



Department  
for Education

# Identifying further education teacher comparators

Research brief

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Social Science in Government

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## Executive summary

Establishing occupational comparators for further education (FE) teachers is important in light of reforms that look set to increase demand for FE, which will in turn have an impact on the required flows of teachers into and around the FE sector. This exploratory analysis implements econometric matching to identify those occupations which are 'statistically similar' to FE teaching in terms of working hours, demographic profile and qualifications. Econometric matching involves finding a suitable comparator group relying on the predicted likelihood of a certain state (in this case being an FE teacher), as calculated by a statistical model. The suitable comparator group is obtained by 'matching' individuals who are in that state (in this case FE teachers) with individuals who are not (in this case the potential comparators), on the basis of the predicted likelihood.

The econometric matching procedure relies on data from the Labour Force Survey (LFS) and the FE Staff Individualised Record (SIR). Using this approach and these data, 'Other teaching professionals' (e.g. secondary education teaching professionals) are, unsurprisingly, found to be the most significant comparator occupation. When identifying comparators with relevant industry experience for vocational subjects (e.g. 'Engineering and Manufacturing Technologies' or 'Health, Public Services and Care'), a mix of skilled occupations are likely to be relevant comparators. For example, the comparator occupations for Construction teachers include 'Construction and building trades' (e.g. bricklayers and plumbers), but also 'Production managers and directors'.

These findings are confirmed by analysis of the dynamics observed in labour market data drawn from the Annual Survey of Hours and Earnings (ASHE) and discussions with relevant sector stakeholders. However, these findings should be considered exploratory at this stage.

Data from the ASHE and the SIR were also used to compare the pay level and pay growth of FE teachers with the comparator occupations. The results of this analysis should be considered 'experimental', due to the presence of some data limitations.

## Chapter 1: Introduction

The further education (FE) sector is undergoing significant reform, most crucially the introduction of T levels<sup>1</sup> and the commitment within the Industrial Strategy<sup>2</sup> to “establish a technical education system that rivals the best in the world”.<sup>3</sup>

Given this outlook, the Department for Education (DfE) commissioned Frontier Economics to undertake research to identify those occupations comparable to FE teaching in terms of a range of characteristics (such as pay, working conditions, experience, and qualifications), i.e. ‘FE teacher comparators’. The aim of this analysis was to allow DfE to further strengthen their understanding of the characteristics of those teaching in the FE sector, and build the evidence base informing policy around FE teacher recruitment and retention. Any approach to improving teacher recruitment and retention needs to be informed by an understanding of two inter-related areas:

1. What are the key alternative or comparator occupations available to FE teachers?
2. What are the pay and conditions available to FE teachers if they chose to work in one of those comparator occupations?

This project aimed to answer the first question, and undertake preliminary analysis to inform a response to the second. Both aspects of the study were exploratory, and limited to existing data, but the work related to the second question should be considered particularly experimental.

To achieve its overarching aim, the project was focused on two complementary objectives:

1. Reviewing the existing evidence and datasets that enable comparison between FE teachers and other appropriate non-FE roles;
2. Developing an econometric framework to identify FE teacher comparators, primarily at the sector level, but also with respect to the type of FE institution, subject area and employment mode.

This research brief presents the key findings from this project. First, it discusses the methodology employed, describing the econometric framework, the data sources and the robustness checks conducted. Second, it presents the findings on FE teacher

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<sup>1</sup> T Levels are courses, which will be on a par with A levels and will provide young people with a choice between technical and academic education post-16. For more information, please see: [News Story: New T Levels mark a revolution in technical education](#)

<sup>2</sup> [Policy Paper: Industrial Strategy – building a Britain fit for the future](#)

<sup>3</sup> Please see p. 11 within the [Industrial Strategy](#).

comparators (question 1 above) and on the experimental analysis of pay differentials (question 2). The findings include comparators for FE teaching professionals in general and for FE teachers in vocational subjects with relevant industry experience in particular.<sup>4</sup> It concludes with a summary of findings and a discussion of areas for further research.

