

Inequalities in the distribution of training in Britain

Abstract

This paper examines the inequalities in the distribution of training which exist in Britain. It does so by using a binomial logit regression model to examine training incidence and an ordered logit regression model to examine training intensity. The investigation uses a matched worker-workplace data set with origins in the 2011 Work and Employment Relations Study. Training inequalities are seen to correlate with both the personal characteristics of the individual and the characteristics of the workplace at which he/she is employed, notably age band, pay grade, tenure and the size of the workplace. However, the training premia which have traditionally accrued to males, graduates, those who have permanent contracts of employment and union members appear to be diminishing if not disappearing.

Keywords

Training inequalities, training incidence, training intensity, Work and Employment Relations Study (WERS 2011)

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Introduction

Education and training have rarely been off the policy agenda in Britain in recent years although the underlying rationale for this is contested (Keep et al, 2010). Conforming to the neo-liberal perspective of the salience of human capital investments, the influential Leitch Review (2006) maintained that “where skills were once *a* key driver of prosperity and fairness, they are now *the* key driver” (p. 9) (Italics in the original). Skills acquisition and development have become what Keep and Mayhew (2010) describe as “the policy makers’ lever of choice” (p. 566). Furthermore, the possession of ‘skills’ has come to be associated with a very diverse set of economic, personal and societal benefits. Consequently, skills development has come to be seen to be the potential solution to multifarious economic and social ‘problems’, for example: employment and wage inequalities; the relatively weak economic performance of both (some) firms and (some) regions of Britain in increasingly competitive global markets; low levels of inter-generational social mobility; welfare dependency; and anti-social behaviour.¹

A working assumption on the part of successive policy makers is that individuals, certified and qualified to varying levels, will be able to make use of their predominantly publicly funded, ‘general’ education as the basis for subsequent, primarily privately funded and predominantly ‘specific’ training at the workplace. The latter is especially important. As Green (2013) argues: “employers are indispensable actors in the supply of skill formation services, through the provisions they make for work-based learning” (p. 27).

Policy makers may perceive training to be the policy lever most appropriate to addressing diverse public policy goals. Nevertheless, decision-makers within organisations hold very different perspectives. Their decisions with respect to training are influenced by private, corporate goals, corporate strategies and corporate and external environmental constraints. One consequence is that inequalities exist in the distribution of training (Lindsay et al, 2012). The skills of all employees may be crucial in some workplaces. In contrast, in other workplaces, for the majority of individuals, skills may be of minor consequence for the jobs they do. Hence the training the latter receive is designed often to meet only induction needs and regulatory and/or statutory requirements, such as health and safety (Keep, 2005). Therefore, the distribution of training varies across workplaces, in terms of its type, level and volume, explained by factors such as the size and industrial sector of the workplace at which the individual is employed. Furthermore, the distribution of training varies within workplaces, explained by factors such as an individual’s qualifications, job status and salary (Green, 2013).

To examine the nature and extent of these training inequalities in Britain, this paper investigates the determinants of training incidence and training intensity making use of a matched worker-workplace data set which has its origins in the 2011 Workplace and Employment Relations Study (WERS 2011). The comparative advantage of WERS 2011 in this context, for example relative to the Labour Force Survey which is frequently used to examine these issues, is the wealth of variables reflecting important characteristics of the workplace which are potentially available (Sutherland, 2004: 2009).

In a period when other surveys suggest that the volume of training is declining (e.g. Felstead et al, 2012) and at a time when training decisions were affected by the recession consequent of and subsequent to the economic and financial crises of 2008-9 (van Wanroy et al, 2013), two questions motivate this research investigation: In terms of both their personal characteristics and the characteristics of the workplaces at which they are employed, who receives training? And how much training does an individual receive? In one respect, therefore, this paper reports an exploratory investigation, but one which addresses substantive issues. Previously, and not unexpectedly, some groups within the workforce, notably males, the more highly qualified, the more highly skilled, those holding permanent contracts of employment and union members have received what might be identified as 'training premia'. Do these premia continue to exist? Further, many within the workforce receive little or no training at all. What is the extent of this 'shortage' of training? Has this increased or decreased? And if it has decreased what are the implications for skills policies, seemingly so central to achieving the diverse set of policy goals identified above?

A literature context

Green (2013) proposes a simple model of the employer's training decision, based upon private (as opposed to public) benefit-cost perspectives (and which abstracts from the crucial distinction between 'general' and 'specific' training and the theoretical and empirical implications which follow from this) (cf. Harhoff and Kane, 1997, *inter alia*). According to this model, training is assumed to increase the marginal product of employees. Consequently, the employer benefits from any additional profit which accrues from this increase, net of any increase in wages paid to employees who receive training. The costs of training are associated with the production forgone on the part of trainees and trainers, and any fees paid to outside training agents/agencies. The marginal benefits of training will tend to fall over time. Similarly, the marginal costs of training will tend to rise. Consequently, for the profit-maximising employer, the point of intersection of the decreasing marginal benefits of training and the increasing marginal costs of training will determine the optimum training point, for example in terms of training volume per worker as measured by the number of days training provided.

Compatible with the expectations associated with this benefit-cost perspective, there is a degree of consensus in the empirical literature about the extent to which certain variables determine whether an individual in employment in Britain receives training, where the training in question is organised at the workplace (and usually paid for by the employer). Moreover, this consensus also exists in equivalent cross-country studies (Arulampalam et al, 2003; Leuven and Oosterbeek, 1999). Most of these variables relate to the personal characteristics of an individual.

In the context of an individual's personal characteristics which do not relate to work, there is a correlation between training and age, with training being more likely for relatively younger members of the workforce and less likely for relatively older members. The younger the worker, over time, the greater the expected benefits to the employer from the training investments made (assuming, that is, the younger worker does not quit) (Green, 1993a; Taylor and Urwin, 2001). Similarly, there is a correlation between training and the level of formal qualifications held by the employee. The higher the level of qualification held, the more likely it is that an individual will receive training (Green 1993a). The marginal returns from training the more highly qualified tend to be relatively greater; and the marginal costs relatively lower.

