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RESEARCH PAPER NO. 1

Estimating the Effect of Raising
Private Contributions to Further
Education Fees on Participation
and Funding

JULY 2009

Estimating the Effect of Raising Private Contributions to Further Education Fees on Participation and Funding

London Economics

BIS Research Paper No.1

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July 2009

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Executive Summary

Background

There is a clear case for a central role for Government in the provision of Further Education (FE), as there are significant positive externalities associated with educational attainment and other market failures to address, such as individual capital constraints. However, there are also several arguments in favour of making some students pay for post compulsory education, as there are significant economic returns over a lifetime associated with qualification attainment.

As a result, those that can afford to do so are increasingly being encouraged to contribute to the cost of their learning. Mirroring the trend towards increased private contributions, the assumed contribution of fees to further education course costs has risen from 32.5% to 37.5% in 2007/08 and this is consistent with the Learning and Skills Council's intention to move towards adult learners contributing 50% towards their fees by 2010¹.

Given this context, it is important to try and understand the likely impact of changes in tuition fees on learners' decisions to participate in further education.

Methodology

The research utilised two major data sources: the ILR administered by the Learning and Skills Council, and a survey of further education colleges, carried out by London Economics. The ILR, which is collected on an on-going basis, contains information (including personal and course-related characteristics) on all individuals and enrolments in further education.

The survey of further education colleges sought to supplement this with other course-related information unavailable in the ILR (e.g. capacity constraints, excess demand, competitors) and qualitative assessments of the importance of tuition fees.

These data sources were used to create a course-level panel dataset over three years (2004/05 - 2006/07) incorporating information on the price paid by learners, enrolment and other course-related characteristics. This was used to estimate the impact of price on enrolment, controlling for institution-level and district-level fixed effects. The differences in price elasticity between groups of learners and types of courses were also explored.

Main findings

The first stage of the analysis examined the ILR data. This revealed several data issues, which it is important to consider when interpreting the results.

- The ILR does not contain data on the headline "price" for each course². This information is needed to assess the cost of the course to learners and the proportion of the fee actually remitted. Only the actual fee paid by students and their eligibility for remission is included in the ILR dataset.

¹ Department for Education and Skills (2006) "Further Education: Raising Skills, Improving Life Chances", Further Education White Paper, March 2006.

² A course refers to each particular learning aim, offered by a particular institution, delivered in a particular location.

- There is significant heterogeneity in fees paid by learners on the same course. There were no variables in the ILR dataset that could explain this heterogeneity. Several ways of calculating the nominal fee for full fee payers were explored, with the mean and the mode found to be the most appropriate measures.
- Where fee remission was received, learners generally paid no fee: only 2% of learners received partial fee remission. As most fee paying learners paid the full fee, the elasticity of demand was calculated for those learners who paid the full fee only.

Given these data issues, the findings should be interpreted with caution.

The next stage estimated the price elasticity of demand using the ILR dataset.

- The overall estimate of the price elasticity of demand indicated that demand for further education is relatively inelastic, standing at between **-0.1 and -0.2** depending on the model specification used.
- Demand for courses with a significant degree of employer support was estimated to be slightly more elastic (-0.22) than non-supported courses. Demand appeared to be more elastic for courses in Hospitality and Sports, Leisure and Travel; English, Languages and Communication; and Information and Communication technology. Even in these cases, however, demand was relatively inelastic.
- The research also indicated that demand is more elastic amongst older learners, amongst women, and amongst non-BME learners.

The information from the survey was combined with the ILR data, to create a smaller, but more detailed dataset of 131 courses. The price elasticity was then recalculated for these courses using a similar specification as in the first stage of the analysis. Each model was estimated twice: once using data on fees and enrolments from the ILR and once using data on fees and enrolments from the survey.

- Using the survey data, the estimated price elasticity of demand was between -0.21 and -0.27.
- Using the ILR data, the estimated price elasticity of demand was more elastic, at between -0.31 and -0.37.
- The ILR data continues to show that demand elasticity is greater for those courses receiving employer support - a finding not replicated using the survey data. Also, none of the additional information collected by the survey had a statistically significant effect on enrolment. However, a more representative dataset, with a larger sample size would be needed to test if this is the case for certain.

Main conclusions and implications

The research suggests that price does affect the demand for further education. However, the size of the impact appears to vary significantly both between different types of further education course, and between different types of learners. The findings suggest that the demand for further education may be inelastic - although the analysis only concentrates on those learners that are currently paying tuition fees and not those individuals in receipt of fee remission who might be expected to be significantly more sensitive to changes in the fee charged.

To place these results in context, the few estimates of the price elasticity of demand for education from the wider economic literature also appear to be inelastic, although these do vary (-0.03 to -1.30 depending on methodology and data used). Within the context of the study, it is also interesting to note that based on the primary data collected from further education colleges, their own subjective assessment is that the elasticity of demand for further education is significantly more elastic than the estimates based on the survey information and the ILR (even when controlling for some of the other factors that further education colleges deem important in determining the student enrolment rates).

Although understanding the elasticity of demand is important, this is only one of a number of factors to consider in the debate on how further education should be funded. Other factors may include: the economic returns associated with qualification attainment (earnings and employment effects); the wider economic (spill-over) effects associated with education, training and qualification attainment; non-monetary wider benefits (such as reduced crime rates, improved health and intergenerational transmission of skills); ability to pay and the possible existence of credit constraints amongst learners (equity considerations); and the future skills needs of the economy.

Next Steps

The analysis undertaken has made the best use of the information currently available; however, there are still some limitations associated with the analysis as a result of evidence gaps and inconsistencies in the Individual Learner Record.

Before considering the role of price and other factors on the demand for further education, and given the burden of data collection already placed on further education colleges, we believe that significant effort should be invested in ensuring that accurate and appropriate information (especially in relation to fees and fee remission) is collected through the ILR for ongoing analysis. Once this is achieved, then it might be possible to consistently and more accurately estimate the elasticity of demand for further education, although the fact that a high proportion of learners receive almost full fee remission will always limit the analysis in some respects.

1 Introduction

1.1 Background

There are several arguments in favour of making students pay for post compulsory education - either during or after their studies - as there are significant economic returns over a lifetime associated with qualification attainment. The economic benefit associated with qualification attainment (as measured by changes in the probability of being employed or earnings premiums) has been studied extensively both in relation to different levels and types of qualification (McIntosh, 2004, 2007), as well as for different types of degree level qualification (Royal Society of Chemistry, 2005).

Although individuals enjoy significant benefits as a result of qualification attainment, there continues to be a central role for government in the provision of post compulsory education. As there are significant positive externalities associated with educational attainment (Moretti, 2003, Dearden *et al*, 2006), assisting individuals to increase their level of qualification attainment results in an increase in average earnings for those who have not gained additional qualifications, as well as for those that have. In addition, there are many potential students - often the poorest members of society - who are faced with credit constraints and other barriers to learning (Heckman and Caniero, 2003) and who would be unable to fund their own studies.

However, those that can afford to do so are increasingly being encouraged to contribute to the cost of their learning. Mirroring the trend towards increased private contributions, the assumed contribution to further education course costs generated through fees has risen from 32.5% to 37.5% in 2007/08 and this is consistent with the Learning and Skills Council's intention to move towards adult learners contributing 50% towards their fees by 2010 (DfES, 2006).

1.2 The price elasticity of demand for education

In theory, increases in the fees faced by students may have some effect on participation - holding all other factors constant. We can measure this effect through the "price elasticity of demand". The price elasticity of demand measures the responsiveness of the demand for further education courses following a change in the price (i.e. the cost of attending including tuition fees and other costs). This is measured as the percentage change in the quantity of further education demanded divided by the percentage change in the price.

Normally, the price elasticity of demand is negative - as prices increase, the quantity demanded falls. If the change in quantity demanded is proportionally more than the percentage change in price, then the elasticity of demand is less than -1, and demand is said to be "elastic". If on the other hand, the percentage change in quantity demanded is less than the percentage change in price (i.e. the elasticity is between 0 and -1) then the good is said to have "inelastic" demand.

There are currently few estimates of the elasticity of demand for education in the United Kingdom, and those that do exist are based on qualitative assessments, rather than detailed quantitative analysis (e.g. LSC (2007); Perry and Mason (2006), Perry (2004)). The main empirical findings in relation to the price elasticity of demand for further education are based on evidence from the United States. The main findings of these studies, across different educational settings (pre-school, public colleges, private education, and universities) are that³:

³ Based on Powdthavee and Vignoles (2006).

- estimates of the price elasticity of demand for education vary hugely, ranging from -0.03 to -1.30, depending on methodology and data used;
- the price elasticity of demand for education appears to be generally **inelastic**; and
- non-whites appear to be more sensitive to changes in tuition fees than whites, as do those from lower income groups.

Although there have been no comparable quantitative estimates of the price elasticity of demand within a UK context, several qualitative studies have been produced, particularly seeking to identify the likely impact of increasing further education fee contributions. This has indicated that there is no evidence of a major impact on learner demand, although specifying the impact of fee changes in the context of other changes within further education (such as budget reductions) is difficult. In fact, the limited impact has been a surprise to many college managers (LSC, 2008). A survey of 40 further education providers found that raising fees had not reduced enrolment at three quarters of respondents, with only three feeling that fee rises were “significantly damaging” (Perry and Fletcher, 2006).

The qualitative research work that has been undertaken has also provided some insight into the factors that affect individuals’ sensitivity to price changes. Some of the most important factors, based on interviews with college staff and analysis of the ILR (LSC, 2007), are listed below.

- Courses with broader economic value to learners are less price sensitive. In particular, courses which are not required to gain (or keep) employment or obtain promotion are likely to have more elastic demand as they can easily be cancelled or postponed.
- Low income learners are likely to have a higher price elasticity.
- Competition (both with other learning providers and other lifestyle and leisure activities) may be an important factor.
- Whether learners are “repeat” learners (i.e. returning for the second or third year of a course). These learners may be more aware of previous prices, and hence more sensitive to price changes.

These results provide useful guidance for the factors that should be controlled for in any econometric analysis. However, given the nature of the research, it does not provide any indication as to the likely size of the price elasticity, or of the relative importance of each of the factors identified above.

1.3 Objectives of the study and structure of the report

The three main objectives for the study were as follows:

- to estimate the price elasticity of demand for further education;
- to assess how this might vary between different groups; and
- to explore whether raising fees might adversely affect particular groups such as those from lower socio-economic groups who might be more sensitive to changes in costs.

These aims were explored using two major data sources. First, information collected by the Learning and Skills Council (LSC) on all learners engaged in further education in each year (the Individual Learner Record or ILR), and secondly, a quantitative survey of further education colleges administered as part of this research.

The remainder of the report is structured as follows. Section 2 provides an overview of the research methodology. Section 3 discusses the various data sources that were used as part of the analysis. Section 4 provides the results from the analysis of the ILR. Section 5 presents the results based on the information collected as part of the survey of further education colleges. Section 6 presents the results following the merging of the ILR and survey data. Section 7 provides an interpretation of the various results and discusses the confidence and robustness of the results, as well as the major conclusions associated with the analysis.

2 Overview of approach

The primary focus of this research project was to assess the impact on learner participation in further education associated with changes in the fees they have to pay (both direct tuition and other course related costs).

This involved three major stages:

Stage 1: Assessment of existing data sources

Stage 2: Additional data collection / quantitative survey

Stage 3: Econometric modelling

Additional information regarding each of these stages is provided below while more detail on the econometric methodology adopted is contained in the annex and in the relevant sections of the report.

Stage 1: Assessment of existing data sources

This stage involved assessing the existing data regarding further education held by the Learning and Skills Council (LSC). This consists primarily of the ILR, the dataset collected by the LSC containing information on all individuals enrolled in further education in England. An initial assessment of the ILR was undertaken (in conjunction with DIUS and a number of further education stakeholders) to identify any weaknesses in the dataset and any evidence gaps that we could be filled through the quantitative survey of further education institutions.

Stage 2: Additional data collection / quantitative survey

In order to supplement the data in the ILR and where possible fill the data gaps identified during Stage 1, London Economics administered an institution specific survey of 297 further education institutions. The survey was developed by London Economics, in discussion with DIUS and the Learning and Skills Council and was piloted with a number of further education colleges.

The survey was designed to link, as much as possible, to the information contained in the ILR (using 2005/06 data, as the latest available at the time of the survey design). Using the ILR, each college was asked to provide three years of data (2004/05 - 2006/07) for their two most popular learning aims, based on the total number of learners studying the learning aim in 2005/06 not eligible for full fee remission. The main elements of the data request are listed below.

- **Enrolment:** the number of students enrolled on a selection of learning aims⁴ over a three year period; the minimum and maximum number of students that could be enrolled on a particular learning aim in a particular year; and the use of waiting lists to understand the extent of excess demand for particular learning aims (if any).
- **Fees:** the nominal fees charged by further education colleges; other course related charges; the identification of multiple courses within a particular learning aim.

⁴ The learning aims selected for the institution specific questionnaires were based on the incidence of fee paying students on particular learning aims.

- **Fee remission:** the type and amount of local fee remission offered and the criteria under which fee remission might be offered to learners.
- **Competitors:** the identification of up to three institutions competing for learners in relation to the specific learning aims for which information was requested from individual institutions.
- **Other factors:** the rating of the importance of various factors on the demand for further education; and a subjective estimation of the impact of changes in fees and funding on learner enrolment.

