Gender and Ethnic Labour Market Differentials in Britain. An Analysis Using the 1998 Workplace Employee Relations Survey

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by

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ABSTRACT

This Thesis consists of six Chapters.

Chapter 1 provides an overview of the economic theories of discrimination, summarises the existing empirical work with respect to gender and ethnicity wage differentials, presents a discussion on equal opportunities policies, and highlights the merits of matched employer-employee data in explaining labour market differentials.

Chapter 2 explains the design of the data, examines and interprets variables of interest and thoroughly looks at five aspects of the data that are of relevance to the Thesis.

Chapter 3 focuses on firm-specific gender and ethnicity pay differentials. The empirical estimation reveals significant gender and ethnic pay gaps. A striking finding of this Chapter is that the firm specific effects although significant and sizeable are not correlated with other variables that may act as indirect indicators of pay differentials.

Chapter 4 focuses on gender and ethnicity job satisfaction differentials. We find that women are more satisfied than men in relation to four different aspects of job satisfaction (influence over the job, amount of pay, sense of achievement and respect from supervisors). An interesting difference with respect to the female results is that ethnic minority workers although are more satisfied than white employees with the influence, achievement and respect they get from their jobs are not satisfied with pay.

Chapter 5 focuses on gender and ethnicity differentials relating to the receipt of employer provided off-the-job training. Female employees have a significantly higher probability of training incidence than men. This differential disappears when we include a measure of workplace segregation. There is no significant gender differential upon training intensity. Ethnic minority employees face a significant disadvantage only with respect to the incidence of training. We also find that equal opportunities policies have a positive and significant impact only on female employees.

Chapter 6 concludes by reviewing the Thesis, providing policy implications and setting up the agenda for future work.
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For some parts of this Thesis data from two other British representative surveys have been utilised, the British Household Panel Survey and the Labour Force Survey. I am grateful to Data Archive at the University of Essex for supplying the data.
Chapter 1

1.0 Introduction

1.1 Overview

This thesis empirically examines gender and ethnic labour market differentials in terms of pay, job satisfaction and training using a rich cross-section employer-employee matched dataset (the 1998 Workplace Employee Relations Survey, henceforth WERS98) for Britain.

Section 1.2 provides an overview of the economic theories of discrimination in order to place the empirical analysis into context. Section 1.3 summarises the existing empirical literature on wage discrimination upon gender and ethnicity\(^1\), reviews conventional estimation methods and types of data that have been utilised and describes their inadequacies and estimation problems. Section 1.4 identifies the inadequacy of Equal Pay Acts and Anti-Discrimination legislation to eliminate gender and race pay gaps and argues why complementary publicly announced equal opportunities policies may fail to reach their objectives as well. Subsequently, Section 1.5 argues why matched employer employee data may be more informative in explaining labour market differentials and highlights their merits. Lastly, we outline what the three empirical chapters examine and summarise major findings.

1.2 Review of the economic theories of discrimination

Before reviewing the economic theories of discrimination it is wise to provide definitions and thus distinguish between discrimination (labour market

\(^1\) Extensive reviews of the empirical and theoretical economics literature in this area can be found in Altonji and Blank (1999), or in leading labour economics textbooks such as Ehrenberg and Smith (2006) or Jacobsen (1998). We provide separate literature reviews for job satisfaction and training in Chapters 4 and 5 respectively.
discrimination) and racism. Labour market discrimination is generally understood as the residual difference in labour market outcomes that cannot be explained by factors such as preferences or human capital endowments of different categories of workers.

According to the International Convention on the Elimination of All Forms of Racial Discrimination (ICERD), racism is defined as follows: “Any distinction, exclusion, restriction, or preference based on race, colour, descent, or national or ethnic origin which has the purpose or effect of nullifying or impairing the recognition, enjoyment, or exercise, on equal footing, of human rights and fundamental freedoms in the political, economic, social, cultural, or any other field of public life”. Thus, racism refers to different characteristics between certain demographic groups (i.e. whites and non-whites, natives and immigrants) whereas labour market discrimination is more general and refers not only to differences between races but to differences between other individual characteristics such as gender, age, religion, etc.

The seminal work on the economics of discrimination is due to Becker (1957, 1971). In his analysis Becker developed three models of discrimination that vary crucially in the source of prejudice. The prejudiced parties are employers, who will hire only from disliked groups of workers if they can pay them a lower wage than members of the preferred group, employees who require higher wages to work with certain types of co-workers than others, or customers who will avoid buying from minority sellers or firms who hire certain types of workers.

Becker’s original work draws from an international trade model. He assumes two economies, one labour abundant (i.e. non-whites) and one capital abundant

(whites) both with identical production functions and perfectly substitutable labour. Without labour market discrimination, labour would be exported by the labour abundant economy to the capital intensive economy. However, with discrimination, the monetary compensation equivalent to the physic disutility of working with non-whites is lost. The crucial assumption of this model is identical tastes between employers. Otherwise, employers with lower than average discrimination will gain by employing non-white labour. For instance, higher than normal profits for non-discriminatory employers will either bid up the market wage rate for non-white labour, or eliminate discriminatory employers by lowering output prices.

In contrast to Becker, Krueger (1963) argued that economic gains rather than personal preferences is the main motive for discrimination. As Becker, Krueger utilised an international trade model and argues that if white owners of capital are interested in maximising the income of the whole white community, as opposed to the income of the white capitalists, the resulting welfare function will be similar to Becker’s, except that discrimination would be directed at maximising white real income rather than avoiding working alongside black workers. The drawback of Krueger’s model though is that it requires some mechanism for forcing all white employers to enforce the tariff arrangement. In the absence of such an enforcement mechanism, white employers could profit by “smuggling” black labour without paying the tariff (Jacobsen, 1998).

Welch (1967) explained employee discrimination in ethnically mixed workforces with non-whites receiving lower wages. He assumed that workers with different human capital endowments complement, rather than substitute each other, that whites have more human capital than non-whites, and employers employ both

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3 The same assumption can be made for female (labour abundant) and male (capital abundant) economies.
whites and non-whites. Employee discrimination then occurs with external inefficiencies being caused by white antipathy working alongside non-white workers. Arrow (1972) elaborated on Welch’s model by assuming that since white workers dislike working alongside non-white workers, the latter are segregated to poorly paid jobs. However, the higher marginal productivity of the more productive non-white workers raises the productivity of the workers generally, enabling white workers in the same occupation to benefit at the expense of their more productive non-white peers.

Akerlof (1985) proposed a taste for discrimination model in which customers would refuse buying from any firm that violates a discriminatory social custom. The key assumption of this model is that in small markets in which every participant is a potential trader, a social custom regulating hiring of various groups can be stable. A non-discriminatory employer will lose profits because the discriminating majority will boycott his business. Since markets are small by assumption, the loss of even a few traders will be costly in foregone profits. Then, unprejudiced employers will find it in their economic interest to perpetuate the custom of discrimination, even if the majority of their customers are unprejudiced. Borjas and Bronars (1989) introduced a search model with consumer discrimination and examined the impact on self-employment outcomes from racial discrimination among customers. They found that customers search for a low price but dislike buying from minority sellers.

Other economic theories of discrimination that do not rely on prejudice, but arise from rational efforts by employers to generate differential outcomes, are statistical discrimination models (Aigner and Cain, 1977). This type of discrimination involves information and transaction costs (Arrow, 1973). Arrow considered the phenomenon of statistical discrimination where employers form a stereotype about
workers’ characteristics to minimise the information costs, which might otherwise be required to make well-informed hiring decisions. His model demonstrates that when the screening process used to determine a worker’s qualification is costly, and prior expectations of productivity differ across race or sex groups, then wage differentials may arise between workers of identical productivity. But, Borjas and Goldberg (1978) suggested that Arrow’s model ignored an important source of wage differentials. By introducing screening bias they found that wage differentials between white and non-white workers could be explained without resort to assumptions of differential ability across groups.

Phelps (1972) allows for the reliability of the screening process to differ across groups. His theory is based on the assumption that traditional indicators of ability are less informative when applied to certain “disadvantaged” workers. Rational employers therefore place less reliance on them and so pay the more able disadvantaged workers less on average than they pay equally able advantaged workers. But Aigner and Cain (1977) show that Phelp’s assumption that all applicants are hired by the firm leads to the conclusion that expected wages are identical across groups as long as the groups under consideration have the same expected productivity. Thus, gender or ethnic discrimination is attributed to rational cost minimising decision-making.

Milgrom and Oster (1987) developed a partial equilibrium model with low and high skill types of labour to explain wage inequality in markets in which individual skills are not easily discoverable by potential employers (i.e. their skills are “invisible”). They argued that potential employers cannot easily discover the job skills of “disadvantaged” workers (women and non-whites) and that “disadvantaged” workers are more likely to be “invisible” when they first enter the labour market.
However, promotion enhances visibility and alleviates this problem. But, given that promotion increases visibility, there is a motive for employers to discriminate against talented “invisibles” in promotion and hide them from other potential employers.

Lundberg and Startz (1983) extended the statistical theory of discrimination to include a human capital investment choice by the workers. Their model suggests that disadvantaged workers’ job skills are less accurately evaluated due to imperfect information on individual productivity or to different distributions of unobserved related characteristics between groups. In general, as the individual is unable to perfectly signal actual productivity to the employer, group averages enter into the employer's decision as to what pay him/her. On average, the employer makes a correct assessment of ability, but this can lead in some models, to different incentives on how much human capital to attain and can, therefore lead to lower average productivity for some groups. Thus, they have less incentive to make productivity-enhancing investments in human capital. Responding to these incentives, workers acquire less human capital, and their average productivity and wages are correspondingly lower.

In the literature, this lower willingness by disadvantaged workers to invest on human capital is known as “self-fulfilling prophecies” (Coate and Loury, 1993; Kremer, 1993; Lang, 1986; Moro, 2003; Moro and Norman, 2004). The existence of statistical discrimination as well as of self-fulfilling prophecies may force disadvantaged groups (i.e. non-whites, females) to crowd into low paying jobs (Bergmann, 1971; Dickens and Lang, 1993), or applying for jobs that do not match their skills (Rosen, 1997) thus depressing marginal productivity and wages and thereby perpetuating initial disadvantages (Breen and Garcia, 2002; Loury, 1998, 2002). A variant of these statistical discrimination models assumes that the
discriminated group (i.e. women) has a higher probability of leaving the labour market (Polachek, 1995), or a comparative advantage in a different field of activity (Lazear and Rosen, 1990).

Other recent variants of statistical discrimination models draw from the psychology literature. For instance, Fryer and Jackson (2004) suggest that discrimination can arise when agents have no a priori motivation to discriminate. For instance, because some types of experiences and “objects” are less frequent in the population (i.e. non-whites) they are crudely classified together. As a result, employers may make less accurate predictions when they are confronted with such objects.

But, Fryer (2004) suggests that existing (one-stage) statistical discrimination models are not very convincing since they ignore what happens when agents overcome the initial disadvantage in hiring and are assigned to a job within a firm. Thus, he proposes a dynamic two-stage statistical discrimination model. The interesting implication of this model is that beliefs of employers about the initially discriminated group can “flip” in equilibrium. For instance, if the difference in the employer’s beliefs and hiring practices are purely a result of statistical discrimination (first stage), then some agents who may have been discriminated against and overcome this initial disadvantage may benefit in the second stage. This “flipping” of beliefs takes place over time as employers learn more about individuals’ actual productivity and take into account the fact that the discriminated against group faced more stricter hiring standards. Then, conditional on being hired, the discriminated against workers within a firm are more talented than non-discriminated workers. Employers may take this into account in favour of the discriminated group when they
promote within the firm. Thus, although the discriminated group faces an initial adversity, once hired, they may be more likely to be promoted.

Moreover, Goldin (2002) argues that it is more realistic to rationalise gender discrimination as a desire by men to maintain their occupational status or prestige rather than as a social distance or “taste” for discrimination towards females. In response to this observation, she develops a “pollution” theory model of discrimination in which male employees discriminate against prospective female employees as a way of protecting their prestige in an asymmetric information context. Prestige in this setting is asymmetrically conferred by some portion of the society and is based on the level of a productivity-related characteristic (i.e. strength, skill, education, ability) that defines the minimum needed to enter a particular occupation.

A major problem with many of the theories that relate gender and race to labour market discrimination is the difficulty in explaining the persistence of discrimination over time in the face of competitive pressures and improved information. This, however, is not to deny that market forces may reduce discrimination. For instance, Black and Strahan (2001) found that increased competition from deregulation in the US banking sector significantly reduced the gender pay gap. Nevertheless, apart from the above rare natural experiment, it is difficult to isolate the effects of product market competition on the labour market.

In response to this, other theoretical models have been developed. For instance, Golberg (1982) reformulated Becker’s taste for discrimination model in terms of “nepotism” towards whites rather than discrimination against non-white workers. His model predicted that nepotistic firms not only can survive, but also in fact can thrive in the long run by reducing their money income towards zero in order to earn non-pecuniary income.
The search literature also allows modelling a situation in which discrimination is a sustainable outcome in the long run (Black, 1995; Bowlus and Eckstein, 2000; Bowlus and Grogan, 2003). According to this literature, the fact that searching for a job is costly allows firms to have monopsonistic power and therefore discriminatory behaviour can arise in equilibrium. In this type of model employers enjoy some monopsonistic power that is translated into larger differences between the discriminated group and the rest of the society. Thus, employers or the majority group at the workplace are discouraged from supporting anti-discrimination policies (Sassaki, 1999).

Other theories that explain differences in pay over time rely on supply side arguments related to human capital formation or the specialisation of women in housework (Altman, 1995; Concoran and Concoran, 1985). These theories view pay inequality as the payment of differing relative marginal productivities and claim that labour market discrimination is not the ultimate cause of pay inequality. Rather, they suggest that if discrimination is of any consequence it is the socialisation of women outside the labour market that results in the development of gender based labour productivity tasks, and so gender pay inequality. For instance, Altman (1995) argues that in a state of the world where labour market discrimination exists and effort intensity is affected by labour compensation, one should not expect market forces, no matter how competitive they are, to eliminate pay inequality due to discrimination. Once discrimination leads women to be paid less than men, women become less productive. Thus, reducing market imperfections cannot be expected to eliminate such pay inequality.

Another key prediction of these models is that women who value traditional roles would be more likely to choose female jobs. The notion of equilibrium in this
strand of models suggests that it will not be rational for a woman earning women’s wages in a traditionally female line of work, to search for work in the male labour market, where wages are higher but so is the probability of being hassled on the job or simply being denied serious consideration for the job. More importantly, even if not all women have to have the same perceptions or tastes of gender appropriate roles, all that is required to get average differences in pay is that women on average value traditional female jobs more than men do and dislike discrimination and hassle from co-workers.

Another strand of the discrimination literature concerns the importance of identity and group solidarity. For instance, Darity (1989) suggests that preferred positions in a system of occupational stratification can be monopolised by the workers of a particular ethnic group, thus generating ethnic conflict. In the same vein, Frijters (1998) directly models coalition behaviour and market uncertainty to explain group discrimination over scarce resources. Thus, insecurity on the part of workers and employers as to whether they will obtain a part of the scarce resources encourages groups of coalitions against other groups to ensure future labour market success. More recently, Akerlof and Kranton (2000) directly include identity into the utility function, which then leads individuals to be prepared to suffer loss of income in order to discriminate against other groups.

1.3 Review of empirical studies of discrimination

In contrast to the handful of economic theories of discrimination, a countless number of empirical studies exist. The applications are very wide and range from product, credit and labour markets (see Symposium: Discrimination in Product, Credit and Labor Markets, Journal of Economic Perspectives (1998), 12, 23-126) to sports
Longitudinal as well as cross sectional studies have found that the total wage differential between men and women (Blau and Kahn, 2003; Katz and Murphy, 1992; O'Neil, 2003; Robinson, 2003; Welch, 2000) and whites and non-whites (Bound and Freeman, 1992; Blackaby et al., 2002; Chandra, 2000, 2003; Smith and Welch, 1989; Welch, 2003) has decreased over the last three decades. This decline is mainly due to introduction of Equal Pay and Anti-Discrimination Laws (Zabalza and Tzannatos, 1985) as well as to Affirmative Action Legislations (Gunderson, 1989; Donohue and Heckman, 1991; Lundberg, 1991).

At the same time overall well-being for women has increased (Blau, 1998), due to women's higher education (Manning and Robinson, 2004), higher female labour force participation rates (Blundell et al., 2002; Costa, 2000) and labour market experience (O'Neil and Polachek, 1993), rising relative demand for female skills (Katz and Murphy, 1992), and convergence of male and female labour market transition rates (Manning, 2000). Also, changes in fertility patterns (Goldin and Katz, 2000), changes in family structure (Goldin, 1997; Goldin, 2004), higher female wage mobility (Dickens, 2000), increases in male wage inequality (Gosling et al., 2000; Bowlus and Robin, 2004) and increases in de-unionisation rates (DiNardo et al., 1996) have also helped to close the gender pay gap.

With respect to ethnicity, convergence in years and quality of schooling have been found for recent cohorts of blacks relative to whites (Card and Krueger, 1992; Fryer and Levitt, 2004) in the US and for some ethnic minority groups in Britain relative to British natives (Dustmann and Theodoropoulos, 2006). Other reasons for
the relative gains of non-whites relative to whites are the selective decline of the labour force participation of low-skill blacks and migration of non-white workers out of the poorest US southern regions (Smith and Welch, 1989).

Despite these relative gains for females and non-whites with respect to white males, the pay gap seems to have a rather persistent trend (Antonovics, 2002; Blank, 2001; Blau and Kahn, 1997; Chay and Lee, 2000; Darity and Nembhard, 2000; Mason, 2000). Blau and Kahn (2004) proposed and found evidence for four factors, which may have affected the slowdown in the convergence of the US gender pay gap in the 1990's as opposed to the 1980's. These are: a) changes in labour force selectivity, b) changes in the gender difference in unmeasured characteristics, c) labour market discrimination and d) changes in the favourableness of supply and demand factors.

Labour economists have used different estimation methods to explain pay differentials (for a review of some of the estimation methods see the first five chapters of: The econometrics of labor market segregation and discrimination, Journal of Econometrics (1994), 61, 1-196). Typically, researchers regress the log of wages on independent variables that potentially capture employees' productivity (education, experience (potential), occupation, industry as well as demographic characteristics) and the residual male/female and/or the white/non-white wage differential is attributed to sex and/or race discrimination. This allows researchers to measure the effect of the demographic group of a worker on wages, with everything else held constant.

Nevertheless, the perennial difficulty, as for instance noted in the review by Darity and Myers (1998) of the US literature on race, is to adequately control for the

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4 The 2000 Nobel Prize winner in Economics, Daniel McFadden, in his biography reports "...I wish the playing field were as level for women and minorities as it was for me". Available from http://emlab.berkeley.edu/users/mcfadden/charteday01/charteday_final.pdf.
possibility of missing quality or human capital variables. A related difficulty is that any differential reward to observed human capital variables (such as education) can be interpreted as either discrimination or as picking up unobserved differences in the content of these variables. Indeed, Neal and Johnson (1996) argue that controlling for pre-market skill levels largely accounts for the US black-white wage gap. However, Mason (1999) examining male interracial wage differentials using US panel data finds strong evidence against the "missing" variable argument and argues in favour of a job competition model. Also, apart from human capital (i.e. formal education, experience, training), other attributes such as non-cognitive skills (Heckman and Rubinstein, 2001) and personal or behavioural characteristics (Bowles et al., 2001) are strong predictors of earnings.

Thus, drawing a firm conclusion from the above specification is inconclusive because the productivity differential between the sexes and ethnicities that cannot be observed may be included in the residual as discussed in Becker (1985) and Altonji and Blank (1999). Because researchers do not obtain such detailed information, it might be that these differences in characteristics can explain differences in wages, and scholars prefer labelling the pay gap as "pay disadvantage" rather than as "pay discrimination" (Pudney and Shields, 2000b). However, it has been found that females and employees from ethnic minority backgrounds earn different amounts even at the same productivity level (Bowlus and Eckstein, 2002). Moreover, Wood et al. (1993) as well as Graddy and Pistaferri (2000) even after comparing cohorts of individuals with the same educational qualifications for the US and the UK correspondingly and thus reducing unobserved individual heterogeneity, found significant gender pay differentials. In addition, Bertrand and Hallock (2001) having data on a fairly homogeneous labour market group (highest paid top executives in a
large data set of US firms) with assumingly the same job motivation, career commitment, and human capital find the gender pay gap to be around 5% in favour of males.\(^5\)

Because of the methodological drawbacks it has been suggested to use experimental techniques or audit studies to examine more directly whether labour market differentials really exist (see Altonji and Blank, 1999). Experimental approaches to examining racial discrimination in the US were used by Fershtman and Greezy (2001). By pairing white and ethnic minority individuals in various strategic games, they were able to ascertain that white male players believed that people of Eastern origin were untrustworthy, which the researchers attribute to “incorrect stereotyping”. Audit studies on labour market discrimination typically focus on the application process and investigate, whether equally qualified individuals of different demographic groups have equal access to get a job (Bertrand and Mullainathan, 2003). Other recent studies try to distinguish between different theories of discrimination by examining contestant behaviour on television game shows (Levitt, 2003; Antonovics et al., 2005).

However, experimental and audit studies (for a review see Riach and Rich, 2002) do not adequately reflect real life situations. They lack information on true productivity and the participants are not representative of the underlying population (Heckman, 1998). Also, studies using self-reported data to examine discrimination (Blackaby and Frank, 2000; Dustmann and Preston, 2001) are unlikely to accurately reflect attitudes if there is a perceived stigma attached to racist views.

\(^5\) Despite the small gender pay gap, the results from this study cannot be generalised to a claim that all female top executives in the US are paid more or less the same as their male counterparts. Also, their results do not rule out lower participation of women in these high paid jobs and sex segregation by firm size and occupation. For instance, only 2.5% of highest paid executives in their sample were women.
The vast majority of the existing empirical research suggests that it is mostly individual characteristics that matter in explaining gender and ethnic labour market differentials. However, without having information on the demand side of the labour market neither the price of labour, nor social interactions can be examined. The employment decision is a joint outcome of the supply as well as the demand side, and is mainly characterised by short-term incomplete contracts due to prohibitive costs of defining and verifying worker’s performance (Bac, 2000), asymmetric information regarding the matching outcome (Altonji and Pierret, 2001), and investment on worker’s skills through bilateral learning and human capital investments (Acemoglu and Pischke, 1998). In addition, Brown and Rea (1995) argue that the employment contract is characterised by a high degree of interdependency between employers and employees, and that this interdependency is an outcome of conflicted and shared interests. Due to the above observations in the literature, one would expect firm specific characteristics and unobserved firm heterogeneity to be important in explaining labour market outcomes.

Also, according to Loury (1998) in examining gender or racial discrimination economists need to look beyond market discrimination and pay considerable attention to social norms and social interactions since these factors may shape human capital formation and form networking opportunities which are useful for job searches. In the same vein, Akerlof (1997, p.1006) argues, “social interaction theory explains why social decisions such as the practice of discrimination are not simple choices based primarily on individual considerations”.

23
1.4 Publicly announced equal opportunities policies

In the previous section we indicated that after 30 years of Equal Pay and Anti-Discrimination Laws in Britain and, despite their relative success, significant pay and other labour market differentials remain. Further, racism continues to be a prominent political issue in Britain with recent attention focused on the existence of institutional racism in large private corporations such as Ford, and in public sector, including the National Health Service (NHS), the police and the armed forces. Yet, there is growing recognition that discrimination is primarily systemic and unintentional (Bertrand et al., 2005), and that its prohibition is not in itself enough to eliminate it in actual practice. Thus, discrimination may include employment policies and practices which may appear neutral, but which disproportionately affect disadvantaged groups such as women and ethnic minorities.

Thus, in the last twenty years alongside the Equal Pay and Anti-Discrimination Acts there has been a growing interest in the development of equal opportunities policies to complement anti-discrimination legislation (Storey, 1999). As a result of viewing gender and race discrimination, equal opportunities policies encourage organisations to review their practices and to eliminate discriminatory organisational procedures (Equal Opportunities Commission (EOC), 1988). The International Labour Organisation (ILO) defines an equal opportunity policy as “a commitment to engage in employment practices and procedures which do not discriminate, and which provide equality between individuals of different groups or sex to achieve full, productive, and freely chosen employment” (L. Lim. More and better jobs for women: An action guide. Geneva: ILO, 1996, p. 109).

However, there is controversy over the best route to take in implementing such policies. There are two possible approaches, equality of opportunity and equality of
result. The first approach includes active recruitment, hiring and training of women, as well as supporting measures such as assistance with child-care, provision of parental leave, and flexible work arrangements. The aim of this approach is to level the playing field, thus promoting the achievement of an appropriate representation of women and the workforce as a whole. The second approach includes policies called positive or affirmative action. These policies are usually intended as temporary measures to remove the effects of past discrimination and correct for the inadequacies of the first approach. They also assume that equality of opportunity policies are insufficient if some groups enter the labour market from unequal starting points due to a history of discrimination. The UK adheres only to the principle of equality of opportunity rather than equality of result. In contrast, employment of equity legislation is implemented in the US and in Canada.

In many countries, equal opportunities policies are of relatively recent origin, and there has been so far little systematic investigation of their effects. Even in the US where affirmative action policies have been in place since the 1960s, their impact on employment outcomes is not particularly well understood (Hahn et al., 1999) and such policies are highly controversial (Fryer and Loury, 2005). Thus, the general opinion over the implementation of equal opportunities policies is divided. For instance, advocates are sceptical that free market hiring decisions are based on pure merit, and firmly believe public policy is necessary to level the field. Critics, on the other hand, argue that equal opportunities policies constitute reverse discrimination and cause employers to hire less qualified individuals, and this leads to labour market inefficiencies. Others argue that introducing considerations other than merit into hiring decisions infects all members of designated groups as potentially less qualified than their peers.
Equal opportunities policies (equality of opportunity) range from having a statement of company policy about non-discrimination to comprehensive set of measures to monitor the situation of discriminated groups, identify and remedy sources of discrimination and improve the opportunities offered to employees from discriminated groups. However, the adoption of equal opportunities policies raises the question of whether equal opportunities policies are assumed in a way to divert attention from the practices of a discriminatory employer, or in a way that reflects the non-discrimination nature of an employer. For instance, it could be the case that firms adopt equal opportunities policies after a complaint or a grievance has arisen, an industrial tribunal application has been raised, or an industrial action such as a strike has taken place.

However, a voluntary approach has its limits as employers may not believe, or have anticipated, that there is a gender or a race pay gap at the establishment and therefore may not think that an equal pay review is necessary. For instance, in the UK firms are under no legal obligation to change their behaviour should they adopt a formal written equal opportunities statement, nor to eliminate any bias against individuals should it be identified within recruitment or promotion decisions (Noon and Hoque, 2001). This suggests that companies are free to use equal opportunities policies behind which they can hide poor practice. There are a number of reasons why firms may do this. For example, Hoque and Noon (2004) argue that firms may adopt equal opportunities policies because of perceived benefits such as their competitive position in the labour market, better employee relations and a positive company image. According to the same authors, other plausible reasons that firms may adopt "show-case" equal opportunities policies are to avoid penalties such as tribunal costs,

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6 We explore the content of equal opportunities policies in Section 2.4 of Chapter 2.
7 For instance, in 1999 industrial action over racism led Ford's president to commit the company to an anti-racism action plan (Noon and Hoque, 2001).
adverse publicity or investigations by the Equal Opportunities Commission or the Commission for Racial Equality.

This voluntary preferential treatment is also evident in the UK by the existence of the Opportunity 2000 scheme. It consists of over 300 organisations, including banks, government departments, police, educational establishments, and others. These organisations set statistical targets for achieving equal representation of minority groups, including women, in their ranks. The organisations involved in the programme have reportedly achieved increasing levels of female participation in management (ILO, 1997).

From the economic theory point of view, enforcement of equal opportunity policies may have a number of benefits and costs to the firm. Rational firm behaviour would suggest that the firm would enforce equal opportunities policies if the benefits exceed the costs. Costs of equal opportunities may include financial costs of implementing and monitoring (i.e. hiring a human resource manager), as well as the administrative burden. Except financial and administrative costs, there may be other obstacles which may justify why equal opportunities polices may not be actually implemented. For instance, the majority or the non-discriminated group inside the firm may be reluctant to share access to higher positions and rewards or may fear reverse discrimination (Arcidiacono, 2003; Leonard, 1984), and hence may react negatively to such policies. Also, individual contracts and pay determination may make equal opportunities policies difficult to enforce (Bruegel and Perrons, 1998). Further, because women and ethnic minority employees are riskier employees in that they have higher turnover rates (Royalty, 1998) employers may not extend or apply the equal opportunities policies to cover them.
On the other hand, there are a number of benefits if the firm does enforce equal opportunities policies. For instance, effective anti-discrimination policies may affect productive efficiency (Perotin and Robinson, 2000). Thus, pay may increase for discriminated groups, and their productivity may increase as a result. Further, due to fair recruitment policies individuals and jobs may be better matched since more objective criteria and systematic search procedures may be used (Blau et al., 1998; Holzer and Neumark, 2000). Thus, with improved career prospects, members of discriminated groups should have more incentives to invest in human capital and stay with the firm. Their motivation may increase and this may have positive spill over effects to the non-discriminated group, who may want to invest on human capital and compete harder on internal labour markets as a result (Schotter and Weigelt, 1992).

However, evidence from Canada suggests that employment equity does not find support from groups of people that is designed to help. For instance, Antecol and Kuhn (1999) found that although Canadian women have benefited from employment equity, they are largely unwilling to acknowledge this gain. At the same time, the study found that employment equity has increased the perception of reverse discrimination among men. Similarly, a study of senior management and professional women in Canada found that fully 70% felt that employment equity has had no effect on their own careers, even though most acknowledged that it has helped other women (Griffith et al., 1998).

Thus, the above discussion suggests that there is a significant gap between adoption and actual implementation of equal opportunities policies as well as in the perceptions on the true impact of equal opportunities policies. In Section 2.4 of Chapter 2 we provide a descriptive analysis of equal opportunities policies as well as identifying establishments with publicly announced equal opportunities policies.
Section 1.2 revealed that much of the economic debate on discrimination has focussed on the existence of discrimination and on identifying those factors of women’s and ethnic minority productivity that are exogenous to the firm (Arrow, 1998). Also, neoclassical models of discrimination predict that wage discrimination among equally productive employees would be eliminated by competition, as discriminating employers would be driven out of business. In Chapters 3, 4 and 5 we challenge this argument and we argue that the debate about labour market discrimination should also take into account features of the work environment.

1.5 Matched employer-employee data and discrimination

Matched employer-employee data are ideal for the study of discrimination as workplaces are units of observation that are generated by economic forces and in which people clearly do interact in a variety of ways, including work, social activity and labour market networks. The uniqueness of the WERS98 in clustering employees to a specific employer makes it the first British dataset that allows interactions between the employer and the employee to be examined. Also, the fact that employees are clustered within workplaces allows us to identify differential treatment of establishments on females and ethnic minority employees. In addition, detailed information on the demand side of the market also allows us to capture the social culture and interactions at the workplace by introducing controls for workplace segregation as well as identifying various job and workplace characteristics which allow us to capture heterogeneity in the quality of the job and the general working environment.

This Thesis empirically examines gender and ethnic labour market differentials by studying three aspects of the employment relationship: pay, job
satisfaction and training. The matched employer-employee data utilised (WERS98) gives us the possibility to control for unobserved firm heterogeneity and to identify its importance with respect to gender and ethnicity (Chapter 3). Moreover, since the employment circumstances and experiences of men and women differ, it is reasonable to assume that gender will have an effect independent of ethnicity. Hence, it could be the case that ethnic minority women are disadvantaged by gender as well as ethnicity (Mirza, 1992). Thus, the experience of ethnic minority women is an integral part of this Thesis.

Because of the widely documented pay disadvantage that women and ethnic minority individuals face in the labour market, one would expect these two groups to be less satisfied with their jobs and receive or choose to undertake less training. Thus, Chapters 4 and 5 of this Thesis seek to examine if these large pay gaps are translated to lower job satisfaction and lower training for female and ethnic minority employees respectively.

This Thesis consists of six chapters. Chapter 2 provides an overview of the dataset, highlights key features of the data and sets the scene for the econometric analysis. Chapter 3 examines firm specific gender and ethnicity pay differentials. We estimate an econometric earnings model using the partially observed pay variable provided by the WERS98 and allow for non-normality and heteroskedasticity in the firm-specific random effects using a semi-parametric finite mixture estimator. It is found that the inclusion of variables that capture observable and unobservable workplace characteristics in a standard Mincerian wage equation explain an important part of the pay gap. The empirical estimation reveals a 22% weekly pay gender gap and a 28% weekly pay race gap. The corresponding hourly estimates are 13% and 19%. A striking finding of this study is that the firm specific effects, although significant and sizeable,
are not significantly correlated with other variables that may act as indirect indicators of pay differentials.

Chapter 4 examines gender and ethnic job satisfaction differentials. Using a random effects ordered probit model we find that female employees are more satisfied at the workplace than their corresponding male peers. In particular, we find that women are happier than men in relation to four different aspects of job satisfaction (influence over the job, amount of pay, sense of achievement and respect from supervisors). The finding that females are happy with the pay they receive runs in contrast to the robust empirical finding in the discrimination literature that women face a significant pay disadvantage in the labour market. An interesting difference with respect to the female results is that ethnic minority workers, although happy with the influence, achievement and respect they get from their jobs, are not happy with pay. We attribute this disparity in satisfaction with pay between females and ethnic minority employees to societal and other cultural factors. Also, we find a very weak and negative relationship between equal opportunities policies and job satisfaction.

Chapter 5 examines gender and ethnic differentials relating to the receipt of employer provided off-the-job training. We find no direct evidence of disadvantage in access to training for female employees in Britain. If anything, female employees given human capital, demographic, job and workplace characteristics have a significantly higher probability of training intensity than men. Interestingly, this differential disappears and becomes negative when we include a measure of workplace segregation. There is no significant gender differential upon training intensity. Ethnic minority employees face a significant disadvantage with respect to the incidence of training but not with respect to the volume of training. However, in contrast, to females, workplace segregation does not exacerbate the ethnic training
gap. Another finding of this chapter relates to the differential treatment of equal opportunities policies upon our two major groups. That is, equal opportunities policies work in favour of female employees but not for ethnic minority employees.

Finally, conclusions, limitations and the agenda for future work are drawn in Chapter 6.
Chapter 2

Description of the WERS98

2.1 Introduction

In this Chapter we initially explain the design of the WERS98 and we examine and interpret variables of interest. Then, we descriptively look at five aspects of the data that are of relevance to the thesis: a) the ethnic and gender composition of the workforces, b) equal opportunities policies and practices of employers, c) pay, d) job satisfaction and e) training. For a detailed analysis of the WERS98 survey with respect to other aspects of the data see Cully et al. (1999).

2.2 The design of WERS98

The WERS98 is a national survey of people at work. Its major purpose is to provide large-scale statistically reliable information about a broad range of industrial relations and employment practices across almost every sector of the economy in Great Britain. It is the fourth series of the Workplace Industrial Relations Survey that began in 1980, and was undertaken again in 1984 and 1990. However, it is the first survey among the series that includes workplaces with less than 25 employees (Cully et al., 1999).

The fieldwork was conducted between October 1997 and June 1998. The principal unit of analysis is the workplace or establishment. A workplace is defined as comprising the activities of a single employer at a single set of premises, for instance,

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8 For reasons of clarity we provide the employee questionnaire in the Data Appendix at the end of the Thesis. We do not provide the management questionnaire because of its length (113 pages). The latter can be viewed through http://www.niesr.ac.uk/research/WERS98/ and then following the appropriate links.
a single branch of a bank, a car factory or a school. The sample of workplaces was selected using the Inter-Departmental Business Register (IDBR) as the sampling frame. The sample is stratified by workplace employment size, and secondly, by industrial activity (Airey et al., 1999).

The WERS98 is divided into three main questionnaires: i) a workplace or management questionnaire, ii) a worker representative questionnaire, iii) and an employee questionnaire. The management interview was carried out face to face with the most senior workplace manager who had day-to-day responsibility for personnel matters. The average duration of the management questionnaire lasted for more than an hour and a half. The target sample was 2,250 workplaces, however 2,191 workplaces participated and the overall response rate was 80% (Cully et al., 1999). Additionally, the management questionnaire includes a self-completion employee profile questionnaire (EPQ) that had to be completed by the workplace manager prior to the interview. The employee profile questionnaire among other variables provides information on the constitution of the labour force, particularly occupational, gender, and ethnic mix.

From the 2,191 workplaces that took part in the survey, interviews were conducted with 947 worker representatives of the largest recognised union at the workplace, or where there were no representatives from recognised unions, the most senior representative on a workplace-level joint consultative committee if one existed. This amounted to a response rate of 82%. The average duration of this questionnaire lasted for 47 minutes. Its main use is to depict differences in perspectives between management and worker representatives and to underline the key areas of worker representatives’ functions (Cully et al., 1999).
The nature of the multistage sampling procedure for the survey of employees was such that employee questionnaires were distributed only in those workplaces where management interviews had taken place. A survey of 25 employees (or all employees, where the number of the employees in the establishment was between 10 to 25 employees) was selected at random at all workplaces participating in the management survey. Of the 44,078 worker questionnaires issued, 28,323 were returned implying a 64% response rate. The worker questionnaire used a self-completion format without direct interviewer involvement.

