Research Report

Training and progression in the labour market

by Sin Yi Cheung and Stephen McKay

DWP Department for Work and Pensions

Department for Work and Pensions

Research Report No 680

Training and progression in the labour market

Sin Yi Cheung and Stephen McKay

A report of research carried out by College of Social Service, University of Birmingham on behalf of the Department for Work and Pensions

First Published 2010.

ISBN 978 1 84712 806 5

Contents

List of tables

List of figures

Acknowledgements

We would like to thank the UK Data Archive for granting access to the Families and Children Study, quarterly Labour Force Surveys and the British Household Panel Survey. Neither the data collectors nor the data archive have any responsibility for the analysis and conclusions reported here.

Thanks are also due to the Department for Work and Pensions (DWP) for extensive discussions and feedback regarding the project in its two phases.

The Authors

Dr Sin Yi Cheung is senior lecturer in sociology at the University of Birmingham.

Professor Stephen McKay is the chair in social research at the University of Birmingham.

Summary

Who receives training?

This report concerns the training that people receive while in work, or in anticipation of working in the future, and the effects it has on people's careers. This is training received after the end of education (in most cases). There is a great variety of activities that count as training, and in the statistical analysis we consider how far different kinds of training are associated with different outcomes (hourly wages, in particular).

Data and methods

We draw on three datasets for this study: the Labour Force Surveys (LFS) 1994 to 2008; the Families and Children Study (FACS); and the British Panel Household Survey (BHPS). A range of descriptive statistics were employed to chart the trends over time. Binary logistic regression, ordinary least square (OLS) linear regression, and fixed effects models were used to estimate the effects of training over and above those accounted for by individual traits.

In 2008, training was most commonly received by:

- younger people;
- women;
- those working in the public sector (especially in local government, health or the armed forces), or working for non-profits organisations;
- those working in larger organisations;
- those with higher qualifications;
- higher earners (those in the top quintile of earners);
- those relatively new to the job (training to aid induction).

Trends in training 1994-2008

The proportion of workers aged 16-69[1] in training rose from about 20 per cent in 1994 to reach a high of around 28 per cent in 2003. This trend has been flat or on the decline since then, and particularly from 2005 onwards. Both the LFS and BHPS show this downward trend in the last few years. Training is also seasonal to some extent, with a lower proportion of the workforce in the third quarter (reflecting, perhaps, less training over the summer months).

This recent downward trend is found among virtually all groups. An important exception is older workers, aged 50 or older, who continue to enjoy increasing rates of training provision.

Changes in wages and training, longitudinal description

Hourly wages rates grew by 4.4 per cent between the 2006 and 2007 BHPS interviews, for those respondents working at both waves of interviews. They grew by five per cent where a respondent had received some training, and by four per cent otherwise. The rate of growth was higher where training was received, irrespective of the level of wages in 2006.

The highest increases in hourly earnings between 2006 and 2007 were achieved by young people, those aged between 16 and 34, and especially those at the younger half of this range.

For most age groups, except those under age 20, the rate of wage increase was raised if they had undergone a period of training.

Those who received training, compared to those who had not, showed greater variability in job satisfaction. That is, where a person had received training, they were both more likely to report an increase in job satisfaction, and more likely to report decreased job satisfaction. By contrast, there was greater stability in the reported levels of job satisfaction among those who did not receive training.

Changes in wages and training, longitudinal modelling 1998-2007

We look at the link between higher wages and having undertaken a spell of training in the recent past. This is based on data that tracks people over time. We first use models that control for a wide range of different background information. We then turn to look at statistical models that control for the unmeasured characteristics of people.

---

[1] We used ages 16-69 for most of this report. This takes advantage of the wider group of people to whom the questions were asked, not just those of pre-pension age, and permits some analysis of the increasing proportion of people who work after the age of 65. See Section 2.1.1 for further discussion of this selection.

In standard linear regression models, the wage gain (measured by an increase in hourly earnings) to training (where received in the past year) were four per cent for men, and closer to two per cent for women. Modelling the **median** returns to training by quantile regression, rather than looking at the mean returns to training using the standard approach, produced quite similar results.

When we do not control for differences in individual traits (age, marital status, occupation) the increases in wages associated with past training appear to be much larger. This implies that what might appear to be the effect of training on wages is often largely due to differences in individual traits. Hence, it is important to control for these differences to isolate the specific effect of training on wage progression.

The current 'state of the art' within econometrics recommends the application of fixed-effect models to investigate the effect of training on wage returns. The purpose of these models is essentially to use individuals as their own control group in looking at changes in earnings and training. This provides a better estimate of the contribution of training to wage growth, as it controls for unobserved characteristics of individuals.

The estimated effect of training on wages is much reduced in these fixed-effects models. Training is then associated with an increase in wages of about 0.5 per cent, measured over the period from 1998-2007[2]. However, where the training received was explicitly employer-funded or employer-provided, the size of gain was closer to two per cent.

If we adopt the recent suggestion in the econometric literature and restrict the analysis to only those who anticipated receiving training, the effects of training on wage progression can become statistically insignificant. This is a less tried and tested approach than the above statistical models.

Training does, however, seem to be strongly linked to labour market **transitions** – that is, undergoing a period of training seems to increase the rate of returning to work, and decreases the likelihood of job exit.

Limitations of the study

One of the difficulties in comparing findings across studies is the different measures and definitions used. They can be different even within the same study such as this one. We rely on existing data sets to provide detailed information on the duration, nature and type of training. The LFS essentially merges training with some aspects of education, while the BHPS does better at keeping them distinct. The degree of detail available in these data sets is also different.

---

[2] In the BHPS, which we use for longitudinal analysis, training is measured by the question that mentions *'training schemes or courses…or completed a course of training which led to a qualification'*.

1 Introduction

1.1 Background

Training may be a key route towards employment advancement and job retention. The aim of this study is to explore the connections between skills/training, on the one hand, and retention and advancement in employment, on the other. In this report we define the principal key terms in the following way:

- wage **progression**: the increase in hourly wages (if any) associated with having had training;
- **retention**: any links between training and remaining in paid employment;
- **advancement**: discrete changes in employment associated with training, such as changes in job satisfaction or moving into paid work from unemployment or inactivity. This may also cover career progression, such as promotion.

It is worth noting that most of the past literature has focused on wage progression, taking hourly wage rates as the main (and often the only) dependent variable to analyse. This remains a key focus of this report, and we provide new estimates of the wage gain to training. Normally, advancement can also refer to career progression such as promotion or moving into a higher paid job. However, we do not deal with either outcome in the current study.

Overall, analysis of this set of outcomes requires longitudinal data to examine the consequences of undergoing training of various kinds. Longitudinal data provides the ability to track earnings progression over time, work histories, and to measure levels of, and changes in, education, skill, and training. A feasibility study has established an appropriate method for analysing the effect that training may have on labour market progression (McKay and Sadler, 2009), using longitudinal data.

1.2 Conceptualising training

The concepts of training used by analysts have been quite varied in the literature. Analysts obviously have to draw on what is available within the surveys they use, but the emphasis has generally been on simple measures of training participation

– whether training has been received during a particular time period. The wording of survey questions has, historically, been quite varied with some seeking to merge education and training as is the case with the Labour Force Survey (LFS), whilst others such as the British Household Panel Survey (BHPS) separate them. Here we make a conceptual distinction between education and training. Continuous full-time education until the minimum school leaving age of 16, or the highest level of qualification already held at the time of the survey, is not regarded as training. Any training we refer to in this research is work-related – see later sections for the precise wording of the relevant questions.

It has been less common for studies of the effects of training to discuss and to consider if there are particular effects of the duration of training, the number of courses[3], the purpose of training, who paid for it, and where it took place. These concepts have, however, often been regarded as important in more general discussions about the provision of training.

Additionally, there has also been little attempt to look at the timing of training. Wages are typically regressed on training received in the immediately prior period. Within the economics literature (Leuven, 2004) there has been particular theory-driven interest in the distinction between general and specific training. General training raises a worker's productivity in all firms, while specific training only raises it in their current firm. Naturally, most training has both types of effects, between these two extremes.

There is also interest in the payment for such training, and the theoretical prediction (apparently contradicted by empirical evidence) that firms will only fund specific training. However, few (if any) surveys are able to adequately capture such distinctions or the relevant details of payment (aside from simple direct fee costs, which are often included). It is difficult to accurately capture information on the actual payments made, from surveys, and perhaps particularly for courses that may have taken place many months before interviews. It is also generally true that those building models of training have been somewhat separate from those designing the questions in such studies.

1.2.1 Conceptualising the outcomes of training

There has also been an emphasis on changes in wages. A more recent stream in the literature has been to analyse increases in productivity (e.g. Dearden, Reed and Van Reenen, 2006). There has been much less attention paid to other labour market issues, including whether a person remains in work, their hours of work, duration in jobs, effect on later spells on unemployment or on job satisfaction – among a range of different labour market outcomes.

---

[3] Arulampalam and Booth (2001) being a key exception.

1.2.2 Other issues

The first feature worth noting is that empirical studies have paid most attention to the average effect of training, and not the returns accruing to different groups in the population. Indeed, according to Asplund (2004:62): *'Surprisingly minor attention has been paid to the question whether, and how, the wage effects of investments in company training vary with the characteristics of the trained employees'*.

It is fairly clear that those with lower levels of qualifications receive less training from their employers. However, there has been relatively little emphasis on the effects of training such groups. Blundell, Dearden and Meghir (1996) found a higher return to those with at least intermediate level qualifications. It should also be clear that few results, and no clear results for the UK, are based on any time periods since the mid-1990s.

1.3 Research questions

The main aim of our research is to uncover the causal link between training and changes in employment characteristics – especially wages. There are a number of important subsidiary questions, including:

- Who undertakes training and how does progression, retention and advancement differ between and within key groups?
- What are the benefits deriving from government-funded and privately-funded training and lifelong learning?
- Can training improve low-skilled workers' in-work progression?
- Can we identify the relationship between undertaking training on the one hand and gaining, retaining and advancing in employment on the other?
- Can we identify the impact of retention and advancement on investment in training?

1.3.1 The report

We begin by analysing who received training using the 2008 LFS in Chapter 2, and in Chapter 3 we look at trends in training over time, drawing on data from the LFS from 1994 to 2008. Perhaps surprisingly, the proportion of employees receiving training appears to have been on a slight downward trend in the last few years. It is, however, worth noting that the workforce has continued to grow, until quite recently, so the volume of training provided may not be following any kind of downward trend in aggregate. This is, in addition, the trend in the proportion of people who receive training, rather than the volume of training.

In Chapter 4 we turn to look at longitudinal data, starting with simple descriptions of change between 2006 and 2007, before modelling a ten-year set of observations on the same people (in Chapter 5). Chapter 6 then looks at measures of labour

market advancement and retention, not limited to rates of hourly earnings. Chapter 7 then summarises the main conclusions in relation to the research questions outlined above.

1.4 Data

This report is based on secondary analysis of high quality and large scale datasets.

1.4.1 The quarterly Labour Force Survey

The LFS is a large cross-sectional survey of the workforce. It has the advantage of a very large sample size (around 160,000 individuals, of all ages, per quarter). It is therefore the best dataset for most purposes in analysing smaller sub-groups, including minority ethnic groups. It also has detailed questions about training and occupation, though more limited information on incomes. One of the main training questions, concerning training received in the three months preceding the interview, has been asked since 1994, permitting a long time-series of results. The survey is also released to the data archive within about three months of the interviews taking place – so that at the time of starting analysis (March 2009) it was possible to analyse data from the quarter ending December 2008. Most other datasets are only accessible after a much longer time lag after fieldwork.

1.4.2 The British Household Panel Survey (BHPS)

The BHPS started in 1991, and has continued annually. The original 5,500 households have been followed up since then, and new households introduced as they formed. In latter years, new samples from Scotland, Wales and Northern Ireland, and earlier the introduction of those who took part in the European Community Household Panel, have helped to boost the unweighted sample numbers.

The BHPS is well-suited to looking at both annual changes and at the longer term effects of earlier changes. In time, it is being superseded by the UK Household Longitudinal Study (UKHLS), or *Understanding Society* as it is now branded. Questions on additional education and training appear in most of the surveys, with changes from wave 8 onwards to provide additional details on timing and duration. Questions relating to training ask about the location of training, its purpose and duration, payment of fees, and level of qualification.

The BHPS meets most of the key analysis needs, so most of the panel or longitudinal results in this report are based on it.

1.4.3 The Families and Children Study (FACS)

A further set of analyses is provided from FACS. The FACS began with a sample of around 5,000 low-income families in 1999, continuing annually and with a sample extended to all families from 2001. Around 8,000 families (of all income levels) have been followed up, plus new households introduced as they have

children (or move to sampled areas). FACS asks about additional education or training undertaken each year, whether completed and the qualification (if any) being sought. Similar questions are asked of partners. This dataset is analysed on a longitudinal basis in the course of this project and in particular, looks at results for lone parents, and for mothers within couples with children. These are two groups more on the margins of the labour market. The FACS data includes them in far greater numbers than in the BHPS.

2 Who receives training? A cross-sectional view

2.1 Introduction

Before we go on to establish causality between training and labour market progression, it is important to contextualise the factors that may be associated with training, such as personal, family and job characteristics. It may also be relevant to disaggregate results for different occupational and industrial sectors, such as service/manufacturing and public/private. The first step is to provide an accurate description of who receives training and how the experiences of training vary by individual characteristics and those of their employers.

2.1.1 Training

In this chapter, we present a cross-sectional analysis using the latest available data from the Quarterly Labour Force Survey (LFS) in 2008[4]. The key advantage of the LFS is its large sample size which allows disaggregation of analysis to smaller sub-groups such as those from minority ethnic backgrounds. From summer 1994, respondents aged 16-69 in each quarter of the LFS were asked whether they had received training or education in the preceding three months[5]:

---

4 We have included data from all four quarters in 2008, but have restricted the analysis to respondents in waves 1 and 5 which contain data on income and earnings. This takes into account the rotating panel structure of the LFS sample design and, with respondents included in five consecutive waves in just one year, will not result in any double counting. This is because the wave 1 respondents interviewed in the first quarter of 2008 will not have had their wave 5 interviews in the October to December quarter in the same year. The data are weighted by person weight (PWT07) for all univariate analyses, by average person weight (PWT07/mean(PWT07)) for bivariate analyses and by person income weight (PIWT07) for hourly earnings.

5 This is the variable ED13WK. For all LFS training variables in 2008, please refer to the annex at the end of this report.

In the three months since beginning [date] *have you taken part in any education or any training connected with your job, or a job that you might be able to do in the future (including courses that you have told me about already)?*

1 yes
2 no

According to the 2008 LFS questionnaire, this applies if the respondent is of working age or just older (16-69), in work or in receipt of education or training[6]. It also applies to respondents in employer-based work training, project base work training, or an employee on New Deal in public/private sector, voluntary sector, environmental task force or assisted self-employment, or those working in addition to that done on New Deal Scheme, including those in unpaid work for their own or relative's business. Additionally, this question also applies to respondents with a job or business who were away in the reference week. This question however, does not apply to those who were still in continuous full-time education or who were at school, unemployed persons or economically inactive respondents such as homemakers and the retired. In 2008, 27 per cent of all respondents in employment reported they had received training in the preceding 13 weeks. In other words, when this question asks about education or training connected with your job, it does not include any continuous full-time education that is usually regarded as formal school or post-school qualifications.

In this study we have chosen to include older workers up to the age of 69, rather than introducing a cut-off at either 65 or the current State Pension ages (60 for women). This is mainly because more people continue to work past State Pension age. According to the LFS, only 24 per cent of those aged 60-69 were economically active in 1994, compared to 34 per cent in 2008. One of our key variables, which relates to the job-related training variable in the LFS (ED13WK), also uses the age range of 16-69 years.

The 'recently completed training' questions in the LFS also include respondents not in work or full-time education, but were doing college-based training in the last 13 weeks (Variable FUTUR13). *'The course is connected to a job that the respondent might be able to do in the future'* (ONS 2008: 329). Unlike those who were in employment, only 11 per cent of these respondents who were 'not in employment' reported they had received training or education in the preceding 13 weeks (FUTUR13=1). However, within this group, 78 per cent had done so in the last four weeks (FUTUR4=1).

The pattern is reversed for training received most recently. Most (82 per cent) of the unemployed who had received training in the last four weeks, said they had received it in the last week. This compares with the 51 per cent of those in work who had received training in the last week, if they had received any training in the

[6] An undercount of about 2,000 cases was estimated for the spring 1997 quarter – see Office for National Statistics (ONS) (2008: 329).

past four weeks (ED4WK=1). Such differences may be reflecting the longer period of training provided to the unemployed (see next section).

2.1.2 Type and Nature of Training

The majority (80 per cent) who received training in the last 13 weeks (ED13WK=1 or FUTUR13=1) said the course was related to the jobs they had (JOBED). For the unemployed, this proportion increased to 93 per cent. Among all respondents who received training in the last four weeks, 37 per cent of them reported they had 'on the job training' and 45 per cent said that training was away from the job, while 18 per cent said they had both. '*"On the job training" means learning by example and practice while actually doing the job. Any training conducted in a classroom or training session, even if on employers' premises is not "on the job training"*' (ONS 2008: 337).

Not all training took place at employers' premises, or was offered and paid for by employers. Just over half (57 per cent) said their training was offered and paid for by their employers; 20 per cent said they, or their family and relative paid for it and 12 per cent of them got funds from government or local authorities. Naturally, training for those not in employment was mostly paid for by 'themselves, their family or relatives' (33 per cent); or by the government and local authorities (42 per cent).

Only a third (33 per cent) of those who reported receiving training received it on employers' premises; 16 per cent did it at colleges of further education, 12 per cent did so at universities and a further 11 per cent at private training centres. For those who were not in employment, training mostly took place at colleges of further education (32 per cent) or universities (43 per cent). It is highly likely that this group may include others than the typically unemployed, such as people who are studying while looking for work when they are about to finish their training.

2.1.3 Length and time spent on training

The length of training courses varies greatly, ranging from less than a week to more than three years. As Table 2.1 shows, respondents who were in work tended to do shorter courses, lasting no longer than one week; while those not in employment appeared to have gone for longer training courses. Among this group, nearly two in five (39 per cent) undertook training lasting three years or more. It could be that the unemployed had to re-train where different skills and knowledge are required for gaining a new job. This could also apply to students who were inactive but pursue longer training courses for prospective jobs. While this could well include respondents (especially those not in employment but who were registered on longer term courses) returning to universities or college of further education, it does not include those who were still at school and those still in continuous full-time education. Moreover, many of those currently not in employment may well have been previously in education or training – the training courses may relate to periods prior to the current spell of unemployment.

Table 2.1 Length of training

Column percentages

Length of training course	Percentage of employees in training in the last 13 weeks	Percentage of 'not in employment' in training in the last 13 weeks
Less than 1 week	41	2
1 week but < 1 month	4	2
1 month, < 3 months	3	3
3 months, < 6 months	3	3
6 months, < 1 year	6	9
1 year, < 2 years	7	15
2 years, < 3 years	7	20
3 years or more	9	39
No definite limit, ongoing	20	8
Weighted N	*2,922,911*	*817,172*
1 day	69	38
2 days	17	14
3 days	7	0
4 days	5	13
5 days	2	35
6 days	1	0
Weighted N	*563,142*	*4,025*

Source: LFS 2008 q1-q4, w1 and w5. Weighted by pwt07.

For those whose training courses lasted for less than a week, 69 per cent of these employees only did a one-day course, compared to 38 per cent of those not in employment. Again, the unemployed appeared to be doing longer courses, over a third of them attended five-day courses, spending an average of 27 hours last week on job-related education and training while the employed only spent 13 hours on training last week. Again, it could be that they need to enrol on more comprehensive courses which teach them new skills and knowledge. It could also simply be because they have more time to attend training courses than those who are in work.

In Section 2.2, we examine the relationship between training and a number of personal and family characteristics such as gender, age, ethnicity, religion, qualification, disability, family type and region. We also explore the association between training, occupation and hourly pay. Section 2.3 turns to job and employer characteristics, which range from full-/part-time status, length of employment, sector, and industry to size of workplace.

2.2 Analysis by personal characteristics

2.2.1 Gender and age

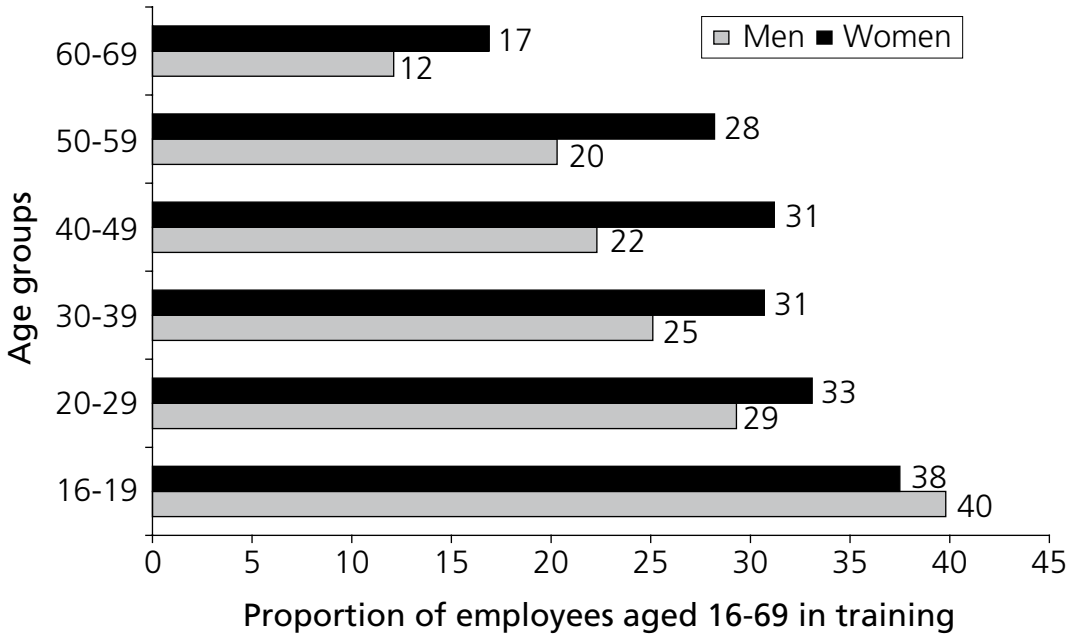
Contrary to some previous evidence (Blundell *et al.*, 1996: 9), female (54 per cent) and younger workers (39 per cent for the 16-19 years old) are more likely to have received training in the last 13 weeks (or in the last three months as reported in the tables and figures in this chapter) than men (46 per cent) and older groups (14 per cent for those aged 60-69).

The opposite gender pattern observed by Blundell *et al.* (1996) is likely to be due to any of three key reasons. First, there is a difference in the source of data being analysed and the definitions used. They used a much narrower definition of training which included only employer-provided training and training leading to a formal vocational qualification. Second, it was necessary to rely on quite a long period of recall between different waves of the National Child Development Study (NCDS), the birth cohort study tracking those born in the same week in 1958. This may mean that some shorter training periods were not included. Third, it is also important that the time reference points are different – the LFS relating to 1998-2007 in this report, while the NCDS data covered 1981-91.

As can be seen in Figure 2.1, this 'gender gap' in receiving training appears to be larger among the older groups. The proportions of teenage boys and girls who received training did not differ much, but they declined much more sharply with age for men than for women. Forty per cent of the youngest men (16-19) compared to 12 per cent of men in their 60s received training; whereas the age gap between the youngest and oldest women was only 21 per cent.

For those who were not in employment, over a third of the 16-19 year olds reported receiving training in the last 13 weeks for both sexes, but this proportion dropped drastically to just over ten per cent for those in their 30s, to three per cent for the 50-59 year olds, and to below one per cent for those aged 60 or above.

Figure 2.1 Training by gender and age group



Source: LFS 2008 q1-q4, w1 and w5. Weighted by adjusted pwt07[1].
Male: $\chi^2 = 787$, d.f. = 5, $p < .001$; female: $\chi^2 = 300$, d.f. = 5, $p < .001$.

[1] All bivariate analyses with count data are weighted by the adjusted PWT07 (i.e. PWT07/mean (PWT07)). This provides a more realistic chi-square statistic than the initial weights.

2.2.2 Ethnicity and religion

Table 2.2 presents the proportion of workers of each ethnic group and religion in receipt of training. For example, 26 per cent of all Caribbean male workers received training compared to 35 per cent of Caribbean women. In general, higher proportions of women receive training than men among all ethnic groups, except for Africans where the gender gap is smaller. African and Caribbean women are most likely to have received training. The gender gap is the largest among the Pakistani and the mixed minority groups. Interestingly, only one in five Chinese men and one in four Chinese women received any training in the preceding three months, a pattern resembling that of the Pakistanis and Bangladeshi who have the lowest proportions in training. It is widely documented that unemployment is disproportionately high among Pakistani and Bangladeshi men (Heath and Cheung, 2006; Clark and Drinkwater, 2007). Even for those who are in employment, they are least likely to have received training.

Table 2.2 Training by ethnicity and religion

Cell percentages

Training in the last three months	Men	Women	All
Ethnicity			
Caribbean	26	35	31
African	34	37	35
Indian	25	31	27
Pakistani	16	27	19
Bangladeshi	19	27	21
Chinese	19	25	22
Black mixed, other mixed	22	33	28
All other non-mixed groups[1]	25	32	28
British, other whites	24	30	27
Religion			
Christian	24	31	27
Buddhist	24	37	31
Hindu	26	33	29
Jewish	23	31	26
Muslim	19	27	21
Sikh	20	28	24
Any other religion	25	32	29
No religion	25	30	27

Source: LFS 2008 q1-q4, w1 and w5. Weighted by mean pwt07.

Ethnicity: male: $\chi^2 = 62$, d.f. = 8, $p < .001$; female: $\chi^2 = 20$, d.f. = 8, $p < .01$.

Religion: male: $\chi^2 = 30$, d.f. = 7, $p < .001$; female: $\chi^2 = 10$, d.f. = 7, $p < .19$.

[1] This group combines black other (non-mixed), other-Asian (non-mixed) and other-other (non-mixed).

Training also varied by religious identification. Only one in five Muslim and Sikh men received training whereas 37 per cent of female Buddhists did so. The proportions among Jewish and Hindu women are also high (at 31 per cent and 33 per cent respectively). However, the results for women are not statistically significant. Existing literature has not systematically examined the relationship between religion and training. Some argue that firms may discriminate against certain type of workers, e.g. women and non-whites (Arulampalam and Booth, 1997). Our results show that, among men, Muslims and Sikhs (and to a lesser extent those of the Jewish religion) may have lower access to training opportunities than the largest religious groups (that is, Christians, and those with no religion).

2.2.3 Qualifications and occupation

The results confirm previous research that there is a positive relationship between higher levels of prior educational attainment and training (Arulampalam and Booth, 1997). Highly qualified men and women are mostly likely to have received

training. Over 40 per cent of women with higher (post-secondary) and degree education had received training in the last three months (Table 2.3). In contrast, less than one in ten among men with no qualifications had access to training. This provides further evidence for the 'low skill, bad job trap' (Arulampalam and Booth, 1997: 198). The gender gap is much wider at the top end of the educational hierarchy, which may be a result of more qualified women working in the public sector – something we explore, below.

Perhaps not surprisingly, small employers and own account workers are least likely to have received training in the last three months because they would have to provide it for themselves. Two-fifths of professional and managerial women had undertaken training compared to less than one in six among those in routine occupations. If training proves to be beneficial to wage gain or career advancement, this may suggest that workers in routine occupations are less likely to progress in their job due to limited access to training.

Table 2.3 Proportion of employees in training by qualification and occupation

Cell percentages

Training in the last three months	Men	Women	All
Highest qualification			
Degree or equivalent	34	42	37
Higher education	29	41	35
GCSE A level	23	31	26
GCSE Grades A-C or equivalent	23	25	24
Other qualifications	17	21	19
No qualifications	8	11	9
N	*46,905*	*40,292*	*87,197*
Occupation			
Higher managerial and professional	31	40	33
Lower managerial and professional	31	39	35
Intermediate occupations	31	24	26
Small employers, own account	8	14	9
Lower supervisory and technical	24	30	26
Semi-routine occupations	18	25	22
Routine occupations	14	13	13
N	*45,890*	*38,716*	*84,606*

Source: LFS 2008 q1-q4, w1 and w5. Weighted by pwt07.

Qualification: male: $\chi^2 = 1445$, d.f. = 5, $p < .001$; female: $\chi^2 = 1748$, d.f. = 5, $p < .001$.

Occupation: male: $\chi^2 = 1945$, d.f. = 6, $p < .001$; female: $\chi^2 = 1531$, d.f. = 6, $p < .001$.

2.2.4 Family Type

Examination of training by family type does not show a discernable pattern. While training does vary significantly by family type (χ^2 = 96, d.f.= 4, p < .001), lone parents with dependent children, the group that attracts most policy attention, did not have lower than average rate in training. The pattern for families with children is also very similar to that of single-person families, with younger age groups more likely to be in training. Rather unexpectedly, lone parents in their thirties with non-dependent children had one of the lowest proportions in training in the last three months, as do lone parents in their sixties and those in this age group but still with dependent children were not doing any training at all.

Table 2.4 Training by family type and age group

Cell percentages

Training in the last three months	16-19	20-29	30-39	40-49	50-59	60-69	N
Single person	37	35	30	25	27	18	12,983
Couple no or non-dep children	41	34	30	26	23	13	35,583
Couple dependent children	37	24	26	27	25	17	31,640
Lone parent non-dep children	37	29	22	23	23	18	3,248
Lone parent dependent children	41	25	32	31	34	0	4,428

Source: LFS 2008 q1-q4, w1 and w5. Weighted by pwt07.

1-person: (χ^2 = 175, d.f. = 5, p < .001); Couple no/ non-dep chd: (χ^2 = 901, d.f. = 5, p < .001); Couple dep chd: (χ^2 = 109, d.f. = 5, p < .001); Lone parent non-dep chd: (χ^2 = 33, d.f. = 5, p < .001); Lone parent dep chd: (χ^2 = 45, d.f. = 5, p < .001);

2.2.5 Disability

Also of policy interest are disabled people. The pattern shown here is surprisingly similar between the disabled and the non-disabled (Table 2.5). Only men with Disability Discrimination Act (DDA) work-limiting disability and current disability fared worse, fewer than one in five received training in the last three months. However, past disability does not appear to be a barrier to training opportunities and in fact they are the group who have highest rates of training even compared with the non-disabled.

Table 2.5 Training by current and past disability

			Cell percentages
Training in the last three months	**Men**	**Women**	**All**
Current disability			
DDA work-limiting disabled	18	28	23
DDA disabled	23	33	28
Work-limiting disabled only	24	33	28
Not disabled	24	30	27
N	*47,323*	*40,563*	*87,886*
Current and past disability			
Current disability only	20	30	25
Current and past disability	22	28	26
Past disability only	33	34	33
Not DDA disabled	24	30	27
N	*47,323*	*40,563*	*87,886*

Source: LFS 2008 q1-q4, w1 and w5. Weighted by pwt07.

Current disability: male: $\chi^2 = 42$, d.f. = 3, $p < .001$; female: $\chi^2 = 17$, d.f. = 3, $p < .001$.

Current and past disability: male: $\chi^2 = 50$, d.f. = 7, $p < .001$; female: $\chi^2 = 5$, d.f. = 7, $p < .20$.

2.2.6 Regional variations

Analysis by government region showed that there was a slight variation in training received (Figure 2.2). Leaving gender differences aside, residents in Wales and the North East were most likely to have received training and the lowest proportion was found in Northern Ireland. South East, South West and Scotland also have above average rates of training. Table A.1 gives the figures for training by region.

Figure 2.2 Training (in the last 13 weeks) by geographical region and gender

Source: LFS 2008 q1-q4, w1 and w5. Weighted by pwt07,
male: $\chi^2 = 105$, d.f. = 12, $p < .001$; female: $\chi^2 = 90$, d.f. = 12, $p < .001$.

2.2.7 Earnings

With cross-sectional data, it would be too hasty to attribute any causal relationship between training and earnings (See also Blundell *et al.* 1999 for a discussion on the difficulty in estimating the causal effect of training on earnings). Nonetheless, as the feasibility report has found, the most common reason people give for training is to develop skills (McKay and Sadler, 2009). It could be that these people are a more motivated group and it would be interesting to see if training is associated with higher pay[7]. Our results show that men with training earned £14.20 per

[7] The earnings questions were first introduced in 1992 and were only asked in wave five and the final interviews due to concerns of non-response. As from 1997 these questions were asked in both waves 1 and 5 in order to double the sample size and to reduce sampling errors. For more details see the LFS user guide and documentation (background.pdf). Data for the analysis on earnings are weighted by PIWT07.

hour compared to only £12.90 for those without ($p < .001$). Similarly, significant difference was also found among women whose hourly wage was £10 without training; while those with training enjoy a statistically significant premium of £1.80. It is worth noting that despite the higher rates of training among women, they still earn less than men. However, as is standard for labour market analysis, we generally look separately at men and women.

More interesting results are observed by further disaggregation. Figure 2.3 shows the average hourly pay for men and women by their training status and age group. Training does not appear to be associated with any wage gain for the youngest age group. In fact, both men and women aged 16-19 who undertook training earned significantly less (£5.27 and £5.66 for men and £5.34 and £5.70 for women; $p < .001$). However, training is indeed associated with significantly higher hourly pay for both men and women from the 20s onwards.[8] There may have been some degree of selection into training as people who choose to undertake training may be more motivated and more experienced, but this was least apparent among those aged under 20. Table A.2 gives the full details.

Figure 2.3 Training (last 13 weeks) by hourly pay, age group and gender

Source: LFS 2008 q1-q4, w1 and w5. Weighted by the income weight pwit07.

[8] The wage difference by training status for all age groups is statistically significant at $p < .001$ level.

Highest qualification, earnings and gender

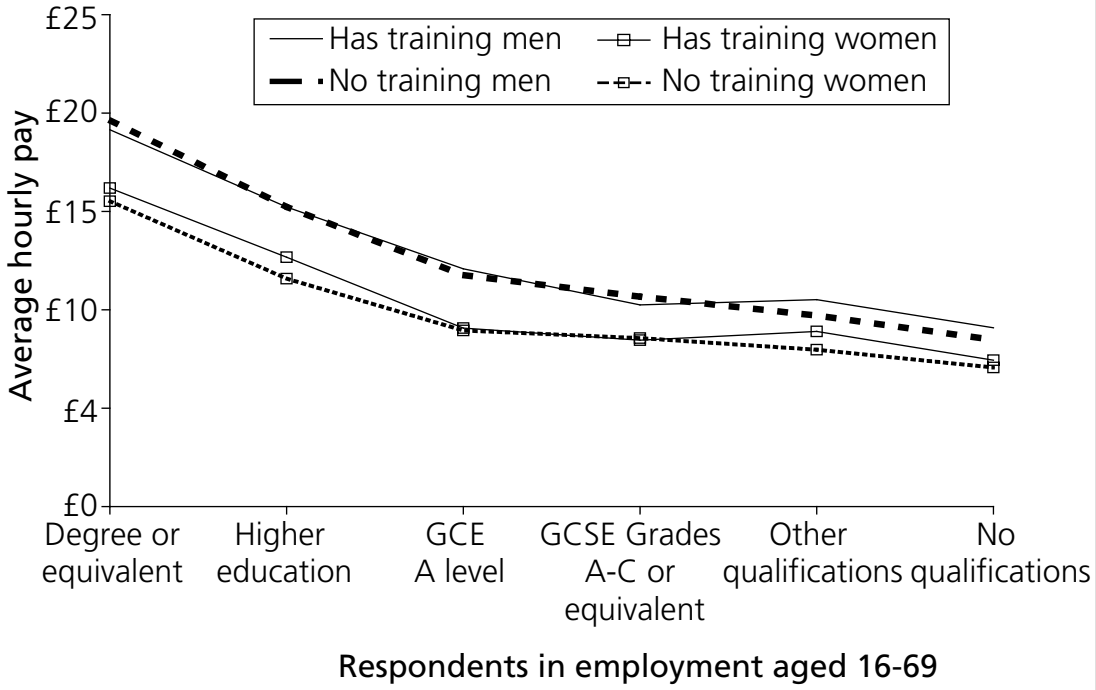
Although the relationship between training and labour market progression is not a straightforward one, one of the benefits of training that existing research has documented is wage gain (Booth, 1993, Blundell *et al.*, 1996). However, unlike Arulampalam and Booth (1997) who identified no wage growth for the poorly qualified, we find the opposite: the higher wage associated with training observed here is not significant for respondents with higher levels of qualification. In fact, men with degrees qualifications who undertook training earn marginally less than their peers without training ($p < .01$). Table A.3 gives actual figures.

Similarly, training makes no difference in wage growth for male respondents with post-secondary qualifications ($p < .99$) and for females with A-level and GCSE qualifications ($p < .30$ and $p < .21$)[9]; while men with GCSE qualifications actually earn more without undertaking any recent training. However, training does seem to be associated with higher wages for those with no qualifications and for both men ($p < .02$) and women ($p < .04$).

There is only a small apparent uplift in hourly pay for those who have other qualifications and women with higher (post-secondary) and degree qualifications. It is reasonable to expect that the benefits of training only accrue in the long run and may not be visible after 13 weeks, as is measured by this training question. We shall return to this in more details using the BHPS in Chapter 4.

[9] For male respondents, the significance levels of the results by training status are as follows: degree: $p < .01$; A-level: $p < .01$; GCSE $p < .01$; other qualification: $p < .001$; no qualification: $p < .02$. For female respondents, all results are significant at $p < .001$ level unless already stated.

Figure 2.4 Training by hourly pay, qualification and gender



Source: LFS 2008 q1-q4, w1 and w5. Weighted by piwt07.