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<sup>4</sup> It was not possible to identify comparators for academic subjects, because there is no detailed data available that could be used to infer the relevant academic skills and knowledge of the individuals in the sample. This is explained in more detail in the Methodology section (see p.10).

## Chapter 2: Methodology

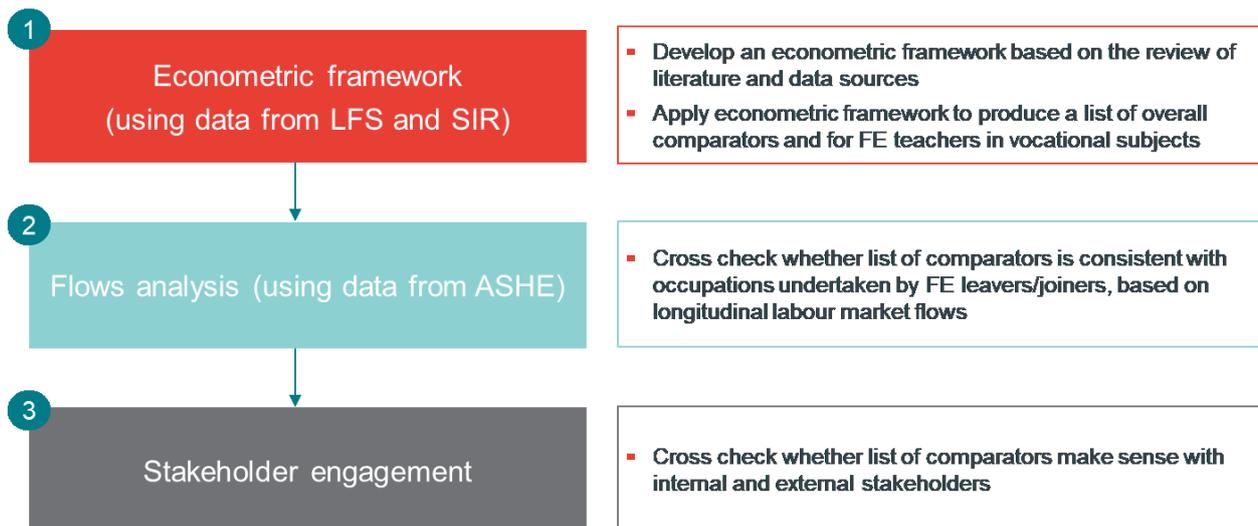
A three-step methodology (see Figure 1 below) was used for this study.

Step 1 involved developing and applying an econometric framework to produce a list of comparators. Broadly speaking, an econometric framework uses a statistical model or procedure applied to real data to formulate an answer to a policy question.

The econometric framework in step 1 employed a state-of-the-art econometric matching procedure, detailed below, and was peer-reviewed by academic experts and DfE analysts. The framework relied on data from the FE Staff Individualised Record (SIR) and the Labour Force Survey (LFS). While these were the most reliable sources available for this purpose, they have limitations. These limitations are set out on p.10 below.

Steps 2 and 3 were designed to verify the robustness of the findings from the econometrics in step 1 and ensure their consistency with other labour market data and the views of key stakeholders operating in the sector. Step 2 involved comparing the list of comparator occupations from the econometrics with the occupations of those leaving or joining FE teaching recorded in the Annual Survey of Hours and Earnings (ASHE) longitudinal data. Step 3 involved qualitative feedback on the list of comparators from a range of FE sector stakeholders.

Figure 1: Overview of methodology



Source: Frontier Economics

## 2.1 Econometric framework

The econometric framework adapts a propensity score matching (PSM) methodology<sup>5</sup> constructed by Bryson and Forth (2017), which aimed to identify comparators for public sector occupations covered within the remit of a Pay Review Body (PRB). The PSM methodology used by Bryson and Forth (2017) involves estimating the likelihood of being covered by the PRB through an econometric model. It relies on this predicted likelihood to 'match' occupations covered by the PRB with a set of comparator occupations which are not covered by the PRB. The PSM methodology employed for this study adapts Bryson and Forth's (2017) methodology by estimating the econometric framework using more granular data sources, with larger sample sizes and specific information for FE teachers.