In the following analysis we employ the management as well as the employee questionnaire. Also, we weight the responses given by managers and employees in order to take account the complex survey design and thus to represent the sampling population. The weights for the employee sample were calculated as the inverse sampling probabilities of selection for an individual employee with an additional allowance for differential non-response by gender, full-time/part-time status and broad occupational group (Pardon and Pickering, 2001). The weights for the management sample were calculated as the inverse of the probability of selection for an establishment but without differential non-response as the differences in response rates by establishment size and by industrial classification were small (Pardon and Pickering, 2001).

2.3 Ethnic and gender composition of the workforces

The distribution with respect to gender in the employee questionnaire was more or less even, 51% of the respondents were males and 49% were females. However, ethnic minority employees made up only 3% of the workforce. Respondents had to choose their ethnic group by selecting one out of nine available boxes. Those were:
White, Black Caribbean, Black African, Black other, Indian, Pakistani, Bangladeshi, Chinese and another ethnic group. Due to the undersampling of ethnic minorities and in order to have enough observations within cells for ethnic minorities we group four ethnic minority groups together that distinguish between white and non-white individuals. Thus, the ethnic minority group is defined as the set of Blacks, Indians, Pakistanis and Bangladeshis. Although this grouping of different ethnic minority groups into one is convenient it hides individual group heterogeneity. For instance, there is evidence for Britain suggesting that both educational achievements as well as the labour market performance vary significantly between ethnic minority groups (Dustmann and Theodoropoulos, 2006).

In the following paragraphs of this Section we review the distribution of gender and ethnicity across occupations and industries. We also review the distribution of segregation at the workplace by providing the percentages of the workforce who are females and from an ethnic minority background as well as their regional distribution. The above issues are important, as they will help us to examine both the extent of gender and ethnic clustering in certain occupations and industries as well as the extent of establishment segregation across regions.

The employee questionnaire identified nine occupational groups according to the 1991 Standard Occupational Classification Guides. The largest occupational group was clerical and secretarial employees (16%). Professional staff as well as operative employees accounted for 13%. The next largest occupational group was employees in "other occupations" (12.4%). Figures 2.1 and 2.2 graph the occupational distribution with respect to gender and ethnicity respectively.
Figure 2.1 Occupation Structure by Gender.

Compared to men, low presence of women was observed in managerial or senior administrative posts (e.g. general manager, marketing sales manager), in craft and skilled service jobs (e.g. tool maker, electrician, motor mechanic), and in operative and assembly jobs (assembly line worker, packer). In contrast, women were overrepresented in clerical and secretarial jobs (e.g. postal clerk, secretary) and in professional jobs (teacher, lecturer, social worker). As the female labour force grows (Blundell et al., 2002) and educational achievements by women increase (Manning and Robinson, 2004), women are entering many occupations where they were underrepresented in the past, particularly the professions (i.e. professional staff). For instance, only a 2 percentage higher proportion of men than women were holding professional jobs. However, women continue to cluster in sales and clerical sectors and are making slower inroads into “blue-collar” occupations (craft and skilled service). There are various explanations offered for sex occupational and industry segregation upon job sorting ranging from choice-based arguments to discrimination.

Occupational density across ethnic and non-ethnic minority groups did not differ a great deal. As Figure 2.2 shows, there were relatively larger numbers of ethnic
minority employees observed in professional occupations, and in clerical and secretarial occupations as opposed to whites. Ethnic minorities were slightly under-represented in managerial occupations, craft and skilled service occupations and in personal and protective service occupations.

**Figure 2.2 Occupation Structure by Ethnicity.**

<table>
<thead>
<tr>
<th>Occupation Structure by Ethnicity</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>0.25</td>
</tr>
<tr>
<td>Ethnic Minority</td>
<td>0.22</td>
</tr>
</tbody>
</table>

In order to examine the industry structure with respect to gender and ethnicity Figures 2.3 and 2.4 plot the relative proportions of genders and ethnicities for twelve industries according to 1992 Standard Industrial Classification (henceforth SIC92).

**Figure 2.3 Industry Structure by Gender.**

<table>
<thead>
<tr>
<th>Industry Structure by Gender</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>0.20</td>
</tr>
<tr>
<td>Female</td>
<td>0.15</td>
</tr>
</tbody>
</table>
Figure 2.3 illustrates that significantly more men than women worked in the manufacturing, utilities, construction, and in transportation industries. Women were over-represented in the wholesale, education and health sectors. Also, a higher proportion of women than men worked in the finance sector. With respect to the other industries (hotels and restaurants, real-estate, public administration and other services) the distribution was even. Figure 2.4 shows there were no stark differences in the industry structure across the white and ethnic minority groups.

Slightly higher proportions of whites than ethnic minorities were observed in manufacturing, in utilities, in construction, in wholesale and in education. In contrast, slightly higher proportions of ethnic minorities were observed in transport, in finance, in real estate and in health. Approximately, the same proportions of white and ethnic minorities work in hotels and restaurants, public administration and in “other services”.

Two other variables of interest are the percentages of the workforce who are female and non-white (i.e. belong to an ethnic minority group). With respect to females, the responses in percentages range from 0% to 100%, with the average
workplace consisting of 54.4% (with a standard deviation of 31.0%) of workers who are females. Around 2% of workplaces had no female workers and 19% had between 0% and 20%. Another 19% of the workplaces had between 20% and 50%, 32% of the workplaces had between 50% and 80%, and 24% of the workplaces had between 80 and 99%. Finally, around 4% of the establishments had only female employees. The above percentages suggest that the majority of the workplaces were gender mixed and the degree of complete gender segregation was rather small (6% of establishments). However, a slightly higher percentage of establishments were totally female segregated than female absent. Also, in 56% of the workplaces at least 50% of the employees were females.

With respect to the proportion of ethnic minorities at the workplace manager responses range from 0% to 88%, with the average workplace consisting of 4.7% (with a standard deviation of 9.1%) of workers from ethnic minorities. This reflects the 5.5% of the total working population in Britain who are from ethnic minorities (2001 British Labour Force Survey (henceforth LFS), author’s own calculation). Around 41.7% of workplaces had no ethnic minority workers, a further 37.7% of workplaces had between 1 to 5% of their workforce from the ethnic minorities, 9.1% of workplaces had between 6 to 10%, 6.8% of workplaces had between 11 to 30% and 4.7% of workplaces had more than 30% of their workforce from the ethnic minorities. In contrast to the female percentage distribution across establishments, no establishments were totally segregated by ethnic minority employees. However, the vast majority of the workplaces had no ethnic minority employees. 10

There are significant differences in the distribution of female and ethnic minority employees at the establishment level across regions. Table 2.1 shows the

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9 We define working age population as men aged 16-64 and women aged 16-59.
10 Unfortunately, the WERS98 identifies only the gender but not the ethnicity of the manager.
percentage distribution of female and ethnic minority employees (given in deciles) at the establishment level for each region (standard statistical region). Establishments in regions with very low percentages of ethnic minority employees (less than 19.9 percent) are in East Anglia, North East, Scotland, South West and Wales. London is the only region where we observe establishments with significant proportions of ethnic minority employees across the whole percentage distribution. This observation is in line with findings from Dustmann and Theodoropoulos (2006) who using data from the LFS found that around 46% of the ethnic minority population lives in London.

In contrast to the ethnic minority percentage distribution, the female percentage distribution is more uniform across all regions. Establishments in regions with totally segregated female workforce (100%) are in West Midlands, Yorkshire and Humberside, South West, North East and the North West. Interestingly, some of these regions have very low proportions of ethnic minority employees suggesting that the regional distribution of female and ethnic minority employees differs significantly. Put it differently, ethnic minorities live or work in regions with very low proportions of female employees and vice versa. For instance, about 33% of the establishments in Wales have very high proportions of females (90-99.9%) whereas at the same time 66% of the establishments in Wales have no ethnic minorities at all. We tackle the issue of establishment segregation for female and ethnic minority employees in more detail in Chapter 5.
<table>
<thead>
<tr>
<th>Region</th>
<th>Percent of Women</th>
<th>Percent of Non-Whites</th>
<th>Percent of White Employees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yorkshire &amp; Humberside</td>
<td>69.6%</td>
<td>30.4%</td>
<td>100%</td>
</tr>
<tr>
<td>East Midlands</td>
<td>69.6%</td>
<td>30.4%</td>
<td>100%</td>
</tr>
<tr>
<td>West Midlands</td>
<td>69.6%</td>
<td>30.4%</td>
<td>100%</td>
</tr>
<tr>
<td>Wales West</td>
<td>69.6%</td>
<td>30.4%</td>
<td>100%</td>
</tr>
<tr>
<td>Wales South East</td>
<td>69.6%</td>
<td>30.4%</td>
<td>100%</td>
</tr>
<tr>
<td>Scotland North East</td>
<td>69.6%</td>
<td>30.4%</td>
<td>100%</td>
</tr>
<tr>
<td>Scotland South East</td>
<td>69.6%</td>
<td>30.4%</td>
<td>100%</td>
</tr>
<tr>
<td>London West</td>
<td>69.6%</td>
<td>30.4%</td>
<td>100%</td>
</tr>
<tr>
<td>London North East</td>
<td>69.6%</td>
<td>30.4%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table 2.1: Percentages of Women and Ethnic Minority Employees at the Establishment Level by Standard Region.
2.4 Equal opportunities policies and practices of employers

In this section we descriptively examine equal opportunities policies as well as modelling and analysing the determinants of having equal opportunities policies across employers. Our interest is to identify establishments with equal opportunities policies. This is important as the effect of equal opportunities policies on pay, job satisfaction and training is examined in Chapters 3, 4 and 5, respectively. In 1998 there was not a compulsory law that obliged establishments to have formal written equal opportunities policies. Approximately two thirds (67%) of workplaces were covered by formal written equal opportunities policies that dealt with equality of treatment or discrimination. Among the workplaces with equal opportunities policies the areas covered by policies included sex/gender (15.2%), race (15.3%), disability (14.7%), religion (12.8%), marital status (11.4%) and age (10.7%). The areas that featured least often in these policies were sexual orientation (9.8%) and trade union membership (8%). The most popular methods of making the above policies known to employees were through the staff handbook (45%), by means of an induction programme (26%) and through appointments (25%). Only 14% of the policies were announced on a notice board, or by the supervisor or the line manager.

Only in 16% of the establishments managers had tried to measure the effects of equal opportunities policies on the workplaces or on the employees at the establishment. Overall, 38% of workplaces without a formal written policy claimed to have an unwritten one or otherwise aimed at being an equal opportunities employer. 37% of the managers saw them as unnecessary and a further 2% said that they did not need a policy as their workplace employed few or no people from disadvantaged groups.
Across all establishments, approximately 30% of them kept records for employees from ethnic minorities. In 25% of the establishments, statistics were collected on posts held by men and women. 11% of the establishments monitored promotions by gender or ethnicity, and 20% reviewed selection and other procedures to identify indirect discrimination. Only 14% reviewed the relative pay rates of different groups, and 26% made adjustments to accommodate disabled employees.

Table 2.2 presents simple cross tabulations between different employer practices and whether or not the establishment was having a formal written policy on equal opportunities or managing diversity.

<table>
<thead>
<tr>
<th>PRACTICES OF THE EMPLOYERS</th>
<th>FORMAL EQUAL OPPORTUNITIES POLICY</th>
<th>NO POLICY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% of workplaces</td>
<td>% of workplaces</td>
</tr>
<tr>
<td>Keep employees records with ethnic origin</td>
<td>39.1 (0.022)</td>
<td>11.6 (0.026)</td>
</tr>
<tr>
<td>identified</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Collect statistics on posts held by men and women</td>
<td>33.3 (0.021)</td>
<td>8.6 (0.019)</td>
</tr>
<tr>
<td>Monitor promotions by gender, ethnicity etc.</td>
<td>16.2 (0.016)</td>
<td>1.6 (0.010)</td>
</tr>
<tr>
<td>Review selection and other procedures to identify indirect discrimination</td>
<td>29.3 (0.021)</td>
<td>2.8 (0.007)</td>
</tr>
<tr>
<td>Review the relative pay rates of different groups</td>
<td>14.3 (0.015)</td>
<td>14.6 (0.028)</td>
</tr>
<tr>
<td>Make adjustment to the workplace to accommodate disabled employees</td>
<td>34.2 (0.021)</td>
<td>10.8 (0.022)</td>
</tr>
<tr>
<td>None of these</td>
<td>39.7 (0.024)</td>
<td>69.7 (0.036)</td>
</tr>
</tbody>
</table>

Note: Standard errors in parentheses.

As Table 2.2 suggests, workplaces with a formal equal opportunities policy were much more likely to have a range of practices in place which aimed to promote equal treatment. Of interest is however that almost the same proportion of establishments with and without an equal opportunities policy reviewed the relative pay rates of different groups. A more thorough analysis of equal opportunities policies is presented in Table A.2.1 in the Appendix. Managers had to reply to the following question: “Does this workplace or (organisation of which it is part of) have a formal
The dependent variable takes the value of 1 if there was a formal written equal opportunities policy or managing diversity at the establishment or the organisation of which the establishment belonged, otherwise is zero. This binary indicator is modelled on a number of establishment characteristics using a simple probit model. We find that the higher is the percentage of female employees, the higher is the proportion of managers, craft and skilled service, personal and protective service and sales employees, the higher is the probability that the establishment will have equal opportunities policies. Moreover, the larger the size of the workplace (the omitted category less than 25 employees) as well as of the organisation (the omitted category is less than 100 employees), being part of a larger organisation, being a public sector administration establishment, or belonging to education, health, other businesses (real estate, renting) or in construction sectors, the higher is the probability that the establishment will have equal opportunities policies. Also, employing individuals with fixed term contracts (less than a year), if there is a union staff association at the workplace, and trade union density, are all associated with a higher likelihood of the establishment having equal opportunities policies.

In contrast, the higher is the proportion of employees aged over 51, the higher is the proportion of low paid employees, if the establishment has been at its current address for more than 10 years (i.e. older establishments), if an individual or a family is controlling over 50% of the establishment ownership, and if it is both a UK and foreign owned establishment, the lower is the probability that the establishment will have equal opportunities policies. 11

11 We also included a number of additional variables in the above specification, which proved to be insignificant and were excluded. Those variables were: if there is high competition in the market, if the establishment sells its product or services in the local, regional or national market (the omitted category
The above results suggest that it is mainly public sector establishments, establishments with high trade union density and those establishments that employ a large number of workers that are more likely to have equal opportunities policies. Smaller workplaces are less likely to have an equal opportunities policy, perhaps partly because smaller employers have less need for formal policies and monitoring procedures. Also, smaller workplaces may be less able to afford to formulate policies and collect relevant data.

Of great interest is the finding that the higher is the percentage of females as opposed to ethnic minorities, the higher is the probability that the establishment will have equal opportunities policies. This is a striking finding despite the fact that race alongside with gender featured higher among other factors that addressed equality of treatment or discrimination.

However, the distribution of equal opportunities policies among firms may be non-random. In the empirical analysis of Chapters 4 and 5, the incorporation of equal opportunities policies as an explanatory variable raises endogeneity issues. One could handle this endogeneity problem using an instrumental variable (IV) technique. However, according to Schmalensee (1989) in cross sectional studies the IV approach is not appropriate as many of the firm specific variables are likely to be endogenous. This means that there are, in general, no theoretically exogenous variables that can be used as instruments to identify and estimate a structural equation. Nevertheless, the large number of workplace controls we include in our specification may eliminate any potential omitted variable bias. We examine the extent of bias of equal opportunities policies on training in Chapter 5 using a heuristic test of exogeneity.

being the international market), if the market share with respect to the company’s UK market share was more than 50% and region dummies. These findings suggest that factors external to the workplace do not influence the use of equal opportunities policies. Additional variables such as if employees receive payments or dividends from employee share ownership schemes and the proportion of disabled employees at the establishment were also insignificant.
2.5 Pay

In this section we look at the pay question and we highlight any gender and ethnic differences across the pay distribution, thus setting up the agenda for the empirical analysis in Chapter 3. Employees were asked, "How much do you get paid for your job here, before tax and other deductions are taken out? If your pay changes from week to week because of overtime, or because you work different hours each week, think about what you earn on average". Respondents were not free to report their wage exactly, but rather asked to report it within 12 bands representing weekly and annual amounts of wages respectively. The ranges were chosen to approximate decile bands and the top and bottom 5% of the earnings distribution as estimated from the 1996 New Earnings Survey (Airey et al., 1999). The level of missing responses to this question was just 1% (Cully et al., 1999). Also, our measure of pay is standard time wages. It does not include leave pay or any other measure of compensation such as bonuses or other additional sources of pay that could lead to positive errors. Forth and Millward (2002) compare the wage distribution coming from the WERS98 with the spring quarter wage measure of the 1998 Labour Force Survey and find that the two distributions have very similar shapes.

8% of the employees were paid less that £51 per week. In contrast, 3% were paid more than £681 per week. The median worker was paid somewhere between £221 and £260 per week. Figure 2.5 graphs the distribution of wages by gender.
In contrast to the male wage distribution which is skewed to the left, the female wage distribution is skewed to the right. There are large differences in frequencies at both tails of the wage distribution. For instance, there is a relatively larger percentage of females observed at the lower end of the distribution and a relatively smaller percentage of females observed at the upper end of the pay distribution. This may partly reflect the greater percentage of females than males who are employed as part time workers.

Figure 2.6 plots the corresponding pay distribution but with respect to ethnicity. The first block of densities shows that the “white” pay distribution is more uniform whereas the second block of densities shows that higher proportions of ethnic minorities than whites were observed in the middle ranges of the pay distribution. In contrast to the differences observed at the lower and upper parts of the pay distribution between the genders, there are not large differences in pay at the corresponding parts of the pay distribution with respect to ethnicity. Nevertheless, we observe smaller percentages of ethnic minority employees at the top pay range.
2.6 Job satisfaction

In this section we present and interpret responses to the job satisfaction question posed to employees. In the literature there are many arguments against and in favour of using survey type responses, and in particular, stated feelings to explain labour market outcomes. Since, job satisfaction data lay in this category we present evidence in favour of our job satisfaction variables and we briefly review the drawbacks and the advantages of using subjective data. In addition, we descriptively examine differences in job satisfaction between genders, ethnicities and occupational attainment. The multivariate analysis is presented in Chapter 4.

WERS98 is an employee relations survey, which essentially is trying to uncover the experience of being managed (Cully et al., 1999). This is the reason why two of the job satisfaction questions deal with feelings about influence and respect.

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12 Frey and Stutzer (2002b) review the economic research on happiness and argue why economists should use subjective data on human happiness in general and job satisfaction in particular. For further support for the use of happiness data see DiTella and McCullogh (2005) and Senik (2005) and references therein.
rather than more extrinsic aspects such as hours or promotion opportunities.

Employees were directly asked to evaluate their job satisfaction in relation to a) the amount of influence over the job, b) the amount of pay received, c) the sense of achievement and d) the respect from supervisor or line manager. The six responses were: very satisfied, satisfied, neither satisfied nor dissatisfied, dissatisfied, very dissatisfied, and don’t know. On average, around 0.05% of employees responded “don’t know” and 1.6% of employees did not answer each of the job satisfaction questions.13

Job satisfaction measures can be classified as extrinsic (material or economic) aspects, and intrinsic (quality) aspects. WERS98 does not balance material/extrinsic (pay) and quality/intrinsic (influence, achievement, and respect) elements. It has 3 quality questions, none of which are directly comparable with any quality questions in other surveys. It is interesting to compare the coverage of WERS98 job satisfaction questions with other British surveys that have data on job satisfaction and a European survey before we interpret them. These are the British Household Panel Survey (henceforth BHPS), the Social and Economic Change survey (henceforth SCELI), the Employment in Britain Survey (henceforth EBS) and the European Community Household Panel survey (henceforth ECHP). The BHPS and the ECHP are longitudinal surveys, whereas the other two surveys have data at a point in time. There are significant differences in the coverage of job satisfaction questions between these surveys and the WERS98 (for a detailed examination on the coverage between WERS98 and the above surveys see Rose, 2000). Not only the number of questions being asked differs between all the surveys, the ordering of the responses differs as well. For instance, the EBS has 14 questions on job satisfaction, the SCELI has 8

13 The missing responses to the job satisfaction questions were regressed on individual observed characteristics using a simple probit and were found to be purely random.
questions, the BHPS has 7 questions and the ECHP has 6 questions. Further, the BHPS, the EBS and the ECHP surveys, except specific questions on different aspects of job satisfaction have an overall measure of job satisfaction. The WERS98 has only 4 measures of job satisfaction, and not an overall measure.

Job satisfaction behaviour can be characterised as cognitively congruent with actual behaviour. Nevertheless, cognitive testing of the job satisfaction questions is an important aspect that we have to consider before we proceed to the modelling of the data in Chapter 4. Cognitive testing examines if and how respondents understand survey questions or key concepts, do not know or cannot recall the needed information from memory, use an inappropriate strategy for making a judgement, or prefer to hide certain information or provide an “acceptable answer”. With respect to this survey, there was some cognitive testing on the survey of employee questionnaire during the piloting survey (see Airey et al., 1998). Respondents were asked to answer pilot questions “out loud” with the interviewer indicating how and why they gave the answers they did. Approximately twenty-five people participated in the cognitive exercise. Among other changes, the outcome of this exercise was the re-wording of some questions and the use of 3 and 5 point scales, re-ordering some questions to improve clarity and standardising response categories (see Section 3.3.1 in Airey et al., 1998).

2.6.1 Arguments in favour and against job satisfaction data

In the literature the main concern has been that different individuals would use different ways of interpreting job satisfaction questions, or would not use the same scale to answer questions about their well-being. In particular, individuals’ answers to job satisfaction questions depend not only on objective circumstances in which an
individual finds himself or herself but also on his/her psychological state and thus on aspirations, willingness to voice discontent, the hypothetical alternatives to which the job is compared, and so forth (see Elster, 1998).

The impact of satisfaction on employee behaviour could also differ among individuals and among groups, depending on the importance of objective and subjective factors in responses. For instance, it could be the case that different groups of individuals might display a different response propensity as an aspect of their cultural orientation. For instance, an analysis of survey responses for blacks and whites in the US indicates that blacks have a tendency to choose more extreme response categories (Bachman and O'Malley, 1984). Clark (1997, p. 342, footnote 4) refers to the literature that examines how biological and genetic gender differences may affect men and women's behaviour and their responses in survey evaluations. Bertrand and Mullainathan (2001) suggest that measurement of subjective variables may be distorted by a number of sampling and non-sampling errors. Non-sampling errors imply that the wording on the job satisfaction question may have different meanings for different people. Another drawback of survey data is that when individuals have to answer polychotomous questions they consider the middle of the distribution as normal or as a neutral point.

A response to the criticism of studying job satisfaction or any other sort of subjective data is that these concepts are correlated with observable events and actions. For example, psychology studies have shown that the intentions of individuals are good predictors of their actual behaviour (e.g. Tett and Meyer, 1993). In addition Clark et al. (2005) suggest that if the answers of individual workers to job satisfaction questions only contain noise, it is unlikely that such correlations would have been found.
Although individuals appear to overstate their relative happiness (see Bertrand and Mullainathan, 2001), no evidence has been found that people are lying when responding to these surveys (Argyle, 1987). Also, it has been suggested that patterns of responses are reasonable and consistent through time (Steel and Rentsch, 1997). Moreover, according to Veenhoven (1989) any error introduced in this way is believed to be random. Thus, many psychologists conclude that self-reports provide the best means of assessing happiness, despite the many criticisms levelled against such subjective data. Further, Easterlin (1974) in his seminal paper concluded that data derived from answers to such questions were indeed reliable and comparable enough to study the association between income and happiness. In support to this, Hollander (2001) suggested that the concept of utility as subjective well-being is measurable from survey information with sufficient precision. In addition, international evidence suggests that questions on happiness makes the same sense between Americans and Europeans, and that respondents interpret survey questions on well-being in the same way across countries (Alesina et al., 2004).

We believe that using subjective measures such as job satisfaction is a promising way to push forward the literature on gender and ethnic labour marker differentials and will complement the literature on labour marker discrimination. For instance, proxy measures on workers' well being such as satisfaction with pay may help us better understand possible relationships between wage gaps and discrimination (Frijters et al., 2005).

2.6.2 Descriptive statistics

Each panel of Figure 2.7 plots the distribution of each aspect of job satisfaction against the levels of employees' happiness. 58% of employees answered
that they were very satisfied/satisfied with the amount of influence they had over their job. 64% replied that they got a lot of achievement from their job. Approximately 58% acknowledged that they were very satisfied/satisfied with the amount of respect they were getting from their supervisors or line managers. In contrast, just 36% were satisfied/very satisfied with the amount of money they received.

Figure 2.7 Distribution of Each Aspect of Job Satisfaction.

The distribution for each one of the job satisfaction aspects with respect to gender and ethnicity are reported in Tables 2.3 and 2.4. According to the cross tabulations female employees seem to be more satisfied/very satisfied in relation to male employees concerning all aspects of job satisfaction. Male employees are particularly dissatisfied with pay whereas women are still 8% more satisfied. Ethnic minority employees are at least as satisfied/very satisfied as white employees. However, ethnic minority employees seem to be more dissatisfied with pay by 9% compared to their white peers.
Simple cross tabulations between the different aspects of job satisfaction and occupational classification revealed that managers reported the highest levels of satisfaction in relation to every job satisfaction aspect. In contrast, operative employees were the least satisfied. Unsurprisingly, all occupational groups endorsed more the intrinsic aspects (influence, achievement and respect) of job satisfaction. Among them, technical and craft staff were very dissatisfied with pay. Of some importance are the satisfaction levels in relation to contentment with respect. For instance, employees in personal and protective services and the "other" occupation group were as satisfied as professional staff. Also, employees in the personal protective services were as satisfied as managers in relation to satisfaction with achievement.

2.7 Training

In this section we interpret the training question and we descriptively examine training with respect to gender and ethnicity. The formal modelling is presented in Chapter 5. Definitions are important in the study of training (see Miller, 1994). Employees were asked the following question "During the last 12 months how much training have you had, either paid for or organized by your employer: include only training away from your normal place of work, but it could be on or off the premises". Employees were provided a six-scale option to code their responses. Those options were ordinal but were attached a cardinal measurement and were running from "None" (1), "Less than one day" (2), "1 to less than 2 days" (3), "2 to less than 5 days" (4), "5 to less than 10 days" (5) to "10 days or more" (6). Employees were also advised to choose only one of the above options.
It is conventionally believed that off-the-job training in contrast to on-the-job training, is less specific, more costly to provide, of longer duration and undertaken primarily in private training centres. Further, we assume that such training covered only formal courses and schooling conducted by training or educational establishments, agencies or consultants other than, or the same as the respondent’s employer. Those courses could be either courses organised especially for employees of that company, or if they held at an independent training institute for employees of other companies as well.

Boheim and Booth (2004, footnote 13) using the WERS98 data correctly note that the way the question is asked allows one to add a slightly different interpretation, training that is paid for by the individual but organised by the employer. For instance, if general training occurs off-the-job, employees are supposed to cover most, if not all, of the up front cost of the tuition for off-site training and the indirect costs such as transportation and child care. Employees may even have to reduce their work hours in order to undertake off-the-job training. However, in such cases the employer would at least have to carry the costs in organising training.

The above description makes it clear that it is difficult to distinguish between general and specific training. First of all, since the employer, as well as the individual pays for training it is not clear if training is general or specific. Also, on the one hand, training at the workplace is more likely to be specific, on the other training at an external institution is more likely to be general. However, we believe that the WERS98 instrument of training represents some improvement in the quality of training data relative to other surveys since the training question was designed to capture only one aspect of training, off-the-job training, which is more formal and easier to quantify than on-the-job training.
Table 2.5 presents the distribution of training based on responses to the employee questionnaire (all respondents in the raw data).

<table>
<thead>
<tr>
<th>VOLUME OF TRAINING</th>
<th>PERCENTAGES</th>
<th>OBSERVED FREQUENCIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>0.406</td>
<td>10,107</td>
</tr>
<tr>
<td>(0.004)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 1 day</td>
<td>0.093</td>
<td>2,389</td>
</tr>
<tr>
<td>(0.003)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 to less than 2 days</td>
<td>0.133</td>
<td>4,055</td>
</tr>
<tr>
<td>(0.003)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 to less than 5 days</td>
<td>0.192</td>
<td>6,158</td>
</tr>
<tr>
<td>(0.003)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 to less than 10 days</td>
<td>0.089</td>
<td>2,795</td>
</tr>
<tr>
<td>(0.002)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 days or more</td>
<td>0.088</td>
<td>2,515</td>
</tr>
<tr>
<td>(0.002)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>28,019</td>
</tr>
</tbody>
</table>

Note: Standard errors in parentheses.

There are several characteristics of the dependent variable that we have to note before we analyse its observed distribution. First of all, there is the “none” category which captures those individuals that undertook no training 12 months prior to the interview. Secondly there is upper censoring in the data for those respondents that had received 10 days of training or more. Thirdly, the lengths of intervals for the intermediate groups are not equal. Analysing the observed percentages for each category we notice that one out of 2.5 employees had received no training. This large percentage suggests that a large proportion of employees were in occupations or in establishments where training was not offered, or employees rejected training offers made by their employers. Further, our measure of training is of a rather short duration. The majority of individuals (22.6%) received less than 2 days of training.

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14 We cannot directly compare the WERS98 training incidence measure with the corresponding number obtained from other British representative datasets as the training instrument differs. The closest is the BHPS training question which gathers information on any formal training episodes as part of the present employment during the previous year. However, this question was not asked in 1998. Thus, we employed the 1998 LFS wave. The LFS collects information on any job related education or training in the last four weeks connected with the respondent’s job, or a job that the respondent may be able to do in the future. The question covers those in employment and excludes students and those on training government programmes. In the first quarter of this wave, 56% of the respondents said that they had received some training, in quarter two 49% said so, in quarter three 58% and in quarter four 54%. Since four fifths of the LFS respondents are present in each wave, the above percentages are quite robust and indicate more or less the same training incidence as in WERS98.
Approximately 19% received 2 to less than 5 days of training and 17.7% received more than 5 days. Taking the mid-points of each group and top coding the upper group to 20 days the mean value of training was 2.9 days. Comparing this number with other British studies that report training duration seems pretty low. For instance, Booth and Bryan (2002) employing data from the BHPS report the average duration of training to be 12.64 days in the late 1990s, whereas Shields and Wheatley Price (1999a) using data from the LFS, found that more than half British training incidences lasted for more than a week in the mid 1990s with a third lasting for more than a year. There is some rationale for these short duration training courses. According to Green (1999) the financial risk for the employer by investing in short training programmes is less, as the benefits from these courses can be realised only in the short-run while the employees stay with their current employer.

Table 2.5 presents average mean differences on off-the-job training with respect to gender and ethnicity.

<table>
<thead>
<tr>
<th>VOLUME OF TRAINING</th>
<th>MALES</th>
<th>FEMALES</th>
<th>WHITE</th>
<th>ETHNIC MINORITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>0.417</td>
<td>0.395</td>
<td>0.406</td>
<td>0.408</td>
</tr>
<tr>
<td>(0.006)</td>
<td>(0.006)</td>
<td>(0.004)</td>
<td>(0.024)</td>
<td></td>
</tr>
<tr>
<td>Less than 1 day</td>
<td>0.078</td>
<td>0.109</td>
<td>0.094</td>
<td>0.072</td>
</tr>
<tr>
<td>(0.003)</td>
<td>(0.004)</td>
<td>(0.003)</td>
<td>(0.011)</td>
<td></td>
</tr>
<tr>
<td>1 to less than 2 days</td>
<td>0.118</td>
<td>0.147</td>
<td>0.132</td>
<td>0.113</td>
</tr>
<tr>
<td>(0.004)</td>
<td>(0.004)</td>
<td>(0.003)</td>
<td>(0.014)</td>
<td></td>
</tr>
<tr>
<td>2 to less than 5 days</td>
<td>0.189</td>
<td>0.194</td>
<td>0.191</td>
<td>0.226</td>
</tr>
<tr>
<td>(0.005)</td>
<td>(0.004)</td>
<td>(0.003)</td>
<td>(0.023)</td>
<td></td>
</tr>
<tr>
<td>5 to less than 10 days</td>
<td>0.099</td>
<td>0.079</td>
<td>0.089</td>
<td>0.093</td>
</tr>
<tr>
<td>(0.004)</td>
<td>(0.003)</td>
<td>(0.002)</td>
<td>(0.013)</td>
<td></td>
</tr>
<tr>
<td>10 days or more</td>
<td>0.099</td>
<td>0.076</td>
<td>0.088</td>
<td>0.088</td>
</tr>
<tr>
<td>(0.004)</td>
<td>(0.003)</td>
<td>(0.002)</td>
<td>(0.012)</td>
<td></td>
</tr>
<tr>
<td>Observed frequencies</td>
<td>13,766</td>
<td>14,214</td>
<td>26,745</td>
<td>807</td>
</tr>
</tbody>
</table>

Note: Standard errors in parentheses. The observed frequencies do not sum-up to 28,019 as in Table 2.5. Some individuals did not report their gender and/or their ethnic group.

A higher percentage of male relative to female employees reported no incidence of training. However, females seem to have received more training that is of lower intensity. A slightly higher percentage (0.2%) of ethnic minority employees are
observed in the "none" category than their corresponding white peers. With respect to every other category, ethnic minorities reported less training than whites, except for the middle category (2 to less than 5 days) whereas a higher proportion (2.5%) of ethnic minority employees than whites received training.

Simple cross tabulations between occupational status and the amount of training received uncovered a clear divide between occupations that are "blue-collar" and those that are "white collar". Approximately 58% of the respondents who were classified as operative and assembly workers had received no training. Similarly, more than half of employees in "other occupations" (54%) and in craft and skill service jobs (52%) had received no training. In contrast, only 22.6% of professionals had received no training.

More employees in sales jobs (21.5%) than in any other occupation had received less than 1 day of training. The second highest response was for employees in the "other occupations" (12%). Thus, employees in low skill jobs received training that was of very low intensity. As the intensity of training increased managers' responses increased as well. For instance, 31.2% of the managers had received some training between 2 to less than 5 days. The corresponding percentage for professional staff was 30.7%, for technical staff (26.4%) and 22.5% for both clerical and service staff.

Interestingly, the occupational group that received the most training (more than 10 days) was employees in the service sector (17.5%). The second most highly intensified skill group was employees in technical jobs (13.4%), whereas 12.5% of the managers and only 10.9% of professional staff had received more than ten days of training.
We briefly examine training from the manager's point of view, as well as what aspects the training might have covered. These two issues are important in their own right as the receipt of training is a joint decision between the employer and the employee and the content of training is important in determining skill levels. There is evidence suggesting that managers are not particularly well trained themselves and because of this they do not value the training of those below them (see Gospel, 1992). This is depicted in our data as well. For instance, 61% of the managers or line supervisors had not been trained in people management skills. Another 64%, apart from their experience, did not have any formal qualifications in personnel management or a closely related subject.

Managers were asked if there was a standard induction programme to introduce new employees (in the largest occupational group) to the workplace. In 73% of the workplaces there was a standard induction programme. In answering the question “how long this programme take to complete, either in days or in hours”, 77% said that the programme needed days and 23% replied that the programme needed some hours to get completed. The mean estimate for days was 13.9 and for hours it was 7.5.

Managers were also asked how long a new recruit to the core workforce would take to become more competent in his/her job than existing employees. In general, the greater the level of workplace specific skills (e.g. the more time it takes to become fully competent), the more off the job training takes place. Approximately half of the managers said that it took more than a month and up to six months for new employees to perform the same as experienced employees. Another 24% replied “more than one week and up to one month”, 13% “more than six months and up to a year”, 8% “more than a year” and 7% “one week or less”.
Answering the question "What proportion of experienced employees (in the largest occupational group) had formal off the job training over the past 12 months?" approximately 18% of the managers said that "all" experienced employees in the largest occupational group had received some training, 8% said "almost all", 7.5% "most", 9% "around half", 13% "some", 21% "just a few" and interestingly 24% replied "none".

In answering the question "On average how much time those experienced employees spend in formal off the job training sessions over the past 12 months? ", the vast majority of managers (38%) said that approximately those employees spend "2 to less than 5 days" on off-the-job training, and about 1.5% said that none of those experienced employees spent any time on training. Unfortunately, we cannot directly compare employees' responses to those of managers', since the corresponding question in the management questionnaire was preceded by the question on the proportion of employees in the largest occupational group who had received training. Thus, employers had to report intensity of training if at least one worker had received training.

Training was positively correlated with having a personnel specialist at the workplace, an integrated employee plan and holding an "Investors in People" award. The "Investors in People" award is a business improvement tool designed to advance an organisation’s performance through the management and development of its people. In those establishments with a personnel specialist (88%), 86% provided training to their employees.

In the 76% of workplaces where some training took place, managers were shown a list of ten items that training might have covered (Figure 2.8). All apart from 3.5% of managers said that training covered at least one of the ten areas.
The vast majority of training was devoted to health and safety (47.5%), teamworking (32.5%), operation of new equipment (33.2%), customer service (30%), improving communication (29.5%) and computing (28.7%). Although the above training was formal, there is no information in the WERS98 as to whether it led to formal qualifications or whether it was certified. For instance, there is evidence that initiatives such as “Total Quality Management” require people to be trained in so called “soft” skills like customer service, rather than technical skills (Collinson et al., 1998). For example, 57% of workplaces in hotels and restaurants had trained employees in customer service activities. This was just 5% in manufacturing where training in the operation of new equipment was most common (41%).

