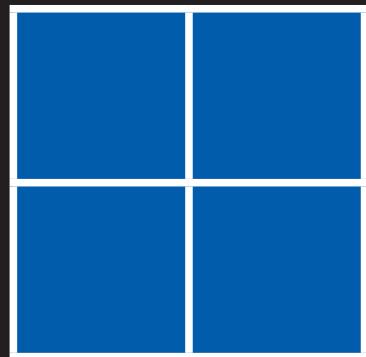


Adult Training, Skills Updating and Recession in the UK: The Implications for Competitiveness and Social Inclusion

Geoff Mason and Kate Bishop

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Adult Training, Skills Updating and Recessions in the UK: The Implications for Competitiveness and Social Inclusion

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Abstract

Analysis of adult training in the UK sheds a great deal of light on the extent to which recent government policy has succeeded in meeting its objectives of improving economic competitiveness while enhancing social inclusion.

Across the UK workforce as a whole, average levels of job-related training have declined through much of the 2000s and have now returned to 1993 levels. Training rates at lower levels of qualification and in older age groups remain in absolute terms well below those for, respectively, highly-qualified and younger employees. But multivariate analysis of Labour Force Survey data from 1993 to 2009 shows that there has been some narrowing of the gap in training provision between low-qualified and highly-qualified employees. This has occurred as training rates for low-qualified people have remained steady or even increased slightly during the 2000s in spite of the overall decline in job-related training.

This may be counted as a partial success for training policies designed to enhance social inclusion. However, the narrowing of the training gap has been achieved more by levelling-down of training rates than by levelling-up. In particular, it reflects declining training rates for younger age groups holding higher education qualifications. These developments have negative implications for economic competitiveness because, as the paper shows through analysis of employer survey data for several different sectors, adult skill improvement and updating needs are widespread and apply to employees at all levels of qualification, not just workers with relatively low qualifications.

Further analysis of longitudinal training data for establishments covered by the employers' survey suggests that the recent period of recession has also contributed to reductions in the coverage of adult training and especially reductions in off-the-job training for skilled and highly-qualified employees. This may help to further narrow the gap in training levels between low-qualified and well-qualified workers but, unless training levels can be raised for employees at all levels of qualification, growth in competitiveness may continue to be hindered by gaps in adult skills.

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1. Introduction¹

Adult training has been at the heart of recent UK policy debates concerning economic competitiveness and social inclusion issues. A series of government papers and reports since the late 1990s have argued that future growth in competitiveness depends in part on improvements in workforce skill levels. Since adults constitute a large majority of the workforce, the obvious implication is that education and training policy should focus on developing opportunities for lifelong learning, not just initial skills training at the start of individuals' working lives. At the same time official documents on lifelong learning have been permeated by a 'social inclusion discourse' (Davies and Hughes, 2009). In particular, attention has been paid to gaps in adult basic skills such as literacy and numeracy, with a clear policy agenda of promoting expanded employment opportunities for social groups who had previously tended to be excluded from the workforce (DfEE, 1998; Moser Report, 1999).² In other governmental reports, more emphasis has been placed on developing 'world class skills' among a wider cross-section of the working-age population, with the aim of expanding the proportions of the workforce who hold qualifications at NVQ Level 3 (e.g. advanced apprenticeship) and NVQ Levels 4 and 5 (e.g. higher technical and university graduate levels) as well as at lower levels (DfES, 2003; Leitch Review of Skills, 2005; DIUS, 2007).

In principle, there are many complementarities between policies aiming to promote both social inclusion and economic competitiveness through adult skills improvement. For a start, the general efficiency of firms and other organisations should improve if

¹ This paper is based on research carried out with the support of the Economic and Social Research Council (ESRC) Centre for Research on Learning and Life-chances in Knowledge Economies and Societies (LLAKES). The ESRC is not responsible for views expressed in this paper. We are grateful to the employers who participated in telephone surveys and also to NIESR and LLAKES colleagues for helpful comments on previous drafts of this paper. Responsibility for any errors is of course ours alone. A further disclaimer relates to material from the Labour Force Survey which is Crown Copyright; this has been made available by the Office for National Statistics (ONS) through the UK Data Archive (UKDA) and has been used by permission. Neither the ONS nor the UKDA bear any responsibility for the analysis or interpretation of the data reported here.

² For Davies and Hughes (2009), the social inclusion discourse in government policy documents has been confined to inclusion through work primarily in order to fit with other policy discourses relating to human capital development and central control. Green, Janmaat and Han (2009) note that the emphasis on social inclusion through waged employment in UK policy discussions has tended to predominate over the much wider concept of 'social cohesion' which takes more account of, among other things, disparities in pay and working conditions among employees. Fuller and Unwin (2003) have also shown that government policy on youth training and apprenticeship has been pulled between pursuing social inclusion goals at the same time as attempting to increase stocks of intermediate skills.

fewer employees are struggling with gaps in literacy and numeracy skills. Higher levels of basic skills among employees should not only improve the performance of day-to-day tasks but should also reduce the need for managers and supervisors to engage in trouble-shooting or ‘fire-fighting’ activities as a result of limited skills at lower levels. However, to the extent that adult training can be influenced by government policies and programmes, available resources are necessarily limited in nature and have to be prioritised. Faced with this constraint, UK government policy has given priority in recent years to funding programmes such as Train to Gain which have, in the main, confined support to training leading to accredited qualifications for employees who have not previously gained educational qualifications equivalent to NVQ Level 2 (e.g. initial vocational qualifications or GCSE passes at grades A-C).

This approach therefore owes much to policy objectives relating to social inclusion. It has been criticised on a number of grounds, for example, its relative neglect of uncertified learning and the relatively low wage returns to adults who acquire NVQ Level 2 vocational qualifications (Dearden, McGranahan and Sianesi, 2004; Wolf, Jenkins and Vignoles, 2006). One counter-argument to this line of criticism is that acquisition of NVQ Level 2 qualifications can serve as a stepping-stone to higher levels of qualification which do attract higher wage returns. Dearden et al (2004) do find some evidence of progression of this kind but so far it only applies to a small proportion of those obtaining NVQ2 vocational qualifications.

A particular consequence of policy-makers’ focus on acquisition of low-level qualifications is that participation in training at levels higher than NVQ2 is largely subject to decisions made by employers and (to a lesser extent) by individuals. In some ways this is appropriate since employers and individuals will benefit from future returns to higher levels of skill. However, for reasons discussed below, one of the great regularities of employer-provided training – spanning different sectors and countries -- is that training rates tend to be highest for employees who are already relatively well-qualified and high-skilled (Acemoglu and Pischke, 1998).

Thus, in the absence of government policies designed to encourage training for adults who already hold NVQ2, NVQ3 or other qualifications below graduate level, it is always possible that adult training will end up being polarised between relatively low-

qualified people who qualify for government-supported training programmes and highly-qualified people whose training is most likely to be supported by employers. Such an outcome would lead to considerable gaps in lifelong learning opportunities for a large section of the workforce in the middle of the skills spectrum, and could hamper growth in competitiveness while not necessarily contributing very much to social inclusion.

In the light of such concerns, a key aim of this paper is to examine recent trends in employer-provided training for adult workers, in order to explore how successful government policy over the last 10-12 years has been in terms of its own objectives, ie, the expansion of training opportunities for adult employees with low or no qualifications (as a contribution to greater social inclusion) and the updating and improvement of adult worker skills across the whole skills spectrum (as a contribution to higher levels of competitiveness).

The paper is structured as follows. We first set out a theoretical framework in Section 2 for understanding the provision of work-related training by employers and consider how this provision might have been affected by recent UK government policies. In the light of this discussion, we suggest that, even if the long-established positive relationship between prior qualifications and the probability of receiving training remains intact, one test of the impact of government policy designed to promote social inclusion is whether or not the strength of this relationship has diminished over time (ie, whether the gap in training participation between low-qualified adults and other better-qualified groups of workers has narrowed). In Section 3, therefore, we explore recent trends in training rates by qualification group through detailed analysis of Labour Force Survey data. We then go on to present new evidence on the extent of adult skills updating and improvement needs in five very different sectors and city-regions (Section 4) and the impact of the 2008-09 recession on employer-provided training intended to fill identified gaps in adult skills (Section 5). We conclude with a summary of our findings and their implications for public policy relating to competitiveness and social inclusion.

2. Theoretical Discussion and Hypotheses

In recent decades most theorising about employer-provided training has been rooted in the well-known distinction by Becker (1964) between general training (which develops skills that are useful in a number of different firms) and firm-specific training. In competitive labour markets, employers have clear incentives to pay for firm-specific training, but it is only individual employees who are expected to benefit from and pay for general training. Much of the post-Becker discussion has been concerned to account for the observable fact that many employers *do* pay for general training leading to skills which are potentially useful in other firms. Some common themes which have emerged in this literature are as follows:

- The general/firm-specific skills dichotomy does not do justice to the variety and complexity of skills which training is intended to develop.
- Training of a general nature is often hard to separate from firm-specific training and different kinds of training are often provided together
- Labour markets are frequently imperfectly competitive in their operation, and employers may be willing to pay for training of a general nature because they have some degree of monopsony power over their employees after completion of training (i.e. post-training wages could fall short of the marginal products of the workers concerned)
- Employer-provided training of a general nature may help to cement workers' loyalty to their existing firms and thus reduce the prospect of losing newly-acquired skills through workers taking up jobs with other employers

Many of these themes are inter-related. For example, Feuer, Glick and Desai (1987) argued that the bargaining relationship between firms and workers could be asymmetric due in part to firms' greater size and resources and the imperfect nature of information available to workers in efforts to assess potential investments in training. Katz and Ziderman (1990) suggested that asymmetries of information could also arise between training and non-training employers since the latter are poorly placed to assess the skills of workers trained elsewhere, especially if those skills are uncertified. Stevens (1994) developed the concept of 'transferable' skills which had value in more than one firm but for which wages could fall below worker productivity for a number of reasons, including small numbers of firms in particular labour markets who valued

particular kinds of skills and various impediments to competitive labour markets such as mobility costs and imperfect information available to both firms and workers.

Acemoglu and Pischke (1999) note that many skills are industry- or occupation-specific in nature and argue that firms' willingness to invest in equipping workers with such skills depends on there being a 'compressed' wage structure such that wages increase more slowly than productivity as skills increase. The sources of such compression could include not just transaction costs and asymmetries of information, but also institutions tending to drive up wages at the low-skills end of the labour market such as trade unions and minimum wage legislation.

One implication of the proposition that employers provide general training when they have some degree of monopsony power over their own skilled workers is that those workers may be able to achieve higher wages by subsequently moving to other firms. Evidence consistent with this argument has been provided for both the US (Loewenstein and Spletzer, 1999) and the UK (Booth and Bryan, 2005). However, the prospect of losing trained workers once they have acquired new skills is something that training firms seek to minimise. Hence, Green et al (2000) suggest that training firms are likely to engage in human resource management practices designed to increase organisational commitment and labour retention. They present evidence for the UK that training firms do succeed in reducing labour mobility through management practices of this kind. In other cases the methods adopted to reduce labour mobility of skilled workers may be more direct. For example, many UK employers who pay tuition fees for employees to study part-time in higher education make this support conditional on the employees staying with their firms for minimum periods of time following their studies (Mason and Hopkin, 2009).

Furthermore, in the United States, as Cappelli (2004) has shown, there is substantial evidence of employer willingness to assist employees to acquire general (or transferable) skills by reimbursing some or all of their fees for part-time studies in post-secondary education and this policy is closely linked to labour retention (*ibid*). Indeed, tuition reimbursement programmes are seen as a means of attracting high-quality employees in the first place as well as securing their services during what are

often lengthy periods of part-time study and in promoting employee loyalty to firms for some time after their studies end.

Taken together, this theoretical and empirical work on employer provision of general skills training and firms' subsequent efforts to retain the services of trained workers sheds further light on why highly-educated employees typically receive more training than do employees with few or no qualifications. First, high levels of ability (as signified by educational qualifications) are likely to be complementary to training and thus contribute to higher returns to training provision (Booth, 1991; Green, 1993; Black and Lynch, 1998; Acemoglu and Pischke, 1998). Second, highly-qualified workers are more able to co-invest in their own education and training as they tend to be less credit-constrained than low-skilled workers. Third, there is a longstanding literature on firms' efforts to retain the services of highly-qualified employees such as scientists and engineers through the operation of 'internal labour markets' in which lengthy tenure is rewarded with higher wages and greater opportunities for training and internal promotion (Taubman and Wachter, 1986; Wachter and Wright, 1990; Siebert and Addison, 1991).

Internal labour markets of this kind have tended to decline in importance in recent years, with typically declining returns to tenure (Grimshaw et al, 2001; Behaghel and Gautié 2006; Marsden 2007). However, Mason and Nohara (2010) show that in both the UK and France, wage returns to tenure for scientists and engineers remain strongly positive and compare favourably with the returns to prior experience with other employers, even though this is an occupational area where increasing value is placed by employers on knowledge acquisition through external recruitment. One possible reason for these continuing high returns to tenure is that firms place relatively high value on the role played by highly-qualified employees in developing and maintaining collective tacit knowledge within firms (Lam, 2000) as well as on the skills and knowledge that they have gained through employer-provided training.

In this context, the UK policy emphasis on enhancing social inclusion through adult training would seem to stand little chance of success since the incentives are so strong for employers to give priority to training for employees who are already well-qualified. However, as foreshadowed in Section 1, even if the long-established

positive relationship between prior qualifications and the probability of receiving training remains intact, there are several reasons why it is worth investigating whether the strength of the relationship between prior education and receipt of training has at least diminished in recent years.

First, as we have noted, government funding support for adult training has tended to favour low-qualified adults rather than high-qualified groups of workers. This might be expected to have a substantial impact on the distribution of training since government funding accounted for an estimated 45% of total UK spending on adult education and training in 2007-08 (IFLL, 2009).

