan, M.-D. (2013), *The Good Teacher Training Guide*, <http://www.buckingham.ac.uk/wp-content/uploads/2014/01/GTTG2013.pdf>.

linked ITTPP and SWFC data to give some indication of the likely downward bias in the SWFC. These are presented in full in Appendix A.

Four-fifths of trainees surveyed in the 'Becoming a Teacher' project indicated that they *expected* to be in teaching after five years, and only 5% reported that they intended to leave by this time (Hobson et al., 2009). This is in contrast to figures presented here, and the actual retention rate reported in later waves of the survey, where the one-year retention rate was under 60%.

In summary, estimates of the retention rate of teachers vary due to the data source used and the sample taken for the denominator (those who register for training, those who achieve QTS, or those who start teaching in the year following QTS). The data source and sample used must therefore be considered when interpreting previous published retention rates. It is also useful to remember that each of the data sources has different types of measurement error or non-response bias, which affect the estimates differently. Most importantly, all figures should be taken as approximate. One can draw some general conclusions, however, that the retention rate for primary and secondary trainees declines over time, and is typically lowest for Teach First and highest for GTP in the long run.

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