2.8 Summary

The purely descriptive analysis presented in this Chapter neither controls for other varying factors among workers and establishments to explain differences in pay, job satisfaction and training, nor allows for unobserved establishment heterogeneity to be taken into account or modelled. Thus, in the next three Chapters we formally
model and examine gender and ethnic differentials with respect to pay, job satisfaction and training. Chapter 3 examines firm specific gender and ethnicity pay differentials. Chapter 4 examines gender and ethnic job satisfaction differentials and Chapter 5 looks at gender and ethnic differentials relating to the receipt of employer provided off-the-job training.
**APPENDIX**

Table A.2.1 Dependent Variable: Equal Opportunities Policies Model. Question: Does this workplace or (organisation of which it is part of) have a formal written policy on equal opportunities or managing diversity? Equation estimated (probit model): 

\[ E_h^* = \beta' x_h + \varepsilon_h \]

where \( E_h^* \) is a latent variable and takes the value of “1” if firm \( h \) has an equal opportunities policies and “0” otherwise.

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>COEFFICIENT</th>
<th>ROBUST STD ERROR</th>
<th>ME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage of females</td>
<td>0.726***</td>
<td>0.214</td>
<td>0.116</td>
</tr>
<tr>
<td>Percentage of ethnic minorities</td>
<td>0.557</td>
<td>0.448</td>
<td>0.089</td>
</tr>
<tr>
<td>Proportion of employees aged 20 or under</td>
<td>-0.181</td>
<td>0.392</td>
<td>-0.029</td>
</tr>
<tr>
<td>Proportion of employees aged 51 or over</td>
<td>-1.369***</td>
<td>0.357</td>
<td>-0.219</td>
</tr>
<tr>
<td>Proportion of low-paid employees (less than £9,000 per year)</td>
<td>-0.756***</td>
<td>0.291</td>
<td>-0.121</td>
</tr>
<tr>
<td>Proportion of managers</td>
<td>1.385***</td>
<td>0.493</td>
<td>0.222</td>
</tr>
<tr>
<td>Proportion of professional staff</td>
<td>0.234</td>
<td>0.310</td>
<td>0.037</td>
</tr>
<tr>
<td>Proportion of technical staff</td>
<td>-0.236</td>
<td>0.310</td>
<td>-0.038</td>
</tr>
<tr>
<td>Proportion of clerical/secretarial staff</td>
<td>-0.222</td>
<td>0.278</td>
<td>-0.036</td>
</tr>
<tr>
<td>Proportion of craft and skilled service staff</td>
<td>0.508*</td>
<td>0.272</td>
<td>0.081</td>
</tr>
<tr>
<td>Proportion of personal and protective staff</td>
<td>0.829***</td>
<td>0.311</td>
<td>0.133</td>
</tr>
<tr>
<td>Proportion of sales staff</td>
<td>0.547**</td>
<td>0.251</td>
<td>0.088</td>
</tr>
<tr>
<td>Proportion of operative and assembly workers staff</td>
<td>-0.046</td>
<td>0.224</td>
<td>-0.007</td>
</tr>
<tr>
<td>Workplace size 25-50 employees</td>
<td>0.035</td>
<td>0.132</td>
<td>0.005</td>
</tr>
<tr>
<td>Workplace size 50-100 employees</td>
<td>0.158</td>
<td>0.135</td>
<td>0.024</td>
</tr>
<tr>
<td>Workplace size 100-200 employees</td>
<td>0.562***</td>
<td>0.148</td>
<td>0.071</td>
</tr>
<tr>
<td>Workplace size 200-500 employees</td>
<td>0.509***</td>
<td>0.155</td>
<td>0.067</td>
</tr>
<tr>
<td>Workplace size &gt;500 employees</td>
<td>0.501***</td>
<td>0.194</td>
<td>0.063</td>
</tr>
<tr>
<td>Organisation size 100-500 employees</td>
<td>-0.032</td>
<td>0.167</td>
<td>-0.005</td>
</tr>
<tr>
<td>Organisation size 500-1,000 employees</td>
<td>0.231</td>
<td>0.206</td>
<td>0.032</td>
</tr>
<tr>
<td>Organisation size 1,000-5,000 employees</td>
<td>0.458***</td>
<td>0.148</td>
<td>0.060</td>
</tr>
<tr>
<td>Organisation size 5,000-10,000 employees</td>
<td>0.550***</td>
<td>0.199</td>
<td>0.065</td>
</tr>
<tr>
<td>Organisation size &gt;10,000 employees</td>
<td>0.942***</td>
<td>0.170</td>
<td>0.120</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>-0.215</td>
<td>0.198</td>
<td>-0.038</td>
</tr>
<tr>
<td>Utilities (e.g. electricity, gas, water)</td>
<td>0.613</td>
<td>0.379</td>
<td>0.066</td>
</tr>
<tr>
<td>Construction</td>
<td>0.648***</td>
<td>0.238</td>
<td>0.069</td>
</tr>
<tr>
<td>Wholesale</td>
<td>0.064</td>
<td>0.199</td>
<td>0.010</td>
</tr>
<tr>
<td>Hotels and restaurants</td>
<td>0.082</td>
<td>0.212</td>
<td>0.013</td>
</tr>
<tr>
<td>Transportation</td>
<td>0.137</td>
<td>0.238</td>
<td>0.020</td>
</tr>
<tr>
<td>Financial services</td>
<td>-0.115</td>
<td>0.264</td>
<td>-0.020</td>
</tr>
<tr>
<td>Other business (e.g. real estate, renting)</td>
<td>0.504***</td>
<td>0.192</td>
<td>0.061</td>
</tr>
<tr>
<td>Public administration</td>
<td>1.148**</td>
<td>0.453</td>
<td>0.096</td>
</tr>
<tr>
<td>Education</td>
<td>0.555**</td>
<td>0.243</td>
<td>0.066</td>
</tr>
<tr>
<td>Health</td>
<td>0.785***</td>
<td>0.237</td>
<td>0.083</td>
</tr>
<tr>
<td>Establishment more than 10 years old</td>
<td>-0.261***</td>
<td>0.092</td>
<td>-0.040</td>
</tr>
<tr>
<td>Individual or family ownership (over 50% ownership)</td>
<td>-0.342***</td>
<td>0.112</td>
<td>-0.065</td>
</tr>
<tr>
<td>Part of a larger organisation</td>
<td>0.604***</td>
<td>0.133</td>
<td>0.122</td>
</tr>
<tr>
<td>UK establishment (51% or more of ownership)</td>
<td>-0.142</td>
<td>0.110</td>
<td>-0.022</td>
</tr>
<tr>
<td>UK and foreign owned establishment</td>
<td>-0.706**</td>
<td>0.355</td>
<td>-0.170</td>
</tr>
<tr>
<td>Vacancies are filled by internal applicants only or internal applicants</td>
<td>-0.146</td>
<td>0.089</td>
<td>-0.024</td>
</tr>
<tr>
<td>Preference, other things being equal, over external applicants</td>
<td>-0.215</td>
<td>0.198</td>
<td>-0.038</td>
</tr>
<tr>
<td>Employees with fixed term contracts (less than a year)</td>
<td>0.232**</td>
<td>0.093</td>
<td>0.036</td>
</tr>
<tr>
<td>Multi-skilled employees (40% of the employees in the largest occupational group are trained to be able to do jobs other than their own)</td>
<td>0.118</td>
<td>0.092</td>
<td>0.018</td>
</tr>
<tr>
<td>Employment to vacancy rate by travel to work area</td>
<td>0.118</td>
<td>0.092</td>
<td>0.025</td>
</tr>
<tr>
<td>Union-staff association at the workplace</td>
<td>0.276**</td>
<td>0.119</td>
<td>0.047</td>
</tr>
<tr>
<td>Trade union density</td>
<td>0.539**</td>
<td>0.208</td>
<td>0.086</td>
</tr>
</tbody>
</table>

*Continued*
Table A.2.1 Dependent Variable: Does this workplace or (organisation of which it is part of) have a formal written policy on equal opportunities or managing diversity? Equation estimated (probit model):
\[ E^*_h = \beta' x_h + \varepsilon_h \], where \( E^*_h \) is a latent variable and takes the value of “1” if firm \( h \) has an equal opportunities policies and “0” otherwise.

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>COEFFICIENT</th>
<th>ROBUST STD ERROR</th>
<th>ME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial performance (a lot better than average/better than average)</td>
<td>-0.021</td>
<td>0.090</td>
<td>-0.003</td>
</tr>
<tr>
<td>Labour productivity (a lot better than average/better than average)</td>
<td>0.045</td>
<td>0.088</td>
<td>0.007</td>
</tr>
<tr>
<td>Changes in technology over the last 5 years</td>
<td>0.268</td>
<td>0.092</td>
<td>0.047</td>
</tr>
<tr>
<td>Trade sector</td>
<td>0.246</td>
<td>0.119</td>
<td>0.043</td>
</tr>
<tr>
<td>Constant</td>
<td>-1.246***</td>
<td>0.320</td>
<td>---</td>
</tr>
<tr>
<td>Log-Likelihood</td>
<td>-633.219</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seudo R2</td>
<td>0.385</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wald chi(49)</td>
<td>498.28</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: ***, **, 1%, 5%, and 10% level of significance correspondingly. The numbers of observations do not sum-up to 2,191 (the number of participating workplaces in the survey). Sixty-four establishments did not answer if they had an equal opportunities policy at the workplace.
Chapter 3

FIRM-SPECIFIC GENDER AND ETHNICITY PAY DIFFERENTIALS IN BRITAIN

3.1 Introduction

Differences in pay between men and women and between white and non-white employees have been arguably the most heavily researched fields in labour economics. However, findings differ between studies as different studies have different model specifications, different earnings measures and utilise different data sets at different points in time. Nevertheless, a common consensus between US and UK studies is that the gender as well as the ethnic pay gaps have decreased over the last three decades partly due to the introduction of Equal Pay Acts and Anti-Discrimination Laws as well as to Affirmative Action Legislations (see Chapter 1, Section 1.3). Joshi and Paci (1998) provide an informative review of Equal Pay Legislation Acts in Britain and Bourn and Whitmore (1996) provide useful comparisons between British law and American legislation.

Despite the relative success of the above laws there is evidence that the closing gap in the male/female wage differential (at least for full-time employees see Makepeace et al., 1999; Blau and Kahn, 2004) is also due to other factors such as welfare reforms, incomes policies and changes in industrial structure (Butler and Heckman, 1977; Borooah and Lee, 1988; Chiplin et al., 1980) that occurred at the same time. Chay and Honore (1998) argue that this disagreement in the literature has arisen because aggregate time series data do not

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15 This Chapter is based on a joint paper with Stephen Pudney (see Pudney and Theodoropoulos, 2005).
explicitly allow one to disentangle coincidental changes in other factors related to relative earnings but unrelated to the above laws.

Recent studies that have examined gender pay differentials in the British labour market are by Bowlus and Grogan (2003) and Manning and Robinson (2004). Studies that have examined the gender pay gap at the international level are Blau and Kahn (1992, 1996) and Weichselbaumer and Winter-Ebmer (2003). The main conclusion that can be drawn from this research is that pay differentials are not fully explained by differences in the observable human capital characteristics of men and women.

These pay differentials have been attributed to different factors. Unequal treatment of females is often rationalised by the higher probability of quitting. A theoretical study by Lazear and Rosen (1990) suggests that women should have greater ability than men if they are to get promoted. Since then, some empirical literature has emerged on promotions (Jones and Makepeace, 1996; Groot and Massen Van de Brink, 1996; Winter Ebmer and Zweimuller, 1997; Albrecht et al., 2003) that provide support to the Lazear and Rosen model.

In contrast to the above studies, Booth et al. (2003) found no significant differences in the probability of promotion for full time workers. However, they argued that discrimination may have an earnings impact even if the probability of promotion is unaffected. At the same time, the empirical literature has identified significant and robust evidence of labour market disadvantage against ethnic minority employees. For instance, studies have found evidence of more limited employment prospects (e.g. Blackaby et al., 1998, 2002), fewer training and promotion opportunities (Pudney and Shields 2000a, 2000b), lower occupational attainment (e.g. Stewart, 1983) and lower wages (e.g. Blackaby et al., 1998, 2002; Blackaby and Frank,
2000; Dustmann and Fabbri, 2003) for ethnic minority groups compared to similar white workers in Britain.

Studies on gender and racial discrimination have typically addressed the question of wage discrimination, namely what fraction of the gender and racial wage differential cannot be explained by differences in skills or in their labour market price. The most extensively used econometric approach for studying the pay gap at a point in time as well as across time is the Blinder/Oaxaca (1973) decomposition (see Greenhalgh 1980; Dolton and Makepeace 1986; Wright and Ermisch, 1991; Harkness, 1996, for UK evidence and Blau and Kahn, 1997, 2001; O’Neil and Polachek, 1993, Juhn et al., 1993 for US evidence). This method decomposes the mean wage differential between, for example, males and females into differences due to observed wage determining characteristics, differences in rewards to these characteristics and an unexplained share which is attributed to discrimination.

However, the Blinder/Oaxaca decomposition and its elaborate extensions (Brown et al., 1980; Reimers, 1983; Cotton, 1988; Neumark, 1998 and Juhn et al., 1993) have come under a variety of criticism (see Suen, 1997). Critics argue (see Fitzenberger and Wunderlich, 2001) the Blinder/Oaxaca decomposition is informative only about the average unexplained differences in wages, not about the distribution of these unexplained differences. Thus, rising wage inequality implies that simple comparisons of average wages of men and women could give a wrong interpretation of the relative positions of female wages with respect to male wages (Machin, 1996). Moreover, Suen (1997) argued that labour market discrimination can lead to a spurious, mechanical positive relationship between the female percentile (in the male distribution) and male wage inequality. Finally, because decompositions are arbitrary one must be very cautious about drawing conclusions on causality.
Nevertheless, all of the above studies are using datasets that provide information only on the employee (individual or household data) or on the employer (plant or firm level data) despite the fact that labour market outcomes are determined by the decisions of both employees and firms and most theoretical explanations on discrimination are based on the matching of employees and employers (Becker, 1971). As Holzer and Neumark (2000, p. 498) recommend “Evidence on employer characteristics and behaviour is likely to yield additional information of two varieties. First, data on hiring from applicant pools potentially tell us more about the demand side of the market from which discrimination emanates. Second, variation in behaviour toward different race/sex groups based on employer characteristics can provide evidence on specific hypotheses regarding discrimination”.

Also, Groshen (1991a) proposes five alternative explanations for employer based wage differentials. These are: a) employers systematically sort workers by ability, b) wages vary because of compensating differentials, c) costly information generates or perpetuates random variation in wages, d) the efficient wage for some employers is above the market wage, and e) workers inside firms exercise a claim on rents. All these alternative scenarios are within our data observationally equivalent to a situation where wages vary among employers.

However, it is only quite recently that we have had datasets providing information on both the employee and the employer (Abowd and Kramarz 1999; Hamermesh 1999; Leonard 1999). For instance, studies using linked employee-employer datasets by Abowd et al. (1999); Goux and Maurin (1999); Hellerstein et al. (1999) and Postel-Vinay and Robin (2002) have found strong firm effects in explaining wage differentials.
In this study we examine firm-specific gender and ethnicity pay differentials in Britain by bringing together the demand and the supply side of the economy. The matched employer-employee data utilised (WERS98) gives us the possibility to control for unobserved firm heterogeneity and identify its importance with respect to gender and ethnicity. Moreover, since the employment circumstances and experiences of men and women differ, it is reasonable to assume that gender will have an effect independent of ethnicity. Hence, it could be the case that ethnic minority women are disadvantaged by gender as well as by ethnicity (see Section 1.5 in Chapter 1). Thus, the experience of ethnic minority women in terms of pay is examined as well. Following Cardoso (2000) we do not only incorporate the standard sex and ethnicity dummies, but in order to allow for the fact that different firms may value the human capital of the employees differently we also interact them with firm specific effects.

In using matched employer-employee data we also contribute to the recent literature that has been using such data to obtain a better understanding of the workings of the labour market. The majority of these studies have used US data from the Worker-Establishment Characteristics Database (WECD), a matching of the Sample Edited Detail File (SEDF) to establishment records in the 1990 Standard Statistical Establishment List (SSEL).

Of the small literature that has focused on sex and racial discrimination using matched employer-employee data three recent examples are Carrington and Troske (1998b), Hellerstein and Neumark (2002) and Bayard et al. (2003). The last of these found that segregation of women in lower-paying occupations, industries and establishments accounted for around half of the gender wage gap.
This Chapter is organised as follows. We begin in Section 3.2 by providing some information about the sample. A measurement of pay is provided in Section 3.3. In Section 3.4 we present our econometric model and propose two alternative tests checking normality. Section 3.5 explores a semi-parametric finite mixture random effects estimator that allows for the interaction of non-normal workplace effects with individual worker's gender/ethnicity characteristics. Section 3.6 presents the complete set of results from the random effects specification and Section 3.7 presents the results from the firm specific effects and their correlations with gender and ethnicity. Section 3.8 uncovers firm-specific indicators of disadvantage at the workplace by calculating the posterior distribution of the firm specific unobservable variables conditional on the observed variables relevant to the establishment and correlating them to critical variables that may act as indirect indicators of discrimination. Finally, conclusions are drawn in Section 3.9.

3.2 The WERS sample

In this chapter we combine both the workplace and employee questionnaires and we use the subset of establishments and workers who supplied complete information on critical variables. Further we restrict our attention to full-time employees, i.e. employees that work over 30 hours per week. The 30 hours cutoff is a largely arbitrary convention. However, there is support for its use; see Van Baselaer et. al. (1997), Bayard and Troske (1999) and Manning and Robinson (2004). Further, when examining the gender wage gap, it is necessary to make a distinction between full-time and part-time employees. Part-time jobs are mainly female and for many reasons they may inherit a systematic wage penalty. Thus our final sample comprises 20,345 workers linked to a set of 1,727 establishments.
The summary statistics of our variables are presented in Table A.3.1 in the Appendix. Average means take into account the complex survey design. Thus, the data are representative of the population of employees in 1998 in Great Britain employed in all but the very small workplaces (less than 10 employees).

3.3 Measurement of pay

Empirical work on labour market data usually uses the hourly wage rate as a measure of the return to labour. In fact, for many workers there is no such thing as an hourly wage. The employment relationship is very often a complex relationship in which there is a package of rewards and constraints accepted by the employee, rather than a simple constant unit price market for workers’ time. To investigate the robustness of our results to this issue, we use two alternative measures of the reward to labour. One is the hourly wage\textsuperscript{16}, reflecting the idea of a spot labour market\textsuperscript{17} where the basic commodity is the unit of workers’ time.

Our second measure is based on a different view of the employment relation and the underlying technology. Suppose that there is a sequence of production periods, each of length $T$ during which productive activity takes place. In each period, the employer requires a fixed set of activities to be completed by each worker. Let this set of productive activity be measured by a quantity $p$. Now suppose that the technology is sufficiently flexible that workers can deliver this contracted volume of activity at a rate and over a time span of their

\textsuperscript{16} WERS98 does not provide an accurate measure of individuals’ hourly wages. We derive hourly wages by dividing the weekly earnings of the individuals by the number of working hours per week, including any overtime or extra hours. Manning (2000) suggests that this alternative measurement makes only a small difference in practice.

\textsuperscript{17} The use of piece-rate or output base pay is quite common in the real world (Lazear, 1986, 2000; Booth and Frank, 1999; Geddes and Heywood, 2003).
own choosing, provided it complies with the overall production timetable. Thus $p$ can be decomposed as:

$$p = t e$$ (3.1)

where $t$ is time spent doing productive work during the production period and $e$ is intensity of effort during time at work. The employer is indifferent between $(t, e)$ combinations satisfying (3.1), provided $t \leq T$. The worker's problem is then to choose a utility-maximising combination $(t, e)$ subject to the constraints $te = p$ and $t \leq T$. Workers with different tastes will choose different $(t,e)$ combinations. When interviewed on the subject of hours of work, respondents are likely to report their hours of work as the conventional standard length of the work period $T$, even if actual activity time $t$ is less than $T$. In either case, the relevant return to productive activity is measured appropriately by the total payment for contracted tasks completed during the production period. Weekly or annual earnings rather than hourly pay are likely to be the best operational measure.

3.4 The Econometric model
3.4.1 The interval regression specification

We use a conventional semi-log regression model for individual pay. For worker $i$ in firm $h$:

$$w_{ih} = \beta_0 + x_{ih} \beta + \xi_{1h} \xi_{1h} + \xi_{2h} \xi_{2h} + \epsilon_{ih} \quad i = 1 \ldots m_n; \quad h = 1 \ldots n$$ (3.2)

where $x_{ih}$ is a vector of observable covariates, $\xi_{1h} = 1$ if worker $i,h$ is female and $\xi_{1h} = 0$ otherwise; $\xi_{2h}$ is a similar dummy if worker $i,h$ is a member of the ethnic minority group. The
unobservable variable $\xi_{ith}$ is the usual random disturbance term distributed with mean zero and unknown variance $\sigma^2$.

The unobservable variable $u_{0ih}$ is a general firm-specific wage premium; $u_{1ih}$ and $u_{2ih}$ are firm-specific gender and ethnicity wage differentials respectively. Conditional on $x_{ih}$, $\xi_{1ih}$ and $\xi_{2ih}$, we treat $u_{0ih}$, $u_{1ih}$ and $u_{2ih}$ as random workplace effects, distributed randomly with unrestricted means and variances, except that $E(u_{0ih}) = 0$. Provided that the vector of observable covariates $(x_{ih})$ is specified appropriately (i.e. no omitted variable bias), there is no loss of generality in making the assumption that there is no correlation between $(x_{ih})$ and the unobserved firm specific effects. Alternatively, the covariance between $(x_{ih})$ and $(u_{jh})$ is zero, or that $\text{cov}(x_{ih}, u_{jh}) = 0$, for $j = 0, 1, 2$.

Given the cross-sectional nature of the data, unobserved individual heterogeneity cannot be identified and thus is consigned in the error term. However, our random firm-specific effect $u_{0ih}$ captures unobserved firm effects common to all individuals at the establishment. This will have no consequence for the estimate of $u_{0ih}$ if the remaining individual effects are uncorrelated with the included firm specific effects. Moreover, given the large bank of information that our dataset provides we do believe that the extra individual and workplace specific control variables we include in our modelling capture to some extent heterogeneity in workers' skills and the general working environment.

There is a complication induced by the design of the WERS98 questionnaire, since the (log) wage $w_{ih}$ is observed only within ranges. Let the observed pay interval for worker $i$ in firm

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18 This model implicitly assumes that the returns to observed characteristics ($x_{ih}$) are the same for men and women and for white and non-white employees. In our analysis though we include enough interactions between observed characteristics and gender and explicitly that capture differences in the slope coefficients between men and women and white and non-white employees.
\( h \) be \( \mathbf{R}_h = (\mathbf{W}_{ih}, \mathbf{W}_{ih}) \) and assume normality for the error term \( \epsilon_{ih} \). Then the log-likelihood for this model is

\[
\ln L = \sum_{h=1}^{H} \ln \left( \Pr(w_{ih} \in \mathbf{R}_h | x_{ih}, \xi_{1ih}, \xi_{2ih}) \right) \tag{3.3}
\]

The relevant probability is

\[
\Pr(w_{ih} \in \mathbf{R}_h | x_{ih}, \xi_{1ih}, \xi_{2ih}) = E_u \left[ P_{ih}(u_{ih}) \right] \tag{3.4}
\]

where:

\[
P_{ih}(u_{ih}) = \Phi \left( \frac{\mathbf{W}_{ih} - \beta_0 - x_{ih} \beta - u_{0ih} - \xi_{1ih} u_{1ih} - \xi_{2ih} u_{2ih}}{\sigma} \right) - \Phi \left( \frac{\mathbf{W}_{ih} - \beta_0 - x_{ih} \beta - u_{0ih} - \xi_{1ih} u_{1ih} - \xi_{2ih} u_{2ih}}{\sigma} \right) \tag{3.5}
\]

and \( E_u[ . ] \) denotes the expectation with respect to the random effects distribution. The implementation of this maximum likelihood estimator requires some method of computing or approximating this expectation.

### 3.4.2 Constant ethnicity and gender differentials

Let the means of \( u_{1ih} \) and \( u_{2ih} \) be \( \mu_1 \) and \( \mu_2 \) respectively. In that case, they can be treated as constant parameters to be estimated, with the dummy variables \( \xi_{1ih} \) and \( \xi_{2ih} \) absorbed into the vector \( x_{1ih} \). Define \( u_{1ih}^* = u_{1ih} - \mu_1 \) and \( u_{2ih}^* = u_{2ih} - \mu_2 \). If we treat the composite variable \( v_{ih} = u_{0ih} + \xi_{1ih} u_{1ih}^* + \xi_{2ih} u_{2ih}^* \) as a residual and estimate equation (3.2) by standard interval regression techniques, the resulting estimates will be inconsistent. There are two separate issues: heteroskedasticity and normality. Since the total error variance varies with the gender and ethnicity dummies between establishments the model would be heteroskedastic.
Moreover, because the dependent variable is observed only in interval form, standard linear regression cannot be used. The alternative nonlinear ML estimator is much less robust and is generally inconsistent under conditions of heteroskedasticity, whether or not the normality assumption is correct.

An alternative approach is to make the further assumption that the differentials $u_{1h}$ and $u_{2h}$ are constant across workplaces. The model then has a homoskedastic random residual of the form $v_{ih} = u_{0h} + e_{ih}$ and will not be subject to the heteroskedasticity bias. In this case, the residual $v_{ih}$ has variance $\sigma^2 = \sigma^2 + \text{var}(u_0)$. However, to define the likelihood function, it is necessary to assume a form for the distribution of pay conditional on observable characteristics. The normality assumption is conventional but may be incorrect. If so, then the interval regression estimates will again be inconsistent. Thus, it is important to check the normality assumption. This is a particularly important issue, since it determines whether or not a semi-parametric approach is called for when we proceed to more complex random-effects models.

3.4.3 Interval regression results

The simple interval regression results are reported in the Appendix in Table A.3.2. We do not discuss them, but we compare them with the more efficient and consistent random effects estimates (Table A.3.3 in the Appendix) in Section 3.6. For the moment, we concentrate on evaluating the normality assumption that underlies the interval regression method. We take a very detailed look at this issue, using two different tests.
3.4.4 Generalised residuals

Based upon moments involving generalised residuals this specification can be tested for non-normality of the error terms. Ignoring random effects, the generalised residuals in the standard interval regression model is defined in the sense of Chesher and Irish (1987):

\[ \hat{v}_{ih} = E(v_{ih} | x_{ih}, W_{ih}, \bar{W}_{ih}) = \frac{\phi\left(\frac{W_{ih} - \hat{\beta}_0 - x_{ih} \hat{\beta}}{\hat{\sigma}}\right)}{\Phi\left(\frac{W_{ih} - \hat{\beta}_0 - x_{ih} \hat{\beta}}{\hat{\sigma}}\right)} - \frac{\phi\left(\frac{W_{ih} - \hat{\beta}_0 - x_{ih} \hat{\beta}}{\hat{\sigma}}\right)}{\Phi\left(\frac{W_{ih} - \hat{\beta}_0 - x_{ih} \hat{\beta}}{\hat{\sigma}}\right)} \]  

(3.6)

Figures 3.1 and 3.2 display kernel estimates of the density function of these residuals for the weekly and hourly pay models. The circled line depicts the estimated density function and the solid line the corresponding normal distribution. The two distributions for both the weekly and the hourly pay models are almost identical except at the median. However, in both cases, long tails at the right end of the residual distribution are evident suggesting a source of bias in conventional maximum likelihood estimates (Chay and Honore, 1998).

Figure 3.1 Distribution of Generalised Residuals for the Weekly Pay Model.
3.4.5 The tails of the pay distribution

The normality assumption often fails in the tails of the distribution (Chay and Honore, 1998). In many different applied contexts it is found that a distribution with rather fatter tails than the normal is appropriate. One way of investigating this issue is to use a goodness-of-fit test comparing empirical and predicted frequencies of observations in the separate pay ranges (Andrews, 1988). We prefer to use a test that focuses directly on the implications of distributional misspecification for the parameters of interest. A natural approach is to aggregate a number of pay intervals at the top or bottom ends of the pay scale, re-estimate the model and then carry out a formal test of the equality of coefficient estimates. We use an alternative likelihood-based technique. We modify the previous notation slightly and write the conditional probability of observing the jth pay interval as:

\[ P_{j\theta}(\theta) = \Phi((W_j - \beta_0 - x_{i\theta} \beta) / \omega) - \Phi((W_{j-1} - \beta_0 - x_{i\theta} \beta) / \omega) \]  

where \( \theta \) is the parameter vector \((\beta_0, \beta, \omega)\). Then the likelihood element for a representative observation is:
where \( y_{jh} = 1 \) if \( w_{sh} \) lies in the \( j \)th pay range \((W_{j-1}, W_j)\) and 0 otherwise. Now consider a subset \( S \) of the pay ranges in the upper or lower tail of the pay distribution and decompose the likelihood element as:

\[
l_{th} = \prod_{j} P_{jth}(\theta)^{y_{th}} = \left\{ \prod_{j \in S} P_{jth}(\theta)^{y_{th}} \right\} \left\{ \prod_{j \notin S} P_{jth}(\theta)^{y_{th}} \right\}
\]

\[
= l_{th}^*(\theta) \cdot l_{th}^{**}(\theta)
\]

where \( y_{th} = 1 \) if \( W_{sh} \in S \) and 0 otherwise.

Note that the two components \( l_{th}^*(\theta) \) and \( l_{th}^{**}(\theta) \) are both likelihoods in their own right and can be maximised separately to give alternative estimates of \( \theta \). We follow the approach of Ruud (1983) and test the specification of the model by carrying out a likelihood ratio test of \( H_0: \theta = \theta^{**} \) using the following statistic:

\[
\chi^2 = -2 \left[ \sum_h \sum_i l_i(\hat{\theta}^*) - \sum_h \sum_i l_i(\hat{\theta}^{**}) - \sum_h \sum_i l_i(\hat{\theta}^{**}) \right]
\]

(3.9)

where \( \theta^* \) and \( \theta^{**} \) are parameter vectors \((\beta_0^*, \beta^*, \omega^*)\) and \((\beta_0^{**}, \beta^{**}, \omega^{**})\) and hats denote estimators calculated by maximising the relevant likelihood. Under the null hypothesis of correct specification, this is distributed as \( \chi^2 \) statistic with degrees of freedom equal to the dimension of \( \theta \). Table 3.1 provides the estimated values of the above test statistic for both the hourly and the weekly models and for a different number of pay ranges. We reject the null hypothesis for all the bottom and top ranges as the critical values of the chi-square test with

80
59 degrees of freedom at 10 percent, 5 percent and 1 percent, are: 73.28, 77.93 and 87.17 respectively.

### Table 3.1 LR Tests for Tail Probabilities.

<table>
<thead>
<tr>
<th>Number of pay intervals aggregated</th>
<th>Weekly pay</th>
<th></th>
<th>Hourly wage</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Bottom tail</td>
<td>Top tail</td>
<td>Bottom tail</td>
<td>Top tail</td>
</tr>
<tr>
<td>7</td>
<td>986.72</td>
<td>9058.43</td>
<td>915.11</td>
<td>8040.06</td>
</tr>
<tr>
<td>8</td>
<td>1131.45</td>
<td>29641.38</td>
<td>1023.32</td>
<td>28013.98</td>
</tr>
<tr>
<td>9</td>
<td>1174.85</td>
<td>949.29</td>
<td>1311.37</td>
<td>44926.10</td>
</tr>
<tr>
<td>10</td>
<td>46571.86</td>
<td>60939.74</td>
<td>745.17</td>
<td>58105.92</td>
</tr>
</tbody>
</table>

Note: all statistics are $\chi^2(59)$; 10%, 5% and 1% critical values are 73.28, 77.93 and 87.17.

The magnitude of the parameter estimates $\theta^*$ and $\theta^{**}$ differs significantly between $l_{ih}(\theta)$ and $l_{ih}^{**}(\theta)$ for all the different pay subsets. Also, some estimates differ not only in terms of power but swap sign as well. Calculation of the test statistic considering less than seven pay subsets proved infeasible because of the small number of observations in those cells.

#### 3.4.6 An ordered probit contrast test

The interval regression model is nested within the following ordered probit model:

$$w^*_{ih} = x_{ih}' + \nu_{ih}$$  \hspace{1cm} (3.10)

where $w^*_{ih} = w_{ih}/\omega$, $\nu_{ih} = \nu_{ih}/\omega$ and $\gamma = \beta/\omega$ and $\omega$ is the standard deviation of $\nu_{ih}$. Let $y_{ih} \in \{1 \ldots m\}$ be the ordinal indicator of the pay interval in which observation $i,h$ falls. Then:

$$\text{Pr}(y_{ih} = j \mid x_{ih}) = \text{Pr}(C_j > w^*_{ih} > C_{j-1} \mid x_{ih}) = \Phi(C_j - x_{ih}'\gamma) - \Phi(C_{j-1} - x_{ih}'\gamma)$$  \hspace{1cm} (3.11)

where $C_0 = -\infty$, $C_m = +\infty$ and $C_1 \ldots C_{m-1}$ are treated as unknown parameters. Let $W_1 \ldots W_{m-1}$ be the fixed limits of the pay ranges imposed by the WERS98 questionnaire design. Then the following restrictions should be satisfied by the ordered probit model:

$$\frac{W_j - \beta_0}{\omega} = C_j$$  \hspace{1cm} (3.12)
In words, equation (3.12) suggests that the upper threshold of the $j$th pay band minus the constant term obtained from the interval regression divided by its standard error should be equal to the corresponding $j$th threshold estimated from the ordered probit regression. These equalities can be tested by means of a likelihood ratio test.

In the hourly pay comparison of the thresholds between the interval regression and the ordered probit models, we have included the working hours per week as a regressor but we have restricted its coefficient to be equal to one over the estimated standard error from the interval regression. This can be verified by the following proof. The hourly interval regression model is given by: $\ln\left(\frac{E}{H}\right) = x\beta + \beta_0 + \epsilon$. From this equation we get estimates for $\beta, \beta_0$ and $\sigma$. Now, the probability of observing a pay range $j$ is given by:

$$Pr(\text{pay range } j) = \Phi\left(\frac{W_j - \beta_0 - x\beta - h}{\sigma}\right) - \Phi\left(\frac{W_{j-1} - \beta_0 - x\beta - h}{\sigma}\right), \text{ where } h = \ln(H).$$

If we rewrite $\Phi\left(\frac{W_j - \beta_0 - x\beta - h}{\sigma}\right) = \Phi\left[\left(\frac{W_j - \beta_0}{\sigma}\right) - x\left(\frac{\beta}{\sigma}\right) - \left(\frac{1}{\sigma}\right)h\right]$, we see that the above statement is valid. For both the hourly and weekly pay definitions, these tests are highly significant and reject the interval regression model (Table 3.2).

| Table 3.2 LR Tests of the Ordered Probit Model Against the Interval Regression Model. |
|-----------------------------|-----------------------------|
| PAY DEFINITION  | $\chi^2$ (9) |
| Hourly         | 567.938        |
| Weekly         | 437.806        |

The chi-squared critical values with 9 degrees of freedom at 10 percent, 5 percent and 1 percent are: 14.684, 16.919 and 21.666 respectively. According to these values we reject the interval regression specification against the ordered probit model.
Figures 3.3 and 3.4 plot the left-hand and right-hand sides of equation (3.12) and give a simple indication of the nature of departures from normality.

**Figure 3.3** Comparison of interval regression and ordered probit thresholds.

![Comparison of interval regression and ordered probit thresholds](image)

**Figure 3.4** Comparison of interval regression and ordered probit thresholds.

![Comparison of interval regression and ordered probit thresholds](image)

By inspecting Figures 3.3 and 3.4 we can see that the main problem is clearly the bottom tail of the conditional pay distribution, where the ordered probit results suggest that the upper limits of
the bottom two pay ranges would need to be shifted rightwards to capture the relatively large number of individuals in that range.

Also, it has to be noted that the parameter estimates between the ordered probit and the interval regression models differ in size as the estimates obtained from the ordered probit models (both weekly and hourly) are on average higher by around factor 3 than those obtained from the interval regression models. However, the level of significance and sign of the estimates between the two models is consistent.

3.5 Semi-parametric random-effects estimation

The maintained hypothesis of normality and homoskedasticity in the simple interval regression model is clearly not tenable empirically. Thus, parametric extensions allowing for heteroskedasticity and normality can be used (Chay and Honore, 1998; Horowitz, 1993; Melenberg and van Soest, 1996; Schafgans, 1998). We now explore an alternative approach that addresses both problems by allowing for the interaction of non-normal workplace effects with individual workers' gender/ethnicity characteristics.

3.5.1 The finite mixture approach

We use a semi-parametric finite mixture (FM) random-effects estimator based on the model given by equations (3.4)-(3.5). This approximates the distribution of the random effects \( u_h \) by an arbitrary trivariate discrete distribution, where the location and magnitude of the probability mass points are treated as fixed parameters.

Thus:

\[
E_u [P_{sh}(u_h)] = \sum_{q=1}^{Q} \pi_q P_{sh}(u^q)
\]

(3.13)
The mass points $u^q$ are additional parameters. The associated probabilities $\pi^q$ must be non-negative and sum to unity, so we parameterise them (without loss of generality) as a multinomial logit:

$$\pi^q = \frac{\exp(\rho^q)}{\sum_{r=1}^{Q} \exp(\rho^r)}$$  \hspace{1cm} (3.14)

where $\rho^1$ is normalised to 0 and $\rho^2 \ldots \rho^Q$ are the underlying free parameters.