Second, there is evidence that the introduction of the National Minimum Wage in 1999 has prompted some employers to seek to improve the productivity of low wage workers through higher levels of training (Arulampalam et al, 2002; Almeida-Santos and Mumford, 2005). This is consistent with arguments that an increase in the degree of compression of the wage structure will enhance the perceived returns to general skills training for employers.

Third, there is evidence that growth (decline) in the tightness of local labour markets is associated with increases (reductions) in employer provision of training for workers who lack experience in their sectors (Majumdar, 2004). Since the UK unemployment rate fell from over 10% in 1993 to around 5% in the mid-2000s, this may have contributed to higher levels of training for low-skilled workers over this period.³

Fourth, the last 20 years have seen very rapid growth in the graduate share of the workforce in the UK since the late 1980s, which has risen from 9% in 1988 to 23% in 2008.⁴ This expansion has been accompanied by evidence of widening dispersion in the financial returns to graduate-level qualifications (Green and Zhu, 2008) and concerns that the average quality of skills and knowledge associated with possession of university-level qualifications has declined over the same period. In particular, there are frequent reports of new, young graduates being found by their employers to

³ Refers to ILO unemployment rate for all persons aged 16 or over in the UK. Derived from Office of National Statistics, <http://www.statistics.gov.uk/statbase>, updated 15.1.10.

⁴ Derived from Labour Force Surveys for 1988 and 2008.

lack communication, problem-solving and other ‘employability skills’ (Mason, Williams and Cranmer, 2009). Given these developments, it is clearly possible that there has been some diminution in the complementarity between higher education qualifications and the perceived ‘trainability’ of new graduates entering the workforce and particularly new graduates in younger age groups who lack prior work experience.

These considerations point to three hypotheses regarding adult training in the UK which are worthy of investigation:

H1: The strength of the positive relationship between formal qualifications and receipt of training has tended to decline over time.

H2: The gap in training levels between adults with low or no qualifications and adults with high-level qualifications has narrowed over time.

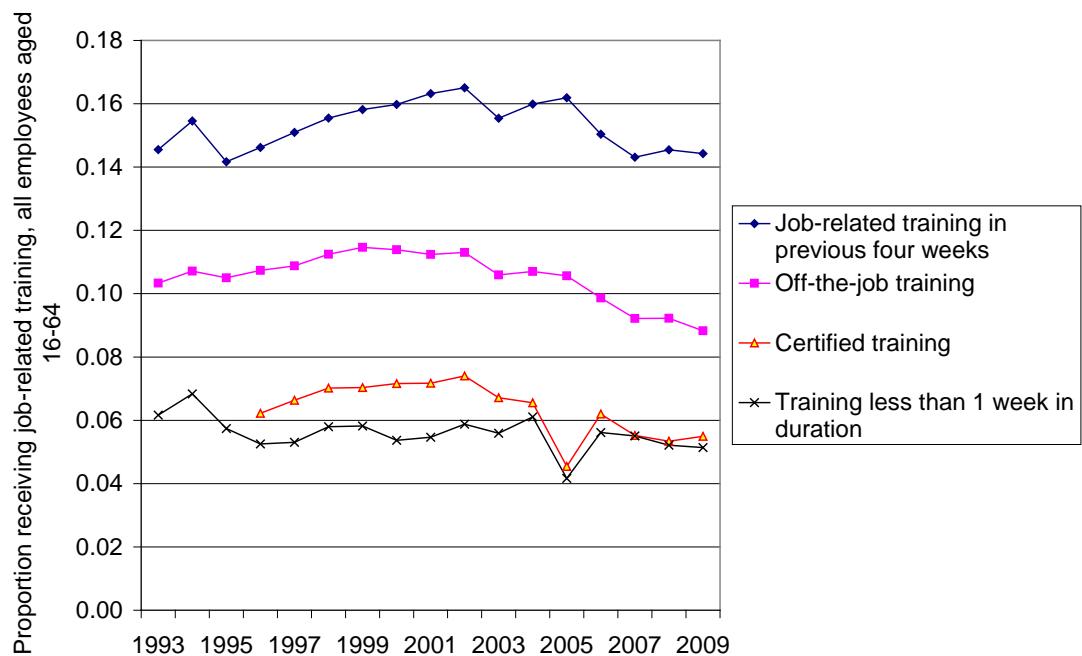
H3: At high levels of formal qualification, the probability of receiving training has declined less for older age groups than for younger workers.

We now make use of Labour Force Survey (LFS) data to submit these hypotheses to empirical scrutiny. H1 and H2 can be seen in some ways as tests of the effectiveness of government policies designed to enhance social inclusion through training provision for adult workers with relatively low or no prior formal qualifications. By contrast, as we argue below, if we find support for H3, this has some bearing on the government’s policy objectives regarding competitiveness since adult workers may be in greater need of skills updating than are younger workers.

3. Trends in Job-Related Training: Multivariate Analysis

Figures 3.1-3.4 provide background information on the evolution of training rates over the period 1993-2009. As of Spring 2009, approximately 14.4% of all employees aged 16-64 reported that they had received job-related training in the four weeks prior to their being interviewed for the LFS – much the same level of training as was reported in 1993 (Figure 3.1). However, the 2009 figure represents the end-point of a period which is clearly divided between an upturn in training rates during the second half of the 1990s and a downturn beginning in 2002. Similar trends can be observed in the proportions of employees reporting that they received off-the-job training and training leading to formal qualifications. By contrast, there is no clear trend in the proportion of employees receiving training of relatively short duration (less than one week in length).

Figure 3.1: Proportion of employees who received job-related training in previous four weeks, all males and females aged 16-64, 1993-2009



Source: Labour Force Survey (Spring quarters)

Notes:

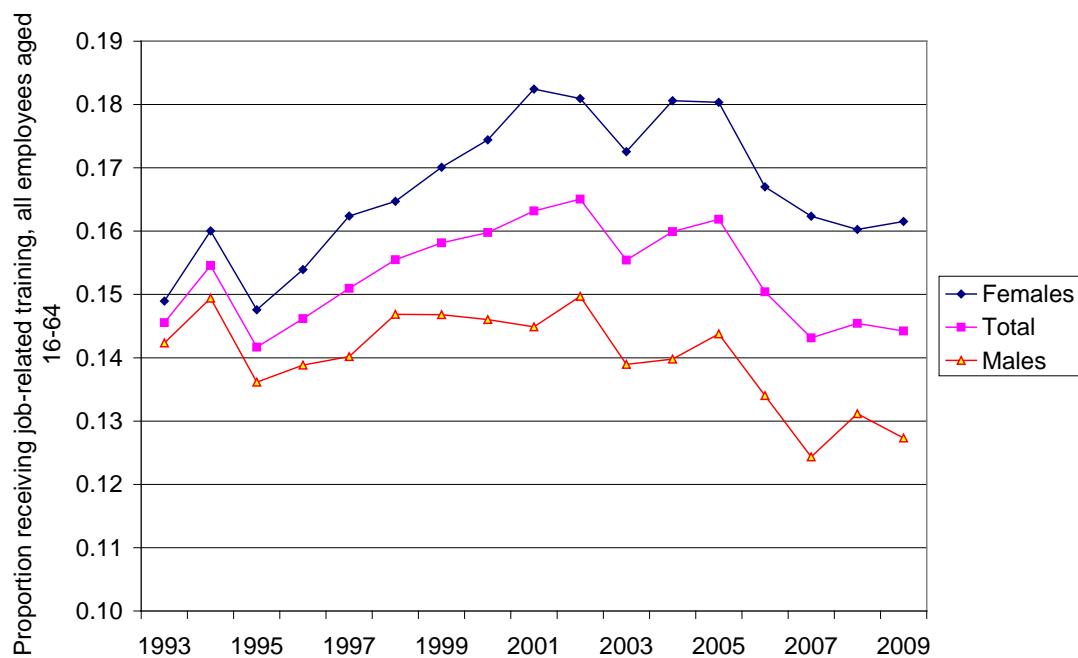
- (a) Refers to March-May quarters from 1993 to 2004 and April-June quarters from 2005 to 2009
- (b) Employees include both full-time and part-time workers. Self-employed persons are excluded from the analysis.
- (c) Certified training refers to training which leads either to a formal qualification or a credit towards such a qualification. LFS questions on the extent to which job-related training is certified were first asked in 1996.

The recent decline in job-related training in the UK has been paralleled by declining participation in other forms of education and training for people in the 25-64 agegroup. Possible explanations for this overall decline in adult learning include the ‘rebalancing’ of government spending on adult learning towards Train to Gain and Skills for Life (basic skills training) since 2005 (Aldridge and Tuckett, 2008; IFLL, 2009); the ways in which funding systems incentivise colleges and training providers to focus primarily on courses for 16-19 year olds leading to accredited qualifications (Mason et al, 2005); reduced provision of VET and leisure-related courses outside the NVQ framework; and increases in course fees at further education level, including a reduction in the proportion of adult learners who are eligible for fee remission (London Economics, 2009; Davies and Hughes, 2009). Trends in adult learning as a whole are analysed in depth in Mason and Bishop (2010, forthcoming). Here we focus primarily on job-related training and its relationship to age and formal qualifications.

Although the growth in training rates during the 1990s was steeper for females than for males, both genders have experienced similar rates of decline in the 2000s (Figure 3.2). In terms of age, it is notable that the proportion of 16-19 year old employees receiving job-related training started to decline as early as 1997 and since 2002 it has been the younger age groups (16-29) who have borne the brunt of the overall decline in training. By contrast, training rates for older age groups (50-plus) have risen slightly against the declining trend in the 2000s (Figure 3.3).

When we turn to analysis by qualification level, training rates for highly qualified persons (with graduate-level or NVQ Level 4 qualifications) are – as expected -- substantially higher than those for employees with lower-level qualifications. However, training rates for highly-qualified employees started to decline in the mid-1990s, much earlier than those of lower-qualified persons. Subsequently, training rates at graduate and NVQ4 levels have fallen during the 2000s at a steeper rate than that experienced by any lower qualification group (Figure 3.4).

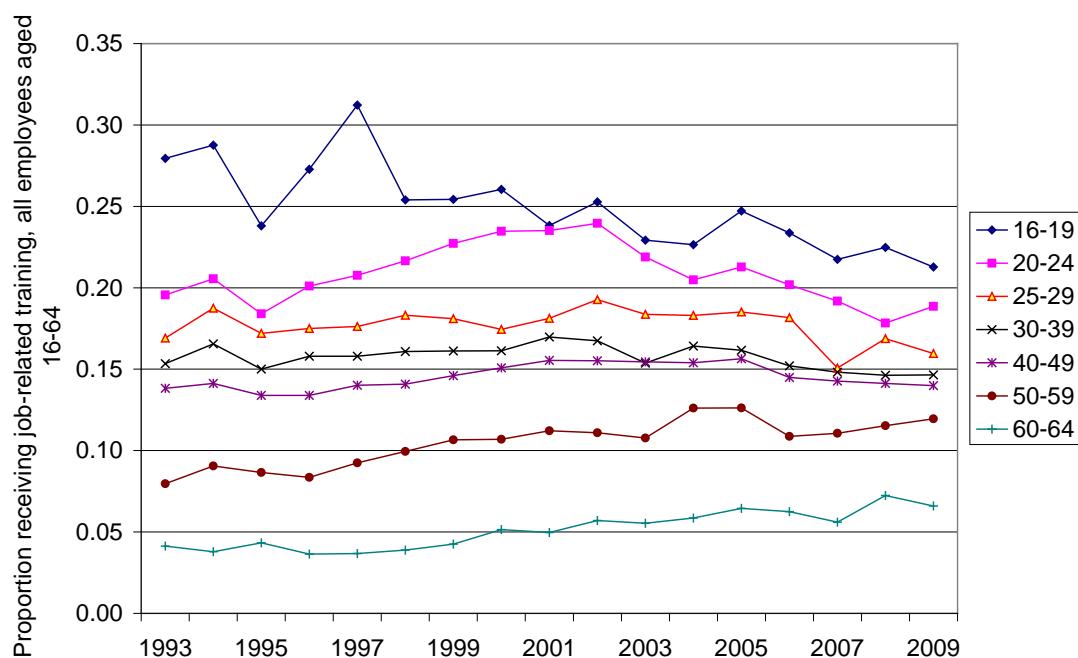
Figure 3.2: Proportion of employees aged 16-64 who received job-related training in previous four weeks, analysed by gender, 1993-2009



Source: Labour Force Survey (Spring quarters)

Notes: See Figure 3.1

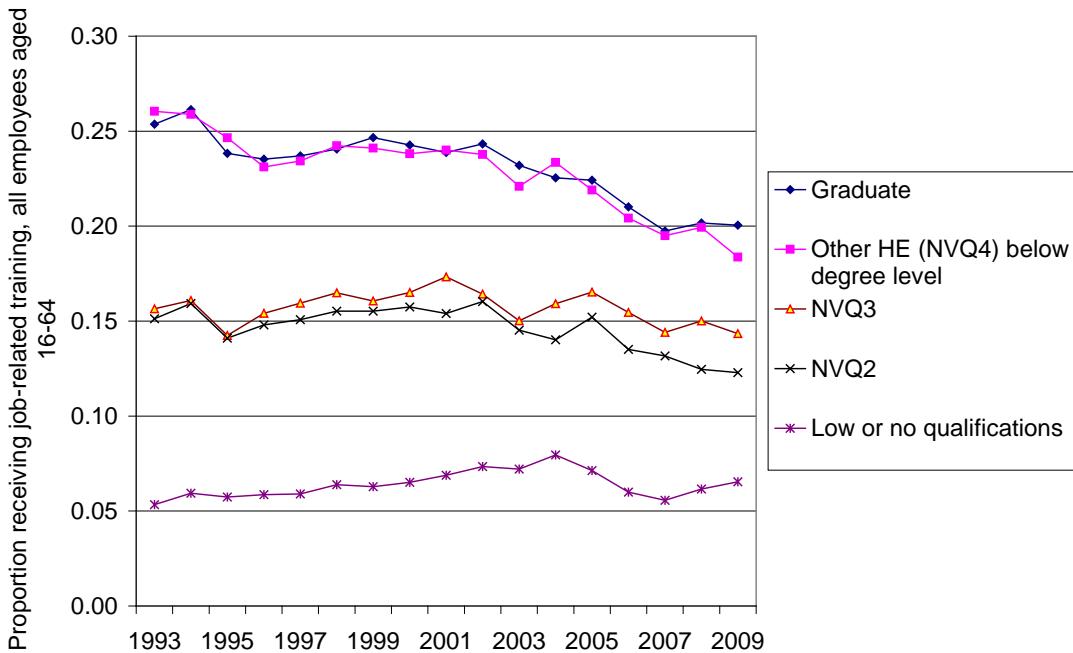
Figure 3.3: Proportion of employees aged 16-64 who received job-related training in previous four weeks, analysed by age-group, 1993-2009



Source: Labour Force Survey (Spring quarters)

Notes: See Figure 3.1

Figure 3.4: Proportion of employees aged 16-64 who received job-related training in previous four weeks, analysed by qualification level, 1993-2009



Source: Labour Force Survey (Spring quarters)

Notes: See Figure 3.1

Qualification groups are defined as follows:

Graduate and above: All Higher and Bachelor (First) degrees and professional qualifications of Bachelor degree standard.