In terms of an individual's personal characteristics which relate to work, there is a correlation between training and an individual's pay grade at the workplace, with those on the higher pay grades having a greater likelihood of receiving training (Arulampalam et al, 2003). Pay grades equate with skills possessed by job holders. There is a more frequent need to re-train and up-skill personnel in the higher skill category. Hence the higher paid are the more likely to receive training. There is also a correlation between training and an individual's job status, with training being more likely to be given to those on full time contracts relative to those on either part time contracts or fixed term contracts (Greenhalgh and Mavrotas, 1996). By definition, those on non-standard contracts of employment are more likely to be part of an establishment's flexible workforce, hired and fired according to the product market circumstances, prevailing or forecast. Consequently, the potential pay offs from any training investments in members of these groups are more problematical. Further, there is a correlation between training and tenure. Training is more likely during an individual's early period of employment at the workplace as he/she acquires, develops and learns to apply the skills required for the job undertaken (Green, 1991: Greenhalgh and Mavrotas, 1994). Finally, there is a correlation between training and trade union membership, with the individual who is a trade union member being more likely to receive training. Two distinct explanations are forwarded for this relationship. First, unionised workplaces tend to be more stable, something which generates a longer time horizon over which to calculate the benefits which accrue from investments in training. Secondly, the collective voice mobilised by the union at the workplace advocates training for its members; and there has been an increasing interest on the part of the trade union movement in Britain in promoting learning at work (Boheim and Booth, 2004: Booth, 1991: Green, 1993b: Findlay and Warhurst, 2011: Hoque and Bacon, 2008).

By way of contrast, in the context of an individual's personal characteristics, the relationship between gender and training received has generated more controversy in the empirical literature. Early studies (Booth, 1991: Greenhalgh and Stewart, 1987) suggest males are more likely to receive training than females. Later studies suggest that the extent of the female training deficit was diminishing (Greenhalgh and Mavrotas, 1994: 1996). Most recently, however, Jones et al (2008) argue that the gender differential has now been reversed. Females, *ceteris paribus*, are more likely than males to receive training.

Green's benefit-cost perspective of the training decision also helps explain the consensus which is to be found in the empirical literature on the relationship between training and workplace size, an important characteristic of the workplace at which an individual is employed. There is a correlation between the likelihood that an individual receives training and workplace size (Green 1991: 1993a: Greenhalgh and Mavrotas, 1996: Harris, 1999). Usually, there are economies of scale in training provision. Consequently, the marginal cost of training an individual employee is lower in larger establishments. Conversely, the marginal cost of training an individual employee tends to be higher in smaller establishments because of the relatively higher opportunity costs associated with withdrawing an individual from work.

However, in contrast, there is a degree of controversy over the extent to which training varies with the Standard Industrial Classification (SIC) of the activity undertaken at the workplace and the formal i.e. legal status of the workplace. For example, Booth (1991) finds training to be more likely within the public sector because of the profit making constraints under which private sector workplaces operate. Greenhalgh and Mavrotas (1996) find that training is more likely within the

'non- trading' sectors of the economy (e.g. health, education, central and local government). These controversies tend to reflect both the limitations (in terms of the potential regressors available) and dates of the data sets analysed. Over time in Britain, what constitutes the public sector - and the terms of reference of some workplaces within it – has changed. Further, technical change has necessitated revisions to the SIC. That said, if adopting a different statistical methodology, Murphy et al (2008) conclude, unambiguously, that an individual in the public sector, relative to the equivalent individual in the private sector, has a training advantage, mostly attributable to the higher skill content of the nature of the work done by the former.

The Data set: the 2011 Workplace Employment Relations Study ²

The 2011 Workplace Employment Relations Study is the sixth in a series of workplace surveys which map the changing contours of employment relations in Britain (Brown et al, 2009). There are four components to the 2011 study viz.: the Survey of Managers; the Survey of Worker Representatives; the Survey of Employees; and, for workplaces in the trading sector, the Financial Performance Questionnaire (van Wanrooy et al, 2013). The Survey of Managers is of central importance. The other components have their origin in the population of workplaces sampled for this survey. The data set examined in this investigation is a matched merger of the survey of managers and the survey of employees.

For the 2011 study, the population sampled for the survey of managers is all workplaces in Britain which have five or more employees operating in Sections C-S of the 2007 Standard Industrial Classification (i.e. Agriculture and Mining is excluded). A workplace is defined as comprising the activities of a single employer at a single set of premises. The population sampled accounts for 35 per cent of all workplaces in Britain and 90 per cent of all employees.

Previous studies had made use of two distinct samples. One was a new cross section sample of workplaces. This was designed to provide representative results for the population of workplaces in existence at the time of the survey. The other was a panel sample comprising workplaces which had participated in the most recent previous cross section survey and which remained in existence at the time of the new survey. This panel sample was used to examine the extent to which and the manner in which individual workplaces had changed over time. The two samples were analysed separately (Culley et al, 1999; Kersley et al, 2006; Millward et al, 2000).

The novel design feature of the 2011 study was the integration of the new cross section sample with the panel sample. Consequently, there is a 'panel sample'; a 'refreshment sample'; and a 'combined sample'. The 2011 sample design had two aims. The first was to obtain interviews at 900 of the 2,295 workplaces which had participated in the cross section sample of 2004. These were to constitute the 'panel sample'. The second was to obtain interviews at a further 1,800 workplaces, selected as a stratified random sample from the Inter Departmental Business Register maintained by the Office for National Statistics. These were to constitute the 'refreshment sample'. When taken together, therefore, the 'panel sample' and the 'refreshment sample' constitute the 'combined sample'.

The profiles of these samples are important. The survey design took cognisance of workplace size and industry sector. The ultimate aim was to select panel and refreshment samples, which, when combined, would generate a final sample which had at least 250 workplaces in the

following size bands viz. 5 -9 employees; 10 – 24; 25 -49; 50 -99; 100 – 199; and 200 -499: at least 150 workplaces in the following size bands viz. 500 -999; 1000 -1999; and 2000+: and a minimum of 85 cases in each industry sector. The sample design, therefore, gives an above average probability of selection to larger workplaces and workplaces in less populated industries. The resulting ‘combined sample’, therefore, is not representative of the total population of workplaces in Britain. Hence, analysis needs to make use of the appropriate weighting factor for each component of the survey, partly to account for the sampling bias in the original survey design and partly to account for variable rates of non-response in its components.

At each participating workplace, the most senior manager responsible for employment relations/human resources/personnel was interviewed. Prior to this interview, this manager was asked to provide a demographic profile of the workplace. The management questionnaire sought information on the following: workplace/organisation characteristics; the management of personnel and employment relations; recruitment, training and the organisation of work; consultation and communication; representation at work; payment systems and pay determination; collective disputes and procedures; fair treatment at work; workplace flexibility; workplace performance; and workplace change.