Occupations and earnings

Simple regression results on wage difference by training status for different occupational groups are mixed. At the top end, training is associated with a small but statistically significant increase in hourly earnings for women in the higher (six per cent increase, $p < .001$) and lower professional and managerial (eight per cent increase, $p < .001$) occupations (results not shown in figure). Similarly, women in lower supervisory and technical positions and semi-routine jobs also have higher wages (nine per cent and three per cent increase, $p < .001$). However, women in intermediate and routine occupations with training actually earn less (three per cent decrease, $p < .01$ and nine per cent decrease, $p < .001$).

The wages for men with training in intermediate jobs were seven per cent higher than those without ($p < .001$) and for those in lower professional occupations, the difference is two per cent ($p < .03$). However, hourly wage does not vary significantly by training status for other occupation groups at the conventional 95 per cent significance levels, including those in routine occupations.

Overall, the LFS 2008 findings suggest that the association between training and progression (measured by higher wages) is observed only for those in professional and managerial jobs. The association between training and progression is not observed (or is much weaker) for workers in routine occupations at the bottom end of the labour market. (See Table A.4 for detailed figures).

2.3 Job and employer characteristics

In this section, we examine the relationship between various job characteristics and training, ranging from the length of employment, full-time or part-time status. Then we move on to study employer characteristics such as sector, industry, and size of workplace.

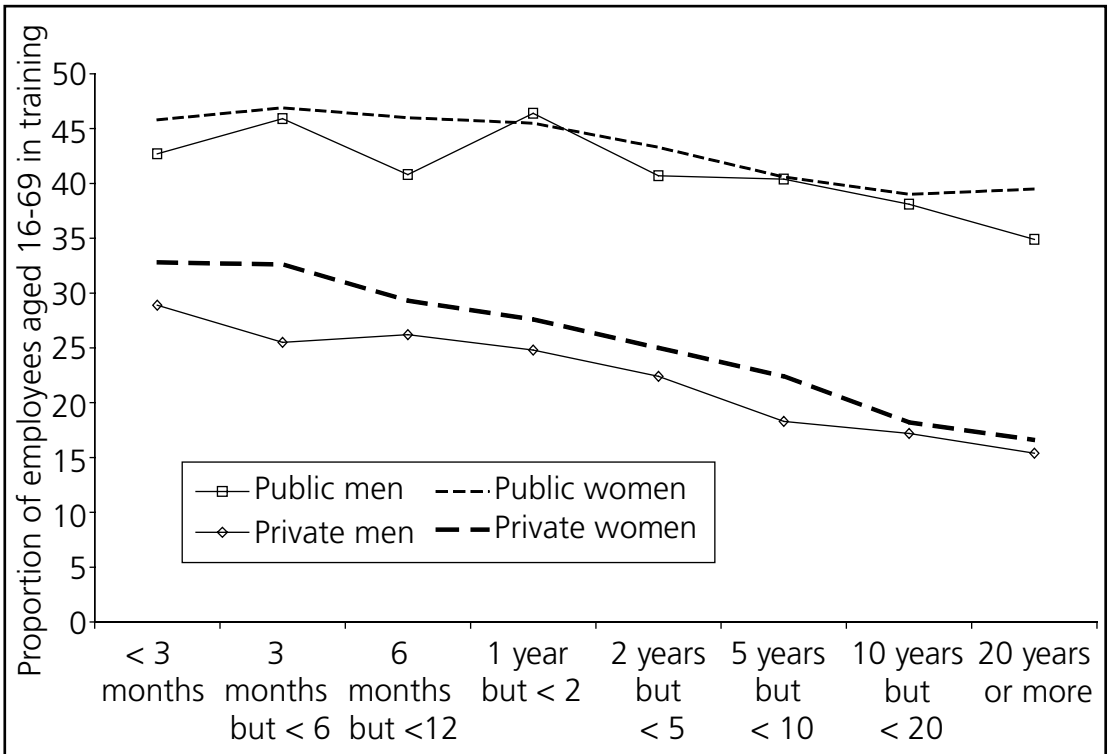
2.3.1 Length of employment

Training does not appear to increase with the length of employment with current employer. Evidence in Figure 2.5 suggests that it actually goes the opposite way.

In the 2008 data, only 4.3 per cent (of all 16-69 year-olds in employment) who answered the main training question (ED13WK) were employed for less than three months with their current employer, and 5.2 per cent of them received training as opposed to 3.9 per cent who did not. (See Table A.5 for all percentages). Further analysis excluding these new employees did not produce significantly different results.

One in three men who had been in their jobs for less than three months received training, compared to only one in five among those who had ten to 20 years of job tenure with the same employer. The change for women is less pronounced with length of employment. Even among women in their job for over 20 years, 29 per cent of them were in some form of training in the last 13 weeks. It is possible that some of these new employees were still on induction programmes.

Figure 2.5 Training (last 13 weeks) by length of employment, gender and public/private sector status



Source: LFS 2008 q1-q4, and w5. Weighted by pwt07.
Public Sector: male: χ^2 =35, d.f. = 7, $p < .001$; female: χ^2 = 37, d.f. = 7, $p < .001$
Private Sector: male: χ^2 = 384, d.f. = 7, $p < .001$; female: χ^2 = 316, d.f. = 7, $p < .001$

When it comes to the type of training, whether or not respondents undertake 'on the job training' or 'training away from job' does not appear to be associated with the length of employment with their current employer. For those who took shorter training courses, the majority (over 65 per cent) took one-day courses and a further 18 to 22 per cent took two-day courses depending on their length of employment but very little variations can be discerned. Nor is the number of days in the last week spent on training.

Table 2.6 Length of time with current employer and length of course (Row %)

Length of time with current employer	Length of training course in days					
	1	**2**	**3**	**4**	**5**	**6**
Less than 3 months	66	19	6	6	3	0
3 months but less than 6	68	21	7	0	4	0
6 months but less than 12	74	19	2	2	3	0
1 year but less than 2	65	13	5	14	2	0
2 years but less than 5	70	13	10	4	2	1
5 years but less than 10	68	18	6	7	1	1
10 years but less than 20	68	17	9	4	2	1
20 years or more	69	18	7	3	2	1
All	69	17	7	5	2	1

Source: LFS 2008 q1-q4, w1 and w5. Weighted by pwt07. $\chi^2 = 40$, d.f. =35, p =.27.

However, loyalty does pay off as 71 per cent of respondents with 20 years or more with their current employers (Table 2.7) had their training paid for whereas only 42 per cent of newer employees (less than three months) had this privilege.

Research has shown that training with the current employer leads to a wage gain (Parent, 1999). It is of course possible that new recruits undertook training prior to gaining employment with their current employers. In fact, it has been demonstrated that employers also reward training acquired with previous employers (Parent, 1999). Furthermore, newer employees' training also tended to take place in private training centres or colleges of further education rather than on employers' premises (see Table A.6). They were also likely to undertake longer training courses lasting over a year and up to three years (Table 2.8).

Over half (55 per cent) of respondents with ten years with their current employers were more likely to attend training courses lasting only up to a week. This rose to 61 per cent for those who have 20 years tenure, compared to just 26 per cent for new employees (less than three months in their new jobs).

Table 2.7 Length of time with current employer and fees for training (Row %)

	Who paid fees for training						
Time with current employer	**Employer/ potential employer**	**TEC/ LEC/ YT/ TFW**	**Other govt/ LA**	**Self, family, relative**	**Other**	**No fees**	**Don't know**
Less than 3 months	41.6		14.9	28.7	2.0	9.9	3.0
3 months but < 6	43.6		21.1	24.8	2.3	8.3	
6 months but < 12	55.1	1.1	14.0	20.2	1.7	5.6	2.2
1 year but < 2	53.4	0.8	14.0	22.0	0.8	5.7	3.4
2 years but < 5	54.6		14.1	22.1	1.9	6.6	0.7
5 years but < 10	65.7		5.6	16.7	2.3	8.5	1.3
10 years but < 20	63.9	0.4	9.2	12.2	2.5	10.9	0.8
20 years or more	71.3		5.3	11.1	1.8	9.4	1.2
Total	57.6	0.3	11.7	19.2	1.9	7.8	1.5

Source: LFS 2008 q1-q4, w1 and w5. Weighted by pwt07. $\chi^2 = 110$, d.f. = 42, $p < .001$.

Table 2.8 Length of time with current employer and length of training course

Column percentage

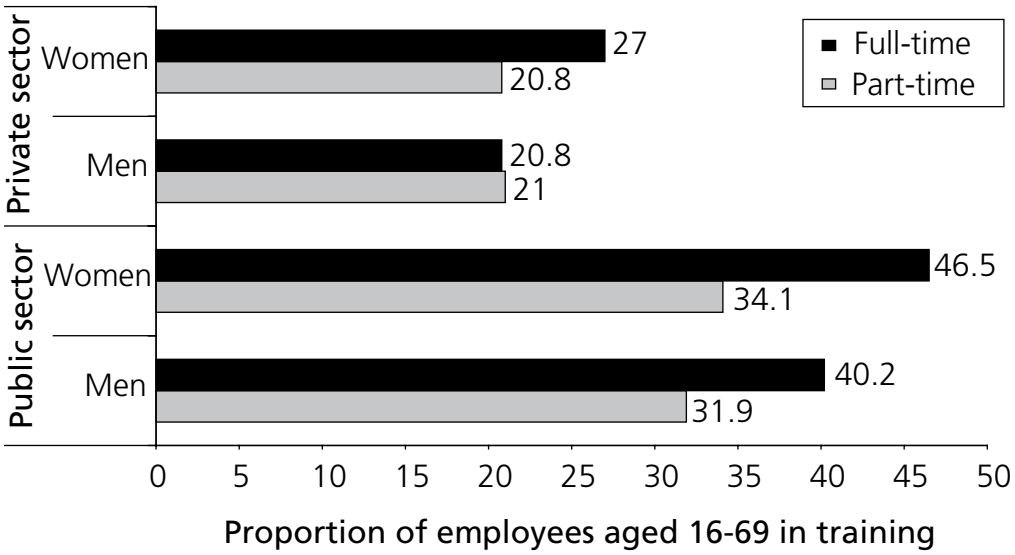
Length of Training Course	Length of time with current employer								
	< 3 months	3 months < 6	6 months < 12	1 year < 2	2 years < 5	5 years < 10	10 years < 20	20 years +	Total
Less than 1 week	26.4	31.0	31.5	29.0	36.3	46.3	54.5	60.8	41.1
1 week, < 2 weeks	7.2	1.3	1.4	1.3	1.7	2.7	2.5	2.5	2.3
2 weeks, < 3 weeks	3.0	1.0	0.5	1.1	0.9	1.1	0.6	0.2	0.9
3 weeks, < 1 month	2.1		0.7	0.3	0.3	0.7	1.4	1.3	0.8
1 month, < 2 months	2.7	1.6		1.1	0.8	1.5	1.8	1.0	1.2
2 months, < 3 months	1.5	2.9	1.7	1.5	1.7	1.4	1.1	1.0	1.5
3 months, < 6 months	3.9	3.2	2.6	3.5	2.5	2.8	2.5	1.6	2.7
6 months, < 1 year	3.9	7.0	7.4	8.3	6.4	6.6	3.0	2.5	5.7
1 year, < 2 years	6.3	7.3	9.7	10.6	9.1	5.6	6.0	3.9	7.5
2 years, < 3 years	9.6	12.5	10.9	11.5	8.3	4.6	2.8	2.0	7.1
3 years +	10.5	12.8	15.0	13.8	11.4	6.3	3.6	1.5	9.0
Ongoing/no definite limit	22.8	19.5	18.6	18.2	20.7	20.2	20.2	21.8	20.2

Source: LFS 2008 q1-q4, w1 and w5. Weighted by adjusted pwt07. $\chi^2 = 611$, d.f. =77, $p < .001$.

2.3.2 Full-/part-time status, sector and gender

The gender gap in training may be further explained by the sector of employment. It is clear from Figure 2.6 that significantly higher proportions of women in the public sector received training in the preceding 13 weeks compared to all the others.

Figure 2.6 Training by full-/part-time status, sector and gender



Source: LFS 2008 q1-q4, w1 and w5. Weighted by pwt07.
Male – full-time: χ^2 =1181, d.f. = 1, p < .001; Part-time: χ^2 = 42, d.f. = 1, p < .001
Female – full-time: χ^2 = 931, d.f. = 1, p < .001; Part-time: χ^2 = 344, d.f. = 1, p < .001

The proportion of all employees in training in the public sector is 41 per cent, almost double the 22 per cent in the private sector. Overall, a slightly higher proportion of all full-time employees (28 per cent) were in training in 2008 compared to 25 per cent of part-time employees. However, the pattern changes when sector is taken into account. Both men and women in part-time employment in the public sector have higher rates (over 30 per cent) of training than all full-timers in the private sector. Overall, the difference between the private and public sector is larger than the difference between part-time and full-time statuses. It was also apparent that this full-time versus part-time difference was somewhat more pronounced in the public sector.

2.3.3 Sector, size of workplace and gender

Figure 2.7 presents the results by size of the workplace and sector. The size of workplace is defined by the number of employees: small establishments have up to 24 employees; medium-sized establishments have 25-499 workers. Finally, establishments with 500 or more employees are defined as large workplaces.

Further evidence of a 'public sector effect' is visible from Figure 2.7. Employees in large establishments with 500 or more employees were more likely to have received training than their counterparts in the private sector. This may be because larger organisations can afford to pay for more training. This is reflected by the fact the majority of training courses in the public sector were paid for by employers

favouring large organisations: 66 per cent, 69 per cent and 72 per cent for small, medium and large establishments. In contrast, the corresponding figures in the private sector were only 47 per cent, 58 per cent and 69 per cent. However, the overall availability of training (including self-funded and employer-paid) in the public sector is almost the same across workplaces of different sizes and for both men and women.

From snapshots like this, it is not possible to determine the direction of causation between advancement and training. It is possible that either training leads to advancement or retention, or that those workers who do well receive some kind of reward in terms of training – and to prepare them for future roles. Moreover, there could be other factors ('intervening variables'), that determine (or at least are strongly associated with) both training and advancement. We shall return to this in multivariate analysis in the next chapter.

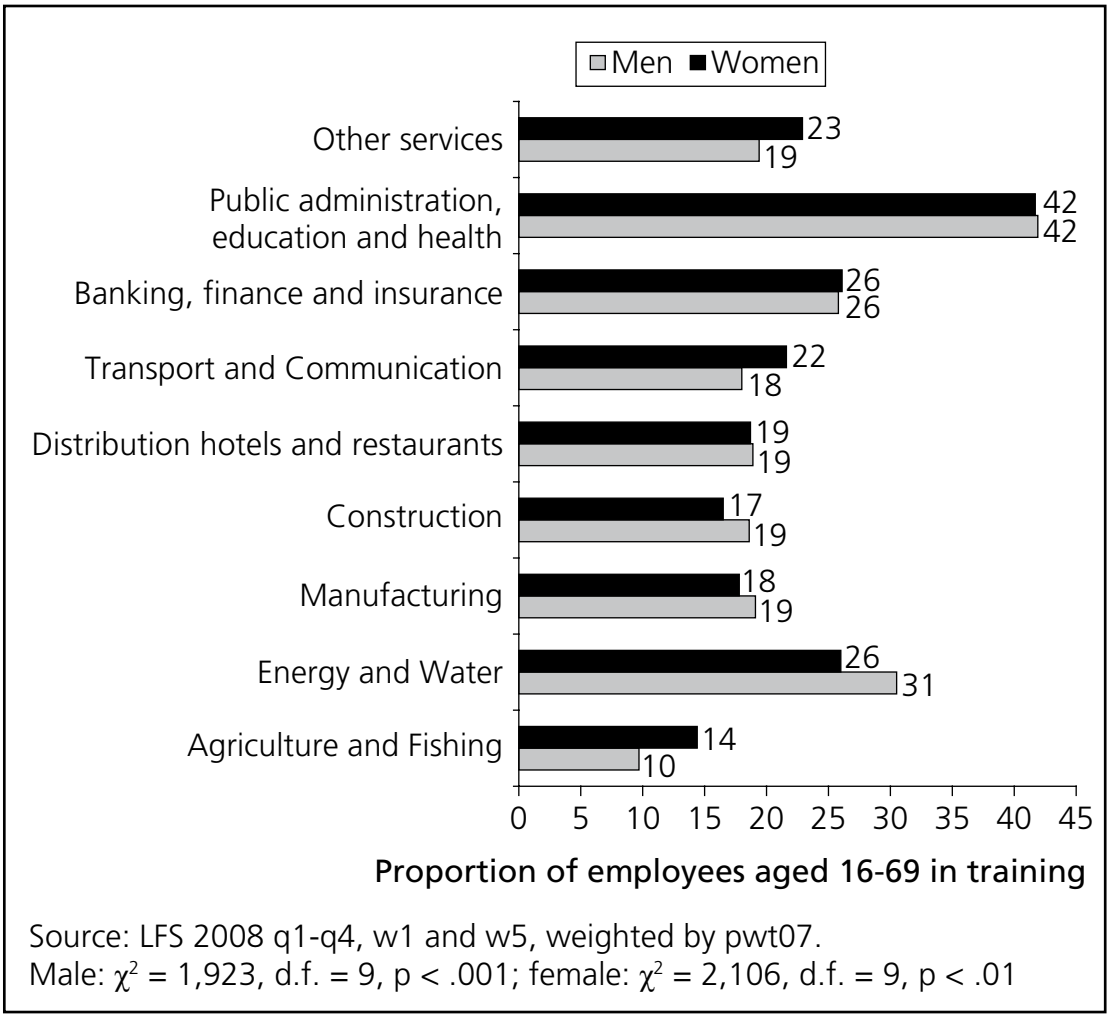
Figure 2.7 Training by size of workplace, sector and gender

Source: LFS 2008 q1-q4, w1 and w5. Weighted by pwt07.
Male: Small establishments (< 25 employees) χ 2 =178, d.f. = 1, p < .001; Medium (25-499) χ^2 = 375, d.f. = 1, p < .001; Large (500+) χ^2 = 88, d.f. = 1, p < .001
Female: Small establishments (< 25 employees) χ^2 = 416, d.f. = 1, p < .001; Medium: χ^2 = 383, d.f. = 1, p < .001; Large (500+) χ^2 = 136, d.f. = 1, p < .001

2.3.4 Industry and type of organisation

An examination of training by industry further illustrates the 'public sector effect' (Figure 2.8 and 2.9). Over 40 per cent of men and women received training in public administration, education and health. In contrast, the lowest proportion can be found in the 'primary' industries such as agriculture and fishing (see Table A.7 for percentages by industry). Similarly, training is also low in manufacturing and construction, and in some service industries such as distribution, hotels and restaurants. At first glance, this might be a result of the gender composition in each industry. However, the proportion of female workers varies from 25 per cent in agriculture and fishing, ten per cent in construction to 50 per cent in hotel and catering. So the low proportion of workers in training in these industries cannot be attributed to gender distribution.

Figure 2.8 Training by industry

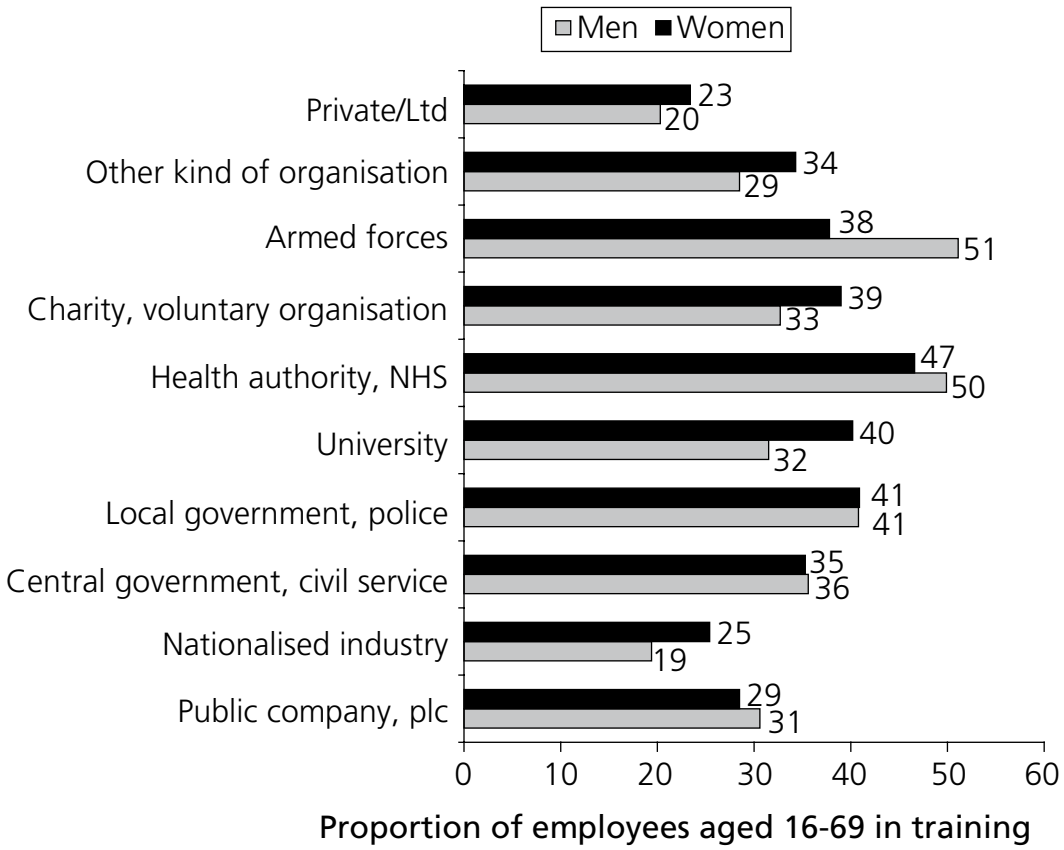


Source: LFS 2008 q1-q4, w1 and w5, weighted by pwt07.
Male: χ^2 = 1,923, d.f. = 9, p < .001; female: χ^2 = 2,106, d.f. = 9, p < .01

The gender distribution in training appears to be reverse once we take the type of organisation into account (Figure 2.9). The largest 'gender gap' in training is in fact in the armed forces. Much higher proportions of men were in receipt of training. Men in the NHS and public companies were also slightly more likely to have

received training. In local authorities, central government and public companies men were just as likely as women to receive training. The second largest 'gender gap' in training can be found in universities (see Table A.8 for full percentages).

Figure 2.9 Training by type of organisation



Source: LFS 2008 q1-q4, w1 and w5. Weighted by pwt07.
Male: $\chi^2 = 230$, d.f. = 8, $p < .001$; female: $\chi^2 = 143$, d.f. = 8, $p < .01$

2.4 Chapter summary

The analysis in this chapter examines training by individual, family and job characteristics. Among the many individual traits identified, age, sex, ethnicity, qualifications all seem to matter. Younger people, women, Africans and Caribbeans are more likely to have received training. This is also true for people with disabilities. Employees in new jobs, full-time workers, those who work for large organisations and in the public sector also have higher incidence of training. While we cannot establish the direction of causality with cross-sectional data, training and earnings do appear to be significantly associated and this is true for both men and women, and for employees aged 20 or above.

3 Trends in UK training provision, 1994-2008

3.1 Introduction

The cross-sectional analysis in the previous chapter provides us with a detailed picture of the relationship between training and personal as well as job and employer characteristics. However, it does not tell us if training provision increases in good times and declines in economic downturns. The 14-year period under observation saw many changes in Britain, including a change of government in 1997 which marked the end of an 18-year Conservative regime. The unemployment rate was halved in the early 2000s and Britain was on its way to economic recovery. The government department responsible for education and training has also undergone major restructuring and name change, reflecting the different policy concerns of successive governments.

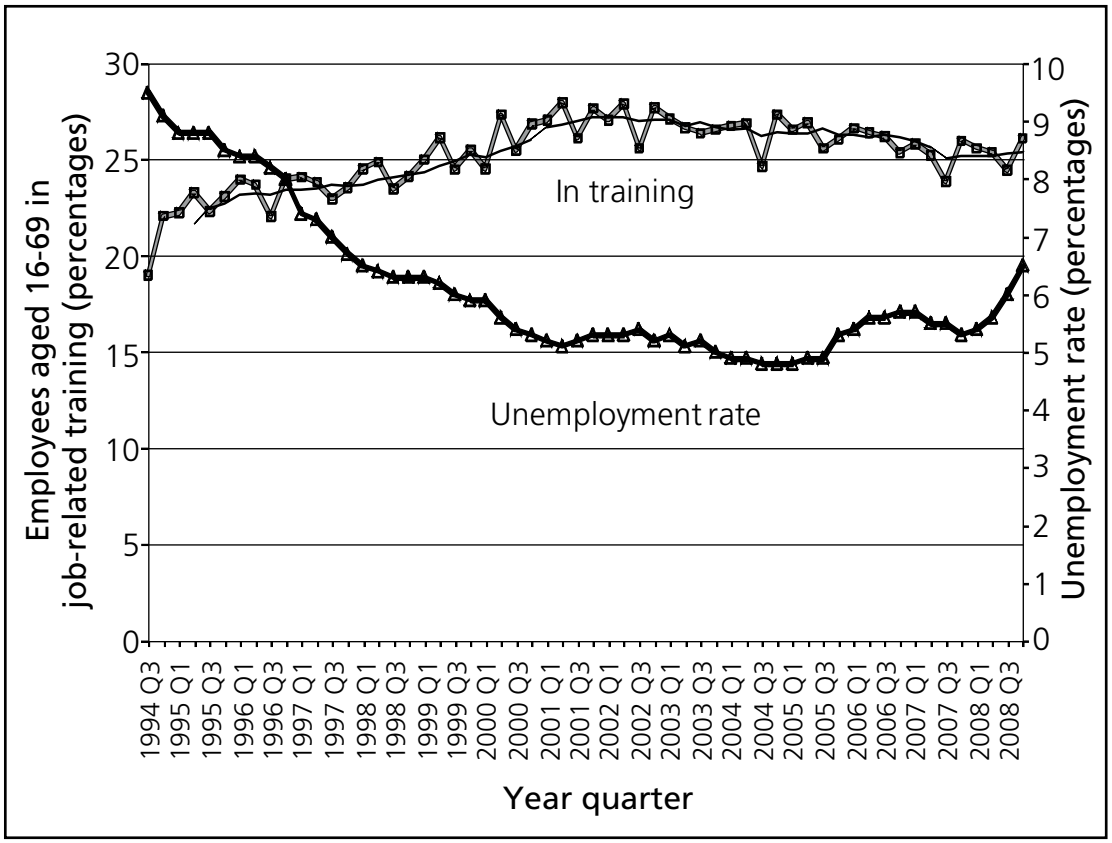
Does training provision vary over time? Are people more likely to opt for additional education and training in a period of economic boom? Can we expect to see any regional difference due to different rates of economic recovery? To answer these questions we need to examine trends in training provision over time. We extract quarterly data from the Labour Force Survey (LFS) between summer 1994 and winter 2008. This gives a total of 58 repeated observations, enough to capture any fluctuations and changes over time. The large sample size also enables us to select wave 5 respondents where earning questions are asked. We continue to use the same key training variable (ED13WK: whether respondents receive work-related training in the last 13 weeks) in the LFS for the analysis throughout this chapter. Analysis of the pooled data set is restricted to a smaller number of variables. Again, we first present the results by personal characteristics, followed by an analysis by employer characteristics.

3.2 Training over time

Training increased steadily between 1994 and 2002, remained higher during 2002-04, but since then appears to have been on a slight downward trend (Figure 3.1). Just under one in five employees received training in 1994 and this rose to nearly one in three between 2001 and 2003. Training started to decline from 2003 onwards and only one in four employees received training in 2008. (see Table B.1 for percentages)

Figure 3.1 also shows a clear negative relationship ($r = -0.85$, $p<0.0001$) between training and unemployment[10]: when unemployment goes down, training increases. Training is highest in a tight labour market with a lower number of people unemployed. What might be the reasons for such a link? It is plausible that employers cut back on training at economic downturn, as they may cut back on investment and other more 'discretionary' items of spending. However, we do need a longer observation period beyond 2008 in order to be sure. It could also be that firms find it easier to recruit people with appropriate skills when they have a larger pool of people to choose from.

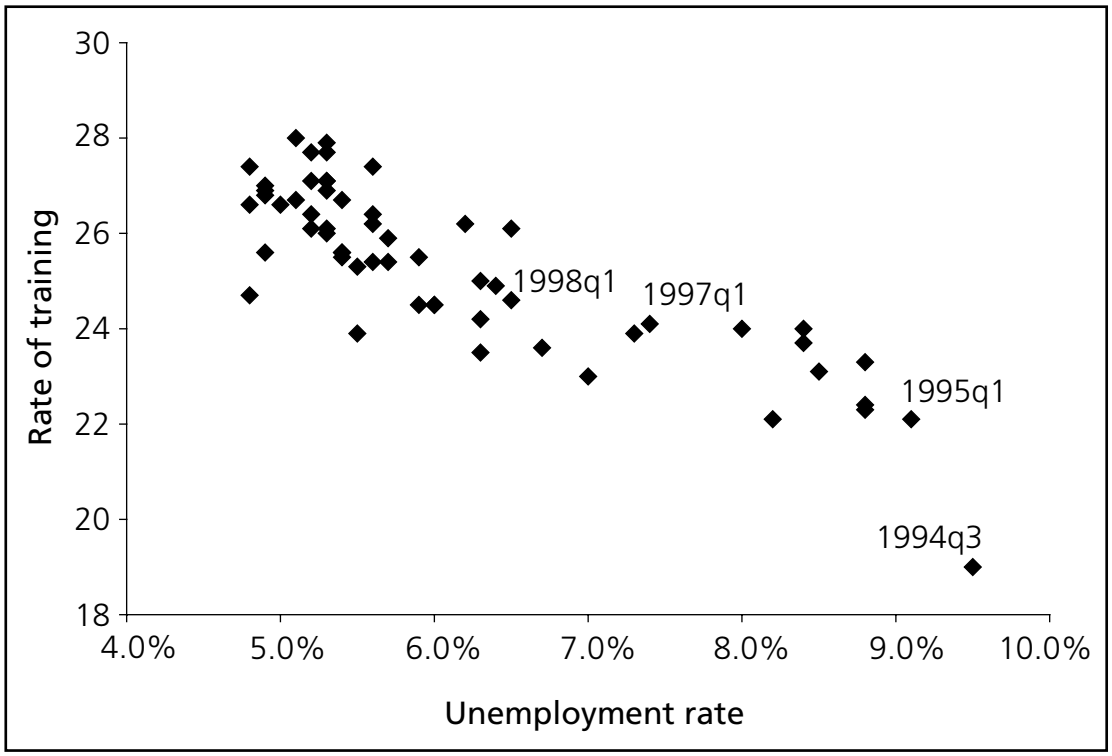
Figure 3.1 Proportion of employees aged 16-69 in training (with 4-qtr moving average showing trend) and unemployment rates 1994-2008



[10] Unemployment is seasonally adjusted monthly data based on three month rolling averages from the LFS – in other words the numbers available for and seeking work rather than the 'claimant count' of those on unemployment-related benefits particularly Jobseeker's Allowance (JSA).

In Figure 3.2 we provide a scatter-plot of the same information, indicating the link between lower unemployment and a higher rate of training. Training increased as unemployment fell, but has fallen back somewhat as unemployment has recently been increasing, though the link is less clear than in the late 1990s (dropping to r= -0.39 for the year 2000 onwards, p<0.02).

Figure 3.2 Percentage of employees aged 16-69 in training, and unemployment rates (%), 1994-2008 [r = -0.85]



We also looked at changes in the level of the Retail Prices Index (RPI), inflation, to see if there was any association with rates of training. However, the small negative correlation was not statistically significant. The same was true of any link with economic growth, measured by the rate of change of Gross Domestic Product (GDP).

In Appendix B, we look at this time series of training provision and break it down into trend, seasonal and random components. This very much confirms the visual picture of a downward trend in training, starting from the end of 2002, some stability around 2005, and then with something of a decline from 2005 onwards.

Training also appears somewhat seasonal, with about a 0.8 percentage point reduction in the third calendar quarter of each year, and a 0.5 percentage point increase in the fourth quarter, tending to occur. However, these are relatively small fluctuations about the main series.

3.2.1 Type of training and time spent on training

Where training done in the last four weeks was not done solely on the job, i.e. they also did 'training away from job' (JOBTRN=2, 3), respondents were asked to distinguish the type of training. The following categories (JOBLRN 1-3) are only available between spring 1999 to autumn 2006:

1 Attend conferences, seminars and workshops.

2 Use information from the Internet or CD-ROMs.

3 Watch TV programmes or videos.

4 None of these.

In 1999, around 73 per cent of respondents said that they attended conferences, six per cent reported Internet or CD-ROMs usage and a further five per cent watched TV programmes or videos. Both conference attendance and Internet use increased to around 77 per cent and eight per cent respectively in 2005 (see Table B.2).

Respondents who were out of work tended to spend more time on training. Those who were unemployed spent on average 29 hours in the last week on training. This is compared to 14 hours for those who were in work. Moreover, consistent with the pattern observed in the cross-sectional analysis in 2008, over 40 per cent of employees spent less than a week on training whereas over 50 per cent of the unemployed spent one to three years on training throughout the period of 1994 to 2008.

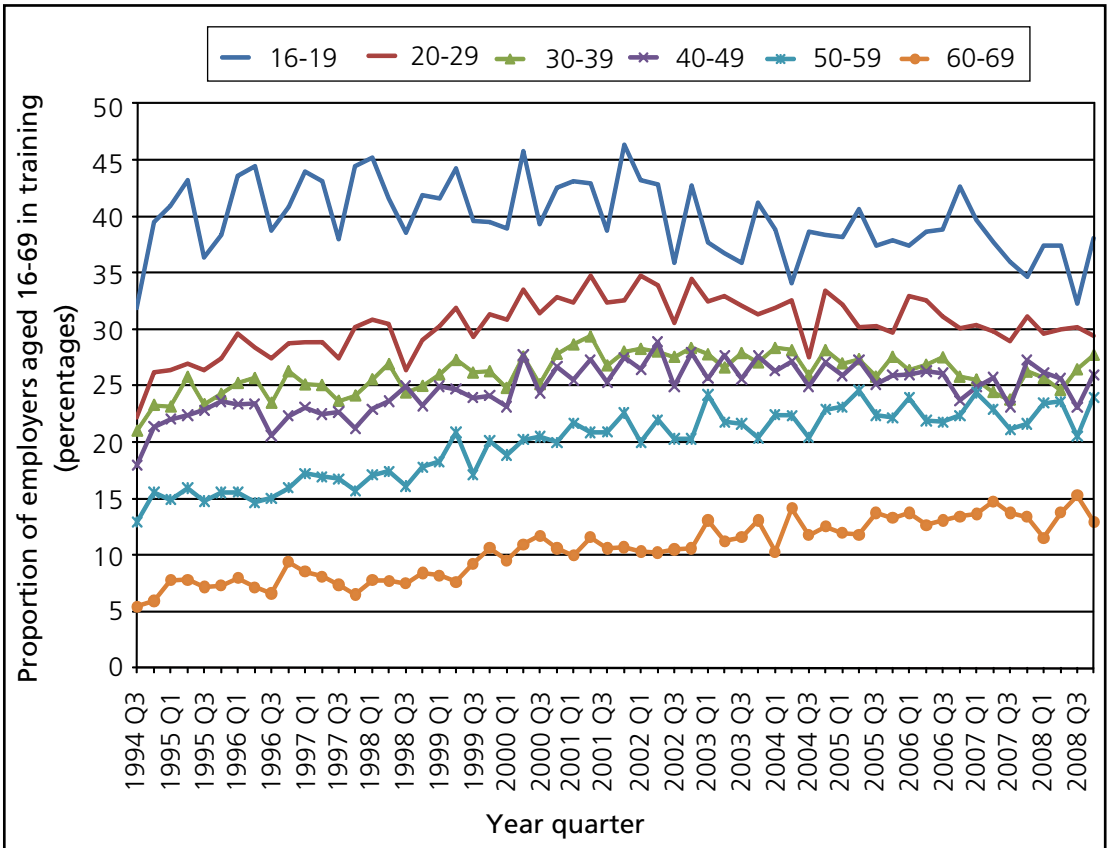
3.3 Trends in training by personal characteristics

3.3.1 Trends in training by age group

Broadly speaking training, has increased over time for almost all age groups. It is, however, least common for those in their 60s, and remains lowest for this group. However, the trend appears to be increasing over time for those aged 50-59, and 60 or over, in contrast to most younger age groups. This may be a positive sign that older workers are receiving opportunities that perhaps were more concentrated on younger workers. It is also worth noting the recent advent of measures to counter age discrimination in employment, including in training opportunities.

The youngest group enjoy the highest rates of training, but their training also fluctuates most between quarters and this could be due to the calendar of school years. This could be a reflection of seasonal demand for labour, which in turn affects the supply of training. Training peaked at 46 per cent for the 16-19 year olds in 2001 and declines to 38 per cent in 2008. Employees in their 20s resemble a similar pattern. For those in their 30s and 40s, training has risen steadily from 20 per cent in 1994 to around 25 per cent in 2008, with a slight surge between 2001 and 2003.