The framework identifies occupations which are 'statistically similar' to FE teaching on the basis of demographic information (age and gender), working hours and educational attainment (measured by the level of the highest formal qualification held). These roles can be considered those most equivalent to FE teaching in terms of their characteristics and hence those most likely to represent outside options for FE teachers. Cross-checking the findings against labour market data from the ASHE found that there is a significant overlap between these comparators and the occupations of individuals joining or leaving FE.

The econometric framework was peer-reviewed by external academic advisers and DfE analysts and relies on the most robust approach possible given existing data limitations (see p.10 below).<sup>6</sup>

The review of data sources conducted for this project suggested that the LFS and the SIR are currently the best datasets for applying the framework. The ASHE and Understanding Society (US) were also considered but were not ideally suited for this application.<sup>7</sup>

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<sup>5</sup> Propensity score matching is a form of econometric matching which involves finding a suitable comparator group, by using the predicted likelihood of a certain state (in this case being an FE teacher), as calculated by a statistical model. The suitable comparator group is obtained by 'matching' individuals who are in that state (in this case FE teachers) with individuals who are not (in this case the potential comparators). This is done on the basis of the predicted likelihood.

<sup>6</sup> Pay is not included in the baseline version of the econometric framework because this can be seen as an outcome variable. However, including pay does not appear to significantly affect the list of comparator occupations; it only has an impact on their order.

<sup>7</sup> More specifically, ASHE does not have information on qualifications, whereas US has a lower sample size than the LFS, because it not possible to pool different cohorts.

To make the best use of the available data sources, information on more than 100,000 workers in comparator occupations from the LFS (employed over the 2013 to 2017 period) was pooled with approximately 8,000 FE teachers from the SIR (employed in the 2016/17 academic year). The LFS was relied on for comparator occupations, because it has more information on background characteristics, such as formal qualifications (ONS, 2018b). For FE teachers the SIR was used because it has a large sample size and contains information by teaching subject (Frontier Economics, 2018). Having information by subject was important because it allowed comparators for specific subjects to be identified.

First, the framework was used to identify the closest comparators for FE teaching professionals overall at the 3-digit SOC level.<sup>8</sup> Then it was applied to identify comparators for individual vocational subject areas (e.g. 'Engineering and Manufacturing Technologies'), by focusing only on workers who also had relevant industry experience. Sector stakeholders helped to identify, for each subject area, the industries that would be most likely to offer occupations that would have adequate knowledge to deliver teaching of those subjects. The econometric framework could then identify the most relevant comparator occupations within these industries for each subject area, as well as recognising their relative importance. This gave an indication of the most comparable roles for targeting individuals with sector specific experience. It might not be valid in a case where individuals become FE teachers specifically because they are looking to change their current circumstances.

This method could not be applied for identifying relevant comparator occupations for academic subjects taught in FE because of the difficulties in measuring subject-specific knowledge, namely the set of competences and knowledge which are likely to be useful to deliver academic teaching in a particular area (e.g. a qualification in biology for science teachers).

### **2.1.1 Limitations of the econometric framework**

There are a number of limitations to the approach adopted in this study.

Limits to the information contained within the LFS and the SIR, such as partial proxies for educational attainment, could, in principle, affect the robustness of the findings. For instance, it is not possible to draw a distinction, using LFS data, between an individual with a first-class degree and an individual with a third-class degree. This could lead to the inclusion of comparator occupations that require a different level of qualifications and skills to FE teachers. The two cross-checks, using the ASHE and engaging stakeholders,

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<sup>8</sup> The standard occupational classification (SOC) is a common classification of occupational information for the UK. For more information, please see: [The Office for National Statistics description of SOC](#)

were important for providing reassurance that these limitations do not appear to have a significant effect on the results (see below).