At each participating workplace, permission was sought from the manager to distribute a self-completion questionnaire to employees at the workplace. If the manager agreed, 25 employees were selected randomly from a list of all employees and invited to complete the questionnaire. At workplaces with fewer than 25 employees, each employee participated. In addition to asking questions which related to the personal characteristics of the individual and his/her household characteristics, the survey of employees sought information about the individual’s job; the workplace at which he/she is employed; personal views about working at this workplace; and representation at work.

The focus of this investigation of training inequalities is responses to the following question asked in the survey of employees:

“Apart from health and safety training, how much training have you had during the last 12 months, either paid for or organised by your employer?”

Column 2 of Table 1 shows the percentage distribution of responses to the question identified. In the analysis which follows, ‘Whether or not an individual receives training’ is assumed to define ‘training incidence’. 32 per cent received no training. Expressed otherwise, the training participation rate was 68 per cent. The six categories of the number of days of training received are used to define ‘training intensity’.

Insert Table 1 near here

Columns 3 and 4 of Table 1 show the corresponding percentage distribution of responses to the same question from the equivalent surveys undertaken in 2004 and 1998 (Kersley et al, 2006; Cully et al, 1999). Two observations may be made from a comparison of the three percentage distributions. First, between 1998 and 2011, the percentage who receives no training decreases progressively from 36.07 per cent in 1998 to 31.99 per cent in 2011. Secondly, the percentage who receives the two greatest number of days of training also decreases progressively, from 18.96 per

cent in 1998 to 15.89 per cent in 2011. The second observation is compatible with Felstead et al's (2012) claim that the volume of training has decreased over the last decade. Also, it may be a manifestation of employers' desire to 'train smarter' (as quoted in Felstead et al, 2012, p. 983).

The Estimation Models

In the models estimated, the assumption is that an individual participates in training if the net benefits of the final outcome (to employer, employee or some combination of both) is perceived to be positive, a decision which may be modelled as a latent variable.

A conventional binomial logistic regression model is used to identify the determinants of training incidence (i.e. the likelihood that an individual receives training) viz.:

$$y_{iw} = X_{iw} \beta + \varepsilon_{iw}$$

where y_{iw} is the recoded response of an individual (i) in a workplace (w); X_{iw} β and ε_{iw} are, respectively, a vector of independent variables, a set of coefficients to be estimated, and an error term (Cameron and Trivedi, 2010). In the estimation, $y_{iw} = 1$, if the individual reports that he/she received training (and = 0 otherwise) (Table 1).

An equally conventional ordered logistic regression model is used to identify the determinants of training intensity (i.e. the likelihood that an individual receives one of the six training outcomes measured in terms of the number of days of training received) (Table 1). It too conforms to convention viz.:

$$y^*_{iwm} = X_{iw} \beta + \varepsilon_{iw}$$

such that,

$y_{iw} = 1$ (i.e. 'none')	if $\tau_0 = -\infty \leq y^*_i < \tau_1$
$y_{iw} = 2$ (i.e. 'less than 1 day')	if $\tau_1 = \leq y^*_i < \tau_2$
$y_{iw} = 3$ (i.e. '1 to less than 2 days')	if $\tau_2 = \leq y^*_i < \tau_3$
$y_{iw} = 4$ (i.e. '2 to less than 5 days')	if $\tau_3 = \leq y^*_i < \tau_4$
$y_{iw} = 5$ (i.e. '5 to less than 10 days')	if $\tau_4 = \leq y^*_i < \tau_5$
$y_{iw} = 6$ (i.e. '10 days or more')	if $\tau_5 = \leq y^*_i < \tau_6 = \infty$

where y_{iwm} is the response of an individual (i) in a workplace (w) reporting the number of days of training received (m); τ is some threshold point where, when crossed by the latent variable y^* , the observed number of days of training received category changes; and X_{iw} β and ε_{iw} are, respectively, a vector of independent variables, a set of coefficients to be estimated, and an error term (Cameron and Trivedi, 2010).

In both models, the vector of independent variables comprises variables of three sorts: viz. variables denoting the personal characteristics of an individual which are independent of the workplace (such as gender, age and formal qualifications); variables which denote the personal

characteristics of an individual which relate to the workplace (such as pay, job status and tenure); and variables which denote the characteristics of the workplace at which the individual is employed (such as its formal i.e. legal status and the Standard Industrial Classification (SIC) of the activity undertaken at the workplace). A full list of the independent variables employed in the estimations is presented in column 1 of Table 3.

Given both the model of the employer's training decision and the empirical studies reviewed above, therefore, the a priori expectations are that the receipt of training and the amount of training received will correlate with an individual's age, qualifications, pay grade, job status; tenure; and union membership status; and the size and formal status of the workplace at which he/she works. More precisely, the likelihood that an individual receives training – and the amount of training an individual receives – will be greater for those in the relatively younger age groups; those who have degree status; those in the relatively higher pay groups; those who hold permanent contracts of employment; those who are new or relatively more recent recruits to the workplace; those who are union members; and those who are employed in relatively larger sized establishments. In contrast, however, the nature of the relationship between training and other variables, notably gender, is assumed to be more problematical.

The Results

First the principal results of the models estimating training incidence and training intensity, respectively, are presented. The detail may be observed in the relevant tables. Then both sets of results are discussed.

Training incidence

The variables associated with an individual's personal characteristics of age, pay grade, tenure and trade union membership are jointly statistically significant (Table 2, columns 2, 3 and 4). Further, many of the coefficients of the relevant individual variables are signed appropriately, although not all are statistically significant (Table 3, columns 2, 3 and 4). Notably (where all results are relative to the appropriate reference category), an individual in the relatively younger age bands is more likely to receive training whereas an individual in the relatively older age bands is less likely to receive training; an individual in the relatively lower pay grades is less likely to receive training whereas an individual in the relatively higher pay grades is more likely to receive training; an individual with relatively shorter lengths of tenure is more likely to receive training whereas an individual with relatively longer tenure durations is less likely to receive training; and an individual who is no longer a trade union member or an individual who has never been a trade union member is less likely to receive training.

Insert Tables 2 and 3 near here

However, although this time in the context of single variables which reflect the personal characteristics of the individual: the coefficient of female (relative to male) is positively signed, but the result is not statistically significant; and the coefficient denoting graduate status (relative to the individual who does not have a degree) is negatively signed, but again the result is not statistically significant.