Figure 3.3 Proportion of employees aged 16-69 in training, by age group (1994-2008)



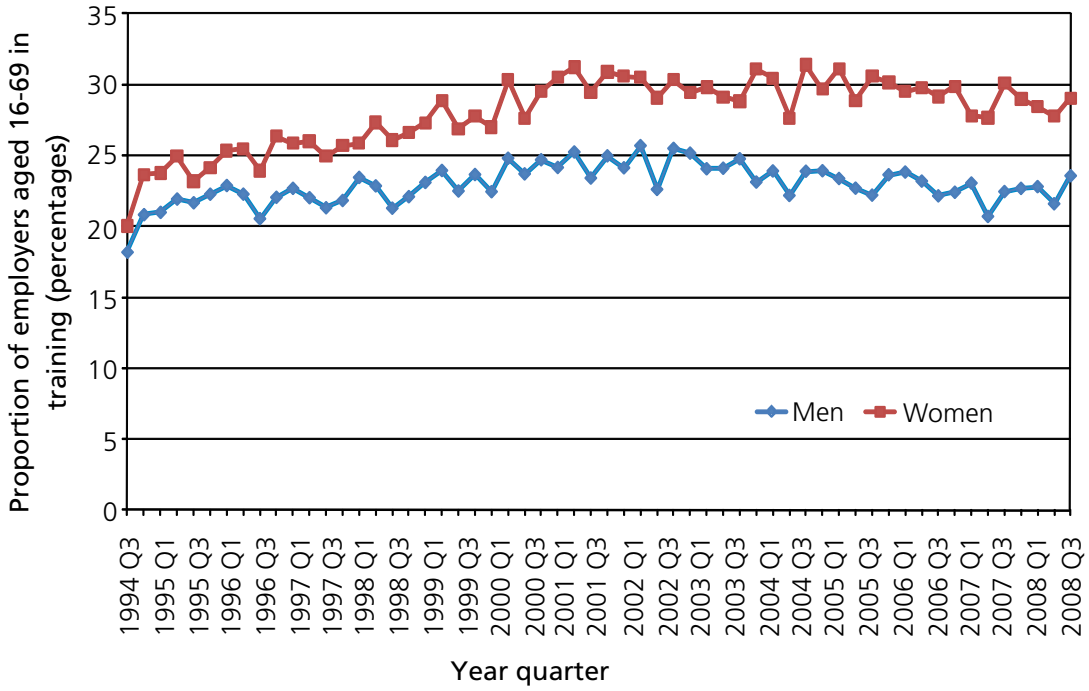
Source: QLFS 1994-2008, wave 5, weighted by PWT07[1]. All results over time are significant at p <.001 level.

[1] All bivariate analyses with count data are weighted by the adjusted PWT07 (i.e. PWT07/mean (PWT07)). This provides a more realistic chi-square statistic.

3.3.2 Training by gender over time

We saw from the cross-sectional analysis that women are more likely to receive training than men. The trend shown in Figure 3.4 suggests that the gender gap is widening over time. About one in five men and women received training in summer 1994. This has increased to 31 per cent for women in 2004 but only 26 per cent for men in 2002. Though persistent, this gap has become more stable from 2005 onwards (see Table B.3 for full percentages).

Figure 3.4 Proportion of employees aged 16-69 in training, by gender 1994-2008

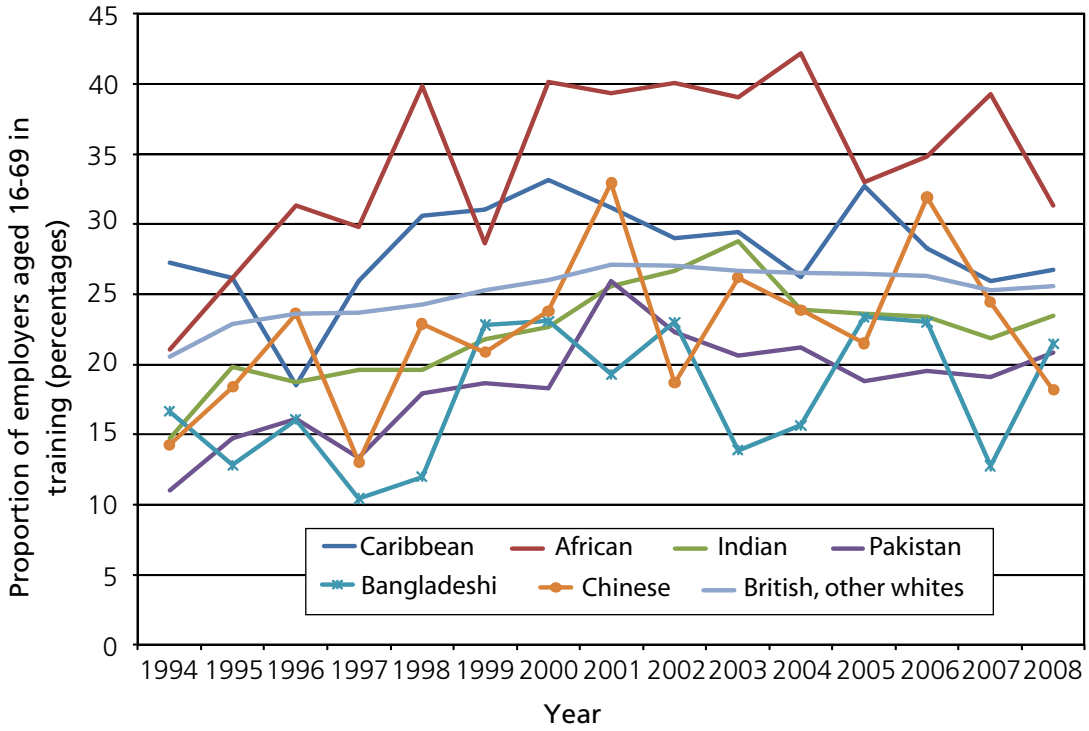


Source: QLFS 1994-2008, wave 5, weighted by PWT07. All results over time are significant at p <.001 level.

3.3.3 Training and ethnicity 1994-2008

There is a great deal of fluctuations in training received by ethnic minorities compared to that of the British and other whites, which resembles the national trend from 1994 to 2008. This could be a result of the smaller sample size (even with weighted data) of each sub-group. The fluctuating trends in minority groups' access to training may also be a result of differential access to employment over time. Nonetheless, two clear trends can be observed from Figure 3.5. First, Africans have significantly higher rates of training than any other groups, followed by Caribbeans who also fare better than the majority group of British and other whites. All the other minority ethnic groups tend to have lower than average rates in training, especially before 2001 (Table B.4 gives detailed percentages).

Figure 3.5 Proportion of employees aged 16-69 in training, by ethnicity 1994-2008

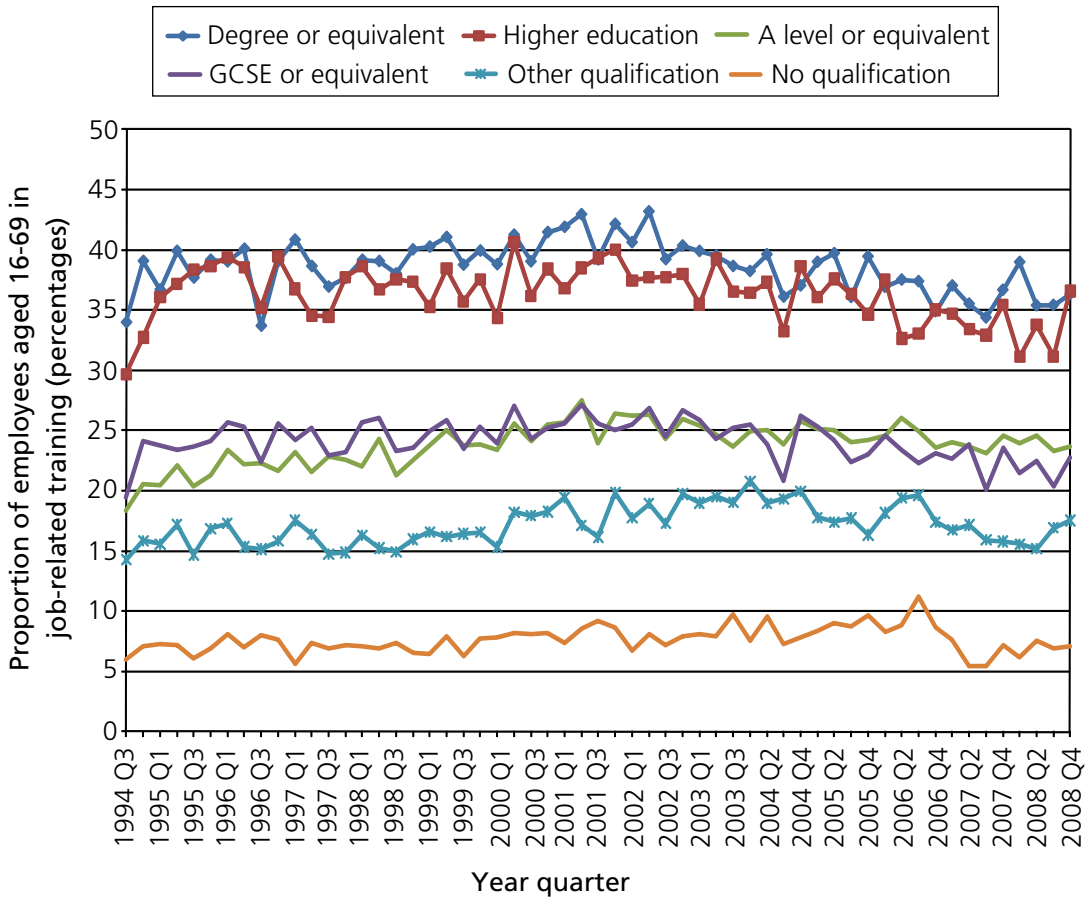


Source: QLFS 1994-2008, wave 5, weighted by PWT07. Results over time for all ethnic groups are significant at p <.05 level except for the Bangladeshis (p = .18).

3.3.4 Training and qualification and occupation 1994-2008

We have seen in the previous chapter that highly qualified people were more likely to access training. The trends we can see here, in Figure 3.6, confirm the same story.

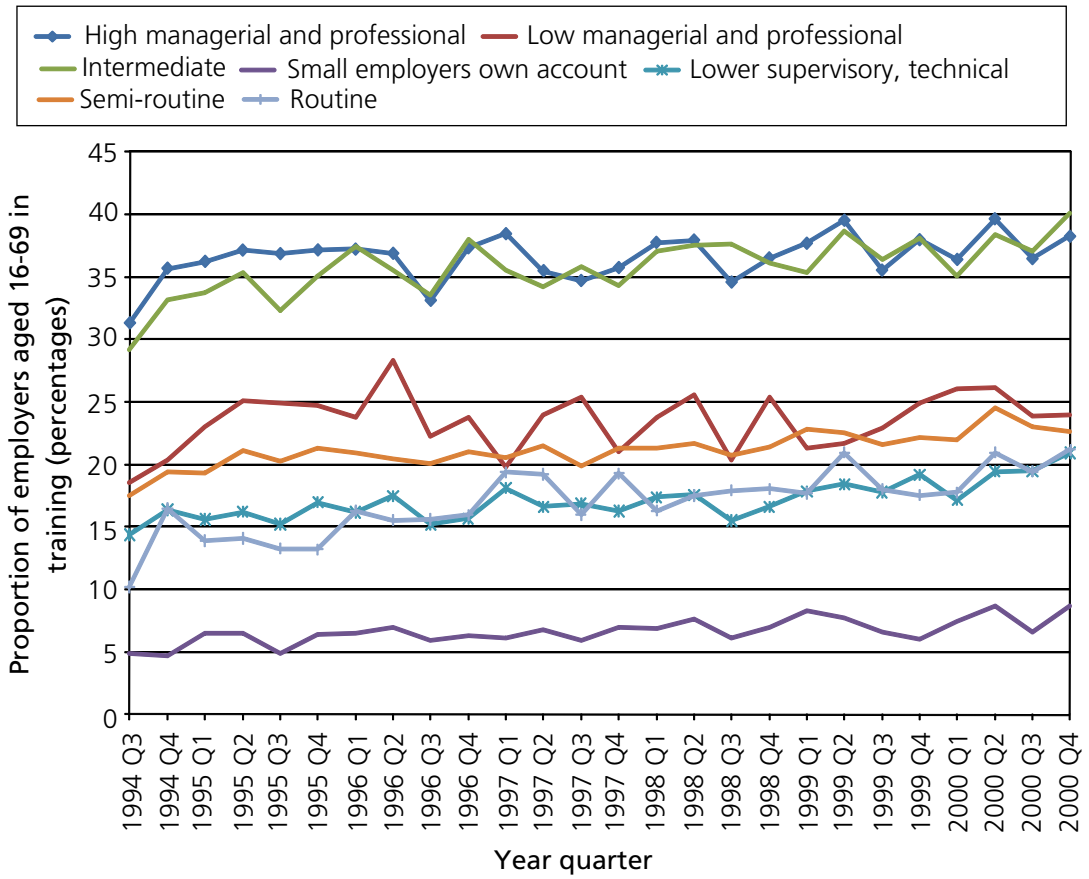
Figure 3.6 Proportion of employees aged 16-69 in training, by qualification 1994-2008



Source: QLFS 1994-2008, wave 5, weighted by PWT07. All results over time are significant at p <.001 level.

The trends by qualification shows an unequivocal divide between the highly and the poorly qualified in access to training. Workers with higher education and degrees enjoy significantly higher rates of training compared to those with A-level and GCSE qualifications. Between 2001 and 2002, almost one in two degree holders received training compared to only about one in ten among those without any formal qualifications. As we saw in Figure 3.1, the national trend in training provision has been declining since 2003. The trend by qualification resembles this pattern. Although the decline in training at the top (for the highly qualified) is slightly sharper than that at the bottom, there are very few signs that the gap is closing (see Table B.5 for full percentages).

Figure 3.7 Proportion of employees aged 16-69 in training, by occupation 1994-2000

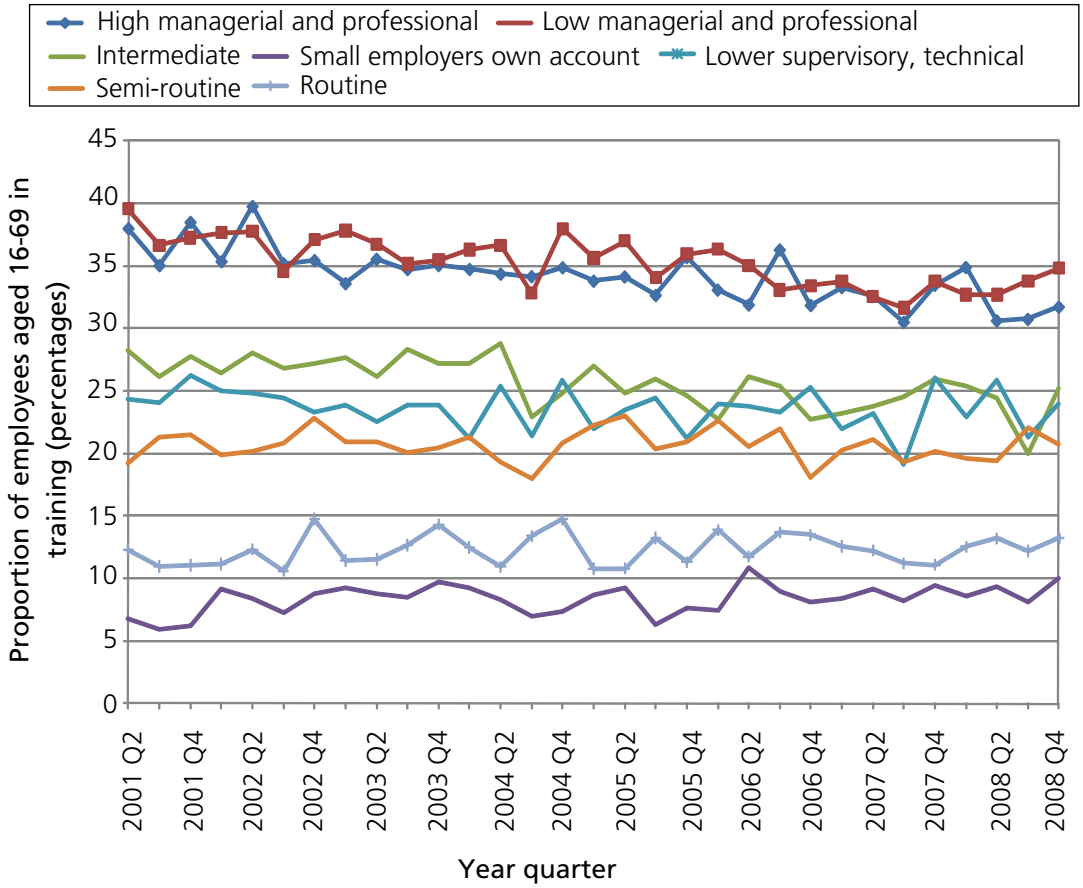


Source: QLFS 1994-2008, wave 5, weighted by PWT07. All results over time are significant at p <.01 level.

The trend by occupation is presented in two periods due to the change in classification from social economic groups to National Statistics – Social Economic Class (NS-SEC) in 2001. Figure 3.7 gives the results from 1994-2000 and Figure 3.8 presents the trends from 2001 onwards.

The pattern we see here is not strictly a hierarchical one. The divide in training between higher professional and managerial jobs and lower level routine manual work is still clearly visible. Interestingly, workers in intermediate occupations were just as likely as managerial and professional employees to enjoy a much higher than average rate of training. Small employers and own account workers have by far the lowest proportion in training. This is not surprising because small employers and self-employed persons may not have as much funds to pay for training. What is rather unexpected is that semi routine workers had higher rates of training than lower supervisory and technical workers, whose rates of training were more similar to those in routine occupations. Table B.6 gives the full percentages.

Figure 3.8 Proportion of employees aged 16-69 in training, by occupation 2001-2008



Source: QLFS 1994-2008, wave 5, weighted by PWT07. All results over time are significant at p <.05 level.

A different pattern can be observed from 2001. Figure 3.8 shows that higher and lower level professionals and managers have very similar rates of training (detailed percentages available in Table B.7).

We should, however, be cautious in interpreting these changes because of the change in classifications in socio-economic groups and social class. Some occupations, such as clerical and secretarial jobs, were reclassified as intermediate occupations but others remain as semi-routine occupations, and certain lower supervisory and technical occupations were re-classified as lower managerial positions[11].

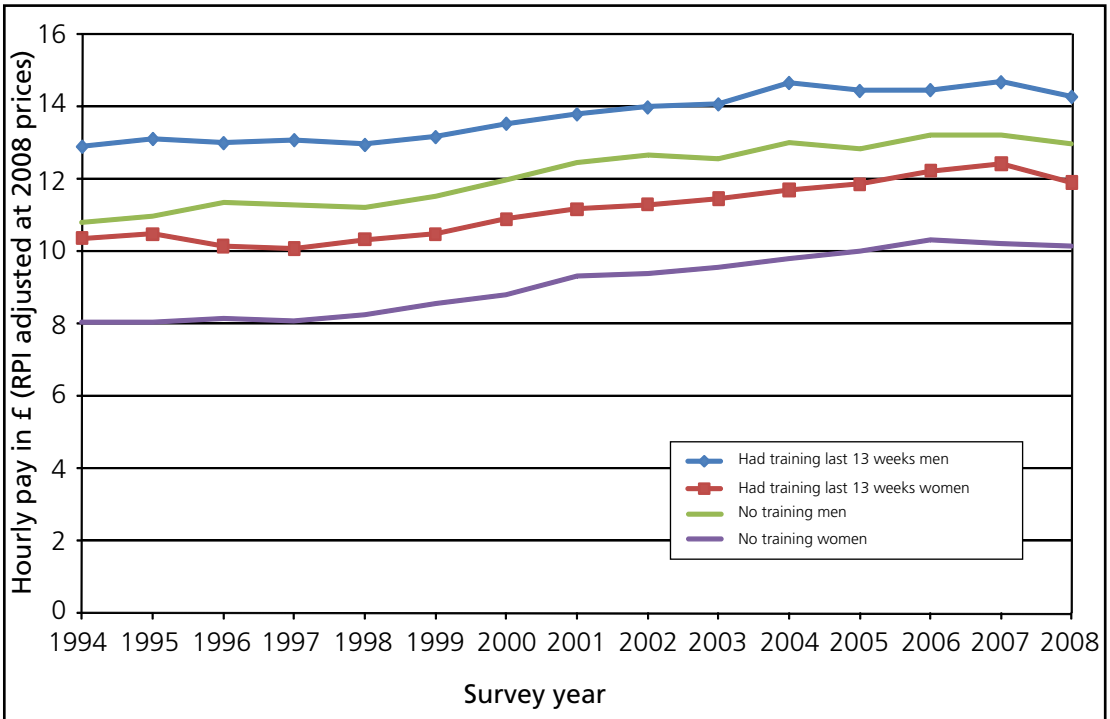
[11] For more details, please see the NS-SEC re-classification 2000 in the LFS user guides or consult the Office for National Statistics (ONS) documentation on NS-SEC 2000.

3.3.5 Training and hourly earnings 1994-2008

Figure 3.9 charts the trend in the relationship between training and hourly earnings by gender. The hourly earnings are adjusted to 2008 prices using the RPI available at the national statistics website[12].

An earning gap is clearly visible between those with training and those without, and the pattern is consistent over time. Naturally, we cannot attribute any causal relationship with repeated cross-sectional observations such as this as there may be other confounding factors that explain the earning gap, such as qualifications and work experience. See Table B.8 for full percentages.

Figure 3.9 Hourly earnings and gender, by training 1994-2008



Source: QLFS 1994-2008, wave 5, weighted by the income weight PIWT07[1]. All results over time are significant at p <.001 level.

[1] Hourly earnings are adjusted to 2008 prices using the Retail Price Index 1994-2009 (Office for National Statistics) and weighted by the adjusted PIWT07 (i.e. PIWT07/ mean (PIWT07)). This provides a more realistic chi-square statistic.

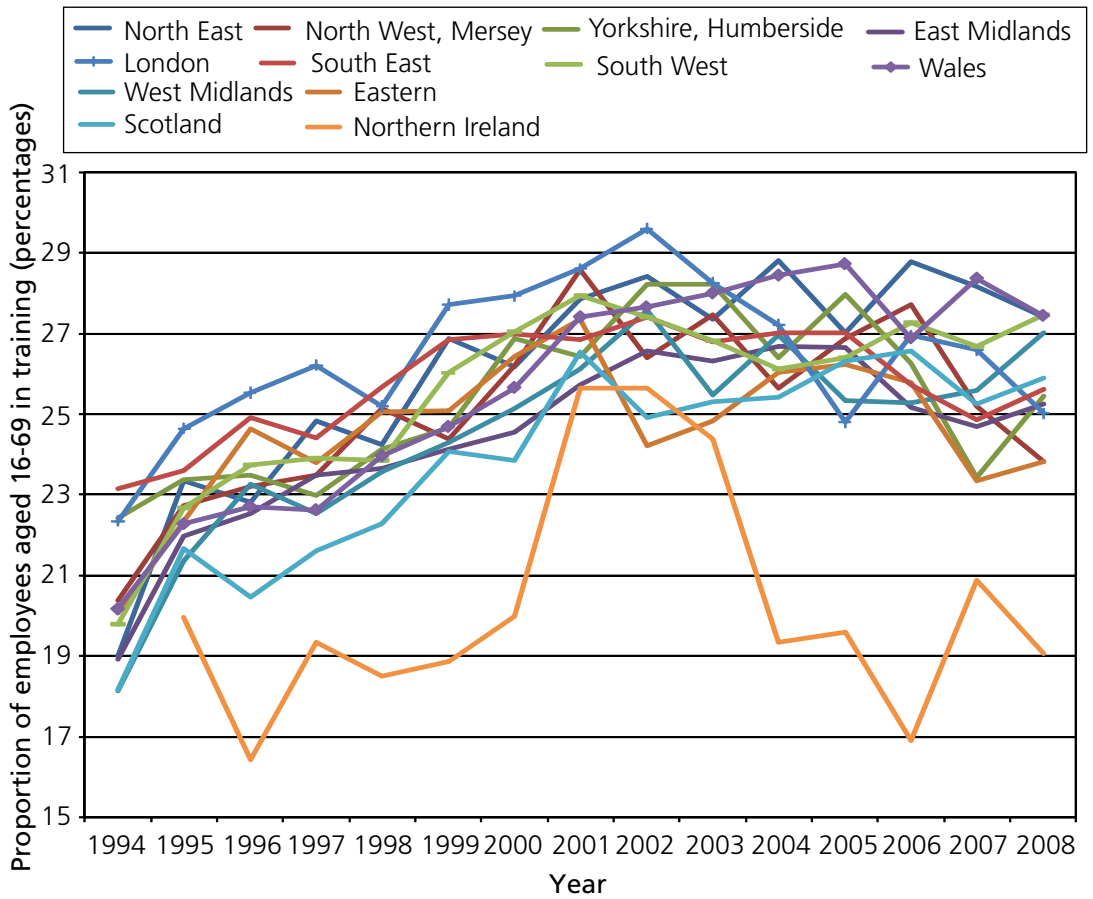
3.3.6 Training and regional variation 1994-2008

Training in different government regions broadly resembles the national trends. The provision increased from around 20 per cent in 1994 to almost over

12 RPI data, downloadable in various formats, may be found at: http://www.statistics.gov.uk/STATBASE/tsdataset.asp?vlnk=7173&More=N&All=Y.

30 per cent in 2001; with the North East being the highest, especially since 2001, and Northern Ireland, though fluctuating wildly, being consistently the lowest. Many regions such as the North East and London maintained a 30 per cent or above training rates until well into 2004. It is worth reporting is that training in Wales started at around 20 per cent in 1994 and reached 33 per cent in 2002 and has not fallen below 30 per cent since. Table B.9 gives full details of percentages by year.

Figure 3.10 Trends in training, by region 1994-2008



Source: QLFS 1994-2008, wave 5, weighted by the income weight PIWT07. All results over time are significant at p <.001 level.

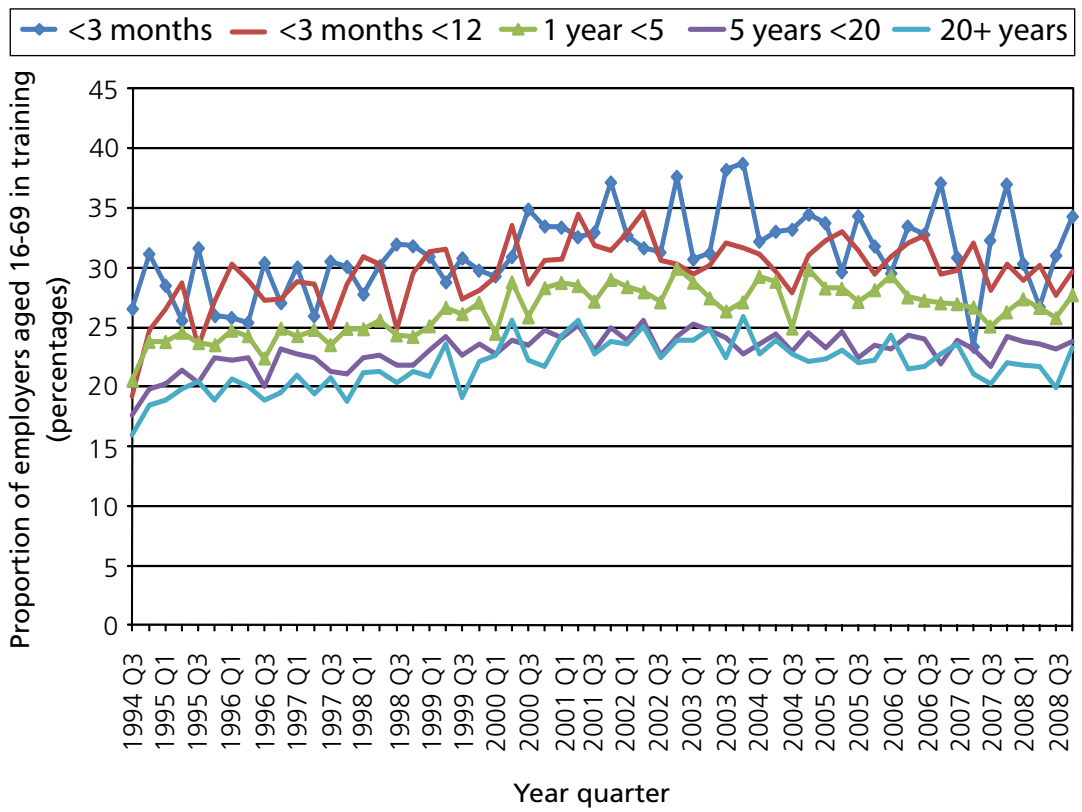
3.4 Trends in training by job and employer characteristics

3.4.1 Training and length of employment 1994-2008

Consistent with the finding in the cross-sectional analysis, training provision is much higher among newer employees. Those who had only been in their jobs for up to six months have the highest rates of training, followed by those who had been with their current employers for up to one and two years. Those with longer lengths of service (i.e. over two years, five years, ten and twenty years)

have lower levels of training. This may suggest that training is less important for the more experienced employees who have been with the same employer for a considerable period and know the organisation and their jobs well. What is also clear from Figure 3.11 is that there are much more seasonal fluctuations for new employees than for those in service for more than two years. This may be an artefact of the age structure of the workforce. The pattern we observe here is almost identical to the trends by age group where we have seen training for the younger age groups also fluctuate most over time (see Figure 3.3). This could also be a result of the variation in skills and training required by different occupations and sectors, and the sensitivity of new hires to the economic cycle. (See Table 3.10 for full percentages).

Figure 3.11 Proportion of employees aged 16-69 in training, by length of employment 1994-2008



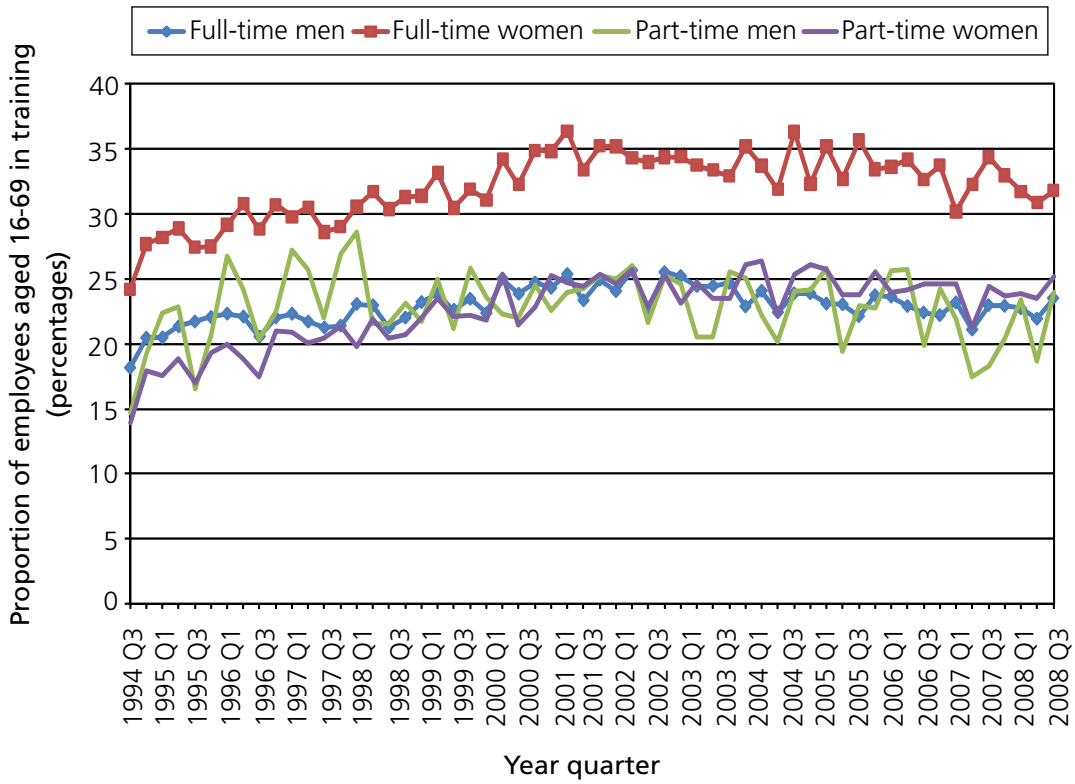
Source: QLFS 1994-2008, wave 5, weighted by PWT07. All results over time are significant at p <.001 level.

3.4.2 Training and full-time/part-time employment 1994-2008

Analysis by full-/part-time status shows that full-time workers had more training than their counterparts in part-time employment in 1994 (figure not shown) but this gap of seven per cent reduced to three per cent in 2008. From Figure 3.12 we can see a striking and persistent advantage enjoyed by women in full-time

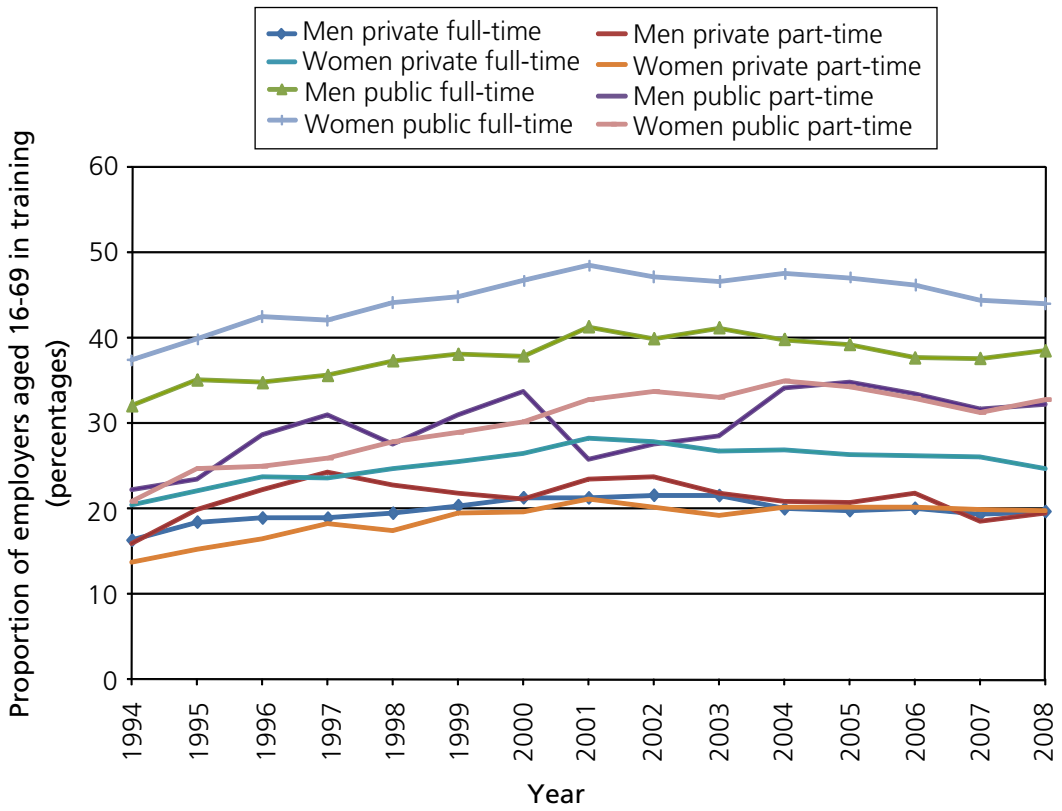
work. Table B.11 gives the full percentages. What privileges women in full-time employment but not men? Might this be a public sector effect? What do the other three groups have in common to have such a similar pattern in access to training over time?

Figure 3.12 Proportion of employees aged 16-69 in training, by full-/part-time status and gender 1994-2008



Source: QLFS 1994-2008, wave 5, weighted by PWT07. All results over time are significant at $p < .001$ level.

Figure 3.13 Proportion of employees aged 16-69 in training, by full-time/part-time status, sector and gender 1994-2008



Source: QLFS 1994-2008, wave 5, weighted by PWT07. All results over time are significant at p <.001 level.

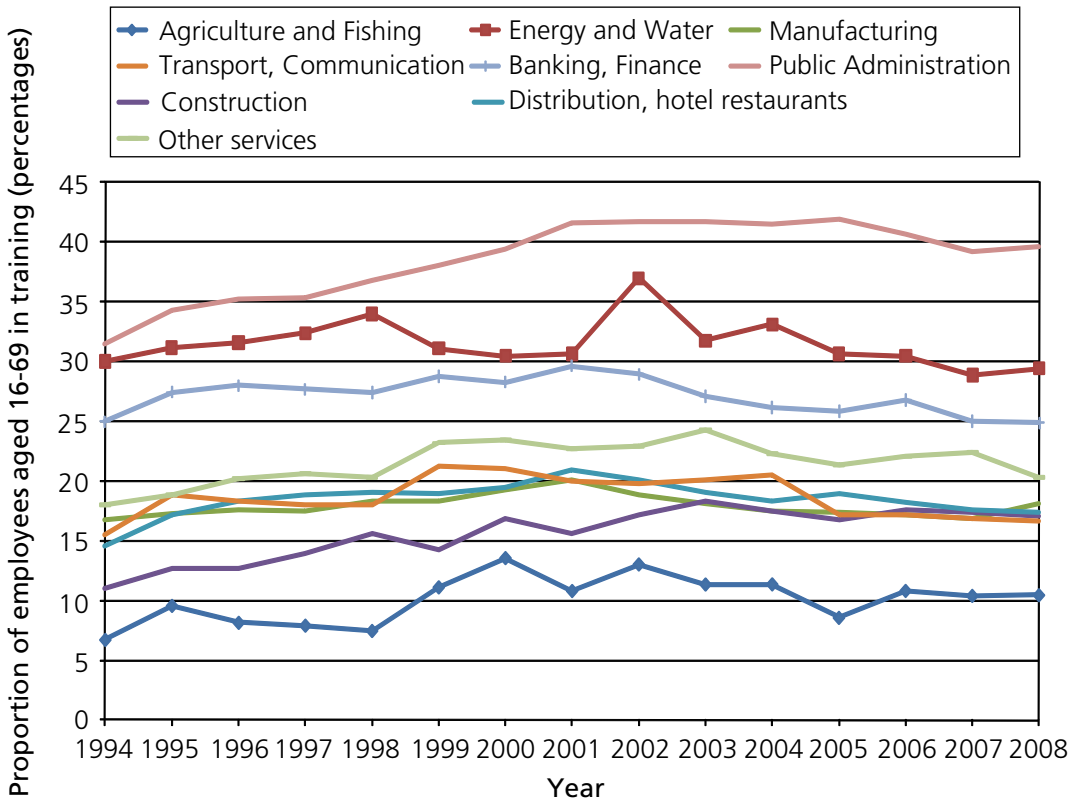
Further disaggregation (Figure 3.13) shows that it was indeed women in full-time employment in the public sector who enjoy the highest rates of training throughout the period under observation, followed by men working full-time in the public sector. Training in the private sector is significantly lower, irrespective of gender and full-time or part-time status. Table B.12 gives full details on percentages. This analysis clearly demonstrates the merits of disaggregation by key dimensions such as sector of employment and this would have been otherwise masked by the apparent gender difference of full-time/part-time status.