Other HE (NVQ4) below degree level: BTEC/SCOTVEC Higher National awards, sub-degree qualifications in teaching and nursing and equivalent awards; Foundation degrees, Diplomas in Higher Education and other higher education qualifications below Bachelor degree level.

NVQ3: A level, A-S level, Scottish CSYS, Scottish Higher and equivalent awards; BTEC National awards, City & Guilds advanced craft and craft awards, GNVQ Advanced awards, completed trade apprenticeships and equivalent awards

NVQ2: GCSE grade A-C, O level, CSE grade one and equivalent Scottish awards; GNVQ Intermediate and Foundation awards; BTEC General and First awards; City & Guilds awards below craft level; SCOTVEC National Certificate modules; YT, YTP certificates and equivalent awards.

In order to explore the relationship between training rates, gender, age and qualification levels in a multivariate context, we model the probabilities that individuals receive job-related training, conditional on them having entered employment, as follows:

$$(1) \Pr(Trg_i | Emp_i = 1) = F(X_i \beta_1)$$

where

$$(2) \Pr(Emp_i) = F(Z_i\beta_2)$$

$$Trg_i \begin{cases} = 1 & \text{if the individual has received job - related training in the previous four weeks} \\ = 0 & \text{if no job - related training has been received} \end{cases}$$

$$Emp_i \begin{cases} = 1 & \text{if the individual is in paid employment} \\ = 0 & \text{if the individual is not in paid employment} \end{cases}$$

$F(\cdot)$ is the cumulative distribution function of the standard normal distribution; X_i is a vector of individual and establishment-level characteristics that might be expected to influence the probability of receiving training (for example, age, qualifications, whether employed part-time, whether employed on a temporary contract, occupation, sector, region and establishment size); and Z_i is a vector of individual characteristics that might be expected to influence the probability of being in employment.

This choice of specification reflects the fact that job-related training data are only available for individuals in employment, which could lead to biased estimates of the determinants of job-related training if we did not account for prior selection into employment. Tables 3.1-3.2 report the results of Heckman probit estimates at five-year intervals for males and females respectively. The prior selection equation in each case is identified by the inclusion of variables relating to ethnicity, home purchase and marital status which are highly correlated with the probability of being in employment.

These tables report the marginal effects of each independent variable taking a value of one as compared to a value of zero, evaluated at the means of independent variables in each equation. Thus, to take two examples, in Table 3.1, Column 1, the estimated probability of 16-19 year old males receiving training is 36 percentage points (pp) higher than it is for the reference group -- 50-59 year old males -- after controlling for qualifications and other individual characteristics as well as establishment characteristics). In Column 2 the probability of graduate males receiving training is 11 pp higher than it is for males in the low or no qualifications reference group.

In order to assess trends over time in the relationship between qualifications and the probability of receiving job-related training, Figures 3.5-3.6 show the marginal effects attached to qualification variables derived from separate Heckman probit analyses for each year between 1993-2009. Since there is considerable year-to-year volatility in these effects, the results are presented as three-year moving averages. For both males and females the results provide support for Hypothesis 1 which posited that the strength of the positive relationship between formal qualifications and receipt of training has tended to decline over time. It is notable that the decline for males (especially at graduate and Other NVQ4 levels) occurred primarily during the 1990s whereas signs of a similar decline for highly-qualified females only began in the early 2000s. Comparisons of the mean marginal effects of each qualification at the beginning and end of the whole period show that the marginal effect of high-level qualifications on the probability of receiving training was significantly lower in 2007-09 than in 1993-95 for both males and females (Table 3.3). Thus we also find support for our second hypothesis that the gap in training provision between adults with low or no qualifications and adults with high-level qualifications has narrowed over time.

Which age groups are most affected by this decline in training provision for highly-qualified persons? We conclude this analysis by considering evidence relating to Hypothesis 3 which posited that, at high levels of formal qualification, the probability of receiving training has declined less for older age groups than for young people. Figure 3.7 shows that the marginal effect of age on the probability of receiving training for males aged 20-24 has declined more sharply from 2000 onwards (relative to the 50-59 age reference category) than have the marginal effects associated with ages 25-49. The same is broadly true for females from 2003 onwards although the disparities between age-groups for females have not been as great as for males (Figure 3.8). As shown in Table 3.4, the reduction in probability of training for 20-24 year old males and females has been heavily concentrated at graduate and Other NVQ4 levels, and indeed has been matched by reductions in training levels for highly-qualified 25-29 year olds as well. Thus our estimates do provide support for H3. By contrast, towards the lower end of the qualifications scale, training rates for younger workers with NVQ2 qualifications were much the same in 2007-09 as they had been in 1993-95. In the low or no qualifications category, training rates in 2007-09 were generally higher or much the same for all age groups than they had been in 1993-95 (Table 3.4).

To recapitulate, average levels of job-related training have declined through much of the 2000s and have now returned to 1993 levels. By the end of the 2000s training rates for younger age groups holding graduate- and other NVQ4-level qualifications were significantly lower than in the mid-1990s. This may reflect the widening dispersion of salaries and career prospects for the expanded supply of young graduates discussed in Section 2 since graduates entering jobs for which degrees are not required may be less highly regarded by their employers as candidates for job-related training than are other graduates.

As expected, training rates at lower levels of qualification and in older age groups remain in absolute terms well below those for, respectively, highly-qualified and younger employees. But there has clearly been some narrowing of the gap in training rates between low-qualified and highly-qualified employees as training rates for low-qualified people have tended to remain steady or even increase during the 2000s in spite of an overall decline in training provision. This may be counted as a partial success for government policies designed to enhance social inclusion through job-related training. However, the way in which it has been achieved – more by levelling-down than by levelling-up – is at odds with policy objectives of improving competitiveness at the same time as expanding social inclusion. We now go on to assess the implications of these different trends in training provision for competitiveness in UK enterprises.

Table 3.1: Heckman probit regression estimates of the probability of receiving job-related training, males aged 16-64, UK, 1993, 1998, 2003, 2008 – Marginal effects (evaluated at sample means)

	(1)		(2)		(3)		(4)	
MALES	1993		1998		2003		2008	
Age16_19	0.3551	***	0.3313	***	0.2541	***	0.2530	***
	(0.026)		(0.021)		(0.021)		(0.023)	
Age20_24	0.1658	***	0.1986	***	0.1678	***	0.1027	***
	(0.016)		(0.016)		(0.015)		(0.014)	
Age25_29	0.0970	***	0.1248	***	0.0837	***	0.0676	***
	(0.012)		(0.013)		(0.012)		(0.011)	
Age30_39	0.0740	***	0.0777	***	0.0577	***	0.0349	***
	(0.009)		(0.009)		(0.008)		(0.008)	
Age40_49	0.0453	***	0.0365	***	0.0496	***	0.0194	***
	(0.008)		(0.008)		(0.008)		(0.007)	
Age60_64	-0.0355	**	-0.0638	***	-0.0483	***	-0.0434	***
	(0.011)		(0.012)		(0.012)		(0.009)	
Graduate	0.1015	***	0.1124	***	0.0725	***	0.0829	***
	(0.013)		(0.014)		(0.012)		(0.013)	
NVQ4	0.1312	***	0.1281	***	0.0671	***	0.1031	***
	(0.015)		(0.015)		(0.013)		(0.016)	
NVQ3	0.0793	***	0.0891	***	0.0368	***	0.0624	***
	(0.009)		(0.010)		(0.009)		(0.011)	
NVQ2	0.0746	***	0.0659	***	0.0336	***	0.0454	***
	(0.010)		(0.011)		(0.010)		(0.011)	
Observations	38514		37261		33235		29605	
Log likelihood	-11100000		-11400000		-11500000		11900000	
Wald Chi2	1708		1572		1209		1031	
Wald test of independent equations (p-value)	0.016		0.080		0.595		0.867	

Source: Labour Force Survey (Spring Quarters)

Notes:

* significant at 10%; ** significant at 5%; *** significant at 1%

Heckman probit estimates, population-weighted. Robust standard errors in parentheses. The dependent variable = 1 if the individual has received job-related training in the previous four weeks and = 0 if he/she has not received any such training. Marginal effects are evaluated at the mean values of other independent variables, conditional on being in paid employment rather than being unemployed, inactive or in unpaid work. The reference category for age groups is age 50-59. For qualification groups the reference category is low or no qualifications. Other independent variables in the main equation are part-time status, temporary status, occupation, sector, region and establishment size. In the selection equation employment status is regressed on age, qualifications, ethnic group, home ownership and marital status.

Table 3.2: Heckman probit regression estimates of the probability of receiving job-related training, females aged 16-64, UK, 1993, 1998, 2003, 2008 – Marginal effects (evaluated at sample means)

	(1)	(2)	(3)	(4)		
FEMALES	1993	1998	2003	2008		
Age16_19	0.2363 (0.024)	0.1900 (0.019)	0.2052 (0.019)	0.1309 (0.018)	***	***
Age20_24	0.0977 (0.014)	0.0972 (0.014)	0.1240 (0.014)	0.0839 (0.012)	***	***
Age25_29	0.0650 (0.011)	0.0495 (0.010)	0.0619 (0.011)	0.0409 (0.010)	***	***
Age30_39	0.0497 (0.009)	0.0364 (0.008)	0.0358 (0.008)	0.0253 (0.007)	***	***
Age40_49	0.0577 (0.010)	0.0287 (0.008)	0.0409 (0.008)	0.0317 (0.007)	***	***
Age60_64	-0.0457 (0.013)	-0.0765 (0.014)	-0.0510 (0.013)	-0.0254 (0.011)	**	
Graduate	0.1355 (0.017)	0.1382 (0.016)	0.1231 (0.014)	0.0971 (0.014)	***	***
NVQ4	0.1431 (0.017)	0.1453 (0.016)	0.1284 (0.014)	0.1079 (0.015)	***	***
NVQ3	0.1000 (0.013)	0.1140 (0.013)	0.0863 (0.011)	0.0819 (0.013)	***	***
NVQ2	0.0626 (0.009)	0.0664 (0.010)	0.0617 (0.010)	0.0455 (0.010)	***	***
Observations	41547	40803	37060	35769		
Log likelihood	-12500000	-13600000	-14000000	-15000000		
Wald Chi2	1829	1409	1562	902.2		
Wald test of independent equations (p-value)	0.283	0.064	0.144	0.121		

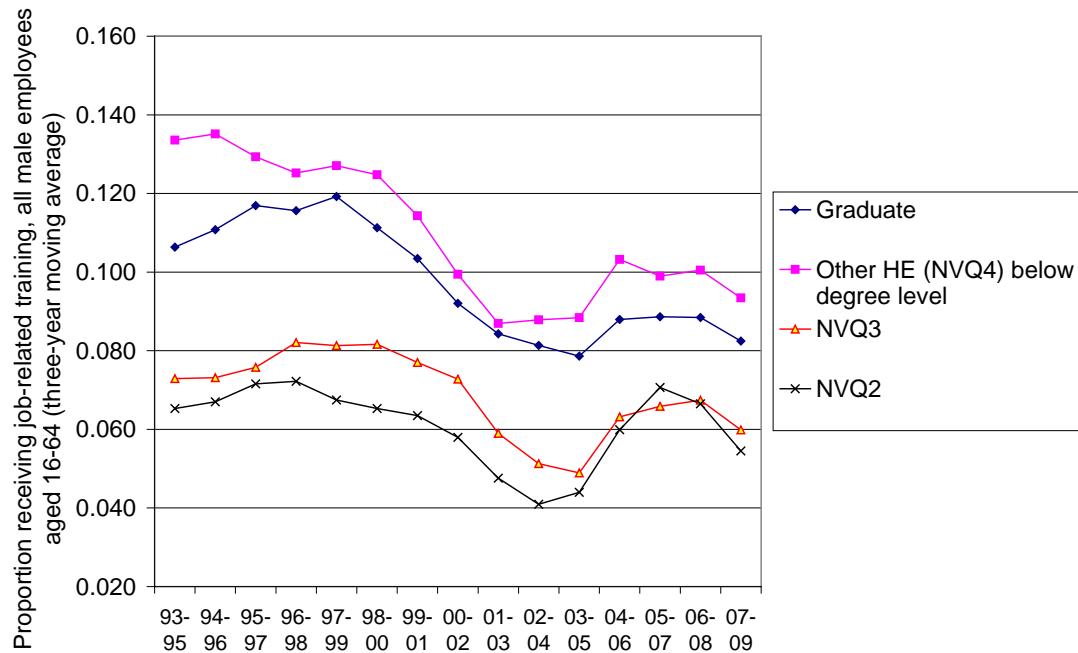
Source: Labour Force Survey (Spring Quarters)

Notes:

* significant at 10%; ** significant at 5%; *** significant at 1%

For details of estimating procedures, see notes to Table 3.1.

