

The Determinants Of Training : Evidence From The 1998 Workplace and Employee Relations Survey

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ABSTRACT

This paper uses a matched employee-workplace data set with origins in the 1998 Workplace and Employee Relations Survey (WERS'98) to identify the determinants of two probabilities: that an individual receives training and that an individual receives a specified amount of training. A binomial probit is used to estimate the former and an ordered probit the latter. Both models have three types of explanatory variables reflecting personal characteristics independent of the workplace, personal characteristics that relate to the workplace and characteristics of the workplace itself. There are two principal results. First, the characteristics of the workplace at which the individual is employed are important determinants of both probabilities, demonstrating the relative merits of a data base such as the WERS'98 data base for analysing the determinants of training. Second, the principal determinants of both probabilities are age, educational qualification, occupation, the nature of the employment contract held, whether unions (or staff associations) are present at the workplace, the size of the workplace and the existence at the workplace of certain employee relations and human resource management policies and practices such as an equal opportunities policy.

1. INTRODUCTION

Training in Britain is very unequally distributed, with most of it going to those who are already highly educated, in higher status occupational groups, unionised and not working in small firms.

THIS IS ONE of several 'stylised facts' on training presented by Green in his commentary on the state of working Britain (1999, p. 127). He finds little difference in the distribution of training by gender or by type of employment contract (p. 136).² Shields and Wheatley Price (1999) find marked ethnic differences in the probability that an individual receives train-

ing, with non-white full time employees receiving less training than their white counterparts.

Both Green and Shields and Wheatley Price make use of *Labour Force Survey* data. Excellent though this data set may be with respect to personal characteristics relevant to examining whether an individual receives training this data source has one principal disadvantage. There is negligible detail provided about the workplace at which the individual is employed, which is *a priori* a probable important source of complementary variables when seeking to explain the determinants of training.

This paper makes use of a matched employee-workplace data set that has its origins in the *1998 Workplace and Employee Relations Survey* (Abowd and Kramarz, 1999). It merges selected variables from two of the three surveys undertaken viz. the 'survey of employees' and 'management questionnaire'. The novelty of the paper, relative to Green and Shields and Wheatley Price, is twofold: first, the incorporation of a more comprehensive set of workplace type variables into the estimation of the determinants of training; and, second, the estimation of the probability that an individual receives a specified amount of training, measured in days spent undertaking off-the-job training.

The results of this paper are of central importance to the ongoing policy debate about 'workforce development' (Clarke, 2002). Skills are perceived by policy makers to be the key to 'success', measured, for example, in terms of both corporate and national productivity and competitiveness (Ashton and Green, 1996; DfEE, 2001; Finegold and Soskice, 1988). Although an increasing proportion of the workforce possesses formal qualifications of some description, this is attributable more to education prior to entry into the labour market rather than training when in it. Further, if access to training is as limited and as unequally distributed as Green and Shields and Wheatley Price, *inter alia*, indicate, it is imperative that the specific nature of the problem is correctly diagnosed so that relevant policy measures may be implemented. In this context, the *1998 Workplace and Employee Relations Survey* data base may be more appropriate than, for example, the *Labour Force Survey* for this initial purpose.

2. THE DATASET AND THE ESTIMATION STRATEGY

The data set has its origins in two of the questionnaire surveys associated with the *1998 Workplace and Employee Relations Survey* (hereafter WERS'98). The basic unit of analysis in the survey is the workplace. The 2,193 sample of workplaces is representative of all British workplaces with ten or more employees. The management questionnaire targeted one individual at each workplace with day-to-day responsibility for personnel matters. Responses to this questionnaire produce, *inter alia*, information about the characteristics of the workplace and its employee relations and human resource management policies and practices. In each workplace, the management respondent was asked to provide the names of all employees at the workplace. When that indi-

vidual consented, 25 names were selected at random from the list. The names were invited to complete what is the survey of employees. 44,283 questionnaires were distributed in this way. 28,237 were completed and returned. Responses to this questionnaire produce information about the individual both independent of the workplace and related to his/her employment there. Selected variables are extracted from both these surveys and merged to create the data set analysed.³

One of the questions in the survey of employees asked: *During the last 12 months, how much training have you had, either paid for or organised by your employer?* (Respondents were asked to include only training away from their normal place of work but either on or off the premises.) Respondents were invited to tick one of six boxes. One box was for those who had received no training. The others were for those who had received varying amounts of training of the type defined (viz. less than one day; one to less than two days; two to less than five days; five to less than ten days; and ten days or more.)