In the context of the sets of factor variables associated with the characteristics of the workplace at which the individual is employed, workplace size, the SIC of the workplace and the formal status of the workplace are each jointly statistically significant in identifying the determinants of training incidence (Table 2, columns 2, 3 and 4). In terms of the coefficients of the individual variables associated with workplace size, relative to the appropriate reference category, whereas an individual who is employed at relatively smaller workplaces is less likely to receive training, an individual who is employed at relatively larger workplaces is more likely to receive training. The effect of the SIC of the activity undertaken at the workplace at which the individual is employed upon the likelihood that an individual receives training is seen best in the context of some illustrative, statistically significant, examples, where all results are relative to the reference category of an individual employed in Education. An individual employed in Manufacturing; in Construction; in Accommodation and Food Services; and in Information and Communication is less likely to receive training. In contrast, an individual employed in Real Estate Activities; and in Human Health and Social Work Activities is more likely to receive training. Finally in the context of the formal status of the establishment, relative to the reference category of an individual employed in a workplace in local/central government, an individual employed in a workplace which is a government owned limited company is less likely to receive training. In contrast, an individual employed in a workplace which is a QUANGO is more likely to receive training.

Training intensity

There are some minor, but nonetheless important, differences between the determinants of training intensity and the previously reported determinants of training incidence.

In the context of the determinants of training intensity, the sets of factor variables associated with age band; pay grade; tenure; trade union membership; the size of the workplace; the SIC of the workplace; and the formal status of the workplace are again jointly statistically significant. In this instance, however, so too is the set of factor variables associated with job status (Table 2, columns 5, 6 and 7). Furthermore, in terms of the individual dummy variables associated with these eight sets of factor variables, more of these are statistically significant in the context of age band; pay grade; job status; and the formal status of the workplace. Partly off- setting this, fewer of the individual dummy variables associated with the size of the workplace are statistically significant (Table 3, columns 5, 6 and 7). The signs of the coefficients of the single dummy variables (and their statistical significance) denoting having graduate status; having no academic qualifications; having no professional/vocational qualifications; and having supervisory responsibilities do not change. However, the sign of the coefficient of female changes from being positive in the context of training incidence to being negative in the context of training intensity. Once again, the result is not statistically significant.

If anything, therefore, the ordered logistic model of training intensity provides superior estimates to the binomial logit model of training incidence. That the 5 'cuts' denoting the latent variable crossing over to greater amounts of training received are also statistically significant further substantiates this argument.

Whereas the sign of the coefficient of a variable in the logit regression denotes that training is more/less likely to be received, the sign of the coefficient of a variable in the ordered logit regression reflects whether the latent variable increases/decreases with the regressor e.g. when the

coefficient of an independent variable is positive then an increase in the value of this variable decreases the likelihood of being in the lowest category (in this instance 'no training') and increases the likelihood of being in the highest category (in this instance receiving 10 days or more of training).

The average marginal effects of the six possible training outcomes associated with the ordered logit regression are reported in Table 4. An examination of these makes manifest the nature and extent of inequalities in the distribution of training received by individuals. Three statistically significant results illustrate this well (where all the numerical outcomes reported are relative to the appropriate reference category).

First, in the context of pay grade, an individual earning £61 -£100 per week is +6.7 per cent more likely to receive no training. He/she is -1.5 per cent less likely to receive five to less than 10 days of training, and -1.0 per cent less likely to receive 10 days or more of training. In contrast, an individual earning £521 -£650 per cent is -11.9 per cent less likely to receive no training. He/she is +4.0 per cent more likely to receive five to less than 10 days of training, and +3.0 per cent more likely to receive 10 days or more of training. Secondly, in the context of the SIC of the workplace at which the individual is employed, an individual employed in Manufacturing is +12.4 per cent more likely to receive no training. He/she is -4.3 per cent less likely to receive five to less than 10 days of training, and -3.2 per cent less likely to receive 10 days or more of training. In contrast, an individual employed in Real Estate Activities is -5.0 per cent less likely to receive no training. He/she is +2.5 per cent more likely to receive five to less than 10 days of training, and +2.2 per cent more likely to receive 10 days or more of training. Finally, in the context of the formal status of the workplace, an individual employed in a government-owned limited company is +11.2 per cent more likely to receive no training. He/she is -3.3 per cent less likely to receive five to less than 10 days of training, and -2.3 per cent less likely to receive 10 days or more of training. In contrast, an individual employed in a QUANGO is -16.0 per cent less likely to receive no training. He/she is +8.0 per cent more likely to receive five to less than 10 days of training, and +8.5 per cent more likely to receive 10 days or more of training.

Insert Table 4 near here

That said, some of the results of the ordered logisitic regression of training intensity which are *not* statistically significant also warrant note. The coefficients of the variables denoting female and graduate status are not statistically significant (and, moreover, both are negatively signed). One of the two coefficients associated with the sets of variables denoting job status and trade union membership is not statistically significant. The coefficients of the two individual variables denoting the largest size of workplace are not statistically significant (although their positive signs accord with expectations). And, finally, eight of the coefficients of individual variables denoting the formal status of the workplace are not statistically significant.

Discussion

In many respects, these results are in accord with the a priori expectations specified above which reflect the deductions which may be made from Green's model of the employer's training decision. Furthermore they confirm many of the conclusions made in earlier studies of the determinants of training. The nature of the training inequalities which exist in Britain, manifest in the context of training incidence and training intensity, are seen to correlate with factors associated with both the

personal characteristics of an individual and the characteristics of the workplace at which he/she is employed, notably age band; pay grade (which is assumed to proxy skill); tenure; and the size of the workplace. For example, articulated in terms of the determinants of training incidence, younger workers are more likely to receive training, whereas older workers are not; higher paid members of the workforce are more likely to receive training, whereas the less highly paid are not; individuals who are newly recruited to workplaces are more likely to receive training, whereas those with longer tenure are not; and those who work in larger workplaces are more likely to receive training, whereas those employed in smaller workplaces are not.

In contrast to these same expectations and earlier empirical studies, there is some evidence which suggests that in some instances training inequalities have diminished, if not disappeared. Traditional training premia no longer appear to accrue unambiguously to males, graduates; those in permanent jobs; and those who are trade union members. Indeed, this may be seen as the major empirical finding of the exploratory research reported.