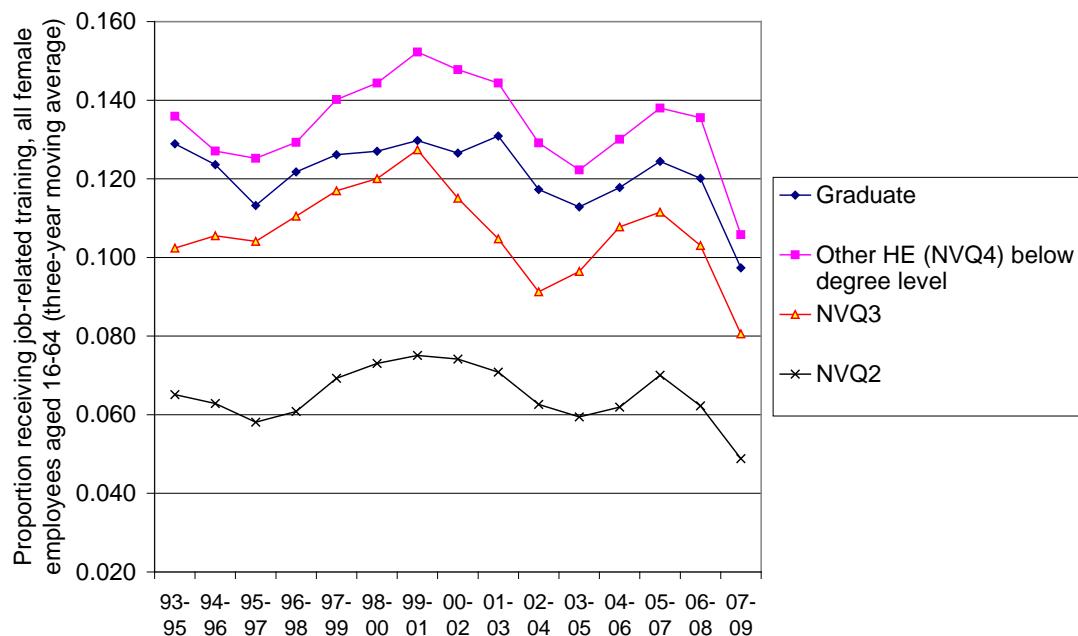
Figure 3.5: Heckman probit estimates: marginal effects of qualifications on the probability of receiving job-related training (reference category: low or no qualifications), all male employees aged 16-64, 1993-2009 (three-year moving average)



Source: Labour Force Survey (Spring Quarters)

Notes: See Table 3.1.

Figure 3.6: Heckman probit estimates: marginal effects of qualifications on the probability of receiving job-related training (reference category: low or no qualifications), all female employees aged 16-64, 1993-2009 (three-year moving average)



Source: Labour Force Survey (Spring Quarters)

Notes: See Table 3.1.

Table 3.3: Heckman probit estimates: marginal effects of qualifications on the probability of receiving job-related training (reference category: low or no qualifications), all employees aged 16-64, 1993-95 compared with 2007-09

		1993-95	2007-09	Difference between 1993-95 and 2007-09 means (T-test, p-value)	
Males	Graduate	0.106	0.082	0.062	*
	Other HE (NVQ4) below degree level	0.134	0.093	0.007	***
	NVQ3	0.073	0.060	0.143	
	NVQ2	0.065	0.055	0.275	
Females	Graduate	0.129	0.097	0.050	*
	Other HE (NVQ4) below degree level	0.136	0.106	0.058	*
	NVQ3	0.102	0.081	0.078	*
	NVQ2	0.065	0.049	0.076	*

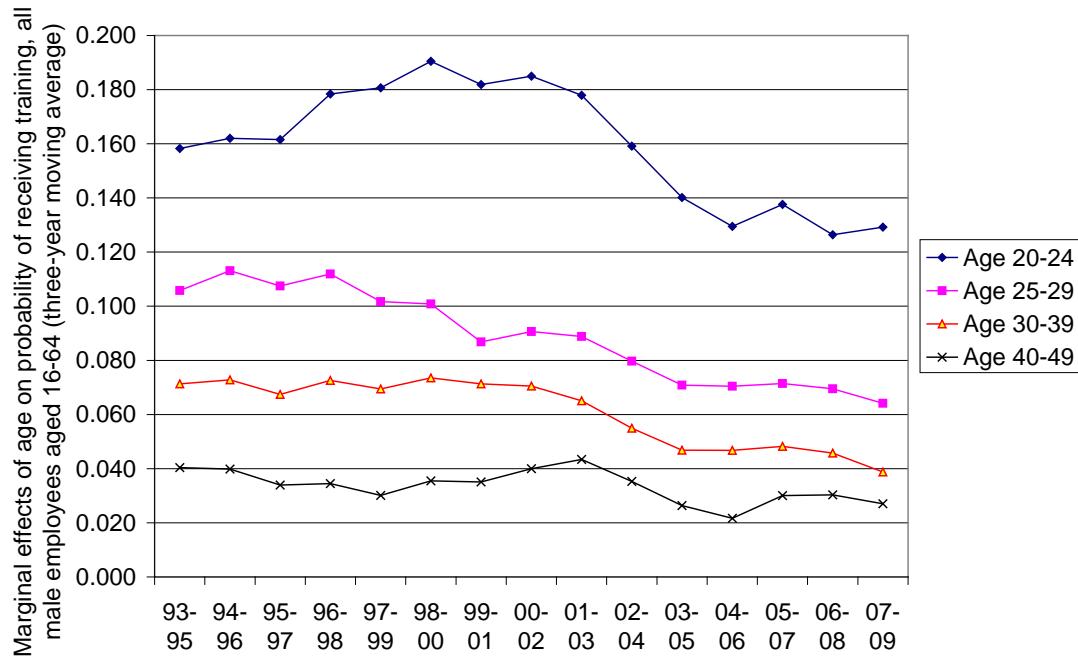
Source: Labour Force Survey (Spring Quarters)

Notes:

* significant at 10%; ** significant at 5%; *** significant at 1%

For details of estimating procedures, see notes to Table 3.1.

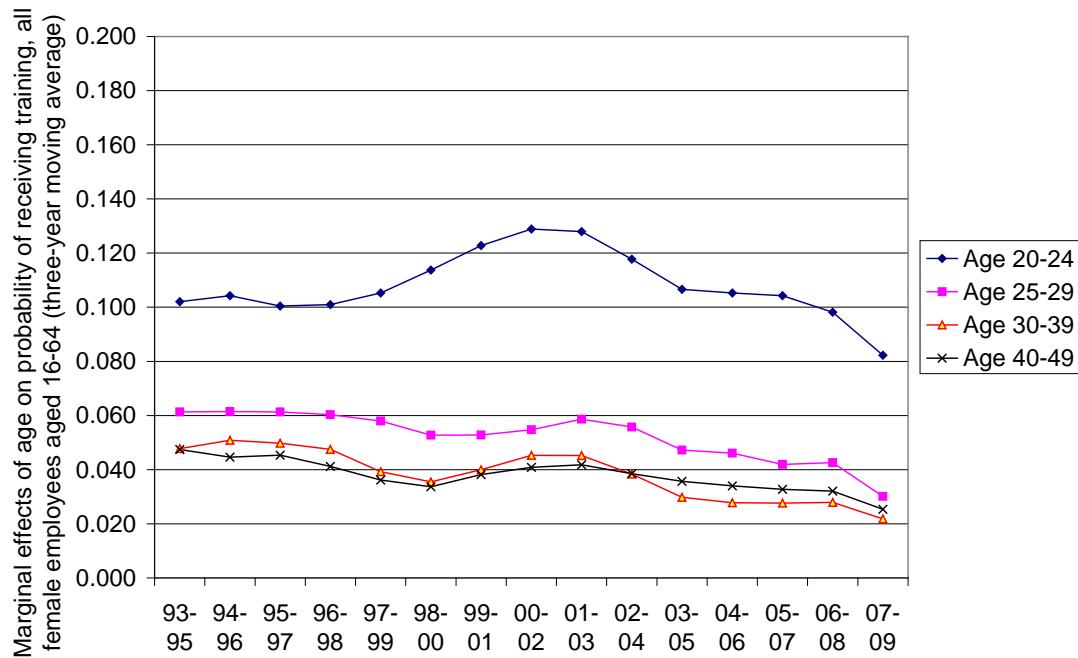
Figure 3.7: Heckman probit estimates: marginal effects of age on the probability of receiving job-related training (reference category: age 50-59), all male employees aged 16-64, 1993-2009 (three-year moving average)



Source: Labour Force Survey (Spring Quarters)

Notes: See Table 3.1.

Figure 3.8: Heckman probit estimates: marginal effects of age on the probability of receiving job-related training (reference category: age 50-59), all female employees aged 16-64, 1993-2009 (three-year moving average)



Source: Labour Force Survey (Spring Quarters)

Notes: See Table 3.1.

Table 3.4: Proportion of employees aged 20-59 receiving job-related training in 1993-95 and 2007-09, analysed by gender, qualification level and age group

(A): Males

		Age-group	1993-95	2007-09	Ratio 07-09/ 93-95	Difference between 1993-95 and 2007-09 means (T-test, p-value)	
Males	Graduate	20-24	0.314	0.216	0.69	<0.001	***
		25-29	0.287	0.199	0.69	<0.001	***
		30-39	0.237	0.175	0.74	<0.001	***
		40-49	0.212	0.163	0.77	<0.001	***
		50-59	0.166	0.162	0.97	0.617	
Males	NVQ4	20-24	0.308	0.218	0.71	<0.001	***
		25-29	0.279	0.153	0.55	<0.001	***
		30-39	0.242	0.173	0.71	<0.001	***
		40-49	0.190	0.164	0.87	0.005	**
		50-59	0.156	0.131	0.84	0.029	**
Males	NVQ3	20-24	0.222	0.199	0.90	0.002	***
		25-29	0.169	0.133	0.79	<0.001	***
		30-39	0.147	0.125	0.85	<0.001	***
		40-49	0.112	0.114	1.02	0.656	
		50-59	0.067	0.089	1.33	<0.001	***
Males	NVQ2	20-24	0.162	0.152	0.94	0.190	
		25-29	0.147	0.121	0.83	<0.001	***
		30-39	0.143	0.095	0.67	<0.001	***
		40-49	0.124	0.095	0.77	<0.001	***
		50-59	0.110	0.073	0.66	<0.001	***
Males	Low or no qualifications	20-24	0.074	0.094	1.26	0.002	***
		25-29	0.054	0.061	1.12	0.160	
		30-39	0.058	0.054	0.93	0.282	
		40-49	0.060	0.057	0.95	0.471	
		50-59	0.035	0.033	0.95	0.547	

Table 3.4 (continued): Proportion of employees aged 20-59 receiving job-related training in 1993-95 and 2007-09, analysed by gender, qualification level and age group

(B): Females

		Age-group	1993-95	2007-09	Ratio 07-09/93-95	Difference between 1993-95 and 2007-09 means (T-test, p-value)	
Females	Graduate	20-24	0.328	0.253	0.77	<0.001	***
		25-29	0.302	0.224	0.74	<0.001	***
		30-39	0.260	0.212	0.81	<0.001	***
		40-49	0.312	0.243	0.78	<0.001	***
		50-59	0.225	0.221	0.99	0.825	
Females	NVQ4	20-24	0.320	0.235	0.74	<0.001	***
		25-29	0.294	0.197	0.67	<0.001	***
		30-39	0.286	0.210	0.73	<0.001	***
		40-49	0.297	0.242	0.82	<0.001	***
		50-59	0.228	0.227	1.00	0.942	
Females	NVQ3	20-24	0.255	0.220	0.86	<0.001	***
		25-29	0.182	0.157	0.86	0.003	***
		30-39	0.169	0.156	0.93	0.070	*
		40-49	0.155	0.180	1.16	<0.001	***
		50-59	0.105	0.137	1.30	<0.001	***
Females	NVQ2	20-24	0.155	0.154	1.00	0.930	
		25-29	0.140	0.123	0.88	0.005	**
		30-39	0.135	0.123	0.91	0.007	**
		40-49	0.148	0.117	0.80	<0.001	***
		50-59	0.104	0.101	0.97	0.609	
Females	Low or no qualifications	20-24	0.085	0.100	1.17	0.042	**
		25-29	0.067	0.065	0.97	0.724	
		30-39	0.069	0.080	1.17	0.001	**
		40-49	0.060	0.071	1.18	<0.001	***
		50-59	0.036	0.051	1.42	<0.001	***

Source: Labour Force Survey (Spring Quarters)

Notes:

* significant at 10%; ** significant at 5%; *** significant at 1%

4. Adult Skills Updating and Improvement Needs

Much of government policy and spending on education and training in different parts of the UK is aimed at young people prior to or shortly after their entry to the labour market. For example, in England and Wales in 2007-08 total spending on higher education came to £9.04 billion (DIUS, 2009, Table 11) of which three quarters is estimated to have gone to learners under 25, according to the Inquiry into the Future for Lifelong Learning (2009). This compares with a total spend of £4.24 billion on adult further education and skills in the same year, the bulk of which was funded through the Learning and Skills Council (LSC). In 2007-08 LSC expenditure on education and training for people aged 19+ on behalf of the Department for Innovation, Universities and Skills (DIUS) came to £2.86 billion. This spending includes the cost of 19+ further education, apprenticeships, and the Train to Gain programme. By contrast, total LSC spending on behalf of the Department for Children, Schools and Families (DCSF) for vocational education and training for younger age groups came to £4.14 billion (DIUS, 2009, Table 12).⁵

To some extent, the relatively low priority accorded to adult training seems to be vindicated by national surveys of employers which suggest that only small proportions of employers experience problems with meeting adult skill requirements. The two most common measures of skill deficiency made available to policy-makers are: firstly, the proportion of employers reporting ‘skill-shortage vacancies’, ie, hard-to-fill vacancies which are attributable to skills-related factors; and secondly, the proportion of establishments reporting internal skill gaps, defined as having one or more employees who are not fully proficient in their jobs. Between 2004-07, the proportion of establishments reporting skill-shortage vacancies at a single point in time did not rise above 6%, according to estimates derived from successive National Employers Skills Surveys (IFF, 2008). Over the same time period the proportion of establishments reporting internal skill gaps varied between 15-20%, with approximately 6-7% of all employees regarded as lacking full proficiency (*ibid*).