3.4.3 Training and industry and type of organisation 1994-2008

As was observed in the cross-sectional analysis, training opportunities are not evenly distributed across different industries. Public administration has the highest rate of training provision, followed by energy and water. Banking and finance resembles the national trends most, with an average rate of training provision from 23 per cent in 1994 to around 32 per cent in 2001 and then back to around 25 per cent in 2008 – see Figure 3.14.

Agriculture and fishing has the lowest provision of training throughout this period. This could be an artefact of employment status because of high incidences of self-employment in these industries. Construction, distribution and restaurants, and manufacturing also have lower than average provision. This may be a result of the high proportion of low-skilled jobs in these industries. (Table B.13 gives the full percentages).

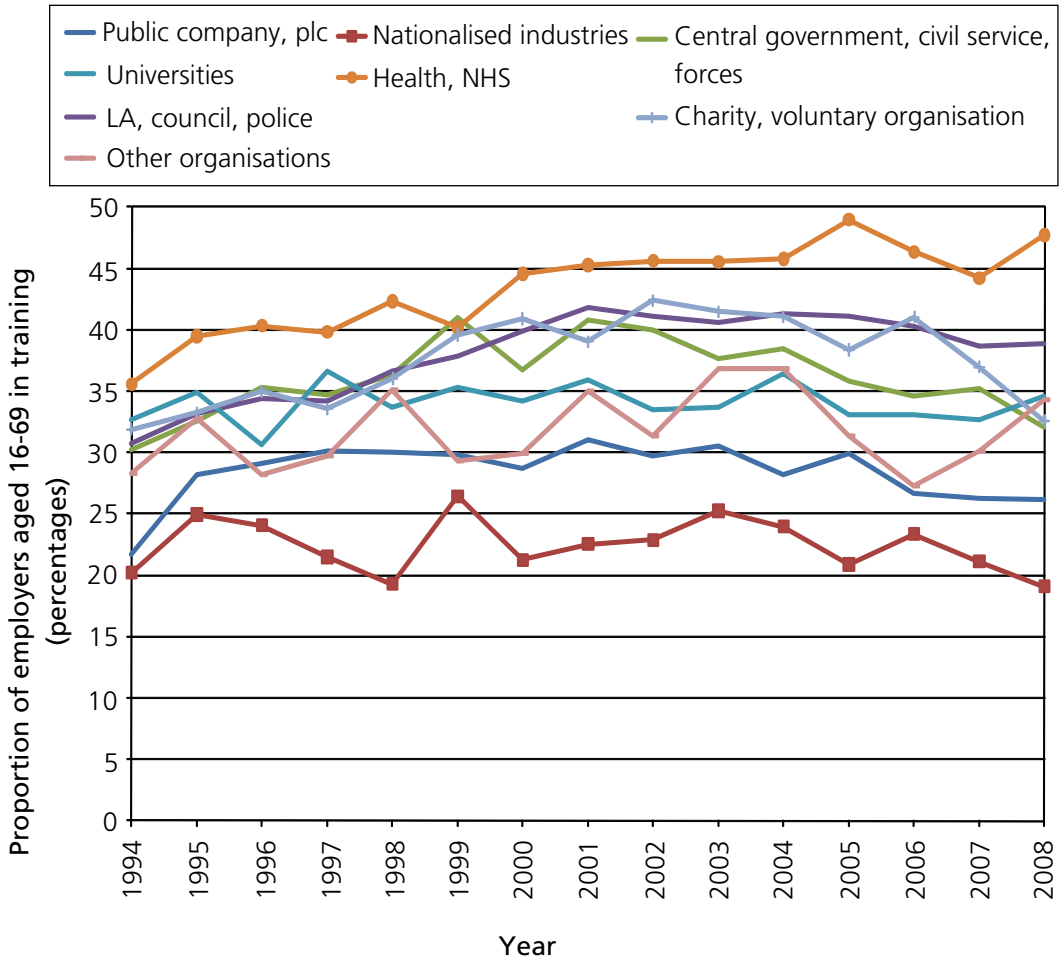
Figure 3.14 Proportion of employees aged 16-69 in training, by industry 1994-2008



Source: QLFS 1994-2008, wave 5, weighted by PWT07. Results for all industrial sectors except energy and water ($p = .47$) are significant at $p < .001$ level.

Figure 3.15 shows the trends by the type of organisation (variable SECTRO in the LFS). Here we can see that within the public sector, there is great variation in the proportion of employees in training. Those working in the NHS and health authority have the highest rate of training, followed by those in local authorities and central government, which has been on a downward trend since 2002. Employees in nationalised industries had the lowest rate of training throughout this 14-year period. Charities and other organisations are middling but remaining above 30 per cent. See Table 3.14 for the full percentages.

Figure 3.15 Proportion of employees aged 16-69 in training, by type of organisation 1994-2008



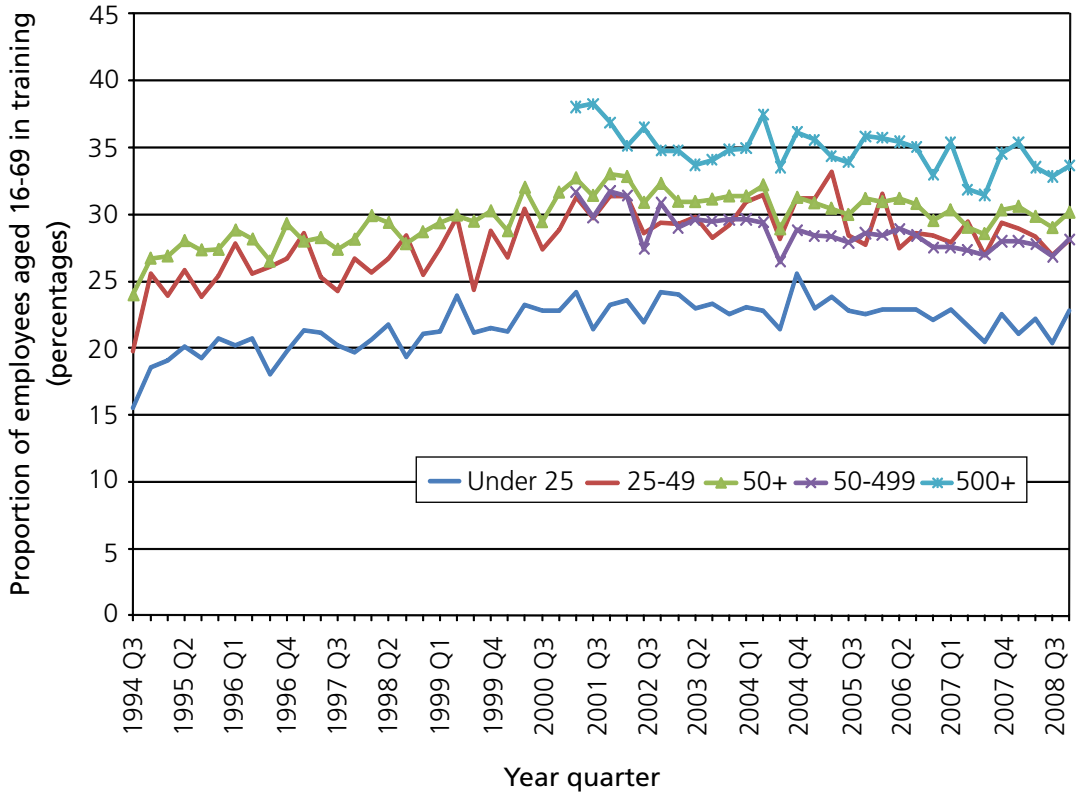
Source: QLFS 1994-2008, wave 5, weighted by PWT07. Results for all types of organisations are significant at p <.05 to p < .001 level except nationalised industries (p = .32), universities (p = .41), and other organisations (p = .11).

3.4.4 Training and size of establishment 1994-2008

We have seen from the cross-sectional analysis that employees in the largest establishments were more likely to receive training. The trends analysis confirms this pattern, Figure 3.16 displays the proportions of employees in training by the size of the establishment, which are defined by the number of workers employed: Firms with up to 24 employees are defined as small. Those with 25-59 employees are medium-sized establishments while firms with more than 50 workers are defined as large. In the LFS data, a more detailed classification is available since 2001 allowing further disaggregation between large (firms with 50-499 employees) and very large establishments (firms with 500 or more employees). Overall, the message is consistent: company size matters when it comes to training. Only between 22 and 25 per cent of employees received training on employer's premises in small firms since 2001 (see Table B.15 for figures), compared to almost 40 per cent for

very large ones. This may suggest that large establishments have more resources in providing training. Nevertheless, the decline in the proportion of workers in receiving training since 2004 is highly visible for establishments of all sizes, even (or perhaps especially) for those with a large workforce.

Figure 3.16 Proportion of employees aged 16-69 in training, by size of establishment 1994-2008



Source: QLFS 1994-2008, wave 5, weighted by PWT07. Results for establishments with 500+ employees are significant at p <.01 level and at p < .001 level for all other establishments of different sizes.

3.5 Who receives training?

In this section, we model the odds of training on both personal and employers' characteristics using logistic regression and composite data of LFS 1994-2008. In the main analysis, we present results including the variable on disability which only became available in 1998. We repeat the analysis without disability but with data from 1994. The full set of results are available in Appendix B (Tables B.16-B.21).

Table 3.1 gives the results of the logistic regressions according to respondents' personal details (age, ethnicity, qualification, disability and so on), job (full-time or part-time, length of employment, occupation) and employers' (sector, size of establishment) characteristics. Tables 3.2 and 3.3 present the results in the private and public sectors respectively. A note in interpretation: if there was no effect of each variable, then the odds ratios would be close to the value 1.0. Higher values

than this indicate a higher likelihood of being associated with training, and values below one a lower likelihood.

By and large the regression results confirm the findings in the previous sections using bivariate analysis. Africans were more likely to have received training than the British and other whites, while the opposite is true for all other minority ethnic groups. The logistic regression also gives a few unexpected findings. Controlling for qualification and occupation, despite their overall labour market success, Chinese and Indians were closer to Pakistanis and Bangladeshis in their receipt of training and compared less favourably with British and other whites. It may not be expected, but workers with disability, whether work-limiting or not, were in fact more likely to receive training. Younger workers were more likely to receive training and the proportion of employees in training starts to decline for men in their 40s and for women in their 50s. However, qualifications appear to be positively associated with training.

As with job characteristics, new employees were more likely to receive training, up to a year with their current employers. Training declines for those who have job tenure with the same employer for two years or more. Full-time workers were in a favourable position to receive training compared to part-timers. With the exception of self-employed and own account workers, all respondents in other occupations appear to be more likely to have received training in the last 13 weeks compared with workers in routine occupations.

Respondents in the private sector were much less likely to receive training. The same is true for those in small (0-24 employees) and medium-sized (25-49 employees) establishments compared with their peers in large (50+ employees) establishments, except for women in medium-sized firms.

The trend over time in the odds of receiving training is also broadly in agreement with the descriptive analysis presented earlier. Controlling for both personal and job characteristics, respondents in earlier years, e.g. 1994 to 1998 were less likely to have received training compared to those in the early 2000s (see Table B.19 for parameter estimates). This is also true for male employees from 2004 onwards as well as for female employees from 2001 onwards. This downward trend is particularly clear for women. Perhaps surprisingly, as can be seen in Tables B.20 and B.21, the decline in training is more severe in the public sector and again this decline is much sharper for women.

Separate models for the private and public sectors were estimated. Three findings are most noteworthy. First, ethnic minority groups were less likely to have received training than their white counterparts in the private sector. In contrast, with the exception of Indian and Pakistani women and Bangladeshi men, many groups were not significantly different from the British whites in the public sector, with African men being more likely to have received training. Second, newer employees were more likely to have training in the private sector than their peers in the public sector. Third, workers in small and medium-size establishment in the public

sector were actually more likely to receive training and the opposite is true in the private sector.

A more detailed measure of size of establishment is available in the LFS since 2001. We repeat the analysis with two further categories: large (50-499 employees) and very large (500+ employees) establishments. The results are largely consistent with previous findings that training is less likely in all smaller (0-24, 25-49, 50-499) establishments compared to very large ones (500+). Again, as seen in the previous analysis (Table 3.1), while women in large establishments (50-499) were less likely to receive training, this is not the case in medium-size companies (25-49). Further disaggregation of the analysis sectors sheds more light on this anomaly. Results in the private sector are consistent with expectation that large organisations have more resources for training than smaller ones. Employees in smaller workplaces (0-24, 25-49) in the public sector were significantly more likely to receive training compared to their counterparts in very large establishments (Table 3.6).

Table 3.1 Odds ratios of logistic regression on the receipt of training (1998-2008)

Model	Men	Women
Age group (ref: 30-39)		
16-19	3.37***	2.35***
20-29	1.27***	1.09***
40-49	.89***	1.09***
50-59	.75***	.98
60-69	.48***	.73***
Ethnicity (ref: British, other whites)		
Caribbean	1.08	1.03
African	1.57***	1.22**
Indian	.83***	.76***
Pakistani	.82***	.70***
Bangladeshi	.72***	.69**
Chinese	.71***	.70***
All mixed groups	.89	1.19**
All non-mixed groups	1.16**	1.10*
Disability status (ref: not disabled)		
Both Disability Discrimination Act (DDA) disabled and work-limiting	1.00	1.05*
DDA disabled only	1.09***	1.14***
Work-limiting disabled only	1.09**	1.25***

Continued

Table 3.1 Continued

Model	Men	Women
Qualification (ref: GCSE A-C or equivalent)		
Degree or equivalent	1.38***	1.68***
Post-A level higher education	1.28***	1.81***
GCE A level or equivalent	1.04**	1.25***
Other qualification	.79***	.82***
No qualification	.39***	.41***
Occupation (ref: routine occupation)		
High managerial or professional	2.49***	2.32***
Low managerial or professional	2.35***	2.34***
Intermediate occupations	2.15***	1.61***
Small employers, own account work	.69***	.74**
Low supervisory or technical occupations	1.71***	1.95***
Semi-routine occupations	1.33***	1.47***
Full-time status (ref: part-time)	1.11**	1.27***
Length of employment (ref: 1 year but < 2)		
Less than 3 months	1.24***	1.17***
3 but < 6 months	1.19***	1.16***
6 but < 12 months	1.05**	1.08***
2 years but < 5	.90***	.88***
5 years but < 10	.80***	.78***
10 years but < 20	.84***	.77***
20 years or more	.88***	.78***
Private Sector (ref: public)	.53***	.53***
Size of establishment (ref: with 50+ employees)		
0-24 employees	.79***	.96***
25-49 employees	.90***	1.11***
Constant	.29***	.30**
Model Chi-square (d.f.)	18,085 (48)	19,452 (48)
N (weighted)	*185,899*	*179,952*

Models controlling for year of survey (reference category: 2000); *** p < .001, ** p < .01, * p < .05.

Source: LFS 1998-2008, all wave 5 respondents in employment (i.e. ED13WK applies).

Table 3.2 Training in the private sector (1998-2008) – odds ratios

Model	Men	Women
Age group (ref: 30-39)		
16-19	3.42***	2.32***
20-29	1.31***	1.15***
40-49	.89***	1.08***
50-59	.73***	.94
60-69	.48***	.76***
Ethnicity (ref: British, other whites)		
Caribbean	1.21**	1.05
African	1.62***	1.57**
Indian	.82***	.76***
Pakistani	.81**	.74***
Bangladeshi	.78	.64**
Chinese	.68**	.59***
All mixed groups	.96	1.18**
All non-mixed groups	1.15**	1.15*
Disability status (ref: not disabled)		
Both DDA disabled and work-limiting	1.02	1.07*
DDA disabled only	1.11***	1.19***
Work-limiting disabled only	1.10**	1.31***
Qualification (ref: GCSE A-C or equivalent)		
Degree or equivalent	1.38***	1.58***
Post-A level higher education	1.24***	1.70***
GCE A level or equivalent	1.03**	1.24***
Other qualification	.78***	.83***
No qualification	.39***	.41***
Occupation (ref: routine occupation)		
High managerial or professional	2.48***	2.31***
Low managerial or professional	2.26***	1.99***
Intermediate occupations	2.12***	1.43***
Small employers, own account work	.69***	.73**
Low supervisory or technical occupations	1.72***	1.83***
Semi-routine occupations	1.31***	1.33***
Full-time status (ref: part-time)	1.07*	1.21***

Continued

Table 3.2 Continued

Model	Men	Women
Length of employment (ref: 1 year but < 2)		
Less than 3 months	1.27***	1.31***
3 but < 6 months	1.19***	1.20***
6 but < 12 months	1.06**	1.09**
2 years but < 5	.91***	.88***
5 years but < 10	.80***	.78***
10 years but < 20	.85***	.75***
20 years or more	.94***	.77***
Size of establishment (ref: with 50+ employees)		
0-24 employees	.75***	.85***
25-49 employees	.83***	1.00
Constant	.17***	.19**
Model Chi-square (d.f.)	11,623 (47)	7,904 (47)
N (weighted)	*15,1153*	*11,3846*

Models controlling for year of survey (reference category: 2000); *** p < .001, ** p < .01, * p < .05.

Source: LFS 1998-2008, wave 5 respondents in employment (i.e. ED13WK applies) in the private sector.

Table 3.3 Training in the public sector (1998-2008) – odds ratios

Model	Men	Women
Age group (ref: 30-39)		
16-19	2.59***	2.20***
20-29	1.01**	.96
40-49	.90***	1.11***
50-59	.79***	1.01
60-69	.49***	.71***
Ethnicity (ref: British, other whites)		
Caribbean	.80	1.01
African	1.44***	.89
Indian	.88	.75***
Pakistani	.84	.68**
Bangladeshi	.52*	.80
Chinese	.83	.95
All mixed groups	.72*	1.18
All mon-mixed groups	1.17	1.03
Disability status (ref: not disabled)		
Both DDA disabled and work-limiting	.96	1.03
DDA disabled only	1.05	1.09**
Work-limiting disabled only	1.07	1.18**
Qualification (ref: GCSE A-C or equivalent)		
Degree or equivalent	1.32***	1.70***
Post-A level higher education	1.31***	1.83***
GCE A level or equivalent	1.06	1.25***
Other qualification	.82***	.81***
No qualification	.40***	.44***
Occupation (ref: routine occupation)		
High managerial or professional	3.10***	2.72***
Low managerial or professional	3.65***	3.27***
Intermediate occupations	2.71***	2.10***
Small employers, own account work	---------	---------
Low supervisory or technical occupations	1.75***	2.18***
Semi-routine occupations	1.55***	1.80***
Full-time status (ref: part-time)	1.29***	1.35***

Continued

Table 3.3 Continued

Model	Men	Women
Length of employment (ref: 1 year but < 2)		
Less than 3 months	1.04	.84***
3 but < 6 months	1.19**	1.07
6 but < 12 months	.96	1.11**
2 years but < 5	.85***	.85***
5 years but < 10	.76***	.76***
10 years but < 20	.75***	.74***
20 years or more	.70***	.74***
Size of establishment (ref: with 50+ employees)		
0-24 employees	1.07*	1.18***
25-49 employees	1.16***	1.29***
Constant	.29***	.30**
Model Chi-square (d.f.)	2,808 (47)	6,383 (46)
N (weighted)	*34,746*	*66,106*

Models controlling for year of survey (reference category: 2000); *** p < .001, ** p < .01, * p < .05.

Source: LFS 1998-2008, wave 5 respondents in employment (i.e. ED13WK applies) in the public sector.

Table 3.4 Odds ratios of logistic regression on the receipt of training (2001-2008): Size of establishment

Model	Men	Women
Size of establishment (ref: with 500+ employees)		
0-24 employees	.73***	.93***
25-49 employees	.85***	1.11***
50-499 employees	.91***	.96*
Constant	.28***	.25***
Model Chi-square (d.f.)	11,078 (46)	131,56 (46)
N (weighted)	*124482*	*122,688*

Same models as in Table 3.1 except size of establishment. *** p < .001, ** p < .01, * p < .0.

Source: LFS 2001-2008, all wave 5 respondents in employment (i.e. ED13WK applies).

Table 3.5 Odds ratios of logistic regression on the receipt of training (2001-2008): Size of establishment (private sector)

Model	Men	Women
Size of establishment (ref: with 500+ employees)		
0-24 employees	.65***	.77***
25-49 employees	.74***	.91***
50-499 employees	.83***	.87***
Constant	.17***	.17**
Model Chi-square (d.f.)	6,901 (45)	5,154 (45)
N (weighted)	*100,727*	*76,214*

Same models as in Table 3.2 except size of establishment .*** p < .001, ** p < .01, * p < .05.
Source: LFS 2001-2008, all wave 5 respondents in employment (i.e. ED13WK applies).

Table 3.6 Odds ratios of logistic regression on the receipt of training (2001-2008): Size of establishment (public sector)

Model	Men	Women
Size of establishment (ref: with 500+ employees)		
0-24 employees	1.11*	1.13***
25-49 employees	1.13**	1.25***
50-499 employees	1.00	.99
Constant	.16***	.15**
Model Chi-square (d.f.)	1,811 (44)	4,277 (44)
N (weighted)	*23,755*	*47,474*

Same models as in Table 3.3 except size of establishment .*** p < .001, ** p < .01, * p < .05.
Source: LFS 2001-2008, all wave 5 respondents in employment (i.e. ED13WK applies).

3.6 Chapter summary

Training has been in decline since 2002. A clear negative relationship can be seen between training and unemployment. Additionally, no link can be found between economic growth and training either. Some seasonal trend in training was identified, with a small decline in the third calendar quarter of each year and a slight increase in the fourth quarter.

The trends analysis confirms the snap-shot in 2008. Younger groups, women, workers with more qualifications are more likely to have received training. Full-time and public sector work is associated with higher levels of training.

The results of the binary logistic regressions suggest that most individual characteristics are significantly associated with the likelihood of the receipt of training. Age, ethnicity, disability, qualification and occupation are all statistically significant. While disability does not seem to be a hindrance to access to training, ethnic minority groups are significantly worse off especially in the private sector. Even in the public sector, some Indian and Pakistani women and Bangladeshi men are less likely to have received training. This may be a reflection of the inefficacy of equal opportunity policies in job-related training.

4 Training and wage progression: descriptive analysis

4.1 Background

In a 'snapshot' of training undertaken, it is likely both that higher earners receive more training than lower earners, and that training leads on to higher earnings. It is possible that the causal links run in both directions. In order to have a greater chance of identifying a causal link it is necessary to have data over time about the same people. Given two very similar individuals, how will their future circumstances differ if one receives training the other does not? That is the key issue of debate, and in the absence of formal experiments it has to be answered using the data we have on observed training and later outcomes.

In this report we aim to explain the contribution that longitudinal data may make to understanding how training affects progress in employment. The overall aim is to explore the connections between skills/training, on the one hand, and retention and advancement in employment, on the other. This requires longitudinal data (data about the same people over a period of time) to examine the consequences of undergoing training of various kinds. Longitudinal data provides the ability to track earnings progression over time, work histories, and to measure levels of, and changes in, education, skills and training.

4.2 Results for 2007

The smaller sample size of the British Household Panel Survey (BHPS) makes it less suitable to any analysis of the contemporary situation than the Labour Force Survey (LFS). Its strength is longitudinal. Nevertheless, some descriptive analysis will help to confirm that it conveys the same sets of relationships as the LFS.

In the BHPS since 1998, the training question asked of respondents was *'Have you taken part in any training schemes or courses at all since September 1st* [last year] *or completed a course of training which led to a qualification? Please include part-time college or university courses, evening classes, training provided by an employer either on or off the job, government training schemes, Open University courses, correspondence courses and work experience schemes'*. Before this question is asked, the respondent is asked about any full-time education provision they have received in the past year, and asked to exclude any such formal education when answering this question about training.

This is a somewhat different question from the LFS, including some aspects of formal education – but the **emphasis** is very clearly on training, mentioned in the first sentence of the main question (the latter clarification does indicate that more generic training is also included). As we show in Table 4.1, training provision tends to be lowest among those over 50, and is rather higher among the young. The BHPS figures, which we show separately for those in paid work, also confirm the LFS finding that women are more likely to undergo training than men. This provides further confirmation of the figures from the LFS. Of course, these simple figures by age do not control for different characteristics of employers or the individuals concerned.

Table 4.1 Participation in training, all aged 16-69, in 2007/08

Cell percentages

Training in the last year	16-19	20-29	30-39	40-49	50-59	60-69	All
All respondents aged 16-69							
All	20	29	26	28	18	8	22
Men	21	26	27	27	16	9	21
Women	20	31	26	28	20	8	23
TOTAL (weighted base)	*934*	*1,814*	*2,132*	*2,507*	*2,134*	*2,045*	*11,566*
TOTAL (unweighted base)	*1,015*	*2,059*	*2,390*	*2,564*	*2,092*	*1,817*	*11,937*
Sub-sample: Workforce (employees, self-employed and unemployed)							
All	31	32	28	30	22	16	27
Men	33	29	27	28	19	13	25
Women	28	36	29	32	26	21	30
TOTAL (weighted base)	*347*	*1,442*	*1,812*	*2,201*	*1,619*	*718*	*8,139*
TOTAL (unweighted base)	*358*	*1,588*	*2,016*	*2,174*	*1,565*	*572*	*8,273*

Source: BHPS wave 17 (2007-08). All aged 16-69. Weighted by qxrwtuk1.

We also identify the same kind of link between training and the type of organisation being worked for – with less training in the private sector than in either the public sector or the third sector (see Table 4.2). Rates of training appear highest in local government, and for those working in the non-profit sector or 'third sector'.

Table 4.2 Participation in training, all aged 16-69, in 2007/08

Cell percentages

Training in the last year	Private	Civil service	Local Government	NHS	Non-profit	Other	All
Base = employees							
All	25	33	42	37	41	29	30
Men	26	30	37	33	34	27	27
Women	24	35	44	38	44	31	32
TOTAL (weighted base)	*4,431*	*304*	*1,028*	*564*	*273*	*213*	*6,813*
TOTAL (unweighted base)	*4,498*	*309*	*1,072*	*610*	*265*	*200*	*6,954*

Source: BHPS wave 17 (2007/08). All aged 16-69. Weighted by qxrwtuk1.

4.3 Analysis of changes in hourly wages 2006/07

In this section we provide some simple descriptive analysis to illustrate some of the main principles of the modelling approach we take later. We look at changes between the last two waves of the BHPS, those waves starting in 2006 and 2007. We explore the characteristics associated with changes in hourly earnings between these interviews, focusing on the role of training.

4.3.1 Wages in 2006

Median hourly wages rates grew by 4.3 per cent between the 2006 and 2007 BHPS interviews in money terms, for those respondents working at both waves. The median growth in hourly earnings was five per cent where a respondent had received some training[13], and four per cent otherwise. As we show in Table 4.3, the rate of growth was higher where training was received, irrespective of the level of wages in 2006. Generally speaking, wages rose fastest at the lower end, and most slowly for higher earners, But within each band of earnings, here shown in deciles, faster increases in wages were associated with undergoing at least some training in the year before the 2007 interview. For example, in the fifth decile, wages rose by five per cent, year-on-year for those who did some training, and by 4.1 per cent for those on the same levels of wages who did not receive any training. This gap, with higher wage increases for those receiving training, became much smaller in the top fifth of the distribution of earnings. However, as indicated

[13] See the BHPS question in Section 4.2. The interviewers were also instructed to exclude leisure courses but include continuing courses started.

in the text under the table, only the changes in deciles 5 (for both genders) and in genders 1 and 7 (for men) show statistically significant differences in wage growth compared with those who were trained with those who were not.

Table 4.3 Changes in hourly money earnings 2006/07, by decile and training received

			Percentage changes in hourly money pay 2006-07	
Decile of hourly pay rate, in 2006 (those in work)	**Group – whether received training in between surveys**	**Unweighted base**	**Median**	**Mean**
1 (lowest)	Some training	90	8.0	79.6
	No training	297	8.3	51.6
2	Some training	136	7.0	14.0
	No training	461	3.4	12.7
3	Some training	140	8.3	13.4
	No training	396	5.2	10.4
4	Some training	161	7.3	11.9
	No training	479	5.5	9.4
5	Some training	199	4.1	10.0
	No training	482	5.0	9.1
6	Some training	181	7.8	10.2
	No training	408	4.3	8.7
7	Some training	172	3.4	13.9
	No training	446	2.7	5.2
8	Some training	216	3.6	5.4
	No training	444	3.2	5.9
9	Some training	198	2.9	4.4
	No training	416	2.9	2.9
10 (highest)	Some training	136	2.7	4.3
	No training	313	2.5	3.3
All	Some training	1,629	5.0	13.3
	No training	4,142	4.0	10.8
All – grand total		**5,771**	**4.3**	**11.8**

Base: those with some earnings in 2006 and 2007, and reporting a main status of employed or self-employed in 2006. Statistical significance: taking the mean changes, only the results for decile 7 for men, and decile 9 for women, are statistically significant ($p < 0.05$) based on t-tests (for mean changes). For median changes, and using Mann-Whitney U test, the statistically significant changes were for men in decile 1; decile 5 both genders; and decile 7 for men.

An important lesson from this analysis is that wages at the lower end of the labour market may be quite unstable. It may be that wages are being mis-measured to some degree. Alternatively, there may be some element of 'regression to the mean' in looking at wage changes over time. In other words, there are some extreme values at any point in time that will tend to be less extreme when the same individuals are observed later (see Bland and Altman, 1994). Nevertheless, within most (but not all) deciles of earnings, those receiving training went on to have higher median earnings growth than those who did not. Controlling for initial earnings, receiving training was generally associated with higher later earnings than for those who did not receive training in the past year.

However, this was perhaps less clear among some of those on lower earnings, where the receipt of training was not always associated with any earnings gains above those who did not receive any training. Some of those in the lowest hourly earning decile in 2006 went on to have very large increases in earnings in the next year, so that the increases in the mean far outstrip the changes in the median. It is plausible that some of the lowest earners are there on a temporary basis, with earnings below their usual level, or perhaps such incomes are mis-measured as being lower than they really are. Moreover, we might expect more rapid wage progression among some younger workers in the early stages of their careers.

4.3.2 Age group

A similar analysis to the above shows results by age group. The highest increases in hourly earnings between 2006 and 2007 were achieved by young people, those aged between 16 and 34, and especially those at the younger half of this range (Table 4.4). This may be partly reflecting an overlap with the groups of lower earnings, particularly at the very bottom of the earnings distribution, some of who experience quite rapid earnings growth in their early career.

For most age groups – though not all – the rate of wage increase was raised if they had undergone a period of training. Among men aged 16-24, for instance, wages rose by some 20 per cent where training was provided, compared to 12 per cent (still an impressive increase) where no training was undertaken. Conversely, for women of the same age there was no premium associated with having a period of training. Only women aged 16-24, and over 55, failed to see any wage premium through having training. For the age groups in between, a spell of training was associated with women's wages increasing more quickly than in the absence of training. However, it is only fair to point out that the margin of the gain to training was often rather small, generating a wage increase only a few percentage points higher than in the absence of training. In the note under the table we clarify that most of the differences in wage changes, comparing those who took training with those who did not, are not statistically significant. Those changes that were statistically significant were for men aged 35-44 and 55-59.

Table 4.4 Changes in hourly money earnings 2006/07, by age, gender and training received

Age group	Whether received training in between surveys	Unweighted base	Percentage changes in hourly money pay 2006/07			
			Median		Mean	
			Men	Women	Men	Women
16-24	Some training	214	17	7	34	12
	No training	427	11	8	22	20
25-34	Some training	400	6	7	20	12
	No training	926	7	5	14	8
35-44	Some training	527	6	4	16	8
	No training	1,210	4	3	13	9
45-54	Some training	379	3	4	2	7
	No training	1,020	3	4	4	12
55-69	Some training	155	5	2	39	3
	No training	637	3	3	16	5
All	Some training	1,675	6	5	19	9
	No training	4,220	4	4	13	10
All – grand total		5,895	14	10	5	4

Base: those with some earnings in 2006 and 2007, and reporting a main status of employed or self-employed in 2006. Statistical significance: for mean changes the only statistically significant change was for men aged 35-44 ($p<0.05$). For median changes, the only statistically significant changes were for men aged 35-44 and men aged 55-69 ($p<0.05$).

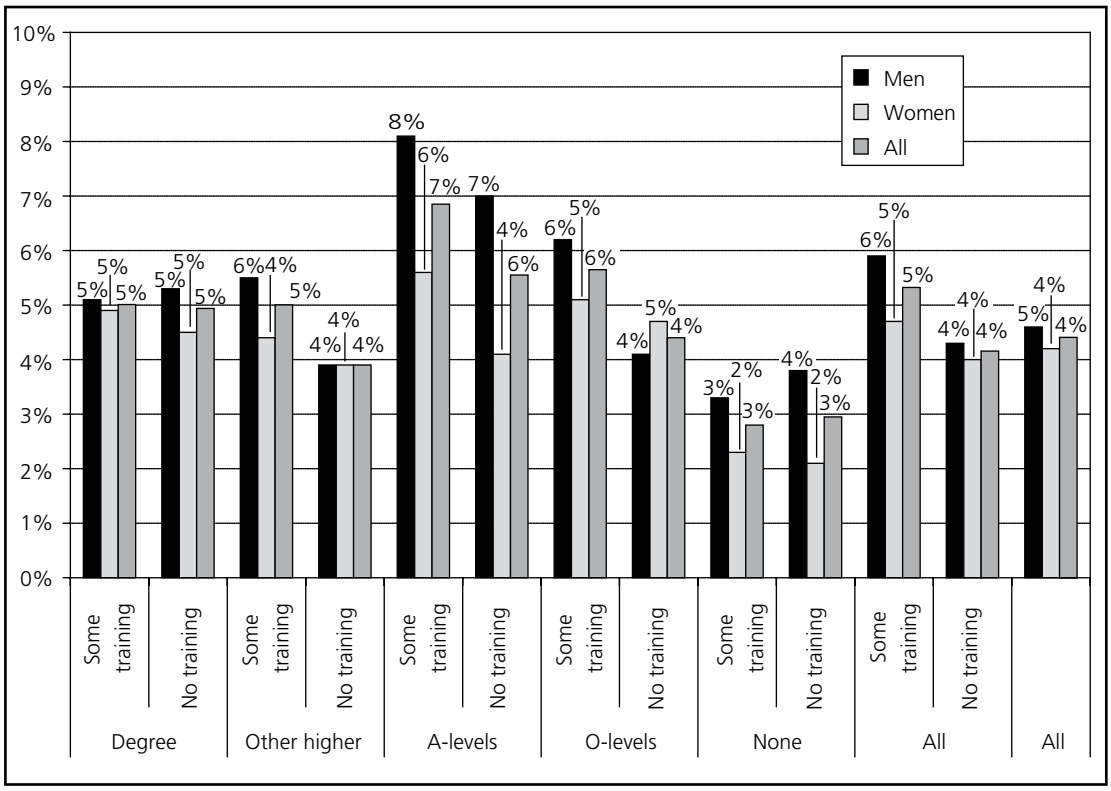
4.3.3 Existing qualifications

Next we consider the growth in hourly earnings, controlling for the starting qualifications of respondents. While earnings are positively correlated with higher educational qualifications, the rate of growth of earnings was actually highest for those with level 2/3 qualifications in the form of O-levels and A-levels (and their equivalents). This is likely to be reflecting, in part, more rapid wage growth occurring at younger ages. It is generally well-established that the overall rate of return is generally greatest with higher level qualifications: these figures are based on the incremental change in earnings when groups with different qualifications then acquire more training.

Rates of earnings increase were lowest among those with no qualifications, a group that is more likely to contain older workers. As shown in Figure 4.1, for those with A/O levels, rates of increase were somewhat higher for those who had received training, compared to those who did not. For men with A-levels, training in the past year was associated with an increased hourly wage 8.1 per cent higher, compared with 7.0 per cent for those with A levels who did not receive training.

Among all women respondents, the corresponding figures were 5.6 per cent (trained) and 4.1 per cent (no training in past year).

Figure 4.1 Wage change following training, by qualifications and gender



4.4 Chapter summary

In this report we aim to explain the contribution that longitudinal data may make to understanding how training affects progress in employment. This chapter has explained some of the difficulties of estimating the effect that a period of training might have on later wage growth. It is likely both that higher earners receive more training than lower earners, and that training leads on to higher earnings – in other words that there are important causal links running in both directions.

To attempt to estimate the link between training and wages it is necessary to follow the same people over time – such as with the BHPS. We give some two-wave examples of looking at how training may affect the rate of wage growth. And for most age groups – though not the youngest – the rate of wage increase was raised if they had undergone a period of training

This sets the scene for the multivariate analysis in Chapters 5 and 6 that extends the analysis into many waves of data and not a simple two year perspective.

5 Modelling longitudinal changes in wage progression linked to training

5.1 Introduction

In this section we build upon the descriptive analysis of the previous chapter, and set up multivariate regression models of the association between undergoing some training and the level of hourly wages. We start with a simple linear regression model which links the receipt of training of any kind (in the past year) to the current hourly wage level, so we may investigate whether higher wages are associated with having received training. The limitations of such models, which are more appropriate with snapshot data rather than with data on the same people over time, means that the results are likely to overstate the effects of training. Therefore, this provides an upper limit on the size of the effect we are investigating.

We also estimate quantile regression models to consider if the effects are the same when looking at the conditional **median** change, rather than the mean which is modelled by a standard linear regression. We also look at the upper and lower ends of the distribution of earnings, to see if the effect of training is different at higher and lower levels of earnings. This should help us to answer whether training leads to higher wages (progression) for lower earners, or only for higher earners, or if the effect is the same no matter what the level of earnings being considered.

A further section, however, explains that a better approach to capturing the effect of training is through a so-called 'fixed-effects' specification. This generates rather lower estimates of the effects of training, mostly by using each person as their

individual control group – so that the effects of motivation and unmeasured skills are incorporated. The effect of training on wages is higher, however, when the focus is on finger-grained measures of training – such as whether it is employer-provided – rather than the more standard use of a simple yes/no for having received training in the previous year.