The framework identifies comparator occupations that require a workforce with similar characteristics to the existing FE workforce. Using the comparators identified in this study as the basis for setting pay or wider recruitment policy might not be appropriate if there is a desire to attract a different calibre of FE teacher in future. Ideal recruits to FE might have a different base of skills, experience(s) and educational attainment and would also likely have a different set of comparator occupations. Identifying a set of comparator occupations for ideal recruits to FE could be important for clarifying which occupations a recruitment and retention strategy should target. It was beyond the scope of this project to undertake this analysis and would likely involve a more time-intensive qualitative exercise to understand what qualifications and skills are necessary for different teaching roles.

## **2.2 Cross-checking the findings from the framework**

As a first cross-check, the ASHE data was used to verify whether the list of comparator occupations from the framework was representative of labour market flows in and out of FE teaching. Specifically, the analysis identified the most common occupations that current FE teachers used to work in, and the most common occupations that former FE teachers now work in. This list of occupations was compared with the list of occupations identified by the econometric framework to identify the extent of overlap. The ASHE data was used for this purpose because it is longitudinal, follows individuals for up to 15 years, and has high-quality information on working conditions and work status that is provided directly by the employer (ONS, 2018a).

The ASHE data was used as a cross-check to the findings from this work rather than the direct route to identifying comparators. The relatively small number of leavers and joiners each year makes it difficult to assess the relative weights of different occupations, especially in smaller subject areas (such as 'Retail and commercial enterprise'), rendering it unfit for this purpose.

As an additional cross-check, external stakeholders with specific FE sector experience were asked to comment on whether the econometric findings were aligned with their experience of the sector. Engaging with the stakeholders in this way was important to identify the industry-level experience which could be relevant for the vocational subjects, and gives further confidence in the robustness of the findings.

## Chapter 3: Findings

The top 10 comparator occupations for all FE teachers, identified by the econometric framework, are shown in Table 1 below. Next to each comparator occupation is an ‘incidence’ indicator showing how relevant each comparator is with respect to the total FE teaching population. For example, out of the closest comparators for 100 FE teachers, 25 of those comparators would be expected to be ‘Other teaching professionals’, 7 to be ‘Functional managers and directors’ etc.

As might be expected, ‘Other teaching professionals’ is the closest comparator occupation to FE teachers as a group, displaying an overall incidence of almost four times as much as the second highest comparators. The other occupations are industry roles which might be important for vocational subjects.

FE teachers compare closely with a wide range of occupations, reflecting the diversity of the FE sector itself. The comparator occupations are largely either managerial (e.g. ‘Functional managers and directors’) or technical and highly-skilled (e.g. ‘Engineering professionals’). Given the type of subjects taught in the FE sector, ranging across both the academic and technical spheres, this range of comparator occupations makes intuitive sense.

**Table 1: Top 10 comparator occupations – all FE teachers**

<b>Occupation (3-digit SOC and title)</b>	<b>Incidence</b>
231 Other teaching professionals (e.g. secondary education teachers)	24.5%
213 Information technology and telecommunications professionals	7.4%
113 Functional managers and directors	7.4%
242 Business, research and administrative professionals	6.1%
221 Health professionals	5.8%
223 Nursing and midwifery professionals	4.9%
356 Public services and other associate professionals	4.3%
212 Engineering professionals	4.0%
125 Managers and proprietors in other services	3.7%
112 Production managers and directors	3.0%

Source: Frontier Economics using data from LFS and SIR for England

### 3.1 Comparator occupations for vocational subjects

The top 5 comparator occupations for FE teachers, by vocational subject, are presented in Table 2 below.

These findings do not include teachers as a comparator occupation, due to the way the econometric framework was designed. The objective of this exercise was to assess which roles in industry are most comparable to FE teaching. For this reason, the findings only include comparator occupations in sectors that equip teachers with subject-specific knowledge (e.g. the manufacturing industry for the subject 'Engineering and manufacturing technologies').