The survey was sent (via email) to 297 further education institutions in England in April 2008 (following preliminary testing with several institutions). In the first instance, the survey was sent direct to college principals who then forwarded it within the further education institution to their most appropriate colleague. A series of follow-ups, including an initial email and two telephone calls, was undertaken to maximise response rates.

In total 69 responses were achieved, representing a response rate of 23%. This was lower than the initial target of 40% - possible explanations for this are discussed in the following section of this report.

Stage 3: Econometric modelling

In the third stage of the analysis, the data collected during the previous two stages was analysed to provide an estimate of the impact of changes in tuition fees on enrolment in further education. Each of the data sources - the ILR and the quantitative survey of further education colleges - were analysed separately. The two data sources were then combined, to provide an econometric analysis incorporating the detailed data obtained from the survey.

3 Discussion of data sources

This section discusses the two major data sources used during the analysis: the ILR and the quantitative survey of further education colleges (the “FE College Survey”). Following a discussion of the two data sources separately we compare and contrast the two sources - making use of information that appeared in each dataset. This was an important starting point for the later analysis, but also provides useful insight into the robustness of the final results.

3.1 ILR data

The research utilised ILR data for the three years from 2004/05 to 2006/07. For each year, this dataset includes detailed information on all learners enrolled in further education, including data regarding a number of personal characteristics, the learning aims undertaken, and information regarding any funding received. This data is primarily collected on a learner or learning aim basis; however, for the purposes of the study, the modelling approach required data at a course and institution level. In other words, it was necessary to consider the number of students enrolled (and the fees paid by those enrolled) on a particular course at a particular institution.

3.1.1 Institutions and learning aims included

We initially screened out a number of the learners included in the ILR. First, in order to correspond with the information to be collected from the survey of further education colleges, only specialist further education institutions for which contact details were available were included (297 institutions). Secondly, only learners aged 19 or over were included. Third, learning aims identified as basic skills were excluded, as generally learners are not charged for these courses (precluding an estimation of the price elasticity).⁵

Following this initial screening, the 1,000 most popular learning aims (based on total number of learners in 2005/06⁶) were selected and used as the basis of the remainder of the analysis.

3.1.2 Definition of a “course”

Initially we planned to identify a course as a particular learning aim being offered at a particular further education college (e.g. a NVQ in Information Technology Level 3 provided by further education college X). However upon further analysis and consideration of the ILR data, it became clear that there was substantial variation within some further education colleges in relation to the location of delivery of particular learning aims⁷. This is likely to reflect the same learning aim being offered by the same institution both on the main college campus, other college campuses, external sites, and through franchise activity. Therefore, we moved from the original unit of analysis (learning aim) to an alternative unit of analysis (course). The following definition was decided on as the basis for the ongoing analysis:

⁵ Although learning aims flagged in the ILR as basic skills were removed, the final dataset did contain a number of courses which appeared based on learning aim name as if they may be basic skills courses (e.g. basic literacy and numeracy courses).

⁶ Separate learning aims were identified based on the learning aim title and NVQ level. The 2005/06 dataset was the latest available at the initiation of the project (September 2007).

⁷ This was based on the delivery location postcode variable contained in the ILR (A23). Each postcode was assigned to a district based on the National Postcode Database, and courses treated as separate where they were offered in different districts. A separate category was included where learning aims were provided via distance learning.

A course refers to each particular learning aim offered by a particular institution delivered in a particular location.

3.1.3 Identifying the relevant variables

The next stage was to aggregate the learner-level data to obtain a course-level dataset. In practice, this proved to be difficult as the responses for a number of variables varied between learners on the same course. Notably, for instance, learners on the same course paid were recorded as paying very different fees (once fee remission was accounted for). As such a number of assumptions were required in order to meaningfully aggregate the course information.

A full list and description of each of the variables estimated based on the ILR is included in the annex. However, we provide a brief discussion of the major assumptions below.

Enrolment

Enrolment on each course was estimated through a count of the number of students enrolled, split according to the type of fee remission received. Several groups were identified based on the extent and type of fee remission received⁸:

- No fee remission (“full fee payers”): learners not eligible for fee remission.
- Means-tested fee remission: waiving of fees based on a national policy not to charge fees to those learners on certain benefits.
- Local remission - zero fee: waiving of fees based on local provider policy.
- Local remission - other: waiving of fees based on local provider policy.
- Other funding: other reasons for fee remission comprised predominantly of learners in receipt of other funding.
- National entitlements: waiving of fees for certain courses based on national policy.
- Learner-specific reasons: learners do not pay the full fee for other reasons such as bad debt.

Fees and fee remission

One of the main issues in aggregating the data from individual level to course level was to identify the “nominal fee” charged by institutions to learners. The ILR contains information on the *actual* fee paid by the learner and identifies whether learners are eligible for fee remission, but does not list the headline “price” associated with a course. This information was required to be able to assess the cost of the course to learners, and also to estimate the proportion of the fee actually remitted by each category of learner.

Initially, we expected that all *full* fee payers on each course would pay (at least approximately) the same fee. However, examination of the dataset indicated that there was, in fact, significant heterogeneity in terms of the fees paid by different learners on the same course.

⁸ This breakdown is based in part on the categorisation included in Fletcher et al. (2008).

One reason for this could be that our definition of a “course” may not be appropriate – some learning aims may be taught as part of a number of qualifications and may attract varying fees as a result⁹. Alternatively, the variation in the fee paid may reflect differences in delivery type (although we found little evidence of this¹⁰) or some element of price discrimination. However, we were unable to identify any variables in the dataset that explain the observed differences in fees.

Given this issue, we assessed three different methods of calculating the nominal fee for each course, focusing on those learners paying the full fee in each year: the mean fee paid by learners, the maximum paid, and the mode (i.e. the most common fee paid).

Each of these methods has both advantages and disadvantages. Theoretically we might expect the maximum fee to be the most appropriate estimate of the ‘price’ associated with attendance and enrolment on a course; however, this would also lead to any estimate of the elasticity of demand being particularly sensitive to any outliers in the dataset.

On the other hand, the adoption of the mean fee paid has the advantage of taking into account the fees paid by all learners, but has the disadvantage of not necessarily representing the actual fee paid by any one individual. Finally, the adoption of the modal fee is the most accurate fee paid for the largest number of students, but may not be unique.¹¹ If the dataset were perfect, we would expect the three measures to provide the same (or very similar) results. However, in practice this was not the case, and there were substantial variations between the different methods of fee estimation. For instance, the estimated nominal fee across all courses was much higher based on using the maximum fee, in comparison to the mode or the mean. On the other hand, the average fee across courses using the mode estimation was similar (less than £5 difference) to the result when using the mean.

The differences between the three measures of the nominal fee are explored further below, through comparing these results to those of the FE College Survey.

Other course characteristics

The ILR also contains information regarding several other characteristics associated with each of the enrolments in further education. These include the length of the course (in terms of days) and the number of guided learning hours offered as part of tuition; delivery method (e.g. class based or distance learning); and the employer role in the course.

We investigated incorporating each of these variables into the analysis. In some cases however (e.g. the existence of LSC funding) this was not possible due to the heterogeneity across learners on the same course.

⁹ Although in practise, many learning aims were also courses in their own right (i.e. NVQs).

¹⁰ One particular possibility that we felt may explain this heterogeneity was the type of course delivery - i.e. whether the course was provided part-time or full-time. This information was not provided directly within the ILR - and although information was available on the mode of delivery (e.g. continuous daytime) this was “unclassified” for approaching 20% of learners. Further, including this in the course definition did not substantially improve the accuracy. Only around 2% more learners were paying a fee equal to the nominal fee (based on the mode) despite a large (around 20%) increase in the number of courses.

¹¹ Where the mode was not unique we selected the highest mode as the value of the nominal fee.

3.2 Survey data

3.2.1 Response rates

Following the initial administration of the survey and a number of follow ups (two via e-mail and at least one by telephone), surveys were returned by 69 institutions, covering a total of 133 learning aims. This represented a 23% response rate from the 297 institutions surveyed. There were a number of reasons for the 23% response rate. First, only the contact details of the college principal were readily available; on whom we then had to rely upon to direct the survey to the college's Management Information office. This made it harder to follow-up colleges and to assist them with any queries that they may have had about the survey.

A number of institutions were deterred from responding through a belief that the questionnaire would require a large amount of resources to complete. This was surprising, given that the data requested is similar to that provided as part of ILR data returns (and courses were selected deliberately to match those in the ILR). Furthermore, during the test/pilot phase of the questionnaire the survey was designed to avoid this difficulty. Other respondents, however, felt that the survey was straightforward to complete, suggesting that the appearance of the questionnaire was off-putting, or management information systems and the use of ILR data vary considerably between institutions.

A connected issue was the use of learning aims from the ILR. First, some institutions found it easier to identify information using learning aim codes (used in the ILR), rather than the learning aim names that were used as the focus of the survey. Second, the use of the ILR to select the two "most popular" learning aims led to difficulties in some cases where learning aims covered multiple courses. This was particularly the case for "generic" learning aims, which can cover a large number of different courses¹². Although these problems were avoided where institutions submitted queries this may have deterred other potential respondents.

3.2.2 Data quality and issues

In general, although the survey design was successful, it is possible that the survey was subject to voluntary response bias - that is that the further education institutions that responded to the survey may be different in some way to those that decided not to respond. For instance, we may expect that those institutions that are currently interested in implementing a market-based approach to fee-setting might have been either more interested in responding, or more likely to have the data available to do so. To the extent that these institutions use different pricing and fee remission strategies could result in some bias in the survey results.

¹² A generic learning aim is one that appears to cover a range of courses. A particular example is unitised courses.

3.3 Comparison of the ILR and survey data

To assess the data obtained from each of the two independent data sources, we compared the information in the ILR to the responses from the FE College Survey. The two sources were linked using the learning aim codes associated with the learning aims selected as the basis for the institution specific survey questionnaires from 2005/06 (i.e. the two most popular courses as discussed in the methodology section). Overall, 130 of the 133 learning aims were matched in the ILR: two learning aims were excluded as they were not in the top 1,000 most popular learning aims (which was used as the basis for analysis in the ILR) while a further learning aim was not uniquely identified within the ILR (as the NVQ level was not specified).

A further issue was that the information in the ILR, unlike the FE College Survey, was disaggregated according to the location of delivery of the learning aims. As such, these courses had to be aggregated for the purposes of the comparison.

3.3.1 Comparison of the nominal fee

As discussed in Section 0, the nominal fee was estimated from the ILR data in three different ways: using the mean, mode and maximum of the actual fee paid by full fee paying students. Comparing these estimates of the fees paid by students to the tuition fees reported by colleges in the survey provides an alternative method of assessing which estimation method adopted for the ILR was the most appropriate.

The estimation of the nominal fee using the mode or mean was, in general, close to the value provided by the survey. The average nominal fee across the courses (using the mode definition) in the ILR data was approximately 5-10% higher than that in the FE College Survey, and the nominal fee from the two different sources was equal in almost half of the cases (nominal fee calculated as the mode of full fees paid). The estimate of the nominal fee using the maximum value appeared to be the least accurate

Whilst on average, the data sources provide relatively comparable information about nominal fees paid by learners (when considering the modal value), a closer look at the distribution of the differences shows that for many courses the two data sources provided very different estimates of the nominal fee.

In fact, ILR and survey data are within 10% of each other in only around 50% of cases. In some cases the difference is extremely large (with the estimate of the nominal fee using the modal value from the ILR ranging from between 7% to over 1000% of the estimate based on the FE College Survey data. In assessing these results however, it should be noted that the various assumptions made in first identifying and then comparing the results are such that we may expect some significant deviations.

3.3.2 Comparison of enrolment

Since the aggregation level in our learner database and in the survey is different (as the courses in the ILR are disaggregated by delivery location), in order to assess the number of students enrolled on particular courses it was necessary to aggregate the ILR courses relating to the same institution and learning aim.

Analysis of the ILR database indicated that, on average across the courses, the enrolment figure in the ILR was sometimes significantly different from the equivalent figure reported through the FE College Survey. While the median difference was close to 0%, some discrepancies were extremely large (with the difference ranging from -95% to as high as 14,100%).

3.3.3 Comparison of local policy fee remission

The ILR database identified the number of students on each course receiving fee remission based on local provider policy, while the survey examined whether providers offer fee remission, and on what basis.

However, when comparing these results in the two datasets, there was a surprising lack of consistency. Fewer than half of the learning aims had consistent information on local fee remission - i.e. the same results in both the FE College Survey and the ILR. In fact, around 56% of the learning aims were classified as containing students receiving local fee remission in the ILR, although this was not identified through the FE College Survey.

3.4 Conclusions

This section has analysed the data sources used and the methods used to construct the various variables that form the basis of the later analysis. A number of assumptions were adopted in order to construct relevant course definitions and hence estimate enrolment numbers and (particularly) levels of fees paid.

Given these issues, we carried out a comparison of the two data sources used: the ILR and the FE College Survey, in order to sense check the assumptions used. The analysis indicated a number of differences, even for fundamental course level characteristics (such as number of learners enrolled) that we might expect to be fairly straightforward to estimate. These issues are an important consideration in assessing the results of the subsequent analysis.