5.2 Linear regression estimates of the training effect on hourly earnings

Linear regression estimates for the association between training and hourly wages are shown in Table 5.1. Results are shown separately for men and women.

Three models were developed, to show the association between training and wage growth, and how much of it may be the result in differences in personal characteristics. In the first model we look at training, and at differences in age (also including the square of age to allow for non-linear effects between age and wages). The second model contains a much richer set of control variables, including work experience and qualifications, following a fairly standard 'Mincer-style' specification of the wage equation based on human capital theory (Mincer, 1974). This means including in the models information on qualifications, and on work experience (including years of work experience, squared, as is standard).

A third specification of the models then uses information not only on training in the past years, but also on training in the year before that. This is in addition to a full set of economic and demographic characteristics. The point of including training from more than a year ago is to make some allowance for the effects of training to take longer to feed through to affecting hourly wages.

In these models, the reported numbers represent the increase in wages received by those who had been trained in the previous year, over and above that received by those who did not undergo a period of training in the previous year.

In the simplest models, training in the preceding year is associated with an 11 per cent increase in wages for men, and closer to 15 per cent for women. Training is included as a 0/1 term (a 'dummy variable' or 'indicator variable') with the value 1 indicating that training has been received in the last year, and the value zero that it has not. But these models control only for age. When a fuller set of control variables is included, the gains to training fall to four per cent for men, and closer to three per cent for women. These numbers indicate that what might appear to be the effect of training is actually due to differences in characteristics – such as working for the public sector, having higher level qualifications, and so on. Even so, this is still an imperfect set of controls, and the fixed-effects models shown later do more to control for unobserved individual characteristics that persist across time.

Table 5.1 Effects of training on hourly wage rates – linear regression results

	Training coefficient reported	
	OLS	
Model – set of controls used	**Men**	**Women**
Age, age-squared	11.2***	14.4***
Age, age-squared, qualifications, sector/industry, hours-worked (and squared), marital status, experience[1] (and squared)	4.3***	2.9***
With full range of controls from cell above, plus new independent (dummy) variable for training: trained either last year or the previous year	5.0***	4.0***
Unweighted sample sizes		
Person years observed	*36,224*	*40,200*
Different individuals	*7,580*	*8,504*

All models have controls for year. Source: British Household Panel Survey (BHPS) 1998-2007.
*** p < .001, ** p < .01, * p < .05.

[1] The variable for experience captures the time spent in the current spell of paid work, across different jobs.

In the final row of Table 5.1 we include information from training in the previous wave. This serves to increase the observed effect of training. This may indicate either (a) that past training takes some time to filter through to wages, or (b) that there may be some importance to a pattern of training provision whereby regular training is needed for a career to progress. We explore these points further in Section 5.4.

In addition to average growth in wages, it is potentially important to consider changes at all parts of the earnings distribution. So, any analysis might look separately at lower-skilled and other groups of key interest (including members of ethnic minorities, those with experience of unemployment, older workers). Results for these groups may turn out to be somewhat different from the aggregate results.

5.2.1 Regressions looking at the median and higher/lower earnings

Regressions are largely based on looking at outcomes at the mean, rather than at what might be happening separately for higher or lower earners. To examine the implications for those away from the average, we need to use an alternative method – known as quantile regression (Koenker and Bassett, 1978). This is an approach that shifts attention away from the conditional-means of classical regression, to the conditional-median (and the full range of quantiles). It may therefore be useful in considering changes at different parts of the earnings distribution, including at the bottom end where policy interest may be greatest,

and also at the higher levels of earnings. Key results (the effect of training on hourly earnings) from just such a quantile regression approach are listed in Table 5.2. The annex to this chapter shows the results in more detail.

Despite the attractions of taking a quantile approach, robust to outliers and looking at higher and lower earners, the kinds of results generated remain relatively similar to the standard linear regression model. The model for the median wage increase is quite close to the regression results above, which 'predict' the mean rather than the median outcome. This does tend to imply that the effect of training on wages, to the extent that it occurs, is present across the wage distribution and not concentrated on lower or higher earners (or middle-earners).

Table 5.2 Effects of training on hourly wage rates – quantile regressions

	At 25th percentile		At median		At 75th percentile	
Model – set of controls	**Men**	**Women**	**Men**	**Women**	**Men**	**Women**
Age, age-squared	12.4***	15.0***	12.3***	17.3***	10.0***	16.2***
Age, age-squared, qualifications, sector/ industry, hours-worked (and squared), marital status, experience, experience^2	5.1***	2.7***	4.8***	3.9***	3.7***	3.0***
With full range of controls listed in above cell, plus new independent (dummy) variable for training: trained either last year or the previous year	5.7***	3.7***	5.3***	4.9***	4.7***	3.9***
Unweighted sample sizes						
Person years observed	*36,224*	*40,200*	*36,224*	*40,200*	*36,224*	*40,200*
Different individuals	*7,580*	*8,504*	*7,580*	*8,504*	*7,580*	*8,504*

Source: BHPS waves 8-17.

All models have controls for year. *** p < .001, ** p < .01, * p < .05.

5.3 Tackling the selection issue

An important and challenging aim of research linking training with employment outcomes is to attempt to establish the causality of the relationship. This is because of the possibility that undergoing training may be **endogenous**. Those who add to their skills through training may have been the most job-ready, or ambitious, or different in some other way to those who did not. We may attempt to control for observed differences using a range of multivariate (regression) techniques. However, to make causal statements we need to be aware of the potential for **unobserved** differences between those taking training, and those who do not.

5.3.1 The fixed-effects model

The basic idea of the fixed effects model is to capture information on individuals that is unobserved, by making comparisons with the same individual over time. According to Allison (2009: 1), *'The basic idea is very simple: Use each individual as his or her own control'*. These models rely on looking at the differences in earnings at the individual level in response to changes in training for those individuals – rather than differences in earnings across individuals.

One may think of a simple model where one compares growth rates in wages between two points of time, for workers who received and did not receive training. The focus is on growth, with the assumption that unmeasured differences between the trained and the untrained are captured by the initial level of wages. This is a simple form of what is known as a fixed-effects model. It is assumed that the initial wage, in such models, captures sources of unobserved variation and so the focus is on change over time (see Bassanini *et al.*, 2005; McKay and Sadler, 2009, for further details).

In Table 5.3 we contrast the fixed-effects estimates with those from a standard linear regression. It is clear that the estimated effects of training are much reduced in the fixed-effects model: training is associated with an increase in wages for women of about 1.8 per cent – which might increase a wage of, say £6 per hour to become £6.11 per hour (assuming no growth in wages for those not having training). Among men, the change was smaller (0.5 per cent) and not statistically significant. No doubt a small change, as for women, is better than no change, but changes of this magnitude are clearly unlikely to transform a person's fortunes.

Estimates roughly double, however, when the previous two years are considered rather than the year preceding the interview. In Section 5.4 we explore the timing issue in more detail.

Table 5.3 Effects of training on hourly wage rates – OLS and fixed-effect estimates

	OLS		Fixed-effects	
Model – set of controls	**Men**	**Women**	**Men**	**Women**
Age, age-squared	11.2***	14.4***	0.4 ns	0.7 ns
Age, age-squared, qualifications, sector/industry, hours worked (and squared), marital status, experience, experience^2	4.3***	2.9***	0.1 ns	0.1 ns
With full range of controls as listed in cell above, plus new independent (dummy) variable for training: trained either last year or the previous year	5.0***	4.0***	0.5 ns	1.8***
Unweighted sample sizes				
Person years observed	*36,224*	*40,200*	*36,224*	*40,200*
Different individuals	*7,580*	*8,504*	*7,580*	*8,504*

Source: BHPS waves 8-17.

All models have controls for year. *** p < .001, ** p < .01, * p < .05. ns – not statistically significant.

In most of this report we have used a simple conceptualisation of training (whether received, or not, in the past year), in line with most econometric research in this area. In Table 5.4 we show the effects of using alternative measures of training. These look at whether the employer paid for the training fees, if training was either at the workplace or an employer training centre, and if at least four separate instances of training were recorded in the past year. These help to either narrow down the scope of training (to focus on employer-provided training) or to extend the time horizon.

A number of these measures are associated with greater effects of training on hourly wages. In particular, rather than an effect of 0.5 per cent, where the course was explicitly employer-funded or employer-provided, the size of gain was closer to two per cent (1.5 per cent for men, and 1.9 per cent for women). Where a person had four or more training courses in the previous year, a small group, the wage effect was well over two per cent.

Table 5.4 Effects of training on hourly wage rates – alternative definitions of training, fixed-effects models

	Coefficients on having had training of different kinds	
Model – full set of controls, dummy variables for those listed, below	**Men**	**Women**
Any training	0.5 ns	1.8***
Employer paid fees for course	1.5**	1.9***
Training at workplace, or employer training centre	0.8 ns	1.9 ***
4+ training episodes reported in last year	2.7*	2.2*
Unweighted sample sizes		
Person years observed	*36,224*	*40,200*
Different individuals	*7,580*	*8,504*

*** p < .001, ** p < .01, * p < .05. ns – not statistically significant.

We also look at some other ways of including training of different types in models of this kind – but generally did not find any statistically significant results. There were no effects from looking at the reasons for taking each course (e.g. to improve skills in job, or more generally). Perhaps surprisingly, there was no positive effect from having a training course that was designed to lead to a qualification, nor from longer courses in general. These factors might be linked to more personal reasons for taking such courses, or perhaps take longer to feed through into job advancement. These findings run counter to the study in Germany by Muehler, Beckmann and Schauenberg (2007), who found a significant positive effect from general training (a five to six per cent increase in wages) but no effect of firm-specific training on wages. This may be reflecting the German training system which provides incentives for most firms to develop training.

5.3.2 Other approaches to the selection issue – actual and expected training

This issue of having an appropriate comparison group is pursued by Leuven and Oosterbeek (2008). They argue that those who received training should be compared with those who were motivated to be trained, but who (owing to some random event) did not attend those training courses. Their point is: *'to narrow down the comparison group to those non-participants who did not participate due to some random event'* (Leuven and Oosterbeek (2008: 425). To identify this group they use specific survey questions that ask (a) whether there was any training that the respondent wanted to attend, but did not[14] , and further (b) the reason for non-participation, including more random events such as sickness. They argue that those giving a positive answer to the first, and describing a random event for the second, are the most appropriate comparison group for those actually

[14] The question was: *Was there any course/training related to work or career you wanted to follow but did not during the past 12 months?*

undergoing training. It is, however, noteworthy that the sample size was only 77 respondents for the more tightly drawn comparison group (this analysis by Leuven and Oosterbeek (2008) uses a relatively small Dutch survey data from 2001).

There are questions in the BHPS that permit a reasonable replication of such an approach, and using a contemporary sample for the UK. BHPS respondents are asked:

> *I am going to read out a list of things which you may or may not want to happen to your current employment situation. For each one can you please tell me whether you would like this to happen to you in the next twelve months. Would you like to* […]
>
> *b) Take up any work related training?* […]

Respondents identifying any particular things they would like to happen are then asked, for each event:

> *Do you think this actually will happen in the coming twelve months?*

This questionnaire meets much of the first part of the comparison group idea of Leuven and Oosterbeek (2008), and may be used to shed further light on the role of selection on the estimated wage gains from training. For the BHPS data, there was not a very close fit between the expectation of training and actually receiving it. Of those who said in the previous year (that we might call time 't-1') that they expected to be trained, at time *t* only 45 per cent reported having received any training. This compares with 17 per cent who received training despite predicting that they would not receive any training. This gives us a very large group who expected to be trained, but did not – accounting for over 15,000 person-years of data. However, it also shows only a limited correspondence between the expectation of training and the reality of having it provided.

Following Leuven and Oosterbeek (2008) we restrict attention to those who expected to receive training, as this is recoded within the BHPS – their study instead captured people who **wanted** to follow a course of training rather than expecting to be trained. The argument is made by Leuven and Oosterbeek that a comparison group based on those wanting to be trained is better than all of those who did not get trained. It is unclear whether those **wanting** to be trained, or **expecting** to be trained, makes for a better comparison group. But each should be an advance on simply looking at the untrained, irrespective of motivations and expectations.

In the analysis already presented, the most robust evidence in favour of an existing effect of training on wages has been found where the employer paid for the course. We now repeat the regression, but restricting attention to those who had expected to receive training in the subsequent year. As we show in Table 5.5 this acts to significantly reduce the estimate effect of training on wages. Even using the measure of training most associated with a positive effect – employer-funded training – we did not find a statistically significant effect of training on wage progression.

Table 5.5 Effects of training on hourly wage rates – fixed-effects models, training defined as employer-paid training only

	Coefficients on having had employer-paid training	
Model – full set of controls, employer-paid training dummy variable	**Men**	**Women**
Whole sample (for comparison)	1.5**	1.9***
Restricted to those who expected to receive training in the last year	0.0 ns	0.5 ns
Unweighted sample sizes (those who expected to received training in the last year)		
Person years observed	*9,219*	*10,129*
Different individuals	*3,592*	*3,945*

*** p < .001, ** p < .01, * p < .05. ns – not statistically significant.

This approach to estimating the gains from training is relatively new, and untested outside of the analysis of Leuven and Oosterbeek (2008) using one small Dutch study. This research, using the much larger BHPS, also finds that using this control group eliminates any observed wage progression effect from training.

5.4 Varying the time period between training and wage effect

In most of the analysis above we have, like past econometric studies, looked at the short-term gains in earnings from any course of training. The models look at current earnings according to any training received in the previous 12 months. Given the nature of annual panel data this is a natural way to proceed.

We have extended this model to account for any training received either in the past year, or in the year prior to that. This is an important extension, and it has showed a larger effect of having training. In the models we looked at whether training had been received in either of the past two years, and this found statistically significant effects in the fixed-effects models – even for men, where there was no such effect when looking at training in the previous year.

It is possible to look further back in time, with the caveat that the longer the time lag used, the fewer the number of data points that will be available. For instance if we have five years of data, and want to look at characteristics from three years before, then the first two years of data will necessarily need to be discarded. This puts a practical limit on how far we may attempt to link current earnings (or other labour market states) with past training. The analysis presented in Table 5.6 tends to indicate that the effect of training may take some years to affect wages, for men, but the effect is rather more short term for women. The models are relatively simple in their treatment of time, looking at the receipt of any training over increasingly long periods of time. The longer the time horizon, for men, the greater the effect of training on earnings. The effects for women seem to be greatest where training was in the last two years.

Table 5.6 Effects of training on hourly wage rates – alternative definitions of timing of training[15]

	Coefficients on having had training of different kinds	
Model – full set of controls, dummy variables for those listed, below	**Men**	**Women**
Any training, last year	0.1 ns	0.8 ns
…last two years	0.2 ns	1.4**
…last three years	1.1*	0.7 ns
…last four years	2.3**	0.3 ns
…last five years	3.8**	1.7 ns
Sample sizes (people)		
Last year	7,580	8,509
Last 2 years	6,300	7,107
Last 3 years	5,774	6,528
Last 4 years	5,372	6,118
Last 5 years	5,039	5,754

Source: BHPS waves 8-17. *** p < .001, ** p < .01, * p < .05. ns – not statistically significant.

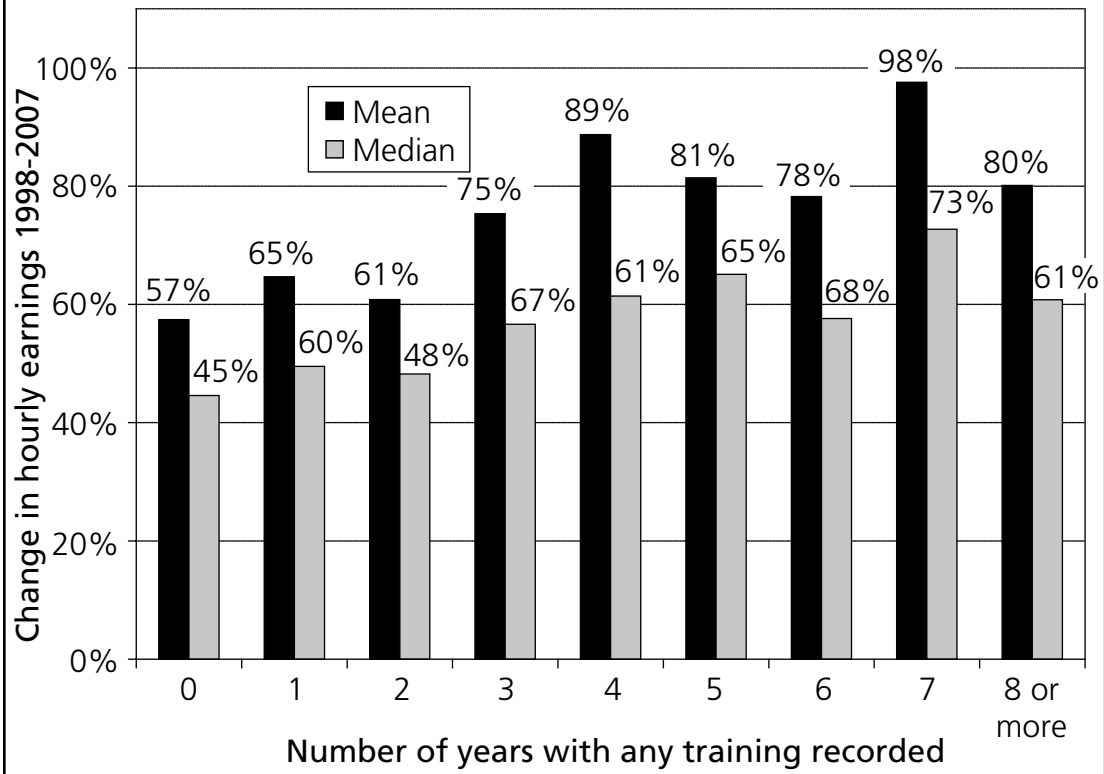
5.4.1 Training trajectories

Another approach to analysing panel data is to consider looking at different trajectories through both training and labour market states. This attempts to characterise the paths of individuals, rather than focusing on each person-year. A simple means of pursuing this idea is to select respondents from BHPS for the entire period 1998-2007, and examine wage growth by the number of years in which training was recorded. A summary of such an analysis is shown in Figure 5.1.

For those interviewed during this period, the overall rate of wage gain between 1998 and 2007 was greater, the more occasions on which training was reported. There was a fairly clear link, as training increased from none to being reported in at least four years, after which any gains appeared to reach a plateau. Even so, it is worth noting that those who reported no training still saw average wage growth of 57 per cent over this time period – compared with a near-doubling of hourly earnings for those receiving training in 7+ years.

[15] This table returns to using the whole sample, not (as in the previous section) only those who were expecting to be trained in the past year.

Figure 5.1 Wage changes 1998-2007, by number of years with any training recorded (out of maximum of ten)



Source: BHPS waves 8-17, ages 16-69, taking part in all ten waves. Differences between years of training are significant at the one per cent level.

5.5 Earnings and training following the transition from unemployment into work

Across the ten years of BHPS data being used, there was a total of 1,755 movements from unemployment into employment (relating to 1,617 making a transition, so there are some people making this transition more than once). Those who made this transition had median hourly earnings of £6.20, compared to a level of £8.20 for employees who had not moved from unemployment in the past year. Rates of training also differed among these groups. Of those who had moved into employment, from unemployment, 19 per cent received some training compared with 31 per cent among other employees.

In the following year, earnings grew by 2.4 per cent among those who had made the transition from unemployment to employment. This was very similar to the earnings growth of those employees who had not just moved into work, who attained annual earnings growth of 2.3 per cent (albeit from a higher base).

5.6 Results for families with children

We may support the results, above, by analysis of data from the Families and Children Study (FACS). This provides a particular focus on mothers raising children, including a much larger sample of lone mothers. These are groups of particular interest in terms of employment policy, and hence the particular focus on this group.

Unlike low-wage workers in the US where training programmes have limited effects (Andersson, Holzer and Lane, 2005), the effect of training on wage progression among these groups appeared to be both positive and statistically significant (see Table 5.7). Even within the fixed-effects model, which takes account of unmeasured differences, we found a positive effect of having had some training on wage progression – even if the effects were small. The analysis above suggests, however, that more narrowly defined training measures (employer provided, paid-for) typically generate larger results.

Table 5.7 Effects of training on hourly wage rates – FACS data (fixed-effects model)

	Coefficients on having had training	
Model – full set of controls, dummy variables for those listed, below	**Lone parents**	**Mothers in couples**
Linear regression	3.7***	2.6***
Fixed effects model	2.6**	1.3**
Unweighted sample sizes		
Person years observed	*5,959*	*18,101*
Different individuals	*2,413*	*6,525*

Source: FACS dataset. *** p < .001, ** p < .01, * p < .05. ns – not statistically significant.

5.7 Chapter summary

This chapter investigates the link between increased earnings and having been through a spell of training in past year (or longer). The analysis is based on BHPS and FACS data that tracks people over time.

In standard linear regression models, among men a spell of training was associated within higher wages (four per cent higher). Among women, in similar models training was correlated with wages that were two per cent higher. Using quantile regression we may investigate the association between training and **median** wages, rather than on mean wages as happens in standard models. However, the results were relatively similar.

What might appear to be the effect of training on wages is often largely due to differences in individual traits, though these figures include the effects of such differences. Fixed-effect models are the standard tool to investigate the association between the receipt of training, and the level of wages. The purpose of these models is to use individuals as their own control group in looking at changes in earnings and training. This provides a better estimate of the contribution of training to wage growth, as it controls for unobserved characteristics of individuals. Training is then associated with an increase in wages of about 0.5 per cent, measured over the period from 1998-2007. However, where the training received was explicitly employer-funded or employer-provided, the size of gain was a little under two per cent.

6 Training and job advancement and retention

Previous sections of the report have looked at wage progression – how far a change in training is associated with an increase in hourly earnings. The effects are often found to be small. In this section, we examine the associations between training and other (non-wage) changes in labour market status and in particular movements into and out of work. Previous research had found little effect of training on labour mobility between firms (Green *et al.*, 2000). Is training associated with a faster return to work (advancement) or a slower rate of work exit (retention)? This is the main question tackled in this section. We also look briefly at any resulting changes in people's job satisfaction, in Section 6.1.3.

6.1 Job advancement

In this section we look at movements into paid work, and examine whether training undertaken before finding a job made for a more rapid transition back into the labour force.

6.1.1 Movement into paid work

In Table 6.1 we show the proportion of different groups of those not in paid work who had returned to work the following year. Overall, during these ten years of British Household Panel Survey (BHPS), around 15 per cent of those not in work had returned to work the following year. The highest rates of moving into work were among those on maternity leave – who might, in any case, be considered to be part of the workforce. Leaving aside this special group, the next highest rates of return to work were found among those on Government training courses (46 per cent) or who were unemployed (36 per cent). Rates of moving into work were particularly low among those who described themselves as either retired (three per cent moving into work) or long-term sick or disabled (four per cent).

Table 6.1 Rate of movement into paid work, among non-workers

Row percentages

Initial job state, time *t-1*	*Unweighted base*	Move into work at time *t*	Unemployed at time *t*	Government training scheme at time *t*[1]	Inactive at time *t*
Unemployed	*3,760*	36	36	1	27
Retired	*9,834*	3	*	*	97
Maternity leave	*543*	74	3	-	23
Family care	*7,963*	14	4	*	82
Student	*5,934*	26	5	1	68
Sick or disabled	*5,212*	4	4	*	91
Government training	*227*	46	22	15	17
Other	*568*	34	9	1	57
All non-workers	*34,041*	15	7	*	77

P<0.001. BHPS waves 8-17, those aged 16-69. Note * indicates <0.5%, whilst '-' means no cases.

[1] The categories are self-defined by respondents, and are mutually exclusive (with only one response permitted per respondent).

We may now model the return to work using a wide range of data on personal characteristics, including educational qualifications, age and gender – plus of course any recent experience of training. The kinds of regression models available are similar to those described in earlier chapters, but need to take account of the dichotomous nature of the outcome variable – either returning to work, or not. Logistic regression models are the principal statistical approach in such circumstances.

The fixed effects specification is perhaps less useful than for linear models, as it drops individuals with no change in status within the range of years observed. This makes it more difficult to identify any statistically significant effects – and, indeed, with the fixed-effects model the effect of training on moving into work is not statistically significant.

Hence, in Table 6.2, we also report key results from a standard logistic regression and a specification based on a random effects model. Compared to the fixed-effects specification, the random-effects model also accounts for the clustering of observations within individuals, however it assumes that the effect for each individual is taken from a distribution rather than being fixed for each person (this also implies using up fewer degrees of freedom in the model). The fixed-effects approach emphasises that interest is in the sample observed, while the random-effects approach is interested in generalising more widely to the whole population of interest. The random-effects approach, for logistic regression models, obtains a larger sample size because it does not need to drop cases where there are no observed transitions, and indeed can include those who remain out of paid work throughout. Nevertheless, the differences in the report coefficients are relatively small.

These models provide reasonable evidence that the receipt of training while out of work, or being on a government training scheme (compared to inactivity), are associated with an increased likelihood of returning to paid work the following year. As we explained in section 3.5, if there was no effect of training, then the odds ratios would be close to the value 1.0. Higher values than this indicate a faster return to work associated with training, which is generally what we find.

Table 6.2 Effects on moving into paid work, from not-working

			Odds ratios
Model – with full range of controls	**Logit**	**Logit, fixed effects**	**Logit, random effects**
Received training in previous year (compared to no training)	1.32***	1.17 ns	1.37***
Status: on a government training scheme[1]	1.53*	1.51 ns	1.75*
Unweighted base	*33,511*	*8,675*	*33,511*

Source: BHPS waves 8-17. All models have controls for year. *** p < .001, ** p < .01, * p < .05. ns – not statistically significant.

[1] This coefficient shows the association between being on a government training course and the likelihood of moving into work, compared to an otherwise similar individual who is not looking for work.

6.1.2 Moving into paid work: families with children

Separate models were also run on data from the Families and Children Study (FACS) to look specifically at lone parents and at mothers living in families with dependent children. These are groups of particular interest, as work is generally the most appropriate means for such adults (and their children) to escape poverty.

Among lone parents, 16 per cent of non-workers joined the labour market each year, compared with 23 per cent for mothers in couples. Among lone parents the rate of starting work was 12 per cent among social tenants, but 31 per cent among those buying a house on a mortgage. Likewise there was a strong link between having higher qualifications, and moving back into paid work.

In standard logistic regression models, undergoing a spell of training increased the odds of returning to work to 2.3 among lone parents, and to 1.3 among mothers in couples. Both results were highly statistically significant. This reduced to an odds ratio in favour of returning to work of 1.4 for lone mothers ($p<0.05$) in a fixed effects model, and was not statistically significant for couples – but on the basis of many fewer observations since non-changing cases are dropped in such models.

6.1.3 Analysis of satisfaction with job, 2006->07

The economic and econometric literature has focused on changes in wages as a key measure. But there are other outcomes that may be of interest. In this section we look at the links between training and changes in job satisfaction. As we show in Table 6.3, between 2006 and 2007 two-thirds of workers in the BHPS reported the same level of job satisfaction , with the remaining third evenly divided between increased and decreased levels of overall job satisfaction. Interestingly, those who received training were both more likely to report an increase in job satisfaction, and more likely to report decreased job satisfaction.

Table 6.3 Changes in satisfaction with job (as employee) 2006/07, by training received

Column percentages

Satisfaction with job, 2006/07	Training, 2006/07	No training, 2006/07	Total
Increased	25	15	16
No change	53	70	67
Decreased	22	15	16
Unweighted base	*2,342*	*10,755*	*13,097*

Base: employees in 2006 and 2007 (BHPS data).

Table 6.4 makes a comparison between all forms of training, and those receiving training at their workplace (or an employer training centre). This is shown, in the next section, to lead to higher than average increases in hourly wages. How does this affect job satisfaction?[16] In fact this kind of training was associated with an even higher degree of change – 29 per cent increasing their level of job satisfaction, while 23 per cent reported reduced levels.

[16] Workers are asked to rate their job satisfaction on a scale from 1 (not satisfied at all) to 7 (completely satisfied). About half give a '6', and a further quarter a '5' – indicating that employees are generally satisfied with their jobs, overall. Only one per cent responded with a '1', in 2007.

Table 6.4 Changes in satisfaction with job (as employee) 2006/07, by type of training received

Column percentages

Satisfaction with job, 2006/07	Employer[1] training, 2006/07	Other training, 2006/07	No training, 2006/07	Total
Increased	29	22	15	16
No change	48	57	70	67
Decreased	23	21	15	16
Unweighted base	*1,004*	*1,338*	*10,755*	*13,097*

Base: employees in 2006 and 2007 (BHPS data).

[1] Defined here as training conducted at the employer, or an employer training centre.

It is not possible to unpick the reasons for this apparent diversity of experience without further investigation. In particular, which groups of workers are the most and least likely to report lower job satisfaction. It may be that while training raises job satisfaction for some workers, for others it merely raises expectations that cannot be met. Or perhaps additional training is a prelude to a change of job, from a less than satisfactory job. It is not possible to address this question in this report, but it provides a reminder that the reported 'benefits' of training may not always be as positive as might be imagined.

6.2 Job retention

6.2.1 Results from the BHPS

Broadly speaking, training (participation in training in the last year, variable 'trainD') significantly reduces the risk of exiting employment into either unemployment or becoming economically inactive, controlling for age, age squared, and year. A value of 1.0 would indicate no effect, while lower values show a greater effect on the risk of leaving employment. The size of effects are quite similar, even after controlling for background information, and between women and men. There is a strong and statistically significant effect, whereby those receiving training in the previous year are less likely to leave employment. We return to the fixed-effects specification of this model, and this finds relatively large effects of training on job retention.

Table 6.5 Effects of training on the annual risk of exiting employment (for 1997-2008)

Odds ratios

	Fixed-effects (odds ratios)	
Model – set of controls	**Men**	**Women**
(1) Age, age-squared	0.5 ***	0.5 **
(2) Age, age-squared, qualifications, sector/industry, hours-worked (and squared), marital status	0.6 **	0.5 ***
(3) With full range of controls listed in above cell, plus new independent (dummy) variable for training: trained either last year or the previous year	0.6 **	0.7 ***
Unweighted base	*34,630*	*33,294*

Source: BHPS waves 8-17. All models have controls for year. *** p < .001, ** p < .01, * p < .05. ns – not statistically significant.

We also modelled different types of training including different reasons for undertaking training. Overall, training that took place at the workplace, or was paid for by employers, and a sequence of at least four training courses all had positive significant effects in reducing the risk of exit from work. The greater number of training episodes also increases the odds of retention and the effect is stronger for men than for women. However, whether training was part of a qualification was statistically significant for women but not for men.

Table 6.6 Effects of training on the risk of exiting employment: alternative definitions of training

Odds ratios from fixed effects logits

Model – full set of controls, dummy variables for those listed	**Men**	**Women**
Any training	0.6 **	0.7***
Employer paid fees for course	0.3**	0.5***
Training at workplace, or employer training centre	0.6 **	0.5 ***
Reasons for training – increase skills in current job	0.9 ns	1.1 ns
Reasons for training – improve skills in current job	0.4 **	0.5 ***
Reasons for training – was for, or part, of a qualification	0.8 ns	0.8 **
4+ training episodes reported in last year	0.1*	0.5*
Unweighted base	*34,630*	*33,294*

Source: BHPS waves 8-17. All models have controls for year. *** p < .001, ** p < .01, * p < .05. ns – not statistically significant.

6.2.2 Risk of exiting employment for the recently employed

As we discussed in Section 5.5, the BHPS enables us to track the progression of those who have recently moved into employment from having been unemployed in the previous year. A year later, three-quarters (75 per cent) are still classified as employees, compared with a very similar 78 per cent of existing employees. However, of those moving from unemployment to employment, some ten per cent then return to unemployment by the next wave of the survey, compared with only three per cent of employees who did not have to make the transition into work from unemployment the previous year.

6.2.3 Results for families with children

Taking all available FACS data from 1999-2005, lone parents in paid work in any given wave had a ten per cent chance of leaving work by the following wave. Among mothers in couples an average of eight per cent stopped working, wave-on-wave. The chances of stopping work reflect various measures of disadvantage. The risk of stopping work, among mothers in couples with children, was 16 per cent for those living in social housing, and 15 per cent for private tenants, compared with only six per cent among those with a mortgage ($p<0.001$). Among lone parents there were similar patterns, with the rate of job exits reaching 20 per cent among social tenants, and 15 per cent for those living in the private rented sector. The rate of leaving work was also much lower among the higher qualified, being only three per cent for lone parents who were graduates.

How does the past receipt of training affect the proportion of those who leave work between waves? Where a lone parent had received training in the previous year, the risk of leaving employment was eight per cent – compared with 11 per cent for those who did not receiving any training. For mothers in couples there was a similar effect: a reduction of about two percentage points in the proportion of mothers in couples leaving employment each year. Both results were statistically significant.

We may take this a step further and examine whether training makes a difference to the risk of leaving employment, independently of other factors. As a dichotomous outcome (left work, or did not) the appropriate means of regression modelling is via a logistic regression model.

Regression analysis of the FACS data for 1999-2005 found that having received training did not affect the likelihood that lone parents would exit work. That risk was associated with age, qualifications and family size – but not having received training in the previous year. Among mothers within couples, however, a recent spell of training reduced the odds of leaving work by around 30 per cent, even after controlling for a wide range of other factors.

6.3 Chapter summary

Around 15 per cent of those not in work returned to work the following year (BHPS 1998-2007). The receipt of training while unemployed, or being on a government training scheme, was associated with an increased likelihood of returning to paid work compared to most groups. This also applied to families with children, the focus of FACS data, and especially to lone mothers.

Those employees in paid jobs, who received training, were both more likely to report an increase in job satisfaction, and more likely to report decreased job satisfaction.

Training also significantly reduces the risk of exiting employment into either unemployment or becoming economically inactive.

7 Key conclusions

In this report, we began with a number of key research questions. A number of analytical methods have been deployed, using three datasets, to address these questions. In this section we bring together some of the key conclusions relating to each of the main research questions. These concern the links between training and various forms of job advancement – moving into work, increasing earnings and remaining in work.

We would expect training to have an impact on productivity and hence on earnings. However, the return to some forms of training may be quite low (e.g. as part of induction, or to refresh knowledge, or if courses are relatively short). Moreover, employees who are more ambitious or who work longer hours may also choose to take more training courses than others. For such reasons it is, therefore, quite hard to identify precise estimates of the effectiveness of training. We have utilised different models and specifications of those models to try to counter such difficulties, and have used many more different measures of training that have previously been included in past studies.

7.1 Who undertakes training and how does progression, retention and advancement differ between and within key groups?

Analyses presented in Chapters 2 and 3 provide detailed information on the groups that are more likely to receive training, and track how that has changed over time (since the mid-1990s). Training is more likely to be received by younger people, women, public sector workers, in larger organisations, and in the first stages of any new job. The differential effect of training, compared to not receiving training, did not appear to differ strongly by age, gender or wage level. There is some suggestion that the effect of training was greater for women on median earnings and men on lower earnings, but these apparent effects were too weak to be statistically significant.

7.2 What are the benefits deriving from government-funded and privately-funded training and lifelong learning?

Provision of Government-funded training is associated with a faster rate of return to work (see Section 6.1). Detailed analysis tends to show that the most effective training (in terms of wage progression) is that provided and/or funded by employers (see Section 5.3). The effect of training often takes some time (2+ years) to affect wages, particularly it seems for men (Section 5.4).

7.3 Can training improve low-skilled workers' in-work progression?

Special statistical techniques were used to look at whether the effect of training on wages was different at different parts of the earnings distribution. There was no systematic difference (Section 5.2.1). Descriptive data tended to show a greater effect for lower earners, but this was not large enough to be statistically significant (Section 4.3.1).

7.4 Can we identify the relationship between undertaking training and gaining, retaining and advancing in employment?

This is the subject of Chapters 5 and 6. A previous report (McKay and Sadler, 2009) summarised the research literature in this area, particularly including the use of fixed effects regression models. While older studies found quite large effects, more recent studies using improved methods have found no effects of training on wages, or only very small effects. In this study, it was only possible to identify relatively weak effects of training on wages – albeit the effects are larger when looking at the receipt of training over a longer time period. However, there seemed to be important associations between receiving training and moving into work and on job retention, and possibly on job satisfaction.

7.5 Can we identify the impact of retention and advancement on investment in training?

This reverses the causal process of most of the rest of this report. This reverse causation is certainly possible, but the links between training and wage growth were found to be relatively weak. The kind of analysis depicted in Figure 5.1 shows that there may well be links in both directions, from training to advancement and progression, and then to training. There may be both positive and negative trajectories of training and changes in labour market status.

Appendix A
Chapter 2: Detailed tables and question wording

Detailed tables

Table A.1 Proportion of employees in training by region and gender

	Men	Women	Total
North East	26.3	33.1	29.7
North West	22.1	30.1	26.1
Yorkshire and the Humber	22.9	28.6	25.75
East Midlands	23.8	29.4	26.6
West Midlands	24.1	31.1	27.6
Eastern	20.7	27.3	24
London	23.2	29.4	26.3
South East	24.7	31.6	28.15
South West	26.1	32	29.05
Wales	24.5	35.5	30
Scotland	27.1	30.6	28.85
Northern Ireland	18	23.5	20.75

Source: LFS 2008 q1-q4, w1 and w5. Weighted by PWT07.

Table A.2 Training by hourly pay (£), age group and gender

	Has Training			No Training		
	Men	Women	Total	Men	Women	Total
16-19	5.27	5.34	5.3	5.67	5.7	5.69
20-29	10.38	9.74	10.06	9.41	8.71	9.08
30-39	15.76	13.24	14.48	14.23	11.43	12.93
40-49	17.36	12.74	14.74	15.07	10.73	12.97
50-59	16.88	12.97	14.66	13.87	10.27	12.13
60-69	14.61	12.45	13.55	12.18	9.54	11.09

Training by hourly pay (£) and gender			
	Men	Women	Total
Has training	14.17	11.81	12.93
No training	12.89	10.09	11.56

Source: LFS 2008 q1-q4, w1 and w5. Weighted by PWT07.