As noted in the literature review, previous studies of the determinants of training have reported gender inequalities, initially in favour of males and more recently in favour of females. Over time, the composition of employment in Britain has changed and with it the industrial and occupational distribution of employment. All of this has had a gender bias. It may well be that initially the diminution in the magnitude of the male training premium and latterly its apparent disappearance/reversal is attributable to these factors (Connelly and Gregory, 2007). Alternatively (perhaps additionally?) that there is no statistically significant difference between females and males with respect to training incidence and training intensity to be found in the results reported in this paper may be attributable to the comparative advantage of using a matched worker-workplace data set which allows for more appropriate controls for the industrial sectors and the types workplaces into which females tend to be concentrated.

Much has been made of 'over-education' in contemporary studies of the labour market in Britain, especially the possibility that, currently, not all graduates are employed in traditional 'graduate' jobs (Dolton and Vignoles, 2000; Jones et al, 2013; Sloane et al, 1999). That graduates do not appear to receive their conventional training premium in the estimations undertaken in this investigation may be another manifestation of this phenomenon. To the extent that not all graduates are employed in jobs which may be described as 'high skilled' jobs, therefore, there is less likelihood that they will receive the training premium accorded to those in high skilled jobs.

Relative to those having typical, permanent contracts of employment, individuals holding atypical, temporary employment contracts are more likely to receive no training and less likely to receive substantive days of training, although the same cannot be said about those holding atypical, fixed period contracts of employment. Formerly, the typical and atypical employment contract holders were seen to be complements within many workforces, with the latter facilitating flexibility within the workplace's internal labour market. Now, with the increased prevalence of individuals holding fixed term contracts of employment at many workplaces, they are more like substitutes than complements. Inter alia, this requires that they, too, receive training, if only to meet the regulatory requirements in operation in some sectors of the economy. This may tend to erode the conventional training premium associated with staff holding permanent contracts of employment.

Relative to trade union members, those who have never been union members are more likely to receive no training and are less likely to receive substantive days of training. However, the same cannot be said for those who once were but who no longer are union members. Trade union membership in Britain is now increasingly concentrated into particular industrial sectors of the economy and, within these particular sectors, specific workplaces (Bryson and Forth, 2011). It may well be, therefore, that once these factors are controlled for, as they have been to a certain extent in this study, the trade union effect generating the traditional trade union training premium disappears.

Finally, previous studies of the determinants of training have also produced seemingly conflicting results with respect to the 'private' versus 'public' sector division, for example seeking to examine the possibility of some training advantage which accrues to the individual employed within the public sector. In the results reported, there are training inequalities to be found not only across predominantly private sector and predominantly public sector SICs but also within private sector and public sector workplaces. What is of consequence in the context of training inequalities is both the SIC of the activity undertaken at the workplace and the formal status of the workplace at which the individual is employed, not whether it is 'private' sector or 'public' sector. In the context of training, therefore, the 'public sector' cannot be treated as an homogeneous entity.

Conclusions

There are two important limitations in this investigation into inequalities in the distribution of training. Both are associated with the WERS 2011 data set used in the analysis. The first refers to the timing of the survey; and the second to the nature of the wording of the training question examined.

The fieldwork for WERS 2011 took place between March 2011 and June 2012, shortly after the recession precipitated by the financial and economic crises of 2008. During the period of the recession, given the fall in output, the corresponding fall in the level of aggregate employment had been comparatively small (Gregg and Wadsworth, 2011). By 2012, nationally if not necessarily across all areas within Britain, it had recovered to its pre-recessionary level. However, there were substantial compositional changes to the stock of workplace jobs during this period, attributable to respective governments' contrasting fiscal stances in response to these crises. Whereas employment in the private sector decreased during 2008 -2009, employment in the public sector increased. Thereafter, whereas employment in the private sector increased, employment in the public sector decreased.

In addition to this change in the stock of workplace jobs, the recession also had a negative impact upon, inter alia, training decisions. Although less than two per cent of the managers surveyed for WERS 2011 reported that a reduction in training expenditures had been one way in which their workplaces responded to the recession, over one in 10 in the survey of employees associated with WERS 2011 who were at the workplace during the recession mentioned that access to training had been restricted during this period. Certainly in terms of Green's basic model of the employer's training decision, any probable reduction in the total benefits (net of total costs) which accrue from training in normal times will reduce the optimum amount of training undertaken at the workplace. Quite probably, this will have a differential impact across workers within workplaces. Further, most likely it will be employees at the benefit/cost margins who will be the more likely to be the 'training losers', for example the older rather than the younger; the low-skilled rather than the high skilled.

It is quite possible that workplace reductions in training expenditures and restricted access to training for some employees continued beyond 2008-9 into 2011-12. Therefore, it is conceded that in several respects the period of the survey may have been an atypical one for undertaking a cross section examination of training incidence and training intensity.

There are certain problems, of both a theoretical and empirical nature, which arise as a consequence of the wording of the question in the survey of employees used to examine training incidence and training intensity. It is not possible to determine whether the training in question was employer initiated or employee initiated (or resulted, ultimately, from some bargain between both parties); whether it was on-the-job or off-the-job (or some combination of both); and whether it was, following Becker (1962), of a 'general' or 'specific' nature. Furthermore, although training is conventionally assumed to be associated with formal learning activities such as courses and structured programmes of activity, there is a potential problem of interpretation in that what some individuals recognise and experience as 'training' may differ from what some human resource management departments recognise, value and implement. For example, whereas the latter may assume that what is of consequence is the development of competencies directly related to enhancing job performance, the former may perceive training only as an activity which facilitates progress and promotion either within the internal labour market of the workplace/organisation or within the wider external labour market.

It is too facile to treat and therefore dismiss all of this as mere 'measurement' error (Card, 2001), although there are certainly elements of this within it. Rather it is more important to emphasise that this exercise of investigating training incidence and training intensity was constrained to examining a subjective, quantitative measure of training volume according to employees' responses to a specific question put in the survey of employees associated with WERS 2011.