However, there may be some inconsistencies in the way in which information relating to learners is collected, entered, retrieved and used by further education colleges. We believe that despite the fact that significant effort was taken to ensure that the questionnaires sent to colleges reflected the particular circumstances and activities of those colleges, the feedback from some (non-respondent) colleges in relation to the accuracy and consistency of the data in the ILR has some fundamental implications for data collection activities in the sector generally and for this analysis specifically. In particular, respondents at several institutions noted that the selected learning aim codes included multiple separate qualifications that should not be analysed together. This implies that, in the analysis, we may be aggregating enrolment and assigning the same fee to different qualifications.

4 Analysis of the ILR

4.1 Introduction

The first stage of the estimation process was to analyse the data contained in the ILR, and use this to provide a preliminary estimation of the price elasticity of demand. Data on all enrolments in further education in England were obtained for the three years 2004/05, 2005/06 and 2006/07. As discussed in detail in Section 3, this individual-level data was aggregated by course-level¹³ for the purposes of the analysis.

The aggregated ILR dataset contained information on approximately 167,000 courses (with each year of a course at each institution entered as a separate observation). This included 51,051 courses in 2004/05, 61,395 courses in 2005/06 and 55,114 courses in 2006/07. This information is presented in Table 1 below.

As the table indicates, the most common types of courses offered by further education institutions are National Vocational Qualifications and “Other vocational” qualifications¹⁴, which account for 22% and 65% of courses respectively. There were, in total, 2.3m, 2.4m and 1.8m learners in 2004/05, 2005/06 and 2006/07, respectively¹⁵.

Course type	2004/05	2005/06	2006/07	Total
GCE A/AS/A2 Level	5,046	4,673	4,114	13,833
GCSE	974	810	709	2,493
GNVQ precursor	472	293	247	1,012
GNVQ/AVCE	143	95	7	245
NVQ	10,868	12,969	12,861	36,698
Access to HE	12	14	13	39
OCN	0	3,001	2,156	5,157
Other vocational	33,536	39,540	35,007	108,083
Total	51,051	61,395	55,114	167,560

Source: London Economics' analysis of the ILR

¹³ A course refers to each particular learning aim offered by a particular institution broken down by each alternative form of delivery offered in a particular location.

¹⁴ The “Other vocational” category includes a variety of courses, including BTECs, Diplomas, unitised courses and various other certificates and awards.

¹⁵ Each learner may be counted several times, if they undertook multiple courses simultaneously. In 2005/06, approximately 495,000 learners were enrolled in more than one course.

4.2 Using the ILR dataset

Due to the data issues discussed in Section 3, any analysis using the ILR data must be treated with caution. Given this, in the next sub-section we provide a brief discussion of the course-level dataset, highlighting areas of particular concern for the price elasticity analysis; and the steps that have been taken to attempt to remedy the various issues.

4.2.1 Enrolment

As shown in Figure 1, the range of the number of learners enrolled across courses is very wide. The number of enrolments on each course was generally very small (with around 80% of courses having fewer than 50 learners). However, the analysis of the data also illustrates a relatively long tail - with the “largest” course including over 8,000 learners¹⁶.

The analysis illustrates that a substantial proportion (approaching 45%) of courses contained fewer than 10 learners¹⁷. This provides an indication of the highly varied nature of further education provision and the extent to which very low scale provision plays an important role in delivery across the sector. It also suggests that, given the heterogeneity of the courses on offer across the sector, the inclusion of all courses in the analysis together may be inappropriate to some extent, as the courses are likely to operate in significantly different ways and the behaviour of students might also vary depending on the fundamental nature of the course.

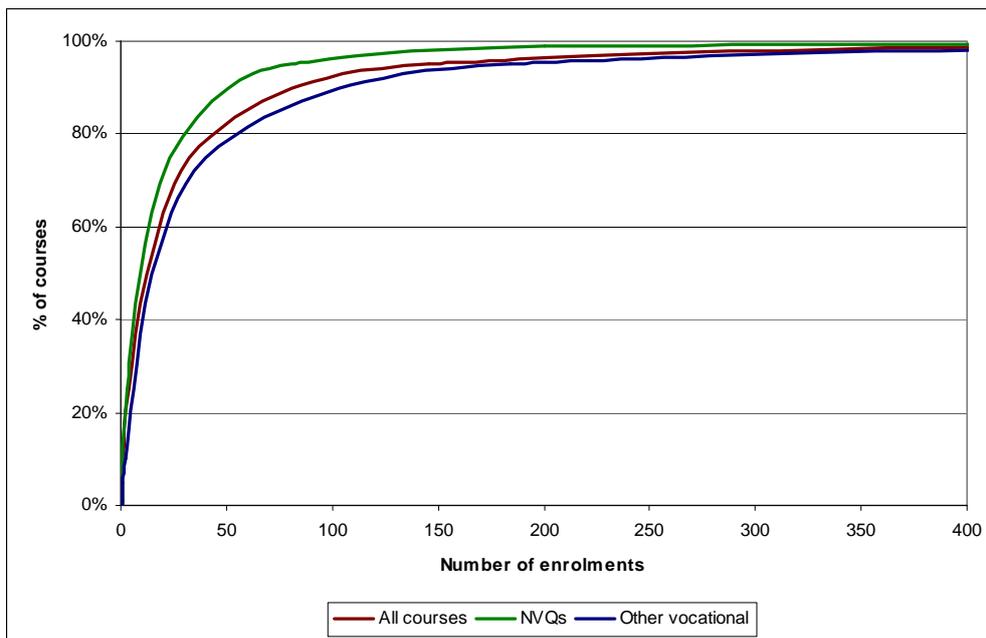
For instance, discussions held with institutions during the survey element of the research suggested that extremely high levels of enrolment may be a result of two factors. First, the course may be a particularly short course offered on multiple occasions throughout the year (i.e. increasing the potential annual capacity for the course). Alternatively some learning aims in the ILR cover multiple different “real” courses offered to learners.

Also, enrolment may vary according to the type of course. In particular the average number of enrolments on courses leading to a National Vocational Qualification is marginally lower than on “other vocational” courses.

¹⁶ The course in question was a Basic ESOL Course at Entry Level.

¹⁷ Furthermore, this proportion remained similarly high even amongst only courses operating in one district – indicating that this was not a result of the course definition used in the analysis.

Figure 1: Distribution of enrolment



Source: London Economics' analysis of the ILR

4.2.2 Fees

Around 50% of the courses contained no learners paying the full fee, i.e. all of the learners enrolled received some form of fee remission. This means that we were unable to estimate the nominal fee faced by these learners.

Of the courses where the nominal fee is reported, there is little evidence of a change in the fee distribution over time - although there is some evidence of growing proportion of courses charging over £300 and a lower proportion charging under £100 each year.

4.2.3 Fee remission

The ILR provides an indication of the type of fee remission received by each learner (for each enrolment). As shown in Table 2, the vast majority of learners receive some fee remission.

Over the three years, the proportion of learners not eligible for fee remission increased from 23% to 30%. The proportion of learners receiving local fee remission has fallen significantly over the period - from 45% to 34%.

However, the high proportion of learners receiving fee remission - and particularly local fee remission (accounting for around a third of learners) may reflect issues in data collection. A previous study (LSC, 2007) has indicated that some institutions may enter learners as receiving fee remission for a variety of reasons, such as receiving fee remission in the second year of a course when they pay up-front for a two year course, or if they pay for multiple qualifications together (i.e. fees are charged per learner not per qualification), or if fees are remitted on all extension activities for basic skills learners. In this case the proportion of learners with fee remission will be over-estimated.

This finding is further supported by the comparison of the ILR and FE college survey datasets (presented in the previous section). As this shows, several courses were identified as containing learners in receipt of local fee remission in the ILR; however, the survey responses in relation to these specific courses indicated that local fee remission was not available.

Table 2: Proportion of learners receiving each type of fee remission			
	2004/05	2005/06	2006/07
No fee remission (“full fee payers”)	23%	29%	30%
Local fee remission	45%	39%	34%
National / other fee remission	32%	33%	35%
Total number of learners (million)	2.27	2.39	1.82

Note: National/ other fee remission is comprised largely of means tested remission and national entitlements. Local fee remission is comprised of “Local fee remission, provider policy” and “Local remission, zero fee”. Source: London Economics’ analysis of the ILR

Table 3 shows that where fee remission was received by learners, they generally paid no fee at all. This indicates that only a low proportion (less than a third) of further education learners actually pay any tuition fee. This suggests that any change in fee policy will have a limited effect on total enrolment in further education, given that the majority of learners will be unaffected.

In addition, the responses given in the FE College Survey (discussed in section 3 and further in section 5) indicate that colleges often offer students less than 100% fee remission (e.g. for early payment). These findings suggest that this may not be reflected in the ILR data, which may influence the later price elasticity results.

Table 3: Average fee remission received by learners			
	2004/05	2005/06	2006/07
National / other fee remission	98%	98%	98%
Local fee remission	94%	94%	95%

Note: Fee remission estimated relative to nominal fee based on the mode. National/ other fee remission is comprised largely of means tested remission and national entitlements. Local fee remission is comprised of “Local fee remission, provider policy” and “Local remission, zero fee”. Source: London Economics’ analysis of the ILR

4.2.4 Data used for the analysis

The discussion above outlines some of the key issues with the ILR data. First, there appears to be substantial variation between the different courses contained within the ILR (which is not surprising given the nature of the further education sector). Secondly, a large proportion of learners pay no fee for further education, and hence are not affected by any changes in fee policy.

Taking into account these issues, the analysis included only learners paying a full fee for their course, as it is not possible to estimate the price elasticity for demand for those in receipt of full remission or to calculate a headline “price” for those in receipt of partial fee remission. As those receiving partial fee remission are only a very small proportion of total learners (under 2% or 35,000 enrolments in 2005/06), this is unlikely to affect the results of the analysis.

We also undertook a substantial “trimming” of the dataset, excluding courses if:

- the learning aim type was neither NVQs or the category of “other vocational” courses¹⁸;
- no information was available on the delivery district (e.g. because the course is offered via distance learning);
- average length of the course was over two years;
- total number of learners was fewer than 10¹⁹;
- total number of learners was greater than 500;
- nominal fee paid per hour of guided learning was greater than £15;
- average fee paid was less than £10;
- average fee paid was more than £1,000;
- average number of learning hours was less than 5 hours or greater than 750 hours; and if
- course was offered in more than 10 locations.

The final sample size then included 14,044 courses in 2004/05, 16,817 courses in 2005/06 and 15,071 courses in 2006/07.

¹⁸ The “Other” category includes a variety of courses, including BTECs, Diplomas, unitised courses and various other certificates and awards. The types of course excluded were GCE A/AS/A2 Level, GCSE, GNVQ precursor, GNVQ/AVCE, NVQ, Access to Higher Education and OCN. Table 1 provides detail on the number of courses of each type.

¹⁹ The number of learners enrolled on a course is estimated annually - i.e. if a class is offered ten times, with ten learners on each occasion, the total number of learners enrolled is 100.

4.3 Econometric approach

Having finalised the dataset to be included in the analysis, we proceeded to develop the most appropriate econometric methodology to identify the price elasticity of demand. We estimated the impact of price on enrolment at course level including individual courses (i.e. a particular learning aim offered by a particular institution delivered in a particular location - as discussed in Section 3) as individual observations²⁰. For each course, up to three years of data was included (depending on whether the course was offered in each year, and subject to the constraints discussed above).

In particular, a series of regressions were undertaken based on the following model:

$$e_{idt} = \alpha + \beta_1 f_{idt} + \beta_2 u_{dt} + \beta_3 c_{dt} + \sum \beta_j X_{idt} + \varepsilon_{idt}$$

where e_{idt} is the natural logarithm of the number of learners (not receiving fee remission); f_{idt} is the natural logarithm of the average fee paid by those learners²¹; u_{dt} is the unemployment rate in the district in which the course is offered; c_{dt} is the natural logarithm of the average fee paid for competitor courses²² and X_{idt} is a vector of course characteristics (e.g. the NVQ level of the course)²³. The error term ε_{idt} can be modelled as a combination of institution level fixed effects, district fixed effects year fixed effects and a random disturbance.

Information on fees, enrolment and other course characteristics were available within the course-level ILR dataset. Unemployment data was obtained from the ONS local labour market indicators by Unitary and Local Authority²⁴.

Given the heterogeneity of further education provision, we might also expect that the elasticity of demand depends on the type of course undertaken. In particular, it is likely that the extent to which a course is linked to a learner's career may affect the demand for that course. We might expect that learners enrolled on these more vocational courses may have less elastic demand. This is because the economic benefits associated with these courses may be higher (relative to the costs) leading to learners being less responsive to price changes (LSC, 2007).

²⁰ Initially, we explored an "enrolment rate regression" approach -commonly used in previous studies, and recommended in the scoping study for this project. Discussion of the reasons for the change of approach is provided in the annex.

²¹ The mean estimate of the nominal fee for consistency with the later estimates of the price elasticity of demand amongst minority groups. Replacing this with the mode estimate had no significant effect on the results.

²² Competitor courses were defined as courses of the same course type and subject type delivered within the same district.

²³ We also considered utilising enrolment rates - that is enrolment per population - as the dependent variable for the analysis. However, given the course level nature of the dataset and the fact that learners may be enrolled in several courses, we decided against this approach.