Table A.3 Training by hourly pay (£), qualification and gender

	Has Training			No Training		
	Men	Women	Total	Men	Women	Total
Degree or equivalent	19.15	16.19	17.57	19.62	15.52	17.75
Higher education	15.23	12.67	13.63	15.23	11.58	13.33
GCE A level	12.08	9.07	10.7	11.76	8.95	10.64
GCSE Grades A-C or equivalent	10.25	8.46	9.25	10.67	8.56	9.46
Other qualifications	10.52	8.9	9.78	9.71	7.97	8.97
No qualifications	9.09	7.44	8.2	8.47	7.07	7.8

Source: LFS 2008 q1-q4, w1 and w5. Weighted by PWT07.

Table A.4 Training by hourly pay (£), occupation and gender

	Has Training			No Training		
	Men	Women	Total	Men	Women	Total
High managerial, professional	21.64	19.73	20.91	21.82	18.68	20.91
Lower managerial, professional	15.8	13.91	14.71	15.5	12.9	14.19
Intermediate occupations	11.18	9.15	9.86	10.49	9.47	9.73
Lower supervisory and technical	9.98	8.16	9.39	10.49	7.51	9.35
Semi-routine occupations	7.81	7.05	7.3	10.02	6.84	7.3
Routine occupations	8.02	5.72	7.28	7.95	6.26	7.47
Never worked, unemployed	7.74	7.89	7.83	8.08	6.62	7

Source: LFS 2008 q1-q4, w1 and w5. Weighted by PWT07.

Table A.5 Proportion of employees in training by length of employment, sector and gender

	Public			Private		
	Men	Women	Total	Men	Women	Total
Less than 3 months	42.7	45.8	44.25	28.9	32.8	30.85
3 months but < 6	45.9	46.9	46.4	25.5	32.6	29.05
6 months but <12	40.8	46	43.4	26.2	29.3	27.75
1 year but < 2	46.4	45.5	45.95	24.8	27.6	26.2
2 years but < 5	40.7	43.3	42	22.4	25	23.7
5 years but < 10	40.4	40.6	40.5	18.3	22.4	20.35
10 years but < 20	38.1	39	38.55	17.2	18.2	17.7
20 years or more	34.9	39.5	37.2	15.4	16.6	16

Source: LFS 2008 q1-q4, w1 and w5. Weighted by PWT07.

Table A.6 Length of time with current employer and main place of training

	Length of time with current employer								
Main Place of Training	< 3 months	3 months < 6	6 months < 12	1 year < 2	2 years < 5	5 years < 10	10 years < 20	20 years +	Total
Premises belonging to employer	28.3	26.3	25.1	30.4	28.9	34.6	41.4	42.3	32.7
Premises belonging to another employer	4.0	2.4	4.3	2.3	3.3	4.9	7.9	5.8	4.4
Private training centre	10.4	6.3	10.9	7.8	10.5	12.2	12.5	12.5	10.7
Community Project				0.6	0.1	0.5	0.7		0.3
Government or LA training workshop	1.7	0.5	0.8	2.5	2.1	3.1	3.4	2.6	2.3
Information Technology Centre		0.5			0.1	0.2	0.4		0.1
At home (for example OU)	3.5	10.2	5.9	5.5	9.4	10.1	5.4	4.6	7.3
Open College	1.2	1.0	1.9	1.2	1.5	1.1	0.2	1.7	1.2
College of Further Education	24.3	23.4	25.3	25.7	15.9	9.4	6.7	5.5	15.6
University	16.2	13.2	13.1	16.0	14.6	10.4	5.4	7.2	11.8
Other educational Institution	2.9	3.9	5.6	2.1	3.6	2.9	3.2	3.8	3.4
None of these	7.5	12.2	7.2	6.0	10.0	10.6	12.7	13.9	10.0

Source: LFS 2008 q1-q4, w1 and w5. Weighted by PWT07.

Table A.7 Training by industry and gender

	Men	Women	Total
Agriculture and fishing	9.7	14.4	10.9
Energy and water	30.5	26	29.5
Manufacturing	19.1	17.8	18.8
Construction	18.6	16.5	18.4
Distribution hotels and restaurants	18.9	18.7	18.8
Transport and communication	18	21.6	18.9
Banking, finance and insurance	25.8	26.1	25.9
Public administration, education, health	41.9	41.7	41.8
Other services	19.4	22.9	21.2

Source: LFS 2008 q1-q4, w1 and w5. Weighted by PWT07.

Table A.8 Training by type of organisation

	Men	Women	Total
Public company, plc	30.6	28.5	29.7
Nationalised industry	19.4	25.4	21.3
Central government, civil service	35.6	35.3	35.4
Local government, police	40.8	40.9	40.9
University	31.5	40.2	36.5
Health authority, NHS	49.9	46.6	47.3
Charity, voluntary organisation	32.7	39	37
Armed forces	51.1	37.8	49.3
Other kind of organisation	28.5	34.3	31.3
Private/Ltd	20.3	23.4	21.5

Source: LFS 2008 q1-q4, w1 and w5. Weighted by PWT07.

Details of training variables used

Labour Force Survey: 2008 Questionnaire November 2007 107

Training done in last 13 weeks, 4 weeks, 1 week

ED13WK UK

In the 3 months since beginning [date] *have you taken part in any education or any training connected with your job, or a job that you might be able to do in the future (including courses that you have told me about already)?*

1 yes
2 no

APPLIES IF RESPONDENT IS OF WORKING AGE, IN WORK OR IN RECEIPT OF EDUCATION/TRAINING

i.e.

IF ((((MEN AND WOMEN AGED 16-69) [Not State pension age]
AND ((YTETMP=1 or 2 or 3) [Employer based work training, Project based work training, temporarily away from employer/project based work training]
OR (NEWDEA4= 3 or 4 or 5 or 7) [Employee in public/private sector, voluntary sector, environmental task force or assisted self employment]
OR (YTETJB=1 AND NEWDEA4=1, 6, 8, 9, or 19))) [Work done in addition to that done on New Deal Scheme]
OR ((WRKING=1) [Paid work in ref wk]
OR (JBAWAY=1) [Has a job/business but away from it in ref wk]
OR (OWNBUS=1) [Unpaid work for own business in ref wk]
OR (RELBUS=1))) [Unpaid work for relative's business in ref wk]
AND ((EDAGE NE 96) [Not still in FT education]
OR (COURSE=3 or 4 or 5 or 6 or 7 or 8 or 9 or 10))) [In FT education but not at school]

ED4WK

...and did you take part in any of that education or training in the 4 weeks ending Sunday the [date]*?*

1 yes
2 no

APPLIES IF ED13WK=1 (taken part in job related education/training in 3 months before ref wk)

FUTUR13

In the 3 months since beginning [date] *have you taken part in any education or training connected with a job that you might be able to do in the future (including courses that you have told me about already)?*

1 yes
2 no

APPLIES TO RESPONDENTS OF WORKING AGE AND DOING COLLEGE BASED TRAINING AND THOSE NOT IN WORK OR FT EDUCATION (all men and women 16-69 who are not at school to whom ED13WK does not apply)

i.e.

IF (MEN AND WOMEN AGED 16-69) [Not State pension age]
AND ((YTETMP = 3 or 5) [At college/training centre, temporarily away from college/training centre]
OR (RELBUS=2)) [No unpaid work for relative]
AND ((EDAGE NE 96) [Not still in FT education]
OR (COURSE=3 or 4 or 5 or 6 or 7 or 8 or 9 or 10))) [In FT education but not at school]

FUTUR4

...and did you take part in any of that education or training in the 4 weeks ending Sunday the [date]*?*

1 yes
2 no

APPLIES IF FUTUR13=1 (taken part in job related education/training in 3 months before ref wk)

ED1FUT

...and did you take part in any of that education or training in the week ending Sunday the [date]?

1 yes
2 no

APPLIES IF TAKEN PART IN JOB RELATED EDUCATION/TRAINING IN PREVIOUS 4 WEEKS

i.e.

IF ((ED4WK=1) taken part in job related education/training in 4 wks before ref wk
OR (FUTUR4=1)) taken part in job related education/training in 4 wks before ref wk

JOBED

Was this work related training part of the education course you previously mentioned?

1 yes
2 no

APPLIES IF RESPONDENT HAS TAKEN PART IN JOB RELATED EDUCATION/TRAINING IN PREVIOUS 3 MONTHS AND IS ON A FT/PT COURSE

i.e.

IF ((ED13WK=1) Taken part in education or training in last 3 months connected to current or future job
OR (FUTUR13=1)) Taken part in education or training in last 3 months connected to current or future job
AND (ATTEND=1 or 2) Enrolled on a FT/PT course and still attending or waiting for term to (re)start

On/off job training

TRNOPP

May I just check, has your current employer ever offered you any training or education either on or away from your job?

1 yes, education or training offered
2 never offered

APPLIES IF RESPONDENT IN WORK AND HAS NOT BEEN ON ANY JOB RELATED TRAINING IN THE PREVIOUS 3 MONTHS

i.e.

IF ((ED13WK=2) Not taken part in job related training in 3 months before ref wk
AND ((WRKING=1) Paid work in ref wk
OR (JBAWAY=1) Has a job/business but away from it in ref wk
OR (OWNBUS=1) Unpaid work for own business in ref wk
OR (RELBUS=1)) Unpaid work for relative's business in ref wk
AND (STAT=1 or 4)) Employee or unpaid worker in a family business

JOBTRN

Was (Is) that training...

1 'on the job' training only
2 or training away from your job
3 or both?

APPLIES IF ED4WK=1 (taken part in job related education/training in 4 wks before ref wk)

Site of training

TRSITE7

Where was the main place that you did this education or training (in the last 4 weeks)?

1 on premises belonging to your employer
2 on premises belonging to another employer
3 private training centre
5 Employment Rehabilitation Centre
6 community project
7 government or local authority training workshop
8 ITeC (Information Technology Centre)
9 at home (Open University/Open Tech or other correspondence course)
10 Open College
11 College of Further Education
12 University
13 other educational institution
14 none of these

APPLIES IF JOBTRN=2 (off job training), 3 (on and off job training) OR FUTUR4=1 (taken part in job related education/training in 4 wks before ref wk)

Training fees

TRNFEE

Who paid the fees for this training?

1 employer or potential employer
2 in Wales: ELWA/Work based training for young people/work based training for adults
in Scotland: LEC/Training for work
in England: LSC/Work based training for young people
3 other government or local authority organisation
4 self, or family, or relative
5 other
6 no fees
7 don't know

APPLIES IF JOBTRN=2 (off job training), 3 (on: and off job training) OR FUTUR4=1 (taken part in job related education/training in 4 wks before ref wk)

Time spent training

TRNLEN

What was/is the total length of the training course?

1 less than 1 week
2 1 week but less than 2 weeks
3 2 weeks but less than 3 weeks
4 3 weeks but less than 1 month
5 1 month but less than 2 months
6 2 months but less than 3 months
7 3 months but less than 6 months
8 6 months but less than 1 year
9 1 year but less than 2 years
10 2 years but less than 3 years
11 3 years or more
12 on going/no definite limit

APPLIES IF ED4WK=1 (taken part in job related education/training in 4 wks before ref wk)
OR FUTUR4=1 (taken part in job related education/training in 4 wks before ref wk)

TRNDAY

How many days did the course/training last?

ASK OR
APPLIES IF TRNLEN=1 (duration of training course <1 wk)

TRHR93

And now thinking of the training you did in the week ending Sunday the [date]*, connected with your job/a job you may do in the future, how many hours did you spend on education or training, including any private study time?*

97 or more=97

APPLIES IF ED1FUT=1 (taken part in job related education/training in ref wk)

TRONJB

How many of those TrHr93 hours were done on the job?

97 or more=97

APPLIES IF ED1FUT=1 (taken part in job related education/training in ref wk)
AND JOBTRN=1 (on job training), 3 (on and off job training)

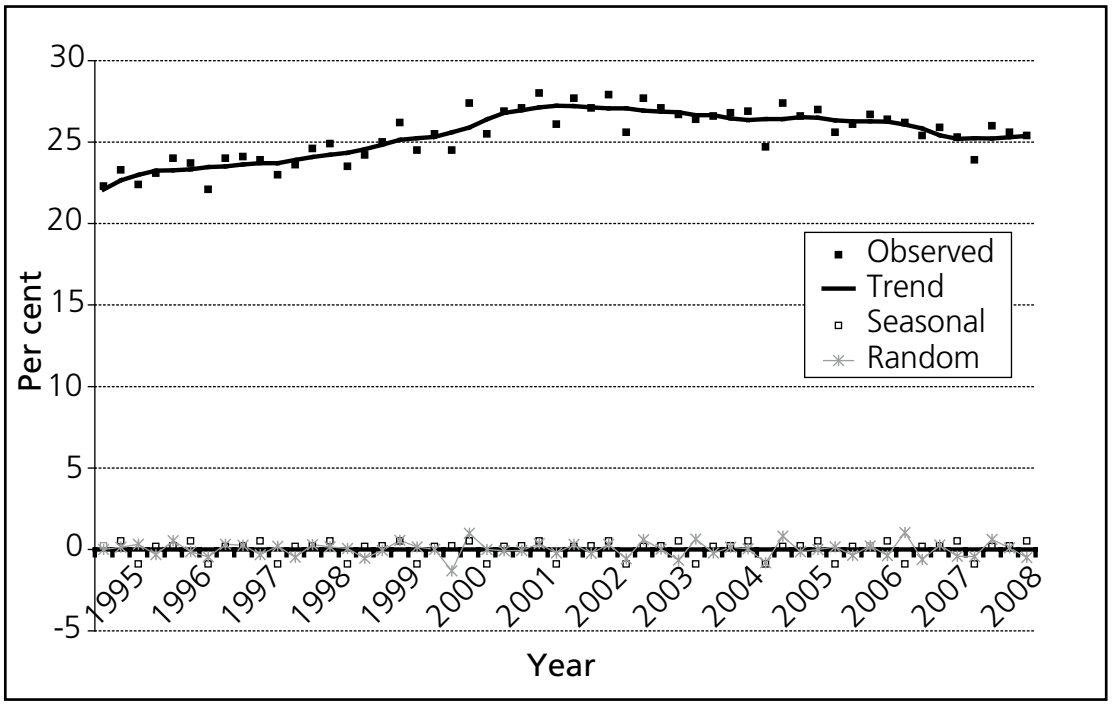
Appendix B
Chapter 3: LFS decomposition and comparison with BHPS figures

Time-series decomposition of the Labour Force Survey series

A time series decomposition of the training time-series is shown below. The top panel shows the actual series, then this is decomposed into a trend, a fixed seasonal element, and last a random factor. These components may be added together to form the overall series. Various different methods are available to decompose a time-series in this way, and this uses the STL method (Kendall, 1976; Cleveland *et al.*, 1990).

This picture confirms a declining trend in training from around 2003, a levelling out around 2005, and decline thereafter with stability (or a slight increase) in the more recent period.

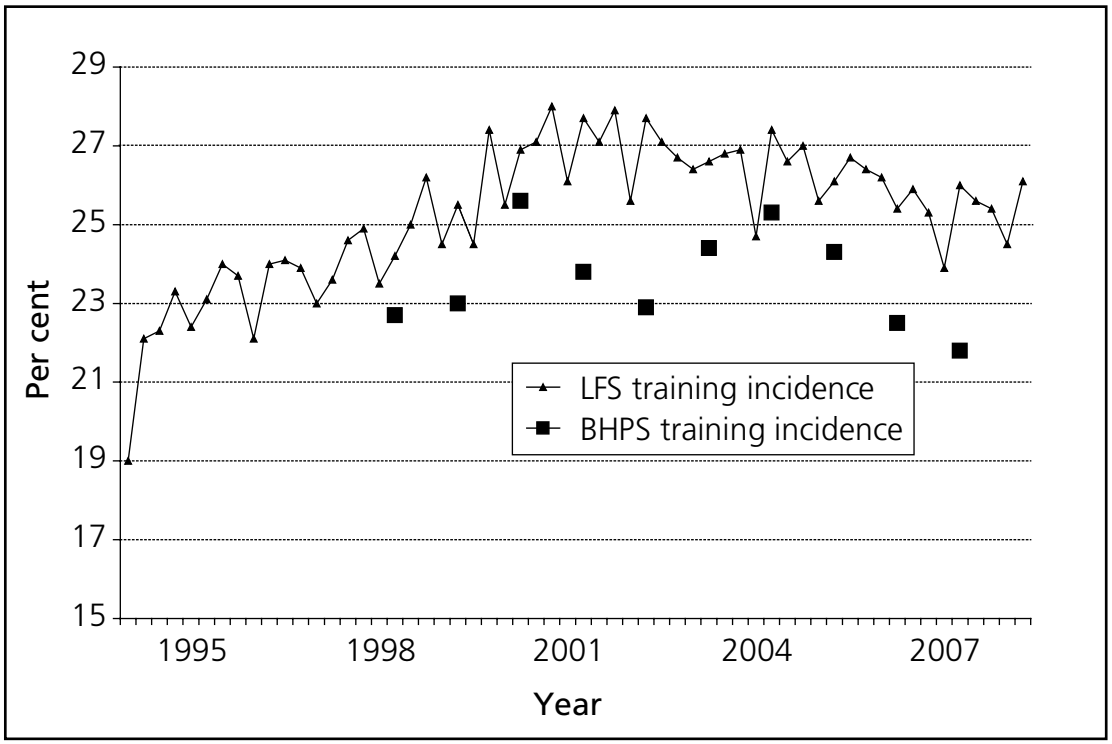
Figure B.1 Decomposition of additive time series



Comparison between Labour Force Survey and British Household Panel Survey time-series for training

The British Household Panel Survey (BHPS) and Labour Force Survey (LFS) questions are quite different. Moreover, while the LFS delivers quarterly data, most of the BHPS interviews take place during the last quarter of each year (so, arguably, the BHPS series could be shifted one quarter to the right). However, as shown below, the BHPS and LFS show a similar upward trend during 1998-2000, and a similar downward trend commencing from around 2004. The series show some divergence during the intervening period of 2001-2003 (and especially the BHS result for BHPS in 2002 appearing to be significantly out of line with the LFS results).

Figure B.2 LFS/BHPS training incidence



Further detailed tables

Table B.1 Training rates and unemployment rates 1994-2008

	Training rates %	Unemployment rates %
1994 Q3	19.0	9.5
1994 Q4	22.1	9.1
1995 Q1	22.3	8.8
1995 Q2	23.3	8.8
1995 Q3	22.4	8.8
1995 Q4	23.1	8.5
1996 Q1	24.0	8.4
1996 Q2	23.7	8.4
1996 Q3	22.1	8.2
1996 Q4	24.0	8.0
1997 Q1	24.1	7.4
1997 Q2	23.9	7.3
1997 Q3	23.0	7.0
1997 Q4	23.6	6.7
1998 Q1	24.6	6.5
1998 Q2	24.9	6.4
1998 Q3	23.5	6.3
1998 Q4	24.2	6.3
1999 Q1	25.0	6.3
1999 Q2	26.2	6.2
1999 Q3	24.5	6.0
1999 Q4	25.5	5.9
2000 Q1	24.5	5.9
2000 Q2	27.4	5.6
2000 Q3	25.5	5.4
2000 Q4	26.9	5.3
2001 Q1	27.1	5.2
2001 Q2	28.0	5.1
2001 Q3	26.1	5.2
2001 Q4	27.7	5.3
2002 Q1	27.1	5.3
2002 Q2	27.9	5.3
2002 Q3	25.6	5.4
2002 Q4	27.7	5.2

Continued

Table B.1 Continued

	Training rates %	Unemployment rates %
2003 Q1	27.1	5.3
2003 Q2	26.7	5.1
2003 Q3	26.4	5.2
2003 Q4	26.6	5.0
2004 Q1	26.8	4.9
2004 Q2	26.9	4.9
2004 Q3	24.7	4.8
2004 Q4	27.4	4.8
2005 Q1	26.6	4.8
2005 Q2	27.0	4.9
2005 Q3	25.6	4.9
2005 Q4	26.1	5.3
2006 Q1	26.7	5.4
2006 Q2	26.4	5.6
2006 Q3	26.2	5.6
2006 Q4	25.4	5.7
2007 Q1	25.9	5.7
2007 Q2	25.3	5.5
2007 Q3	23.9	5.5
2007 Q4	26.0	5.3
2008 Q1	25.6	5.4
2008 Q2	25.4	5.6
2008 Q3	24.5	6.0
2008 Q4	26.1	6.5

Table B.2 Job-related training: methods of study 1999-2006

	Methods of study – job related training			
	Attend conferences, seminars, workshops %	Use internet or CD-ROMs %	Watch TV programmes or videos %	None of these %
1999 Q2	74.3	6.2	5.3	14.2
1999 Q3	71.5	6.6	3.0	19.0
1999 Q4	72.5	5.5	4.9	17.1
2000 Q1	71.1	9.5	5.2	14.2
2000 Q2	74.6	6.0	5.8	13.6
2000 Q3	72.3	9.2	5.3	13.2
2000 Q4	76.9	5.8	3.9	13.4
2001 Q1	69.9	8.4	5.5	16.2
2001 Q2	76.1	5.9	3.2	14.8
2001 Q3	70.4	12.0	4.0	13.6
2001 Q4	75.2	7.4	4.9	12.5
2002 Q1	75.7	8.8	3.4	12.1
2002 Q2	75.8	7.1	3.7	13.4
2002 Q3	72.6	9.2	3.5	14.7
2002 Q4	74.7	7.2	4.2	13.9
2003 Q1	75.4	8.9	4.4	11.3
2003 Q2	77.1	6.7	4.8	11.5
2003 Q3	76.0	7.6	3.4	13.1
2003 Q4	74.2	9.2	3.5	13.1
2004 Q1	75.4	7.7	3.4	13.6
2004 Q2	80.3	7.6	2.9	9.2
2004 Q3	73.8	9.5	3.1	13.6
2004 Q4	76.5	7.1	2.7	13.8
2005 Q1	76.5	7.0	3.6	13.0
2005 Q2	74.9	9.3	2.5	13.3
2005 Q3	78.5	7.9	3.0	10.6
2005 Q4	79.5	8.4	2.8	9.3
2006 Q1	78.3	8.4	1.8	11.6
2006 Q2	74.8	6.6	2.6	16.0
2006 Q3	73.5	9.6	2.8	14.1
2006 Q4	78.6	8.3	2.5	10.5
Total	75.1	7.8	3.8	13.3

Table B.3 Trends in training, by gender 1994-2008 (Quarter)

	Men %	Women %
1994 Q3	18.2	20.0
1994 Q4	20.8	23.6
1995 Q1	21.0	23.8
1995 Q2	21.9	25.0
1995 Q3	21.7	23.2
1995 Q4	22.3	24.1
1996 Q1	22.9	25.3
1996 Q2	22.3	25.5
1996 Q3	20.6	23.9
1996 Q4	22.1	26.4
1997 Q1	22.7	25.9
1997 Q2	22.0	26.0
1997 Q3	21.3	25.0
1997 Q4	21.8	25.7
1998 Q1	23.4	25.9
1998 Q2	22.9	27.3
1998 Q3	21.3	26.1
1998 Q4	22.1	26.6
1999 Q1	23.1	27.3
1999 Q2	23.9	28.9
1999 Q3	22.5	26.9
1999 Q4	23.6	27.8
2000 Q1	22.4	27.0
2000 Q2	24.8	30.3
2000 Q3	23.7	27.6
2000 Q4	24.7	29.5
2001 Q1	24.1	30.5
2001 Q2	25.2	31.2
2001 Q3	23.4	29.4
2001 Q4	25.0	30.9
2002 Q1	24.1	30.6
2002 Q2	25.7	30.5
2002 Q3	22.6	29.1
2002 Q4	25.5	30.3
2003 Q1	25.1	29.4
2003 Q2	24.1	29.8
2003 Q3	24.1	29.1
2003 Q4	24.8	28.8

Continued

Table B.3 Continued

	Men %	Women %
2004 Q1	23.1	31.1
2004 Q2	23.9	30.5
2004 Q3	22.2	27.6
2004 Q4	23.9	31.4
2005 Q1	23.9	29.7
2005 Q2	23.4	31.1
2005 Q3	22.7	28.9
2005 Q4	22.2	30.6
2006 Q1	23.6	30.2
2006 Q2	23.8	29.5
2006 Q3	23.2	29.8
2006 Q4	22.2	29.2
2007 Q1	22.4	29.9
2007 Q2	23.1	27.8
2007 Q3	20.7	27.6
2007 Q4	22.5	30.1
2008 Q1	22.7	29.0
2008 Q2	22.8	28.4
2008 Q3	21.6	27.8
2008 Q4	23.6	29.0

Table B.4 Trends in training, by ethnicity 1994-2008 (Year)

	Caribbean %	African %	Indian %	Pakistani %	Bangladeshi %	Chinese %	British, other whites %
1994	27.3	21.1	14.7	11.0	16.7	14.3	20.6
1995	26.2	26.2	19.8	14.8	12.8	18.4	22.9
1996	18.5	31.3	18.8	16.1	16.1	23.7	23.6
1997	26.0	29.8	19.7	13.4	10.4	13.0	23.7
1998	30.6	39.9	19.6	18.0	12.0	22.9	24.2
1999	31.1	28.6	21.8	18.7	22.8	20.9	25.3
2000	33.2	40.2	22.7	18.3	23.1	23.8	26.0
2001	31.2	39.4	25.6	25.9	19.3	32.9	27.1
2002	29.0	40.1	26.7	22.3	23.0	18.7	27.0
2003	29.4	39.1	28.8	20.7	13.9	26.2	26.7
2004	26.3	42.2	23.9	21.2	15.7	23.9	26.5
2005	32.8	33.0	23.6	18.8	23.4	21.5	26.4
2006	28.3	34.9	23.4	19.5	23.0	31.9	26.3
2007	25.9	39.3	21.9	19.1	12.8	24.4	25.3
2008	26.8	31.4	23.5	20.9	21.5	18.2	25.6

Table B.5 Trends in training, by qualification 1994-2008 (Quarter)

	Degree or equivalent %	Higher education %	A level or equivalent %	GCSE or equivalent %	Other qualification %	No qualification %
1994 Q3	34.0	29.7	18.3	19.5	14.3	6.0
1994 Q4	39.1	32.8	20.5	24.1	15.8	7.1
1995 Q1	36.7	36.1	20.4	23.8	15.6	7.3
1995 Q2	39.9	37.2	22.1	23.4	17.2	7.2
1995 Q3	37.7	38.4	20.4	23.7	14.7	6.1
1995 Q4	39.2	38.7	21.3	24.2	16.9	6.9
1996 Q1	39.0	39.4	23.4	25.7	17.3	8.1
1996 Q2	40.1	38.6	22.2	25.3	15.3	7.0
1996 Q3	33.7	35.2	22.3	22.4	15.2	8.0
1996 Q4	39.1	39.5	21.6	25.6	15.8	7.6
1997 Q1	40.8	36.8	23.2	24.2	17.5	5.6
1997 Q2	38.6	34.5	21.5	25.2	16.4	7.3
1997 Q3	36.9	34.4	22.8	22.9	14.8	6.9
1997 Q4	37.7	37.8	22.6	23.2	14.9	7.2
1998 Q1	39.2	38.6	22.0	25.7	16.3	7.1
1998 Q2	39.1	36.7	24.3	26.1	15.2	6.9
1998 Q3	38.0	37.6	21.3	23.3	15.0	7.4
1998 Q4	40.0	37.3	22.6	23.6	16.0	6.5
1999 Q1	40.3	35.3	23.8	24.9	16.6	6.5
1999 Q2	41.1	38.4	25.1	25.9	16.2	7.9
1999 Q3	38.8	35.7	23.8	23.5	16.4	6.3
1999 Q4	39.9	37.6	23.8	25.3	16.6	7.8
2000 Q1	38.8	34.4	23.4	24.0	15.3	7.8
2000 Q2	41.3	40.7	25.6	27.0	18.2	8.2
2000 Q3	39.0	36.2	24.1	24.3	17.9	8.1
2000 Q4	41.5	38.4	25.5	25.3	18.3	8.2
2001 Q1	41.9	36.8	25.7	25.6	19.5	7.3
2001 Q2	43.0	38.5	27.6	27.2	17.1	8.6
2001 Q3	39.2	39.3	23.9	25.6	16.2	9.2
2001 Q4	42.2	40.0	26.4	25.0	19.8	8.6
2002 Q1	40.6	37.5	26.3	25.5	17.7	6.7
2002 Q2	43.2	37.7	26.3	26.8	18.9	8.1
2002 Q3	39.2	37.7	24.3	24.5	17.3	7.2
2002 Q4	40.4	38.0	26.0	26.7	19.7	7.9
2003 Q1	39.9	35.5	25.4	25.9	19.0	8.1
2003 Q2	39.5	39.2	24.7	24.3	19.5	8.0
2003 Q3	38.7	36.5	23.6	25.2	19.0	9.8
2003 Q4	38.2	36.4	24.9	25.5	20.8	7.6

Continued

Table B.5 Continued

	Degree or equivalent %	Higher education %	A level or equivalent %	GCSE or equivalent %	Other qualification %	No qualification %
2004 Q2	39.6	37.3	25.1	23.8	19.0	9.5
2004 Q3	36.1	33.2	23.9	20.9	19.3	7.3
2004 Q4	37.0	38.6	25.8	26.2	20.0	7.8
2005 Q1	39.0	36.1	25.1	25.3	17.8	8.4
2005 Q2	39.7	37.6	25.0	24.2	17.4	9.0
2005 Q3	36.1	36.3	24.1	22.4	17.7	8.7
2005 Q4	39.5	34.6	24.2	23.0	16.3	9.6
2006 Q1	36.9	37.5	24.6	24.5	18.2	8.2
2006 Q2	37.5	32.6	26.1	23.4	19.4	8.9
2006 Q3	37.4	33.1	24.9	22.3	19.6	11.2
2006 Q4	34.9	35.0	23.6	23.2	17.4	8.6
2007 Q1	37.0	34.7	24.0	22.7	16.7	7.6
2007 Q2	35.5	33.4	23.6	23.8	17.2	5.5
2007 Q3	34.4	32.9	23.2	20.1	15.9	5.5
2007 Q4	36.7	35.5	24.6	23.5	15.8	7.2
2008 Q1	39.0	31.1	23.9	21.5	15.6	6.2
2008 Q2	35.4	33.8	24.6	22.5	15.2	7.5
2008 Q3	35.4	31.1	23.3	20.4	16.9	6.9
2008 Q4	36.3	36.6	23.7	22.7	17.6	7.1

Table B.6 Trends in training, by occupation (1994-2000 quarters)

	High managerial and professional %	Low managerial and professional %	Intermediate %	Small employers own account %	Lower supervisory, technical %	Semi-routine %	Routine %
1994 Q3	31.3	18.6	29.2	4.9	14.4	17.6	10.2
1994 Q4	35.7	20.4	33.2	4.7	16.4	19.4	16.5
1995 Q1	36.2	23.0	33.7	6.5	15.6	19.3	13.9
1995 Q2	37.2	25.1	35.4	6.5	16.2	21.2	14.1
1995 Q3	36.9	24.9	32.3	4.9	15.2	20.3	13.3
1995 Q4	37.2	24.7	35.1	6.4	17.0	21.3	13.2
1996 Q1	37.2	23.8	37.5	6.5	16.2	20.9	16.3
1996 Q2	36.9	28.3	35.5	7.0	17.5	20.4	15.5
1996 Q3	33.1	22.3	33.5	5.9	15.2	20.0	15.6
1996 Q4	37.3	23.8	38.0	6.3	15.7	21.1	16.0
1997 Q1	38.5	19.8	35.5	6.2	18.1	20.5	19.4
1997 Q2	35.5	24.0	34.2	6.7	16.6	21.5	19.2
1997 Q3	34.7	25.4	35.9	5.9	16.9	19.9	16.0
1997 Q4	35.7	21.0	34.3	7.0	16.3	21.3	19.3
1998 Q1	37.8	23.8	37.0	6.9	17.4	21.4	16.3
1998 Q2	38.0	25.6	37.5	7.7	17.6	21.7	17.5
1998 Q3	34.6	20.3	37.6	6.1	15.5	20.7	17.9
1998 Q4	36.5	25.4	36.1	7.0	16.6	21.4	18.1
1999 Q1	37.7	21.3	35.4	8.3	17.9	22.9	17.7
1999 Q2	39.6	21.7	38.7	7.7	18.4	22.6	21.0
1999 Q3	35.5	22.9	36.4	6.6	17.8	21.6	18.0
1999 Q4	38.0	24.9	38.1	6.0	19.2	22.2	17.6
2000 Q1	36.4	26.1	35.0	7.5	17.2	21.9	17.8
2000 Q2	39.7	26.2	38.4	8.7	19.5	24.6	21.0
2000 Q3	36.5	23.9	37.1	6.6	19.5	23.0	19.5
2000 Q4	38.3	24.0	40.1	8.7	20.9	22.7	21.2

Table B.7 Trends in training, by occupation (2001-2008 quarters)

	High managerial and professional %	Low managerial and professional %	Intermediate %	Small employers own account %	Lower supervisory, technical %	Semi-routine %	Routine %
2001 Q2	38.0	39.6	28.2	6.7	24.4	19.3	12.3
2001 Q3	35.1	36.7	26.1	5.9	24.0	21.3	11.0
2001 Q4	38.5	37.3	27.8	6.3	26.2	21.5	11.1
2002 Q1	35.4	37.7	26.4	9.2	25.0	19.9	11.2
2002 Q2	39.8	37.8	28.1	8.4	24.9	20.1	12.3
2002 Q3	35.2	34.6	26.9	7.3	24.5	20.9	10.6
2002 Q4	35.5	37.1	27.2	8.8	23.3	22.9	14.7
2003 Q1	33.6	37.8	27.7	9.2	23.9	21.0	11.4
2003 Q2	35.6	36.7	26.2	8.8	22.5	20.9	11.5
2003 Q3	34.7	35.2	28.3	8.5	23.9	20.1	12.7
2003 Q4	35.1	35.5	27.2	9.7	23.9	20.5	14.3
2004 Q1	34.8	36.3	27.2	9.3	21.2	21.3	12.5
2004 Q2	34.4	36.7	28.8	8.3	25.4	19.3	10.9
2004 Q3	34.2	32.8	22.9	7.0	21.4	18.0	13.4
2004 Q4	34.9	38.0	24.8	7.3	25.8	20.9	14.7
2005 Q1	33.8	35.7	27.0	8.7	21.9	22.3	10.8
2005 Q2	34.2	37.0	24.8	9.3	23.5	23.0	10.8
2005 Q3	32.7	34.1	26.0	6.3	24.5	20.4	13.2
2005 Q4	35.7	36.0	24.6	7.6	21.2	20.9	11.3
2006 Q1	33.1	36.3	22.7	7.5	24.0	22.7	13.9
2006 Q2	31.9	35.1	26.2	10.9	23.8	20.5	11.8
2006 Q3	36.3	33.1	25.4	8.9	23.3	21.9	13.7
2006 Q4	31.9	33.4	22.7	8.1	25.3	18.1	13.5
2007 Q1	33.3	33.8	23.2	8.4	22.0	20.3	12.6
2007 Q2	32.6	32.5	23.8	9.2	23.2	21.1	12.2
2007 Q3	30.5	31.7	24.6	8.2	19.1	19.3	11.2
2007 Q4	33.5	33.8	26.0	9.5	26.1	20.2	11.1
2008 Q1	34.9	32.7	25.4	8.5	22.9	19.6	12.5
2008 Q2	30.6	32.7	24.5	9.4	25.8	19.4	13.2
2008 Q3	30.8	33.8	20.0	8.1	21.3	22.1	12.2
2008 Q4	31.7	34.8	25.2	10.0	24.0	20.8	13.2

Table B.8 Trends in training and hourly earnings (£) and gender 1994-2008 (RPI adjusted to 2008 prices)

	Had training last 13 weeks		No training	
	Men	Women	Men	Women
1994	12.92	10.37	10.82	8.04
1995	13.13	10.49	10.97	8.06
1996	13.02	10.16	11.37	8.17
1997	13.10	10.09	11.28	8.09
1998	12.97	10.34	11.22	8.25
1999	13.18	10.48	11.53	8.56
2000	13.55	10.90	11.97	8.81
2001	13.81	11.18	12.46	9.34
2002	14.00	11.30	12.69	9.39
2003	14.08	11.46	12.57	9.56
2004	14.67	11.71	13.01	9.80
2005	14.45	11.87	12.86	10.03
2006	14.48	12.24	13.23	10.32
2007	14.69	12.43	13.21	10.24
2008	14.29	11.91	12.99	10.17

Table B.9 Trends in training, by region 1994-2008 (Year)

Year	North East %	North West, Mersey %	Yorkshire and the Humber %	East Midlands %	West Midlands %	Eastern %	London %	South East %	South West %	Wales %	Scotland %	Northern Ireland %
1994	19.0	20.4	22.4	18.9	18.1	20.1	22.4	23.2	19.8	20.2	18.2	
1995	23.3	22.7	23.4	22.0	21.4	22.3	24.6	23.6	22.7	22.3	21.7	20.0
1996	22.8	23.2	23.5	22.5	23.3	24.6	25.5	24.9	23.7	22.7	20.5	16.4
1997	24.8	23.5	23.0	23.5	22.5	23.8	26.2	24.4	23.9	22.6	21.6	19.4
1998	24.3	25.2	24.1	23.6	23.6	25.1	25.2	25.7	23.9	24.0	22.3	18.5
1999	26.9	24.4	24.7	24.1	24.3	25.1	27.7	26.9	26.0	24.7	24.1	18.9
2000	26.2	26.2	26.9	24.6	25.2	26.4	27.9	27.0	27.0	25.7	23.9	20.0
2001	27.8	28.6	26.4	25.7	26.1	27.3	28.6	26.9	28.0	27.4	26.5	25.6
2002	28.4	26.4	28.2	26.6	27.6	24.2	29.6	27.4	27.4	27.7	24.9	25.7
2003	27.4	27.5	28.2	26.3	25.5	24.8	28.2	26.8	26.8	28.0	25.3	24.4
2004	28.8	25.7	26.4	26.7	27.0	26.0	27.2	27.0	26.1	28.4	25.4	19.3
2005	27.0	26.9	28.0	26.7	25.3	26.2	24.8	27.0	26.4	28.7	26.3	19.6
2006	28.8	27.7	26.3	25.2	25.3	25.8	27.0	25.7	27.3	26.9	26.6	16.9
2007	28.2	25.2	23.4	24.7	25.6	23.4	26.6	24.9	26.7	28.4	25.2	20.9
2008	27.4	23.8	25.4	25.3	27.0	23.8	25.0	25.6	27.5	27.4	25.9	19.1