Note that distribution \{$\pi^q, u^q$\} is degenerate unless some elements of the vectors $u^q$ are equal. However, since the parameter space is not constrained with respect to the $u^q$, degeneracy is not being imposed on the distribution. An alternative specification would be to have a fixed set of mass points for each $u_0, u_1$ and $u_2$ and then generate the $u^q$ as the set of their cartesian products. This would be a restricted version of our model and would have the disadvantage that for a given number of parameters it would generate many more terms in the sum of equation 3.13. The log-likelihood function given by equation (3.3) is maximised numerically for a sequence of specifications with different numbers of mass points $Q$ (see Figure 3.5). It is important to repeat the computational algorithm from a number of alternative starting points (five in this case), since there are known to be multiple optima in this class of likelihoods (Laird, 1978; Lindsay, 1981; Heckman and Singer, 1984).
3.6 Results

The results from the simple interval regression are close to the ones from the semi-parametric random effects estimator. Except gender (a 0/1 dummy taking the value of 1 if the individual is female), ethnicity (a 0/1 dummy taking the value of 1 if the individual is member of an ethnic minority group) and their interaction, other individual attributes include the age of the individual and its non-linear term (age squared), marital status (a 0/1 dummy taking the value of 1 if the individual is single), health status (a 0/1 dummy taking the value of 1 if the individual has a long standing health problem), five dummy variables that capture the highest educational qualification of the individual (postgraduate degree, first degree, A-levels, high GCSE (O-levels, grades A-C) (General Certificate of Secondary Education, equivalent to the honours high school curriculum in the US), and low GCSE (CSE, grades D-

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19 However, both the weekly and the hourly semi-parametric random effects estimates have smaller standard errors than the non-heterogeneous interval regression results.
G), the omitted category is “no qualification”), and having a vocational qualification (i.e. trade apprenticeship, NVQs or City and Guilds Certificate).

The specification of the impact of individual ethnicity and gender is the following. We started with an eight-category breakdown formed from the interaction of the two gender groups with the following four ethnic groups: Black (Afro-Caribbean and African); Indian; Pakistani and Bangladeshi. When estimated as a simple interval regression (with no random establishment effects), the intercepts for these four groups could be represented adequately by three dummy variables. Two of these distinguish females and a separate ethnic minority group. The third indicates ethnic minority women and thus captures an interaction effect. As explained in Chapter 2 (Section 2.3), the ethnic minority group is defined as the set of Blacks, Indians, Pakistanis and Bangladeshis. The restrictions embodied in this specification can be just accepted at the 5% level of significance despite the large sample size. The computed value for the corresponding Wald $\chi^2(4)$ test was 8.67 implying a p-value of 7.0% (a robust covariance matrix estimate was used to take account of sample clustering within firms). Since there was virtually no difference between the restricted and unrestricted models in the estimates of other coefficients, this specification was judged to be acceptable. It is also particularly convenient since it allows us to work with a single disadvantaged racial group.

Job characteristics include eight dummy variables that capture broad occupational classification according to the 1991 Standard Occupational Classification Guides (manager, professional, associate professional and technical, clerical and secretarial, craft and skilled

\footnote{It has been argued before whether one should include controls for occupational status in a study of discrimination since occupational differences may be caused by discrimination (Blau and Ferber, 1987). However, this view assumes that the only characteristic of an occupation is whether it is open to females or not. At the same time, it is widely accepted that occupations are affected differentially by compensating wage differentials and efficiency wages which are orthogonal to gender (Bell and Ritchie, 1998). Thus, omitting occupation controls leads to inefficient and upward biased estimates.}
service, personal and protective service, sales, plant and machine operatives, omitted category "other occupation" i.e. cleaner, postal worker), trade union membership (a 0/1 dummy), having a temporary job (a 0/1 dummy) and a continuous variable capturing years of tenure in the current job divided by 10.

We also include four interaction terms between occupational status and educational achievement. These are: holding a managerial or a professional post and having a degree, being associate professional or technical staff and having an A-level or a degree, holding a personal and protective service job and having a degree, an A-level, or an O-level, and working as a sales staff and having a CSE. We further include an interaction between being skilled (i.e. associate professional and technical, clerical and secretarial, craft and skilled service, personal and protective service) and female.

Workforce composition variables capture the profile of the stock of workers employed by the establishment at the time of the survey. This records the profile of the establishment's workforce in terms of gender (percentage of women at the establishment), ethnicity (percentage of ethnic minority employees at the establishment), and their corresponding interactions with the gender and ethnicity dummy variables respectively. We also control for the proportion of each occupational group at the establishment (i.e. managers, professional staff, technical staff, clerical staff, craft (skilled) staff, service staff and sales staff), proportion of part-time employees, and proportions of staff over 50 years of age and under 21 years of age respectively. Other establishment attributes include the size of the workforce (natural logarithm of the number of employees at the establishment), proportion of employees that belong to trade unions (union density) and its interaction with gender and ethnicity, two dummy variables for the legal status of the establishment (public sector
administration and its interaction with gender, private sector services, omitted category is private sector manufacturing), being a multi-establishment (part of a larger organization, a 0/1 dummy), if the degree of competition in the market that the establishment operates is very high/high (a 0/1 dummy), and if the establishment supplies its goods and services to the local market (a 0/1 dummy). Additionally, we control for the region at which the establishment is located according to the standard statistical region classification by including four region specific dummy variables (London, Rest of the South East, West-Midlands and Scotland)\textsuperscript{21} as well as two dummy variables coming from the management questionnaire and capturing different levels of the unemployment to vacancy rate by travel to work area.

Table A.3.2 in the Appendix gives the results of the random effects wage equation for both the weekly and hourly specifications estimated using a likelihood based on the distribution of equation 3.3. The random effects model involves three establishment-specific unobservables: a general firm specific effect $u_{oh}$; a female firm specific effect $u_{ih}$; and an ethnic minority firm specific effect $u_{2h}$. The coefficients are in general consistent in sign, significance and magnitude across the two specifications. We present the results simultaneously from the weekly and hourly specifications.

There are positive returns to job tenure and union membership. The age profile has the usual human capital inverse U-shape. Unmarried status and work-relevant health problems are both associated with a significant decrease in both weekly and hourly wages.

\textsuperscript{21} Initial tests showed that the dummy variables for the other regions obtained an insignificant coefficient in both the weekly and hourly specifications and were excluded. Their exclusion did not have an impact on the coefficients of the other covariates.
Returns to educational attainment are around 6%\textsuperscript{22} for having a low education qualification (low CSE) and as high as 22% for having a university degree. A postgraduate degree has an incremental return of 26% for weekly wages and 17% for hourly wages. Interestingly, holding a vocational qualification such as a trade apprenticeship, NVQs, or a City and Guilds Certificate is associated with a small but significant wage disadvantage of around 1%. In our specification we also include some interaction dummies between occupational status and educational achievement. The estimates reveal that combinations of jobs with higher educational achievements provide higher wage premia. The characteristics of the job are also important influences, with a large wage disadvantage being associated with temporary jobs.

The returns to occupational attainment are higher for high status jobs (managers and professional staff). Skilled employees (technical, craft, clerical and service) enjoy significant weekly and hourly wage premia. We find that the interaction dummy between being female and skilled is positive and significant in both models. Intuitively, this implies that female skilled employees enjoy a wage premium as opposed to other female employees. According to Groshen (1991b) this suggests a non-linear relationship between occupational wages and being female for both sexes, and that a pooled specification is more appropriate than single equations for men and women. The corresponding interaction dummy for the ethnic minority group was insignificant. This result hints that returns to skill levels both observed and unobserved are higher for women.

To test for the effects of workplace segregation on earnings, except controlling for the percentage of female and ethnic minority employees at the establishment we interact them

\textsuperscript{22} Following Halvorsen and Palmquist (1980), this is calculated as $100\times[\exp(0.056)-1]$, where the number 0.056 is the estimated coefficient of having a low school qualification as reported in Table A.3.3 in the Appendix. Other effects are calculated in the same way.
with their corresponding dummy variables. We find that the higher the percentage of female and ethnic minority employees at the establishment the lower is pay for all employees. This is a crucial finding and suggests that workplace segregation harms all the workers at the establishment. An alternative interpretation of this finding is that these two variables may capture the relative quality of the establishment suggesting that establishment that pay low wages are of lower quality in terms of the educational structure of their workforce. Empirical studies that focus exclusively on the gender and ethnic segregation such as segregation by occupation, employer, or by industry are by Sorensen (1990); Groshen (1991); Carrington and Troske (1994, 1998a, 1998b); Reilly and Wirjanto (1999) and Bayard et al. (2003).

An interesting result that emerges from our analysis is that although the coefficient of the percentage of female employees is negative and significant its interaction with the female dummy makes it positive and significant. This suggests that female employees get a higher wage working at establishments with high densities of female employees. This may imply that bargaining power for women is higher in establishments where women are overrepresented. In contrast, the corresponding interaction for ethnic minority employees has the opposite and significant effect. The latter result suggests that ethnic minority employees get lower wages in establishments with a high density of other ethnic minority employees. Note that the interacted coefficients are not directly interpretable. For instance, as the percentage of female employees at the establishment is zero, then the true effect of the female dummy on weekly wages is equal to (-0.22, see Table 3.3) or 22%. If the percentage of female employees is 50%, then the actual effect of the female dummy is -0.220+50(0.0007) or roughly 18.5%. Moreover, if the workforce is totally female, then the true effect is 15%. The corresponding weekly pay gaps for the ethnic minority variable are 28%, 38% and 48.
Thus, we see that establishment segregation has a much larger effect for ethnic minority workers compared to females.

We find a significant relationship between the occupational profile of an establishment and its wage-setting behaviour. Establishments employing high proportions of managerial and professional staff pay higher wages to all employees. Also, establishments with a high proportion of skilled labour tend to pay relatively high wages to all its employees. Interestingly, the coefficient of the proportion of craft staff is only significant in the hourly regression. This implies that the higher is the proportion of those employees at the establishment, the less are the working hours. Also, workplaces employing high proportions of part-time, young, and old staff tend to pay relatively low wages.

Union density within the workplace (defined as the proportion of the workforce believed by management to be union members) generates a moderate but significant weekly wage premium (4%) and an even higher hourly wage premium (11%) for both members and non-members. According to Blau and Kahn (1996), unionised firms may be more likely to generate a lower degree of gender and race discrimination as compared to a decentralised bargaining system and non-unionised firms. However, we find that the interaction dummy between female and union density is insignificant in the weekly regression but negative and significant at the 10% level of significance in the hourly regression. This finding is consistent with Hildreth (1999) who found an insignificant decline in the union wage differential for male workers, but a significant decline for female workers. In contrast, the interaction dummy between the ethnic minority dummy variable and union density is positive and significant in both specifications.
Firm size has a positive influence on wages (Brown and Medoff, 1989; Troske, 1999; Coles 2001). On average, establishments with many employees pay a weekly/hourly wage premium of around 3% to 4%. The business conditions faced by the employer also play a significant role. Establishments, whose main product market is local rather than regional, national or international, are associated with generally low levels of pay. Being part of a large firm (multi-establishment) increases both weekly and hourly pay by 4.6% and 3.4% correspondingly. There is also evidence of rent sharing (see Blanchflower et al., 1996; Hildreth and Oswald, 1997), with highly competitive product market conditions implying slightly lower wage levels of about 1.6% for weekly wages and 2.6% for hourly wages.

Working in the public sector (administration) involves a significant pay disadvantage of 7.4% for weekly wages and 6.8% for hourly wages. However, the interaction dummy between a public sector establishment and being female is positive and significant. This implies that there is a positive return to working in the public sector for women, or it just reflects equal pay for equal work policies. Alternatively, it may suggest that the greater degree of wage bargaining in the public sector helps to close the pay gap. Blackaby et al. (1996) found that gender and racial discrimination are less significant in the public than in the private sector. But, Pudney and Shields (2000a) found significant gender and racial pay differentials in the nursing profession, a profession that is dominated by the public sector.

For the private sector (services) the pay disadvantage is only significant for hourly wages (3.1%). This suggests that private sector service workers work longer hours and accords with Nickell and Quintini (2002) finding that the relative pay of most public sector workers (both male and female, except those in police and related groups) in the UK has declined sharply after the mid-1980s. Note also that, Blackaby et al. (1999) comparing pay
between the public and the private sectors in the UK found that public sector employees enjoy a higher wage premium in the lower tail of the wage distribution with respect to private sector employees but a pay disadvantage in the upper tail of the wage distribution correspondingly.

There are regional disparities in earnings. We find weekly and hourly wage differences between different regions, however both weekly and hourly earnings are highest in London (picking up compensating differentials for the higher cost of living), the South East and the West Midlands. Also, in Scotland employees enjoy higher hourly wages (see Blackaby and Frank, 2000). Further, the tighter is the labour market (i.e. high unemployment to vacancies ratios by travel to work area) the higher is the incidence of low paid jobs.

3.7 The random effects distribution

Our preferred specification is a 9-point trivariate discrete distribution for the establishment effects (this is also suggested from Figure 3.5).\(^\text{23}\) The specification was determined by means of likelihood ratio criteria. We reject the specifications of 10 and 11 mass points in favour of 9 mass points for both models. The computed \(\chi^2\) of the mean of the log-likelihood for the weekly random effects model between 9 and 10 mass points is 3.454. The critical \(\chi^2\) values with four degrees of freedom (equal to the number of extra parameters being estimated) at 10\%, 5\% and 1\% are respectively: 7.779, 9.488 and 13.277. Accordingly, the computed \(\chi^2\) of the mean of the log-likelihood between 9 and 11 mass points is 4.490. The

\(^{23}\) Estimation was done in GAUSS using the MAXLIK procedure. Since WERS98 is a stratified two-stage probability sample we also carried out a weighted estimation of the above specification by including into the estimation the establishment weight. The changes in the magnitude of the coefficients were very moderate, and the standard errors were approximately the same (on how to handle survey weights in multiple regression analyses of stratified samples see DuMouchel and Duncan, 1983). An interpretation of this result is that the coefficients of the random effects wage equation do not depend on the sampling probabilities.
critical $\chi^2$ values with eight degrees of freedom at 10%, 5% and 1% are respectively: 13.362, 15.507 and 20.090. Likewise, for the hourly specification the computed $\chi^2$ of the mean of the log-likelihood between 9 and 10 mass points is 2.418, and the corresponding value between 9 and 11 mass points is 4.834.

The implied means, standard deviations and correlations of the three establishment effects $u_{1h}, u_{2h}, u_{3h}$ obtained through equation 3.2 for both the weekly and the hourly regressions are given in Table 3.3.

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>WEEKLY REGRESSION</th>
<th>HOURLY REGRESSION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean of general effect ($u_o$)</td>
<td>4.150 (0.035)</td>
<td>0.407 (0.037)</td>
</tr>
<tr>
<td>Mean of gender effect ($u_1$)</td>
<td>-0.218 (0.013)</td>
<td>-0.133 (0.013)</td>
</tr>
<tr>
<td>Mean of race effect ($u_2$)</td>
<td>-0.159 (0.027)</td>
<td>-0.140 (0.026)</td>
</tr>
<tr>
<td>Std dev ($u_o$)</td>
<td>0.140 (0.005)</td>
<td>0.148 (0.005)</td>
</tr>
<tr>
<td>Std dev ($u_1$)</td>
<td>0.071 (0.008)</td>
<td>0.065 (0.008)</td>
</tr>
<tr>
<td>Std dev ($u_2$)</td>
<td>0.086 (0.045)</td>
<td>0.076 (0.022)</td>
</tr>
<tr>
<td>$\sigma$</td>
<td>0.251 (0.001)</td>
<td>0.247 (0.001)</td>
</tr>
<tr>
<td>$\hat{\rho}_{01}$</td>
<td>-0.520 (0.061)</td>
<td>-0.576 (0.065)</td>
</tr>
<tr>
<td>$\hat{\rho}_{02}$</td>
<td>-0.041 (0.462)</td>
<td>-0.015 (0.250)</td>
</tr>
<tr>
<td>$\hat{\rho}_{12}$</td>
<td>-0.461 (0.607)</td>
<td>-0.283 (0.360)</td>
</tr>
</tbody>
</table>

Note: Standard errors in parentheses.

As we can see, the means for both gender and race firm specific effects are different, especially for the weekly regression, where the means imply an average pay disadvantage of 22% for women relative to men and a 16% pay disadvantage for ethnic minorities relative to whites. Our estimated gender pay gap is as high as that reported by Harkness (1996), slightly
higher than the 21% disadvantage reported by Mumford and Smith (2004) who use the same dataset as in this study, and in the range of 20%-25% reported by Bowlus and Grogan (2003).

However, the positive coefficient (10% see Table A.3.2) estimated for the interaction dummy variable (being an ethnic minority woman) implies that relative to whites, ethnic minorities face an average pay disadvantage of roughly 28% rather than 38% that would be implied by summing up the separate gender and ethnicity effects. Another way of putting this is to say that weekly racial pay differentials are on average 22% for ethnic minority men but only 6% for ethnic minority women.

The variances of the firm effects in the weekly regression are all very significant. The variance of the general firm effects is double the variance of the gender effect, and almost double that of the race effect. The significant negative correlation $\hat{\rho}_{01}$ (the correlation between the unobserved general firm-specific wage premium and the firm-specific gender wage premium) implies that in contrast to men, high-wage firms tend to pay low female weekly wages. However, the correlations between the general firm effect and ethnicity wage premium ($\hat{\rho}_{02}$), and between the female wage premium and the ethnicity wage premium ($\hat{\rho}_{12}$) are insignificant.

For the hourly regression the mean firm effects imply an average pay disadvantage of 13% for women and 14% for ethnic minorities. On an hourly pay basis, racial pay differentials are on average 13% for ethnic minority men and just 6% for ethnic minority women. The male finding closely mirrors the 11% male wage differential found in the UK in the 1990s by Blackaby et al. (1998, 2002). Again, the variances of the firm effects are all
very significant. The correlation of $\hat{\rho}_{01}$ is again negative and highly significant, while correlations between $\hat{\rho}_{02}$ and $\hat{\rho}_{12}$ are insignificant.

It is very important to highlight the finding that the racial pay gap is lower for females than for males. This is in line with Bayard et al. (1999), Wadsworth (2003) and Antecol (2001), who suggest that cultural factors as well as family investment decisions play a strong role in determining gender wage differentials for ethnic minorities. Unfortunately, we do not observe the probability of being employed and thus we cannot control for sample selection (Heckman, 1979).

Finally, as we observe in Table 3.3, the relative gender gap in full-time weekly earnings is higher by 9% than that in hourly earnings. This suggests that there are systematic differences in the weekly hours worked for employees at different points of the wage distribution.

3.8 Firm-specific indicators of disadvantage

The posterior distribution of random effects (u) conditional on the observed variables relevant to establishment h is given by the ratio:

$$dF(u_h | X_h, \Xi_h) = \frac{Pr(y_h | X_h, \Xi_h, u_h) dF(u_h)}{Pr(y_h | X_h, \Xi_h)}$$

(3.15) where $y_h = \{y_{1h} y_{2h} \cdots \}$, $X_h = \{x_{1h} x_{2h} \cdots \}$, $\Xi_h = \{\xi_{11h} \xi_{21h}, \xi_{12h} \xi_{22h}, \cdots \}$. The mean of this distribution for workplace h, using the finite mixture assumption provided in Section 3.5.1 is given by the ratio:
where $u^q$ are mass points and $\pi^q$ the associated probabilities.

Our aim in this section is to uncover indirect indicators of disadvantage at the workplace by investigating the empirical relationship between $\hat{u}_{0h}$, $\hat{u}_{1h}$ and $\hat{u}_{2h}$, and variables that relate to employees' perceptions about managers and working conditions, as well as variables that capture employer's policies, practices and establishment's performance.

Variables that capture employees' perceptions are whether employees think that managers are poor/very poor in treating them fairly, whether employees think that managers are poor/very poor in dealing with work problems employees may have, feelings over job security at the workplace, and employees' judgement about whether the job they personally do is done by only/mainly men, equally done by men and women, or only/mainly done by women. Variables that capture policies and practices at the establishment are whether managers have tried to measure the effects of equal opportunities policies on the workplace or on the employees at the establishment (given that those policies exist), whether any tribunal applications in the last year were on sex or race discrimination and the number of complaints made, and whether any grievances on sex or race discrimination were raised at the establishment in the past year through a formal procedure. A variable that captures the establishment's performance is whether managers think that labour productivity at the establishment is a lot better/better than average compared with other establishments in the same industry.
These variables were not included in the econometric specification as they may be viewed as endogenous. Those employees or employers who answered affirmatively in the above questions are coded as \((Y=1)\) and those answered negatively are coded as \((Y=0)\). Tables 3.4 and 3.5 present cross tabulations for those establishments in which there was at least one employee record and a positive percentage of women and ethnic minority employees who responded to the survey. In this case we end up with 1,715 firms.
<table>
<thead>
<tr>
<th></th>
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<tbody>
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</tr>
</tbody>
</table>

**Table 3.4 Intercorrelations Between the Emotional Mean of the Firm's Specific Effect and Variables of Interest from the Employee Questionnaire.**
<table>
<thead>
<tr>
<th>Year</th>
<th>White Male</th>
<th>White Female</th>
<th>Black Male</th>
<th>Black Female</th>
<th>Hispanic Male</th>
<th>Hispanic Female</th>
<th>Asian Male</th>
<th>Asian Female</th>
<th>Native American Male</th>
<th>Native American Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>1091</td>
<td>114</td>
<td>803</td>
<td>1093</td>
<td>1093</td>
<td>114</td>
<td>1093</td>
<td>1093</td>
<td>1093</td>
<td>1093</td>
</tr>
<tr>
<td>2015</td>
<td>114</td>
<td>114</td>
<td>803</td>
<td>1093</td>
<td>1093</td>
<td>114</td>
<td>1093</td>
<td>1093</td>
<td>1093</td>
<td>1093</td>
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<tr>
<td>2016</td>
<td>114</td>
<td>114</td>
<td>803</td>
<td>1093</td>
<td>1093</td>
<td>114</td>
<td>1093</td>
<td>1093</td>
<td>1093</td>
<td>1093</td>
</tr>
<tr>
<td>2017</td>
<td>114</td>
<td>114</td>
<td>803</td>
<td>1093</td>
<td>1093</td>
<td>114</td>
<td>1093</td>
<td>1093</td>
<td>1093</td>
<td>1093</td>
</tr>
</tbody>
</table>

Table 2.3: Interactions Between the Estimated Means of the Firm-Specific Effects and Variables of Interest from the Management Questionnaire.
From Tables 3.4 and 3.5 it is evident that the interacted means between the estimated differentials and the above variables do not differ from the original means of the firm specific effects (see Table 3.3). This is a rather surprising finding. Although one would expect the above variables to have a strong effect on wages or even be endogenous in a wage specification, they are not correlated with the firm-specific wage differentials.

Nevertheless, there are a number of competing explanations. It could well be the case that the mechanisms under which women and ethnic minority employees are getting unjustified lower wages are well hidden, as workplace discrimination is mostly indirect after the introduction of anti-discrimination legislations. Also, discrimination on pay even within standard pay scales towards women and ethnic minority employees rather than on other labour market aspects (promotion, training, etc.) is easier to hide since the former is private whereas the latter are public. Intuitively, it is easier for establishments to discriminate on less visible dimensions of the employment relationship such as earnings rather than on observables such as promotion and training.

Another explanation could be that women and non-white employees do not report or find it difficult to report their dissatisfaction or their complaints and grievances to their managers or to industrial tribunals. Shields and Wheatley Price (2002) examining the determinants of racial harassment for nurses in Britain suggest that the majority of such assaults go unreported and less enter the employment tribunal system. This may be due either to the fact that there is no legal support for individuals claiming sex discrimination (Joshi and Paci, 1998) or that resorts to grievances and tribunal procedures are not really accessible to low skilled employees (Pudney, 2000).
3.9 Conclusions

In this chapter we empirically test for firm specific gender and ethnicity pay differentials using the partially observed pay variable provided by the WERS98. Using two alternative tests we proved that the maintained hypothesis of normality and homoskedasticity in the simple interval regression are not tenable empirically. Thus, using a semi-parametric finite mixture random effects estimator we address both problems by allowing for the interaction of non-normal workplace effects with individual workers' gender/ethnicity characteristics.

We found robust evidence in support of significant pay differentials between men and women and between white and non-white employees. The empirical estimation reveals a 22% weekly gender pay gap and a 28% weekly race pay gap. The corresponding hourly estimates are of a lower magnitude (13% and 19% correspondingly), representing effective number of hours worked and thus capturing true productivity. We also show that the inclusion of unobserved establishment heterogeneity in a conventional human capital based earnings function adds an important feature to the determinants of wages. For instance, we have found strong evidence that high wage firms tend to pay low female wages.

Our methodology cannot identify the nature of discrimination. In other words, the estimated coefficients on the worker gender and race dummies cannot distinguish between Becker's three sources of discrimination (employer, employee, customer) as the coefficients could be measuring any combination of all three (see Bodvarsson and Partridge, 2001). However, by calculating the posterior distribution of the firm specific unobservable variables and by correlating them to other variables that may have a large impact on employees' pay, we found no significant correlation. Thus, it is very difficult to draw any policy implications that might help to reduce the above differentials since the pay disadvantage seems to vary from
establishment to establishment and somewhat strikingly be uncorrelated with other important determinants of wages.

However, we can speculate on some of them. Implementing and monitoring equal opportunity policies further may be an implication that the current government has to think about seriously. Further, any policy changes with regard to existing “pay for work of equal value” legislation should be directed towards the amendment of the existing laws, or through the introduction of new job evaluated grading structures. Bayard et al. (1999) give support to the evidence that the majority of the wage gap was due to the individual's gender and not explained by segregation. We give support to the above argument. However, establishment segregation matters as well. We find that the higher is the percentage of female employees at the establishment the lower are the wages for all employees. However, female employees get actually higher wages in female segregated establishments. In contrast, we find both the direct and the indirect effects of establishment segregation to be significantly negative for ethnic minority employees. Thus, one may have to devise different policies for reducing the gender gap and different policies for reducing the race gap. It seems that “comparable worth pay” legislation would be more appropriate for reducing the race rather than the gender pay gap.

Because of the large and significant gender and ethnic pay gaps found in this Chapter, the next Chapter tries to examine if these pay gaps are translated into lower job satisfaction for women and ethnic minority employees respectively.
### APPENDIX

**Table A.3.1 Sample Properties of Variables (Weighted N=20,345).**

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>MEAN</th>
<th>VARIABLE</th>
<th>MEAN</th>
<th>VARIABLE</th>
<th>MEAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Job tenure (years)</td>
<td>7.128</td>
<td>Clerical</td>
<td>0.154</td>
<td>Female percentage</td>
<td>48.242</td>
</tr>
<tr>
<td>(0.010)</td>
<td></td>
<td>(0.006)</td>
<td></td>
<td></td>
<td>(1.174)</td>
</tr>
<tr>
<td>Temporary job</td>
<td>0.019</td>
<td>Craft</td>
<td>0.133</td>
<td>Female percentage &amp; female</td>
<td>21.777</td>
</tr>
<tr>
<td>(0.001)</td>
<td></td>
<td>(0.007)</td>
<td></td>
<td></td>
<td>(0.681)</td>
</tr>
<tr>
<td>Working hours per week</td>
<td>42.677</td>
<td>Service occupation</td>
<td>0.059</td>
<td>Trade union density</td>
<td>0.264</td>
</tr>
<tr>
<td>(0.137)</td>
<td></td>
<td>(0.007)</td>
<td></td>
<td></td>
<td>(0.013)</td>
</tr>
<tr>
<td>Trade union member</td>
<td>0.443</td>
<td>Sales</td>
<td>0.047</td>
<td>Minority &amp; union density</td>
<td>0.012</td>
</tr>
<tr>
<td>(0.013)</td>
<td></td>
<td>(0.003)</td>
<td></td>
<td></td>
<td>(0.001)</td>
</tr>
<tr>
<td>Age (years)</td>
<td>39.508</td>
<td>Operatives</td>
<td>0.164</td>
<td>Female &amp; union density</td>
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</tr>
<tr>
<td>(0.016)</td>
<td></td>
<td>(0.010)</td>
<td></td>
<td></td>
<td>(0.004)</td>
</tr>
<tr>
<td>Female</td>
<td>0.366</td>
<td>Skilled female</td>
<td>0.192</td>
<td>Public sector</td>
<td>0.264</td>
</tr>
<tr>
<td>(0.008)</td>
<td></td>
<td>(0.006)</td>
<td></td>
<td></td>
<td>(0.016)</td>
</tr>
<tr>
<td>Minority</td>
<td>0.028</td>
<td>Sale &amp; CSE</td>
<td>0.010</td>
<td>Private sector (services)</td>
<td>0.545</td>
</tr>
<tr>
<td>(0.002)</td>
<td></td>
<td>(0.001)</td>
<td></td>
<td></td>
<td>(0.018)</td>
</tr>
<tr>
<td>Ethnic minority woman</td>
<td>0.012</td>
<td>Service &amp; (GCSE or Alevel or Degree)</td>
<td>0.040</td>
<td>Female &amp; public sector</td>
<td>0.134</td>
</tr>
<tr>
<td>(0.002)</td>
<td></td>
<td>(0.005)</td>
<td></td>
<td></td>
<td>(0.006)</td>
</tr>
<tr>
<td>Ethnic minority man</td>
<td>0.016</td>
<td>Technical &amp; (Alevel or Degree)</td>
<td>0.054</td>
<td>Competitive firm</td>
<td>0.584</td>
</tr>
<tr>
<td>(0.001)</td>
<td></td>
<td>(0.003)</td>
<td></td>
<td></td>
<td>(0.017)</td>
</tr>
<tr>
<td>Ethnic majority man</td>
<td>0.619</td>
<td>Professional staff or manager &amp; Degree</td>
<td>0.112</td>
<td>Ln (Size of firm)</td>
<td>3.675</td>
</tr>
<tr>
<td>(0.009)</td>
<td></td>
<td>(0.005)</td>
<td></td>
<td></td>
<td>(0.025)</td>
</tr>
<tr>
<td>Ethnic majority woman</td>
<td>0.353</td>
<td>Proportion part-time</td>
<td>0.192</td>
<td>Part of a large firm</td>
<td>0.691</td>
</tr>
<tr>
<td>(0.008)</td>
<td></td>
<td>(0.008)</td>
<td></td>
<td></td>
<td>(0.023)</td>
</tr>
<tr>
<td>Low school qualification (CSE)</td>
<td>0.122</td>
<td>Proportion managerial</td>
<td>0.112</td>
<td>Market local</td>
<td>0.308</td>
</tr>
<tr>
<td>(0.004)</td>
<td></td>
<td>(0.005)</td>
<td></td>
<td></td>
<td>(0.019)</td>
</tr>
<tr>
<td>High school qualification (GCSE)</td>
<td>0.248</td>
<td>Proportion professional</td>
<td>0.145</td>
<td>London</td>
<td>0.112</td>
</tr>
<tr>
<td>(0.005)</td>
<td></td>
<td>(0.009)</td>
<td></td>
<td></td>
<td>(0.016)</td>
</tr>
<tr>
<td>A-level</td>
<td>0.147</td>
<td>Proportion technical</td>
<td>0.074</td>
<td>Rest of the South East</td>
<td>0.226</td>
</tr>
<tr>
<td>(0.004)</td>
<td></td>
<td>(0.008)</td>
<td></td>
<td></td>
<td>(0.021)</td>
</tr>
<tr>
<td>Degree</td>
<td>0.175</td>
<td>Proportion clerical</td>
<td>0.194</td>
<td>West Midlands</td>
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</tr>
<tr>
<td>(0.004)</td>
<td></td>
<td>(0.009)</td>
<td></td>
<td></td>
<td>(0.016)</td>
</tr>
<tr>
<td>Postgraduate degree</td>
<td>0.062</td>
<td>Proportion craft</td>
<td>0.114</td>
<td>Scotland</td>
<td>0.076</td>
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<td>(0.003)</td>
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<td>(0.009)</td>
<td></td>
<td></td>
<td>(0.009)</td>
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<tr>
<td>Vocational qualification</td>
<td>0.404</td>
<td>Proportion sales staff</td>
<td>0.081</td>
<td>Banded total</td>
<td>0.667</td>
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<td>(0.006)</td>
<td></td>
<td>(0.006)</td>
<td></td>
<td>unemployment/vacancy rate by travel to work area (3%-6%)</td>
<td>(0.023)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Banded total unemployment/vacancy rate by travel to work area (more than 7%)</td>
<td>(0.010)</td>
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<tr>
<td>Health problem</td>
<td>0.061</td>
<td>Proportion services staff</td>
<td>0.075</td>
<td>Ln(lower level of wage per week)</td>
<td>5.519</td>
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<tr>
<td>(0.003)</td>
<td></td>
<td>(0.007)</td>
<td></td>
<td></td>
<td>(0.013)</td>
</tr>
<tr>
<td>Unmarried</td>
<td>0.227</td>
<td>Proportion over 50</td>
<td>0.152</td>
<td>Ln(upper level of wage per week)</td>
<td>5.804</td>
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<tr>
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<td>(0.006)</td>
<td></td>
<td></td>
<td>(0.013)</td>
</tr>
<tr>
<td>Managerial</td>
<td>0.113</td>
<td>Proportion under 21</td>
<td>0.051</td>
<td>Ln(lower level of wage per hour)</td>
<td>1.778</td>
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<td>(0.003)</td>
<td></td>
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<td>(0.013)</td>
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<tr>
<td>Professional</td>
<td>0.144</td>
<td>Minority percentage</td>
<td>4.136</td>
<td>Ln(upper level of wage per hour)</td>
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<td>(0.282)</td>
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<td>Technical</td>
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<td>Minority percentage</td>
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<tr>
<td>&amp; minority</td>
<td>(0.004)</td>
<td>(0.598)</td>
<td></td>
<td></td>
<td>(0.013)</td>
</tr>
</tbody>
</table>

*Note: Standard errors in parentheses.*
Table A.3.2 Non-Heterogeneous Interval Regression Results (robust standard errors).