Nevertheless, there are two important conclusions to be made from this novel analysis of the internationally acclaimed WERS 2011 data set. First, the analysis suggests that the training premia which traditionally accrued to selected groups within the workforce – males, graduates, those holding permanent contracts of employment and trade union members – appear to be diminishing if not disappearing. Future research, perhaps making use of alternative data sets, is now necessary to corroborate this finding and offer more substantive explanations for the phenomenon observed. Secondly, the analysis reaffirms the importance of certain variables – notably age, pay grade and tenure – in determining training outcomes. The likelihood of receiving training, and receiving proportionately more days of training, is greater for those in the relatively younger age groups, the relatively higher pay grades and new or recent recruits to the workplace. One corollary of this, however, is that it reveals the inequalities which exist in the distribution of training by identifying the individuals who receive either no or few training opportunities.

Ultimately, what is of consequence is that the training an individual receives is appropriate to his/her immediate and longer run skills development requirements, and that the skills acquired are put to productive use in the workplace at which he/she is employed. By training, therefore, what employers are doing is augmenting the supply of skills. The policy agenda recognises the salience of the workplace and the crucial role played by the employer in skills formation. However, what the policy agenda needs to address more forcibly are the issues made manifest in the findings of this

research investigation, viz. that more than 30 per cent of employees in employment receive no training; that such is the limited amount of training received by the majority of those who do receive training that any skills development which results is highly unlikely to generate the economic and social benefits with which white papers associate them; and that many individuals within the workforce who are in most need of skills development to improve their prospects in the labour market are the very individuals who receive no training.

Inequalities in the distribution of training are inevitable when a private benefit-cost calculus is used to determine training decisions because there is little or no profit to be made by employers from making human capital investments in many segments of their workforces. It is not an example of market failure. It is a failure on the part of policy makers to recognise that the use of exclusively private criteria in the training decision will not produce the socially optimum outcomes which they seek. Further, it is the task of public policy to recognise that formal training of the type examined here is but one component part of the process of skills formation. And, to the extent that there are shortfalls identified for some groups of individuals within this part, there is a need to compensate for this elsewhere. One such possibility is programmes to train low skilled employees of small firms, because there are a disproportionately high number of low paid, low skilled employees within the working population in Britain. Finally, there is a need to appreciate that achieving goals such as removing employment and wage inequalities and promoting greater inter-generational social mobility will entail moving beyond the neo-liberal supply-side policy perspective and recognise the need to design and implement public policies which seek to change the process and product strategies of firms and thereby increase the demand for more highly skilled workers.

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Notes

¹ The opening paragraph of 'Rigour and Responsiveness in Skills', the most recent government white paper of relevance, illustrates well some of these observations. "In today's global race we need a highly skilled workforce. Higher levels of skills help workers to become more effective: 20% of the growth in the output of UK workers can be attributed to the growth in their skill levels. Those who improve their skills are more likely to go on to further study or to progress higher in their chosen occupation. They are also more likely to have children who are more successful in school. So getting our vocational and technical education system right is both socially and economically vital" (DfE and BIS, 2013, p. 1).

² The Workplace Employment Relations Study, 2011 was sponsored by: the Department for Business, Innovation and Skills (BIS), the Economic and Social Research Council (ESRC), the UK Commission for Employment and Skills (UKCES), the Advisory, Conciliation and Arbitration Service (ACAS) and the National Institute of Economic and Social Research (NIESR). The principal investigators were: BIS, ACAS, and NIESR. The data were collected by NatCen Social Research. The data were deposited at the UK Data Archive (UKDA) by BIS. The data were accessed via UKDA. Crown copyright is held jointly with ESRC, UKCES, ACAS and NIESR. Crown copyright material is reproduced with the permission of the Controller of HMSO and the Queen's Printer for Scotland. None of the above parties bears any responsibility for the analysis of the data set undertaken or any interpretation made from this analysis. The bibliographic citation for this data collection is: Department for Business, Innovation and Skills, Advisory, Conciliation and Arbitration Service and National Institute of Economic and Social Research, Workplace Employee Relations Survey, 2011 [computer file]. Colchester, Essex: UK Data Archive [distributor], February, 2013. SN: 7226, <http://dx.doi.org/10.5255/UKDA-SN-7226-1>.

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Table 1. Percentage distribution of ‘days of training received in the last 12 months’, 2011, 2004 and 2011.

Days	Percentage (2011)	Percentage (2004)	Percentage (1998)
None	31.99	34.02	36.07
Less than 1	12.77	9.25	8.53
1 to less than 2	17.01	15.10	14.47
2 to less than 5	22.33	21.95	21.98
5 to less than 10	9.75	10.26	9.98
10 days or more	6.14	8.67	8.98
Number of observations	21,794	22,221	28, 019

Source: Author’s own calculations from the original data sets. Note, in the 1998 Survey of employees there was no prior qualification made about “Apart from health and safety training”.

Table 2. ‘F’ tests for the joint statistical significance of sets of factor variables in the logistic regression of ‘training incidence’ and the ordered logistic regression of ‘training intensity’.

Factor Sets	Logistic Regression of ‘Training Incidence’			Ordered Logistic Regression of ‘Training Intensity’		
	Df	F	P > F	Df	F	P > F
Age band	(8, 19854)	8.47	0.0000	(8,19854)	16.87	0.0000
Pay grade	(13, 19854)	6.25	0.0000	(13, 19854)	12.12	0.0000
Job status	(2, 19854)	0.66	0.5184	(2, 19854)	5.79	0.0031
Tenure	(4, 19854)	9.74	0.0000	(4, 19854)	11.25	0.0000
Trade union membership	(2, 19854)	7.41	0.0006	(2, 19854)	7.74	0.0000
Workplace size	(5, 19854)	12.92	0.0000	(5, 19854)	7.16	0.0000
SIC of workplace	(16, 19854)	18.56	0.0000	(16,19854)	22.13	0.0000
Formal status of workplace	(11, 19854)	4.90	0.0000	(11, 19854)	5.13	0.0000

Footnote to Table 2:

F statistics are adjusted for the survey design.

Table 3. Estimation results: logistic regression of the dependent variable 'training incidence'; and the ordered logistic regression of 'training intensity'.