Table B.10 Trends in training, by length of employment 1994-2008

	< 3 mths %	3 mths <12 %	1 yr <5 %	5 yrs <20 %	20+ years %
1994 Q3	26.6	19.3	20.5	17.6	15.9
1994 Q4	31.2	24.8	23.8	19.9	18.5
1995 Q1	28.5	26.5	23.8	20.2	18.9
1995 Q2	25.6	28.8	24.6	21.4	19.8
1995 Q3	31.6	23.4	23.7	20.4	20.5
1995 Q4	26.0	27.2	23.5	22.4	18.9
1996 Q1	25.8	30.3	24.7	22.2	20.7
1996 Q2	25.4	29.0	24.3	22.5	20.0
1996 Q3	30.4	27.2	22.4	20.0	18.9
1996 Q4	27.0	27.3	24.9	23.2	19.6
1997 Q1	30.0	28.8	24.3	22.7	21.0
1997 Q2	25.9	28.6	24.8	22.5	19.4
1997 Q3	30.5	24.9	23.5	21.3	20.8
1997 Q4	30.1	28.7	24.9	21.1	18.8
1998 Q1	27.8	30.9	24.9	22.4	21.2
1998 Q2	30.1	30.3	25.6	22.6	21.3
1998 Q3	32.0	24.9	24.3	21.8	20.3
1998 Q4	31.8	29.5	24.2	21.8	21.3
1999 Q1	30.9	31.4	25.1	23.1	20.9
1999 Q2	28.8	31.6	26.7	24.2	23.6
1999 Q3	30.8	27.3	26.1	22.6	19.1
1999 Q4	29.8	28.1	27.1	23.6	22.1
2000 Q1	29.3	29.3	24.5	22.8	22.6
2000 Q2	30.9	33.5	28.8	23.9	25.5
2000 Q3	34.9	28.6	25.9	23.5	22.2
2000 Q4	33.5	30.7	28.3	24.8	21.7
2001 Q1	33.4	30.7	28.8	24.1	24.3
2001 Q2	32.6	34.5	28.5	25.2	25.6
2001 Q3	33.0	31.9	27.2	23.1	22.8
2001 Q4	37.2	31.5	29.0	24.9	23.9
2002 Q1	32.7	33.0	28.4	23.9	23.6
2002 Q2	31.7	34.7	28.0	25.6	25.0
2002 Q3	31.3	30.6	27.1	22.6	22.5
2002 Q4	37.7	30.3	30.0	24.2	23.9
2003 Q1	30.7	29.4	28.8	25.3	23.9
2003 Q2	31.2	30.2	27.5	24.7	24.8
2003 Q3	38.2	32.0	26.4	24.2	22.4
2003 Q4	38.7	31.7	27.1	22.7	25.9

Continued

Table B.10 Continued

	< 3 mths %	3 mths <12 %	1 yr <5 %	5 yrs <20 %	20+ years %
2004 Q1	32.2	31.1	29.3	23.6	22.8
2004 Q2	33.0	29.7	28.9	24.4	23.9
2004 Q3	33.2	27.9	24.9	22.9	22.8
2004 Q4	34.5	31.0	29.9	24.5	22.1
2005 Q1	33.8	32.3	28.3	23.2	22.3
2005 Q2	29.6	33.0	28.3	24.6	23.1
2005 Q3	34.3	31.5	27.1	22.4	22.0
2005 Q4	31.8	29.4	28.1	23.4	22.2
2006 Q1	29.5	30.9	29.3	23.2	24.3
2006 Q2	33.5	32.1	27.5	24.4	21.6
2006 Q3	32.8	32.7	27.3	24.0	21.7
2006 Q4	37.1	29.4	27.0	21.9	22.7
2007 Q1	30.9	29.7	27.0	23.9	23.6
2007 Q2	23.4	32.1	26.7	23.2	21.0
2007 Q3	32.3	28.1	25.1	21.7	20.2
2007 Q4	37.0	30.3	26.3	24.2	22.0
2008 Q1	30.3	28.9	27.4	23.8	21.8
2008 Q2	26.7	30.2	26.7	23.6	21.8
2008 Q3	31.0	27.7	25.8	23.2	19.9
2008 Q4	34.3	29.7	27.7	23.8	23.3

Table B.11 Trends in training, full-time/part-time status, by gender 1994-2008

	Full-time		Part-time	
	Men %	Women %	Men %	Women %
1994 Q3	18.2	24.2	14.7	14.0
1994 Q4	20.5	27.7	19.2	18.0
1995 Q1	20.5	28.2	22.4	17.5
1995 Q2	21.3	28.9	22.8	18.9
1995 Q3	21.7	27.4	16.6	17.0
1995 Q4	22.1	27.5	20.7	19.3
1996 Q1	22.3	29.1	26.7	19.9
1996 Q2	22.1	30.8	24.3	18.9
1996 Q3	20.6	28.8	20.3	17.5
1996 Q4	22.0	30.7	22.5	21.0
1997 Q1	22.3	29.8	27.2	20.9
1997 Q2	21.7	30.5	25.7	20.1
1997 Q3	21.3	28.6	22.0	20.4
1997 Q4	21.4	29.0	26.9	21.4
1998 Q1	23.1	30.5	28.6	19.8
1998 Q2	23.0	31.7	21.5	22.0
1998 Q3	21.3	30.4	21.5	20.5
1998 Q4	22.0	31.3	23.2	20.7
1999 Q1	23.2	31.4	21.8	22.0
1999 Q2	23.8	33.1	25.0	23.5
1999 Q3	22.6	30.5	21.2	22.1
1999 Q4	23.5	31.9	25.8	22.2
2000 Q1	22.4	31.1	23.6	21.8
2000 Q2	25.0	34.2	22.3	25.4
2000 Q3	23.8	32.3	22.0	21.5
2000 Q4	24.7	34.9	24.5	22.9
2001 Q1	24.3	34.8	22.5	25.2
2001 Q2	25.4	36.4	24.0	24.7
2001 Q3	23.3	33.4	24.2	24.4
2001 Q4	24.9	35.2	25.3	25.3
2002 Q1	24.0	35.2	25.0	24.6
2002 Q2	25.6	34.3	26.0	25.7
2002 Q3	22.7	34.0	21.6	22.9
2002 Q4	25.5	34.4	25.3	25.2

Continued

Table B.11 Continued

	Full-time		Part-time	
	Men %	Women %	Men %	Women %
2003 Q1	25.2	34.4	24.6	23.1
2003 Q2	24.4	33.7	20.5	24.7
2003 Q3	24.5	33.4	20.5	23.5
2003 Q4	24.7	32.9	25.6	23.5
2004 Q1	22.9	35.2	25.1	26.1
2004 Q2	24.1	33.7	22.2	26.4
2004 Q3	22.4	31.9	20.2	22.2
2004 Q4	23.9	36.3	24.0	25.4
2005 Q1	23.9	32.3	24.2	26.1
2005 Q2	23.1	35.2	25.8	25.8
2005 Q3	23.0	32.7	19.4	23.8
2005 Q4	22.1	35.7	22.9	23.8
2006 Q1	23.7	33.4	22.7	25.6
2006 Q2	23.6	33.6	25.7	23.9
2006 Q3	22.9	34.2	25.7	24.1
2006 Q4	22.4	32.7	19.9	24.6
2007 Q1	22.2	33.8	24.3	24.6
2007 Q2	23.2	30.2	21.9	24.6
2007 Q3	21.1	32.3	17.5	21.3
2007 Q4	23.0	34.4	18.3	24.4
2008 Q1	22.9	33.0	20.5	23.7
2008 Q2	22.7	31.7	23.4	23.9
2008 Q3	21.9	30.8	18.7	23.5
2008 Q4	23.5	31.8	24.0	25.2

Table B.12 Trends in training, by full-time/part-time status, sector and gender 1994-2008

	Men				Women			
	Private		Public		Private		Public	
	FT %	PT %	FT %	PT %	FT %	PT %	FT %	PT %
1994	16.4	16.0	32.1	22.2	20.5	13.8	37.4	20.9
1995	18.5	19.9	35.1	23.6	22.2	15.3	39.9	24.7
1996	18.9	22.2	34.8	28.7	23.8	16.5	42.5	25.0
1997	18.9	24.3	35.6	31.0	23.6	18.3	42.1	25.9
1998	19.5	22.8	37.4	27.6	24.7	17.5	44.2	27.8
1999	20.4	21.8	38.1	31.0	25.5	19.5	44.9	29.0
2000	21.3	21.1	37.9	33.7	26.5	19.6	46.7	30.2
2001	21.3	23.4	41.3	25.9	28.3	21.2	48.5	32.8
2002	21.6	23.8	39.9	27.6	27.8	20.2	47.2	33.8
2003	21.5	21.8	41.2	28.6	26.7	19.3	46.6	33.1
2004	20.0	20.9	39.8	34.2	26.9	20.2	47.6	35.0
2005	19.8	20.7	39.2	34.9	26.3	20.2	47.1	34.3
2006	20.1	21.8	37.7	33.5	26.3	20.2	46.2	33.0
2007	19.4	18.5	37.6	31.6	26.1	19.9	44.4	31.3
2008	19.7	19.5	38.5	32.3	24.8	19.8	44.0	32.8

Table B.13 Trends in training, by industry 1994-2008

	Agriculture and fishing %	Energy and water %	Manufacturing %	Construction %	Distrubution, hotel restaurants %	Transport, communication %	Banking, finance %	Public administration %	Other services %
1994	6.7	30.0	16.7	11.0	14.6	15.5	25.0	31.5	18.0
1995	9.6	31.2	17.3	12.6	17.1	18.8	27.5	34.3	18.8
1996	8.2	31.6	17.6	12.7	18.3	18.3	28.0	35.2	20.2
1997	7.9	32.4	17.5	14.0	18.9	18.0	27.7	35.3	20.6
1998	7.5	34.0	18.4	15.6	19.0	18.1	27.4	36.8	20.3
1999	11.1	31.1	18.4	14.2	19.0	21.2	28.8	38.0	23.2
2000	13.6	30.5	19.2	16.9	19.5	21.0	28.3	39.4	23.4
2001	10.8	30.7	20.1	15.6	20.9	20.0	29.6	41.6	22.7
2002	13.0	37.0	18.9	17.2	20.1	19.7	29.0	41.7	22.9
2003	11.3	31.8	18.1	18.3	19.0	20.1	27.1	41.7	24.2
2004	11.4	33.1	17.5	17.5	18.3	20.5	26.1	41.5	22.3
2005	8.6	30.7	17.4	16.8	19.0	17.2	25.8	41.9	21.4
2006	10.8	30.5	17.2	17.6	18.2	17.2	26.8	40.7	22.0
2007	10.4	28.9	16.9	17.4	17.6	16.9	25.0	39.2	22.4
2008	10.5	29.4	18.1	17.1	17.3	16.6	24.9	39.6	20.3

Table B.14 Trends in training, by type of organisation 1994-2008

	Public company, plc %	Nationalised industry %	Central government, civil service, forces %	Local authority, council, police %	Universities %	Health, NHS %	Charity, voluntary organisation %	Other organisation %
1994	21.7	20.2	30.2	30.7	32.6	35.6	31.9	28.3
1995	28.2	25.0	32.6	33.2	34.9	39.5	33.2	32.8
1996	29.1	24.1	35.3	34.4	30.6	40.3	35.0	28.2
1997	30.1	21.5	34.7	34.2	36.7	39.8	33.5	29.7
1998	30.0	19.3	36.4	36.6	33.7	42.3	36.0	35.1
1999	29.8	26.4	41.0	37.9	35.3	40.2	39.6	29.4
2000	28.7	21.3	36.8	39.9	34.2	44.6	40.9	29.9
2001	31.0	22.5	40.8	41.8	36.0	45.3	39.0	35.0
2002	29.8	22.9	40.0	41.1	33.5	45.6	42.4	31.4
2003	30.5	25.3	37.7	40.6	33.7	45.5	41.5	36.8
2004	28.2	24.0	38.5	41.3	36.4	45.8	41.1	36.9
2005	29.9	20.9	35.8	41.2	33.1	49.0	38.4	31.3
2006	26.6	23.4	34.6	40.3	33.0	46.3	41.0	27.3
2007	26.3	21.1	35.2	38.7	32.6	44.2	37.0	30.1
2008	26.1	19.1	32.1	38.8	34.6	47.7	32.6	34.3

Table B.15 Trends in training, by size of establishment 1994-2008

	Under 25 %	25-49 %	50+ %	50-499 %	500+ %
1994 Q3	15.5	19.8	24.0		
1994 Q4	18.6	25.6	26.7		
1995 Q1	19.1	23.9	26.9		
1995 Q2	20.1	25.9	28.0		
1995 Q3	19.2	23.8	27.3		
1995 Q4	20.7	25.4	27.4		
1996 Q1	20.2	27.8	28.8		
1996 Q2	20.8	25.6	28.1		
1996 Q3	18.1	26.0	26.5		
1996 Q4	19.8	26.7	29.3		
1997 Q1	21.4	28.6	28.0		
1997 Q2	21.2	25.3	28.3		
1997 Q3	20.2	24.3	27.4		
1997 Q4	19.7	26.7	28.1		
1998 Q1	20.6	25.7	29.9		
1998 Q2	21.7	26.7	29.4		
1998 Q3	19.3	28.4	27.8		
1998 Q4	21.1	25.5	28.7		
1999 Q1	21.2	27.5	29.4		
1999 Q2	23.9	29.8	29.9		
1999 Q3	21.2	24.4	29.5		
1999 Q4	21.5	28.8	30.2		
2000 Q1	21.3	26.8	28.8		
2000 Q2	23.2	30.4	32.0		
2000 Q3	22.8	27.4	29.4		
2000 Q4	22.8	28.9	31.6		
2001 Q2	24.2	31.3	32.7	31.7	38.0
2001 Q3	21.4	29.7	31.4	29.8	38.3
2001 Q4	23.3	31.4	33.0	31.7	36.9
2002 Q2	23.6	31.4	32.8	31.4	35.1
2002 Q3	22.0	28.6	30.9	27.4	36.5
2002 Q4	24.1	29.4	32.3	30.9	34.8
2003 Q1	24.0	29.3	31.0	29.0	34.8
2003 Q2	23.0	29.8	30.9	29.6	33.7
2003 Q3	23.3	28.3	31.1	29.5	34.1
2003 Q4	22.6	29.2	31.4	29.6	34.8

Continued

Table B.15 Continued

	Under 25 %	25-49 %	50+ %	50-499 %	500+ %
2004 Q1	23.1	30.9	31.4	29.6	34.9
2004 Q2	22.8	31.5	32.2	29.4	37.5
2004 Q3	21.4	28.2	28.9	26.5	33.5
2004 Q4	25.6	31.2	31.3	28.8	36.1
2005 Q1	23.0	31.2	30.8	28.4	35.6
2005 Q2	23.8	33.2	30.4	28.4	34.3
2005 Q3	22.8	28.5	30.0	27.9	33.9
2005 Q4	22.6	27.8	31.2	28.6	35.9
2006 Q1	22.9	31.5	30.9	28.5	35.7
2006 Q2	22.9	27.5	31.2	28.9	35.4
2006 Q3	22.9	28.6	30.8	28.4	35.0
2006 Q4	22.1	28.5	29.5	27.5	33.0
2007 Q1	22.9	27.9	30.3	27.5	35.4
2007 Q2	21.7	29.4	29.0	27.3	31.9
2007 Q3	20.5	27.0	28.6	27.0	31.4
2007 Q4	22.6	29.3	30.3	28.0	34.6
2008 Q1	21.1	29.0	30.6	28.0	35.4
2008 Q2	22.2	28.4	29.8	27.8	33.5
2008 Q3	20.4	27.0	29.0	26.9	32.8
2008 Q4	22.8	28.1	30.1	28.1	33.7

Table B.16 Full model for Table 3.1 (including year) – Odds ratios of logistic regression on the receipt of training (1998-2008)

Model	Men	Women
Age group (ref: 30-39)		
16-19	3.37***	2.35***
20-29	1.27***	1.09***
40-49	.89***	1.09***
50-59	.75***	.98
60-69	.48***	.73***
Ethnicity (ref: British, other whites)		
Caribbean	1.08	1.03
African	1.57***	1.22**
Indian	.83***	.76***
Pakistani	.82***	.70***
Bangladeshi	.72***	.69**
Chinese	.71***	.70***
All mixed groups	.89	1.19**
All non-mixed groups	1.16**	1.10*
Disability status (ref: not disabled)		
Both DDA disabled and work-limiting	1.00	1.05*
DDA disabled only	1.09***	1.14***
Work-limiting disabled only	1.09**	1.25***
Qualification (ref: GCSE A-C or equivalent)		
Degree or equivalent	1.38***	1.68***
Post-A level higher education	1.28***	1.81***
GCE A level or equivalent	1.04**	1.25***
Other qualification	.79***	.82***
No qualification	.39***	.41***
Occupation (ref: routine occupation)		
High managerial or professional	2.49***	2.32***
Low managerial or professional	2.35***	2.34***
Intermediate occupations	2.15***	1.61***
Small employers, own account work	.69***	.74**
Low supervisory or technical occupations	1.71***	1.95***
Semi-routine occupations	1.33***	1.47***
Full-time status (ref: part-time)	1.11**	1.27***

Continued

Table B.16 Continued

Model	Men	Women
Length of employment (ref: 1 year but < 2)		
Less than 3 months	1.24***	1.17***
3 but < 6 months	1.19***	1.16***
6 but < 12 months	1.05**	1.08***
2 years but < 5	.90***	.88***
5 years but < 10	.80***	.78***
10 years but < 20	.84***	.77***
20 years or more	.88***	.78***
Private sector (ref: public)	.53***	.53***
Year of survey (ref: 2000)		
1998	.92***	.93**
1999	.97	.97
2001	1.01	.92***
2002	1.01	.88***
2003	.99	.84***
2004	.95*	.85***
2005	.92***	.84***
2006	.91***	.81***
2007	.86***	.76***
2008	.90***	.74***
Size of establishment (ref: with 50+ employees)		
0-24 employees	.79***	.96***
25-49 employees	.90***	1.11***
Constant	.29***	.30***
Model Chi-square (d.f.)	18,085 (48)	19,452 (48)
N (unweighted)	*185,899*	*179,952*

Models controlling for year of survey (reference category: 2000); *** p < .001, ** p < .01, * p < .05.

Source: LFS 1998-2008, all wave 5 respondents in employment (i.e. ED13WK applies).

Table B.17 Full model for Table 3.2 – Odds ratios of logistic regression on the receipt of training (1998-2008) in the private sector

Model	Men	Women
Age group (ref: 30-39)		
16-19	3.42***	2.32***
20-29	1.31***	1.15***
40-49	.89***	1.08***
50-59	.73***	.94
60-69	.48***	.76***
Ethnicity (ref: British, other whites)		
Caribbean	1.21**	1.05
African	1.62***	1.57**
Indian	.82***	.76***
Pakistani	.81**	.74***
Bangladeshi	.78	.64**
Chinese	.68**	.59***
All mixed groups	.96	1.18**
All non-mixed groups	1.15**	1.15*
Disability status (ref: not disabled)		
Both DDA disabled and work-limiting	1.02	1.07*
DDA disabled only	1.11***	1.19***
Work-limiting disabled only	1.10**	1.31***
Qualification (ref: GCSE A-C or equivalent)		
Degree or equivalent	1.38***	1.58***
Post-A level higher education	1.24***	1.70***
GCE A level or equivalent	1.03**	1.24***
Other qualification	.78***	.83***
No qualification	.39***	.41***
Occupation (ref: routine occupation)		
High managerial or professional	2.48***	2.31***
Low managerial or professional	2.26***	1.99***
Intermediate occupations	2.12***	1.43***
Small employers, own account work	.69***	.73**
Low supervisory or technical occupations	1.72***	1.83***
Semi-routine occupations	1.31***	1.33***
Full-time status (ref: part-time)	1.07*	1.21***

Continued

Table B.17 Continued

Model	Men	Women
Length of employment (ref: 1 year but < 2)		
Less than 3 months	1.27***	1.31***
3 but < 6 months	1.19***	1.20***
6 but < 12 months	1.06**	1.09**
2 years but < 5	.91***	.88***
5 years but < 10	.80***	.78***
10 years but < 20	.85***	.75***
20 years or more	.94***	.77***
Year of survey (ref: 2000)		
1998	.90***	.95
1999	.97	.99
2001	1.02	.99
2002	1.01	.94
2003	1.01	.87***
2004	.96	.92**
2005	.93**	.87***
2006	.93**	.85***
2007	.88***	.82***
2008	.91***	.77***
Size of establishment (ref: with 50+ employees)		
0-24 employees	.75***	.85***
25-49 employees	.83***	1.00
Constant	.17***	.19**
Model Chi-square (d.f.)	11,623 (47)	7,904 (47)
N (unweighted)	*151,153*	*113,846*

Models controlling for year of survey (reference category: 2000); *** p < .001, ** p < .01, * p < .05.

Source: LFS 1998-2008, wave 5 respondents in employment (i.e. ED13WK applies) in the private sector.

Table B.18 Full model for Table 3.3 – Odds ratios of logistic regression on the receipt of training (1998-2008) in the public sector

Model	Men	Women
Age group (ref: 30-39)		
16-19	2.59***	2.20***
20-29	1.01**	.96
40-49	.90***	1.11***
50-59	.79***	1.01
60-69	.49***	.71***
Ethnicity (ref: British, other whites)		
Caribbean	.80	1.01
African	1.44***	.89
Indian	.88	.75***
Pakistani	.84	.68**
Bangladeshi	.52*	.80
Chinese	.83	.95
All mixed groups	.72*	1.18
All non-mixed groups	1.17	1.03
Disability status (ref: not disabled)		
Both DDA disabled and work-limiting	.96	1.03
DDA disabled only	1.05	1.09**
Work-limiting disabled only	1.07	1.18**
Qualification (ref: GCSE A-C or equivalent)		
Degree or equivalent	1.32***	1.70***
Post-A level higher education	1.31***	1.83***
GCE A level or equivalent	1.06	1.25***
Other qualification	.82***	.81***
No qualification	.40***	.44***
Occupation (ref: routine occupation)		
High managerial or professional	3.10***	2.72***
Low managerial or professional	3.65***	3.27***
Intermediate occupations	2.71***	2.10***
Small employers, own account work	---------	----------
Low supervisory or technical occupations	1.75***	2.18***
Semi-routine occupations	1.55***	1.80***
Full-time status (ref: part-time)	1.29***	1.35***

Continued

Table B.18 Continued

Model	Men	Women
Length of employment (ref: 1 year but < 2)		
Less than 3 months	1.04	.84***
3 but < 6 months	1.19**	1.07
6 but < 12 months	.96	1.11**
2 years but < 5	.85***	.85***
5 years but < 10	.76***	.76***
10 years but < 20	.75***	.74***
20 years or more	.70***	.74***
Year of survey (ref: 2000)		
1998	.96	.89**
1999	1.00	.93*
2001	.95	.79***
2002	.86**	.78***
2003	.91*	.78***
2004	.87**	.75***
2005	.85***	.78***
2006	.80***	.74***
2007	.79***	.68***
2008	.84***	.69***
Size of establishment (ref: with 50+ employees)		
0-24 employees	1.07*	1.18***
25-49 employees	1.16***	1.29***
Constant	.18***	.21***
Model Chi-square (d.f.)	2,808 (47)	6,383 (46)
N (unweighted)	*34,746*	*66,106*

Models controlling for year of survey (reference category: 2000); *** p < .001, ** p < .01, * p < .05.

Source: LFS 1998-2008, wave 5 respondents in employment (i.e. ED13WK applies) in the public sector.

Table B.19 Odds ratios of logistic regression on the receipt of training (1994-2008)

Model	Men	Women
Age group (ref: 30-39)		
16-19	3.30***	2.44***
20-29	1.27***	1.09***
40-49	.87***	1.08***
50-59	.71***	.95***
60-69	.43***	.64***
Ethnicity (ref: British, other whites)		
Caribbean	1.00	.99
African	1.52***	1.14**
Indian	.82***	.73***
Pakistani	.79***	.67***
Bangladeshi	.67***	.67**
Chinese	.62***	.74***
All mixed groups	.93	1.18**
All non-mixed groups	1.13**	1.09
Qualification (ref: GCSE A-C or equivalent)		
Degree or equivalent	1.41***	1.68***
Post-A level higher education	1.33***	1.81***
GCE A level or equivalent	1.04**	1.25***
Other qualification	.76***	.82***
No qualification	.54***	.41***
Occupation (ref: routine occupation)		
High managerial or professional	2.47***	2.26***
Low managerial or professional	2.24***	2.26***
Intermediate occupations	2.20***	1.67***
Small employers, own account work	.64***	.68**
Low supervisory or technical occupations	1.56***	1.76***
Semi-routine occupations	1.37***	1.38***
Full-time status (ref: part-time)	1.06**	1.27***
Length of employment (ref: 1 year but < 2)		
Less than 3 months	1.23***	1.16***
3 but < 6 months	1.19***	1.16***
6 but < 12 months	1.06***	1.07***
2 years but < 5	.93***	.87***
5 years but < 10	.84***	.79***
10 years but < 20	.87***	.78***
20 years or more	.94***	.79***

Continued

Table B.19 Continued

Model	Men	Women
Private sector (ref: public)	.54***	.54***
Year of survey (ref: 2000)		
1994	.79***	.75***
1995	.92***	.84***
1996	.92***	.90***
1997	.91***	.89***
1998	.94**	.91***
1999	.97	.96
2001	1.02	.92**
2002	1.02	.89***
2003	1.00	.85***
2004	.96	.86***
2005	.93**	.85***
2006	.92***	.82***
2007	.87***	.77***
2008	.91***	.75***
Size of establishment (ref: with 50+ employees)		
0-24 employees	.79***	.94***
25-49 employees	.91***	1.11***
Constant	.29***	.30***
Model Chi-square (d.f.)	25,338 (49)	27,538 (49)
N (unweighted)	*266,880*	*258,476*

Models controlling for year of survey (reference category: 2000); *** p < .001, ** p < .01, * p < .05.

Source: LFS 1994-2008, all wave 5 respondents in employment (i.e. ED13WK applies).

Table B.20 Odds ratios of logistic regression on the receipt of training (1994-2008) in the private sector

Model	Men	Women
Age group (ref: 30-39)		
16-19	3.34***	2.38***
20-29	1.30***	1.14***
40-49	.86***	1.07***
50-59	.70***	.92***
60-69	.43***	.66***
Ethnicity (ref: British, other whites)		
Caribbean	1.08**	1.07
African	1.57***	1.47**
Indian	.79***	.71***
Pakistani	.78**	.69***
Bangladeshi	.70**	.66**
Chinese	.58**	.61***
All mixed groups	.99	1.14
All non-mixed groups	1.10	1.14*
Qualification (ref: GCSE A-C or equivalent)		
Degree or equivalent	1.38***	1.61***
Post-A level higher education	1.24***	1.67***
GCE A level or equivalent	1.03**	1.25***
Other qualification	.78***	.83***
No qualification	.39***	.39***
Occupation (ref: routine occupation)		
High managerial or professional	2.48***	2.17***
Low managerial or professional	2.05***	1.87***
Intermediate occupations	2.19***	1.47***
Small employers, own account work	.65***	.67**
Low supervisory or technical occupations	1.57***	1.60***
Semi-routine occupations	1.33***	1.22***
Full-time status (ref: part-time)	.99	1.20***
Length of employment (ref: 1 year but < 2)		
Less than 3 months	1.26***	1.27***
3 but < 6 months	1.18***	1.18***
6 but < 12 months	1.07**	1.06**
2 years but < 5	.93***	.87***
5 years but < 10	.84***	.78***
10 years but < 20	.88***	.75***
20 years or more	.99	.76***

Continued

Table B.20 Continued

Model	Men	Women
Year of Survey (ref: 2000)		
1994	.79***	.79***
1995	.93**	.87***
1996	.93**	.95
1997	.91***	.94*
1998	.93**	.93**
1999	.96	.99
2001	1.02	.99
2002	1.05	.94
2003	1.01	.88***
2004	.97	.92**
2005	.94**	.87***
2006	.94**	.85***
2007	.88***	.82***
2008	.92***	.77***
Size of establishment (ref: with 50+ employees)		
0-24 employees	.76***	.83***
25-49 employees	.84***	.98
Constant	.18***	.20**
Model Chi-square (d.f.)	16,700 (48)	11,676 (48)
N (unweighted)	*216,602*	*165,399*

Models controlling for year of survey (reference category: 2000); *** p < .001, ** p < .01, * p < .05.

Source: LFS 1994-2008, wave 5 respondents in employment (i.e. ED13WK applies) in the private sector.

Table B.21 Odds ratios of logistic regression on the receipt of training (1994-2008) in the public sector

Model	Men	Women
Age group (ref: 30-39)		
16-19	2.51***	2.25***
20-29	1.15**	.97
40-49	.90***	1.10***
50-59	.74***	.98
60-69	.45***	.64***
Ethnicity (ref: British, other whites)		
Caribbean	.84	.92
African	1.36***	.84
Indian	.91	.76***
Pakistani	.85	.67**
Bangladeshi	.56*	.70
Chinese	.77	1.02
All mixed groups	.76*	1.23
All non-mixed groups	1.20	1.02
Qualification (ref: GCSE A-C or equivalent)		
Degree or equivalent	1.32***	1.65***
Post-A level higher education	1.33***	1.85***
GCE A level or equivalent	1.05	1.23***
Other qualification	.80***	.81***
No qualification	.36***	.42***
Occupation (ref: routine occupation)		
High managerial or professional	2.86***	2.74***
Low managerial or professional	3.38***	3.28***
Intermediate occupations	2.56***	2.18***
Small employers, own account work	---------	----------
Low supervisory or technical occupations	1.49***	2.08***
Semi-routine occupations	1.58***	1.72***
Full-time status (ref: part-time)	1.31***	1.35***
Length of employment (ref: 1 year but < 2)		
Less than 3 months	1.04	.86***
3 but < 6 months	1.27**	1.11*
6 but < 12 months	.99	1.12**
2 years but < 5	.89***	.86***
5 years but < 10	.80***	.78***
10 years but < 20	.77***	.77***
20 years or more	.75***	.75***

Continued

Table B.21 Continued

Model	Men	Women
Year of survey (ref: 2000)		
1994	.79***	.69***
1995	.90*	.79***
1996	.89*	.83***
1997	.91*	.83***
1998	.98	.89***
1999	1.00	.92*
2001	.97	.80***
2002	.88**	.79***
2003	.92	.79***
2004	.88**	.76***
2005	.86***	.79***
2006	.82***	.77***
2007	.81***	.70***
2008	.85***	.70***
Size of establishment (ref: with 50+ employees)		
0-24 employees	1.06**	1.17***
25-49 employees	1.17***	1.28***
Constant	.18***	.20***
Model Chi-square (d.f.)	4,062 (48)	9,504 (47)
N (unweighted)	*50,278*	*93,077*

Models controlling for year of survey (reference category: 2000); *** p < .001, ** p < .01, * p < .05.

Source: LFS 1994-2008, wave 5 respondents in employment (i.e. ED13WK applies) in the public sector.

Appendix C
Chapter 5: Key regression results

List of main independent variables

jbhrs	Hours of paid work
hrs2	Hours, squared
experience	Experience in years
exp2	Experience-squared (and divided by 100[17])
marr	Married (0/1)
sepd	Separated (0/1)
divd	Divorced (0/1)
widw	Widowed (0/1)
age	Age
age2	Age-squared
	Dummy variables for sector of employment (8 levels
	Dummy variables for highest educational qualification (14 levels)
trainD	Training in the last year (0/1)
train2	Training in the last or previous year (0/1)

[17] This is multiplied by 100 to aid interpretation of the resulting coefficients, which would otherwise by that much smaller in size.