As one might expect, the top comparator occupations for each subject are those working in a similar area and/or with similar skills in industry or the public sector. For example, teachers of 'Health, public services and care' match most closely with 'Nursing and midwifery professionals'. Similarly, 'Engineering and manufacturing technologies' teachers match most closely with 'Engineering professionals'. Looking at the list more broadly, it is evident that FE teachers compare closely with a range of more skilled (e.g. 'Managers and proprietors in other services') and less skilled (e.g. 'Other elementary services occupations') industry roles. This reflects the wide range of technical and practical skills that are taught within the FE sector.

**Table 2: Top 5 comparator occupations – by subject**

Subject	Occupation (3-digit SOC and title)	Incidence
Arts, media and publishing	341 Artistic, literary and media occupations	32.1%
	247 Media professionals	11.9%
	342 Design occupations	8.3%
	354 Sales, marketing and related associate professionals	6.5%
	113 Functional managers and directors	5.3%
Health, public services and care	223 Nursing and midwifery professionals	18.2%
	221 Health professionals	15.8%
	614 Caring personal services	15.7%
	222 Therapy professionals	6.0%
	323 Welfare and housing associate professionals	5.0%
Business, administration and law	242 Business, research and administrative professionals	17.6%
	353 Business, finance and related associate professionals	12.4%
	113 Functional managers and directors	11.1%
	241 Legal professionals	10.2%
	412 Administrative occupations: Finance	9.2%

Engineering and manufacturing technologies	212 Engineering professionals	18.3%
	112 Production managers and directors	10.3%
	243 Architects, town planners and surveyors	7.7%
	113 Functional managers and directors	7.5%
	354 Sales, marketing and related associate professionals	6.9%
Leisure, travel and tourism	344 Sports and fitness occupations	22.0%
	621 Leisure and travel services	11.4%
	113 Functional managers and directors	7.6%
	354 Sales, marketing and related associate professionals	7.5%
	122 Managers and proprietors in hospitality and leisure	7.4%
Retail and commercial enterprise	622 Hairdressers and related services	14.4%
	927 Other elementary services occupations	13.3%
	125 Managers and proprietors in other services	12.4%
	354 Sales, marketing and related associate professionals	7.6%
	356 Public services and other associate professionals	6.8%
ICT	213 Information technology and telecommunications	51.0%
	113 Functional managers and directors	13.5%
	415 Other administrative occupations	6.9%
	242 Business, research and administrative professionals	5.1%
	354 Sales, marketing and related associate professionals	5.1%
Construction, planning and the built environment	531 Construction and building trades	14.0%
	112 Production managers and directors	12.1%
	212 Engineering professionals	11.6%
	243 Architects, town planners and surveyors	9.3%
	113 Functional managers and directors	6.4%
Agriculture, horticulture and animal care	221 Health professionals	22.0%
	613 Animal care and control services	18.9%
	511 Agricultural and related trades	14.5%
	911 Elementary agricultural occupations	10.0%
	415 Other administrative occupations	5.0%

Source: Frontier Economics, using data from LFS and SIR for England

### 3.2 Cross-checking the findings

Cross-checking these findings against the labour market flows identified in the ASHE data adds confidence in these findings.<sup>9</sup> There is a strong overlap between the

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<sup>9</sup> Due to the low sample sizes for some occupations, the full list of results is not presented here.

comparators listed in the tables above and the flows in and out of FE teaching. All occupations reported in Table 1 were observed in the ASHE flows.

Comments from stakeholders also validated the relative incidence of different occupations. In particular, stakeholders confirmed that ‘Other teaching professionals’ should be seen as the most comparable occupation.

### **3.3 Using findings for an exploratory analysis of pay differentials**

Using data from the ASHE and the SIR, it was possible to conduct experimental analysis comparing the pay level and pay growth of FE teachers with the comparator occupations identified above.