²⁴ Data from October to September in each of the three years. Unemployment based on Annual Population Survey data in 2004/05 and model based estimates in 2005/06 and 2006/07. Unemployment rate estimated as percentage of the economically active working age population aged 16 or above. This differs from the learner data, which excludes learners aged 16-18. However, given the fact that the 16-18 year olds are only a small proportion of the economically active population, this is unlikely to influence the results of the analysis.

The extent to which a course is supported by an employer may also affect the price sensitivity, and to test for this effect we included an interaction term²⁵ measuring the importance of the employer's role²⁶. The expected direction of the effect is not clear: recent qualitative research has indicated that colleges generally feel that employers are less price sensitive than individuals; however some colleges had found the opposite (particularly in the case of small enterprises) (LSC, 2007).

It is also possible that the relationship between enrolment and tuition fees varies between labour market sectors. Although the ILR does not directly address this, we are able to identify the subject of each qualification (e.g. business, ICT...). We test for the significance of these effects through a series of interaction terms and fixed effects.

Finally, we also control for wider factors that may also impact on enrolment. These include the district unemployment rate (to control for labour market effects²⁷) and the estimated average price level of other courses of the same course and subject type (e.g. NVQ in Information and Communications Technology) in the same district (to control for the price of "substitute" courses).

4.4 Results of econometric analysis

Table 4 reports the results of three different specifications of the model. In model specification 1, the (logarithm of) the average nominal fee is regressed on the (logarithm of) enrolment²⁸. Model specification 2 includes an interaction term for employer support, and also fixed effects for the level of vocational qualification and subject type (only the results for the level of vocational qualification fixed effects are displayed). Model specification 3 then adds interaction terms for each of the subject types.

²⁵ Interaction terms are created by multiplying a dummy variable by the value for the log nominal fee. For example, assume that prior to the inclusion of an interaction term, a model is calculated as:

$$e_{idt} = \alpha + \beta_1 \ln \text{nominal fee} + \varepsilon_{idt}$$

In this case the estimated price elasticity (across all courses) is the estimate of the coefficient β_1 . If an interaction term with the dummy variable D_{emp} , equaling 1 for courses with employer support and 0 otherwise, is included then the modified model is:

$$e_{idt} = \alpha + \beta_1 \ln \text{nominal fee} + \beta_2 D_{emp} \times \ln \text{nominal fee} + \varepsilon_{idt}$$

In this case the estimated price elasticity is β_1 for courses without employer support, and $(\beta_1 + \beta_2)$ for courses with employer support (i.e. where D_{emp} is equal to 1).

²⁶ Using a dummy variable equal to one if more than 50% of the learners on the course were undertaking provision directly related to their employment (based on ILR variable A19). Support from the employer includes dedicated employer provision and other instances where an employee is undertaking a vocational learning aim relevant to that employment.

²⁷ Those individuals actually unemployed (and hence receiving benefit) will be excluded from the analysis, as they are generally eligible for fee remission. However, labour market conditions (controlled for through the unemployment rate) may also affect other learners, through enhancing the likely returns and hence attractiveness of a qualification.

²⁸ The use of logarithms means that the coefficients on the nominal fee term(s) in each estimation can be interpreted as an elasticity of demand.

Table 4: Selected regression results

	(1)	(2)	(3)
Nominal Fee	-0.17** (0.01)	-0.14** (0.01)	-0.13** (0.02)
Employer Support*Nominal Fee	-	-0.07 (0.17)	-0.09** (0.02)
Unemployment rate	0.01 (0.01)	0.01 (0.23)	0.01 (0.01)
Average price of substitute courses	-0.07 (0.01)	-0.07 (0.01)	-0.05** (0.01)
Level 2 vocational qualifications	-	-0.11	-.10** (0.01)
Level 3 vocational qualifications	-	-0.06	-0.08** (0.02)
Subject type interaction terms			
Science and mathematics	-	-	0.43** (0.13)
Land based provision	-	-	-0.17** (0.06)
Construction	-	-	0.06 (0.04)
Engineering, technology and manufacturing	-	-	0.04 (0.03)
Business administration, management and professional	-	-	0.24** (0.02)
ICT	-	-	-0.20** (0.03)
Retailing, customer service and transportation	-	-	-0.07 (0.07)
Hospitality, sports, leisure and travel	-	-	-0.35** (0.03)
Hairdressing and beauty therapy	-	-	-0.13** (0.03)
Health, social care and public services	-	-	-0.01 (0.02)
Visual and performing arts and media	-	-	-0.08** (0.04)
Humanities	-	-	-0.07 (0.21)
English, languages and communication	-	-	-0.33** (0.08)
Foundation programmes	-	-	0.07** (0.04)
Observations	42,750	42,750	42,570
Adj. R ²	0.0911	0.1610	0.1763

Note: District-level, institution-level and year fixed effects are not shown displayed. Subject type and employer role fixed effects are not displayed for specifications 2 and 3. For interaction terms (employer support and subject categories), the coefficients are additive (where statistically significant). In other words, to estimate the elasticity of demand for ICT courses, it is necessary to add the base estimate (-0.13) to the estimated coefficient representing the subject type interaction term (-0.20) - providing a final estimate of -0.33. The "base" estimate relates to the "not known" subject type. Note that the coefficients relating to the level of vocational qualifications are not additive.

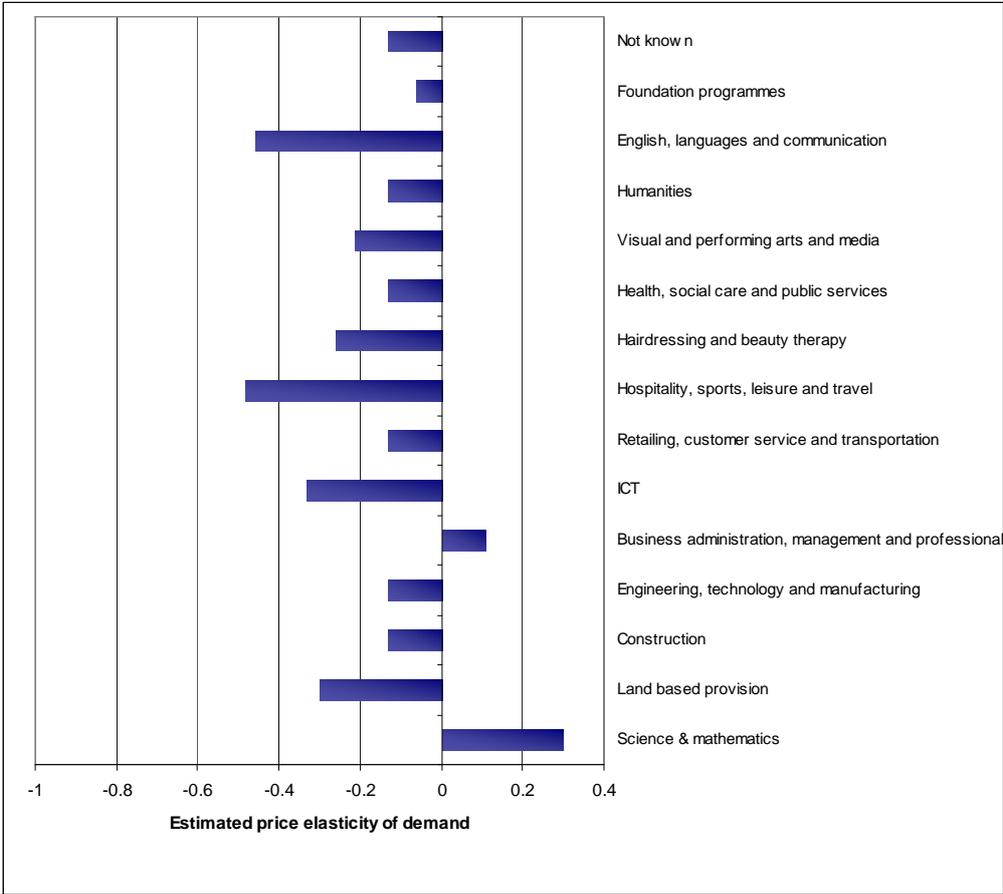
Source: London Economics' analysis of the ILR

The results indicate that, in general the price elasticity of demand for further education courses is relatively inelastic - standing at between **-0.1 and -0.2**. This estimation is relatively consistent across the different specifications estimated, and is strongly statistically significant in all cases.

In addition, we found that the elasticity of demand is higher (i.e. more elastic) for courses where the employer plays a role in supporting learners. This is somewhat surprising - although it should be noted that the difference, while statistically significant, is of only a small size (the estimate of the price elasticity of demand is estimated to be -0.22).

Several of the interaction terms for different subject types were significant (model 3). Using this we can estimate the elasticity of demand for different subjects - as displayed in Figure 2 below.

Figure 2: Estimated price elasticities by subject type



Note: Results based on specification 3 in the table above. Where interaction effects were not significant (at 10%) the base estimate (for the “not known” subject type) are shown.
 Source: London Economics’ analysis of the ILR

In general, the price elasticity of demand was close to the overall estimate of -0.1 to -0.2 above. For some subject types, however, the effect of tuition fees on enrolment is larger. In particular this is true for the Hospitality, Sports, Leisure and Travel (-0.48), English, Languages and Communication (-0.46) and Information and Communications Technology (-0.33) - although it should be noted that these estimates remain fairly inelastic. These results suggest that those courses which may be more career orientated (rather than leisure orientated) *may* have a more inelastic demand. It seems likely that the three subject

types with more elastic demand estimates contain a higher proportion of “leisure” courses than other areas (e.g. construction or hairdressing). This was also supported by some comments received from respondents during the further education institution survey - particularly the fact that some leisure courses (e.g. swimming/badminton) compete with other leisure activities (e.g. eating out/cinema) and as such are much more elastic in nature.

However, given the heterogeneity of the courses in each subject group, a more detailed understanding of the content of each of the courses would be required to understand whether it is this effect that is driving the difference in elasticity across subject types.

However, the estimated elasticity is marginally *positive* for two course types - ‘Business Administration, Management and Professional’ and ‘Science and Mathematics’. Given the counter-intuitive nature of this result, this suggests that there may be other factors related to both price and enrolment that we are unable to control for in the model.

For example, the ILR information did not include key information both in terms of supply side constraints, and the presence of competitors in the market. However, the information obtained through the FE college survey, presented in the following section, allows us to investigate these issues in more detail.

In addition, there is some anecdotal evidence that suggests that the price of courses reflects the quality of the course and that increases in price may lead to a shift in consumer behaviour and an increase in enrolment rates.²⁹ This may be reflected in the counter-intuitive results relating to the relationship between the average price of substitute courses and enrolment found above, where the estimated coefficients were consistently found to be negative. This implies that a higher price of substitute courses is associated with lower enrolment on a particular course. However, this may reflect the difficulty in identifying the appropriate courses to use as substitutes - we used all courses of the same subject type and course type in the district. In particular, it could be that courses often act as complements, rather than substitutes. This is suggested also by the fact that around a third of learners undertook more than one learning aim in 2005/06.

4.5 Impact on minorities

One of the key aims of the project was to investigate how increases in fees impact certain minority groups - according to socio-economic status, age, gender and ethnicity. The particular groups examined were:

- **Ethnicity:** BME and non-BME;
- **Gender:** Male and female;
- **Age:** 19-25; 26-29; 30-39; 40-49; 50-64; 65+).

In order to estimate these effects, it was necessary to disaggregate each of the course observations identified above, according to the group (e.g. male or female) that learners are in.

²⁹ For instance Perry (2004) reports that some colleges believe that fee levels can act as an indicator of quality, particularly for some courses.

For instance, in the case of gender, the model specification estimated was

$$e_{idts} = \alpha + D_s + (\beta_1 + \beta_s D_s) f_{idts} + \beta_2 u_{dt} + \beta_3 c_{dt} + \sum \beta_j X_{idt} + \epsilon_{idts}$$

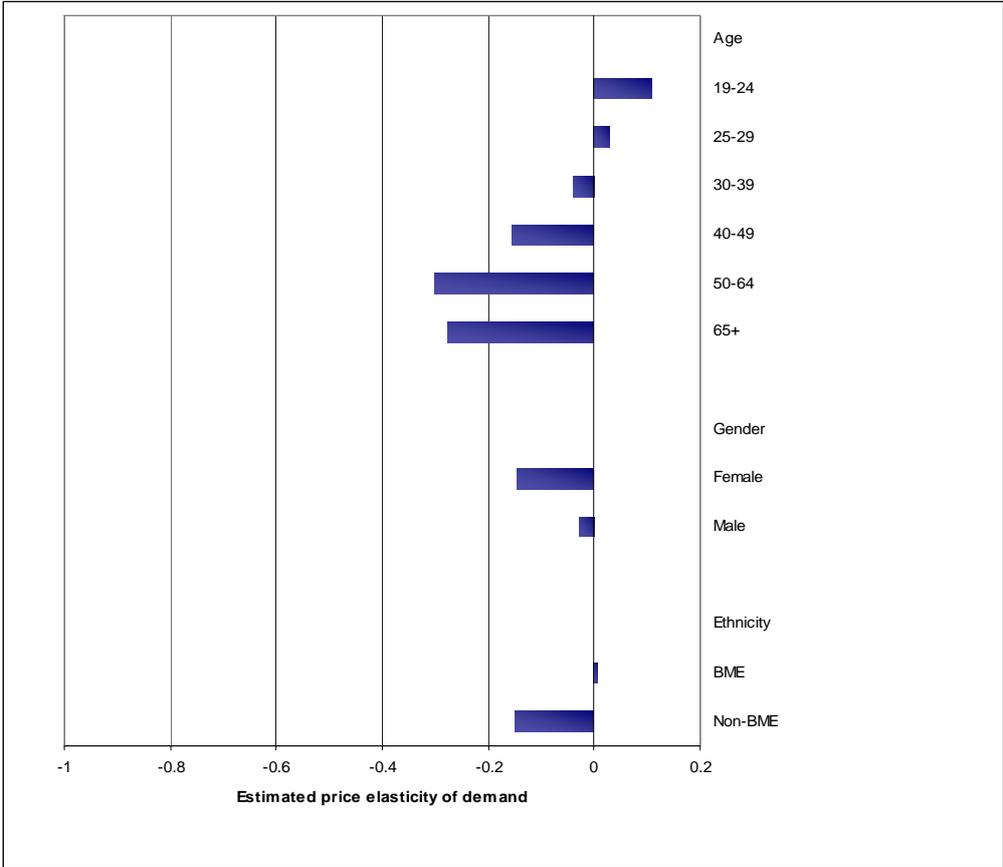
where e_{idts} represents the enrolment of each gender on each course, f_{idts} is the average fee paid by learners of each gender, D_s is a dummy variable equalling 1 if learners are female and learners are male, and all other variables have the same meanings as previously. In this specification, the estimate of β_1 provides the elasticity for men, whereas the estimate of $(\beta_1 + \beta_s)$ provides the elasticity for women. Since women might be expected to be more price sensitive, we expect the estimate of β_s to be negative. Similar specifications (with appropriate dummy variables) were used for the ethnicity and age analysis.