<table>
<thead>
<tr>
<th>COVARIATE</th>
<th>WEEKLY PAY</th>
<th>HOURLY PAY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tenure/10</td>
<td>0.063***</td>
<td>0.070***</td>
</tr>
<tr>
<td>Temporary Job</td>
<td>-0.091***</td>
<td>-0.073***</td>
</tr>
<tr>
<td>Age</td>
<td>0.503***</td>
<td>0.466***</td>
</tr>
<tr>
<td>(Age/10)^2</td>
<td>-0.055***</td>
<td>-0.050***</td>
</tr>
<tr>
<td>Unmarried</td>
<td>-0.086***</td>
<td>-0.079***</td>
</tr>
<tr>
<td>Trade union member</td>
<td>0.065***</td>
<td>0.054***</td>
</tr>
<tr>
<td>Low school qualification (Low CSE)</td>
<td>0.053***</td>
<td>0.054***</td>
</tr>
<tr>
<td>High school qualification (High CSE)</td>
<td>0.119***</td>
<td>0.116***</td>
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<td>Intermediate school qualification</td>
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<td>0.151***</td>
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<td>University degree</td>
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<td>0.202***</td>
</tr>
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<td>Postgraduate degree</td>
<td>0.404***</td>
<td>0.344***</td>
</tr>
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<td>Vocational qualification</td>
<td>-0.016***</td>
<td>-0.014***</td>
</tr>
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<td>Health problem</td>
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<td>-0.030***</td>
</tr>
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<td>Female</td>
<td>-0.226***</td>
<td>-0.129***</td>
</tr>
<tr>
<td>Minority</td>
<td>-0.161***</td>
<td>-0.132***</td>
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<tr>
<td>Ethnic minority woman</td>
<td>0.091***</td>
<td>0.087***</td>
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<td>Managerial</td>
<td>0.581***</td>
<td>0.512***</td>
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<td>0.284***</td>
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<td>Clerical</td>
<td>0.096***</td>
<td>0.132***</td>
</tr>
<tr>
<td>Craft (skilled manual)</td>
<td>0.162***</td>
<td>0.150***</td>
</tr>
<tr>
<td>Service occupation</td>
<td>0.165***</td>
<td>0.157***</td>
</tr>
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<td>Sales</td>
<td>0.191***</td>
<td>0.192***</td>
</tr>
<tr>
<td>Operative</td>
<td>0.036***</td>
<td>0.015</td>
</tr>
<tr>
<td>Professional or managerial &amp; degree</td>
<td>0.145***</td>
<td>0.112***</td>
</tr>
<tr>
<td>Technical &amp; (a level or degree)</td>
<td>0.078***</td>
<td>0.074***</td>
</tr>
<tr>
<td>Service &amp; (high CSE or, a level or, degree)</td>
<td>0.102***</td>
<td>0.084***</td>
</tr>
<tr>
<td>Sales &amp; low CSE</td>
<td>-0.142***</td>
<td>-0.091***</td>
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<tr>
<td>Female and skilled</td>
<td>0.038***</td>
<td>0.036***</td>
</tr>
<tr>
<td>Percentage of female &amp; female</td>
<td>0.0009***</td>
<td>0.0006**</td>
</tr>
<tr>
<td>Percentage of females</td>
<td>-0.0024***</td>
<td>-0.0014***</td>
</tr>
<tr>
<td>Percentage of ethnic minority &amp; minority</td>
<td>-0.0017**</td>
<td>-0.0023**</td>
</tr>
<tr>
<td>Percentage of minorities</td>
<td>-0.0009*</td>
<td>-0.0005</td>
</tr>
<tr>
<td>Proportion part-time staff</td>
<td>-0.237***</td>
<td>-0.219***</td>
</tr>
<tr>
<td>Proportion managerial staff</td>
<td>0.195***</td>
<td>0.256***</td>
</tr>
<tr>
<td>Proportion professional staff</td>
<td>0.186***</td>
<td>0.224***</td>
</tr>
<tr>
<td>Proportion technical staff</td>
<td>0.098***</td>
<td>0.192***</td>
</tr>
<tr>
<td>Proportion clerical staff</td>
<td>0.225***</td>
<td>0.310***</td>
</tr>
<tr>
<td>Proportion craft (skilled) staff</td>
<td>0.037</td>
<td>0.091***</td>
</tr>
<tr>
<td>Proportion service staff</td>
<td>0.103***</td>
<td>0.141***</td>
</tr>
<tr>
<td>Proportion sales staff</td>
<td>0.216***</td>
<td>0.267***</td>
</tr>
<tr>
<td>Proportion staff over 50</td>
<td>-0.227***</td>
<td>-0.171***</td>
</tr>
<tr>
<td>Proportion staff under 21</td>
<td>-0.374***</td>
<td>-0.395***</td>
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<tr>
<td>Ln(employment)</td>
<td>0.030***</td>
<td>0.033***</td>
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Continued
Table A.3.2 Non-Heterogeneous Interval Regression Results (robust standard errors)

<table>
<thead>
<tr>
<th>COVARIATE</th>
<th>WEEKLY PAY COEFFICIENT</th>
<th>STD ERROR</th>
<th>COVARIATE</th>
<th>HOURLY PAY COEFFICIENT</th>
<th>STD ERROR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Union density</td>
<td>0.045**</td>
<td>0.0178</td>
<td>Union density</td>
<td>0.110***</td>
<td>0.0188</td>
</tr>
<tr>
<td>Female &amp; trade union density</td>
<td>-0.008</td>
<td>0.0185</td>
<td>Female &amp; trade union density</td>
<td>-0.053***</td>
<td>0.0184</td>
</tr>
<tr>
<td>Minority &amp; trade union density</td>
<td>0.093**</td>
<td>0.0400</td>
<td>Minority &amp; trade union density</td>
<td>0.071*</td>
<td>0.0384</td>
</tr>
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<td>Public sector (administration)</td>
<td>-0.097***</td>
<td>0.0167</td>
<td>Public sector (administration)</td>
<td>-0.106***</td>
<td>0.0166</td>
</tr>
<tr>
<td>Female &amp; public sector</td>
<td>0.037***</td>
<td>0.0122</td>
<td>Female &amp; public sector</td>
<td>0.018</td>
<td>0.0124</td>
</tr>
<tr>
<td>Private sector (service)</td>
<td>-0.029**</td>
<td>0.0132</td>
<td>Private sector (service)</td>
<td>-0.051***</td>
<td>0.0135</td>
</tr>
<tr>
<td>Part of large firm</td>
<td>0.025</td>
<td>0.0119</td>
<td>Part of large firm</td>
<td>0.026**</td>
<td>0.0122</td>
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<tr>
<td>Local product market</td>
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<td>0.0096</td>
<td>Local product market</td>
<td>-0.023**</td>
<td>0.0098</td>
</tr>
<tr>
<td>Highly competitive market</td>
<td>-0.020**</td>
<td>0.0091</td>
<td>Highly competitive market</td>
<td>-0.033***</td>
<td>0.0092</td>
</tr>
<tr>
<td>London</td>
<td>0.219***</td>
<td>0.0148</td>
<td>London</td>
<td>0.217***</td>
<td>0.0152</td>
</tr>
<tr>
<td>Rest of the South East</td>
<td>0.089***</td>
<td>0.0105</td>
<td>Rest of the South East</td>
<td>0.086***</td>
<td>0.0112</td>
</tr>
<tr>
<td>West-Midlands</td>
<td>0.040***</td>
<td>0.0139</td>
<td>West-Midlands</td>
<td>0.036***</td>
<td>0.0141</td>
</tr>
<tr>
<td>Scotland</td>
<td>0.186</td>
<td>0.0131</td>
<td>Scotland</td>
<td>0.040***</td>
<td>0.0125</td>
</tr>
<tr>
<td>Banded total unemployment (area)</td>
<td>-0.052***</td>
<td>0.0101</td>
<td>Banded total unemployment (area)</td>
<td>-0.050***</td>
<td>0.0102</td>
</tr>
<tr>
<td><strong>Banded total unemployment (area)</strong></td>
<td><strong>-0.078</strong>*</td>
<td>0.0161</td>
<td><strong>Banded total unemployment (area)</strong></td>
<td><strong>-0.065</strong>*</td>
<td>0.0171</td>
</tr>
<tr>
<td>Constant</td>
<td>4.176***</td>
<td>0.0484</td>
<td>Constant</td>
<td>0.380***</td>
<td>0.0453</td>
</tr>
<tr>
<td>Sigma</td>
<td>-1.262***</td>
<td>0.0094</td>
<td>Sigma</td>
<td>-1.271***</td>
<td>0.0097</td>
</tr>
<tr>
<td>Llog=-35549.694</td>
<td>Wald chi2(59)=16970.47</td>
<td></td>
<td>Llog=-35279.004</td>
<td>Wald chi2(59)=13570.85</td>
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<tr>
<td>N=20345</td>
<td>Prob&gt;chi2~0.0000</td>
<td></td>
<td>N=20345</td>
<td>Prob&gt;chi2~0.0000</td>
<td></td>
</tr>
</tbody>
</table>

Note: **,***, *, 10%, 5% and 1% level of significance correspondingly. The results are obtained by estimating equation 3.2 \( w_{ih} = \beta_0 + x_{ih}\beta + u_{ih} + \xi_{1ih}u_{1ih} + \xi_{2ih}u_{2ih} + \epsilon_{ih} \) as a standard interval regression model. The dummy variables \( \xi_{1ih} \) and \( \xi_{2ih} \) are absorbed into the vector of observable characteristics \( x_{ih} \) and we treat the composite error term \( v_{ih} \) as a residual.
<table>
<thead>
<tr>
<th>COVARIATE</th>
<th>WEEKLY PAY COEFFICIENT</th>
<th>STD ERROR</th>
<th>COVARIATE</th>
<th>HOURLY PAY COEFFICIENT</th>
<th>STD ERROR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tenure/10</td>
<td>0.063***</td>
<td>0.0041</td>
<td>Tenure/10</td>
<td>0.065***</td>
<td>0.0041</td>
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<td>0.0123</td>
<td>Temporary Job</td>
<td>-0.072***</td>
<td>0.0124</td>
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<td>Age</td>
<td>0.491***</td>
<td>0.0115</td>
<td>Age</td>
<td>0.445***</td>
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<tr>
<td>Age/10^0.5</td>
<td>-0.053***</td>
<td>0.0014</td>
<td>(Age/10)^0.5</td>
<td>-0.048***</td>
<td>0.0014</td>
</tr>
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<td>Married</td>
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<td>Trade union member</td>
<td>-0.066***</td>
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</tr>
<tr>
<td>Trade union member</td>
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<td>0.0048</td>
<td>TU member</td>
<td>0.046***</td>
<td>0.0049</td>
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<tr>
<td>Low school qualification (Low)</td>
<td>0.056***</td>
<td>0.0081</td>
<td>Low school qualification (Low CSE)</td>
<td>0.057***</td>
<td>0.0079</td>
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<td>High school qualification</td>
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<td>0.0066</td>
<td>High school qualification</td>
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<td>0.0067</td>
</tr>
<tr>
<td>Intermediate school qualification (High CSE)</td>
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<td>0.0081</td>
<td>Intermediate school qualification (High CSE)</td>
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<td>Postgraduate degree</td>
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<td>Vocational qualification</td>
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<td>Health problem</td>
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<td>Ethnic minority woman</td>
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<td>Professional</td>
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<td>Professional</td>
<td>0.394***</td>
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<td>0.0100</td>
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<td>0.0099</td>
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<td>0.158***</td>
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<td>Craft (skilled manual)</td>
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<td>Service occupation</td>
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<td>Sales</td>
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<td>0.0093</td>
<td>Operative</td>
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<td>0.0092</td>
</tr>
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<td>Professional or managerial &amp; degree</td>
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<td>0.0113</td>
<td>Professional or managerial or degree</td>
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<td>0.0112</td>
</tr>
<tr>
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<td>0.0131</td>
<td>Technical &amp; (alevel or degree)</td>
<td>0.060***</td>
<td>0.0127</td>
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<tr>
<td>Service &amp; (highese or, alevel or, degree)</td>
<td>0.051***</td>
<td>0.0172</td>
<td>Service &amp; (highese or, alevel or, degree)</td>
<td>0.039***</td>
<td>0.0165</td>
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<tr>
<td>Sales &amp; low CSE</td>
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<td>Sales &amp; low CSE</td>
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<td>Skilled</td>
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<td>0.0086</td>
<td>Female &amp; skilled</td>
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<td>0.0002</td>
<td>Percentage of female &amp; female</td>
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<td>0.0002</td>
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<td>0.0002</td>
<td>Percentage of females</td>
<td>-0.0014***</td>
<td>0.0002</td>
</tr>
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<td>0.0007</td>
<td>Percentage of ethnic minority &amp; minority</td>
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<td>0.0006</td>
</tr>
<tr>
<td>Percentage of minorities</td>
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<td>0.0005</td>
<td>Percentage of minorities</td>
<td>-0.0013***</td>
<td>0.0004</td>
</tr>
<tr>
<td>Proportion part-time staff</td>
<td>-0.233***</td>
<td>0.0211</td>
<td>Proportion part-time staff</td>
<td>-0.207***</td>
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<td>Proportion managerial staff</td>
<td>0.231***</td>
<td>0.0356</td>
<td>Proportion managerial staff</td>
<td>0.250***</td>
<td>0.0401</td>
</tr>
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<td>0.0219</td>
<td>Proportion professional staff</td>
<td>0.200***</td>
<td>0.0231</td>
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<td>0.0265</td>
<td>Proportion technical staff</td>
<td>0.210***</td>
<td>0.0285</td>
</tr>
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<td>Proportion clerical staff</td>
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<td>0.0207</td>
<td>Proportion clerical staff</td>
<td>0.314***</td>
<td>0.0228</td>
</tr>
<tr>
<td>Proportion craft (skilled) staff</td>
<td>0.028</td>
<td>0.0253</td>
<td>Proportion craft (skilled) staff</td>
<td>0.058**</td>
<td>0.0237</td>
</tr>
<tr>
<td>Proportion service staff</td>
<td>0.091***</td>
<td>0.0206</td>
<td>Proportion service staff</td>
<td>0.111***</td>
<td>0.0224</td>
</tr>
<tr>
<td>Proportion sales staff</td>
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<td>0.0235</td>
<td>Proportion sales staff</td>
<td>0.205***</td>
<td>0.0253</td>
</tr>
<tr>
<td>Proportion staff over 50</td>
<td>-0.215***</td>
<td>0.0285</td>
<td>Proportion staff over 50</td>
<td>-0.191***</td>
<td>0.0324</td>
</tr>
<tr>
<td>Proportion staff under 21</td>
<td>-0.254***</td>
<td>0.0361</td>
<td>Proportion staff under 21</td>
<td>-0.317***</td>
<td>0.0437</td>
</tr>
<tr>
<td>Ln(employment)</td>
<td>0.031***</td>
<td>0.0032</td>
<td>Ln(employment)</td>
<td>0.037***</td>
<td>0.0033</td>
</tr>
<tr>
<td>Union density</td>
<td>0.044***</td>
<td>0.0155</td>
<td>Union density</td>
<td>0.105***</td>
<td>0.0157</td>
</tr>
</tbody>
</table>

Continued
<table>
<thead>
<tr>
<th>COVARIATE</th>
<th>WEEKLY PAY</th>
<th>HOUROLY PAY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>COEFFICIENT</td>
<td>STD ERROR</td>
</tr>
<tr>
<td>Female &amp; trade union density</td>
<td>0.005</td>
<td>0.0164</td>
</tr>
<tr>
<td>Minority &amp; trade union density</td>
<td>0.122***</td>
<td>0.0427</td>
</tr>
<tr>
<td>Public sector (administration)</td>
<td>-0.077***</td>
<td>0.0166</td>
</tr>
<tr>
<td>Female &amp; trade union density</td>
<td>0.035***</td>
<td>0.0127</td>
</tr>
<tr>
<td>Private sector (services)</td>
<td>-0.014</td>
<td>0.0122</td>
</tr>
<tr>
<td>Part of large firm</td>
<td>0.045***</td>
<td>0.0091</td>
</tr>
<tr>
<td>Local product market</td>
<td>-0.030***</td>
<td>0.0089</td>
</tr>
<tr>
<td>Highly competitive market</td>
<td>-0.016*</td>
<td>0.0085</td>
</tr>
<tr>
<td>London</td>
<td>0.220***</td>
<td>0.0127</td>
</tr>
<tr>
<td>Rest of the South East</td>
<td>0.097***</td>
<td>0.0098</td>
</tr>
<tr>
<td>West-Midlands</td>
<td>0.032**</td>
<td>0.0132</td>
</tr>
<tr>
<td>Scotland</td>
<td>0.011</td>
<td>0.0124</td>
</tr>
<tr>
<td>Banded total</td>
<td>-0.046***</td>
<td>0.0088</td>
</tr>
<tr>
<td>Unemployment/vacancy rate by travel to work area</td>
<td>-0.078***</td>
<td>0.0157</td>
</tr>
<tr>
<td>Sigma</td>
<td>0.251***</td>
<td>0.0099</td>
</tr>
<tr>
<td>-2Llog=68930.260</td>
<td>AIC=40.021</td>
<td></td>
</tr>
<tr>
<td>N=20345</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: *, **, *** 10%, 5% and 1% level of significance correspondingly. The results are estimated by approximating equation 3.4 \( \Pr(w_{ih} \in R_{ih} | x_{ih}, \xi_{1ih}, \xi_{2ih}) = E_u[P_{ih}(u_h)] \) through a semi-parametric random effects finite-mixture estimator. This approximates the distribution of the random effects \( u_h \) by an arbitrary trivariate discrete distribution where the magnitude and location of mass points are treated as fixed parameters.
Chapter 4

Labour Market Disadvantaged but Happy Workers? A Re-Examination Using Matched Employer-Employee Data

4.1 Introduction

Chapter 3 uncovered significant and robust firm specific gender and ethnic pay differentials. To the extent that these pay gaps are thought to be due to active discrimination, other things held constant, one would expect women and ethnic minorities to experience lower levels of job satisfaction than their respective male and white counterparts. In contrast to the above prediction, the small but growing research on job satisfaction reveals that women report higher levels of job satisfaction than men. This contradiction is known as the "job satisfaction paradox".

In this Chapter we examine exactly this. Having data on four different measures of job satisfaction and a rich matched employer-employee dataset (WERS98) we examine if there are any gender and ethnic differentials relating to satisfaction with: a) the amount of influence over the job an employee has; b) the amount of pay he/she receives; c) the sense of achievement he/she gets from work; and d) the respect he/she perceives from supervisors or line managers. To check for the robustness of our results and to compare them with the results of other studies on job satisfaction we construct an overall measure of job satisfaction by summing the four job satisfaction aspects. We also examine the direct effect of equal opportunities policies upon job satisfaction as well as we look at how employees view the employment relationship. The latter is crucial as the implicit aspects of the
employment relationship may be important in determining job satisfaction at the workplace.

A drawback in the existing job satisfaction literature is the lack of controls for unobserved individual heterogeneity (Clark et al., 2005). However, in this Chapter we argue that another drawback of the existing literature is heterogeneity arising from the other side of the labour market. That is firm heterogeneity. For instance, the psychology literature (see Brown, 1994; Fricko and Beehr, 1992) suggests that organisational factors related to companies' practices, gender concentration and working conditions are also important in determining job satisfaction.

Another important drawback of the existing literature in examining the determinants of job satisfaction is that most of the studies report results from an overall measure of job satisfaction. Thus, they cannot fully disentangle gender and ethnic differentials with respect to single item measures of job satisfaction. For instance, in previous studies the measure of job satisfaction combines both monetary and non-monetary features (see Clark and Oswald, 1996; Clark et al., 1998). The only studies that report results from different aspects of job satisfaction are by Brown and McIntosh (1998), Clark (1997) and Idson (1990). However, the above three empirical studies only control for a limited number of workplace characteristics, mainly establishment size and industrial sector.

In looking at self-reported assessments of job satisfaction, this Chapter diverges from much of the economics literature. The WERS98 allows us to match workers from the same employer, control for numerous workplace characteristics and empirically investigate whether there are unobservable workplace effects influencing job satisfaction. In contrast to the econometric model applied in Chapter 3, in this Chapter we only correct for intercept heterogeneity. In others words, we do not
control for slope heterogeneity by interacting unobserved firm heterogeneity with gender and ethnicity. The reason for doing so is that in contrast to wages there is not a theoretical reason why unobserved firm heterogeneity would differ or be significantly correlated with gender and ethnicity. Moreover, initial testing showed that unobserved firm heterogeneity was approximately or exactly the same for men and for women for each aspect of job satisfaction. Also, correlations between unobserved firm heterogeneity and the male dummy variable as well as between unobserved firm heterogeneity and the female dummy variable were almost the same. In our analysis however, we capture differences in slope coefficients by including interactions between observed workplace characteristics and gender and ethnicity. Thus, the usefulness of using matched employer employee data in this Chapter is not to model interactions between unobserved firm specific effects and gender and ethnicity, but rather to incorporate enough establishment characteristics that capture social interactions at the workplace, workers' skill levels, job quality and the general working environment.

In addition to identifying gender and ethnic job satisfaction differentials, studying well-being at work is an interesting topic to examine in it's own right. Since work is an important part of most peoples' lives, the satisfaction they derive from work is likely to be a major determinant of their overall utility levels. According to sociologists (Wilson, 1996; Hochschild, 1997) job satisfaction is an important element of overall well-being. Sociologists suggest that each job is not only a set of technical functions or tasks. Rather, it is a complex social environment which conditions the perceptions of those holding the jobs and those that manage them. They also suggest that there is an intrinsic element of social determination involved in jobs. This
intrinsic element carries over to the values of certain inputs being influenced by social rather than strictly economic factors.

Freeman (1978, p.135) argues, "How people feel about their jobs is not meaningless but rather has useful information about economic life and should not be ignored". Along the same line of argument Freeman (1978) proposed that job satisfaction depends on socially identifiable but missing or unobserved factors which give it systematic exogenous variation. Thus, he recommended that consistent estimates could be obtained by using satisfaction and other subjective variables that depend on unobserved work characteristics as proxies, using models of unobserved characteristics. Job satisfaction has also been found to affect general economic outcomes. For instance, Hamermesh (2001) argued that job satisfaction could be used to analyse inequality in the overall returns to work, and Frijters et al. (2005) found that job satisfaction can help us to understand possible relationships between wages and co-worker discrimination.

In addition, job satisfaction is important for the employers as well since it is likely to influence a worker’s and hence a firm’s performance. Productivity and profitability are likely to be higher if workers have a high level of job satisfaction. Job turnover is also likely to be higher in firms that have a low level of job satisfaction, thus resulting in higher training costs.

The outline of this Chapter is as follows. Section 2 presents an interdisciplinary summary of the existing literature on job satisfaction. In Section 3, we outline the choice of independent variables. Section 4 presents the empirical model employed to best describe the data, and Section 5 presents predicted probabilities. Section 6 interprets the results for each different facet of job satisfaction as well as for an overall measure. Section 7 deals with sample-selection issues. Section 8 looks at
the employment relationship, while Section 9 draws policy implications and concludes.

4.2 Existing evidence

In this section we start by reviewing the economic theory on job satisfaction and we highlight its limitations by assessing the role of reference levels and expectations in determining job satisfaction outcomes. Then, we reassess the existing empirical evidence on personal, job and on workplace characteristics and we pay particular attention to our three main variables of interest, gender, ethnicity and equal opportunities policies in Sections 4.2.1, 4.2.2 and 4.2.3 respectively.

Jahoda (1988) suggests that economic theory does not provide us with the necessary tools to model psychological outcomes. For instance, the standard microeconomic utility model suggests that an individual’s utility function is given by:

\[ U = u(y, h), \]

(4.1)

where utility increases with income \((y)\) and decreases with hours of work \((h)\). This utility function is known as self-limited because job satisfaction levels of other individuals do not enter into the utility function. In other words, no arguments in the standard utility function allow for interpersonal comparisons.\(^{24}\) Akerlof (1997, p. 1005) argues that “traditional economics has been based on methodological individualism” and strongly recommends that the standard microeconomic utility framework should be extended to include dependence of individuals’ utility on the utility or actions of others. According to Cole et al. (1992) allowing for interpersonal comparisons in the standard utility function is necessary, since a lot of economic concepts are not allocated through markets but rather through different social

\(^{24}\) Simple theoretical models that can proxy job satisfaction in utility terms are extended microeconomic utility models that allow for extra arguments in the utility function.
mechanisms which are worth investigating. Given the limitations of the standard utility model in modelling psychological outcomes as well allowing for interpersonal comparisons economic theory cannot be tested (Jahoda, 1988).

The main focus of attention in the economics literature has been the influence of pay on job satisfaction (see Brown et al., 2004; Clark et al., 2005 and references therein). Standard economic theory suggests that higher pay is associated with higher job satisfaction. In other words, the higher is one's own wage the more satisfied is the individual. However, one key insight of the social psychology literature (see Festinger, 1954; Stouffer, 1949; Homans, 1961; Adams, 1963), as well as the sociology literature (Davis, 1959; Pollis, 1968; Runciman, 1966), is that relative material payoffs affect people's well-being and behaviour. Also, without the assumption that at least for some people relative payoffs matter, it is difficult to reconcile the empirical regularities observed in many experiments (see Andreoni and Vesterlund, 2001; Brown et al., 2004; Fehr and Schmidt, 1999). In the economics literature, theoretical (see Pollak, 1976; Frank, 1985) as well as empirical (see Hamermesh, 1997; Cappelli and Sherer, 1988; Clark, 1997; Clark and Oswald, 1996; McBride, 2001) studies suggest that individuals gain satisfaction not from a high level of earnings per se, but from a high level of earnings relative to some comparison or expected level. This observation that the job satisfaction of an individual is also affected by the income of his/her peers is not directly incorporated in the standard microeconomic utility framework (see equation 4.1).

With respect to working hours and job satisfaction different results have been obtained. Clark (1996, 1997) and Clark and Oswald (1996) found a significant negative relationship between hours of work and job satisfaction. In contrast, Bartel (1981) and Schwochau (1987) found the opposite. This contradiction in the literature
may be due to the fact that working hours is a choice variable and thus endogenously determined. However, its inclusion reflects the economists (unlike psychologists) notion of the job satisfaction equation as an empirical counterpart of a utility function in which income and leisure are thought to be the two major determinants of job satisfaction.

Frey and Stutzer (2002a) argued that standard economic theory is wrong in assuming that having a job reduces your utility as job satisfaction research rejects this argument. The authors presented evidence suggesting that having a job increases your happiness, while not having a job makes you unhappy. Thus, they suggested that economists should start from this basis and only then consider under what conditions work is perceived to be a burden. Ng (2003) argued that developments in psychological and related studies suggest a re-consideration of the traditional economic analysis in general, and of welfare economics in particular. He also suggested that welfare economics is incomplete as it analyses preferences without going on to analyse welfare or happiness. In the same vein, Hollander (2001) presented a critical view on the standard utility model and proposed that standard economic theory cannot arrive at its usual welfare and policy inferences without considering subjective well-being. He also suggested that if utility is considered as subjective well-being, then relative status models (see Duesenberry, 1949) fit the data better than standard mainstream models.25

Psychologists argue that there is a wide variety of reference level effects and state that the ways and degrees to which they can influence behaviour is the object of an extensive psychology literature (see Bell, 1982). Reference levels can exist either through interpersonal comparison with a reference group or through psychological

25 The relative income hypothesis was formulated and econometrically tested by Duesenberry (1949) where he defined relative status as an individual’s aspirations, desires or needs.
comparison with one's own aspiration level. In the economics literature, the first approach is used. According to Hamermesh (1977) and Clark and Oswald (1996), workers' expressions on job satisfaction are relative and depend on what their peers receive and what the workers themselves expected when they entered work. Hamermesh (2001) used workers with the same personal characteristics as the reference group. Akerlof and Kranton (2000) provided a theoretical basis for models which focus on an agent's identity as an engine for their economic choices and it is apparent that in such settings relative position and interpersonal comparison play a major role. Layard (1980, p. 745) argues, "Happiness depends not only on status and income per se, but also on what a person expected his income and status to be".

The importance of relative standing may have a biological explanation as well. For instance Frank (1999) after reviewing biological and non-biological evidence suggests that the male dominance in spheres where aggressive competition to get to the top is important (i.e. chief executive officers in business, male university professors) may be explained by biological factors. The biological inclination may also be reinforced by nurture, especially in our society that values competition and materialistic achievements. For instance, Ng (2003, p. 318) suggests that "our nurture-influenced nature to do better than others is also a factor contributing to imperfect rationality, though it may foster advances in knowledge that are extremely beneficial".

Except relative status, individual expectations about working outcomes have been regarded as important in determining job satisfaction. According to Locke (1976) individuals' expectations or desires influence levels of job satisfaction. However, most of the studies in examining the expectations argument have used indirect rather than direct measures. This is due to a lack of data on individuals' expectations.

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26 Psychology studies have found that as much as 30% of the variation of job satisfaction might stem from genetic factors (see Baron and Byrne, 2002).
expectations. Clark (1996, 1997) and Clark and Oswald (1996) provided evidence that expectations are affected by a worker's age, educational level and occupation. Easterlin (2001) showed the importance of past and future expectations as determinants of job satisfaction. He suggested that despite positive expectations about the future, job satisfaction remains constant over a lifetime, since aspirations shift with income. Also, according to the goal pursuit literature (see Heckhausen and Schultz, 1995) an individual will be satisfied when outcomes are beneath his/her perceived "primary control". For example, an individual's expectation of his/her future income depends on the availability of work and on the ability of the individual to find work and perform complicated tasks. We put more emphasis on the expectations argument when we review the literature with respect to gender and ethnicity in Sections 4.2.1 and 4.2.2 respectively.

A variety of personal characteristics have also been found to have significant effects on reported job satisfaction levels. When authors allow for non-linearities of age in a job satisfaction regression they find job satisfaction to follow a "U"-shaped pattern through life (Clark and Oswald, 1996; Clark, 1997; Sloane and Williams, 1996). Clark et al. (1996) explained the "U" shape relationship between age and job satisfaction in terms of changing expectations or comparisons across time of what a job should entail. Alternatively, job satisfaction starts high with the first job. Then employees become dissatisfied, and reach minimum levels of well-being somewhere in their mid-thirties.

The results with respect to education are somewhat inconclusive. Clark and Oswald (1996) found that education is negatively correlated with job satisfaction among workers, even though better educated workers have better jobs. This finding implies that even if education brings rewards it also increases expectations causing
greater disappointment and dissatisfaction. Hagenaars (1986) shows that in a multi-
country study, those with higher levels of education need higher levels of income to
attain certain levels of well-being. In contrast, Gordon and Denisi (1995) found that
more educated people are not less satisfied. Lydon and Chevalier (2001) provided
support for this finding by suggesting that individuals who obtained good first degrees
turn out to be more satisfied with their jobs. This discrepancy in the results can be
explained by the fact that all the above studies include actual levels of education in
their regressions. One study that uses two different levels of education is Tsang et al.
(1991). The authors imputed two measures of education for each individual's job, a
required and an over-education measure. They found that required education is
positively related to job satisfaction whereas over-education is associated with lower
job satisfaction. They also found that individuals with skill levels higher than those
required by their jobs feel unchallenged and thus are less satisfied. Alternatively
having qualifications exceeding those needed for a particular job match is associated
with discontent, as those extra qualifications may be associated with job mismatch
(see Allen and van der Velden, 2001).

Clark (2003) found evidence that high wage occupations are indeed high
satisfaction occupations. Blanchflower and Oswald (1998) found that job satisfaction
is greatest among self-employed British and Americans as opposed to other
employees. In sharp contrast, Clark (2003) found a negative coefficient of self-
employment on job satisfaction. Nevertheless, there is evidence suggesting that
having a job is not only undertaken for pecuniary reasons. Rather, it provides intrinsic
satisfaction, which is revealed by the fact that many people are prepared to undertake
unpaid work. For example, for many people, volunteer and charity work is a source of
intense satisfaction. For instance, Gardner and Oswald (2001) found that job
satisfaction is highest of all in the non-profit organisations\textsuperscript{27} and Acemoglu and Pischke (1998) suggested that workers also care about the non-pecuniary job characteristics.

Another strand of the literature explains quits or job durations directly by means of job satisfaction scores and employees' characteristics (Freeman, 1978; Clark et al., 1998; Gordon and Denisi, 1995; Ward and Sloane, 2000). These studies have shown that dissatisfied workers are more likely to quit their current matches.\textsuperscript{28} In other words, the self reported level of job satisfaction is a good predictor for job mobility beyond the effect of wages. For instance, Akerlof et al. (1988) showed that job changes lead to an increase in job satisfaction and Altonji and Paxson (1988) present evidence that job mobility leads to more satisfactory working hours. Shields and Ward (2000) found increasing numbers of quit rates for the nursing profession due to the low levels of job satisfaction reported by nurses.

Iaffeldano and Muchinsky (1985) found that more satisfied workers are also more productive. By the same line of argument Amabile (1996) argued that employees experiencing little satisfaction from their work and having low intrinsic motivation find it difficult to engage with the organisation they work for and be creative and innovative. This might imply extra costs to employers, as they would

\textsuperscript{27} Further evidence that non-pecuniary job characteristics matter as well is provided by Argyle (1987). The author found evidence that in the UK 32\% of respondents would carry on with their present jobs even if they were not financially dependent to do so. However, 65\% would want to work "at something".

\textsuperscript{28} According to Festinger's (1957) cognitive dissonance theory individual behaviour may be driven by subjective beliefs rather than by objective data of the state of the world. This theory suggests that every worker expects a certain relationship between his/her input of effort and the outcome that he/she obtains in terms of pay and satisfaction. The theory predicts that when the degree of dissonance becomes excessive or is in disequilibrium, tension and dissatisfaction will arise and the individual will take steps to restore the balance. For instance, whenever perceived efforts exceed rewards, the individual will respond by demanding a pay increase, raising grievances, reducing effort or quitting the firm.
have to pay more to monitor the performance of their dissatisfied employees (Holmstrom and Milgrom, 1991).

A large number of papers have examined the relationship between trade union membership and job satisfaction (Borjas, 1979; Freeman, 1978; Clark, 1996; Meng, 1990; Miller, 1990; Clark and Oswald, 1996; Gordon and Denisi, 1995; Heywood et al., 1997). However, a common consensus for the true impact of trade union membership on job satisfaction has not been reached. The majority of the studies have found that being a trade union member has large and significant negative effects on reported job satisfaction. But, Bender and Sloane (1998) found that the negative impact of union membership on job satisfaction disappears when allowing for the state of industrial relations. They suggested that poor employee-employer relations might explain this finding. However, in the literature there is some consensus that reverse causation may be true as less satisfied workers are more likely to join a union. However, Heywood et al. (2002), controlling for individual worker effects (i.e. sorting), found that unions do not attract dissatisfied workers as the previous literature has suggested.

A limited number of studies have found that workplace characteristics are also related to individual job satisfaction. For instance, Idson (1990) looked at the relationship between establishment size and job satisfaction. He reported that while higher wages paid in larger establishments act to increase job satisfaction, absence of controls for the nature of the work environment leads employees to be less satisfied with their jobs in larger establishments. By introducing controls for work regimentation he found the effect of establishment size to be reduced on one measure of job satisfaction (overall satisfaction with the job), and to be removed in three alternative measures. Ostroff (1992) argued that job satisfaction levels within a
company affect organisational performance by altering the level of analysis from the individual level to the whole organisation. In addition, he suggested that job satisfaction could also be affected by the structure of the industry. For instance, job satisfaction in service industries has become more important since there is evidence of a positive relationship between employee satisfaction and customer satisfaction (see Rogers et al., 1994 and Fosam et al., 1998).

With respect to the British population as a whole, Green (2005) using data from three different nationally representative British datasets found declining levels of jobs satisfaction. In particular, he reported that in 1992, 51.8% of all employees were very satisfied or completely satisfied with their jobs, while the corresponding figure in 2001 was just 43.1%. Breaking the above numbers into the private and public sector he found that the analogous decrease in the private sector was 7.4% while that in the public sector was 4.2 percentage points higher. He suggested that this decline is largely associated with a combination of rising work effort and declining task discretion. Gardner and Oswald (2001) provided support to the above findings. Employing data from the BHPS they found that overall working life in Britain got worse during the 1990s and that the decline in job satisfaction was more significant in the public sector.

In terms of European job satisfaction rankings, Kaiser (2002) using three waves from the ECHP (1995-1997) reported that the UK meets the European average job satisfaction level. Denmark leads, being followed by Austria, Luxemburg, the Netherlands, and Ireland, while Finland, Belgium, Germany and France exceed the European average. The Mediterranean countries have the lowest job satisfaction levels. More interestingly, separating the countries with respect to different welfare regimes Kaiser found that those countries assigned to a social democratic welfare
regime exhibit the highest level of job satisfaction followed by countries with a liberal and a corporatist welfare regime.

In the next three sub-sections 4.2.1, 4.2.2 and 4.2.3 we review the relevant literature with respect to gender, ethnicity and equal opportunities policies respectively.

4.2.1 Gender and job satisfaction

Despite the consistent labour market wage differentials that women face, a common finding in the job satisfaction literature is that females are happier workers than their male peers (Blanchflower and Oswald, 1999; Brown and McIntosh, 1998; Clark, 1996, 1997; Sloane and Williams, 1996 and Ward and Sloane, 2000). This empirical finding may be due to a number of different reasons. For instance, Clark (1997) suggested that in Britain the satisfaction differential might be explained by the possibility that women's labour market expectations are more than being met. He attributed this finding to the long-run persistence of labour market discrimination which has led to women having lower aspirations and being more easily satisfied.

Another plausible explanation is that because of intermittent labour force participation women are more likely to compare work with the alternative of housework and simply report themselves as more satisfied because they are happy to be in the workforce. Clark (1997) arrived at this conclusion after having controlled for different occupations that men and women have, different work values, as well as sample selection. However, he found that the gender job satisfaction gap is eliminated for the young, the well educated, those in professional occupations and those working in workplaces dominated by males.29 Thus, he suggested that women in such groups

29 Sloane and Ward (1997) found that older women may expect less from their jobs than younger women because of the more restricted role of women in the labour markets that they observed when they grew up. In contrast, male workers, old and young, will have similar job expectations due to the relative stability of male opportunities in the workplace.
would have the same job expectations as men and thus report similar satisfaction levels. In contrast, women not belonging to the above groups expect less and hence report higher satisfaction levels than their male peers who perform similar jobs. Further, using a 12-point measure of mental stress coming from the General Health Questionnaire (GHQ) the author found that men and women with identical levels of mental stress, and the same individual and job characteristics reported significantly different levels of job satisfaction. Additionally, Sanz de Galdeano (2001) using propensity scores to match men and women, and controlling for sample selection, found no evidence that the job satisfaction paradox fades away. Thus, she argued that this paradox cannot be explained by the presence of systematic gender differences in observable characteristics. Nonetheless, in accordance with Clark (1997) she found evidence that the gender job satisfaction differential is significantly reduced for the most educated, divorced workers and those in managerial or professional jobs, for all of whom expectations are more likely to be similar.

Poza and Poza (2000) assumed that large differentials in reported job-satisfaction levels between genders are to a certain extent a result of differing work inputs and outputs. Examining job satisfaction for 21 countries they found that the gender satisfaction paradox does not apply to all countries. They suggested that it is an Anglo-Saxon phenomenon, mainly applied to the UK and the US. According to their input-output model, women have lower perceived levels of work role inputs and higher levels of work role outputs compared to men. In other countries, such as Spain, Denmark, Japan, France and Norway, the opposite is true. Men report higher job satisfaction than women, which correlates with their higher wages. Kaiser (2002) confirmed the above results. He found evidence of the job satisfaction paradox for Germany, the UK and for Ireland as well. As in Poza and Poza (2000), he found no
significant effect for Denmark. In contrast, for the Netherlands and Portugal he reported that the effect of being female on overall job satisfaction is negative.

Lalive and Stutzer (2003) provided another explanation of how the life satisfaction paradox could be understood by studying the relationship between the approval of an “equal rights” amendment and gender differences in well-being in Switzerland. They took citizens’ approval of equal rights amendments as a proxy for the norm that “men and women shall have the right to equal pay for work of equal value”. Rejecting an explanation in terms of active discrimination, they found that employed women are less satisfied with life in liberal communities where the gender wage gap is lower. They proposed that this occurs because progressive women still feel penalised (paid below their reference standard). In contrast, they found that the life satisfaction of women is higher in traditional communities with the larger gender pay gap. These two findings support an understanding of gender differences in salaries in terms of an internalised reference wage standard. This internalised reference standard is defined as a cognitively relevant standard that affects how individuals evaluate their income.

4.2.2 Ethnicity and job satisfaction

In contrast to the robust gender job satisfaction differential there is no common consensus with respect to race. For example, Bartel (1981) using US data (National Longitudinal Survey, NLS) and having controlled for earnings and occupational status as well as allowing for sample selection issues found that black men were significantly more satisfied than their white peers. As in the case for women, an interpretation of this result is that even though blacks earn lower wages than whites and should therefore be less satisfied, discrimination might have also
caused blacks to be satisfied with lower wages. In contrast, Idson (1990) has found that job satisfaction levels among blacks and other minority workers in the US have been consistently lower than that of whites.

British studies have produced contradictory results as well. For instance, Clark (1996) found that blacks are dissatisfied with pay. For Indian sub-continent workers he found that they were more likely to be satisfied with work itself. Clark and Oswald (1994) found that the dummy variable on ethnicity was statistically insignificant but positive. Brown and McIntosh (1998) using an overall measure of job satisfaction found the ethnicity coefficient to be large and negative but statistically insignificant. However, when they incorporated the ethnicity dummy variable as an explanatory variable in four different job satisfaction models (short term rewards, long-term prospects, social relations and work levels) they found the ethnicity coefficient to be positive but statistically insignificant. Nguyen et al. (2003) using British data (National Educational Longitudinal Study) found that both black male and female workers were significantly dissatisfied with their pay as opposed to their white peers. Their result was highly statistically significant suggesting the existence of dissatisfaction over pay among black workers.