⁵ This figure includes the costs of 16-19 further education and 16-18 apprenticeships. It excludes a further £2.03 billion of LSC spending on behalf of the DCSF which was allocated to school sixth forms.

Such findings imply that the great majority of British employers do not have any unmet skill needs among their existing employees. However, when skill requirements are probed through different survey questions, a more complex picture emerges. For example, in a 2004 survey of establishments in a number of different sectors – telecoms services, mechanical engineering, vehicle maintenance and textiles and clothing manufacturing – employers were asked to identify ‘core groups’ of employees defined as the group ‘with the skills and knowledge which make the greatest contribution to the success of business’ (excluding managerial staff). They were then asked a series of questions about the skill improvement and updating needs of their core employees. Of the 452 employers in the survey, only 17% said that no skills needed improving among core employees in the next 12 months. The proportions of employers reporting at least some skill improvement needs ranged from 67% in textiles and clothing manufacturing to as many as 93% in telecoms services (Mason, Osborne and Rincon-Aznar, 2005).

The skill improvement and updating needs in question covered a wide range of technical and practical skills, generic skills such as team-working, problem-solving and communication skills and general Information Technology (IT) and computing skills. Significantly, the incidence of skill improvement needs was just as high for core employees in highly-qualified and skilled occupations as it was for core employees with relatively low qualifications (*ibid*). Thus it is possible that recent reductions in training rates for highly-qualified workers in the UK (as reported in Section 3 above) could contribute to skill updating and improvement needs going unmet, in addition to skill deficiencies arising from the low absolute levels of job-related training for low-qualified workers.

In order to explore the degree of matching between job-related training and adult skills updating needs in more detail, a new telephone survey of 409 employers was carried out in mid-2008. These employers were spread across five different sectors and city-regions chosen for diversity (retail in the Southampton area, social work in Glasgow, architectural and engineering services in Birmingham, cultural sectors in Manchester and electronics and related engineering activities in Bristol and the South

West).⁶ Table 4.1 provides information on the mix of establishment size-groups covered in the 2008 survey and the occupations most commonly identified as core employees in each sector. In addition to the main telephone survey, semi-structured telephone interviews were carried out with 45 respondents who agreed to discuss their skill requirements in more depth; details of these establishments are listed in Appendix Table A3.

Across the sample, core employees were most likely to be qualified at graduate level in architectural and engineering services; at intermediate level in social work establishments; and at NVQ2 and lower levels in retail (Table 4.2A). As in the 2004 study, only a minority of establishments (11%) reported that no skills needed updating or improving among their core employees. The proportion of respondents who could identify skill improvement needs ranged from 82% in retail to 95% in social work, with the deficiencies typically relating to generic skills alone (for example, leadership, supervisory, communication, customer handling or team-working skills) or to generic and technical skills in combination (Table 4.2B).

When we look at skill updating and improvement needs in more detail, it is clear that they apply to core employees at all qualification levels, not just those who hold lower-level or no qualifications (Table 4.3A). What stands out is the lack of emphasis on basic skills (e.g. literacy and numeracy) as compared to the prevalence of updating needs relating to the use of IT and other new equipment, communicating effectively with customers and fellow-employees, problem-solving and taking on responsibilities for management and supervision.⁷

The main factors driving changes in skill requirements are also similar for core employees at high, intermediate and low levels of qualification, in particular, skills deriving from the introduction of new goods or services, new work practices, new technologies or new legislative or regulatory requirements (Table 4.3B). However, the pace of change may be greater for graduate-level core employees than for lower-qualified core employees. Only one in ten establishments with core employees at

⁶ These city-regions form the geographical lens for the LLAKES Centre's research at the meso level; see www.llakes.org for more details.

⁷ It seems likely that gaps in basic skill gaps, where they exist, do not apply to occupations selected as core employees.

graduate level reported that skill requirements had not changed in the previous 2-3 years. By contrast, one in five establishments with core employees in relatively low-qualified occupations reported that skill requirements had not changed recently.

Table 4.1: Employers Skills Updating Survey, 2008 – respondents analysed by sector, size group and core employee occupations

City-region:	Birmingham	Glasgow	Manchester	South West (a)	Southampton	
Sector:	Architectural and engineering services	Social work	Cultural industries (b)	Electronics and related engineering	Retail	Total
<i>Number of establishments</i>						
Size group:						
5-9	18	22	26	12	38	116
10-24	29	44	36	24	34	167
25 - 49	14	12	11	8	11	56
50 - 99	3	10	5	5	3	26
100 - 199	4	6	8	2	4	24
200 - 249	1	2	1	1	1	6
250 - 499	3	2	1	1	4	11
500 - 999	1	0	0	2	0	3
Total	73	98	88	55	95	409
Occupations commonly identified as core employees	Architects	Care assistants and home carers	Library assistants and clerks	Science and technology professionals	Sales and retail assistants	
	Civil engineers	Housing welfare officers	Archivists and curators	Skilled metal and electrical trades	Shelf fillers	
	Construction managers		Journalists	Process, plant and machine operatives		
	Architectural/town planning technicians		Sales-related occupations			

Source: Employers Skills Updating Survey, 2008

Notes: (a) In the electronics and related engineering sector, the survey initially targeted employers in the Bristol city-region but then had to diversify into other parts of the wider South West region in order to increase the sample size.

(b) Cultural industries are defined as covering the following activities: artistic and literary creation and interpretation; operation of arts facilities; motion picture and video activities; library, archives, museums and other cultural activities; publishing; reproduction of recorded media; and radio and television activities.

(c) Sectors defined as follows (Standard Industrial Classification, 2003):

Architectural and engineering services: SIC 742; Social work: SIC 853;

Cultural industries: SIC 9231, 9232, 9211, 9251, 9252, 2211, 2212, 2213, 2214, 2215, 2230, 9220;

Electronics and related engineering: SIC 30-33, SIC 353; Retail: SIC 521-524

Table 4.2: Main qualifications held by core groups of employees and core group skills in need of improvement, 2008, analysed by sector

	Architectural and engineering services	Social work	Cultural industries	Electronic and related engineering	Retail	Total
<i>Percent of establishments</i>						

A: Main qualifications held by core groups of employees

University degree or equivalent	51	17	30	16	5	23
Intermediate-level qualifications (a)	16	58	24	29	25	32
NVQ2 or lower qualifications	25	21	43	45	59	39
Not known	8	3	3	9	11	7
Total	100	100	100	100	100	100

B: Core group skills in need of improvement

Technical and generic skills in combination (a)	52	38	38	45	41	42
Generic skills only (a)	38	56	45	40	41	45
Technical skills only	1	1	3	4	0	2
No skills need improvement	8	5	14	11	18	11
Total	100	100	100	100	100	100
<i>n =</i>	73	98	88	55	95	409

Source: Employers Skills Updating Survey, 2008

(a) Generic skills here include leadership, supervisory, communication, customer handling, team-working, problem-solving and general IT skills.

(b) Intermediate-level qualifications comprise Other NVQ4 qualifications below Bachelor degree level and NVQ3 qualifications.

The supplementary interviews with respondents highlighted many sector-specific factors contributing to recurring changes in skill requirements. In architectural and engineering services and electronics-related engineering, for example, many of the new skill needs were driven by customer requirements:

We're reskilling into tunnelling, it's a new sector and we've been driven by a broader client base. We need new technical, craft and practical skills... An example would be reskilling people in tunnelling to build up a tunnelling fraternity -- on the technical side we need engineers and quantity surveyors to be able to work in a tunnelling environment and know the difficulties. On the practical side we need enough drivers to

drive tunnelling machines and spray concrete operatives to follow up behind [A7, civil engineering]

We get a constant requirement for this [industry standard] and many contractors require us to be familiar with it. It's got two edges: it helps us meet quality standards and also helps us win work so we are making sure all operators and inspectors are trained [E4, electronic engineering]

In other sectors, managerial respondents emphasised regulatory issues such as registration requirements for social work and compliance with health-related legislation in some branches of retail such as pharmacy. But a common tendency in all sectors was establishments seeking to upgrade skills primarily as a means of achieving higher standards and competing more effectively in their respective markets, as these comments illustrate:

We are going to carry on with what we do now- product knowledge. Products are always changing, there is always new research and new legislation, so we will focus on upskilling, and a mixture of off and on the job training [R2, health products retail]

We want to develop communication and interpersonal skills. Most of our workforce... have diverse backgrounds in informal caring and so what we want to do is capture and redirect their informal skills, and make them realise what they have can be directed to a more formal qualification- the SVQ [Scottish Vocational Qualification][S2, community care project]

We've reskilled office staff to learn products as well so they can give technical info on the phone. They've had to do product training they can answer questions now. They went on the in house product training with the engineers so they can see the products they are selling and get a basic knowledge if people ask questions on the equipment [C4, theatre services company]

The majority is in-house...training people to make certain things, but we've also just financed a PhD and we've just financed another person to start a PhD...it's across the spectrum from a technician to formal education. [E1, electronic engineering]

As a result, in many cases the continuing existence of skill gaps did not reflect a lack of previous training but rather the need for training to continue in response to the pace of change. Only 14% of establishments had not provided any on-the-job training at all for core employees in the previous 12 months and as many as two thirds of them had provided such training for 60% or more of core employees (Table 4.4, Part A). The

incidence of off-the-job training was lower (especially for core employees with intermediate or lower qualifications) but still a third of establishments had provided off-the-job training for 60% or more of core employees. Seven out of ten establishments had made some use of external training providers, more so for core employees with graduate or intermediate qualifications than for core employees with NVQ2 or lower qualifications (Table 4.4, Part B). As many as 62% of establishments said it was ‘very likely’ that they would provide additional on-the-job training in the next 12 months and this proportion rose to 69% for off-the-job training (Part C).

Taken together, therefore, the survey results paint a picture of changing skill requirements at all levels of qualification, to which many employers respond with adult skills training designed to improve their competitiveness. However, this training provision is uneven and varies greatly between different kinds of employer and between different groups of employee. Furthermore, since 2008 the UK economy has been hit by recession which may have affected employers’ training decisions. Therefore, in Section 5 we explore the factors contributing to adult training provision in a multivariate context, with particular attention to the impact of recession on training levels.

Table 4.3: Core group skills in need of improvement and factors driving changes in core skill requirements, 2008, analysed by main qualifications held by core group employees

Main qualifications held by core employees:	University degree or equivalent	Intermediate-level qualifications	NVQ2 or lower qualifications	Not known	Total
<i>Percent of establishments</i>					

A: Core group skills in need of improvement

Computing skills	41	58	41	48	47
Communication, customer handling, problem-solving and team-working skills	77	80	74	48	75
Leadership and supervisory skills	63	61	47	15	53
Technical and practical skills	44	44	46	33	44
Basic skills	0.1	0.3	0.3	0.1	0.2
No skills in need of improvement	10	8	13	19	11

B: Factors driving changes in core group skills over previous 2-3 years

Development of new goods and services	49	48	44	30	45
Introduction of new working practices	43	54	44	41	47
Introduction of new technologies or equipment	54	51	47	48	50
New legislative or regulatory requirements	49	62	48	48	53
Changed for other reasons	11	5	8	11	8
No change in skill requirements	10	13	22	15	16
Don't know	3	0	1	4	1
<i>n =</i>	<i>94</i>	<i>130</i>	<i>158</i>	<i>27</i>	<i>409</i>

Source: Employers Skills Updating Survey, 2008

Note: Multiple responses permitted.

Table 4.4: Recent training provision and likelihood of organising future training for core group employees, 2008

Main qualifications held by core employees:	University degree or equivalent	Intermediate-level qualifications	NVQ2 or lower qualifications	Don't know	Total
<i>Percent of establishments</i>					

A. Training provision for core group employees in past 12 months

<i>On-the-job training</i>					
None	22	7	12	36	14
Up to 30%	8	5	6	4	6
30-59%	18	15	13	12	15
60% or more	53	73	68	48	65
Total	100	100	100	100	100
<i>Off-the-job training</i>					
None	25	21	38	54	31
Up to 30%	14	23	20	12	19
30-59%	27	18	12	8	17
60% or more	33	39	30	27	33
Total	100	100	100	100	100

B. Use of external providers for core group training in past 12 months

Commercial training providers	57	58	38	36	49
FE colleges	44	52	23	19	37
Universities	44	23	11	11	22
Equipment supplier training	41	42	32	31	37
No use of external training provider	17	21	38	52	29

C: Likelihood of organising training for core group employees in next 12 months

<i>On-the-job training</i>					
Very likely	57	70	62	41	62
Quite likely	27	21	21	30	23
Not very likely	9	7	12	11	10
Not at all likely	6	2	4	19	5
Don't know	1	1	1	0	1
Total	100	100	100	100	100
<i>Off-the-job training</i>					
Very likely	70	75	66	48	69
Quite likely	27	22	24	33	25
Not very likely	2	2	6	7	4
Not at all likely	1	2	3	11	3
Total	100	100	100	100	100
n =	94	130	158	27	409

Source: Employers Skills Updating Survey, 2008

5. Adult Upskilling: The Impact of Recession

The potential effects of recession on employer-provided training may take several different forms. Some employers may respond to reductions in sales revenue and profits by cutting spending on training. Others may see recession as an opportunity to devote more time to training. Forward-thinking employers seeking to develop new business strategies for surviving the recession may identify raising skills as a key ingredient in those strategies. Others may lose strategic direction as they become caught up in day-to-day survival issues.