For the each of these three groups, we re-estimated model specification 1 and model specification 2 from above. The main results (based on model specification 2) are shown in Figure 3.

The results provide some evidence that the elasticity of demand for certain groups is more elastic than others. In particular, the estimate for male learners is very close to 0, in comparison to -0.14 for female learners. Similarly, there is evidence that demand from older learners is more elastic - with an estimate of around -0.3 for learners over 30.

Finally - and less intuitively - the estimate for non-BME learners is much more elastic than BME learners (for whom the projected elasticity is in fact slightly positive).

Figure 3: Estimated price elasticities for different groups of learners



Note: Based on series of estimations of specification 2 above, with the inclusion of interaction effects for each minority group.
 Source: London Economics' analysis of the ILR

Again, however, these effects must be treated with caution given the emergence of some unexpected effects - notably positive price elasticity for younger learners - which suggests that the model fails to capture some important influences on enrolment levels.

A particular problem is that, as the analysis does not include learners receiving fee remission, those that might be expected to demonstrate a high degree of responsiveness to changes in the price of tuition have been excluded. As we would expect the most vulnerable learners to be more likely to receive fee remission, this may reduce the observed differences between the different groups in this analysis.

Finally, the fact that the analysis is focused on absolute enrolment levels, rather than enrolment *rates*³⁰ (i.e. enrolment per population) may also lead to inaccuracy in the estimates. If the percentage of the population comprised of these minority groups is much lower in one district than another, then we would expect an overall lower number of enrolments even if all other factors were equal. This may be a particular issue for the BME group - although it may affect gender and age groupings as well.

³⁰ The reasons for this are discussed in the detailed methodology contained in the annex.

5 Analysis of the FE College Survey

5.1 Introduction

To complement the analysis of the ILR, a survey of further education institutions was undertaken. The survey was undertaken with the ultimate aim of merging the data collected into the ILR for further analysis; however, given the information collected, it was also possible to consider this information in isolation.

297 further education institutions across England were contacted and each questionnaire was customised according to specific learning aims recorded in an institution's ILR return. Following three rounds of follow-up contact (via e-mail and telephone) a total of 69 responses were obtained.

In total, the questionnaire returned information relating to 133 different learning aims (up to two for each further education institution). For the majority of these, data was returned for the entire three year period (2004/05 - 2006/07), although in some cases this was not possible, particularly as courses had not been offered in each year (we encountered some situations where learning aims were no longer offered by colleges after 2005/06 and instances where 2005/06 was the first year of provision). In total, data was available for 118 learning aims in 2004/05, 132 learning aims in 2005/06 and 123 learning aims in 2006/07.

The types of courses in terms of subject and NVQ level are displayed in the table overleaf. As this indicates, the majority of the learning aims considered by the study were either NVQ level 1 or NVQ level 2. The most popular subject area of the courses investigated was Hospitality, Sports, Leisure and Travel.

Table 5: FE College Survey - types of learning aims

	NVQ Level			Total
	Level 1	Level 2	Level 3	
Land based provision	0	3	0	3
Construction	0	3	0	3
Engineering, technology and manufacturing	1	8	3	12
Business administration, management and professional	0	0	5	5
ICT	5	2	0	7
Retailing, customer service and transportation	0	1	0	1
Hospitality, sports, leisure and travel	15	18	1	34
Hairdressing and beauty therapy	0	0	1	1
Health, social care and public services	6	10	2	18
Visual and performing arts and media	2	3	0	5
English, languages and communication	3	1	0	4
Not known	29	7	0	36
Total	61	56	12	129

Note: Three learning aims were not linked to the ILR, and are not included.

Source: London Economics' analysis of the FE College Survey and ILR

5.2 Enrolment

As shown in Table 6, the level of enrolment varied considerably between the different learning aims examined, from only a few (less than five) to several thousand students enrolled on individual learning aims. Interestingly, the average enrolment on the learning aims considered decreased significantly over the period. Specifically, in 2004/05, the mean enrolment stood at 451, while this had decreased to just over 250 by 2006/07.

Table 6: FE College Survey - enrolment by learning aim

	N	Mean	Minimum	Maximum	Standard deviation
2004/05	110	451	2	4,505	782
2005/06	126	384	8	3,343	469
2006/07	116	256	1	1,516	314

Source: London Economics' analysis of the FE College Survey

In Table 7, we provide some additional information on the incidence of growth and decline of enrolments by learning aim. In particular, between 2004/05 and 2005/06, approximately 63% of learning aims posted an increase in enrolment with a median increase in the number of learners enrolled of 23%. Between 2005/06 and 2006/07, on the other hand, the mean growth in enrolment (across learning aims) was actually negative, with three quarters of learning aims experiencing a fall in the number of learners enrolled. However, despite this, a number of learning aims reported very large growth in enrolment (albeit in some cases from a low base).

Across the entire period of the survey, there was a 17% reduction in the number of learners enrolled on these learning aims and approximately 57% of the learning aims considered posted a reduction in the number of learners enrolled.

Table 7: FE College Survey - change in enrolment			
	% learning aims where enrolment...		Median change
	Fell	Grew	
2004/05 - 2005/06	37%	63%	23%
2005/06 - 2006/07	76%	24%	-27%
2004/05 - 2006/07	57%	40%	-17%

Note: Three learning aims experienced no change in enrolment between 2004/05 and 2006/07, and so percentages do not add to 100%..
 Source: London Economics' analysis of the FE College Survey

5.3 Learning aim capacity

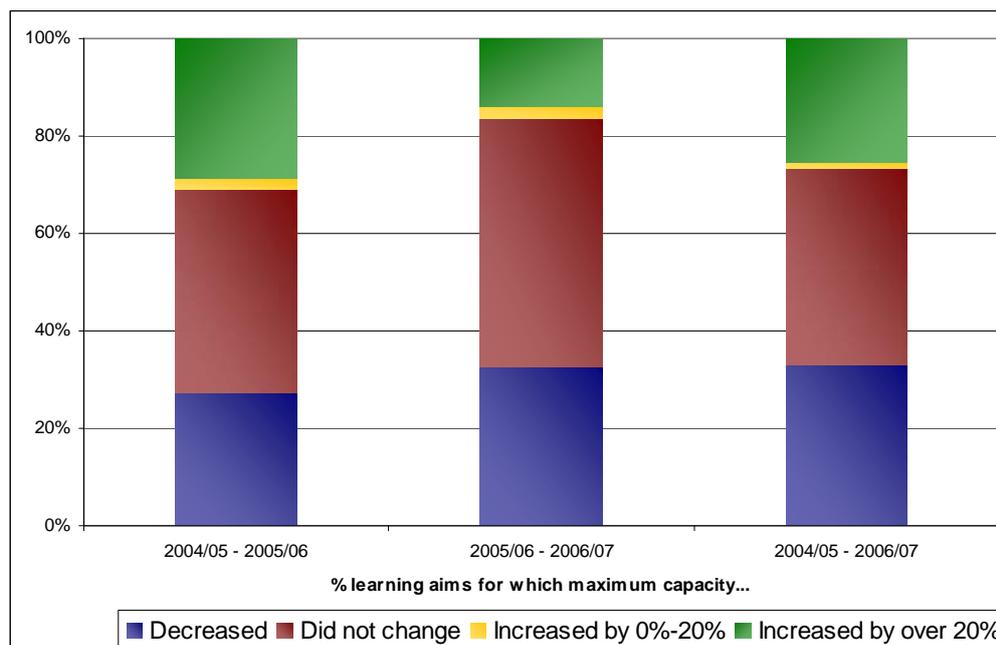
An important area of the survey was to examine some of the supply side issues that might be affecting further education colleges and in particular the existence (or otherwise) of capacity constraints for the provision of learning aims (as this information is not available in the ILR). This supply side information related to both the maximum capacity for each learning aim within a given year and the minimum capacity associated with the learning aim (i.e. the number of learners necessary for provision of the course to be viable).

The survey indicated that capacity issues were common, with respondents claiming that 76% of the learning aims were subject to maximum capacity and 82% were subject to a minimum capacity in 2005/06³¹.

However, as shown in Figure 4, for many learning aims, the maximum capacity changed significantly (by over 20%) between years. This suggests that there is some flexibility over time in terms of the number of learners that can be offered a place on a particular course: colleges appear to be willing to adjust the structure of provision to meet increasing demand for more popular learning aims.

³¹ The true level may be higher, as the survey did not indicate whether non responses reflected the absence of a capacity restriction, or that the respondent was unable to quantify the limit.

Figure 4: FE College Survey - change in maximum capacity



Note: Excluding cases where reported enrolment was substantially larger than reported capacity.
 Source: London Economics' analysis of the FE College Survey

Further, the evidence from the survey suggested that those learning aims for which capacity grew over the period were associated with higher average fee growth per annum (over the two-year period) than those without capacity growth. Learning aims with increasing capacity over the two year period were subject to average growth of 17% per annum - in comparison to 12% for other learning aims³².

This finding may be significant when interpreting the econometric results. It may be the case that further education colleges offering courses with high levels of demand are responding over time through increasing the level of capacity to provide those courses and increasing the fees associated with those courses simultaneously. The overall effect may be that there is an increase in the total fee charged alongside an increase in enrolment.

5.4 Excess demand

The FE college survey also explored the existence of excess demand for the learning aims in question in two ways. First, the enrolment and capacity figures discussed above were used to estimate the *capacity usage* of each learning aim. Secondly, further education colleges were asked whether waiting lists were offered for each learning aim and whether learners on the waiting list were eventually able to undertake the learning aim - or whether there was unmet demand.³³ These questions were introduced to account for the possibility that any increase in the price of tuition (and other costs) might have no impact on the number of students enrolled, if the course was already over-subscribed. Failure to control for this factor

³² Growth figures exclude any learning aims which were subject to a growth in tuition fees of above 100% in any year; and any learning aims that did not return three years of data.

³³ Ideally, the analysis would include information about application rates and the extent to which applications for each learning aim exceeded enrolments. However, further education colleges in general have very limited information in relation to applications. Therefore these alternative measures were developed based on consultation with key stakeholders within the further education sector.

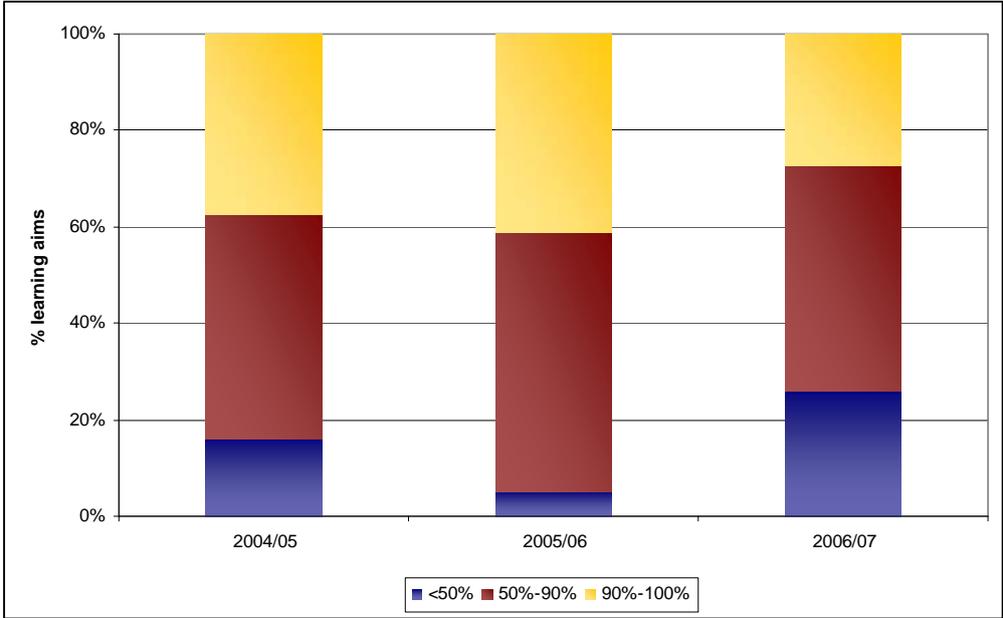
might result in underestimating the elasticity of demand (i.e. suggesting that the demand for further education is less responsive to changes in price than is actually the case).