The available data placed significant limitations<sup>10</sup> on what it was possible to confidently and robustly conclude about either pay levels for FE teachers or pay differentials between FE teachers and comparators. Therefore, the analysis does not provide fully robust estimates of the pay levels for FE teachers or pay differentials between FE teachers and comparators. However, it provides early indications of subject areas where recruitment and retention pressures for FE teachers are likely to be greatest as a result of pay differentials. The differential in pay between FE teaching and comparators appears to be greatest in a number of areas identified by the Government’s Industrial Strategy as key to the UK’s growth prospects, specifically ‘Construction, planning and the built environment’, ‘Engineering and manufacturing technologies’, and ‘ICT’ (as well as ‘Business, administration and law’).

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<sup>10</sup> One of the key limitations has to do with the sample of individuals used to compute the pay differentials. The pay analysis currently relies on information for all teachers and compares this with information for all individuals in that subject’s comparator occupation(s). Due to data limitations, it is not possible to identify the subset of the comparator occupations which are most similar to FE teachers (in terms of age, location and gender) and compare the pay for these two groups.

## Chapter 4: Conclusion and areas for further research

### 4.1 Key findings and limitations

Any approach to improving FE teacher recruitment and retention needs to be informed by an understanding of two inter-related areas:

1. What are the key alternative or comparator occupations available to FE teachers?
2. What are the pay and conditions available to FE teachers if they chose to work in one of those comparator occupations?

Building on a review of data sources (LFS, SIR, ASHE and US) and existing methodologies (e.g. Bryson and Forth, 2017), this study develops and applies a state-of-the-art econometric framework to identify FE teaching comparators as a first step towards informing recruitment and retention policy in FE.

It finds that 'Other teaching professionals' (especially secondary education teaching professionals) are the most representative comparator group for FE teachers as a whole and are relevant to determining future FE policy. When considering vocational subject areas specifically, a mix of skilled and less-skilled occupations are likely to be relevant comparators. This reflects the wide range of skills at different levels that need to be acquired in FE qualifications for building a set of competencies that can be useful in the workplace.

The LFS and the SIR do not permit an accurate measure of educational attainment because they only have detailed information on the level of the highest qualification, not on the grades or the subject studied. While this is an important limitation, cross-checking the findings with labour market flows and stakeholders confirms that the identified comparators appear reliable.

Analysis of pay provides early indications that pay differences appear greatest for 'Construction, planning and the building environment', 'Engineering and manufacturing technologies', 'ICT' and 'Business, administration and law', but should be considered experimental at this stage. Further refinements are suggested below.

### 4.2 Areas for further research

There are three main avenues that could be explored within a similar econometric framework:

**1. Local level analysis:** using similar data sources to analyse how comparators vary at the regional (or more granular) level. This could add nuance by reflecting variations in local labour market conditions.

**2. Consider variation in competencies:** the analysis does not account for the frequency of use of different competencies (e.g. use of socio-emotional skills) within occupations. Using the O\*NET dataset, it might be possible to identify occupations that are similar to FE teaching in terms of the mix of skills used (e.g. jobs that might require individuals to be able to explain concepts to others). O\*NET has already been used in a UK context, for instance for designing the 15 Sainsbury routes for technical education (ITPE, 2016).

**3. Refine the exploratory pay analysis:** further work will be necessary to evaluate pay differentials between FE teachers and the comparators. To overcome the current data limitations, it would be important to compare pay for a set of sufficiently similar FE teachers and individuals in comparator occupations, using data from the ASHE and the SIR.

More broadly, two areas deserve further attention beside the three discussed above, but potentially within a more qualitative framework:

**4. Think about optimal comparators:** the analysis does not identify which occupations involve the 'optimal' level of qualifications and skills FE teachers may be expected to have. This would likely require a more detailed exercise to understand the skills mix within different industry roles.

**5. Understand what causes teachers to join or leave:** the analysis does not identify the push and pull factors that may cause FE teachers to join and/or leave the profession. This would likely involve a primary survey and wider stakeholder engagement.

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