The experience of past recessions provides mixed evidence on this score. The early 1980s recession contributed to the virtual collapse of apprenticeship training in some sectors, but there is little evidence about its effects on shorter-duration employer-provided training. Better data are available for the early 1990s recession in which it seems that the loss of skilled jobs had more significant effects on the stocks of skills than any reduction in training. Indeed, some forms of employer-provided training held up fairly well during the early 1990s, partly because of regulatory requirements in some sectors and partly because of some employers' strategic responses to intensified market competition (Felstead and Green, 1996). In a survey of UK firms' reactions to the early 1990s recession, Geroski and Gregg (2007) found that firms were much less likely to cut expenditures on training and product and process innovation than they were to cut spending on other forms of investment such as plant and machinery, buildings and advertising and marketing.

In the present recession, the decline in output in the last 18 months has been much more severe than in the corresponding period in the early 1990s.⁸ Nonetheless, the limited available evidence, such as surveys of employers carried out by the Chartered Institute of Personnel and Development (CIPD), suggests that the proportion of employers reporting increases in training budgets during the current recession is as great as the proportion reporting reductions in spending on training. The great

⁸ See 'The progress of the current recession', at www.niesr.ac.uk

majority of their respondents report no change in training budgets to date (CIPD, 2009).

In order to explore the impact of the present recession, the respondents to our Employers Skills Updating Survey in mid-2008 were asked to participate in a follow-up survey 12 months later. Some 285 establishments agreed to do so, approximately 70% of the 2008 sample. As shown in Table 5.1, in spite of this attrition, the achieved sample in mid-2009 still represented a broad mix of sectors, size groups and core employee qualifications.

Table 5.1: Employers Skills Updating: Follow-Up Survey, 2009 – respondents analysed by sector, size group and core employee qualifications

	Architectural and engineering services	Social work	Cultural industries	Electronic and related engineering	Retail	Total
<i>Percent of establishments</i>						

A. By sector and size group

Size group:						
5-9	31	19	28	24	45	29
10-24	38	48	40	42	30	40
25 – 49	19	14	12	18	13	15
50 – 99	4	10	5	11	2	6
100 - 199	4	5	12	0	3	5
200 - 249	2	3	2	3	2	2
250 - 499	2	1	2	3	5	2
Total	100	100	100	100	100	100

B. By sector and main qualification level of core groups

University degree or equivalent	52	19	30	16	7	24
Intermediate-level qualifications	21	57	23	32	27	34
NVQ2 or lower qualifications	23	20	43	45	53	36
Don't know	4	4	3	8	13	6
Total	100	100	100	100	100	100
n =	48	79	60	38	60	285

Source: Employers Skills Updating Follow-up Survey, 2009

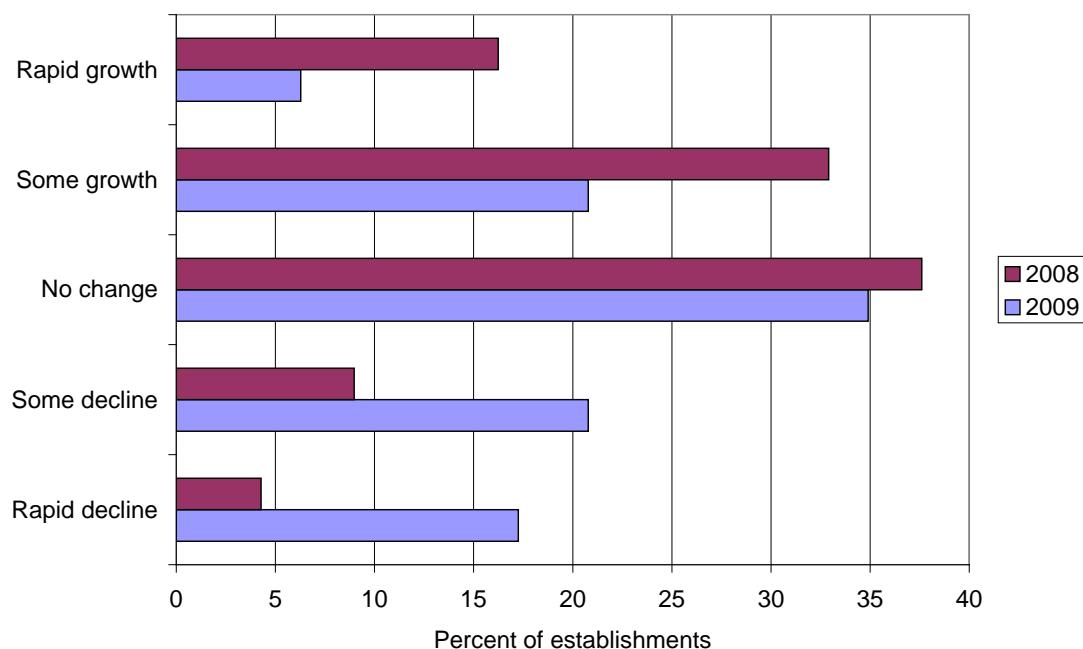
As a result of the recession, a high proportion of establishments in the follow-up survey had experienced declining sales or budgets or slower growth in sales/budgets than they had reported in mid-2008 (Figure 5.1), with particularly sharp downturns occurring in architectural and engineering services. However, the majority of establishments reported that sales/budgets were constant or still growing to some extent. This diversity of experience is paralleled in their responses on training expenditure. In line with findings by the CIPD and others, the great majority said that their spending on training was unchanged. The proportion reporting cuts in training budgets (19%) was much the same as those reporting an increase (16%). Again, there was considerable diversity among sectors, with declines in spending on training more likely to occur in architectural and engineering services and cultural sectors than in retail, electronic engineering or social work (Figure 5.2).

However, when we compare establishments' responses on core employee training in mid-2008 with their responses in mid-2009, there is evidence of reductions in the proportion of employees receiving training in a majority of firms, and in particular a decline in off-the-job training. In the case of on-the-job training, the proportion of establishments engaging in such training was little changed between 2008 and 2009. But the coverage of on-the-job training did decline: the proportion of establishments providing such training for 60% or more of their core employees dropped from just under two thirds in mid-2008 to just under a third 12 months later (Figure 5.3). At the same time, the proportion of establishments who did not provide any off-the-job training for core employees rose from 29% in mid-2008 to 47% in mid-2009. There were also falls in the proportion of core employees receiving off-the-job training in those establishments which did maintain provision.

In essence, our longitudinal data suggest that many establishments' training plans were blown off course by the recession. This conclusion emerges clearly when attention is confined to establishments which in mid-2008 reported themselves as 'very likely' to provide training for core employees in the next 12 months in order in order to fill acknowledged gaps in skills. While the great majority (92%) of these establishments did provide on-the-job training in that period, as many as 41% of them did not provide any off-the-job training. This pattern of responses broadly applies across all levels of qualifications held by core employees, but with two main

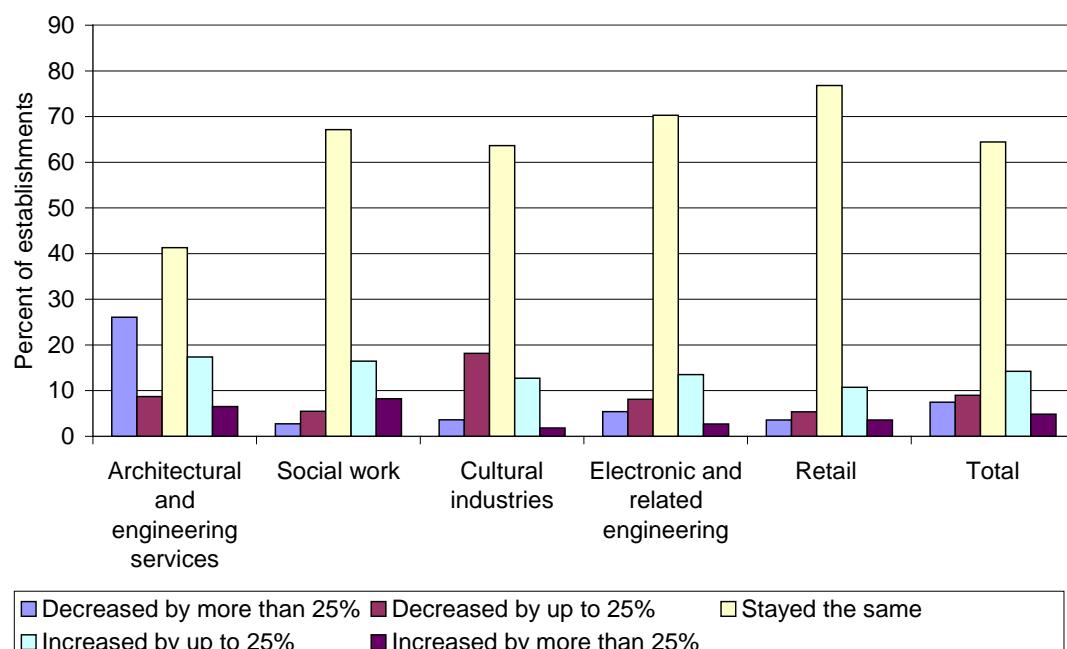
exceptions: graduate-level staff were less likely than other core employees to receive on-the-job training while spending on off-the-job training was most likely to be cut back for lower-qualified workers (Table 5.2).

Figure 5.1: Change in sales/budgets over previous 12 months, 2008 and 2009 (n=234)



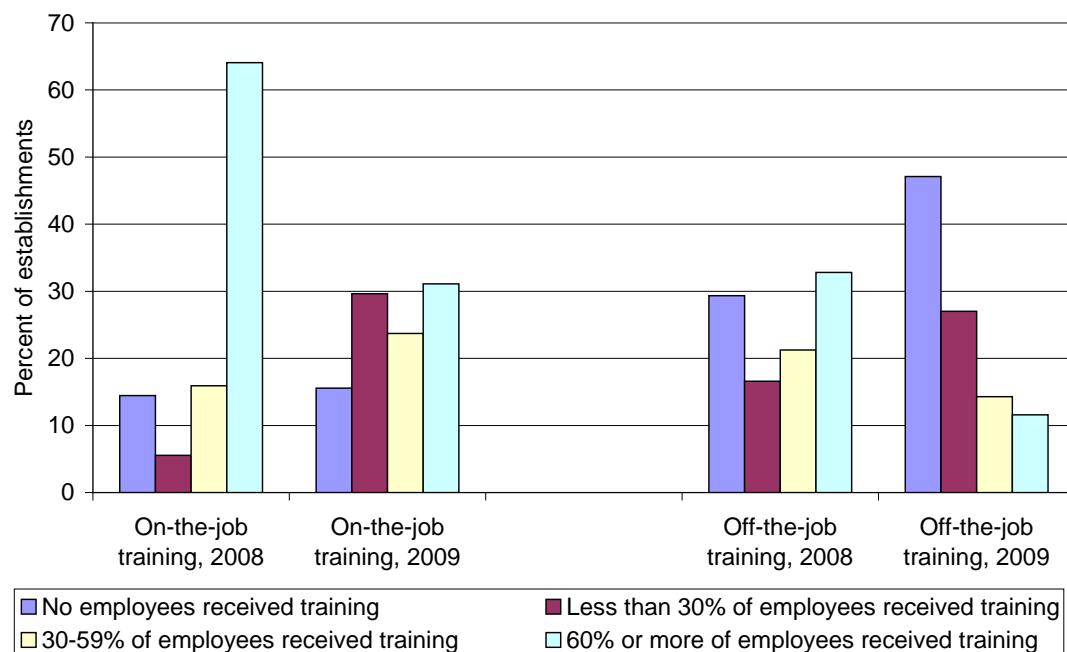
Source: Employers Skills Updating Survey, 2008; Employers Skills Updating Follow-up Survey, 2009

Figure 5.2: Change in training expenditure over previous 12 months, 2009 (n=255)



Source: Employers Skills Updating Follow-up Survey, 2009

Figure 5.3: Training provision for core group employees, 2008 and 2009 (n=270)



Source: Employers Skills Updating Survey, 2008; Employers Skills Updating Follow-up Survey, 2009

Table 5.2: Training provision for core employees in 2009 by establishments who said in 2008 that it was ‘very likely’ that they would provide training in the next 12 months

Main qualifications held by core employees:	University degree or equivalent	Intermediate-level qualifications	NVQ2 or lower qualifications	Don't know	Total
<i>Percent of establishments</i>					
On-the-job training, 2009					
No employees received training	20	2	10	0	8
Less than 30% of employees received training	29	39	21	29	29
30-59% of employees received training	26	32	29	14	29
60% or more of employees received training	26	27	41	57	34
Total	100	100	100	100	100
Off-the-job training, 2009					
No employees received training	40	25	58	38	41
Less than 30% of employees received training	35	39	18	13	30
30-59% of employees received training	17	18	12	13	15
60% or more of employees received training	8	18	12	38	14
Total	100	100	100	100	100
n =	48	67	66	8	189

Source: Employers Skills Updating Follow-up Survey, 2009

In order to investigate the factors underlying different kinds of training provision for core employees before and after the onset of recession in mid-2008, we carried out a probit analysis with controls in place for a number of variables including core group qualifications, sector, establishment age and size, foreign ownership, union recognition and recent trends in sales. The results suggest that, in the 12 months prior to mid-1998, the provision of off-the-job training was positively and significantly related to a summary measure of adult skill improvement needs based on 2008 interview data (Table 5.3, Column 3). By contrast, in this same period, on-the-job training provision was not significantly related to the skill improvement needs measure (Column 1). Twelve months later, in mid-2009, this position was reversed. While off-the-job training provision was no longer significantly related to perceived gaps in skills, the provision of on-the-job training was now positively and significantly associated with skill improvement needs (Columns 2 and 4).