The controversial results in the literature of the impact of ethnicity on job satisfaction may be due to the common problem of undersampling of ethnic minorities in most of the representative surveys that have data on job satisfaction. Another plausible interpretation is that due to the heterogeneity of ethnic minority groups in terms of unobserved individual traits (i.e. cultural characteristics, religion) some ethnic groups may be more or less satisfied than others.
4.2.3 Antidiscrimination and equal opportunities policies

There is no existing study that examines the direct effect of equal opportunities policies on job satisfaction. However, some indirect evidence exists on the effects of anti-discrimination legislation on overall well being, and on equal opportunities policies on racial harassment for a specific professional group.

For instance, in terms of overall well-being, Blanchflower and Oswald (2003) argued that antidiscrimination policies in both the US and Britain have not been effective in raising the well-being of women. In particular, for the USA they found that although black people have closed the well-being gap with respect to whites, they are much less happy. Shields and Wheatley Price (2002) reported different qualitative and quantitative results for the effects of equal opportunities policies on racial harassment in the British nursing profession. However, they found evidence that equal opportunities policies reduced racial harassment only when they restricted their sample to ethnic minority employees.

4.3 The WERS98 sample

In this Chapter we merge the management questionnaire into the employee one, so we have data at the individual level. Our sample comprises of 24,093 individuals clustered in 1,764 establishments. A small number of observations were deleted due to either missing responses from managers about key workplace characteristics or missing responses from employees on job satisfaction. A binary probit suggested that missing observations from the employee questionnaire were random in personal characteristics (i.e. on gender and ethnicity). The sample characteristics of the variables used in the regression analysis are reported in Table A.4.1 in the Appendix.
Except gender, ethnicity and their interaction, other personal characteristics include the age of the individual and its non-linear term (age squared/100), marital status (being married), if the employee has any dependant children below four years old and the health status (having a long standing health problem) of the individual. We also include five dummies that capture the highest educational achievement of the individual (postgraduate degree, first degree, A-levels, high GCSE (grades A-C), and low GCSE (grades D-G), the omitted category is “no qualification”).

In our fitted model we also take into account variables that provide information on the characteristics of the job. These are, eight dummies for the broad occupational classification of the individual (manager, professional, associate professional and technical, clerical and secretarial, craft and skilled service, personal and protective service, sales, plant and machine operatives, omitted category “other occupations” i.e. cleaner, postal worker) as well as an interaction between being skilled (i.e. associate professional and technical, clerical and secretarial, craft and skilled service, personal and protective service) and female. We also include the natural logarithm of the working hours per week, and dummy variables for having a permanent job (as opposed to temporary or fixed-term job), a part-time job, being a trade union member, and job flexibility dummy variables such as working at/or from home in normal working hours, sharing a full-time job with someone else, and having flexible working hours. We also include interactions between being female and having a part-time job and being female and having flexible working hours.

In addition, we include two dummy variables that capture job cell segregation at the establishment (i.e. employees think that the “job at the establishment is equally done by men and women”, or “it is mainly/only done by women”). The omitted category is that the work is “done mainly/only by men”. Again, we interact the
dummy variable indicating that the work is done mainly/only by women with the gender dummy. Moreover, we incorporate two dummy variables, each taking the value of one if employees had discussed chances of promotion and their training needs with their supervisors or line managers within the 12 months prior to the survey and zero otherwise.

Following the standard microeconomic utility model we also control for the employee’s actual/own wage. As we saw in Section 2.5 of Chapter 2 our measure of the wage is provided in intervals. In the empirical analysis we create a continuous variable that sums over the midpoints of each pay range and we take its logarithm. By doing so, we also avoid any multicollinearity problems between wages and working hours per week.

The management questionnaire provides a large bank of information on workplace characteristics. Thus, we include variables such as: the logarithm of the size of the establishment (the number of employees), the size of the organisation (a 0/1 dummy where 1 indicates more that 2,000 employees), if the establishment is part of a larger organisation (a 0/1 dummy), broad industrial classification according to SIC92 (manufacturing, utilities, construction, wholesale, hotels and restaurants, transportation, financial services, other business, public administration, education, and health services, omitted category “other community, social and personal service activities”), the location of the establishment\(^{30}\) (10 region dummies, omitted category “Rest of the South East”), the type of the market (a dummy variable if the market is local as opposed to being regional, national or international), unemployment to vacancy rates by travel to work area, if the establishment has equal opportunities policies (a 0/1 dummy) and its interaction with gender and ethnicity.

\(^{30}\) Using an F-test we reject the null hypothesis that the region dummy coefficients are equal to each other and equal to zero.
Importantly, we take into account the composition of the workforce by including the percentage of women and the percentage of ethnic minority employees at the establishment. To capture any non-linearities between these two continuous variables and job satisfaction we interact them with their respective dummies. In addition, we introduce cross interactions by interacting the percentage of females and being an ethnic minority worker and the percentage of ethnic minorities and being female. We also include the proportion of employees at the establishment that were above fifty years old.

Lastly, we include a dummy variable taking the value of one if employees were entitled to an employer pension scheme as well as a dummy variable taking the value of one if according to the respondent manager the level of labour productivity at the establishment compared to other establishments in the same industry was a lot better/better than average.

4.4 Modelling

We extend the basic microeconomic utility function (equation 4.1) by including individual (x), job (j) and observed workplace characteristics (w). Thus, the amended utility function can be written as:

\[ U = u(y, h, x, j, w) + e, \]

The error term e is interpreted as representing interpersonal differences in evaluating job satisfaction because of taste heterogeneity in the population as well as measurement error.

At this point we should make the distinction between life satisfaction (utility which individuals do maximise) and job satisfaction which is part of the satisfaction experienced during work hours. Working income is taken home and thus affects non-
work hours (leisure). The above distinction makes utilities derived from job satisfaction and life satisfaction differ. Having outlined our extended theoretical framework and made the distinction between life and job satisfaction, we next present our empirical framework.

4.4.1 A random effects ordered probit model

The most common characteristic of subjective data is that they are collected on a discrete basis. These are usually index variables where higher values stand for higher self-reported happiness levels. Sociologists and work psychologists usually construct the dependent variable by averaging the ordinal responses to the questions concerning satisfaction. Thus, satisfaction is implicitly assumed to be cardinal. Hence, they employ ordinary least squares (OLS) as their estimation technique and they fail to account for the fact that the dependent variable is ordinal. This implies that a score of four does not indicate exactly twice as much job satisfaction as a score of two. Also, the literature on job satisfaction in other social sciences lacks discussion both of measurement errors in the dependent variable and what is subsumed in the error term. Moreover, happiness measures are bounded. For example, someone with a satisfaction score of 6 last year has no way of indicating that he/she is even happier this year. As such, ordered probit or ordered logit estimation is required in cross sections (Clark et al., 2005).

Our empirical model has to take account of the characteristics of the data. In such ordinal measures of the dependent variable ordered probit techniques are appropriate (Maddala, 1983). Moreover, individual and job characteristics might not be the only attributes that affect employees’ reported levels of job satisfaction. There could be some other unobserved characteristics that may affect reported levels of job
satisfaction. For instance, as we argued in the introduction and the literature review sections of this Chapter, these unobserved characteristics may come from the establishment side. In response to this assumption we introduce a random effects ordered probit model to capture any unobserved firm level effects that may affect reported job satisfaction.\(^{31}\)

A positive estimated coefficient in a random effects ordered probit equation implies that the variable shifts the probability mass point to the right, which increases the probability that a person will report high job satisfaction. As shown in Section 2.6 of Chapter 2 employees were directly asked to evaluate their job satisfaction in relation to a) the amount of influence over the job, b) the amount of pay received, c) the sense of achievement and d) the respect from supervisor or line manager. The responses of the job satisfaction questions were ordered from 1 signifying “very satisfied” to 5 “very dissatisfied”. However, we have re-ordered them so that a higher value corresponds to a higher reported level of satisfaction.

According to the ordered probit model when two respondents give the same answer, they are assumed to enjoy similar satisfaction levels, implying that ordinal interpersonal comparability is permitted (see Chapter 2, Section 2.6.1).\(^{32}\)

For worker \(i\) in firm \(h\) we have:

\[
S_{ih}^* = \beta_1'X_{ih} + \beta_2'J_{ih} + \beta_3'W_h + \epsilon_{ih} \quad \text{for } i=1,2,...,m_h; \quad h=1,2,...,n
\]  

\(^{31}\) Although we do not have repeated observations of individuals, we do have workers clustered within firms. Thus, a fixed effects estimator could be used to average out firm specific effects. However, under a fixed effects estimator the relative impact of time invariant characteristics would be lost (e.g. percentages of female and ethnic minority employees at the establishment). For a derivation of the fixed effects ordered logit estimator see Ferrer-i-Carbonel and Frijters (2004) and for an application see D'Addio et al. (2003).

\(^{32}\) For some recent issues on interpersonal comparability see Van Praag (1991) and Sen (1999). Ferrer-i-Carbonell and Van Praag (2003) argue that it is impossible to provide direct evidence that the interpersonal comparability assumption is guaranteed. Such an assumption would require the existence of a basic and generally accepted method of direct (e.g. physical) satisfaction measurement, but such a method does not exist. In practice, comparability is always approximate as the discrete scaling implies a rounding-off error for each response.
\[ \varepsilon_{ih} = u_{ih} + v_h \]  

(4.4)

where, \( S^* \) is a given worker's unobserved job satisfaction level, \( X, J \) and \( W \) are vectors of observable individual, job and workplace characteristics, respectively, which we expect to influence \( S^* \); \( v_h \) is an unobserved normally distributed effect fixed within establishments and varying across establishments, and \( u_{ih} \) is a random error.\(^{33}\) We also assume that \( v_h \) and \( u_{ih} \) for individual \( i \) in establishment \( h \) are orthogonal to the covariates. The variance of the composite error term is not identified and is given by:

\[ \sigma^2_e = \sigma^2_s + \sigma^2_v \]  

(4.5)

Thus, we adopt the normalisations that \( E(\varepsilon) = 0 \) and that \( \sigma^2_e = 1 \). Now, the correlation between individual error terms for the same firm is a constant and is given by:

\[ \rho = \frac{\sigma^2_s}{1 + \sigma^2_v} \]  

(4.6)

This can be viewed as an indicator of the importance of the firm specific unobserved effect. Therefore, to obtain the unconditional log likelihood we need to integrate the conditional log likelihood. The integration is done with Gauss-Hermite quadrature (see Frechette, 2001a, 2001b; Butler and Moffit, 1982).\(^{34}\)

However, it could be the case that the omission of workplace characteristics that influence job satisfaction are also correlated with the included explanatory variables. This would lead to biases on the estimated coefficients of those explanatory variables. But, by controlling for numerous workplace characteristics we can reduce

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33 Since, we cannot capture unobserved individual heterogeneity we relegate it to the error term.

34 Initially 12 points of quadrature were chosen. The estimates remained robust when a higher number of quadrature points were employed (16 and 25 points). Though, computation time increased enormously.
this omitted variable bias problem. Still, one may argue that the unobserved firm specific random effect \( v_h \) could be correlated with the observed variables. For instance, suppose that \( v_h = \theta W_h + \eta_h \), where \( \text{cov}(\eta_h, W_h) = 0 \). However, by construction \( v_h \) captures only the component of the firm effect that is orthogonal to \( W_h \). In other words, firm specific effects are decomposed into two different parameter spaces \((w_h, v_h)\) that are orthogonal to each other.

We estimate four thresholds as our dependent variable takes five possible values. This follows from the latent variable formulation of the ordered probit model. The satisfaction of a job is a latent variable that is not directly observable. What we observe is the response to a question on satisfaction with the job in general. The observed utility level or job satisfaction level is a categorical ordered response variable. Thus, the true value of job satisfaction \( S^*_k \) is not observed, but we do observe:

\[
\begin{align*}
S_{lc} = 1 & \text{ if } S^*_k \leq c_1 \\
S_{lc} = 2 & \text{ if } c_1 < S^*_k \leq c_2 \\
S_{lc} = 3 & \text{ if } c_2 < S^*_k \leq c_3 \\
S_{lc} = 4 & \text{ if } c_3 < S^*_k \leq c_4 \\
S_{lc} = 5 & \text{ if } c_4 < S^*_k
\end{align*}
\]

where, \( c_1, c_2, c_3, c_4 \) are the four cut-off values for the latent variables that are estimated.

The probability of observing threshold \( c_k \) is \( P_k = \text{Pr}(c_{k-1} < \delta \Gamma + U \leq c_k) \), where \( c \) is the number of categories of the ordered dependent variable (five in this case), \( \delta' = (\beta'_1, \beta'_2, \beta'_3) \) and \( \Gamma = (X, J, W) \). The threshold levels in the ordered response model are an indicator of how the various response categories are distributed.
The first set of results relates to the random effects ordered probit models where each dependent variable represents a different aspect of job satisfaction (Table A.4.2). Table A.4.3 presents the results from the overall measure of job satisfaction derived by summing up the four different aspects of job satisfaction (see Section 4.6.5). Given the difficulty in interpreting the quantitative effect of an explanatory variable on job satisfaction from a non-linear model, we also provide the associated marginal effects for the probability of being “very satisfied”, calculated at the means of the other explanatory variables and setting the random effects term to be equal to zero.

4.5 Predicted probabilities

Before examining the effects of the different variables on the probability of being “very satisfied” with each aspect of job satisfaction it is important to test how well our model predicts each level of job satisfaction. Thus, Table 4.1 presents the predicted probabilities of observing each job satisfaction threshold for each aspect of job satisfaction.

| Table 4.1 Predicted Probabilities for Each Aspect of Job Satisfaction. |
|--------------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| PREDICTED PROBABILITIES | INFLUENCE | PAY | ACHIEVEMENT | RESPECT |
| Pr(S_e = 1) | 0.032 [3.2] | 0.122 [12.5] | 0.045 [4.4] | 0.083 [8.2] |
| Pr(S_e = 2) | 0.126 [12.6] | 0.283 [28.3] | 0.106 [10.6] | 0.126 [12.5] |
| Pr(S_e = 3) | 0.250 [25.3] | 0.236 [23.5] | 0.209 [20.9] | 0.208 [20.8] |
| Pr(S_e = 4) | 0.476 [47.3] | 0.324 [32.3] | 0.492 [49.0] | 0.443 [44.3] |
| Pr(S_e = 5) | 0.116 [11.7] | 0.035 [3.5] | 0.148 [15.1] | 0.140 [14.3] |

Note: Sample proportions in square brackets.

Table 4.1 suggests that our model predicts almost perfectly each aspect of job satisfaction since the predicted probabilities are either very close or the same to the observed frequencies in the sample (see also Figure 2.7 in Chapter 2).
4.6 Results
4.6.1 General influences on job satisfaction

Before we start explaining the results of our variables of interest we briefly interpret the results for the other correlates of each aspect of job satisfaction. Of course, we could have different specifications for males and females as the determinants of job satisfaction may differ by gender (Sloane and Williams, 1996). However we allow unobserved firm heterogeneity to be the same for men and women since there is no theoretical reason why unobserved firm heterogeneity should differ between genders. Given the large number of covariates in our analysis we group them in three different categories: personal, job and workplace characteristics.

We find the usual U-shaped relationship between age and job satisfaction (Clark and Oswald, 1996; Warr, 1992). The coefficient of age is negative and highly significant and that of age squared is positive and highly significant in all specifications. Setting the partial derivative with respect to age equal to zero the minima of these U-shapes occur at ages 34, 38, 23 and 29 respectively for satisfaction with influence, pay, achievement and respect. Interestingly, the above numbers reveal that workers reach a minimum for satisfaction with the amount of pay at an older age than in the case of the other measures of satisfaction. Being married increases levels of satisfaction with respect to influence and achievement. A negative and highly significant determinant in relation to all four types of job satisfaction is if an employee has any long-standing health problems or disabilities that limit what she/he can do at work. The negative impact turns out to be highest in terms of satisfaction with influence (ME= -3.2%).

In contrast to human capital theory, but consistent with the over-education argument (Tsang et al., 1991), higher levels of education are associated with reduced job satisfaction. Having a postgraduate degree has the largest negative effect with all
four aspects. Nevertheless, education does have indirect beneficial effects upon job satisfaction, because of greater pay. For instance, by looking at the coefficient of the education dummies across all four models we see that the smallest negative effect of education upon happiness at work occurs with satisfaction with pay (ME=1.5%).

Turning to job characteristics, we find that in accordance with economic theory and in contrast to Clark and Oswald (1996), own income has a positive and significant effect on all four measures of job satisfaction. Its biggest effect is on satisfaction with pay (ME=3.5%). In other words, the higher the wage in the current job, the higher is the probability that the employee will attain a higher job satisfaction level. The coefficient of working hours per week is negative and significant with respect to influence, pay and respect, but is positive and insignificant with respect to achievement. This suggests that longer working hours make employees unhappy, but at the same time hard working employees enjoy some achievement over their work input.

The results regarding occupational classification suggest that managers have the highest job satisfaction levels for every single type of job satisfaction. The highest satisfaction occurs with respect to influence (ME= 7.1%) and the lowest with respect to pay (ME=0.5%). Interestingly, the coefficient of the “Second Major Group” dummy variable (professionals) is negative and significant in relation to pay satisfaction, but positive and highly significant in relation to satisfaction with achievement. The picture for the other occupational groups is rather mixed. For instance, employees in the “Third Major Group” (associate professional and technical staff) are dissatisfied with influence and pay. Craft and skilled service employees are dissatisfied with pay, but are significantly satisfied with achievement. On the other hand, personal and protective service employees are dissatisfied with influence but are
significantly satisfied with achievement. Operative employees are the most dissatisfied group with respect to all the job satisfaction aspects. Their highest level of dissatisfaction is with achievement (ME= -4.1%) and the lowest with pay (ME= -0.6%). These results suggest a pattern of occupational hierarchy in terms of job satisfaction, as those who hold low status occupations are less likely to be satisfied.

Employees that have the opportunity to work at/or from home in normal working hours are more satisfied than those that work within the workplace. This is true for satisfaction with influence, pay and respect. Accordingly, employees that have a higher flexibility in their timetable report higher levels of happiness with all four measures. However, the interaction dummy between having a flexible timetable and being female enters as negative. It is insignificant in three (i.e. influence, pay and respect) out of the four measures, but significant at the 5% level with respect to achievement (ME= -1.6%). This implies that flexible working arrangements are not appropriately structured for female employees. Finally, employees that share a full-time job are satisfied with influence, achievement and respect, but not with pay.

We find that job satisfaction is an increasing function of job opportunities. For instance, having discussed chances of promotion and training needs with the supervisor or line manager significantly increases satisfaction at work. Of particular interest is the coefficient of the promotion dummy in the satisfaction with pay regression. Contrary to prior considerations its coefficient is negative and highly significant. A plausible interpretation of this finding is that thinking about promotion opportunities, employees expect to get higher pecuniary rewards from what actually is being offered or what is being received.

Having a permanent job is associated with a significant loss of satisfaction in all facets of job satisfaction. An interpretation of this finding is that permanent jobs
are associated with more working hours, an inflexible timetable and more routine which is inherently undesirable (Hamermesh, 2005).\footnote{Moreover, Hamermesh (2005) found that routine behaviour is observed more frequently among full-income workers who may prefer routine as opposed to temporal variety given that they receive a compensating wage differential. This is reflected in our results as well. For instance, we find that the dissatisfaction of having a permanent job is lower in satisfaction with pay as opposed to satisfaction with achievement and respect.} This finding is most important in terms of the reallocation of working hours, as full-time employees would like to work fewer hours (see Gasparini et al., 2000). Another interesting result is that although the dummy variable capturing part-time work is entering as positive and significant in all specifications, its interaction with the female dummy is negative and significant with respect to two of the job aspects, influence and respect. This is an interesting finding given that the vast majority of part-time employees are women. A negative and highly significant association is found between union membership and all four measures of job satisfaction. The biggest negative effect is on satisfaction with influence (ME=3\%). The smallest negative effect is on satisfaction with pay (ME= 0.3\%). The last finding is consistent with the trade union wage premium literature (Hildreth, 1999).

Of great interest are the variables that relate to what employees think about job cell segregation at the workplace. For instance, working in an office or at a production line where men and women equally do the work, is associated with increased feelings of respect. The coefficient of this dummy variable is positively associated with the other aspects of job satisfaction but is not significant. In contrast, if the work is carried out only or mainly by women, there are negative and significant effects in satisfaction with influence, achievement and respect. Its effect on pay with happiness is negative but insignificant. The above findings imply that in establishments where women mainly/only do the work, employees are more dissatisfied not with the extrinsic aspect of job satisfaction (i.e. pay) but rather with the quality aspects. This finding may
suggest a "taste for discrimination" or disutility of men working alongside women (Becker, 1991), or men dislike working with women if women hold superior job positions (Baldwin et al., 2001). However, when we interact the above dummy variable with the gender dummy (being female) we get exactly the opposite picture. The coefficient of their cross product is positive and significant in three out of the four aspects (influence, achievement and respect), but is negative and insignificant in satisfaction with pay. In other words, women like working with other women but are not satisfied with the pay they receive.

We find that the larger the size of the workplace the more dissatisfied employees are (see also Idson, 1990). The negative effect of the size of the establishment on job satisfaction is lowest for satisfaction with pay rather than with the other aspects of job satisfaction confirming previous research on the establishment wage premium (Troske, 1999). The size of the organisation has a negative and significant effect in two of the job aspects, achievement and respect. This implies that employees in large organisations may often feel isolated, do not have discretion over their work and find the workplace impersonal. In contrast, establishments that are part of a larger organisation (multi-establishments) have more dissatisfied employees with respect to influence and pay. Working in establishments where there are high proportions of employees above 50 years old moves the job satisfaction mass point to the right. This result suggests that in establishments with high proportions of older employees working conditions may be more relaxed, and aspirations or high expectations about jobs have settled down.

Workers in manufacturing, utilities (electricity, gas and water supply), construction, wholesale, financial and in the hotel industry are significantly satisfied with pay. Employees in manufacturing, utilities and construction industries are
satisfied with the amount of influence they have over their jobs as opposed to transport and public administration employees.

In most of the industries except in education (ME=2.7%), employees are dissatisfied with respect to the achievement they gain. In sharp contrast, public sector administration workers are extremely disappointed with achievement from work (ME= -2.9%). Moreover, employees in the utilities (ME=3.4%) and education (ME=3.6%) sectors enjoy the most respect. Finally, employees in the health sector are not significantly satisfied or dissatisfied with any of the job satisfaction aspects. Nevertheless, they seem to be dissatisfied with pay but satisfied with achievement.

Employer pension schemes are negatively associated with satisfaction with respect but positively associated with pay satisfaction. This finding suggests that having a pension scheme in force at the workplace does not satisfy employees regarding non-pecuniary characteristics, but slightly affects (ME=0.3%) pecuniary aspects of the job. In establishments where managers believe that productivity in the workplace is higher in relation to other establishments in the same industry, employees feel more content in relation to satisfaction with pay and satisfaction with respect. In accordance with Clark (1996) we do not find a North-South divide in job satisfaction. Employees in the South West, the East Midlands, Wales, the North East and the North West report higher levels of contentment in relation to influence and respect than employees in any of the other regions. Considering satisfaction with pay, only employees in the East and West Midlands are satisfied. Employees in East Anglia, the East Midlands, the North East and Wales are more satisfied about the influence on their jobs. We now turn to describe the job satisfaction results in relation to our three main variables of interest, gender, ethnicity and equal opportunities policies.
4.6.2 Gender and job satisfaction

The coefficient of the female dummy variable is positive and highly significant in relation to all the job satisfaction aspects. The asymptotic t statistics show that its strongest effect is on satisfaction with pay. This is in contrast with the results of Chapter 3 where we found that females face a significant pay disadvantage. There are a number of alternative explanations for this finding. These explanations range from labour market discrimination that shapes expectations to norms regarding the appropriate pay of women compared to men. For instance, it could be the case that females do not perceive their lower pay as disadvantageously unfair. Thus, women may be happy with the pay they receive, as they perceive that the pay disadvantage they face might be due to factors other than discrimination. However, Hampton and Heywood (1993) found evidence that women do perceive and anticipate pay discrimination. The authors examined pay perceptions of a particular labour market group, young and well educated female physicians. Having data on 529 female and 1,343 male physicians in the US the authors found a positive correlation between wage discrimination and women's perception on the inadequacy of their earnings. Thus, they suggested that women feel less satisfied with their rewards when the gender earnings differentials increase. However, the results of that study cannot be generalised to the whole economy as their sample was drawn from a specific labour market group with high expectations.

Norms prescribing female's wages to be lower than men's wages can be expected to positively affect women's subjective well being because their lower level salary standards reduce the gap between expected pay and actual pay. One could also explain the above result using the notion of gender identity (Akerlof and Kranton, 2005).

36 We indirectly examine the role of expectations in Section 4.6.4.
37 Individuals were asked, "Considering your career stage, what do you consider an adequate income (after expenses but before taxes) from your professional activities?"
2000) since there exist strong gender specific behavioural prescriptions. An important assumption or stereotype is for women to be cooperative, selfless and modest (Andreoni and Vesterlund, 2001). In the labour market this maybe translated in lower appropriate wages and reluctance in wage bargaining. Another plausible explanation of the positive female job satisfaction differential is the recent evidence suggesting that men engage in more routine behaviour than women (even within couples), because they spend more time in routine market work (Hamermesh, 2005).

The coefficient of the percentage of women at the workplace is positive and significant in relation to the three aspects, influence, pay and respect. This suggests that the higher the percentage of women at the establishment the more satisfied employees are with those three aspects. In contrast, the cross product between the percentage of females at the establishment and being female is negative and insignificant in relation to satisfaction with influence, pay and respect. However, as we demonstrated in Chapter 2, the above coefficients are not directly interpetable. For instance, if the percentage of female employees at the establishment is zero, then the true effect of the female dummy on satisfaction with pay is equal to 0.329 or 32.9%. If the percentage of female employees at the establishment is 50% then the actual effect of the female dummy on satisfaction with pay is equal to: 0.329+50(-0.001)=0.279 or 27.9%, and if the percentage of female employees at the establishment is 100% then the female satisfaction with pay reduces to 22.9%. This finding suggests that being female and working at an establishment with high percentages of female employees significantly reduces satisfaction with pay.

38 This is partly reflected in the results of Chapter 3 where we found the interaction dummy between trade union density at the workplace and being female to be negative and significant in the hourly pay model. From the general labour economics literature there is also evidence that labour supply elasticities are lower for women than for men and that women are less sensitive to wage differences (Ransom and Oaxaca, 2004).
However, this finding is in sharp contrast to the findings of Chapter 2 where we found that the gender pay gap is lower for females who work in establishments with high percentages of female employees. This is an interesting contradiction and may suggest that relative pay matters. This interpretation becomes more evident when we look at the interaction dummy between being female and skilled. It has a positive and significant coefficient in relation to satisfaction with influence at the 5% level and negative and highly significant (at 1% level) in relation to satisfaction with pay. The above results imply that female employees who are skilled have more influence over their jobs than female unskilled employees but they feel underpaid. This result raises the issue of relative pay and hints that female employees in a given-pay band would be less satisfied if they believed their own skill levels were higher than that of other female employees’ skill levels who nonetheless received the same pay.

Also, the interaction between female and the percentage of ethnic minority employees is negative and significant at the 10% with respect to pay. This result suggests that female employees (both white and non-white) are feeling under-paid in establishments where there are high percentages of ethnic minority employees.

4.6.3 Ethnicity and job satisfaction

We find that ethnic minority employees have significantly higher satisfaction levels than their white peers. The ethnic minority coefficient and the marginal effects are extremely high in each of the intrinsic job satisfaction aspects, its highest effect being on satisfaction with influence. The coefficient of the cross product between the percentage of ethnic minority employees at the establishment and being an ethnic minority worker is positive and insignificant in relation to satisfaction with influence and pay and negative and insignificant in relation to satisfaction with achievement and
respect. However, its interpretation is not straightforward. For instance, if there are no ethnic minority employees at the establishment, then the true effect of ethnic minority on satisfaction with influence is equal to 0.532% or 53.2%. If the percentage of ethnic minority employees is say 50%, then the true effect of the minority dummy on satisfaction with influence is equal to: 0.532+50(0.001)=0.582 or 58.2%. This finding suggests that ethnic minorities are happier (in terms of job influence) in establishments with a higher proportion of employees with the same ethnic origin is observed. This implies something interesting about networking and bargaining at the workplace. For instance, it could be the case that the bargaining power of ethnic minority employees is higher in establishments where more employees of their ethnic origin work.

In sharp contrast to the female results, ethnic minority employees are not satisfied with their pay. This finding is interesting as in Chapter 3 we found that ethnic minority employees face a significant pay disadvantage. This finding concurs with Paul (2003) who found that non-white workers in Britain perceive their pay as disadvantageously unfair as well as with Nguyen et al. (2003) who found that male and female black workers are significantly dissatisfied with their pay as opposed to their white peers.

The percentage of ethnic minority employees at the workplace is negative but insignificant in all models. This may partly capture the result of Frijters et al. (2005) who found that the higher the proportion of ethnic minority employees at the establishment the relatively more dissatisfied white males are. Finally, the interaction dummy between being an ethnic minority employee and the percentage of women at the establishment is negative and highly significant in relation to achievement from work. The latter result could be explained if lower unobserved ability ethnic minority
workers are more likely to be found in workplaces with a higher density of female employees.

4.6.4 Equal opportunities policies and job satisfaction

We verify the results by Blanchflower and Oswald (2003) as well as those by Shields and Wheatley Price (2002) as we find a weak negative relationship between equal opportunities and each facet of job satisfaction. The interaction dummy between having equal opportunities policies at the establishment and being an ethnic minority employee has a negative and significant effect at the 10% level only with respect to job influence. This result implies that in establishments where equal opportunities are in place ethnic minority employees have lower levels of flexibility or discretion over their work. This result raises the question of whether an equal opportunities policy at the workplace is employed in order to divert attention from the practices of a discriminatory employer, rather than a reflection of the non-discriminatory nature of an employer (see Chapter 2).

As we argued in section 2.4 of Chapter 2, it is not plausible with the existing data to determine whether the firm’s commitment to the equal opportunities policies is “genuine” or it is just “show casing”. Another plausible explanation of the weak relationship between equal opportunities policies and each aspect of job satisfaction is that the apparent heterogeneity of workplaces makes it hard for equal opportunities policies to take into account all the relevant aspects of working conditions.

Finally, we find unobserved firm specific characteristics, although small, to significantly affect the likelihood of reported job satisfaction. For instance, the unobserved firm specific component explains 4.3% (satisfaction with achievement) to 7.3% (satisfaction with pay) of the corresponding job satisfaction variance. This
suggests that unobserved firm heterogeneity is higher in explaining material (i.e. explicit) aspects of job satisfaction rather than quality (i.e. intrinsic) aspects.

4.6.5 An overall measure of job satisfaction

To check for the robustness of our results with respect to gender and ethnicity and to compare them with the results of other studies on job satisfaction we constructed an overall measure of job satisfaction by summing up the scores over the four aspects of job satisfaction. The scale thus runs from 4 (all four responses indicating total dissatisfaction) to 20 (all four responses indicating total satisfaction). In order to reduce the number of reported thresholds in the overall ordered probit model and thus to have easier interpretable marginal effects, we report the results (see Table A.4.3) from an overall measure of job satisfaction with four thresholds as we have collapsed the five point responses of the four job satisfaction measures into binary variables (i.e. “1”= very satisfied, satisfied, and “0”=otherwise). Robustness checks showed that the results were qualitatively and quantitatively the same had we not collapsed the thresholds of each job satisfaction facet to 0/1 dummies. Also, a dummy variable capturing the missing responses to the job satisfaction questions and added as a covariate in a non-heterogeneous ordered probit job satisfaction model proved to be insignificant suggesting that missing responses were randomly distributed.

The overall job satisfaction variable seems to be a good summary measure of the individual job satisfaction aspects. This is verified by comparing the coefficients across the four different job satisfaction specifications (influence, pay, achievement

39 The scale reliability coefficient using Cronbach alpha is 0.74. Cronbach's alpha assesses the reliability of a summative rating scale of the variables specified. The corresponding value of Cronbach's alpha from the eighth wave of the BHPS is equal to 0.76 for satisfaction with a) "able to use your own initiative, b) pay, c) work itself, and d) relations with boss.
and respect) and those coming from the overall measure. If respondents answer all of the satisfaction questions with respect to a consistent reference group, then we would expect them to consistently report satisfaction or dissatisfaction across all of the items. Thus, their responses to each job satisfaction variable will be strongly related to each other. So, we should not be surprised that the estimated coefficients of the different job satisfaction facets are strongly statistically significant in the overall satisfaction equation. The fact that there are differences in the estimated coefficients across the different aspects of job satisfaction (mainly between the explicit and implicit aspects) suggests that some components weigh more heavily in the respondents' calculations of overall satisfaction than others.

We begin by briefly describing the results for all the covariates of the overall job satisfaction regression except for gender and ethnicity. Then we concentrate on the latter two variables and we carry out a number of robustness checks.

We find a U-shaped relationship between job satisfaction and age (see also Levy-Garboua and Montmarquette, 1998). Higher levels of education are associated with less satisfied workers as is having a health problem. Being married is correlated with higher levels of job satisfaction, whereas having children is not.

With respect to the job, longer hours are related to lower satisfaction levels. This concurs with Clark and Oswald (1996) and concerns the trade-off between labour and leisure. Actual income has a significant positive effect on job satisfaction. This finding contradicts the results of Clark and Oswald (1996) and Clark (1997) that reported levels of job satisfaction are weakly correlated with absolute wages when one does not control for relative wage.

Those with managerial responsibilities are the most satisfied employees followed by professional staff. In contrast, technical, clerical and operative employees
are significantly dissatisfied with their jobs. Being female and skilled has a positive, yet insignificant effect on overall satisfaction. Holding a permanent job is associated with lower levels of job satisfaction\(^{40}\) as well as being a trade union member.\(^{41}\) Having a part-time job is positively and significantly associated with job satisfaction. In contrast, female part-time employees are discontent with their jobs. Having a flexible work timetable, sharing a full-time job and working at home increases levels of overall satisfaction. In contrast, the interaction between having a flexible work timetable and being female is negative and significant at the 5% level. Having discussed chances of promotion as well as training needs with supervisors or line managers moves the job satisfaction probability to the right.

In establishments where men and women equally do the work, employees are relatively satisfied. In contrast, in establishments where only women perform the work, employees are significantly dissatisfied. Conversely, being female and working at an establishment where most of the work is carried out by females is associated with higher levels of job satisfaction. In other words, women like to work with other women.

The size of the establishment as well as the size of the organisation is associated with lower levels of job satisfaction. Idson (1990) argues that the firm size effect stems from the fact that worker autonomy is positively correlated with job satisfaction, and in larger firms this freedom is more likely to be reduced or curtailed. If the establishment is part of a large organisation, it has a negative effect on job satisfaction.

\(^{40}\) This is line with Booth et al. (2002) who found no difference in overall job satisfaction between workers in permanent jobs and workers on fixed-term contracts.

\(^{41}\) We also estimated a reduced form specification for the overall measure of job satisfaction that did not condition on trade union membership. The results did not display noticeable differences in the magnitude of the coefficients compared to those from the full specification. None of the coefficients changed sign. Nevertheless, some of the results bear the effects from the omitted trade union dummy. For instance, there is a 2.4% change in the coefficient of the public sector administration dummy between the two specifications. This change has the highest impact among all the right hand side variables and implies that a large proportion of public sector employees are trade union members.
satisfaction, but this effect is not significant. In contrast, working in establishments with high proportions of employees that are over 50 years old makes employees happy. Workplaces in the electricity and construction industries have the most satisfied employees. In contrast, employees that work in public sector administration are the most dissatisfied. Employees who work in the South West, the East Midlands, in Wales and in the North East are the happiest. The tightness of the labour market as captured by the local unemployment to vacancy rates by travel to work area has a positive but insignificant impact on job satisfaction. Higher levels of labour productivity at the establishment as compared to other establishments in the same industry are associated with higher levels of job satisfaction at the workplace.\textsuperscript{42}

Equal opportunities policies at work are associated negatively but not significantly with job satisfaction. The interaction dummy capturing equal opportunities and ethnicity has a larger negative magnitude than the single equal opportunities dummy but is not significant. In contrast, the interaction of equal opportunities with the female dummy has a very small positive yet insignificant effect. Finally, although the firm-specific unobserved variable does not explain a large portion of the total variance (4.2%), it is highly significant and highlights the

\textsuperscript{42} To investigate this further, we ran separate regressions for males and females and found that the productivity variable had a positive and significant coefficient only in the male sample. This finding is in contrast with a priori expectations. For instance, one would expect female employees to be more productive as they are more satisfied employees compared to males (provided there are no differences in unobserved characteristics). Although, the exact meaning and nature of the subjective productivity variable is uncertain, since the respondent manager might not have been the respondent's boss, it may nevertheless suggest that managers undervalue female productivity levels (indirect or valuative discrimination, see Meyerson et al., 2001). Holzer (1990) using data on wages and employers' subjective evaluations of worker productivity argued that correlations between wages and productivity scores result from a tendency of supervisors to give higher wage employees higher scores, thereby rationalising the higher wages these workers already receive. More interestingly, in WERS98 we observe the sex of the interviewed manager and we created an interaction dummy between the sex of respondent manager (being male) and the productivity variable. Strikingly, we found that the above cross product dummy was negative and insignificant in the female sample but positive and significant at the 5% level in the male sample. As productivity evaluations are important predictors of promotion and income levels these findings are of high importance.
importance of using employer-employee data in studying job satisfaction at the workplace.