The generic model used in the analysis is of the type:

$$y^*_{ij} = \mathbf{X}_{ij}\beta + \varepsilon$$

where the observed values of y are outcomes for individual ' i ' employed at workplace ' j ' generated by the regressors. \mathbf{X} is a vector of exogenous variables depicting three distinct variable types, viz. the individual's personal characteristics independent of the workplace (such as gender, age etc.); the individual's characteristics which relate to the workplace (such as nature of employment contract held, occupation, tenure etc.); and the characteristics of the workplace at which the individual is employed (such as its SIC, size, the extent of the coverage of collective bargaining, whether it has a corporate strategy, selected employee relations and human resource management policies and practices etc.). β is a set of parameters to be estimated; and ε is an error term.

The first estimation is of a binomial probit, where $y_{ij} = 1$ (signifying that the individual receives training) if $y^*_{ij} > 0$ and = 0 otherwise. The binomial probit is estimated twice, once without the workplace variables uniquely available in the WERS'98 data set then again with these variables included.

The second estimation is of an ordered probit where

$$\begin{aligned} y_{ij} &= 0 && \text{if } y^*_{ij} = \mu_0 \\ &= 1 && \text{if } \mu_0 < y^*_{ij} = \mu_1 \\ &= 2 && \text{if } \mu_1 < y^*_{ij} = \mu_2 \\ &= 3 && \text{if } \mu_2 < y^*_{ij} = \mu_3 \\ &= 4 && \text{if } \mu_3 < y^*_{ij} = \mu_4 \\ &= 5 && \text{if } y^*_{ij} > \mu_4 \end{aligned}$$

The ' μ 's are free parameters reflecting an ordinal ranking of the amount of training an individual receives. Accordingly, '0' signifies that the individual

receives no training; '1' that he/she receives less than one day; '2' that he/she receives one to less than two days; '3' that he/she receives two to less than five days; '4' that he/she receives five to less than ten days; and '5' that he/she receives ten days or more. Table 1 presents the percentage frequency distribution of these responses. Approximately one third of respondents receive no training of the type described. By contrast one in ten receive ten days or more.

Table 1. The percentage distribution of the quantity of training received by individuals in the last 12 months

<i>Quantity of training received</i>	<i>Percentage</i>
None	33.74
Less than 1 day	6.97
1 to less than 2 days	14.11
2 to less than 5 days	24.19
5 to less than 10 days	11.62
10 days or more	9.38
Total	7591

Source: WERS data

The names and descriptors of the independent variables reported in the two estimations are presented in Table 2. '*' in this table identifies the workplace characteristic variables from the WERS'98 data set and, *a priori*, of importance to whether an individual receives training. For example, whether an induction programme for new recruits operates (*induct*); whether the workplace chooses to structure its internal labour market (*multiskil* and *filvac*); whether the workplace employs short term contract staff (*temply* and *tempmy*); whether an equal opportunities policy exists at the workplace (*equalops*); and whether the workplace is 'Investors in People' recognised (*IiP*). The other WERS'98 variables used in the estimations are identified in note 4 of Table 3.

Following precedent (e.g. Forth and Millward, 2001), the data set is analysed using Stata's survey estimation facilities (Stata Corporation, 2001). The 'establishment identifier' variable is used to cluster the observations by workplace, thereby taking cognisance of unobserved intra-workplace characteristics. Observations are weighted to sum to the total population in workplaces in Great Britain with 10 or more employees using the appropriate weighted variable (Forth and Kirby, 2000).

Table 2: The names and the descriptors of the variables reported in the two estimations

<i>Variable name</i>	<i>Variable description</i>
<i>Personal characteristics independent of the workplace</i>	
Male	(=1)
Age2	Aged between 20 -24 (=1)
Age3	Aged between 25 - 29 (=1)
Age4	Aged between 30 -39 (=1)
Age5	Aged between 40 -49 (=1)
Age6	Aged between 50 -59 (=1)
Age7	Aged 60 or more (=1)
Marstat2	Widowed (=1)
Marstat3	Divorced/separated (=1)
Marstat4	Living with spouse or partner (=1)
Hiqua11	With CSE or equivalent/GCSE (grades D-G) as highest qualification (=1)
Hiqua12	With 'O' level or equivalent/GCSE (grades A-C) as highest qualification (=1)
Hiqua13	With 'A' level or equivalent as highest qualification (=1)
Hiqua14	With degree or equivalent as the highest qualification (=1)
Hiqua15	With postgraduate degree or equivalent as the highest qualification (=1)
Vocqual	Possessing some recognised vocational qualification (e.g. apprenticeship, City & Guilds etc.0 (=1)
Disabil	With some long standing health problem or disability which limits what can be done or work/home/leisure (=1)
Ethnic	White (=1)
<i>Personal characteristics related to the workplace</i>	
Occupat1	Managers & senior administrators (=1)
Occupat2	Professional (=1)
Occupat3	Associate professional & technical (=1)
Occupat4	Clerical & secretarial (=1)
Occupat5	Craft & skilled service (=1)
Occupat6	Personal & protective service (=1)
Occupat7	Sales (=1)
Occupat8	Operative & assembly (=1)
Tenure1	Employed at the workplace for less than 1 year (=1)
Tenure2	Employed at the workplace for 1 to less than 2 years (=1)
Tenure4	Employed at the workplace for 5 to less than 10 years (=1)
Tenure5	Employed at the workplace for 10 years or more (=1)
Emcontr2	Employed on a temporary contract (=1)
Emcontr3	Employed on a fixed term contract (=1)
Loghours	Log of the number of hours worked
Logexhours	Log of the number of over time hours normally worked