Similar results are obtained when we replace the summary measure of skill improvement needs with indicators of the types of skill that need improvement. In mid-2008 off-the-job training provision was 24 pp higher in establishments reporting improvement needs in combinations of technical/computing and generic skills than it was in establishments with no reported skill improvement needs (Table 5.4, Column 3). Twelve months later the coefficient on the same variable was much smaller and no longer statistically significant (Column 4). By contrast, on-the-job training was significantly and positively related to three different categories of skill improvement need in mid-2009 but not in mid-2008 (Columns 1-2).

These findings are consistent with the following interpretation of the changes in training incidence shown in Figure 5.3:

1. Pre-recession, in the 12 months up to mid-2008, on-the-job training was widespread but was not systematically related to skill improvement needs. By contrast, off the-job training was provided for smaller numbers of core employees and was much more closely tailored to perceived gaps in skills.
2. Twelve months later, the coverage of on-the-job training was reduced and, where it existed, it was much more likely to be targeted at employees with identified skill improvement needs than it had been in the earlier period. At the same time off-the-job

training was reduced even further, to the point that many establishments no longer made use of off-the-job training to meet identified needs for skills improvement.

The positive coefficient on the sales change variable in Column 4 of both Tables 5.3 and 5.4 suggests that one factor driving reductions in off-the-job training in many establishments was declines in sales or budgets in the 12 months to mid-2009. At the same time in many establishments the relative importance of on-the-job training has increased, which is consistent with firms and other organisations taking advantage of slower market conditions to use internal resources to improve skill levels.⁹ This raises the question of how much it matters – for skill levels and for organisational performance – if there is a shift away from off-the-job training towards on-the-job training.

In the supplementary interviews which were carried out in 2009, respondents expressed a number of different views on this matter. In some cases, the managers concerned reported that all or most of their skill needs could be met by on-the-job training, for example:

Historically, in terms of on-the-job training, that's the way we look at it, it's providing training to junior members of staff to carry out the role of QS [quantity surveying]. A university degree goes somewhere, say 50% of the way, and the actual practical means of fulfilling the role of QS can only be achieved by experience and on the job training. In terms of supplementary training, off the job training, seminars and things we get specialist advice say on legal matters, as the law does change in our industry, but we've taken the decision that it will be secondary, although we recognise it needs to be carried out in the medium and short term. [A9, quantity surveying]

On the job [training] allows you to work in reality with problems being thrown up there and then, it's easy just to get partial solutions with off the job training and when you are dealing with people in a state of crisis this doesn't always work. [S9, children's care services]

We don't need off the job training, we employ people to do a job, to our standard and we teach them to do things how we like them done, not necessarily how they are done elsewhere. [E5, electronic engineering]

⁹ Estimates derived from the Labour Force Survey suggest that the proportion of employees aged 16-64 who report receiving off-the-job training declined gradually as a proportion of all those receiving job-related training for all years since 1999 except for 2006 (see Figure 3.1 above). Between Spring 2008 and Spring 2009, the off-the-job training share of people receiving some kind of job-related training declined from 63.4% to 61.2%, a steeper fall than in any other year since 1999. This is consistent with our survey findings.

Table 5.3: Probit regression estimates of the probability of providing on- and off-the-job training for core employees, 2008 and 2009, with summary measure of skill improvement needs – Marginal effects (evaluated at sample means)

	On-the-job training		Off-the-job training	
	2008	2009	2008	2009
Core group qualifications_graduates	-0.2267*** [0.083]	-0.2504*** [0.085]	0.0998 [0.073]	0.0857 [0.094]
Core group qualifications_intermediate	-0.0557 [0.061]	0.0035 [0.054]	0.0852 [0.071]	0.1733** [0.081]
Architectural and engineering services	-0.0149 [0.070]	0.0528 [0.063]	0.2461*** [0.060]	0.2509** [0.105]
Social work	0.0528 [0.050]	0.0975** [0.048]	0.3025*** [0.051]	0.3499*** [0.088]
Cultural industries	0.0811* [0.047]	0.1012** [0.047]	0.1483* [0.086]	0.1945* [0.108]
Electronics and related engineering	-0.1336 [0.112]	-0.0235 [0.088]	-0.0235 [0.107]	0.0082 [0.136]
Single-establishment organisation	-0.0213 [0.044]	-0.0072 [0.051]	0.0882 [0.070]	-0.1094 [0.078]
Foreign ownership	-0.0586 [0.081]	0.1215*** [0.031]	0.0195 [0.098]	0.3037*** [0.090]
Union recognition	-0.0684 [0.072]	0.0026 [0.059]	0.1729** [0.086]	0.0759 [0.096]
National or foreign market focus	0.0548 [0.044]	0.0193 [0.048]	-0.0572 [0.073]	-0.1528* [0.080]
Sales change in previous 12 months	0.0387* [0.021]	0.0091 [0.021]	0.0391 [0.036]	0.0534 [0.033]
Skill improvement needs index	0.0033 [0.007]	0.0193** [0.008]	0.0289** [0.012]	-0.0073 [0.013]
Observations	234	254	234	253
Pseudo R squared	0.176	0.174	0.244	0.179
Wald Chi2	34.44	44.59	68.01	54.87

Source: Employers Skills Updating Survey, 2008; Employers Skills Updating Follow-up Survey, 2009
Notes: * significant at 10%; ** significant at 5%; *** significant at 1%

Probit estimates. Robust standard errors in parentheses. The dependent variables = 1 if the establishment has provided training for core employees in the previous 12 months and = 0 if no such training has been provided. Marginal effects are evaluated at the mean values of other independent variables. The reference category for core employee qualification groups is NVQ2 and lower qualifications. For sectors the reference category is retail. The skill improvement needs index is an additive measure of the number of different types of core employee skills described as needing improving or updating in 2008 (ranging from zero to ten). The measure of sales change is an index ranging from 1 = rapid decline in sales to 5 = rapid growth in sales. Other independent variables in the main equation are measures of age of establishment and establishment size and indicators of whether establishments had recently introduced new products, processes or forms of work organisation.

Table 5.4: Probit regression estimates of the probability of providing on- and off-the-job training for core employees, 2008 and 2009, with indicators of different types of skill improvement need – Marginal effects (evaluated at sample means)

	On-the-job training		Off-the-job training	
	2008	2009	2008	2009
Core group qualifications_graduates	-0.2275*** [0.084]	-0.2475*** [0.086]	0.0959 [0.075]	0.0842 [0.094]
Core group qualifications_intermediate	-0.0604 [0.060]	0.0077 [0.054]	0.0839 [0.071]	0.1709** [0.082]
Architectural and engineering services	-0.028 [0.076]	0.0152 [0.072]	0.2420*** [0.063]	0.2590** [0.106]
Social work	0.0493 [0.050]	0.0781 [0.051]	0.3029*** [0.053]	0.3561*** [0.089]
Cultural industries	0.0775* [0.046]	0.0883* [0.049]	0.1395 [0.091]	0.2068* [0.106]
Electronics and related engineering	-0.1418 [0.113]	-0.0482 [0.096]	-0.0355 [0.112]	0.0147 [0.137]
Single-establishment organisation	-0.0099 [0.042]	-0.018 [0.051]	0.0818 [0.072]	-0.1048 [0.080]
Foreign ownership	-0.0599 [0.084]	0.1098*** [0.034]	0.0233 [0.098]	0.3046*** [0.091]
Union recognition	-0.0704 [0.073]	-0.018 [0.061]	0.1691* [0.087]	0.0669 [0.097]
National or foreign market focus	0.053 [0.041]	0.0247 [0.047]	-0.0627 [0.072]	-0.1538* [0.080]
Sales change in previous 12 months	0.0432** [0.022]	0.0073 [0.020]	0.0335 [0.036]	0.0558* [0.033]
Technical/computing and generic skill improvement needs	0.0684 [0.067]	0.1911*** [0.071]	0.2400** [0.104]	0.0333 [0.105]
Technical/computing skill improvement needs only	0.0266 [0.064]	0.1197*** [0.033]	0.0777 [0.121]	0.0017 [0.156]
Generic skill improvement needs only	0.0045 [0.067]	0.0846* [0.048]	0.1490* [0.082]	0.0457 [0.114]
Observations	234	254	234	253
Pseudo R squared	0.176	0.174	0.244	0.179
Wald Chi2	34.44	44.59	68.01	54.87

Source: Employers Skills Updating Survey, 2008; Employers Skills Updating Follow-up Survey, 2009
Notes: * significant at 10%; ** significant at 5%; *** significant at 1%

See notes to Table 5.3 for details of estimates except for the measures of skill improvement needs which here take the form of dummy variables denoting, respectively, technical/computing and generic skill improvement needs; technical/computing skill improvement needs only; and generic skill improvement needs only. The reference category for these variables is 'No skill improvement needs'.

But in a larger number of cases, managers had strong views about the respective advantages of on-the-job and off-the-job training and aimed to provide a mix of both. Several of them considered that off-the-job training was more useful for highly-qualified and senior staff than for lower-skilled people:

[Off-the-job training provides] technical expertise and the principles of leadership and management, but individuals still need to come back to the workplace and put the learning into practice, not just put the training folder in their drawer...It benefits the more sophisticated, professional level employees who need a bit more stimulus. [A6, engineering design and assembly]

Off the job is good for the harder stuff, an example is a course we did two years ago on negotiation, it was residential, we couldn't afford that now. On the job is more for coaching, it is for the easier stuff. [C1, publishing]

Both off and on the job training are important- they go hand in hand. Off is better for learning new skills and concepts- you are in a safe environment to practice and take on board the learning, you can then follow up with on the job learning and put the theory into practice. [C7, publishing]

Off the job does have some advantages for say training managers and supervisors we'd send them to a local college and they can rub shoulders with other managers - that's all very good for getting ideas. [E3, electronic engineering]

One of the benefits of off the job for the sales management side of things is that it takes you out of the day to day work, you get outside of the system and see a different perspective...you get a bigger picture. It's more suitable for the manager level, I'd have thought. [E7, electronic engineering]

So on and off are complementary as product knowledge can be taught more effectively in a class room but people's understanding and reading other people can only be learned on the job. [R1, leisure retail]

In this context, for a sizeable proportion of establishments, if the main effect of recession is to reduce the scope for off-the-job training, this restricts the options available for managers to decide what the best mix of training methods should be. The downsides of this restriction on training activity may not be immediately apparent but some respondents expressed concerns for the future:

If there has been any reduction [in training] then it has been for the professional staff- our engineering, our CAD [computer-aided design] staff; we've had to cut back as we've not been able to enjoy the training

opportunities that are there for lower level staff. There has been some impact because some individuals had planned to go on training courses ...it's affected motivation...people are saying 'I'm feeling stunted'. [A6, engineering design and assembly]

There is not enough training for admin staff and managers, it is more on an ad hoc basis, we'll work on it next year- that will be a mix of on and off the job [training], again the same logic applies- people will need to go away and study and then be supported in the workplace....[At the moment] we have to focus training on operations staff as we have a primary responsibility to deliver the service. Budgets are tight so there is no developmental slack for non essential, non operations staff. [S5, family resource centre]

It has had an indirect impact; we have had to cut down on staff and as a result we are really busy on the shop floor so it is harder to send staff for training courses. It hasn't had an impact so far but in the longer term it could affect customer service and that is [our] unique selling point - we are strong at giving advice. [R6, health products retail]

Taking these interview findings together with our longitudinal data analysis for establishments in these five sectors, the clear implication is that the recession has contributed to reductions in the coverage of adult training and especially off-the-job training for skilled and highly-qualified employees. This may help to further narrow the gap in training levels between low-qualified and well-qualified workers but it will not help growth in competitiveness.

6. Summary and assessment

1. Since the late 1990s, UK government policy on lifelong learning has sought to raise adult skill levels with the explicit aims of improving economic competitiveness while enhancing social inclusion (usually defined in terms of widening opportunities for low-skilled people to enter waged employment). Given resource limitations, priority in government funding for vocational education and training has been given to programmes such as Train to Gain which have, in the main, confined support to training leading to accredited qualifications for employees who have not previously gained educational qualifications equivalent to NVQ Level 2.
2. On the face of things, placing adult training at the heart of policies on social inclusion seems unlikely to succeed because of the very strong incentives that exist for employers to provide the highest levels of training for employees who are already relatively well-qualified and high-skilled. However, for a number of reasons (including the rapid expansion of graduate output in the last 20 years), the strength of the relationship between prior education and receipt of training seems to have diminished in recent years.
3. This is borne out by multivariate analysis of Labour Force Survey data between 1993-2009, which found that, by the end of this period, average training rates for younger age groups holding graduate- and NVQ4-level qualifications were significantly lower than in the mid-1990s. This may reflect the widening dispersion of salaries and career prospects for the expanded supply of young graduates since graduates entering jobs for which degrees are not required may be less highly regarded by their employers as candidates for job-related training than are other graduates.
4. Across the workforce as a whole, average levels of job-related training have declined through much of the 2000s and have now returned to 1993 levels. Training rates at lower levels of qualification and in older age groups remain in absolute terms well below those for, respectively, highly-qualified and younger employees. But there has clearly been some narrowing of the gap in training rates between low-qualified

and highly-qualified employees as training rates for low-qualified people have tended to remain steady or even increase during the 2000s in spite of the overall decline in training provision.