We now turn to our two main variables of interest, gender and ethnicity. As with each individual aspect of job satisfaction the overall measure of job satisfaction suggests that female employees are happier than their male peers. Also, the higher the percentage of female employees at the establishment the higher is the level of job satisfaction for all employees. These results are in contrast to those results presented by Bender et al. (2005) who suggest that much of the gender job satisfaction differential in the US associated with segregation results from the exclusion of job flexibility variables in a job satisfaction regression. Although we include a generous number of variables capturing job flexibility we still find that female employees are more satisfied than their male counterparts.

Unfortunately, we cannot apply a direct test on the expectations hypothesis (see Section 4.2.1), as WERS98 does not contain information on individuals’ expectations. Following Clark (1997) (see Section 4.2.1, p. 118) and restricting the sample to different sub-samples we found that the gender job satisfaction differential disappears for those who are managerial or professional employees, have a postgraduate diploma, are less that 24 years old, are divorced or separated and in establishments where men do most of the work. Thus, one explanation of the job satisfaction paradox comes from the fact that on average females hold lower job expectations than males.

Ethnic minority employees are happier than their white peers. To examine how robust the ethnicity result is and to match the exact year of the dataset already analysed in this study with another representative British dataset we employed data
from the eighth-wave of the BHPS (i.e. the 1998 wave). A disadvantage of this dataset, as with every other representative survey in Britain that has data on job satisfaction, is that it undersamples employees from an ethnic minority background. For instance, from the 562 new entrants in this particular wave only 23 had an ethnic minority background. Using the overall measure of job satisfaction from the BHPS and regressing it on individual, job characteristics, size of the establishment, as well as industry and region dummies we found that the ethnicity dummy attained a negative and insignificant coefficient.

This is in sharp contrast to the result obtained from the WERS98. However, the BHPS or any other representative British dataset (i.e. the LFS) cannot form the basis of our analysis, because they do not provide any detailed information on workplace characteristics and on the general working environment. For instance, we would argue that such an estimate might not only be biased but might provide the wrong sign as well. The reason is that the BHPS omits crucial workplace characteristics that have been proved to be highly significant in our study. For instance, we found that job satisfaction levels of ethnic minority employees, are not only affected by individual and job related characteristics but also by workplace characteristics such as the proportion of their ethnic group at the establishment.

This proved to be true for instance in relation to satisfaction with influence. The WERS98 results showed that satisfaction for an ethnic minority employee is higher the higher is the percentage of his/her ethnic peers at the establishment. Alternatively, the utility or satisfaction an ethnic minority employee receives from

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43 The BHPS is an annual survey of each adult member of a nationally representative sample of around 5,000 households giving a total of approximately 10,000 individual interviews. The same individuals are re-interviewed at each wave. However, there is entry and exit from the panel.

44 Using the first 12 waves of the BHPS (1991-2002) and applying the longitudinal weight to control for sample attrition we found that a slightly higher proportion of ethnic minority employees dropped out from the panel as opposed to whites.
his/her job depends on with whom he/she is working. It could be the case that ethnic minority workers are segregated in establishments where the proportion of other employees with the same origin is high, and that is why they have more influence and hence are more satisfied.

4.7 Sample-selection bias

One may argue that our results may not be representative of some other population. For instance, it could be the case that job satisfaction answers were recorded only for happy employees, as unhappy employees would quit employment. Thus, it may be possible that the probability of being an employee is correlated with whether the individual would be happy or not with his/her job. For example, if an employee thinks that satisfaction from a job is likely to be high then the probability of working will be correspondingly high. This would cause a non-randomly distributed sample due to different labour market participation rates for female and ethnic minority employees. In other words, there is relatively greater censoring of the female and the ethnic minority sample and the censoring is occurring disproportionately in the least desirable jobs with the lowest job satisfaction. This non-random truncation of the sample could lead to biased estimates of the parameters in each of our job satisfaction regressions.

Moreover, even if the WERS98 did not ask employees if they would prefer to be unemployed rather than be unsatisfied with pay, if employees felt that satisfaction with pay is likely to be low then those individuals would probably choose not to be employees. Then, according to the standard theory of income maximisation, the high proportion of 40.6% of employees in our sample stating dissatisfied/very dissatisfied with their pay should not be observed. Also, according to Argyle (1987) (see footnote
25 in this Chapter) 65% the respondents in his sample would want to work “at something”.

In addition, if our results were driven by sample selection then one would expect to observe female and ethnic minority employees to be managers as according to our results this occupation offers the highest satisfaction. However, only 7% of the female and ethnic minority employees were managers. Also, 9% of the female and 7% of ethnic minority employees were observed in the “other” occupational category. Moreover, in our sampled population, 52% of employees were men and 48% were women. These simple statistics suggest that very small percentages of female and ethnic minority proportions were observed in the most satisfied occupational classification and that participation rates did not differ by gender. Thus, we assume that being an employee or not, is independent of the error term in the job satisfaction equation.

4.8 Employment relations

Since employees spend a large fraction of their time at work and a large fraction of non-family social interactions take place at work it is important to examine the views of employees on the employment relationship and correlate the findings with those obtained in the previous sections. Also, one would expect that the implicit aspects of the employment contract to play a very strong role in determining job satisfaction. Another reason for examining the employment relationship is to indirectly test for sample selection. If sample selection issues bias our results in a serious way, in other words we would observe only happy female and ethnic minority employees in our sample, then we would expect female and ethnic minority employees to be happy with the employment relationship as well.
Employees were asked, "In general, how would you describe the employment relationship here?" As with the job satisfaction questions employees had to tick one out of the five responses available. The responses ran from 1 "Very Good" to 5 "Very Poor". The categories were re-ordered so higher values correspond to better relations.

<table>
<thead>
<tr>
<th>EMPLOYEES %</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Poor</td>
<td>6.0 (0.003)</td>
</tr>
<tr>
<td>Poor</td>
<td>12.8 (0.004)</td>
</tr>
<tr>
<td>Neither good nor poor/bad</td>
<td>27.2 (0.005)</td>
</tr>
<tr>
<td>Good</td>
<td>39.5 (0.006)</td>
</tr>
<tr>
<td>Very Good</td>
<td>14.5 (0.005)</td>
</tr>
</tbody>
</table>

Note: Standard errors in parentheses.

A higher than the median percentage (54.0%) of the employees rated the employment relationship as good/very good\textsuperscript{45}, whereas around 19% judged the employment relationship as poor or very poor\textsuperscript{46}. An interesting comparison, despite the different wording between the questions, is to relate these responses to those responses obtained from the intrinsic measures of job satisfaction (see Figure 2.7 of Chapter 2 which shows the distribution of each aspect of job satisfaction). The allocation of the responses between these two different measures is similar. For instance, around 14% of the employees were very satisfied with the intrinsic measures of job satisfaction. Approximately the same percentage of employees rated the employment relationship as very good. The proportions also match at the other end of the distributions (very dissatisfied, very poor). Although this is an indirect comparison, it provides some extra justification for using the WERS98 data by suggesting that employees use a consistent reference level in responding to subjective questions.

\textsuperscript{45} Excluding managerial staff from the employees survey did not significantly change the responses.  
\textsuperscript{46} Managers were asked the same question as well at the last section of the interview. The vast majority of managers (90%) characterised the employment relationship as very good/good. McCarthy (1994) using the third wave of the Workplace Industrial Relations Survey found that managers were overstating the employment relationship or that measure itself was faulty.
Using a random effects ordered probit model (see Table A.4.4. in the Appendix) we regress the categorical variable of valuing the employment relationship from the employee questionnaire on the same regressors as that for job satisfaction. Overall, there are fewer significant variables in the former specification. However, some major differences arise.

In contrast to the job satisfaction results, female and ethnic minority employees do not report better employment relations than men and white employees do. In particular, the coefficients of the above variables enter as negative but are insignificant. This finding provides some further evidence against sample-selection bias in our sample. For example, one would expect women and ethnic minority employees who report bad working employment relations to leave their jobs rather than work in less friendly environments, or if they continue to work they should have lower and not higher job satisfaction levels than their male and white peers respectively.

We now briefly describe the determinants of how employees view the employment relationship. The higher the percentage of female employees at the workplace the better is the employment relationship. In establishments where men and women equally perform the work, the employment relationship is good. In contrast, in workplaces where women do most of the work, the opposite is true. However, not surprisingly the cross product between female and the former variable is positive and significant. This implies that the employment relationship is good for female employees who work in female dominated workplaces. The above results suggest that although men like working with women they do not like performing the same type of work.
The higher is own income the better is the employment relationship. Also, longer hours of work harm the employment relationship. The education dummies enter as negative and significant whereas having a postgraduate degree has the highest negative effect. In line with the job satisfaction results age has the usual U-shaped profile. In contrast to the job satisfaction results, having dependent children less than four years old is significantly negatively related with workplace social relations. The same is true for employees who face a long-standing health problem.

Managers, professionals and sales employees report good relations at the workplace. The opposite is true for craft and operative workers. Female skilled employees report good relations at the workplace, although the coefficient is at the borderline of significance. Trade union members as well as employees who hold a permanent job are not content with the employment relationship. Having a flexible working arrangement has a positive effect on workplace relations. However, its interaction with females is negative and significant. In contrast, sharing a full-time job and working from home improves the employment relationship. Having discussed chances of promotion and training makes employees more content with the employment relationship.

The bigger the size of the establishment the worse is the employment relationship. Also, only employees in the education industry report positive feelings about the employment relationship. In conjunction with the job satisfaction results, equal opportunities policies have a negative but insignificant effect on relations at the workplace.

An interesting finding is that the unobserved firm specific component (ρ) is approximately four times higher than the one obtained from the overall job satisfaction regression. This implies that unobserved firm heterogeneity has a stronger
effect in explaining a more general concept such as the employment relationship than a more individualistic aspect such as job satisfaction.

4.9 Conclusions and policy implications

This Chapter has used matched employer-employee data to explore the job satisfaction paradox for Britain. Thus, bringing together the two sides of the labour market and implementing a random effects ordered probit model we report estimates on four different facets of job satisfaction as well as on an overall measure. We found that women and ethnic minority employees are more satisfied than male and white employees correspondingly. The most interesting finding that has been neglected from the rest of the literature is that female employees are happy with the pay they receive. On the contrary, ethnic minority employees are not. Equal opportunities policies do not have any impact on job satisfaction. If anything, they seem to negatively affect both groups. Indirectly investigating the expectations hypothesis by restricting the sample to different sub-samples we found that the gender job satisfaction differential disappears for those who hold managerial or professional posts, have a postgraduate degree, are less than 24 years old, are divorced or separated and work in establishments where male employees perform most of the work.

Also, our results showed that working conditions (i.e. working at home, having a flexi-timetable, in establishments where equal proportions of men and women do the work) experienced by individuals are key determinants of their satisfaction levels. Crucially, we uncovered that individual well-being and workplace well-being are interrelated. For instance, observed and unobserved establishment heterogeneity, in other words variables that are omitted or not modelled in other studies play a key role in explaining job satisfaction. This finding has important
policy implications. Interestingly, despite their higher job satisfaction levels, female and ethnic minority employees are not content with the employment relationship.

As satisfaction levels have normative implications in the classical utilitarian sense, they may be used to make normative statements about policies (Frijters, 1999). The finding that women seem to be happy with the pay they receive while ethnic minority employees are not, suggests that perceptions about pay may be culturally and socially influenced. Thus, tackling pay inequality alone will not eliminate feelings of underpayment. For instance, women may be happy with the pay they receive, as they may perceive that the pay disadvantage they face might be due to factors other than discrimination. It is possible that on average women may think that men possess innate skills deserving of a premium. The finding that higher levels of productivity are associated with higher feelings of happiness at the workplace has important policy implications. Female workers may not be any less productive than male workers. This could mean that policies designed to increase the pay of women on face value with that of men are misguided. Moreover, higher pay may lead women to work harder. Thus, it is crucial for women to update their beliefs and recognise their abilities in the labour market.

In contrast, ethnic minority employees seem convinced that they experience discrimination in terms of pay. This may be an equilibrium outcome and may lead ethnic minority employees to exert less effort and be less productive. The result is somewhat a self-fulfilling prophecy (Arrow, 1973; Coate and Loury, 1993; Farmer and Terell, 1996). Thus, the wrong signal is sent to employers who over time may become prejudiced against ethnic minority workers. Thus, current policies that only target pay in an attempt to increase productivity may be misinformed. Simply increasing the pay of non-white workers will not stop them from feeling underpaid in
comparison to white workers. Instead, policies that target problems such as "institutionalised" racism should also be pursued.

The finding that individual well-being and workplace well-being are interrelated suggests that it is unfair to rely only on workers in order to design better jobs. The unit of analysis must be the workplace. In other words, workplaces have an important role in determining employees' job satisfaction. For instance, recent research suggests that employee involvement schemes (e.g. self-directed work teams, quality circles) have a strong and positive impact on employee well being (Freeman and Kleiner, 2000).

Labour differs from the other factors of production in the case that the inputs derived from it can rarely be specified exactly and workers have a discretionary element to their work levels. Workers' behaviour and hence their performance levels in terms of productivity and other work characteristics are influenced by the satisfaction levels that they derive from work. Then it is of interest of the employers as well to have satisfied employees. Thus, according to Layard (1980) economists as well as policy makers should acknowledge the social and economic consequences of this and put in place a dual public policy focus on promoting individual well-being as well as workplace well-being.
<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>MEAN</th>
<th>VARIABLE</th>
<th>MEAN</th>
<th>VARIABLE</th>
<th>MEAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Satisfaction with influence</td>
<td>3.518</td>
<td>Part-time work &amp; female</td>
<td>0.200</td>
<td>Log(establishment size)</td>
<td>657.470</td>
</tr>
<tr>
<td>Satisfaction with pay</td>
<td>2.865</td>
<td>Proportion of employees&gt;50 years old</td>
<td>0.160</td>
<td>No. of employees</td>
<td>127.6</td>
</tr>
<tr>
<td>Satisfaction with achievement</td>
<td>3.583</td>
<td>No educational qualification</td>
<td>0.244</td>
<td>Size of the organisation&gt;2,000</td>
<td>0.396</td>
</tr>
<tr>
<td>Satisfaction with respect</td>
<td>3.417</td>
<td>Low school qualification</td>
<td>0.119</td>
<td>Part of a large firm</td>
<td>0.783</td>
</tr>
<tr>
<td>Overall job satisfaction</td>
<td>13.383</td>
<td>High school qualification</td>
<td>0.266</td>
<td>Market local</td>
<td>0.293</td>
</tr>
<tr>
<td>Promotion chances</td>
<td>0.205</td>
<td>A levels</td>
<td>0.150</td>
<td>Utilities (electricity, gas, water supply)</td>
<td>0.007</td>
</tr>
<tr>
<td>Training needs</td>
<td>0.481</td>
<td>Degree</td>
<td>0.160</td>
<td>Construction</td>
<td>0.031</td>
</tr>
<tr>
<td>Agree that the job is secure</td>
<td>0.563</td>
<td>Postgraduate degree</td>
<td>0.085</td>
<td>Wholesale</td>
<td>0.148</td>
</tr>
<tr>
<td>Flexible work</td>
<td>0.323</td>
<td>Permanent job</td>
<td>0.924</td>
<td>Hotels &amp; restaurants</td>
<td>0.040</td>
</tr>
<tr>
<td>Flexible timetable &amp; female</td>
<td>0.180</td>
<td>Temporary job</td>
<td>0.040</td>
<td>Transportation</td>
<td>0.060</td>
</tr>
<tr>
<td>Job sharing</td>
<td>0.161</td>
<td>Fixed term job</td>
<td>0.032</td>
<td>Financial</td>
<td>0.042</td>
</tr>
<tr>
<td>Work home</td>
<td>0.095</td>
<td>Working hours per week</td>
<td>36.076</td>
<td>Other business (real estate, renting)</td>
<td>0.082</td>
</tr>
<tr>
<td>Work is equally done by men and women</td>
<td>0.296</td>
<td>Income per week (£)</td>
<td>301.7</td>
<td>Public administration</td>
<td>0.089</td>
</tr>
<tr>
<td>Work mainly/only done by women &amp; female</td>
<td>0.339</td>
<td>Part-time</td>
<td>0.249</td>
<td>Education</td>
<td>0.103</td>
</tr>
<tr>
<td>Work mainly/only done by women</td>
<td>0.314</td>
<td>Full-time</td>
<td>0.751</td>
<td>Health</td>
<td>0.129</td>
</tr>
<tr>
<td>Work mainly/only done by men</td>
<td>0.363</td>
<td>Trade union member</td>
<td>0.397</td>
<td>Other</td>
<td>0.032</td>
</tr>
<tr>
<td>Female</td>
<td>0.483</td>
<td>Trade union density</td>
<td>0.362</td>
<td>South West</td>
<td>0.085</td>
</tr>
<tr>
<td>Male</td>
<td>0.517</td>
<td>Divorced</td>
<td>0.071</td>
<td>Rest of the South East</td>
<td>0.187</td>
</tr>
<tr>
<td>Minority</td>
<td>0.026</td>
<td>Married</td>
<td>0.699</td>
<td>East Anglia</td>
<td>0.047</td>
</tr>
<tr>
<td>Ethnic minority woman</td>
<td>0.013</td>
<td>Health problem</td>
<td>0.129</td>
<td>East Midlands</td>
<td>0.087</td>
</tr>
<tr>
<td>Ethnic minority man</td>
<td>0.013</td>
<td>Managers and administrators</td>
<td>0.089</td>
<td>West Midlands</td>
<td>0.101</td>
</tr>
<tr>
<td>White woman</td>
<td>0.463</td>
<td>Professional</td>
<td>0.130</td>
<td>North East</td>
<td>0.067</td>
</tr>
<tr>
<td>White</td>
<td>0.499</td>
<td>Associate professional and technical</td>
<td>0.093</td>
<td>Yorkshire &amp; Humberside</td>
<td>0.082</td>
</tr>
<tr>
<td>White</td>
<td>0.963</td>
<td>Clerical and secretarial</td>
<td>0.159</td>
<td>(0.004)</td>
<td>(0.009)</td>
</tr>
<tr>
<td>White</td>
<td>0.963</td>
<td>Craft and skilled service</td>
<td>0.106</td>
<td>(0.005)</td>
<td>(0.009)</td>
</tr>
<tr>
<td>Other minority group</td>
<td>0.011</td>
<td>Personal and protective service</td>
<td>0.078</td>
<td>(0.006)</td>
<td>(0.009)</td>
</tr>
<tr>
<td>Percentage minority</td>
<td>4.170</td>
<td></td>
<td>0.005</td>
<td></td>
<td>0.106</td>
</tr>
</tbody>
</table>

Continued
**Table A.4.1 Sample Properties of Variables (weighted, n=24,093).**

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>MEAN</th>
<th>VARIABLE</th>
<th>MEAN</th>
<th>VARIABLE</th>
<th>MEAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minority &amp; minority</td>
<td>0.561</td>
<td>Sales</td>
<td>0.095</td>
<td>Local unemployment/vacancy rate</td>
<td>0.772</td>
</tr>
<tr>
<td>(0.079)</td>
<td></td>
<td>(0.005)</td>
<td></td>
<td>(0.014)</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>48.326</td>
<td>Plant and machine</td>
<td>0.123</td>
<td>Equal opportunities</td>
<td>0.808</td>
</tr>
<tr>
<td>(0.252)</td>
<td></td>
<td>(0.007)</td>
<td></td>
<td>(0.011)</td>
<td></td>
</tr>
<tr>
<td>Female &amp; female</td>
<td>31.543</td>
<td>Other (e.g. cleaner, postal worker)</td>
<td>0.111</td>
<td>Equal opportunities &amp; female</td>
<td>0.409</td>
</tr>
<tr>
<td>(0.815)</td>
<td></td>
<td>(0.005)</td>
<td></td>
<td>(0.010)</td>
<td></td>
</tr>
<tr>
<td>Minority &amp; female</td>
<td>2.068</td>
<td>Public sector</td>
<td>0.310</td>
<td>Equal Opportunities &amp; minority</td>
<td>0.023</td>
</tr>
<tr>
<td>(0.137)</td>
<td></td>
<td>(0.011)</td>
<td></td>
<td>(0.002)</td>
<td></td>
</tr>
<tr>
<td>Minority &amp; women &amp; minority</td>
<td>1.375</td>
<td>Private sector (services)</td>
<td>0.454</td>
<td>Labour productivity at the establishment is better compared to other establishments in the same industry</td>
<td>0.416</td>
</tr>
<tr>
<td>(0.131)</td>
<td></td>
<td>(0.012)</td>
<td></td>
<td>(0.016)</td>
<td></td>
</tr>
<tr>
<td>Female &amp; female</td>
<td>0.236</td>
<td>Private sector (manufacturing)</td>
<td>0.236</td>
<td>Employer pension scheme</td>
<td>0.820</td>
</tr>
<tr>
<td>(0.006)</td>
<td></td>
<td>(0.012)</td>
<td></td>
<td>(0.011)</td>
<td></td>
</tr>
</tbody>
</table>

*Note: Standard errors in parentheses.*
<table>
<thead>
<tr>
<th>Variable</th>
<th>Pay</th>
<th>Influence</th>
<th>Respect</th>
<th>Achievement</th>
</tr>
</thead>
<tbody>
<tr>
<td>FEMALE</td>
<td>0.169</td>
<td>0.351</td>
<td>0.311</td>
<td>0.169</td>
</tr>
<tr>
<td>Work injuries or only done by women</td>
<td>0.073</td>
<td>0.133</td>
<td>0.108</td>
<td>0.073</td>
</tr>
<tr>
<td>Work injuries or only done by men and women</td>
<td>0.054</td>
<td>0.099</td>
<td>0.083</td>
<td>0.054</td>
</tr>
<tr>
<td>Work at home</td>
<td>0.037</td>
<td>0.068</td>
<td>0.055</td>
<td>0.037</td>
</tr>
<tr>
<td>Job satisfaction</td>
<td>0.037</td>
<td>0.068</td>
<td>0.055</td>
<td>0.037</td>
</tr>
<tr>
<td>Flexible Incentives</td>
<td>0.046</td>
<td>0.082</td>
<td>0.069</td>
<td>0.046</td>
</tr>
<tr>
<td>Part-time</td>
<td>0.036</td>
<td>0.065</td>
<td>0.053</td>
<td>0.036</td>
</tr>
<tr>
<td>Part-time job</td>
<td>0.036</td>
<td>0.065</td>
<td>0.053</td>
<td>0.036</td>
</tr>
<tr>
<td>Reduced work hours</td>
<td>0.036</td>
<td>0.065</td>
<td>0.053</td>
<td>0.036</td>
</tr>
<tr>
<td>Reduced work hours</td>
<td>0.036</td>
<td>0.065</td>
<td>0.053</td>
<td>0.036</td>
</tr>
<tr>
<td>Health problem</td>
<td>0.036</td>
<td>0.065</td>
<td>0.053</td>
<td>0.036</td>
</tr>
<tr>
<td>Family or other illness</td>
<td>0.036</td>
<td>0.065</td>
<td>0.053</td>
<td>0.036</td>
</tr>
<tr>
<td>-------</td>
<td>---------</td>
<td>---------</td>
<td>---------</td>
<td>---------</td>
</tr>
</tbody>
</table>

Note: Number of observations: 2,469. Summary data. Significance at 95% confidence level.
Table A.4.3 Heterogeneous Random Effects Ordered Probit. Dependent Variable: Overall Measure of Job Satisfaction. Equation Estimated: $S_h = \beta_1 X_{1h} + \beta_2 J_{1h} + \beta_3 W_h + \epsilon_h$, where $S_h$ is a latent variable and ranges from 1 “Very dissatisfied” to 5 “Very Satisfied”.

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>COEFFICIENT</th>
<th>ROBUST STD. ERROR</th>
<th>ME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Permanent job</td>
<td>-0.295***</td>
<td>0.0290</td>
<td>-0.088</td>
</tr>
<tr>
<td>Log (working hours per week)</td>
<td>-0.298***</td>
<td>0.0311</td>
<td>-0.079</td>
</tr>
<tr>
<td>Age</td>
<td>-0.263***</td>
<td>0.4579</td>
<td>-0.068</td>
</tr>
<tr>
<td>Age(^2)</td>
<td>0.041***</td>
<td>0.0055</td>
<td>0.011</td>
</tr>
<tr>
<td>Married</td>
<td>0.064***</td>
<td>0.0169</td>
<td>0.016</td>
</tr>
<tr>
<td>Children</td>
<td>0.028</td>
<td>0.0215</td>
<td>0.067</td>
</tr>
<tr>
<td>Female</td>
<td>0.246***</td>
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<td>Minority</td>
<td>0.378**</td>
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<td>Ethnic minority woman</td>
<td>-0.122</td>
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<tr>
<td>Percentage of minority</td>
<td>-0.002</td>
<td>0.0014</td>
<td>-0.001</td>
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<tr>
<td>Percentage of ethnic minority &amp; minority</td>
<td>0.001</td>
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<td>0.002***</td>
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<td>0.000</td>
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<tr>
<td>Percentage of women &amp; women</td>
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<td>0.000</td>
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<td>Log (weekly income)</td>
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<td>0.097</td>
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<td>Professional</td>
<td>0.063*</td>
<td>0.0360</td>
<td>0.013</td>
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<tr>
<td>Associate professional and technical</td>
<td>-0.110***</td>
<td>0.0381</td>
<td>-0.030</td>
</tr>
<tr>
<td>Clerical and secretarial</td>
<td>-0.129***</td>
<td>0.0392</td>
<td>-0.037</td>
</tr>
<tr>
<td>Craft and skilled service</td>
<td>-0.466</td>
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<td>-0.013</td>
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<td>Personal and protective service</td>
<td>0.282</td>
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<td>0.011</td>
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<tr>
<td>Sales</td>
<td>-0.011</td>
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<td>-0.007</td>
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<td>Plant and machine operatives</td>
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<tr>
<td>Female &amp; skilled</td>
<td>0.043</td>
<td>0.0326</td>
<td>0.011</td>
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<tr>
<td>Health problem</td>
<td>-0.221***</td>
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<td>Trade union member</td>
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<td>-0.042</td>
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<td>Part-time job</td>
<td>0.203***</td>
<td>0.0549</td>
<td>0.056</td>
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<td>Part-time &amp; female</td>
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<td>-0.016</td>
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<td>Flexible timetable</td>
<td>0.259***</td>
<td>0.0234</td>
<td>0.067</td>
</tr>
<tr>
<td>Flexible timetable &amp; female</td>
<td>-0.056*</td>
<td>0.0306</td>
<td>-0.015</td>
</tr>
<tr>
<td>Job sharing</td>
<td>0.064***</td>
<td>0.0205</td>
<td>0.015</td>
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<tr>
<td>Work at home</td>
<td>0.214***</td>
<td>0.0250</td>
<td>0.056</td>
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<td>Work is equally done by men and women</td>
<td>0.043*</td>
<td>0.0227</td>
<td>0.009</td>
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<td>Work mainly or only done by women</td>
<td>-0.216***</td>
<td>0.0508</td>
<td>-0.054</td>
</tr>
<tr>
<td>Work mainly or only done by women &amp; female</td>
<td>0.171***</td>
<td>0.0528</td>
<td>0.046</td>
</tr>
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<td>Percentage of employees&gt;50 years old</td>
<td>0.348***</td>
<td>0.0846</td>
<td>0.084</td>
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<tr>
<td>Log (establishment size) no. of employees</td>
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<td>0.0078</td>
<td>-0.007</td>
</tr>
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<td>Size of the organisation&gt;2,000 employees</td>
<td>-0.056***</td>
<td>0.0210</td>
<td>-0.014</td>
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<td>Part of a large organisation</td>
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<td>0.0263</td>
<td>-0.009</td>
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<td>Manufacturing</td>
<td>0.071</td>
<td>0.0496</td>
<td>0.017</td>
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<td>Utilities (electricity, gas, water supply)</td>
<td>0.283***</td>
<td>0.0608</td>
<td>0.081</td>
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<tr>
<td>Construction</td>
<td>0.157***</td>
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<td>0.042</td>
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<td>Wholesale</td>
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<td>0.0502</td>
<td>-0.011</td>
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<td>Hotels and restaurants</td>
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<td>Transport</td>
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<td>Other business (real estate, renting)</td>
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<td>Public administration</td>
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Table A.4.3 Heterogeneous Random Effects Ordered Probit Model. Dependent Variable: Overall Measure of Job Satisfaction. Equation Estimated: \( S_{ih}^* = \beta_1 X_{ih} + \beta_2 J_{ih} + \beta_3 W_{ih} + \varepsilon_{ih} \), where \( S_{ih}^* \) is a latent variable and ranges from 1 “Very dissatisfied” to 5 “Very Satisfied”.

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>( \beta )</th>
<th>ROBUST STD. ERROR</th>
<th>ME</th>
</tr>
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<tbody>
<tr>
<td>Education</td>
<td>0.077</td>
<td>0.0502</td>
<td>0.019</td>
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<td>Health</td>
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<td>0.0521</td>
<td>0.009</td>
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<td>East Anglia</td>
<td>0.056</td>
<td>0.0460</td>
<td>0.010</td>
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<tr>
<td>East Midlands</td>
<td>0.121***</td>
<td>0.0367</td>
<td>0.032</td>
</tr>
<tr>
<td>London</td>
<td>0.005</td>
<td>0.0362</td>
<td>0.002</td>
</tr>
<tr>
<td>North East</td>
<td>0.100***</td>
<td>0.0429</td>
<td>0.025</td>
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<tr>
<td>North West</td>
<td>0.083***</td>
<td>0.0361</td>
<td>0.020</td>
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<tr>
<td>Scotland</td>
<td>0.026</td>
<td>0.0349</td>
<td>0.006</td>
</tr>
<tr>
<td>South West</td>
<td>0.110***</td>
<td>0.0363</td>
<td>0.030</td>
</tr>
<tr>
<td>Wales</td>
<td>0.139***</td>
<td>0.0473</td>
<td>0.037</td>
</tr>
<tr>
<td>West Midlands</td>
<td>0.034</td>
<td>0.0372</td>
<td>0.009</td>
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<tr>
<td>Yorkshire-Humberside</td>
<td>0.027</td>
<td>0.0387</td>
<td>0.007</td>
</tr>
<tr>
<td>Unemployment to vacancy ratio by travel to work area</td>
<td>0.020</td>
<td>0.0235</td>
<td>0.006</td>
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<td>Market local</td>
<td>0.011</td>
<td>0.0207</td>
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<td>Productivity</td>
<td>0.037**</td>
<td>0.0178</td>
<td>0.010</td>
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<td>Equal opportunities &amp; minority</td>
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<td>-0.032</td>
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<tr>
<td>Equal opportunities &amp; female</td>
<td>0.005</td>
<td>0.0406</td>
<td>-0.003</td>
</tr>
<tr>
<td>Discuss chances of promotion with supervisor/line manager</td>
<td>0.054***</td>
<td>0.0182</td>
<td>0.015</td>
</tr>
<tr>
<td>Discuss training needs with supervisor/line manager</td>
<td>0.224***</td>
<td>0.0159</td>
<td>0.058</td>
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<td>Employer pension scheme</td>
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<td>Thresholds</td>
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<td>--</td>
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<tr>
<td></td>
<td>0.065</td>
<td>0.1526</td>
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</tr>
<tr>
<td></td>
<td>0.655***</td>
<td>0.1526</td>
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<td></td>
<td>1.485***</td>
<td>0.1528</td>
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<td></td>
<td>0.042***</td>
<td>0.0041</td>
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<tr>
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<td>Log Likelihood</td>
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<tr>
<td></td>
<td>24093</td>
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Note: * significant at 10%; ** significant at 5%; *** significant at 1%.
Table A.4.4 Heterogeneous Random Effects Ordered Probit Model on Employees' Views about the Employment Relationship. Equation Estimated: \( E^*_i \beta = \beta_1 X_{i1} + \beta_2 U_{i2} + \beta_3 W_{i3} + \varepsilon_{i4} \), where \( E^*_i \) is a latent variable capturing employees' views about the employment relationship and ranging from 1 "Very poor" to 5 "Very good".

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>( \beta )</th>
<th>ROBUST STD. ERROR</th>
<th>ME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Permanent job</td>
<td>-0.309***</td>
<td>0.0303</td>
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<td>Log (working hours per week)</td>
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</tr>
<tr>
<td>Age</td>
<td>-0.403***</td>
<td>0.0472</td>
<td>-0.074</td>
</tr>
<tr>
<td>(Age/10)^2</td>
<td>0.052***</td>
<td>0.0058</td>
<td>0.009</td>
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<tr>
<td>Married</td>
<td>0.000</td>
<td>0.0172</td>
<td>0.000</td>
</tr>
<tr>
<td>Children</td>
<td>-0.049**</td>
<td>0.0219</td>
<td>-0.009</td>
</tr>
<tr>
<td>Female</td>
<td>-0.015</td>
<td>0.0566</td>
<td>-0.002</td>
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<tr>
<td>Minority</td>
<td>-0.082</td>
<td>0.1596</td>
<td>-0.028</td>
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<tr>
<td>Ethnic minority woman</td>
<td>-0.125</td>
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<td>-0.013</td>
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<tr>
<td>Percentage of minority</td>
<td>-0.003</td>
<td>0.0019</td>
<td>-0.001</td>
</tr>
<tr>
<td>Percentage of ethnic minority &amp; minority</td>
<td>0.001</td>
<td>0.0025</td>
<td>0.000</td>
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<tr>
<td>Percentage of women</td>
<td>0.003***</td>
<td>0.0007</td>
<td>0.001</td>
</tr>
<tr>
<td>Percentage of women &amp; women</td>
<td>-0.001</td>
<td>0.0007</td>
<td>0.000</td>
</tr>
<tr>
<td>Percentage of women &amp; minority</td>
<td>0.000</td>
<td>0.0019</td>
<td>0.000</td>
</tr>
<tr>
<td>Percentage of minority &amp; female</td>
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<td>0.0018</td>
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<td>-0.040</td>
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<td>Clerical and secretarial</td>
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<td>0.0409</td>
<td>-0.009</td>
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<td>Craft and skilled service</td>
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<td>Personal and protective service</td>
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<td>-0.033</td>
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<tr>
<td>Female &amp; skilled</td>
<td>0.056*</td>
<td>0.0338</td>
<td>0.012</td>
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<tr>
<td>Health problem</td>
<td>-0.094***</td>
<td>0.0318</td>
<td>-0.020</td>
</tr>
<tr>
<td>Trade union member</td>
<td>-0.180***</td>
<td>0.0190</td>
<td>-0.037</td>
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<td>Part-time job</td>
<td>0.064</td>
<td>0.0572</td>
<td>0.010</td>
</tr>
<tr>
<td>Part-time &amp; female</td>
<td>-0.015</td>
<td>0.0524</td>
<td>0.005</td>
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<td>0.0243</td>
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</tr>
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<td>Flexible timetable &amp; female</td>
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<td>-0.012</td>
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<tr>
<td>Job sharing</td>
<td>0.059***</td>
<td>0.0215</td>
<td>0.013</td>
</tr>
<tr>
<td>Work at home</td>
<td>0.154***</td>
<td>0.0259</td>
<td>0.032</td>
</tr>
<tr>
<td>Work is equally done by men and women</td>
<td>0.090***</td>
<td>0.0234</td>
<td>0.012</td>
</tr>
<tr>
<td>Work mainly or only done by women</td>
<td>-0.131*</td>
<td>0.0519</td>
<td>-0.022</td>
</tr>
<tr>
<td>Work mainly or only done by men &amp; female</td>
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<td>Percentage of employees&gt;50 years old</td>
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<tr>
<td>Log (establishment size) no. of employees</td>
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<td>-0.015</td>
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<td>Size of the organisation&gt;2,000 employees</td>
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<td>0.0306</td>
<td>-0.003</td>
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<td>Part of a large organisation</td>
<td>0.002</td>
<td>0.0382</td>
<td>0.001</td>
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<tr>
<td>Manufacturing</td>
<td>-0.040</td>
<td>0.0707</td>
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<td>Utilities (electricity, gas, water supply)</td>
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<td>Construction</td>
<td>0.103</td>
<td>0.0836</td>
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<td>Wholesale</td>
<td>-0.066</td>
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<td>Hotels and restaurants</td>
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</table>
Table A.4.4 Heterogeneous Random Effects Ordered Probit Model on Employees’ Views about the Employment Relationship. Equation Estimated: \( E_{ih} = \beta_1'X_{ih} + \beta_2'J_{ih} + \beta_3'W_{ih} + \epsilon_{ih} \), where \( E_{ih} \) is a latent variable capturing employees’ views about the employment relationship and ranging from 1 “Very poor” to 5 “Very good”.