Ideally, the analysis would include information about application rates and the extent to which applications for each learning aim exceeded enrolments. However, further education colleges in general have very limited information in relation to applications. Therefore, in consultation with key stakeholders within the sector, we instead measured excess demand through identifying whether colleges operated waiting lists for each learning aim.

Capacity usage

Figure 5 displays the results of the estimation of capacity usage. As the figure indicates, only a minority (around 40% of learning aims in 2004/05 and 2005/06 and 30% of learning aims in 2006/07) of learning aims were operating near capacity (defined as above 90%). Further, some learning aims had more than 50% excess capacity (ranging from 5% in 2005/06 to 26% in 2006/07). Overall, the average (mean) capacity usage across learning aims was 74% in 2004/05, 81% in 2005/06 and 67% in 2006/07.

Figure 5: FE College Survey - enrolment as percentage of maximum capacity



Note: Values of over 100% adjusted to 100%.
Source: London Economics' analysis of the FE College Survey.

Waiting lists

In support of the suggestion that there is generally spare capacity, fewer than 10% of learning aims were reported to have unmet demand. Around 60% of institutions in each year did not utilise a waiting list at all. A further 30% did use a waiting list, but appeared to be able to move these learners onto the learning aim at a later date.

Even though there has been a decrease in the average capacity utilisation over the period, the proportion of learning aims with waiting lists and unmet demand has remained relatively constant over the period, suggesting that there may be some concentration of unmet demand in particular subject areas³⁴.

5.5 Nominal fees

The survey looked to estimate the full fees paid by learners in undertaking the particular learning aim. The total cost or fee associated with the learning aim was defined as follows:

Adjusted fee to learners = Headline price (of the learning aim) + any other tuition costs (e.g. exam fees) + costs (fees and other costs) of any other associated learning aims not included in the headline price.

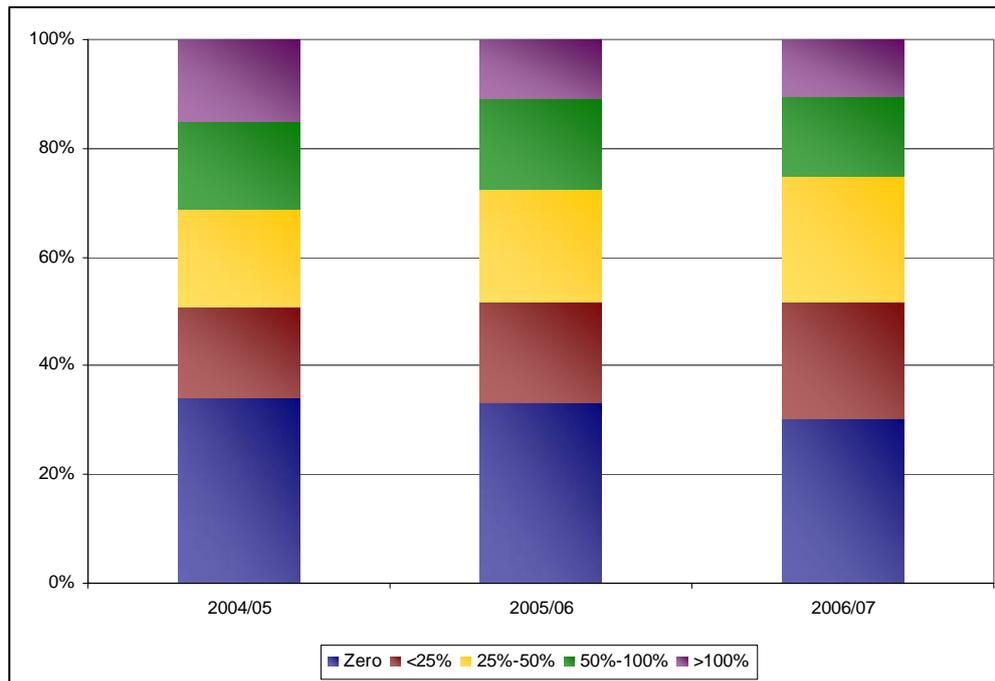
5.5.1 Other fees

The survey indicated a large degree of variation in the 'other' (i.e. non-tuition) fees charged to learners across learning aims.³⁵ As indicated in Figure 6, while there were no other costs associated with around one third of learning aims in each year (blue box), in many learning aims other costs accounted for more than 50% of the headline price of the course (green and purple boxes).

³⁴ It is interesting to note that the learning aims that have unmet demand are essentially the same across the three years of the analysis. The nine learning aims with unmet demand covered the following learning aims: Electrotechnical Technology (Level 2) (3); Certificate in Basic Plumbing Studies (NVQ2) (1); Certificate for IT Users Level 1 (1); Certificate for IT Users Level 1 (1); National Certificate for Personal Licence Holders Level 2 (1); Certificate in Food Hygiene Level 1 (1); Foundation Certificate in Creative Craft Level 1 (1); and Award in Language Skills Level 1 (1).

³⁵ Institutions were not explicitly asked about the type of "other" fees that were charged. Five institutions did provide information however - indicating that other fees included exam fees (4 institutions; 6 learning aims), registration (2 institutions; 4 learning aims), and materials (1 institution; 2 learning aims).

Figure 6: FE College Survey - other fees as a percent of headline price



Note: Assuming other fees zero if no value reported. Excludes observations where the headline price for the learning aim was equal to zero.

Source: London Economics' analysis of the FE College Survey

5.5.2 Total fees

Combining the information relating to the headline price of the learning aim and the information relating to additional course costs passed onto learners (and the fees and other costs of any other associated learning aims not included in the headline price (which were relatively insignificant)), we provide below in Table 8, the mean, median, minimum and maximum of the total fees charged for the learning aims collected as part of the FE College Survey.

The average total fee charged to learners increased from approximately £155 in 2004/05 to £224 in 2006/07; however, the average masks some significant variation between learning aims. In particular, although there were learners undertaking learning aims not paying any fee at all, a few of the learning aims were associated with fees significantly in excess of £1,000.

Interestingly, the proportion of learning aims not charging any fee fell over the period from 11% in 2004/05 to only 3% in 2006/07, while the maximum fee associated with the most expensive learning aims increased from just over £1,500 to more than £1,800. This may reflect the change in priorities in the further education sector, which has led to colleges being given less discretion over which courses can be offered for free, and an emphasis on increasing fee income.

Table 8: FE College Survey - total fees charged

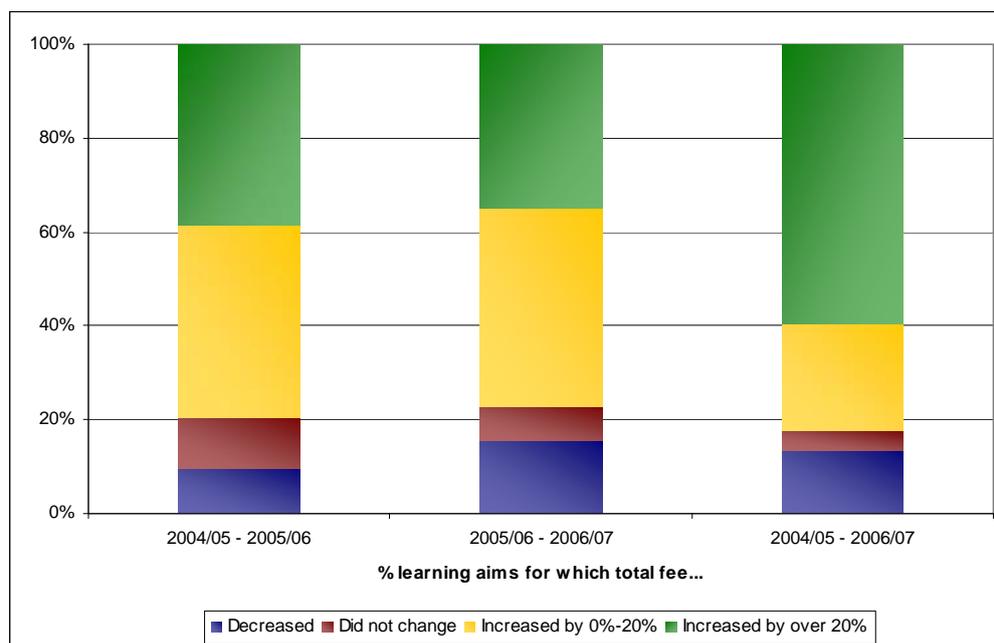
	Mean	Min	Median	Max	Standard deviation
2004/05	£155	£0	£92	£1,585	£210
2005/06	£182	£0	£112	£1,837	£236
2006/07	£224	£0	£146	£1,838	£251

Note: Total fee includes tuition fees and other costs.
 Source: London Economics' analysis of the FE College Survey

Overall across the three-year period the median increase in the total fee was approximately 31%. The mean change was much higher (at over 100%), reflecting the fact that some learning aims underwent very high percentage changes (often from a low base in 2004/05).

In Figure 7, we provide some additional information on the proportion of learning aims that were associated with changes in the total fees charged to learners. Generally (in over 80% of cases) the fees charged to learners increased between 2004/05 and 2006/07, with nearly 60% of learning aims seeing an increase in fees of more than 20%. Reductions in fees, on the other hand, were associated with fewer than 15% of learning aims.

Figure 7: FE College Survey - change in total fees



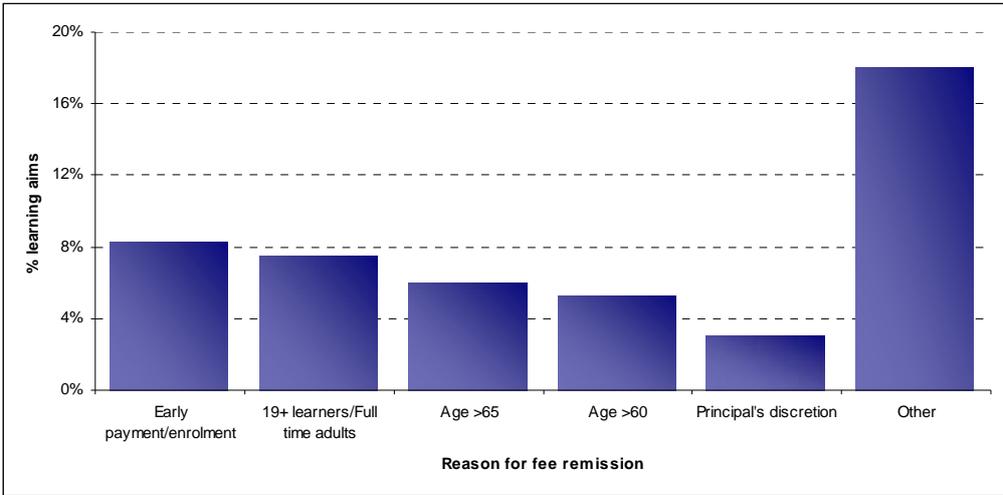
Note: Total fee includes tuition fees and other costs.
 Source: London Economics' analysis of the FE College Survey

5.6 Fee remission

The survey responses indicated that fee remission was available for fifty-one (38%) of the learning aims examined. The most popular reasons for offering remission were for full time adult learning or early payment / enrolment, each of which were offered by approximately 15% of all institutions (offering fee remission).

The survey suggested that the level of fee remission varied depending upon the reason that it was offered. For instance, learners receiving remission as full-time adult students received almost 100% of the fees as fee remission (on average), whereas learners receiving remission for early payment received remission of approximately 10% (on average).

Figure 8: FE College Survey - reasons for and level of fee remission



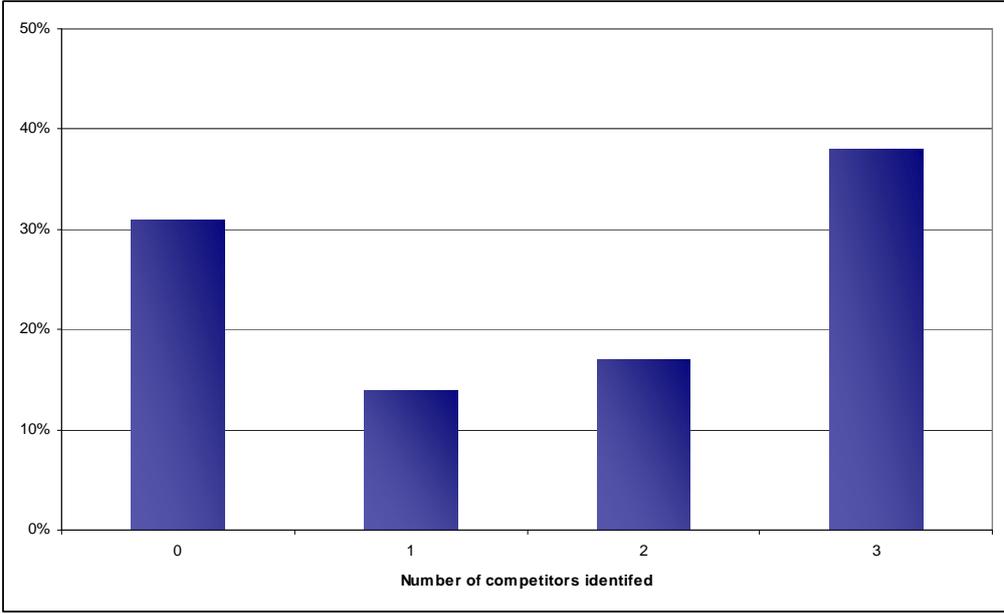
Source: London Economics' analysis of the FE College Survey.