Variable	Coefficient	Lin'ed Std Error	P > t	Coefficient	Lin'ed Std Error	P > t
	Training Incidence			Training Intensity		
Female (=1)	.0625	.0560	0.265	-.0859	.0446	0.054
<i>Age Band (in years)</i>						
16 -17	.3305	.2523	0.190	.5283	.2238	0.018
18 -19	.4384	.1935	0.023	.5300	.1695	0.002
20 -21	.4214	.1590	0.008	.6400	.1545	0.000
22 -29	.1991	.0876	0.023	.3177	.0688	0.000
30 -39 *						
40 -49	-.1905	.0715	0.008	-.1346	.0535	0.012
50 -59	-.2919	.0771	0.000	-.2556	.0566	0.000
60 -64	-.3774	.1158	0.001	-.4692	.0840	0.000
65 and above	-.7847	.1718	0.000	-.7246	.1526	0.000
Graduate (=1)	-.0023	.0662	0.971	-.0411	.0482	0.394
No academic qualifications (=1)	-.2143	.1127	0.057	-.1308	.0970	0.177
No vocational qualifications (=1)	-.2351	.0981	0.017	-.2727	.0835	0.001
Supervise other staff (=1)	.5052	.0589	0.000	.3962	.0451	0.000
<i>Pay Grade (£s, per week)</i>						
60, or less	-.2963	.1802	0.100	-.4394	.1369	0.001
61 -100	-.2380	.1590	0.135	-.2996	.1231	0.015
101 -130	-.2031	.1626	0.212	-.0258	.1399	0.853
131 -170 *						
171 -220	-.1097	.1382	0.427	-.0574	.1083	0.596
221 -260	.0179	.1374	0.896	.1593	.1112	0.152
261 -310	.1579	.1376	0.251	.1757	.1083	0.105
311 -370	.2333	.1368	0.088	.2853	.1085	0.009
371 -430	.2328	.1409	0.099	.3275	.1136	0.004
431 -520	.3883	.1413	0.006	.5071	.1109	0.000
521 -650	.5188	.1466	0.000	.5910	.1111	0.000
651 -820	.7705	.1523	0.000	.7657	.1149	0.000
821 -1,050	.5780	.1727	0.001	.7612	.1320	0.000
1,051 or more	.6545	.1864	0.000	.7724	.1394	0.000

Table 3 (cont.)

Variable	Coefficient	Lin'ed Std Error	P > t	Coefficient	Lin'ed Std Error	P > t
	Training Incidence			Training Intensity		
<i>Job Status</i> Permanent *						
Temporary	-.1391	.1253	0.267	-.3088	.0960	0.001
Fixed period	-.0572	.1554	0.713	.1025	.1154	0.374
<i>Tenure (in years)</i> Less than 1	.0912	.1052	0.386	.0937	.0814	0.250
1 - < 2 *						
2 - < 5	-.2074	.0924	0.025	-.1347	.0691	0.051
5 - < 10	-.2947	.0943	0.002	-.2809	.0701	0.000
10 or more	-.4226	.0952	0.000	-.3203	.0717	0.000
<i>Trade Union Membership</i> A member *						
No, but have been	-.1377	.0772	0.075	-.0648	.0569	0.255
No, and have never been	-.2550	.0662	0.000	-.1898	.0486	0.000
<i>Size of Workplace (in numbers of employees)</i> 5 – 9	-.3610	.1152	0.002	-.3196	.1010	0.002
10 -19	-.2294	.0886	0.010	-.1854	.0718	0.010
20 -49	-.1968	.0754	0.009	-.1816	.0614	0.003
50 -99 *						
100 -499	.1793	.0770	0.020	.0230	.0605	0.703
500 or more	.2476	.0882	0.005	.0774	.0672	0.250
<i>SIC (2007) of workplace</i> Manufacturing	-.6905	.1215	0.000	-.6231	.1017	0.000
Electricity, gas etc. supply	.0432	.3701	0.907	.2931	.2405	0.223
Water supply, sewerage etc.	.1476	.2446	0.546	-.0226	.1936	0.907
Construction	-.4063	.1424	0.004	-.3842	.1218	0.002
Wholesale and retail	-.5637	.1216	0.000	-.7018	.0977	0.000
Transportation and storage	-.4386	.1476	0.003	-.4881	.1200	0.000
Accommodation and food service	-.4723	.1395	0.003	-.5443	.1215	0.000
Information and communication	-.4291	.1572	0.006	-.4781	.1353	0.000

Table 3 (cont.)

Variable	Coefficient	Lin'ed Std Error	P > t	Coefficient	Lin'ed Std Error	P > t
Financial and insurance activities	-.1866	.2020	0.356	-.1689	.1466	0.249
Real estate activities	.4507	.1600	0.005	.3034	.1058	0.004
Professional, scientific and technical activities	-.2945	.1357	0.030	-.5134	.1009	0.000
Admin. and support services activities	-.6067	.1677	0.000	-.5707	.1386	0.000
Public admin. and defence	-.1508	.0968	0.119	-.0981	.0692	0.156
Education *						
Human health and social work activities	.9004	.0938	0.000	.5302	.0579	0.000
Arts, entertainment and recreation	.0833	.1390	0.549	-.0335	.1084	0.757
Other service activities	-.2354	.1510	0.119	-.1481	.1270	0.244
<i>Formal Status of Workplace</i>						
Public limited company	.0340	.1146	0.766	.1135	.0844	0.179
Private limited company	-.1942	.1016	0.056	-.0688	.0746	0.357
Company limited by guarantee	.2729	.1703	0.109	.1082	.1049	0.302
Partnership/self-proprietor	-.1864	.1329	0.161	.0369	.1016	0.716
Trust/charity	.0525	.1066	0.622	.0635	.0671	.0344
Body established by royal charter	-.4168	.2601	0.109	-.1588	.2145	0.459
Co-op/mutual/friendly society	-.0025	.2528	0.992	.0233	.1769	0.895
Government owned limited company	-.6260	.1507	0.000	-.5359	.1290	0.000
Public service agency	.2027	.1463	0.166	.1893	.0951	0.047
Other non-trading public corporation	-.4139	.2603	0.112	-.2928	.1873	0.118
QUANGO	1.4783	.4769	0.002	1.0165	.2571	0.000
Local/central government *						
Constant	1.1867	.1681	0.000			
/ cut 1				-1.1445	.1324	0.000
/ cut 2				-.5267	.1316	0.000
/ cut 3				.2643	.1315	0.045
/ cut 4				1.5593	.1332	0.000
/ cut 5				2.6645	.1377	0.000
Number of observations			= 19,855			= 19,855
Population size			= 90.6243			= 90.6243
Design df			= 19,854			= 19,854
F			(66, 19,789) = 16.51			(66, 19,789) + 24.85
Prob > F			= 0.0000			= 0.0000

Footnotes to Table 3:

*denotes omitted reference category.

dy/dx for the factor levels is the discrete change from the base level.