5. This may be counted as a partial success for government policies designed to enhance social inclusion through job-related training. However, the way in which it has been achieved – more by levelling-down than by levelling-up – is at odds with policy objectives of improving competitiveness at the same time as expanding social inclusion. In our surveys of employers in a wide range of sectors and city-regions, we found a wide range of adult skills improvement and updating needs which were being driven by rapid change in products, technologies, work organisation and regulatory requirements. These skill improvement needs apply to employees at all qualification levels, not just to employees with low-level or no qualifications whose participation in waged employment is a principal objective of social inclusion policies.

6. In many cases the continuing existence of skill gaps did not reflect a lack of previous training but rather the need for training to continue in response to the pace of change. In this context, the overall reduction in job-related training during the 2000s has negative implications for economic competitiveness. Furthermore, our longitudinal employer survey data suggest that the recent recession has blown many firms' training plans off course. The effects of recession have been uneven but, in firms which have experienced sharp reductions in sales, the recession has contributed to reduced coverage of adult training and especially off-the-job training for skilled and highly-qualified employees.

7. Such developments may help to further narrow the gap in training levels between low-qualified and well-qualified workers and therefore appear positive in terms of social inclusion objectives. However, economic competitiveness is likely to be jeopardised unless job-related training rates are increased for all sections of the adult workforce, including employees who are already well-qualified and skilled as well as employees at the lower end of the skills spectrum.

APPENDIX TABLES

Table A1: Descriptive statistics for LFS analysis, 1993 and 2008

	Males, 1993			Females, 1993		
Variable	Obs	Mean	Std. Dev.	Obs	Mean	Std. Dev.
Job-related training	29627	0.14	0.35	28943	0.15	0.36
Employed	42245	0.70	0.46	49038	0.59	0.49
Ethnic minority	40509	0.05	0.21	46526	0.05	0.21
House buyer	43205	0.57	0.50	49771	0.54	0.50
Single	43213	0.37	0.48	49777	0.34	0.47
Age16_19	43213	0.09	0.28	49777	0.08	0.27
Age20_24	43213	0.13	0.33	49777	0.12	0.32
Age25_29	43213	0.13	0.34	49777	0.13	0.33
Age30_39	43213	0.22	0.41	49777	0.22	0.42
Age40_49	43213	0.20	0.40	49777	0.21	0.41
Age50_59	43213	0.16	0.37	49777	0.17	0.37
Age60_64	43213	0.08	0.27	49777	0.08	0.27
Part-time	30185	0.06	0.23	29532	0.41	0.49
Temporary contract	29627	0.05	0.21	28943	0.07	0.25
Graduate	42096	0.13	0.34	45225	0.08	0.27
NVQ4	42096	0.06	0.24	45225	0.08	0.28
NVQ3	42096	0.30	0.46	45225	0.14	0.35
NVQ2	42096	0.15	0.36	45225	0.25	0.43
Low or no qualifications	42096	0.30	0.46	45225	0.40	0.49
Other qualifications	42096	0.06	0.24	45225	0.05	0.21
Managers	30288	0.18	0.38	29550	0.10	0.30
Professionals	30288	0.11	0.32	29550	0.09	0.28
Associate professionals	30288	0.09	0.28	29550	0.10	0.30
Administrative/secretarial	30288	0.08	0.27	29550	0.27	0.45
Skilled trades	30288	0.19	0.39	29550	0.03	0.17
Personal service occupations	30288	0.07	0.26	29550	0.15	0.35
Sales occupations	30288	0.05	0.22	29550	0.12	0.32
Operators	30288	0.15	0.36	29550	0.05	0.21
Elementary occupations	30288	0.08	0.27	29550	0.10	0.30
Agriculture	30284	0.01	0.12	29561	0.01	0.08
Mining	30284	0.01	0.11	29561	0.00	0.04
Manufacturing	30284	0.31	0.46	29561	0.14	0.34
Utilities	30284	0.02	0.14	29561	0.01	0.09
Construction	30284	0.07	0.26	29561	0.02	0.13
Retail	30284	0.13	0.34	29561	0.17	0.38
Hotels	30284	0.03	0.16	29561	0.06	0.23
Transport & communications	30284	0.09	0.29	29561	0.03	0.18
Financial services	30284	0.04	0.18	29561	0.05	0.22
Business services	30284	0.07	0.25	29561	0.07	0.26
Public administration	30284	0.08	0.27	29561	0.07	0.25
Education	30284	0.04	0.21	29561	0.12	0.32
Health & social work	30284	0.02	0.15	29561	0.12	0.32
Other services	30284	0.06	0.24	29561	0.14	0.35
North East	43213	0.05	0.21	49777	0.05	0.21
North West	43213	0.12	0.32	49777	0.12	0.32

Yorkshire & Humber	43213	0.09	0.28	49777	0.09	0.28
East Midlands	43213	0.07	0.26	49777	0.07	0.26
West Midlands	43213	0.09	0.29	49777	0.09	0.29
Eastern	43213	0.09	0.28	49777	0.09	0.28
London	43213	0.12	0.32	49777	0.12	0.33
South East	43213	0.13	0.34	49777	0.13	0.34
South West	43213	0.08	0.26	49777	0.08	0.27
Wales	43213	0.05	0.22	49777	0.05	0.22
Scotland	43213	0.09	0.29	49777	0.09	0.29
Northern Ireland	43213	0.03	0.16	49777	0.03	0.17

	Males, 2008			Females, 2008		
Variable	Obs	Mean	Std. Dev.	Obs	Mean	Std. Dev.
Job-related training	22292	0.13	0.34	23309	0.16	0.37
Employed	29930	0.75	0.43	36057	0.65	0.48
Ethnic minority	30401	0.11	0.31	36452	0.11	0.31
House buyer	30401	0.49	0.50	36451	0.48	0.50
Single	30411	0.53	0.50	36465	0.52	0.50
Age16_19	30411	0.09	0.29	36465	0.08	0.27
Age20_24	30411	0.12	0.32	36465	0.11	0.31
Age25_29	30411	0.11	0.31	36465	0.10	0.30
Age30_39	30411	0.20	0.40	36465	0.21	0.41
Age40_49	30411	0.21	0.41	36465	0.22	0.42
Age50_59	30411	0.18	0.38	36465	0.19	0.39
Age60_64	30411	0.09	0.28	36465	0.09	0.29
Part-time	22403	0.09	0.28	23473	0.37	0.48
Temporary contract	22292	0.05	0.21	23309	0.06	0.24
Graduate	30133	0.20	0.40	36216	0.19	0.39
NVQ4	30133	0.07	0.26	36216	0.10	0.29
NVQ3	30133	0.26	0.44	36216	0.18	0.39
NVQ2	30133	0.20	0.40	36216	0.26	0.44
Low or no qualifications	30133	0.17	0.38	36216	0.20	0.40
Other qualifications	30133	0.09	0.29	36216	0.07	0.26
Managers	22701	0.19	0.40	23681	0.11	0.31
Professionals	22701	0.14	0.34	23681	0.12	0.33
Associate professionals	22701	0.14	0.34	23681	0.16	0.36
Administrative/secretarial	22701	0.05	0.22	23681	0.20	0.40
Skilled trades	22701	0.15	0.36	23681	0.01	0.12
Personal service occupations	22701	0.03	0.16	23681	0.15	0.36
Sales occupations	22701	0.05	0.22	23681	0.12	0.32
Operators	22701	0.12	0.32	23681	0.02	0.13
Elementary occupations	22701	0.13	0.34	23681	0.11	0.32
Agriculture	22688	0.01	0.11	23665	0.01	0.07
Mining	22688	0.01	0.08	23665	0.00	0.05
Manufacturing	22688	0.19	0.39	23665	0.07	0.25
Utilities	22688	0.01	0.10	23665	0.00	0.06
Construction	22688	0.10	0.30	23665	0.02	0.13
Retail	22688	0.14	0.35	23665	0.16	0.37
Hotels	22688	0.04	0.20	23665	0.05	0.22
Transport & communications	22688	0.10	0.30	23665	0.04	0.19
Financial services	22688	0.05	0.21	23665	0.05	0.22

Business services	22688	0.12	0.33	23665	0.10	0.30
Public administration	22688	0.08	0.27	23665	0.08	0.27
Education	22688	0.05	0.22	23665	0.15	0.36
Health & social work	22688	0.05	0.23	23665	0.21	0.41
Other services	22688	0.05	0.21	23665	0.06	0.23
North East	30411	0.04	0.21	36465	0.04	0.20
North West	30411	0.11	0.32	36465	0.11	0.32
Yorkshire & Humber	30411	0.09	0.28	36465	0.09	0.28
East Midlands	30411	0.07	0.26	36465	0.07	0.26
West Midlands	30411	0.09	0.28	36465	0.09	0.28
Eastern	30411	0.09	0.29	36465	0.09	0.29
London	30411	0.13	0.34	36465	0.13	0.34
South East	30411	0.13	0.34	36465	0.13	0.34
South West	30411	0.08	0.27	36465	0.08	0.27
Wales	30411	0.05	0.21	36465	0.05	0.21
Scotland	30411	0.09	0.28	36465	0.09	0.28
Northern Ireland	30411	0.03	0.16	36465	0.03	0.17

Table A2: Descriptive statistics for Employers Skills Updating Survey analysis

All employers, 2008					
Variable	Obs	Mean	Std. Dev.	Min	Max
Core group_onjobtraining	409	0.86	0.35	0	1
Core group_offjobtraining	409	0.71	0.45	0	1
Core group_degree	409	0.23	0.42	0	1
Core group_intermediate qualifications	409	0.33	0.47	0	1
Coregroup_low or no qualifications	409	0.39	0.49	0	1
Core group_qualifications_not known	409	0.07	0.25	0	1
Architectural and engineering services	409	0.18	0.38	0	1
Social work	409	0.24	0.43	0	1
Cultural sectors	409	0.22	0.41	0	1
Electronic engineering	409	0.13	0.34	0	1
Retail	409	0.23	0.42	0	1
Size5_9	409	0.28	0.45	0	1
Size10_24	409	0.41	0.49	0	1
Size25_99	409	0.20	0.40	0	1
Size100_199	409	0.06	0.24	0	1
Size200plus	409	0.05	0.22	0	1
Single	409	0.35	0.48	0	1
Foreign	409	0.11	0.32	0	1
Ageunder10	409	0.14	0.35	0	1
Age10_19	409	0.22	0.42	0	1
Age20plus	409	0.61	0.49	0	1
Age_not known	409	0.02	0.14	0	1
Union	409	0.30	0.46	0	1
National or foreign market focus	409	0.41	0.49	0	1
Sales change index	335	3.44	1.04	1	5
New products	409	0.41	0.49	0	1
New processes or work organisation	409	0.39	0.49	0	1
Summary index of skill improvement needs	409	3.95	2.65	0	10

Follow-up employers, 2009					
Variable	Obs	Mean	Std. Dev.	Min	Max
Core group_onjobtraining	284	0.85	0.36	0	1
Core group_offjobtraining	283	0.55	0.50	0	1
Core group_degree	285	0.24	0.43	0	1
Core group_intermediate qualifications	285	0.35	0.48	0	1
Coregroup_low or no qualifications	285	0.36	0.48	0	1
Core group_qualifications_not known	285	0.06	0.24	0	1
Architectural and engineering services	285	0.17	0.37	0	1
Social work	285	0.28	0.45	0	1
Cultural sectors	285	0.21	0.41	0	1
Electronic engineering	285	0.13	0.34	0	1
Retail	285	0.21	0.41	0	1
Size5_9	285	0.29	0.46	0	1

Size10_24	285	0.40	0.49	0	1
Size25_99	285	0.21	0.41	0	1
Size100_199	285	0.05	0.22	0	1
Size200plus	285	0.05	0.21	0	1
Single	285	0.36	0.48	0	1
Foreign	285	0.11	0.31	0	1
Ageunder10	285	0.14	0.34	0	1
Age10_19	285	0.23	0.42	0	1
Age20plus	285	0.61	0.49	0	1
Age_not known	285	0.02	0.14	0	1
Union	285	0.28	0.45	0	1
National or foreign market focus	285	0.39	0.49	0	1
Sales change index	255	2.78	1.15	1	5
New products	285	0.38	0.49	0	1
New processes or work organisation	285	0.37	0.48	0	1
Summary index of skill improvement needs	285	4.05	2.69	0	10

Table A3: Supplementary interviews carried out with respondents to Employers Skills Updating Survey, 2009

Code	Sector	Employment size-group
A1	Architecture and engineering services	25 - 49
A2	Architecture and engineering services	50 - 99
A3	Architecture and engineering services	25 - 49
A4	Architecture and engineering services	10-24
A5	Architecture and engineering services	5-9
A6	Architecture and engineering services	200 - 249
A7	Architecture and engineering services	25 - 49
A8	Architecture and engineering services	5-9
A9	Architecture and engineering services	10-24
S1	Social work	5-9
S2	Social work	10-24
S3	Social work	10-24
S4	Social work	10-24
S5	Social work	200 - 249
S6	Social work	5-9
S7	Social work	250 - 499
S8	Social work	10-24
S9	Social work	5-9
S10	Social work	10-24
C1	Cultural industries	5-9
C2	Cultural industries	100 - 199
C3	Cultural industries	100 - 199
C4	Cultural industries	10-24
C5	Cultural industries	25 - 49
C6	Cultural industries	25 - 49
C7	Cultural industries	50 - 99
C8	Cultural industries	5-9
C9	Cultural industries	100 - 199
E1	Electronics and related engineering	5-9
E2	Electronics and related engineering	10-24
E3	Electronics and related engineering	200 - 249
E4	Electronics and related engineering	25 - 49
E5	Electronics and related engineering	5-9
E6	Electronics and related engineering	50 - 99
E7	Electronics and related engineering	10-24
E8	Electronics and related engineering	10-24
R1	Retail	5-9
R2	Retail	5-9
R3	Retail	5-9
R4	Retail	50 - 99
R5	Retail	10-24
R6	Retail	5-9
R7	Retail	10-24
R8	Retail	5-9
R9	Retail	5-9

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