The survey also investigated whether fee remission tends to be extended to other costs. This found that on average around 40% - of both Learning and Skills Council and local fee remission - extended to other course costs as well as tuition fees.

5.7 Number of competitors

The survey provided respondents with the opportunity to identify up to three competitors for each learning aim. As shown in Figure 9, in general colleges identified that they faced at least one competitor for each learning aim represented in the survey. It is important to note that the proportion of learning aims without any competitor may be over-estimated if it were the case that respondents were unable to answer the question (and so left the response empty).

Figure 9: FE College Survey - number of competitors identified (percentage of learning aims)



Source: London Economics' analysis of the FE College Survey.

5.8 Factors affecting demand

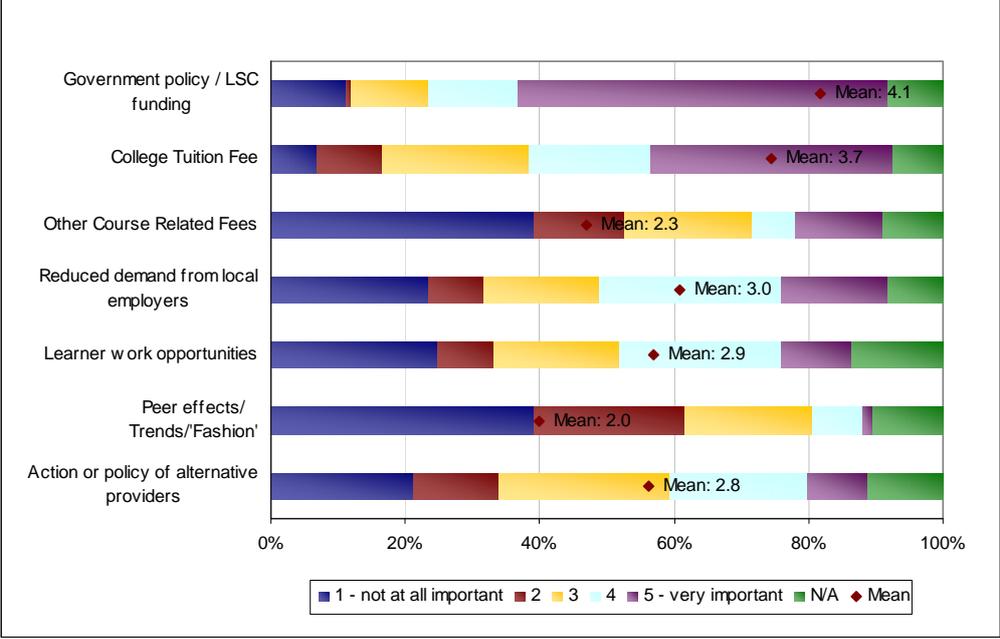
As part of the survey, respondents were asked to provide some indication of the factors that were considered important in relation to determining enrolment on the specific learning aims for which information was requested. On a scale of '1' (not at all important) to '5' (very important), respondents were asked about the (relative) influence of alternative sources of funding (Learning and Skills Council funding, funding derived from private tuition fees and other course related fees), local employment conditions and funding/support from local employers, peer effects and the activities of alternative providers.

As shown in Figure 10, respondents tended to see both LSC funding and college tuition fees as the most important factors affecting demand. In particular, approximately 65% of respondents indicated that Learning and Skills Council funding levels was either 'important' or 'very important', with just over 10% indicating that it was either 'not at all important' or 'quite unimportant'.

Approximately 15% of respondents indicated that the tuition fee charged was relatively unimportant in determining enrolment on the specific learning aims with approximately 50% suggesting that the cost of tuition to be either 'important' or 'very important'. However respondents did not rate the other fees associated with attendance to have any significant effect on enrolment.

With the exception of 'peer effects', there was little difference between the remaining factors. Labour market impacts (including the possibility of reduced demand from employers and learner work opportunities) were both considered relatively important with respondents on average rating them as being 'neither important nor unimportant'. Respondents were evenly split on the impact of alternative college activity on student behaviour; approximately 30% of respondents believed that alternative provider activities were generally important, with an equal proportion considering the behaviour of competitors as being relatively unimportant.

Figure 10: FE College Survey - factors affecting learner demand



Source: London Economics' analysis of the FE College Survey

5.9 Effect of change in LSC funding

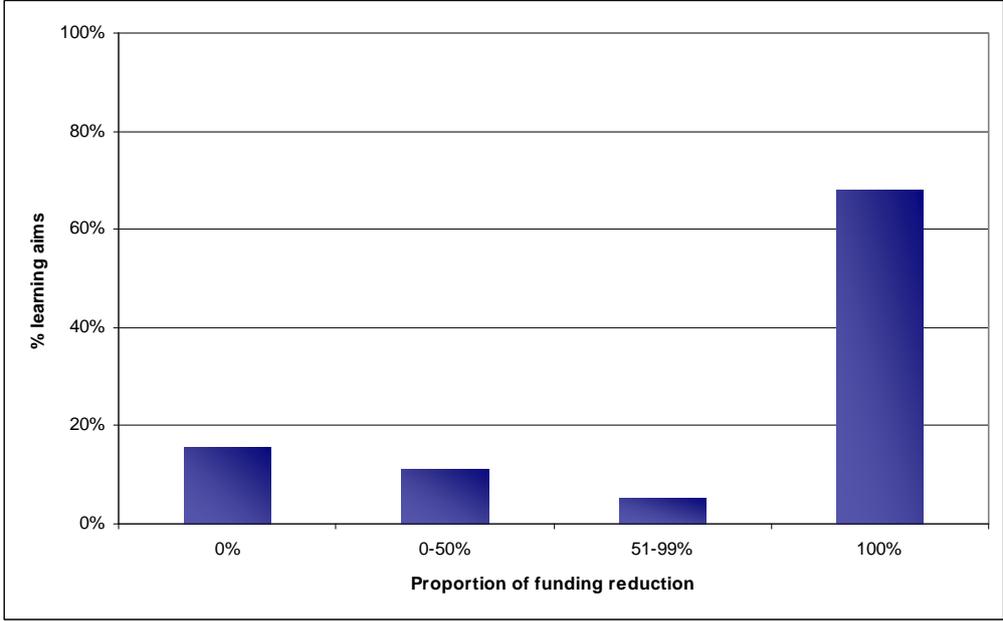
To complement the quantitative analysis based on the FE College Survey and ILR, we attempted to ascertain the expected impact of changes in the total fee charged to learners. Although the results based on these questions have no empirical basis, it is interesting to note the subjective views of further education professionals and compare these to the empirical findings.

We asked respondents what they envisaged might happen following a 10 percentage point reduction in the extent of the Learning and Skills Council subsidy (which currently stands at 62.5% of total course costs).³⁶

Respondents indicated that they would pass on the entirety of a 10 percentage point reduction in Learning and Skills Council funding to learners for the majority (over two thirds) of learning aims. Respondents indicated that they would pass on none of the funding shortfall in only 15% of learning aims.

³⁶ It is important to note that a 10 percentage point reduction in the funding received from the Learning and Skills Council is not equivalent to a 10% increase in student fees.

Figure 11: FE College Survey - proportion of funding reduction that would be passed on to learners



Source: London Economics' analysis of the FE College Survey.

Given the fact that the total fee paid by the average student (approximately £244 in 2006/07) covers approximately 37.5% of the full cost of provision, a 10 percentage point reduction in Learning and Council funding would result in a potential increase in average total fee of £65 per learning aim - equivalent to an increase in excess of 20%.

5.10 Price elasticity of demand

5.10.1 Qualitative results

Finally in this section, we consider respondents' subjective assessments of the price elasticity of demand in relation to the specific learning aims contained within the FE College Survey. Specifically, the respondents were asked to estimate the likely effect on enrolment resulting from a 20% increase in tuition fees.

The estimated effect on enrolment varied between 0% and 100% with the average expectation that a 20% increase in learners' tuition fees would result in a 28% reduction in the numbers of learners enrolled. The median estimate was similar, at 20%.

Combining this information on the responsiveness of learners to the price changes implies an estimated of price elasticity (across learning aims) of between -1.0 and -1.4 (based on the median and mean respectively).

6 Combined analysis

6.1 Introduction

In addition to the qualitative estimation of the price elasticity of demand above, the survey data was also used to provide a quantitative estimate of the price elasticity of demand. As the survey data was linked to the information in the ILR, we were able to merge the two datasets and carry out a similar estimation as in Section 4, taking into account some of the additional information identified through the survey³⁷.

In undertaking and interpreting this analysis, it is important to bear in mind that the survey only covered a very small proportion of further education colleges and courses and is not (nor was intended to be) representative of the sector as a whole. Instead, these courses offer a selection of courses of particular interest due to particularly high enrolment rates, and allow us to gauge the relevance of factors that we were unable to take account of in the analysis of the ILR alone.

A further important consideration is that a comparison of the datasets in areas in which they overlap (such as regarding tuition fees and enrolment) highlighted some significant differences between the two information sources. This suggests that we should be cautious in assessing the result of combining the two.

6.2 Description of the dataset

The survey returned information regarding to 373 potential course observations (with each observation comprising a course offered in a particular year) across a total of 133 learning aims. However, it was only possible to include 320 of these in the final analysis. Three learning aims (8 observations) were not matched at all in the ILR³⁸, while a further 45 observations were dropped because the individual year could not be matched (although the learning aim could overall)³⁹.

In addition, for comparability with the analysis in Section 4, we applied the same restrictions on the dataset, leading to a total of 244 observations being included in the analysis⁴⁰.

The key variables in the analysis - the fees paid and enrolment – are present in both datasets. Furthermore, the measures in each of the two datasets are not identical; the ILR information reports the average *actual* fee paid by learners without fee remission and breaks down of the number of learners according to the incidence and type of fee remission received. The survey data on the other hand reports the headline “price” associated with the course (alongside other learner costs) and only the entire number of learners.

As there is no clear argument as to which source of data is preferable, we estimate each specification twice - using each data source. This has the advantage of allowing us to compare the data sources as well as direct comparability with the findings of the ILR analysis.

³⁷ For further discussion on the merging of the two datasets see section 3.3.

³⁸ Due to the institution reporting information regarding a learning aim that could not be identified uniquely in the ILR (1 learning aim) or because the learning aim was not in the top 1000 learning aims in 2005/06 (2 learning aims).

³⁹ Suggesting that there was a change in the way the learning aim was reported in the ILR between years.

⁴⁰ As the data in this analysis is not disaggregated by district, we removed courses with over 1,000 learners, rather than 500 learners in the ILR analysis.

6.3 Econometric approach

We estimate four different models, using a similar specification as outlined in Section 4.3. As discussed above, each of these is estimated twice – once using ILR data (incorporating only learners without fee remission and the average fee paid by those learners) and once using the FE College Survey data (incorporating the total number of learners, and the headline price paid).

First, we estimate the simple relationship between the (logarithm of) enrolment and the (logarithm of) the price measure, controlling for institution and year fixed effects. As in the ILR analysis, we then include fixed effects and an interaction term to control for the role of employers in the course.

The third model specification then investigates the impact of the factors explored in the study - including dummy variables identifying whether a course had excess demand, the number of competitors identified in the survey and whether the institution offers local fee remission. Finally, we control for fixed effects of different subject types and vocational qualification levels.

6.4 Results

The results for the estimations using the FE College Survey data and the ILR data are shown in Table 9 and Table 10 respectively.

The models consistently indicate a statistically significant impact of tuition fees on enrolment. Further, the *size* of this estimate does not vary significantly across models (although one estimate using the ILR data is insignificant). Using the survey data, the estimated elasticity is around **-0.2**, indicating a relatively inelastic demand. The ILR data suggests that the demand is more elastic at around **-0.3** (or even higher for courses supported by the employer).

Table 9: Combined analysis - regression results (FE College Survey data)				
	(1)	(2)	(3)	(4)
Total Fee	-0.25** (0.09)	-0.22* (0.10)	-0.21* (0.10)	-0.27* (0.11)
Employer Support (fixed effect)	-	0.66 (0.78)	-0.03 (0.92)	1.08 (0.96)
Employer Support*Total fee	-	-0.14 (0.16)	0.05 (0.79)	-0.21 (0.20)
1 competitor	-	-	-0.04 (0.39)	-
2 competitors	-	-	0.71 (0.87)	-
3 or more competitors	-	-	1.24 (0.78)	-
Local fee remission offered	-	-	0.47 (0.74)	-
Excess demand	-	-	0.65 (0.43)	-
Level 2 vocational qualifications	-	-	-	-0.10 (0.22)
Level 3 vocational qualifications	-	-	-	-0.42 (0.47)
Observations	234	234	232	234
Adj. R ²	0.6133	0.6152	0.6287	0.6575

Note: All models also included terms for institution and year fixed effects. Model specification 4 included subject level fixed effects.