Table 2: names and descriptors of variables ...cont

Characteristics of the workplace

Union	Union members (or members of a staff association) present at the workplace (=1)
Coverag1	Where all employees are covered by collective bargaining (=1)
Coverag2	Where almost all employees (i.e. 80 -99%) are covered by collective bargaining (=1)
Coverag3	Where most employees (i.e. 60 -79%) are covered by collective bargaining (=1)
Coverag4	Where around half employees (i.e. 40 -59%) are covered by collective bargaining (=1)
Coverag5	Where some employees (i.e. 20 -39%) are covered by collective bargaining (=1)
Coverag6	Where just a few employees (i.e. 1 -19%) are covered by collective bargaining (=1)
Worksiz2	Where between 25 -49 are employed at the workplace (=1)
Worksiz3	Where between 50 -99 are employed at the workplace (=1)
Worksiz4	Where between 100 -199 are employed at the workplace (=1)
Worksiz5	Where between 200 - 499 are employed at the workplace (=1)
Worksiz6	Where 500 or more are employed at the workplace (=1)
Strategy *	A Strategic plan exist for the workplace (=1)
IiP *	The workplace is Investors in People accredited (=1)
Induct *	A formal induction programme operates at the workplace (=1)
Lendojob *	Where employees take up to 6 months of training to do the job to standard (=1)
Multiskil *	Where less than 40% of the employees at the workplace are described as 'multi-skilled' (=1)
Equalops *	Where a formal equal opportunities policy operates at the workplace (=1)
Temply *	Where some at the workplace are employed on fixed term contracts of less than one year's duration (=1)
Tempmy *	Where some at the workplace are employed on fixed term contracts of more than one year's duration (=1)
Filvac *	Where preference is given to internal candidates when filling vacancies (=1)

3. THE RESULTS

As previously noted, the binomial probit is estimated twice, with and without the WERS'98 workplace characteristic variables. The results are presented in Table 3.

The results of the first estimation of the binomial probit confirm the nature of the unequal distribution of training reported by Green (1999) and others. In the context of educational qualifications, relative to the reference group of those possessing no qualifications, with one exception (notably hiqual1, the

next lowest group in terms of an educational qualifications hierarchy), the coefficients on the dummy variables denoting higher levels of education are positive and the value of the marginal effects are sizeable. For example, those possessing a degree are ten percent more likely to receive training of the type described than those without any educational qualifications. In the context of occupation, relative to the reference group of those in some 'other occupations', only those employed in 'craft' occupations are less likely to receive training. By contrast, those employed in managerial and professional occupations are 12 percent and 19 percent, respectively, more likely to receive training than those employed in the reference category. Those employed at workplaces at which unions (or staff associations) are present are ten percent more likely to receive training. Those employed in larger size workplaces are more likely to receive training.

Table 3: Binomial Probit (dependent variable : whether or not an individual receives off-the-job training in the last 12 months)