** denotes statistically significant at (p < 0.05)

Table 4. Average marginal effects of the six outcomes (in terms of number of days of training received) associated with the ordered logistic regression of ‘training incidence’.

Variable	None	Less than 1 day	1 to less than 2	2 to less than 5	5 to less than 10	10 or more
Female (=1)	.017	.002	-.000	-.007	-.005	-.004
<i>Age Band (in years)</i>						
16 -17	-.091**	-.019**	-.005	.038**	.040**	.038
18 -19	-.092**	-.019**	-.005	.038**	.040**	.038**
20 -21	-.108**	-.024**	-.009	.044**	.049**	.048**
22 -29	-.057**	-.010**	-.001	.025**	.023**	.020**
30 -39 *						
40 -49	.026**	.003**	-.001**	-.012**	-.009**	-.007**
50 -59	.051**	.005**	-.003**	-.023**	-.017**	-.013**
60 -64	.096**	.008**	-.009**	-.043**	-.029**	-.022**
65 and above	.152**	.008**	-.019**	-.067**	-.042**	-.031**
Graduate (=1)	.008	.001	-.000	-.003	-.002	-.002
No academic qualifications (=1)	.025	.003	-.001	-.011	-.008	-.006
No vocational qualifications (=1)	.055**	.005**	-.004**	-.025**	-.017**	-.013**
Supervise other staff (=1)	-.075**	-.011**	.001**	.034**	.023**	.023**
<i>Pay Grade (£s, per week)</i>						
60, or less	.099**	-.000	-.019**	-.043**	-.022**	-.014**
61 –100	.067**	.000	-.012**	-.029**	-.015**	-.010**
101 -130	.055	.000	-.000	-.002	-.001	-.001
131 -170 *						
171 -220	.012	.000	-.001	-.005	-.003	-.002
221 –260	-.034	-.002	.004	.015	.009	.006
261 -310	-.037	-.002	.004	.017	.010	.007
311 -370	-.060**	-.005**	.006**	.028**	.017**	.012**
371 -430	-.068**	-.006**	.007**	.032**	.020**	.015**
431 -520	-.103**	-.012**	.008**	.048**	.033**	.025**
521 -650	-.119**	-.015**	.007**	.055**	.040**	.030**
651 -820	-.149**	-.022**	.005	.069**	.053**	.042**
821 -1,050	-.148**	-.022**	.005	.069**	.053**	.042**
1,051 or more	-.150**	-.022	.005	.069**	.054**	.043**

Table 4. (cont.)

Variable	None	less than 1	1 to less than 2	2 to less than 5	5 to less than 10	10 or more
<i>Job Status</i>						
Permanent *						
Temporary	.062**	.006**	-.005**	-.028**	-.019**	-.015**
Fixed period	-.019	-.002	.000**	.008	.007	.006
<i>Tenure (in years)</i>						
Less than 1	-.016	-.003	-.000	.007	.007	.006
1 - < 2 *						
2 - < 5	.025**	.004	-.000	-.011**	-.009	-.008
5 - < 10	.054**	.007**	-.001**	-.024**	-.019**	-.016**
10 or more	.062**	.008**	-.002**	-.028**	-.022**	-.018**
<i>Trade Union Membership</i>						
A member *						
No, but have been	.012	.001	-.000	-.005	-.004	-.003
No, and have never been	.036**	.005**	-.001**	-.016**	-.013**	-.010**
<i>Size of Workplace (in numbers of employees)</i>						
5 - 9	.064**	.007**	-.004**	-.029**	-.021**	-.016**
10 -19	.036**	.004**	-.002**	-.016**	-.012**	-.009**
20 -49	.035**	.004**	-.001**	-.016**	-.012**	-.009**
50 -99 *						
100 -499	-.004	-.000	.000	.002	.001	.001
500 or more	-.014	-.002	.000	.006	.005	.004
<i>SIC (2007) of workplace</i>						
Manufacturing	.124**	.017**	-.007**	-.059**	-.043**	-.032**
Electricity, gas etc. supply	-.048	-.012**	-.005	.021	.024	.022
Water supply, sewerage etc.	.004	.000	.000	-.001	-.001	-.001
Construction	.073**	.012**	-.001	-.035**	-.028**	-.021**
Wholesale and retail	.141**	.017**	-.009**	-.067**	-.047**	-.035**
Transportation and storage	.095**	.014**	-.003	-.045**	-.034**	-.026**
Accommodation and food service	.107**	.015**	-.004	-.051**	-.038**	-.029**
Information and communication	.093**	.014**	-.003	-.044**	-.034**	-.026**

Table 4. (cont.)

Variable	None	less than 1	1 to less than 2	2 to less than 5	5 to less than 10	10 or more
Financial and insurance activities	.031	.006	.000	-.014	-.012	-.010**
Real estate activities	-.050**	-.013**	-.006**	.021**	.025**	.022**
Professional, scientific and technical activities	.100**	.015**	-.003	-.048**	-.036**	-.027**
Admin. and support services activities	.113**	.016**	-.005	-.054**	-.039**	-.030**
Public admin. and defence	.017	.003	.000	-.008	-.007	-.006
Education *						
Human health and social work activities	-.083**	-.024**	-.014**	.033**	.045**	.043**
Arts, entertainment and recreation	.006	.001	.000	-.002	-.002	-.002
Other service activities	.027	.005	.000	-.012	-.011	-.009
<i>Formal Status of Workplace</i>						
Public limited company	-.021	-.003	.000	.009	.008	.006
Private limited company	.013	.001	-.000	-.006	-.004	-.003
Company limited by guarantee	-.020	-.003	.000	.009	.007	.006
Partnership/self-proprietor	-.007	-.001	.000	.003	.002	.002
Trust/charity	-.012	-.001	.000	.005	.004	.003
Body established by royal charter	.031	.003	-.002	-.014	-.010	-.008
Co-op/mutual/friendly society	-.004	-.000	.000	.002	.001	.001
Government owned limited company	.112**	.008**	-.013**	-.050**	-.032**	-.023**
Public service agency	-.035**	-.005**	.000	.016**	.013	.011
Other non-trading public corporation	.059	.006**	-.005	-.027	-.018	-.014
QUANGO	-.160**	-.041**	-.023	.058**	.080**	.085**
Local/central government *						

Footnotes to Table 4:

*denotes omitted reference category

dy/dx for the factor levels is the discrete change from the base level.

** denotes statistically significant at (p < 0.05).