Source: London Economics' analysis of the FE College Survey and ILR

Table 10: Combined analysis - regression results (ILR data)				
	(1)	(2)	(3)	(4)
Nominal Fee	-0.37** (0.10)	-0.31* (0.10)	-0.35** (0.11)	-0.17 (0.12)
Employer Support (fixed effect)	-	1.76* (0.86)	1.21 (0.92)	2.33* (0.89)
Employer Support*Nominal fee	-	-0.37+ (0.19)	-0.20 (0.21)	-0.50* (0.20)
1 competitor	-	-	-0.10 (0.36)	-
2 competitors	-	-	0.41 (0.52)	-
3 or more competitors	-	-	0.53 (0.53)	-
Local fee remission offered	-	-	-0.12 (0.59)	-
Excess demand	-	-	0.54 (0.44)	-
Level 2 vocational qualifications	-	-	-	0.27 (0.20)
Level 3 vocational qualifications	-	-	-	0.06 (0.42)
Observations	244	244	242	244
Adj. R ²	0.7092	0.7160	0.7195	0.7609

Note: All models also included terms for institution and year fixed effects. Model 4 included subject level fixed effects.

Source: London Economics' analysis of the FE College Survey and ILR.

It is possible that the higher elasticity estimate when the ILR data is used is a reflection of the differences in the datasets. As the ILR data contains only learners not receiving fee remission, whereas the survey dataset includes all learners (some of whom will not be affected by any fee change), this finding is not surprising.

The other major difference between the results is that the ILR data indicates that the demand elasticity is significantly different for employer supported courses - a finding not replicated when the survey dataset is used.

A final notable result is that none of the variables included utilising the survey data, such as the excess demand, the provision of fee remission or the number of competitors had a significant effect. This provides some reassurance that the impact of not including these variables in the ILR analysis may not be very large; however, given the small and unrepresentative nature of the dataset we do not know if this is the case for certain.

The results regarding competition are surprising, as previous research has suggested that this may be a major factor influencing the price elasticity (Perry, 2004). On the other hand, some qualitative work has found that in the rivalry with competitors may not be that important a factor in determining fee levels (Perry and Fletcher, 2006). Further, it should be noted that the analysis controlled only for competition from other colleges; and not wider sources of competition (e.g. other leisure activities such as gym membership) that may affect learners' price sensitivity (LSC, 2007).

Given these issues and the problems encountered with the data sources (discussed above), the results of the analysis must be subject to the appropriate caveats. However, it is interesting to note the consistency of these findings with the earlier ILR analysis, which suggested a similarly inelastic demand. This in turn seems to reflect some of the findings of the qualitative literature, which have suggested that learners have proved less sensitive to price than college staff have expected (LSC, 2007).

7 Conclusions

This report set out to estimate the impact that increased fees faced by learners has on enrolment in further education. Understanding this is important in assessing the potential effect of placing a higher proportion of the cost burden of further education onto the individual. With the move towards a demand-led system, the contribution of learners has generally increased. In particular, the assumed contribution of further education course costs generated through fees increased to 37.5% in 2007/08 and is anticipated to rise further so that adult learners contribute 50% towards their fees by 2010.

The evidence produced, through both quantitative and qualitative analysis indicates that price does affect the demand for further education. However, the channels through which this takes effect, and consequently the size of the impact, appear to vary significantly both between different types of further education course, and between different types of learners. Identifying these effects is particularly difficult given the extensive reform that the further education sector has undergone in recent years.

In considering the impact of price on the quantity of further education demanded, it is important to recognise that the majority (around two thirds) of learners pay no fee for further education. Under Learning and Skills Council policy, many types of learner (e.g. low income or unemployed learners) qualify for fee remission nationwide, while many other learners receive fee remission based on local college policy. Assuming that these learners continue to receive fee remission, the impact of a change in fees on overall enrolment in further education will necessarily be limited, given the small proportion of learners actually affected by fee changes.

For those individuals that do pay full tuition fees, our results suggest that the elasticity of demand for further education is inelastic. The estimates were generally between -0.1 and -0.3, although this varied depending on the subject of the course, and the role of employer in supporting the employee. These findings were reasonably robust to changes in model specification, and using different information sources. However, some results were surprising - for instance, it was estimated that the elasticity of demand for some courses may be positive (i.e. implying that an increased price is associated with an increased demand for a course).

To place these results in context, the few estimates of the price elasticity of demand for education from the wider economic literature also appear to be inelastic, although these do vary hugely (-0.03 to -1.30 depending on methodology and data used). It is also interesting to note that based on the primary data collected from further education colleges, their subjective assessment is that the price elasticity of demand is significantly more elastic than the estimates based on the survey information and the ILR (even when controlling for some of the factors that further education colleges deem important in determining the student enrolment rates).

We would emphasise that these results should be treated with caution, given the complexity of the further education sector, and the fact that several difficulties were encountered with both the ILR and survey datasets. Analysis of the ILR suggested there may be a number of inconsistencies in the way in which information is recorded between further education colleges. Often, the fees paid by learners undertaking the same learning aim at the same institution are different, which suggests that the course-based methodology utilised in the research (that implicitly assumes a homogenous price across learners) may not be fully accurate.

In considering the results, it is also important to understand the current context of further education provision. The sector has undergone extensive reform in recent years, following the establishment of the Learning and Skills Council in 2001, and the publication of *Further Education: Raising Skills, Improving Life Chances* in 2006. The economic role of the sector has been emphasised, with the aim of making courses increasingly demand-led, necessitating a change in mindset from learning providers. Inevitably such adjustments are not automatic and optimal course provision and pricing strategies will be achieved only after a period of trial and error, and with sufficient Government guidance⁴¹.

Given that many of these changes occurred during the period covered by the analysis (2004/05-2006/07) this may have affected the price elasticity estimates, particularly due to changes in the menu of courses offered by colleges during the period. For instance, as funding for some courses has been removed, rather than impose higher prices on learners where funding has been removed (or reduced), colleges may have decided not to offer the course at all.

Further, as well as changes in the courses provided, the content of individual courses may have changed between years. In fact, with the emphasis placed on the need for a demand-led further education system, colleges are actively encouraged to review learner and employer feedback, and adjust their course offering accordingly. If this is common, changes in enrolment may reflect other factors in addition to changes in price, and if the trend is for course quality to improve, then this may explain the findings of positive price elasticities. Similarly, given the existence of capacity constraints in further education, colleges may also react to high demand by both increasing prices and raising maximum enrolment. The survey found some evidence of this effect with courses with growing capacity associated with higher average growth in tuition fees.

Although the estimation of the price elasticity of demand is important, this is only one of a number of factors to consider in the debate on how further education should be funded. Other factors may include: the economic returns associated with qualification attainment (earnings and employment effects); the wider economic (spill-over) effects associated with qualification attainment; and non-monetary wider benefits (reduced crime rates, improved health and intergenerational transmission of skills). In addition to this, when considering changes to the contribution that learners make to tuition fees, it is also important to consider issues relating to ability to pay and the possible existence of credit constraints (equity), as well as the future skills needs of the economy.

Next Steps

The analysis undertaken has made the best use of the information currently available; however, there are still some limitations associated with the analysis as a result of evidence gaps and inconsistencies in the Individual Learner Record.

Before considering the role of other factors on the demand for further education, and given the burden of data collection already placed on further education colleges, we believe that significant effort should be invested in ensuring that accurate and appropriate information (especially in relation to fees and fee remission) is collected through the ILR for ongoing analysis. Once this is achieved, then it might be possible to consistently and more accurately estimate the elasticity of demand for further education, although the fact that a high proportion of learners receive almost full fee remission will always limit the analysis in some respects.

⁴¹ See for instance www.smarterfees.com, which provides a toolkit to help colleges increase the income they generate from fees.

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Annex 1 - Econometric methodology

The fundamental aim of the study was to estimate the elasticity of demand for further education at a disaggregated level, by focusing on the change of enrolment on particular courses, based on the change of fee on that course over time (controlling for other effects).

Initially, we explored an “enrolment rate regression” approach - commonly used in previous studies, and recommended in the scoping study for this project⁴². This approach estimates how actual enrolment rates (i.e. enrolment per population) may vary according to the fees being charged by different further education institutions.

Having undertaken a thorough investigation of the further education sector and the available data underpinning the analysis; however, we decided that this approach was neither appropriate nor feasible. First, it became clear that many further education colleges offer courses in several geographical areas - preventing the accurate definition of an “enrolment rate” for any particular institution. Secondly, it was not possible to obtain information through the survey (on fees and enrolment) for a range of comparable courses at different further education institutions. In particular, in the original discussions with the Department for Innovation Universities and Skills and representatives of further education colleges, we realised that there was significant heterogeneity across the courses offered within institutions within the same subject area and level within the National Classification of Vocational Qualifications. For instance, we provided further education colleges with information on a number learning aims (derived from the ILR) within a relatively tightly defined subject area (for example Information and Communications Technology) at level 2. We were informed that even though the various qualifications are nominally at the same level, each qualification was viewed very differently and any attempt to aggregate over subject area (even at the same level) would be meaningless. As a result, this precluded aggregating several courses (e.g. all Level 2 qualifications in hairdressing), and so necessitated a focus at a course level.

However, the implication of moving from the aggregate level to the course level was that the concept of an enrolment “rate” lost meaning - given the ability of learners to switch between courses easily, and the fact that learners may be enrolled in several courses simultaneously.

Therefore, the analysis was tailored to optimise the data that was available with the result that the use of a course level approach implying a set of models of the form:

$$e_{idt} = \alpha + \beta_1 f_{idt} + \beta_2 u_{dt} + \beta_3 c_{dt} + \sum \beta_j X_{idt} + \varepsilon_{idt}$$

where e_{idt} is the natural logarithm of the number of learners (not receiving fee remission); f_{idt} is the natural logarithm of the average fee paid by those learners; u_{dt} is the unemployment rate in the district in which the course is offered; c_{dt} is a measure of competitor courses and X_{idt} is a vector of course characteristics (e.g. the NVQ level of the course, the availability of fee remission).⁴³

⁴² Powdthavee, K. and Vignoles A., (2006) “The Price Elasticity of Demand of further education in the UK: A Scoping Study”, Department for Innovation Universities and Skills (2006).

⁴³ We also considered utilising enrolment rates - that is enrolment per population - as the dependent variable for the analysis. However, given the course level nature of the dataset and the fact that learners may be enrolled in several courses, we decided against this approach.

In this model specification, we would expect the estimate of β_1 to be negative reflecting that an increase in tuition fees might be expected to reduce enrolment rates; but would expect the estimate of β_3 to be positive so that increases in tuition fees in adjacent colleges (relative to the particular institution's own tuition fee) would be expected to increase enrolment rates (cross price elasticity of demand).

Unemployment rates in the area should act as a stimulus to education: a low likelihood of finding a job reduces the opportunity costs of being in education and increases the number of individuals participating in all forms of education. Therefore, we expect a positive sign on the estimate of β_2 .⁴⁴

Ideally, we would also include a measure the application rate on individual courses to control some of the unobserved variation in the demand for enrolment that is independent of the tuition fees (and that depends on reputation, for example). However, as discussed in the main report, we found that information in relation to applications was generally not collected in a consistent manner (if at all). As such, rather than focusing on application rates, the general view from further education college stakeholders was that it might be possible to collect specific information relating to the extent to which potential enrolments might exceed designated course capacity. Therefore, we collected information from further education colleges on whether they operated 'waiting lists' for the learning aims included in the survey and to what extent those individuals on waiting lists (if they did exist) were eventually enrolled on the learning aim in question. Combining this information with information on the maximum course capacity allowed us to assess the extent to which there might be any excess or unmet demand for particular learning aims.

In general the survey indicated that in most cases there was little if any unmet demand (i.e. enrolment was essentially equivalent to applications).

⁴⁴ In fact, the effects of unemployment can be more complex than this. It is true that higher unemployment will increase the applicants to additional education, but it could be that individuals decide to go into higher, not further education. In this way, the effect of unemployment on FE participation would be more difficult to predict. On the other hand, individuals may not decide to pursue further education if they perceive that, as a result of high unemployment, additional education will make little difference to their chances of finding a job.

Annex 2 - Summary of key variables estimated from the ILR

Table 11: Variables based on the ILR database in the London Economics dataset		
Variable name	ILR fields used	Description
nominal_fee_mode	A13	Mode of fees paid by full fee payer learners
nominal_fee_mean	A13	Mean of fees paid by full fee payer learners
nominal_fee_max	A13	Maximum of fees paid by full fee payer learners
lsc_fund	A10	Dummy variable equalling 1 if there is at least one learner with LSC funding in the course, and 0 otherwise
other_fund	A11	Dummy variable equalling 1 if there is at least one learner with non-LSC other funding on the course and 0 otherwise
delivery_method	A18	Categorical variable: 1: course delivery is at the workplace for every learner, 2: distance learning for each learner, 3: other delivery (class contact, etc.) for each learner, 0: heterogeneous delivery method
employer_support	A19	Dummy variable equalling 1 if over 50% of learners on a course received support from their employer; and 0 otherwise.
average_length	A28, A29	Mean number of (planned) days of learning
learning_hours_mean	A32	Mean number of guided learning hours

Note: All variables calculated at a course level.
Source: London Economics