<i>Variable name</i>	<i>Coefficient Marginal Effect</i>		<i>Coefficient Marginal Effect</i>	
	<i>First estimation</i>		<i>Second estimation</i>	
Constant	-0.408 (.425)		-3.234 (.618)	
Male	-.111 (.076)	-.043 (.029)	-.009 (.067)	-.003 (.026)
Age2 **/*	-.461 (.195)	-.182 (.076)	-.376 (.206)	-.148 (.081)
Age3 **/*	-.454 (.206)	-.179 (.080)	-.333 (.199)	-.131 (.079)
Age4 ***/**	-.568 (.206)	-.223 (.079)	-.552 (.196)	-.216 (.078)
Age5 ***/**	-.631 (.202)	-.247 (.077)	-.611 (.191)	-.239 (.076)
Age6 ***/**	-.750 (.206)	-.292 (.076)	-.721 (.206)	-.281 (.076)
Age7 ***/**	-.997 (.271)	-.371 (.082)	-.974 (.269)	-.365 (.085)
Marstat2	.148 (.273)	.056 (.102)	-.106 (.241)	-.041 (.095)
Marstat3 */*	.260 (.139)	.098 (.051)	.237 (.136)	.089 (.049)
Marstat4 */*	.212 (.128)	.083 (.051)	.198 (.114)	.077 (.044)
Hiqua1	.000 (.087)	.000 (.034)	.056 (.087)	.021 (.037)
Hiqua2 **/**	.212 (.098)	.081 (.038)	.227 (.100)	.086 (.037)
Hiqua3 */**	.183 (.106)	.070 (.040)	.251 (.105)	.095 (.038)
Hiqua4 */**	.248 (.145)	.094 (.055)	.458 (.165)	.169 (.058)
Hiqua5	.094 (.213)	.036 (.081)	.291 (.200)	.108 (.071)
Vocqual	.027 (.058)	.010 (.022)	.022 (.057)	.008 (.022)
Disabil	-.189 (.131)	-.074 (.053)	-.142 (.114)	-.055 (.045)
Ethnic	-.008 (.142)	-.003 (.055)	.067 (.133)	.026 (.052)
Occupat1 /*	.322 (.210)	.121 (.073)	.462 (.259)	.169 (.088)
Occupat2 ***/**	.521 (.169)	.190 (.053)	.468 (.232)	.171 (.079)

Table3: Binomial probit ...cont

Occupat3	.122 (.189)	.047 (.071)	.239 (.206)	.090 (.075)
Occupat4	.153 (.190)	.059 (.072)	.265 (.230)	.100 (.085)
Occupat5	-.097 (.184)	-.038 (.073)	-.006 (.222)	-.002 (.086)
Occupat6 ***/**	.504 (.179)	.180 (.055)	.462 (.191)	.165 (.061)
Occupat7 ***/**	.717 (.174)	.243 (.047)	.833 (.236)	.271 (.059)
Occupat8	-.244 (.171)	-.096 (.068)	-.071 (.215)	-.028 (.084)
Tenure1	.024 (.077)	.009 (.030)	.066 (.098)	-.025 (.037)
Tenure2 **/**	.246 (.124)	.093 (.045)	.340 (.132)	.126 (.047)
Tenure4	.045 (.083)	.017 (.032)	.022 (.077)	.008 (.029)
Tenure5	-.056 (.129)	-.021 (.050)	-.071 (.120)	-.027 (.047)
Emcontr2 */**	-.307 (.177)	-.121 (.070)	-.466 (.179)	-.184 (.069)
Emcontr3 */**	-.312 (.188)	-.123 (.074)	-.392 (.185)	-.155 (.073)
Loghours /**	.132 (.095)	.051 (.037)	.235 (.101)	.091 (.039)
Logexhours	.003 (.014)	.001 (.005)	.003 (.015)	.001 (.006)
Union **/**	.274 (.119)	.106 (.046)	.217 (.094)	.084 (.036)
Coverag1 ***/	.535 (.153)	.200 (.055)	.052 (.117)	.020 (.045)
Coverag2	.009 (.144)	.003 (.056)	-.187 (.132)	-.073 (.052)
Coverag3	.048 (.181)	.018 (.069)	.098 (.195)	.037 (.074)
Coverag4	-.020 (.145)	-.008 (.056)	.135 (.159)	.051 (.059)
Coverag5	.104 (.164)	.040 (.062)	.200 (.262)	.075 (.095)
Coverag6 *	.371 (.196)	.136 (.067)	.085 (.177)	.032 (.067)
Worksiz2	-.336 (.207)	-.132 (.080)	-.041 (.123)	-.015 (.048)
Worksiz3	.052 (.182)	.020 (.070)	.215 (.131)	.082 (.048)
Worksiz4 /**	.155 (.179)	.059 (.067)	.283 (.140)	.106 (.050)
Worksiz5 /**	.162 (.173)	.062 (.065)	.345 (.144)	.128 (.050)
Worksiz6 /**	.240 (.177)	.090 (.064)	.352 (.160)	.129 (.054)
Strategy			-.015 (.124)	-.006 (.048)
IiP /**			.157 (.077)	.060 (.029)
Induct /**			.287 (.108)	.113 (.042)
Lendojob /**			-.285 (.082)	-.108 (.030)
Multiskil			.061 (.071)	.024 (.027)
Equalops /**			.264 (.091)	.103 (.036)
Temply			.050 (.064)	.019 (.025)
Tempmy			-.021 (.080)	-.008 (.031)
Filcav			.100 (.073)	.039 (.028)
Number of obs.	7550		7550	
F	(46,476) 10.19		(86,433) 17.27	
Prob > F	0.000		0.000	