OLS results – full range of controls, training this year or last

Men

```
      Source |       SS       df       MS              Number of obs =   29573
-------------+------------------------------           F( 40, 29532) =  463.90
       Model |  3461.87867    40  86.5469668           Prob > F      =  0.0000
    Residual |   5509.6434 29532  .186565197           R-squared     =  0.3859
-------------+------------------------------           Adj R-squared =  0.3850
       Total |  8971.52208 29572  .303378942           Root MSE      =  .43193

------------------------------------------------------------------------------
 log-hr-earn |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       jbhrs |   .0076816   .0008945     8.59   0.000     .0059284    .0094348
        hrs2 |  -.0001512   .0000108   -13.96   0.000    -.0001725     -.00013
experience   |   .0067298   .0010548     6.38   0.000     .0046622    .0087973
        exp2 |   -.016516   .0038905    -4.25   0.000    -.0241416   -.0088904
        marr |   .1312475   .0072627    18.07   0.000     .1170123    .1454827
        sepd |   .0681586   .0194235     3.51   0.000     .0300877    .1062295
        divd |   .0518612   .0121759     4.26   0.000     .0279958    .0757265
        widw |   .1284972   .0328506     3.91   0.000     .0641085    .1928858
      train2 |   .0503841   .0054207     9.29   0.000     .0397593    .0610089
         age |   .0828468    .001518    54.58   0.000     .0798715    .0858222
        age2 |  -.0009358   .0000182   -51.40   0.000    -.0009715   -.0009001
CentralGvt   |     .00747   .0122524     0.61   0.542    -.0165453    .0314853
Local Govt   |  -.0199266   .0089678    -2.22   0.026    -.0375039   -.0023494
NHS & HE     |  -.0302776   .0138957    -2.18   0.029    -.0575138   -.0030413
Nat. industry|   .0446596   .0262652     1.70   0.089    -.0068213    .0961405
Non-profit   |  -.2079319   .0186262   -11.16   0.000      -.24444   -.1714237
Armed forces |   .1459087   .0291661     5.00   0.000     .0887419    .2030755
Other        |  -.1306778   .0287926    -4.54   0.000    -.1871127    -.074243
Higher degre |   .4543827   .0218687    20.78   0.000     .4115191    .4972463
First degree |   .3450072   .0189395    18.22   0.000     .3078849    .3821295
Teaching qua |   .0650619   .0284232     2.29   0.022     .0093511    .1207727
Other higher |   .0519229   .0181912     2.85   0.004     .0162674    .0875784
Nursing qual |   .1509243    .077632     1.94   0.052    -.0012378    .3030864
A levels     |  -.0266817   .0186496    -1.43   0.153    -.0632358    .0098723
O levels     |  -.1133713   .0184461    -6.15   0.000    -.1495265   -.0772161
Commerce qua |  -.1841055   .0562383    -3.27   0.001    -.2943351   -.0738759
CSE gd 2-5   |  -.1810481   .0210336    -8.61   0.000    -.2222748   -.1398214
Apprentice   |  -.1675219   .0271658    -6.17   0.000     -.220768   -.1142757
Other qual   |  -.3195344   .0384795    -8.30   0.000    -.3949559   -.2441129
No qual      |  -.3046903   .0194889   -15.63   0.000    -.3428893   -.2664912
Still at sch |  -.1220676   .0468502    -2.61   0.009    -.2138961    -.030239
    Constant |   .2559477   .0326779     7.83   0.000     .1918975     .319998
------------------------------------------------------------------------------
```

Women

```
      Source |       SS       df       MS              Number of obs =   32573
-------------+------------------------------           F( 40, 32532) =  458.82
       Model |  3345.62012    40  83.6405031           Prob > F      =  0.0000
    Residual |  5930.46328 32532  .182296301           R-squared     =  0.3607
-------------+------------------------------           Adj R-squared =  0.3599
       Total |   9276.0834 32572  .284787038           Root MSE      =  .42696

------------------------------------------------------------------------------
 log-hr-earn |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       jbhrs |    .010316   .0007808    13.21   0.000     .0087856    .0118463
        hrs2 |  -.0001143   .0000136    -8.42   0.000    -.0001409   -.0000876
experience   |   .0072795   .0011021     6.60   0.000     .0051193    .0094397
        exp2 |  -.0136763   .0045388    -3.01   0.003    -.0225726     -.00478
        marr |  -.0289994   .0073296    -3.96   0.000    -.0433656   -.0146331
        sepd |  -.0404514   .0157659    -2.57   0.010    -.0713531   -.0095496
        divd |  -.0247092   .0101474    -2.44   0.015    -.0445985   -.0048199
        widw |  -.0381424   .0190302    -2.00   0.045    -.0754422   -.0008426
      train2 |   .0401082   .0051375     7.81   0.000     .0300385    .0501778
         age |   .0561321   .0014449    38.85   0.000     .0532999    .0589642
        age2 |  -.0006409   .0000176   -36.36   0.000    -.0006754   -.0006063
CentralGvt   |   .1300537   .0123176    10.56   0.000     .1059108    .1541966
Local Govt   |   .1048916   .0068205    15.38   0.000     .0915232      .11826
NHS & HE     |   .1484129   .0079203    18.74   0.000     .1328888    .1639371
Nat. Indust  |   .0900297   .0472806     1.90   0.057    -.0026421    .1827014
Non-profit   |   .0018733    .011656     0.16   0.872    -.0209728    .0247194
Armed Forces |    .012662   .0558345     0.23   0.821    -.0967757    .1220998
Other        |   .0099029   .0221989     0.45   0.656    -.0336077    .0534135
Higher degre |   .5681375   .0238873    23.78   0.000     .5213174    .6149575
First degree |   .4606505   .0205555    22.41   0.000     .4203609    .5009401
Teaching qua |   .4196374   .0243676    17.22   0.000      .371876    .4673989
Other higher |   .0993755   .0200591     4.95   0.000     .0600589    .1386921
Nursing qf   |   .2205606   .0258668     8.53   0.000     .1698608    .2712604
A levels     |   .0452449   .0204078     2.22   0.027     .0052449    .0852449
O levels,eqv |  -.0426394   .0201236    -2.12   0.034    -.0820824   -.0031964
Commerce Qfv |  -.0441315   .0238153    -1.85   0.064    -.0908103    .0025473
CSE gde 2-5  |  -.1446237   .0237399    -6.09   0.000    -.1911547   -.0980927
Apprentice   |  -.1853969    .058658    -3.16   0.002    -.3003688   -.0704251
Other qf     |  -.1974308     .03754    -5.26   0.000    -.2710105    -.123851
No quals     |  -.2168004   .0210873   -10.28   0.000    -.2581323   -.1754685
At school    |  -.1034377   .0447433    -2.31   0.021    -.1911363   -.0157392
    Constant |   .3724985    .032155    11.58   0.000     .3094735    .4355236
------------------------------------------------------------------------------
```

Quantile regressions

Men – full set, median

```
Median regression                                       Number of obs =     29573
  Raw sum of deviations 12583.36 (about 2.1764338)
  Min sum of deviations 9490.894                        Pseudo R2     =    0.2458

------------------------------------------------------------------------------
 log-hr-earn |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       jbhrs |   .0142206   .0009351    15.21   0.000     .0123877    .0160535
        hrs2 |   -.000225   .0000113   -19.87   0.000    -.0002472   -.0002028
experience   |   .0061565   .0011022     5.59   0.000     .0039961     .008317
        exp2 |  -.0166583   .0040648    -4.10   0.000    -.0246256    -.008691
        marr |   .1348142   .0075954    17.75   0.000     .1199269    .1497014
        sepd |   .0557847   .0203076     2.75   0.006     .0159809    .0955884
        divd |   .0446198   .0127335     3.50   0.000     .0196616    .0695781
        widw |   .1631303    .034214     4.77   0.000     .0960694    .2301913
      trainD |   .0480107   .0060197     7.98   0.000     .0362119    .0598096
         age |   .0796908   .0015876    50.20   0.000      .076579    .0828026
        age2 |  -.0008986    .000019   -47.20   0.000    -.0009359   -.0008613
CentralGvt   |   .0027736    .012805     0.22   0.829    -.0223247    .0278719
Local Govt   |  -.0069243   .0093671    -0.74   0.460    -.0252842    .0114357
NHS & HE     |  -.0220672     .01452    -1.52   0.129     -.050527    .0063926
Nat. Indust  |   .0762025   .0274342     2.78   0.005     .0224303    .1299746
Non-profit   |  -.1843924   .0194727    -9.47   0.000    -.2225598    -.146225
Armed Forces |   .2045993   .0304522     6.72   0.000     .1449116     .264287
Other        |  -.0634904   .0300619    -2.11   0.035     -.122413   -.0045678
Higher degre |    .463328   .0228546    20.27   0.000      .418532     .508124
First degree |   .3567776   .0197903    18.03   0.000     .3179877    .3955676
Teaching qua |   .0937361   .0296989     3.16   0.002     .0355249    .1519473
Other higher |   .0459041   .0190029     2.42   0.016     .0086575    .0831507
Nursing qf   |    .259659   .0800778     3.24   0.001     .1027031     .416615
A levels     |   -.028984   .0194836    -1.49   0.137    -.0671727    .0092046
O levels,eqv |  -.1184992    .019266    -6.15   0.000    -.1562615   -.0807369
Commerce Qfv |  -.2865499   .0584653    -4.90   0.000    -.4011444   -.1719554
CSE gde 2-5  |  -.1699127   .0219733    -7.73   0.000    -.2129813    -.126844
Apprentice   |  -.1656607   .0283751    -5.84   0.000    -.2212771   -.1100443
Other qf     |  -.2892659   .0400472    -7.22   0.000    -.3677602   -.2107715
No quals     |  -.3095006   .0203431   -15.21   0.000     -.349374   -.2696272
At school    |  -.0898862   .0487912    -1.84   0.065    -.1855192    .0057467
    Constant |    .171322   .0341716     5.01   0.000     .1043442    .2382997
------------------------------------------------------------------------------
```

Women – full set, median

```
Median regression                                       Number of obs =     32573
  Raw sum of deviations 13400.96 (about 1.9175462)
  Min sum of deviations  9955.84                        Pseudo R2     =    0.2571

------------------------------------------------------------------------------
 log-hr-earn |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       jbhrs |    .016162   .0008167    19.79   0.000     .0145612    .0177627
        hrs2 |  -.0001829   .0000142   -12.89   0.000    -.0002107   -.0001551
experience   |   .0079436   .0011576     6.86   0.000     .0056747    .0102126
        exp2 |  -.0108913   .0047697    -2.28   0.022    -.0202401   -.0015425
        marr |  -.0137083   .0077011    -1.78   0.075    -.0288028    .0013862
        sepd |  -.0389509   .0165564    -2.35   0.019    -.0714021   -.0064997
        divd |  -.0240683    .010658    -2.26   0.024    -.0449584   -.0031782
        widw |  -.0298763   .0199773    -1.50   0.135    -.0690325    .0092799
      trainD |   .0394492   .0056073     7.04   0.000     .0284586    .0504398
         age |   .0479475   .0015175    31.60   0.000     .0449732    .0509218
        age2 |  -.0005482   .0000185   -29.61   0.000    -.0005845   -.0005119
CentralGvt   |   .1360938   .0129362    10.52   0.000     .1107384    .1614492
Local Govt   |   .1187784   .0071643    16.58   0.000      .104736    .1328208
NHS & HE     |   .1548382   .0083216    18.61   0.000     .1385275    .1711489
Nat. Indust  |   .1116959   .0494007     2.26   0.024     .0148687    .2085231
Non-profit   |   .0277259   .0122357     2.27   0.023     .0037435    .0517082
Armed Forces |    .118404   .0581955     2.03   0.042     .0043385    .2324694
Other        |   .0212131   .0233061     0.91   0.363    -.0244678     .066894
Higher degre |   .6539252   .0250899    26.06   0.000     .6047481    .7031023
First degree |   .5263903   .0215875    24.38   0.000     .4840779    .5687026
Teaching qua |   .5038458   .0255951    19.69   0.000     .4536783    .5540132
Other higher |   .1316418   .0210661     6.25   0.000     .0903516    .1729321
Nursing qf   |   .3459534   .0271675    12.73   0.000     .2927042    .3992026
A levels     |   .0617507   .0214279     2.88   0.004     .0197512    .1037503
O levels,eqv |   .0081526   .0211261     0.39   0.700    -.0332554    .0495606
Commerce Qfv |  -.0085743   .0250047    -0.34   0.732    -.0575844    .0404358
CSE gde 2-5  |  -.1088243   .0249232    -4.37   0.000    -.1576748   -.0599738
Apprentice   |   -.160975   .0611859    -2.63   0.009    -.2809017   -.0410482
Other qf     |  -.1691644   .0393602    -4.30   0.000    -.2463119    -.092017
No quals     |  -.1806553   .0221193    -8.17   0.000      -.22401   -.1373006
At school    |  -.1022678   .0468503    -2.18   0.029    -.1940961   -.0104396
    Constant |   .3439259   .0337781    10.18   0.000     .2777196    .4101322
------------------------------------------------------------------------------
```

Fixed-effects models

Men – full set, training this year or last

```
Fixed-effects (within) regression               Number of obs      =     29573
Group variable (i): pid                         Number of groups   =      7374

R-sq:  within  = 0.2625                         Obs per group: min =         1
       between = 0.0587                                        avg =       4.0
       overall = 0.0995                                        max =         8

                                                F(40,22159)        =    197.23
corr(u_i, Xb)  = -0.2384                        Prob > F           =    0.0000

------------------------------------------------------------------------------
 log-hr-earn |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       jbhrs |  -.0034774   .0009096    -3.82   0.000    -.0052603   -.0016945
        hrs2 |  -.0000971   .0000108    -8.98   0.000    -.0001183   -.0000759
experience   |   .0047921   .0009431     5.08   0.000     .0029435    .0066407
        exp2 |  -.0095537    .003526    -2.71   0.007     -.016465   -.0026425
        marr |  -.0189201   .0114193    -1.66   0.098    -.0413027    .0034625
        sepd |   .0072325   .0197834     0.37   0.715    -.0315444    .0460095
        divd |  -.0060808   .0178075    -0.34   0.733    -.0409847    .0288231
        widw |    -.01778   .0456604    -0.39   0.697    -.1072776    .0717177
      train2 |   .0046373   .0043435     1.07   0.286    -.0038763    .0131509
         age |   .0843967   .0062355    13.53   0.000     .0721746    .0966188
        age2 |  -.0011936   .0000352   -33.87   0.000    -.0012627   -.0011245
CentralGvt   |   .0263857   .0153842     1.72   0.086    -.0037684    .0565399
Local Govt   |   .0060484   .0130945     0.46   0.644    -.0196178    .0317147
NHS & HE     |  -.0109769   .0186193    -0.59   0.556    -.0474721    .0255183
Nat. Indust  |   .0380029   .0220443     1.72   0.085    -.0052055    .0812113
Non-profit   |  -.0320035   .0196262    -1.63   0.103    -.0704723    .0064652
Armed Forces |   .0817702   .0395099     2.07   0.038     .0043281    .1592124
Other        |  -.0169029    .022066    -0.77   0.444    -.0601537     .026348
Higher degre |   .1297846    .057397     2.26   0.024     .0172824    .2422869
First degree |   .0691065   .0471903     1.46   0.143    -.0233898    .1616029
Teaching qua |   -.081798   .1114566    -0.73   0.463    -.3002609    .1366649
Other higher |  -.1211943   .0437641    -2.77   0.006     -.206975   -.0354136
Nursing qf   |  -.0637988   .1687893    -0.38   0.705    -.3946379    .2670403
A levels     |  -.1342387   .0441917    -3.04   0.002    -.2208576   -.0476198
O levels,eqv |  -.1609683   .0439933    -3.66   0.000    -.2471983   -.0747383
Commerce Qfv |  -.4427206   .1158144    -3.82   0.000    -.6697251   -.2157161
CSE gde 2-5  |  -.2210444   .0510036    -4.33   0.000     -.321015   -.1210738
Apprentice   |  -.2714036   .0666657    -4.07   0.000    -.4020732   -.1407341
Other qf     |  -.1161744    .080859    -1.44   0.151    -.2746638    .0423149
No quals     |  -.1326584    .048864    -2.71   0.007    -.2284352   -.0368815
At school    |  -.2296713   .0652195    -3.52   0.000    -.3575062   -.1018364
    Constant |   1.024453   .2014888     5.08   0.000     .6295208    1.419386
-------------+----------------------------------------------------------------
     sigma_u |  .55239849
     sigma_e |  .24443101
         rho |  .83626184   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(7373, 22159) =     9.50         Prob > F = 0.0000
```

Women – full set, training this year or last

```
Fixed-effects (within) regression               Number of obs      =     32573
Group variable (i): pid                         Number of groups   =      8224

R-sq:  within  = 0.2115                         Obs per group: min =         1
       between = 0.0989                                        avg =       4.0
       overall = 0.1376                                        max =         8

                                                F(40,24309)        =    163.00
corr(u_i, Xb)  = -0.1168                        Prob > F           =    0.0000

------------------------------------------------------------------------------
 log-hr-earn |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       jbhrs |  -.0061488   .0008842    -6.95   0.000     -.007882   -.0044156
        hrs2 |  -.0000168   .0000147    -1.14   0.253    -.0000456     .000012
experience   |  -.0005436   .0011426    -0.48   0.634    -.0027831    .0016959
        exp2 |   .0028923   .0050194     0.58   0.564    -.0069459    .0127306
        marr |  -.0359734   .0129624    -2.78   0.006    -.0613805   -.0105664
        sepd |  -.0188587    .020225    -0.93   0.351    -.0585009    .0207835
        divd |  -.0280716   .0188942    -1.49   0.137    -.0651054    .0089623
        widw |   .0053151   .0362005     0.15   0.883    -.0656402    .0762703
      train2 |   .0176508   .0046821     3.77   0.000     .0084736    .0268281
         age |   .0622488   .0067875     9.17   0.000     .0489448    .0755527
        age2 |  -.0008764    .000039   -22.49   0.000    -.0009528      -.0008
CentralGvt   |   .0450952   .0174468     2.58   0.010     .0108985    .0792919
Local Govt   |    .051024    .010511     4.85   0.000     .0304218    .0716261
NHS & HE     |   .0440351   .0121852     3.61   0.000     .0201514    .0679187
Nat. Indust  |  -.0323691   .0389521    -0.83   0.406    -.1087176    .0439794
Non-profit   |  -.0158405    .013593    -1.17   0.244    -.0424837    .0108027
Armed Forces |   .0392489   .0547858     0.72   0.474    -.0681346    .1466324
Other        |  -.0474465    .019299    -2.46   0.014    -.0852736   -.0096193
Higher degre |   .2505035   .0719768     3.48   0.001     .1094244    .3915825
First degree |   .1180076   .0597103     1.98   0.048     .0009718    .2350435
Teaching qua |   .2602759   .1234135     2.11   0.035     .0183779    .5021739
Other higher |  -.0898675    .057242    -1.57   0.116    -.2020653    .0223304
Nursing qf   |  -.0685816    .066768    -1.03   0.304     -.199451    .0622878
A levels     |  -.0558133   .0574912    -0.97   0.332    -.1684995    .0568729
O levels,eqv |  -.1415738   .0573065    -2.47   0.014     -.253898   -.0292496
Commerce Qfv |  -.0881306   .0727604    -1.21   0.226    -.2307456    .0544843
CSE gde 2-5  |  -.0604253   .0678406    -0.89   0.373     -.193397    .0725463
Apprentice   |  -.1134498   .3079014    -0.37   0.713    -.7169555    .4900559
Other qf     |  -.0699053   .1241199    -0.56   0.573    -.3131879    .1733773
No quals     |  -.1028863   .0618261    -1.66   0.096    -.2240693    .0182966
At school    |  -.3744308   .0826737    -4.53   0.000    -.5364764   -.2123852
    Constant |   .9773315   .2199522     4.44   0.000     .5462115    1.408451
-------------+----------------------------------------------------------------
     sigma_u |  .48231185
     sigma_e |  .27606945
         rho |  .75322312   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(8223, 24309) =     6.51         Prob > F = 0.0000
```

Appendix D
Chapter 6: Key to independent variables used in the XTLOGIT models (BHPS)

jbhrs	Hours of paid work
hrs2	Hours, squared
marr	Married
sepd	Separated
divd	Divorced
widw	Widowed
age	Age
age2	Age, squared

We next show details of logistic regression models for moving into work and leaving work. We show standard models, fixed-effects and then random-effects variants. We do not show **all** of the models discussed in the text – which look at many different definitions of training and in some cases look separately at men and women rather than treating gender as an independent variable.

Moving into paid work

Logistic regression Number of obs = 33511
LR chi2(35) = 5641.34
Prob > chi2 = 0.0000
Log likelihood = -10961.589 Pseudo R2 = 0.2047

enterw	Odds Ratio	Std. Err.	z	P>|z|	[95% Conf.	Interval]
traint_1	1.32313	.0640902	5.78	0.000	1.203294	1.454901
_Iyear_9	1.165715	.091556	1.95	0.051	.999398	1.35971
_Iyear_10	1.06183	.0764296	0.83	0.405	.9221173	1.222711
_Iyear_11	1.024677	.0744535	0.34	0.737	.8886657	1.181505
_Iyear_12	1.056162	.0754038	0.77	0.444	.9182477	1.214791
_Iyear_13	1.047741	.0759083	0.64	0.520	.9090443	1.2076
_Iyear_14	1.074521	.0779985	0.99	0.322	.9320234	1.238804
_Iyear_15	1.045139	.0766101	0.60	0.547	.9052737	1.206614
_Iyear_16	.889257	.06607	-1.58	0.114	.7687493	1.028655
Higher degre	2.043219	.3164004	4.61	0.000	1.508353	2.76775
First degree	2.214409	.2572072	6.84	0.000	1.763556	2.780521
Teaching qua	1.130596	.200297	0.69	0.488	.7989285	1.599951
Other higher	1.105189	.1216667	0.91	0.364	.8906982	1.371332
Nursing qf	.6054202	.139586	-2.18	0.030	.385304	.9512845
A levels	.6426126	.0706234	-4.02	0.000	.518086	.7970704
O levels,eqv	.7466343	.0816232	-2.67	0.008	.6026336	.9250443
Commerce Qfv	.6522421	.1126922	-2.47	0.013	.4648802	.915117
CSE gde 2-5	.714057	.0920175	-2.61	0.009	.5546795	.9192289
Apprentice	.7255534	.1668214	-1.40	0.163	.462337	1.138623
Other qf	.4419135	.0983744	-3.67	0.000	.2856611	.6836334
No quals	.3827093	.0446234	-8.24	0.000	.3045228	.4809701
At school	.4994064	.0994643	-3.49	0.000	.3380061	.7378767
unemployed	1.15075	.1182949	1.37	0.172	.9407605	1.407612
retired	.1898477	.0247623	-12.74	0.000	.1470216	.2451488
family care	.3376334	.034981	-10.48	0.000	.2755849	.4136523
student	.5812853	.0619639	-5.09	0.000	.4716859	.7163508
disabled	.1421883	.0168371	-16.47	0.000	.1127379	.1793321
Govt scheme	1.528695	.2593786	2.50	0.012	1.096213	2.131803
male	1.132484	.0453366	3.11	0.002	1.047022	1.224921
age	1.085449	.0109944	8.10	0.000	1.064113	1.107213
age2	.9985581	.0001244	-11.59	0.000	.9983144	.9988019
Marr	1.28491	.0764443	4.21	0.000	1.143487	1.443823
Sepd	1.161464	.1416198	1.23	0.220	.9145701	1.475009
Divd	1.446936	.1175464	4.55	0.000	1.233955	1.696678
Widw	1.400612	.2088246	2.26	0.024	1.045701	1.875979

Conditional **fixed-effects logistic regression** Number of obs = 8675
Group variable: pid Number of groups = 2330

Obs per group: min = 2
avg = 3.7
max = 9

LR chi2(34) = 1202.90
Log likelihood = -2425.3322 Prob > chi2 = 0.0000

enterw	OR	Std. Err.	z	P>|z|	[95% Conf.	Interval]
traint_1	1.173627	.1011777	1.86	0.063	.9911709	1.38967
_Iyear_9	.4084456	.2958983	-1.24	0.216	.0987374	1.689612
_Iyear_10	.7273544	.461721	-0.50	0.616	.2096078	2.523973
_Iyear_11	1.006209	.5412459	0.01	0.991	.3506079	2.887717
_Iyear_12	.9582415	.4353726	-0.09	0.925	.3933104	2.334611
_Iyear_13	1.002658	.3679649	0.01	0.994	.4883944	2.058424
_Iyear_14	1.031042	.2938047	0.11	0.915	.5898187	1.802328
_Iyear_15	.9623915	.1993049	-0.19	0.853	.6413183	1.444209
_Iyear_16	.761272	.1053419	-1.97	0.049	.5804353	.9984488
Higher degre	56.13069	58.86041	3.84	0.000	7.187927	438.3259
First degree	18.03092	16.89502	3.09	0.002	2.873689	113.1347
Teaching qua	14.4166	22.46188	1.71	0.087	.6802085	305.5508
Other higher	.9478428	.8418476	-0.06	0.952	.1662351	5.40443
Nursing qf	.1578206	.2332895	-1.25	0.212	.0087081	2.860256
A levels	.5823794	.5223634	-0.60	0.547	.1003976	3.378226
O levels,eqv	.2041342	.1842965	-1.76	0.078	.0347884	1.197837
Commerce Qfv	.0252893	.0392976	-2.37	0.018	.0012029	.5316647
CSE gde 2-5	.1421777	.1448142	-1.92	0.055	.0193128	1.046689
Apprentice	326261.4	1.82e+08	0.02	0.982	0	.
Other qf	.1271466	.219052	-1.20	0.231	.0043434	3.722032
No quals	.5771171	.5598578	-0.57	0.571	.0862022	3.863754
At school	.067228	.0917551	-1.98	0.048	.0046323	.9756628
Unemployed	1.221692	.2458793	0.99	0.320	.8234701	1.81249
retired	.4437073	.1179419	-3.06	0.002	.2635352	.7470584
family care	.8749026	.1753891	-0.67	0.505	.5906386	1.295978
student	.5795859	.1240488	-2.55	0.011	.3810089	.8816588
disabled	.4579128	.1160876	-3.08	0.002	.2786062	.7526183
Govt scheme	1.510999	.4951414	1.26	0.208	.7949371	2.872074
age	1.635351	.1550958	5.19	0.000	1.357949	1.969421
age2	.9950258	.0005518	-8.99	0.000	.9939449	.9961079
Marr	.6584347	.1551421	-1.77	0.076	.4149067	1.044901
Sepd	.6516411	.2076937	-1.34	0.179	.3489073	1.217046
Divd	1.030768	.3139966	0.10	0.921	.5673673	1.872652
Widw	2.56934	1.565519	1.55	0.121	.778355	8.481358

Random-effects logistic regression Number of obs = 33511
Group variable: pid Number of groups = 10073

Random effects u_i ~ Gaussian Obs per group: min = 1
avg = 3.3
max = 9

Wald chi2(35) = 2230.61
Log likelihood = -10738.109 Prob > chi2 = 0.0000

enterw	OR	Std. Err.	z	P>|z|	[95% Conf.	Interval]
traint_1	1.367147	.0838239	5.10	0.000	1.212343	1.541718
_Iyear_9	.8031804	.0791742	-2.22	0.026	.662072	.9743634
_Iyear_10	.8452426	.0741801	-1.92	0.055	.7116694	1.003886
_Iyear_11	.907426	.0790234	-1.12	0.265	.7650401	1.076312
_Iyear_12	.9384569	.0799838	-0.75	0.456	.7940854	1.109076
_Iyear_13	.9761187	.0837257	-0.28	0.778	.8250716	1.154818
_Iyear_14	1.026206	.0878266	0.30	0.762	.8677313	1.213622
_Iyear_15	1.032903	.0883289	0.38	0.705	.8735125	1.221379
_Iyear_16	.8496788	.0730761	-1.89	0.058	.7178732	1.005685
Higher degre	3.661763	.8628778	5.51	0.000	2.307324	5.811283
First degree	3.634812	.6429772	7.30	0.000	2.569859	5.141082
Teaching qua	1.093839	.2825373	0.35	0.728	.6593093	1.814754
Other higher	1.190794	.1977983	1.05	0.293	.859898	1.649023
Nursing qf	.4207	.1362495	-2.67	0.008	.2229971	.7936807
A levels	.5309714	.0878242	-3.83	0.000	.3839546	.7342811
O levels,eqv	.6187608	.1020942	-2.91	0.004	.4477919	.8550062
Commerce Qfv	.5346042	.1330243	-2.52	0.012	.3282691	.8706323
CSE gde 2-5	.6366807	.1236804	-2.32	0.020	.4350797	.9316967
Apprentice	.6916192	.2120949	-1.20	0.229	.37917	1.261537
Other qf	.3477793	.1111332	-3.31	0.001	.1859094	.6505881
No quals	.2812459	.0489813	-7.28	0.000	.1999137	.3956671
At school	.3717102	.1052168	-3.50	0.000	.2134333	.6473611
unemployed	1.302851	.1746573	1.97	0.048	1.001808	1.694357
retired	.1666911	.0273626	-10.91	0.000	.1208333	.2299526
family care	.3412468	.0459538	-7.98	0.000	.262085	.4443193
student	.5145209	.0717053	-4.77	0.000	.3915406	.6761284
disabled	.1175093	.0179071	-14.05	0.000	.0871684	.1584112
Govt scheme	1.749164	.3883522	2.52	0.012	1.131998	2.702811
male	1.277324	.0745657	4.19	0.000	1.139229	1.432159
age	1.141187	.0162075	9.30	0.000	1.109859	1.173399
age2	.9978155	.0001729	-12.62	0.000	.9974766	.9981545
Marr	1.284301	.109144	2.94	0.003	1.087249	1.517067
Sepd	1.128502	.1834435	0.74	0.457	.8206069	1.551919
Divd	1.536504	.1771843	3.72	0.000	1.225677	1.926155
Widw	1.500679	.2927177	2.08	0.037	1.023894	2.199483
/lnsig2u	.5871359	.0796653			.4309948	.7432769
sigma_u	1.341204	.0534237			1.240479	1.450109
rho	.353495	.0182064			.3186783	.3899385

Likelihood-ratio test of rho=0: chibar2(01) = 446.96 Prob >= chibar2 = 0.000

Leaving paid work

Logistic regression

Number of obs	= 67953
LR chi2(30)	= 2380.88
Prob > chi2	= 0.0000
Log likelihood = -15874.627	Pseudo R2 = 0.0698

leavew	Odds Ratio	Std. Err.	z	P>|z|	[95% Conf.	Interval]
traint_1	.7018105	.0269506	-9.22	0.000	.6509272	.7566714
_Iyear_9	1.167133	.0855902	2.11	0.035	1.010877	1.347541
_Iyear_10	1.243419	.0835412	3.24	0.001	1.090004	1.418427
_Iyear_11	1.156224	.0788573	2.13	0.033	1.011551	1.321588
_Iyear_12	1.17395	.0782458	2.41	0.016	1.030186	1.337777
_Iyear_13	1.150221	.0773875	2.08	0.038	1.008119	1.312353
_Iyear_14	1.143958	.0773518	1.99	0.047	1.001968	1.306069
_Iyear_15	1.313509	.0867138	4.13	0.000	1.154089	1.49495
_Iyear_16	1.104818	.0754548	1.46	0.144	.9664006	1.263062
Higher degre	.8521676	.1179571	-1.16	0.248	.6496833	1.11776
First degree	.786597	.0895307	-2.11	0.035	.6293153	.9831874
Teaching qua	1.028305	.1477692	0.19	0.846	.775895	1.362828
Other higher	.7900048	.0858539	-2.17	0.030	.6384475	.9775393
Nursing qf	1.062362	.1846984	0.35	0.728	.7555887	1.493686
A levels	.925147	.1032096	-0.70	0.486	.7434479	1.151253
O levels,eqv	.8702773	.0956587	-1.26	0.206	.7016099	1.079493
Commerce Qfv	.8342591	.1269417	-1.19	0.234	.6191292	1.124141
CSE gde 2-5	1.095555	.1404819	0.71	0.477	.8520902	1.408585
Apprentice	1.467486	.2430846	2.32	0.021	1.060657	2.03036
Other qf	1.257899	.2696282	1.07	0.284	.8264038	1.914693
No quals	1.200735	.1362441	1.61	0.107	.96131	1.49979
At school	1.815927	.4649792	2.33	0.020	1.099368	2.999534
male	.4928679	.0164204	-21.24	0.000	.4617128	.5261252
self-employed	.9278973	.0500862	-1.39	0.166	.8347445	1.031445
age	.734161	.0063081	-35.97	0.000	.7219009	.7466292
age2	1.003638	.0000969	37.63	0.000	1.003449	1.003828
Marr	1.292218	.064963	5.10	0.000	1.170965	1.426028
Sepd	1.379203	.1558081	2.85	0.004	1.10527	1.721029
Divd	1.362588	.0977472	4.31	0.000	1.183866	1.568291
Widw	1.42725	.1697166	2.99	0.003	1.130531	1.801847

Conditional **fixed-effects logistic regression** Number of obs = 15728
Group variable: pid Number of groups = 3166

Obs per group: min = 2
avg = 5.0
max = 9

LR chi2(28) = 926.54
Log likelihood = -4561.1563 Prob > chi2 = 0.0000

leavew	OR	Std. Err.	z	P>|z|	[95% Conf.	Interval]
traint_1	.9046291	.0504836	-1.80	0.072	.8109023	1.009189
_Iyear_9	.1140822	.0742088	-3.34	0.001	.0318804	.4082366
_Iyear_10	.2034809	.1169214	-2.77	0.006	.0659808	.6275227
_Iyear_11	.3236175	.1579014	-2.31	0.021	.124368	.842084
_Iyear_12	.3958036	.162421	-2.26	0.024	.1770854	.8846605
_Iyear_13	.526333	.1731846	-1.95	0.051	.2761731	1.00309
_Iyear_14	.6395247	.1606997	-1.78	0.075	.3908117	1.046519
_Iyear_15	.9097263	.161328	-0.53	0.594	.6426306	1.287835
_Iyear_16	.8686362	.0998177	-1.23	0.220	.6934637	1.088058
Higher degre	.1869031	.2555414	-1.23	0.220	.012818	2.725294
First degree	.3306529	.4137284	-0.88	0.376	.0284649	3.840923
Teaching qua	.6295047	1.6276	-0.18	0.858	.0039646	99.95449
Other higher	2.296303	2.783971	0.69	0.493	.2133326	24.7173
Nursing qf	35.19323	58.61532	2.14	0.033	1.345114	920.7874
A levels	3.321654	4.033915	0.99	0.323	.3073479	35.89869
O levels,eqv	3.478134	4.217526	1.03	0.304	.3229936	37.45404
Commerce Qfv	8.958058	12.2688	1.60	0.109	.6115382	131.2213
CSE gde 2-5	11.16813	14.77114	1.82	0.068	.8359273	149.2082
Apprentice	4.85e-06	.0037877	-0.02	0.988	0	.
Other qf	8.110853	15.23592	1.11	0.265	.2042292	322.1182
No quals	2.84646	3.528254	0.84	0.399	.2507383	32.31391
Self-employed	.715759	.085591	-2.80	0.005	.5662125	.9048032
age	.4640435	.0398116	-8.95	0.000	.3922219	.5490168
age2	1.008381	.0004233	19.88	0.000	1.007551	1.009211
Marr	2.853223	.3969078	7.54	0.000	2.172333	3.74753
Sepd	1.879735	.4372914	2.71	0.007	1.191455	2.965621
Divd	1.991298	.4290682	3.20	0.001	1.305348	3.037708
Widw	1.169995	.4481414	0.41	0.682	.5522678	2.478669

Random-effects logistic regression Number of obs = 67953
Group variable: pid Number of groups = 13932

Random effects u_i ~ Gaussian Obs per group: min = 1
avg = 4.9
max = 9

Wald chi2(30) = 1649.34
Log likelihood = -15643.565 Prob > chi2 = 0.0000

leavew	OR	Std. Err.	z	P>|z|	[95% Conf.	Interval]
traint_1	.7032897	.0306595	-8.07	0.000	.6456939	.7660231
_Iyear_9	.9240489	.0762661	-0.96	0.339	.7860339	1.086297
_Iyear_10	1.06568	.0795755	0.85	0.394	.9205903	1.233635
_Iyear_11	1.053553	.0788943	0.70	0.486	.9097356	1.220107
_Iyear_12	1.07673	.0784504	1.01	0.310	.9334446	1.242011
_Iyear_13	1.104428	.0806608	1.36	0.174	.9571293	1.274395
_Iyear_14	1.11773	.0816826	1.52	0.128	.9685723	1.289858
_Iyear_15	1.3241	.0943009	3.94	0.000	1.151593	1.522447
_Iyear_16	1.103399	.0807612	1.34	0.179	.9559397	1.273605
Higher degre	.7490041	.140421	-1.54	0.123	.5186848	1.081596
First degree	.6791078	.105951	-2.48	0.013	.500194	.922017
Teaching qua	.950594	.1896045	-0.25	0.799	.6430064	1.405319
Other higher	.7345285	.1096853	-2.07	0.039	.5481519	.9842749
Nursing qf	1.119845	.2684621	0.47	0.637	.6999998	1.791504
A levels	.9381302	.1436711	-0.42	0.677	.694872	1.266547
O levels,eqv	.8504803	.1284673	-1.07	0.284	.63254	1.143511
Commerce Qfv	.805604	.1687606	-1.03	0.302	.5343295	1.214602
CSE gde 2-5	1.189607	.2095122	0.99	0.324	.8423468	1.680027
Apprentice	1.492405	.3487315	1.71	0.087	.9440295	2.359324
Other qf	1.483742	.4359848	1.34	0.179	.8341421	2.639226
No quals	1.309843	.2046466	1.73	0.084	.9643388	1.779135
At school	2.070636	.7684133	1.96	0.050	1.000513	4.285335
male	.4147451	.0189506	-19.26	0.000	.3792172	.4536016
self-employed	.9069156	.0612979	-1.45	0.148	.7943917	1.035378
age	.6802557	.0082057	-31.94	0.000	.6643614	.6965302
age2	1.004599	.0001396	33.03	0.000	1.004326	1.004873
Marr	1.364833	.0859232	4.94	0.000	1.206402	1.54407
Sepd	1.425801	.1947738	2.60	0.009	1.090886	1.86354
Divd	1.451903	.1331887	4.06	0.000	1.21298	1.737887
Widw	1.456588	.2345394	2.34	0.020	1.062372	1.997087
/lnsig2u	.4561757	.0687666			.3213957	.5909557
sigma_u	1.256196	.0431921			1.17433	1.343768
rho	.3241704	.0150657			.2953684	.3543685

Likelihood-ratio test of rho=0: chibar2(01) = 462.12 Prob >= chibar2 = 0.000

References

Allison, P. (2009). *Fixed effects regression models*. London: Sage Publications.

Andersson, F., Holzer, H. and Lane, J. (2005). *Moving up or moving on: Who advances in the low-wage labor market*. New York: Russell Sage Foundation.

Arulampalam, W. and Booth, A. (1997). 'Who gets over the training hurdle? A study of the training experiences of young men and women in Britain'. *Journal of Population Economics Vol. 10 No.2*, pp.197-217.

Arulampalam, W. and Booth, A. (2001). 'Learning and earning: do multiple training events pay? A decade of evidence from a cohort of young British men'. *Economica Vol.68 No.271*, pp. 379-400.

Asplund, R. (2004). *The provision and effects of company training: a brief review of the literature*. The Research Institute of the Finnish Economy ETLA. http://econpapers.repec.org/paper/rifdpaper/907.htm (accessed 28 August 2008).

Bassanini, A., Booth, A., Brunello, G., De Paola, M. and Leuven, E. (2005). *Workplace training in Europe*. Bonn: IZA (Institute for the Study of Labor) Discussion Paper No 1640.

Bland, J.M. and Altman, D.G. (1994). 'Statistic notes: regression towards the mean'. *British Medical Journal* Vol. 308, p.1499.

Blundell, R., Dearden, L. and Meghir, C. (1996). *The determinants and effects of work-related training in Britain*. London: Institute for Fiscal Studies.

Blundell, R., Dearden, L., Meghir, C. and Sianesi, B. (1999). 'Human capital investment: the returns from education and training to the individual, the firm and the economy'. *Fiscal Studies*, Vol. 20, pp.1-23.

Booth, A. (1993). 'Private sector training and graduate earnings'. *Review of Economics and Statistics* Vol. 75 pp. 164-170.

Clark, K. and Drinkwater, S. (2007). *Ethnic minority in the labour market: dynamics and diversity*. York: Joseph Rowntree Foundation and Bristol: the Polity Press.

Cleveland, R., Cleveland, W. McRae, J. and Terpenning, I. (1990). 'STL: A Seasonal-Trend Decomposition Procedure Based on Loess'. *Journal of Official Statistics*, Vol. 6, pp. 3–73.

Dearden, L., Reed, H. and Van Reenen, J. (2006). 'The impact of training on productivity and wages: evidence from British panel data'. *Oxford Bulletin of Economics and Statistics*, Vol. 68, No. 4, pp. 397-421.

Green, F., Felstead, A., Mayhew, K. and Pack, A. (2000). 'The impact of training on labour mobility: individual and firm-level evidence from Britain'. *British Journal of Industrial Relations* Vol. 30 No.2 pp. 261-275.

Heath, A. and Cheung, S.Y. (2006). *Ethnic penalties in the labour market: employers and discrimination*. Leeds: CDS (Department for Work and Pensions, Research Report No. 341).

Kendall, M., (1976). *Time-series*, Charles Griffin & Co Ltd.

Koenker, R. and Bassett, H. (1978) 'Regression Quantiles'. *Econometrica*. January, 46:1, pp. 33–50.

Leuven, E. (2004). 'The economics of training: a survey of the literature'. *Journal of Economic Surveys*.

Leuven, E. and Oosterbeek, H. (2008). 'An alternative approach to estimate the wage returns to private-sector training'. *Journal of Applied Econometrics* Volume 23 Issue 4, Pages 423 – 434.

McKay, S. and Sadler, L (2009). *Using Longitudinal data to study the effects of training on job advancement*. Unpublished report to DWP.

Mincer, J. (1974) *Schooling, Experience and Earnings*. Cambridge MA: National Bureau of Economic Research.

Muehler, G., Beckmann, M. and Schauenberg, B. (2007). 'The returns to continuous training in Germany: new evidence from propensity score matching estimators'. *Review of Managerial Science* vol 1 no. 3 pp 209-235.

Office for National Statistics (2008). *Labour Force Survey User Guide – Volume 3: Details of LFS variables 2008*, (part of ESDS documentation).

Parent, D. (1999). 'Wages and mobility: the impact of employer-provided training'. *Journal of Labor Economics*, Vol, 17, Issue 2, pp.298-317.

This research reviews recent trends on training, and seeks to uncover the link between training and changes in employment characteristics. Specifically, it looks for a relationship between undertaking training and gaining, retaining and advancing in employment.

The report does find a small effect on wages of undergoing training, and also increases in the rate of retention and moving into paid work. However, the incidence of training appears to be falling (which may be reflecting higher unemployment), except among older workers.

If you would like to know more about DWP research, please contact:
Paul Noakes, Commercial Support and Knowledge Management Team,
3rd Floor, Caxton House, Tothill Street, London SW1H 9NA

http://research.dwp.gov.uk/asd/asd5/rrs-index.asp

Research Report No. 680
ISBN 978-1-84712-806-5