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>( \beta )</th>
<th>ROBUST STD. ERROR</th>
<th>ME</th>
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<tbody>
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<td>Public administration</td>
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<td>0.180**</td>
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<td>0.001</td>
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<td>0.516</td>
<td>0.0665</td>
<td>0.007</td>
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<tr>
<td>East Midlands</td>
<td>0.097*</td>
<td>0.0535</td>
<td>0.014</td>
</tr>
<tr>
<td>London</td>
<td>0.129**</td>
<td>0.0529</td>
<td>0.022</td>
</tr>
<tr>
<td>North East</td>
<td>0.062</td>
<td>0.0631</td>
<td>0.012</td>
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<tr>
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</tr>
<tr>
<td>Scotland</td>
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<tr>
<td>South West</td>
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<tr>
<td>Wales</td>
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<td>West Midlands</td>
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<td>Yorkshire-Humberside</td>
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<td>-0.004</td>
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<tr>
<td>Unemployment to vacancy ratio by travel to work area</td>
<td>0.020</td>
<td>0.0342</td>
<td>0.005</td>
</tr>
<tr>
<td>Market local</td>
<td>0.032</td>
<td>0.0299</td>
<td>0.006</td>
</tr>
<tr>
<td>Productivity</td>
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<td>0.0260</td>
<td>0.018</td>
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<tr>
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<td>-0.003</td>
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<td>0.035</td>
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<tr>
<td>Equal opportunities &amp; female</td>
<td>0.036</td>
<td>0.0433</td>
<td>0.000</td>
</tr>
<tr>
<td>Discuss chances of promotion with supervisor/line manager</td>
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<td>0.0187</td>
<td>0.012</td>
</tr>
<tr>
<td>Discuss training needs with supervisor/line manager</td>
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<td>0.0165</td>
<td>0.046</td>
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<tr>
<td>Employer pension scheme</td>
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<td>0.0389</td>
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<tr>
<td>C2</td>
<td>-2.116***</td>
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<td>C3</td>
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<tr>
<td>C4</td>
<td>0.273</td>
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<tr>
<td>( \rho )</td>
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<td>LR chi2(75)</td>
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Note: * significant at 10%; ** significant at 5%; *** significant at 1%.
Chapter 5
Off-the-Job Employer Provided Training, Workplace Segregation and Equal Opportunities Policies in Britain

5.1 Introduction

Workplace training is increasingly becoming an important component of human capital generation and an engine of lifelong learning. For instance, recent evidence suggests that programmes that encourage non-cognitive skills and help individuals to acquire new skills effectively promote their long-term success (Heckman and Krueger, 2004). Also, it has been found that employer provided-training offers significant gains to both workers and firms (Lynch, 1994) and that productivity is higher in firms or in cities with a better trained workforce (Moretti, 2004). The provision of workplace training by employers is considered to be important since firms are driven by market forces and will supply the skills that the market demands (Booth and Snower, 1996). But, since the skills that will be needed tomorrow are not necessarily ones that are in demand today, a flexible mechanism is needed (Arulampalam and Booth, 1998). Mechanisms that rely on either educational institutions or governments to lead the way are unlikely to meet the desired level of flexibility or their objectives. For instance, US evidence (see Gritz, 1993) suggests that participation in private training programmes as opposed to participation in government programmes improves the employment prospects of women by increasing both the frequency and duration of employment spells. Thus, the best way to proceed is likely to encourage and support mechanisms operating in the marketplace itself. In many instances, this is interpreted as providing incentives, support and information to firms.
However, the investments being proposed by firms are in workers, and so getting them to participate is crucial (Prendergast, 1999). But, participation in employer provided training programmes may be limited due to a number of reasons.

One reason concerns labour market segregation. For instance, it is a common finding in the labour market segregation literature that the composition of the labour force differs widely across employers. There are two main theories for this empirical observation: a) taste based discrimination, and b) quality sorting recruitment. The first theory suggests that preferences by employers (co-workers or customers) will lead to employers recruiting particular types of workers but not others (Becker, 1971; Darity and Mason, 1998). The second explanation distinguishes workers by their quality or productivity, and stresses sorting effects according to which similar workers will be matched together in firms, if their skills are complements in the production process (Kremer, 1993). However, both theories complement each other and predict that workers with different attributes will be segregated into different workplaces. At the same time, workplace segregation can be viewed as a voluntary choice for labour market disadvantaged groups (i.e. females and ethnic minority employees) if taste for discrimination and gender or racial harassment are lower, or job related opportunities are higher in establishments with more females and ethnic minorities respectively.

The above arguments suggest that the factors influencing the gender and ethnic composition of a work group are complex. Theoretical work in economics has addressed the issue of the optimal size of a minority for both the employees and the employers. For the employees the optimisation typically recognises a productivity interaction between groups, such as communication within homogenous groups is superior, or a preference interaction, where one or more groups receive disutility from working with a minority (Rapoport and Weiss, 2003). Firms themselves may desire a particular gender or racial
composition in order to appeal to potential customers. For instance, banks may wish the composition of employees in the workplace or at a particular section of the workplace (i.e. reception area) to roughly match those of their customers (Kim and Squires, 1996). Social psychologists have also measured the influence of work group gender composition on the commitment and on effectiveness (productivity) of the group. For instance, a US study (Knouse and Dansby, 1999) found that the optimal female and minority composition in terms of perceived work group effectiveness is between 11% and 30%.

Also, according to endogenous growth theory (Lucas, 1998, p.19) “Human capital accumulation is a social activity, involving groups of people in a way that has no counterpart in the accumulation of physical capital”. This interaction between employees creates local human capital spillovers at the establishment, and thus the level of segregation at the workplace becomes highly significant. For instance, it could be the case that training and human capital spillovers are higher for women and ethnic minority employees in establishments where higher proportions of their corresponding peers are observed.

The sorting of employees into different establishments may be viewed as endogenous due to labour market discrimination against women and ethnic minority employees. In this Chapter although we acknowledge the potentiality of this problem we do not examine the source of workplace segregation across establishments, but we limit the analysis to quantifying the impact of gender and ethnic workplace segregation upon the receipt of employer provided training. Hence, we make the assumption that employees are randomly allocated into different workplaces.47 This assumption finds some support in

47 One possible source of exogenous variation would result from government imposed positive affirmative actions, or positive discrimination in favour of female and ethnic minority employees in selected occupations or industries. However, no such policy exists in Britain. In Section 2.3 of Chapter 2 we demonstrated that the degree of complete establishment segregation was rather moderate. Only 6% of the establishments were totally gender segregated (2% had no female workers and 4% were totally female segregated). In contrast, 42% of the establishments did not have any ethnic minority workers.
the recent US empirical evidence. For instance, Carrington and Troske (1998a) and Hellerstein and Neumark (2004) found that the interfirrm distribution of black and white workers was close to that implied by random assignment. The above papers also provide evidence that black and white workers in the same firm deploy different skills. In contrast, there is no British study that tries to identify and examine the extent of sorting of female and ethnic minority employees across establishments and, moreover, their effects on training. The paucity of research on workplace segregation in Britain is possibly due to the lack of data linking workers to establishments.

Another reason concerns the allocation of training across employees. This may be problematic in terms of equity. For instance, firms are likely to support and implement mechanisms that demand that a group of workers (e.g. females and ethnic minorities) assume the majority of the risk if managers believe that females (Green, 1991; Lynch, 1991) and ethnic minority employees (Shields and Wheatley Price, 1999b; Loewenstein and Spletzer, 1997) are more inclined to quit their jobs. Also, due to taste or statistical discrimination (see Chapter 1, pp. 12-13) managers may be unfair in the decision regarding who gets trained (Shields and Wheatley Price, 1999b).

Natural policies to employ when considering issues relating to workers, and particularly to issues related to equity towards workers, are equal opportunities policies. For instance, Shields and Wheatley Price (1999b, p.524) cite qualitative studies (Beishon et al., 1995; Palmer, 1992) as well find indirect evidence that discrimination in the provision of training takes place despite the fact that discrimination in the provision of training opportunities, on the grounds of race, has been outlawed since the Race Relations Act of 1976.

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48 For different techniques of how to compute segregation indices see Hutchens (2004) and Carrington and Troske (1997).
The importance of training in the economy has not only been highlighted by examining who receives or provides training, but also from concerns about wage inequality (Gosling et al., 2000), skill biased technological change (Acemoglu, 2002), endogenous growth theory (Lucas, 1988) and the positive external effects of training on the human capital of latter cohorts and on higher quality goods (Stokey, 1991). Also, the effects of changes in work organisation on the demand for skills (Acemoglu, 1999; Kremer and Maskin, 1996; Maurin and Thesmar, 2004) and workplace innovation (Black and Lynch, 2004; Caroli and Van Reenen, 2001) have been highlighted. Further, training has not only economic but social effects as well. According to the Organisation for Economic Cooperation and Development (OECD 1993, Chapter 2) training may generate external benefits such as reductions in crime rates, depression and other illnesses.

The determinants of employer provided training have been extensively documented and debated. However, much of what is known about employer provided training is based on descriptive analyses of survey data. These datasets are typically collected on the supply side of the labour market and are based on household surveys that contain self-reported measures of training. The training questions in these surveys are retrospective and measure training flows [(e.g. the British Household Panel Survey (henceforth BHPS), the British Social Attitudes Survey (henceforth BSAS), the Labour Force Survey (henceforth LFS) and the National Child Development Study (henceforth NCDS)]. Except controlling for establishment size and industrial sector a limitation of much past research has been the inability to control for a large array of establishment characteristics. As a result, it is not possible to tell whether a certain demographic group

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49 A cross section British survey with detailed information on training is the Working in Britain Survey. However, this survey lacks information on firm characteristics, as the unit of analysis is the individual. Another limitation of this dataset is that although it is a nationally representative sample, it provides information on only 2,466 employed individuals.

50 We are aware of two other British based employer surveys with information on training. The Employers' Manpower and Skills Practices Survey (EMSPS) provides a wide set of questions on the training...
receives more training, regardless of employer characteristics, or if the correlation with training is due to this group being more likely to find employment in establishments that do substantial amounts of training.

According to Frazis et al. (2000) the empirical findings of a number of determinants of training are not clear and many studies offer conflicting evidence. In this Chapter, we argue that the lack of solid evidence with respect to gender and ethnicity is due to the shortcomings of the data sources used in the previous literature, and we set out to address these shortcomings using the WERS98. As we stated in Section 2.7 of Chapter 2 employees were asked the following question “During the last 12 months how much training have you had, either paid for or organized by your employer: include only training away from your normal place of work, but it could be on or off the premises”. Employees were provided a six-scale option to code their responses. Those options were ordinal but were attached a cardinal measurement and were running from “None” (1), “Less than one day” (2), “1 to less than 2 days” (3), “2 to less than 5 days” (4), “5 to less than 10 days” (5) to “10 days or more” (6). Employees were also advised to choose only one of the above options. Given the nature of the training instrument we employ a random effects ordered probit model to examine gender and ethnic differences in the intensity of training. We also employ a random effects probit model to examine corresponding

environment in the firm. This survey was carried in 1990/91 and was linked to the third Workplace Industrial Relations Survey (WIRS). However, the information on training in the WIRS is very limited (Chapman, 1993). Another employer survey but however of limited scope is the 1996 Employer Survey. This survey involved 149 large and 313 small/medium sized establishments with less than 500 employees. With the exception of information on the establishment size and its formal status, (public/private sector) this survey does not provide any other information on establishment characteristics (Green et al., 2000).

To the best of our knowledge there have been four very recent studies using the WERS98 to examine training. The first is a study by Boheim and Booth (2003) which examines the correlation between union presence and private sector training. The second study (Addison and Belfield, 2004), examines the relationship between training, unions and firm performance. Almeida-Santos and Mumford (2004) examine employee training and wage compression, whereas the study by Collier et al. (2003) uses only one element of the WERS98, the management questionnaire and examines establishment survival. None of the above studies examine the effects of workplace segregation and equal opportunities policies in identifying gender and race differentials upon the receipt of training. Also, since the research questions addressed in this Chapter differ from those of the above studies the estimation methods we implement differ from those methods utilised in the above papers.

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differences in the incidence of training by collapsing the six ordinal categories in two
categories. For instance, those individuals without any training were recoded as “0” and
those with a positive amount of training were recoded as “1”.

The detailed matched employer employee survey data allow us to
comprehensively control for a wide-range of workplace characteristics, capturing both
workplace quality and workforce composition in estimating differences in the
determinants of training intensity and training incidence. Failure to control for such
characteristics could otherwise lead to a spurious relationship between female and ethnic
minority densities, equal opportunities policies and our two dependent variables, the
intensity and the incidence of training.

The empirical strategy in this Chapter differs from the previous two empirical
Chapters. In this Chapter we exploit the relevant advantage of the WERS98 (over other
surveys that study the determinants of training) by including a large number of firm
characteristics that may help explain differences on the incidence as well as on the
intensity of training between genders and ethnicities. More precisely, in this Chapter we
examine the effects of workplace segregation and equal opportunities policies upon
training differentials with respect to gender and ethnicity. In order to identify the role of
workplace segregation and equal opportunities policies upon the incidence and intensity
of training we conduct a three-step analysis that exploits the various characteristics of the
WERS98. Our basic specification (termed Basic model) excludes the percentages of
female and ethnic minority employees at the establishment as well as the equal
opportunities policies dummy variable. Then, we add in the percentages of female and
ethnic minority employees at the establishment and their corresponding cross products
(termed Extended model 1) and observe their impact on gender and ethnicity dummy
variables. In contrast to Shields and Wheatley Price (1999b) we provide direct evidence
on the effects of equal opportunities policies on training by including an equal opportunities policies dummy variable and interact it with gender and ethnicity (termed *Extended model 2*). This last specification is based on the fact that we regard the variables added from *Extended model 1* to *Extended model 2* as important variables in identifying the effects of equal opportunities policies upon training and more specifically upon gender and ethnicity.

This Chapter proceeds as follows. In Section 5.2, we outline the economic theory of training and in Section 5.3 we review the existing empirical evidence. Section 5.4 presents the variables employed, whereas Section 5.5 discusses the choice of econometric modelling. The results from our empirical models are presented in Section 5.6. Section 5.7 forms a heuristic test of exogeneity of the equal opportunities policies. Finally, Section 5.8 discusses policy implications and concludes.

5.2 Theory of training

In this section we highlight the differences between firm specific and general training, we explain how general training may arise, and briefly explain the investment strategy of the employer and the employee as well as analyse the costs associated with training.\(^{52}\) Having a theoretical background on the above issues is important because as we saw in Section 2.7 of Chapter, 2 the WERS98 question on training does not explicitly distinguish between firm specific and general training and who pays for it.

According to Becker (1964) skills can be divided in two categories: a) skills specific to a given firm and b) completely general, i.e. training that is transferable to other firms. Becker’s model of training predicts sharp differences in training outcomes between

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\(^{52}\) For a detailed discussion and testing of the various theories of training on wages and cost sharing see Booth and Bryan (2005).
general and firm-specific skills. However, the drawback of the distinction between firm specific and general training is that it fails to describe the full range of training empirically because most skills learned on the job may be somewhere in between the two extremes of firm specific and general training.

The above observation finds support in the empirical as well as in the theoretical literature. For instance, empirical studies such as Loewenstein and Spletzer (1999) having data on the generality of training found no systematic differences in the wage returns to specific and general training provided by the current employer. They suggest that this can be partly explained by measurement error in the data, poorly phrased questions that do not exactly capture the economic concepts of specificity and generality, as well as the possibility that both employers and employees share the costs of general and specific training.

Theoretical studies such as Lazear (2003) suggest that it is difficult to give convincing examples where firm specific training approaches general training. Thus, he relaxes Becker’s assumption and allows all skills to be general in that there are other firms that use some or a portion of each of the skills. For instance, he assumes that firms use skills in different combinations and attach different weights to each of the skills. In other words, investment on training is a weighted average of relevant skill weights inside the firm and outside, where the weights depend on probability of separation and the distribution of outside opportunities.

In the case that training is transferable to a small number of firms, Becker (1964) suggests that the effect of training is difficult to assess, but he conjectured that such training is more likely to be specific training rather than general training because of the
monopsony power held by the firms. Stevens (1994, p.540) generalises the Becker model to include the case of transferable training, which “is of some value to at least one firm in addition to the training firm”. This argument implies that skills are transferable to some but not all the firms, since some skills are specific to the type of work one does.

5.2.1 General training

The empirical literature on training suggests that firms seem to pay for general training, and that employees view training events as general (Booth and Bryan, 2005). For instance, according to Green and Felstead (1994), 75% of training in Britain is employer funded. Also, Green et al. (2000) found that for training episodes that lead to transferable skills, employers carried at least some of the cost in 84% of the cases. Booth and Bryan (2002) using data from the BHPS found that 85% of the training events were viewed as improving general training. This is supported by US evidence as well. For example, Loewenstein and Spletzer (1999) using data from the 1993 National Longitudinal Survey of Youth (NLSY) as well as the Employer Opportunity Pilot Survey (EOPP) found that 63% of workers reported that almost all or all of the skills learned were transferable. More importantly, they found that employers not only recognise the value of skills that workers have learned from the training provided by previous employers, but they also substitute previous training for their own training. Further, Booth and Bryan (2005) provide evidence of the transferability of training in Britain by suggesting that the returns to accredited training with future employers are higher by 5.4% than the returns to training with the current employer.

As a result, several authors have developed theoretical models to explain firm-sponsored training. Acemoglu and Pischke (1998, 1999b) assume perfect competition

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53 For an excellent exposition of the monopsony model with respect to training see Chapter 11 in Manning (2003).
among employers, so their models do not imply anything about the role of market size on training. For instance, the model in Acemoglu and Pischke (1998) allows for free entry of firms at all points in time. In addition, their model does not make the distinction between general and specific training. All training is perfectly general, so that the result of firm sponsored training is not driven by firm specific human capital.

Further, Booth and Zoega (1999); Chang and Wang (1996); Katz and Ziderman (1990); Loewenstein and Spletzer (1998); Scoones and Bernhardt (1998); Bhaskar and To (2002) and Brunello (2002) propose conditions under which firms might invest in general training. The crucial assumption of all the above papers is that firms invest in general training if wages are compressed relative to productivity. Booth and Bryan (2002) suggest that the intuition behind this is that if productivity is increasing at a faster rate than wages, firms' profits are increasing over some range. Thus, firms might be willing to finance training.

Balmaceda (2005) and Scoones and Bernhardt (1998) provide alternative theoretical reasons of why general training may arise. The first author develops a theoretical model and shows that firm sponsored general training arises naturally when general and specific training are separable in the production technology and wages are determined by bargaining outside options. The study by Scoones and Bernhardt examines models with self enforcing contracts in which workers take part in the firm specific investment and suggests that the functioning of the labour market and, specifically, the way in which outside offers arrive, effectively turns firm specific human capital into general capital.
Autor (2001) examines why temporary help establishments provide free training in portable computer skills. A basic assumption in his model is that training is more productive and therefore more valuable for highly productive workers. Autor’s model assumes that firms profit from doing so by obtaining an informational advantage concerning the ability of the workers, which can then be exploited by offering wages below marginal productivity. Hence, firms performing training will observe worker quality, whereas non-training firms will not. Autor justifies this assumption by the empirical feature that the training provided by the firms began and ended with assessment.

General training may also arise due to non-pecuniary reasons. For instance, Booth and Zoega (2004) suggest that worker heterogeneity can generate conditions under which firms will invest in the general training of their workers. This is because a high ability worker raises the average level of talent in a firm and may consequently increase the range of tasks that can be performed within its ranks. Moreover, in the absence of any countervailing market power, some firms acquire monopsony power in the market for labour trained to do the more advanced tasks. They also suggest that because the degree of monopsony power is increasing in task complexity, firms whose employees undertake more sophisticated training tasks are more willing to finance general training.

Leuven et al. (2004) study the reciprocity assumption and find that when a firm invests more in a worker’s skills than theory predicts, the worker may interpret this as a

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54 In the US temporary help establishments act as information brokers in the labour market, rather than as simply a provider of spot market labour services. According to the author, they pay up-front costs of training (about $150 per trainee) prior to job assignment without any contractual obligation to perform work. Cappelli (2002) finds that a substantial payment for college education in the US is paid by the employers in order to improve employee quality, attract better workers, and reduce turnover. Acemoglu and Pischke (1998) and Pischke (2001) show that in Germany firms voluntarily offer apprenticeships to their workers. The skills provided to these workers are highly general, but firms bear a considerable fraction of the costs of training. Leuven and Oosterbeek (1999) show that in Canada, the Netherlands, Switzerland and the US firms often pay for the direct costs of training when the worker initiated the training and/or if this training is provided outside the firm.
kind action of the firm which deserves some reward.\textsuperscript{55} The worker can pay back by behaving less opportunistically than standard theory predicts. If the firm anticipates this kindness it will be prepared to invest more or underinvest less. The authors test this assumption using Dutch data and find that workers who behave less opportunistically are 15\% more likely to participate in a training course.

Kuhn and Sweetman (1999) suggest that it may be interesting to split general human capital into general human capital that is useful both inside the current firm and in other firms, and general human capital that is useful only at other firms. They claim that individuals may initially invest in skills of various types before they know what firm or industry they will be associated with.\textsuperscript{56} Once they join a particular firm, they are likely to invest further in some of those skills, and not in others which are not directly relevant for their current firm.

\textbf{5.2.2 Investment strategy and cost sharing}

In this sub-section we review the theory of investment in training and cost sharing since in the WERS98 it is not clear whether the employer or the employee has paid for it. Human capital theory predicts that if the worker contributes to the costs\textsuperscript{57}, he/she will share in the benefits and vice versa. Also, according to the standard analysis, the worker invests in specific human capital by accepting a lower wage than his/her alternative wage,

\textsuperscript{55} The assumption of reciprocity is closely related to Akerlof's (1982) "gift-exchange" model of efficient wages. In his model wages are determined and in turn also influence the norms of workers' effort.

\textsuperscript{56} Neal (1995) and Patent (2000) suggest that it may be interesting to consider industry specific human capital.

\textsuperscript{57} As we stated in Section 2.7 of Chapter 2 measuring the costs of training is difficult especially given the heterogeneous nature of training (see Leuven, 2003) as well as the way the training question is phrased. Costs can be divided in two categories: a) direct costs (e.g. expenditures on training material, training personnel, travel costs, etc.) and b) indirect/opportunity costs depending on whether training takes place during working hours (i.e. the worker produces less during training, colleagues or supervisors spend time training the workers, training uses capital which could have been used more productively otherwise) or outside working hours and the employee is bearing the opportunity cost in terms of foregone leisure as well as child care.
and receives a return on his/her investment during the post-investment periods in the form of a higher wage than his alternative wage. The employer invests in specific human capital by paying the worker a wage larger than the value of his/her marginal product, and receives a return on the investment in subsequent periods by paying a wage smaller than the value of his/her marginal product. According to Lazear's (2003) argument concerning skill weights, it is natural that the firm would pay for at least some of the human capital that appears to be general. However, Lazear (2003) suggests that as the skill mix becomes more idiosyncratic workers are less likely to pay for training even though each component is general.

With cost sharing there is an incentive for both employers and employees to maintain their employment relationship (Loewenstein and Spletzer, 1998; Acemoglu and Pischke, 1998). Regarding the exact size of the share, Becker (1964, p.44) remarks that "the shares of each depend on the relation between quit rates and wages, layoffs rates and profits, and on other factors such as costs of funds, attitudes towards risk and desires for liquidity". In the case of firm specific training Hashimoto (1981) developed a model in which the gains and costs of training are shared between firms and employees in such a way that is an ex-ante profitable venture for both parties.

Oosterbeek et al. (2001) using a two-stage bargaining game between employers and employees studied experimentally whether employers and workers should invest in firm specific training. They found that investment incentives are the same for the worker and the employer when the market for alternative jobs is frictionless. However, they found that actual bargaining outcomes can provide a reasonable explanation for the observed differences between employers' and workers' investment levels.
5.3 Existing empirical evidence

The literature on the economics of training is immense and extensive reviews among others are provided in Ashenfelter and Lalonde (1997), Booth and Snower (1996) and Lynch (1994). In this section we briefly review the findings of the main determinants of training and concentrate more on gender and ethnicity. We start by reviewing existing empirical evidence on individual, job related and economy wide characteristics.

An important issue identified by human capital theory concerns the optimal timing of work and training during the life cycle. From a theoretical point of view the returns to early human capital investments are higher than investments later in life for at least two reasons. Firstly, the payoff period is longer. As Becker (1964) suggested the potential length of payback period declines with older workers as increased age reduces the time in which the benefits from training can be reaped. Secondly, human capital has dynamic complementarities, as according to Heckman (2000) early learning makes subsequent learning easier.

According to Bishop (1977) the expected relationship between education and training is positive if education and training are complements and training increases ability. In the same vein, Altonji and Spletzer (1991) noted that the positive correlation between education and training observed in many empirical studies might reflect complementarity in production or the presence of factors that influence investment in both forms of human capital. For example, firms will prefer to train the individuals who are most able to benefit from training and perhaps faster to learn. Interestingly, Blundell et al. (1996) found that formal qualifications gained after school appear to have no significant effect on the probability of receiving employer provided-training.

58 This suggests that ability is not only innate but it can also increase through training.
The existing literature has put forward inconclusive evidence regarding the impact of marital status on the probability of receiving training. Green (1993a) reported that marriage reduces the probability of receiving training for women, whereas Booth (1991) has shown that marital status has no effect upon training for either sex. In contrast, Greenhalgh and Stewart (1987) found that married men receive, ceteris paribus, more training than single men.

Job characteristics have also been found to significantly affect training incidence. There is evidence that individuals in particular occupational groups may be more likely to experience training, through complementarity in the production of particular occupational groups and training, or because occupational classifications may proxy individual ability and motivation (Altonji and Spletzer, 1991). The same authors argued that higher job skill requirements increase both the marginal productivity of knowledge and the effect of training activities on knowledge. They therefore predicted that employees in high-level jobs are more likely to receive training. Indeed, Arulampalam and Booth (1998) found the training incidence to be higher for workers in professional or managerial occupations. Also, there is general agreement on the finding that higher-level occupations require more retraining (Greenhalgh and Stewart, 1987; Rigg, 1989, Green, 1991).

Economic theory suggests that employees with longer working hours are more likely to receive training because they can earn higher returns from training than employees with shorter working hours. This is consistent with the result found by Greenhalgh and Mavrotas (1994). In contrast, Oosterbeek (1998) found that firms seem not to distinguish between employees with short and long working hours. This is plausible if not only firms' gain but also if firms' costs of training are proportionate to hours of work.
The tenure effect has historically been interpreted as evidence of the accumulation of firm specific human capital (Becker, 1962). Workers with longer tenure are more likely to remain with the firm and are therefore a less risky object for the firm to invest in. Nevertheless, this theoretical argument is countered by the fact that it is worthwhile for firms to train recently hired workers because they have a lot to learn about their job and the firm. This is reflected in the empirical literature where it has been found that the probability that an individual receives employer provided training is greater in the first year of job tenure (Bishop, 1977; Orje, 2000).  

Full time employees or employees in permanent employment have a higher probability of being trained than part time employees or employees with a fixed term or a temporary contract (Arulampalam and Booth, 1998). On the one hand, part time working has a similar effect to age by reducing the time available to capture the benefits from training. On the other hand, workers with a permanent contract are assumed to have a higher training probability, as they are less likely to leave or to be dismissed. Moreover, temporary staff may end up being used as a cheaper option to adjust firm-level employment, with lower wages and severance payments, and poor human capital accumulation (Booth et al., 2002, Arulampalam et al., 2004a).

With respect to training and wages, Becker (1962, 1964) highlighted the importance of training as a factor in accumulating human capital and how this can be translated into effective growth in the value of the workers’ marginal productivity and consequently in their wage. Thus, wages and training outcomes are almost certainly determined simultaneously. In a recent paper Arulampalam and Booth (2001), controlling

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59 However, this finding seems to be a statistical artifact of the data. For example, in a single cross section when a single occurrence of training over a specified period is used, those with shorter tenure are found to be more likely to receive training. In contrast, if the question asks whether the respondent has ever received any training in their current job, employees who have been in that job longer are more likely to reply positively (Loewenstein and Spletzer, 1997).

60 For the impact of training on current as well as on future wages see Manning (2003) and for a review of the literature on the returns to training see Bartel (2000).
for the endogeneity of training in a wage growth equation, found training incidence for young British men to have a positive effect on wage growth. The literature, however, faces two problems. The first is that good instruments are rarely available (Manning, 2003). The second is that due to the difficulty in distinguishing between general and specific training the effect of training on wages is difficult to identify (Loewenstein and Spletzer, 1999).

The impact of unionism on training is far from uniform in the literature. For instance, Brown (1989) in a survey of empirical evidence on private training found examples where unions have a positive, a negative, and no appreciable effect on training. Also, it has been suggested that unions may have differential impacts upon specific and general training (Green and Lemieux, 2001). On the one side, it is a common finding in the literature that unions are associated with longer tenure jobs and thus more firm specific investment, as firms and workers both believe the relationship will last longer and therefore will be willing to invest more. On the flipside, greater job stability in the union sector could lead to lower investment in general training since unions limit employees' incentives to move to other firms. With respect to British evidence, Arulampalam et al. (1997) found that trade union membership is negatively associated with training incidence, whereas Addison and Belfield (2004) found that whether or not a worker receives training is not affected by the union recognition status of a plant or by the structure of collective bargaining.

Workplace characteristics have also been found to affect the incidence of training. For instance, recent research on training shows that large employers are more likely to offer training and that their employees are more likely to invest in firm-specific human capital (Barron et al., 1987; Holtmann and Idson, 1991; Idson, 1990). Thus, large employers may not only be hiring more skilled workers, but they may be also more likely
to produce more skilled workers. This may be due to the fact that larger employers may:

a) face economies of scale (Green 1991, 1993b; Green et al., 1996; Greenhalgh and Mavrotas 1994, 1996; Rigg, 1989; Booth 1990, 1991); b) have lower required rates of return on training (Barron et al., 1987); c) have greater ability to absorb losses with turnover among trained workers; d) have better capacity to screen potential employees before hiring them (Barron et al., 1987; Holtmann and Idson, 1991); e) face complementarity between training and capital as larger firms have a higher capital/labour ratio; f) have standard induction programmes designed to introduce new employees to work conditions and qualify them with the appropriate skills (Booth, 1991) and g) face more regulations and bureaucracy and so provide more training in the nature of meeting safety regulations, etc. (Felstead and Green, 1994). In contrast to all of the above arguments, Deloitte et al. (1989) found that enterprise size rather than establishment size is an important determinant.

The industrial classification of the workplace may indicate the presence of demand factors, for instance, if the workplace is in an expanding or low technology industry (Dearden et al., 2000). Following conventional wisdom we would expect that industries with the highest levels of technological change to provide more training than the low technology industries. Shields (1998) using data from various waves of the LFS found that training is highest in the “non-tradeable” industries of health, education and public administration. In contrast, he found that the likelihood of receiving training is lower in manufacturing, transport and the service sector. Similarly, Booth (1991) showed that the public sector provides more training than the private sector. Thus, she argued that private sector firms might be less likely than public sector firms to engage in training as private sector firms are more constrained by the need to make profits. To this extent, private sector firms may be less willing to finance training through fears that training investment
may be lost via poaching of trained workers by rival non-training firms. Also, private sector firms may be subject to greater demand fluctuations, making worker redundancies likely and expensive since training investments would thereby be lost. However, Green (1993b) and Green et al. (1996) did not find such correlation.

With respect to economy wide characteristics there is evidence that training in Britain moves procyclically. For instance, Finegold and Sockice (1988) emphasize the vulnerability of the British system to short-termism reduction of expenditure during a recession.61 However, Green et al. (1996) found no significant effect of local unemployment on training. Concerning differences in training between regions, Green et al. (1996) found that the region in which the establishment is located has very little influence upon training. In contrast, Brunello and Gambaroto (2004) found that local labour market density (measured as the number of employees per squared kilometre) negatively influences the amount of employer provided training in the UK.

5.3.1 Gender and training

The pattern of gender differentials upon the receipt of training has changed over the last fifteen years. The reason for this change is unclear and many factors have been proposed. We begin by reviewing the studies that provide evidence of discrimination or disadvantage against women. Then, we re-assess those studies that provide evidence of a positive training differential in favour of women and outline some plausible factors for this change.


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61 At the time the WERS98 was taking place Britain had moved out of recession and was growing at 1% above its average rate for the period since 1980 (Cully et al., 1999).
based on 1987 data found that females were less likely to receive training than males in the UK labour market. Green (1991) found that for the UK in 1984 the age training profile for men was steeper than that for women and that, ceteris paribus, men received 40 hours more training than women. More specifically, he found that younger women are discriminated against with respect to access to training (see also Booth, 1991) and that women with family responsibilities were less likely to suffer discrimination in access to training opportunities earlier in their careers. Moreover, Booth (1993) using a survey of British graduates of the same cohort (1980 cohort) and thus reducing problems of unobserved heterogeneity found that men were more likely to receive training than women. She also found that training in earlier jobs is more portable for men than for women.

Mallier and Rosser (1987) as well as Vella (1994) emphasized the importance of role models and the reinforcement of girls' and women's expectations. They argued that sex discrimination with respect to training occurs before and during the work life cycle and that opportunities are structured in a way that predisposes an outcome in which women, a) have less access to the means of skill acquisition, and b) tend to acquire skills predominantly in those areas that reinforce existing occupational segregation.

These findings are in line with U.S. studies where it is reported that women receive less training than their male counterparts (Altonji and Spletzer, 1991; Bishop, 1996; Duncan and Hoffman, 1979; Lynch, 1992; Neil-Olsen and Sexton, 1996; Royalty, 1996). The last authors suggested that gender differences in workplace promotion and training practices explain why women accumulate less training than men. However, they provided evidence that these sources of gender differences were reduced between 1976 and 1985.
In contrast to all the above evidence, recent evidence suggests that in the UK women are more likely to participate in training than men (see Greenhalgh and Mavrotas, 1994, 1996; Gibbins, 1994; Dearden et al., 1997; Green and Zanchi, 1997; Shields, 1998). Greenhalgh and Mavrotas (1993) showed that the pattern of training in the UK labour market has changed in recent years with the incidence of training among females exceeding that among males by 1989. Also Green (1993a) suggested that discrimination over training opportunities might alter over time and over the course of the business cycle. Green (1999) found that there is little evidence of sex discrimination over the quantity of training received.

Greenhalgh and Stewart (1987) found that women undertake more external training but less on the job training. Similar results are reported for the US (see Veum, 1993) as well as for Australia (see Miller, 1994; Wooden and VandenHeuvel, 1997). Veum (1996) attributes this differential to the fact that women are more likely to work fewer hours and to be employed in entry-level positions that are associated with greater training intensity. Oosterbeek (1998) utilising Dutch data found that women were more eager to engage in training than men but that firms preferred to train their male workers. A plausible interpretation of this result is that employed women have on average greater training needs than men, in order to compensate for more frequent labour market interruptions.

Finally, Jones et al. (2004) reviewed the literature on training incidence and proposed five main factors why this change may have occurred: a) institutional and social changes have resulted in improvements in the labour market status of women; b) increased labour force participation for women gives rise to a statistical re-entrants effect, thus training is higher among those returning to the labour market following interruptions of their work histories; c) women have characteristics associated with higher training
incidence, including superior qualifications that younger workers bring to the market and occupational composition; d) technological (e.g. introduction of computers) and labour demand changes by employers coinciding with occupational segregation by gender have favoured women; and e) the monopsonistic power of the employer declines as the probability of re-employment increases. To study changes in the incidence of training over time the authors utilised data from the LFS over a seven-year time period (1995-2001) and found that indeed women are more likely to receive job related education and training than males. Overall, they suggested that over this time period changes in characteristics (i.e. qualifications and occupations) explain most of the current gender differential in favour of women, but that changes in preferences reflecting differences in the returns to training explain the size of the change in incidence over time.

However, as we argued in Section 2.7 of Chapter 2, the content of training is very important and a major limitation of the existing literature mainly due to data limitations, is distinguishing between training that leads to formal qualifications or not. For instance, it could be the case that although women have a higher training intensity, they may be trained: a) in soft skills (i.e. health and safety skills, improving communication, word processing, spreadsheet applications, etc.); b) skills that are not certified; or c) in skills that do not have a positive impact that would affect positively their productivity levels and thus their wages.

Further, Green (1993a) argued that the quality of British government training programmes may have worsen in consequence of funding cutbacks at precisely the point when female participation began to increase. It is also likely that the apparent training advantage women gained in the 1990s may disappear entirely if one examines the intensity and the quality of training. As we stated in Section 2.7 of Chapter 2, there is no information in the WERS98 whether training led to any formal qualifications or it was
certified. However, in contrast to the rest of the literature we provide evidence on the intensity of training.

5.3.2 Ethnicity and training

In contrast to females, there is no evidence that in recent years ethnic minorities have a higher probability of obtaining training as opposed to their white peers. However, the literature is far from conclusive. For instance, Shields and Wheatley Price (1999b) found that compared to their white peers, non-white employees are less likely to report that they have undertaken an employer funded training spell as well as being less likely to have been offered training by their current employer. They attribute this disadvantage to the possibility that ethnic minorities may: a) be poor communicators in English language; b) not be able to transfer their human capital into the British economy; c) lack knowledge of local labour market conditions; d) be unaware of training opportunities or specific skills that have to acquire; and e) employers may be uncertain as to the quality of any education or experience received by immigrant employees in their native country. Also, Bishop and Suk (1996) have referred to the difficulties that immigrants may face in accessing enough credit to cover up-front costs of training.

Greenhalgh and Stewart (1997), Booth (1991), Arulampalam and Booth (1997) have also found evidence of disadvantage for ethnic minorities with respect to training, whilst other studies have not (Booth, 1991; Green et al., 1996; Jones et al., 2004). Booth (1991) found no ethnic differences using the 1987 wave of the BSAS, while Booth (1993) using the British National Survey of 1980 Graduates found that non-white male graduates were more likely to be trained. Green et al. (1996) found that discrimination amongst ethnic groups does not appear to be evident in the access to training for any occupation. In
contrast, they suggested that establishments with employees from ethnic minorities provide slightly more training.

There is a similar ambiguity coming from the US literature as well. For instance, Altonji and Spletzer (2001) using data from the National Longitudinal Survey of the High School of 1972 (NLSHS72) found that blacks have a higher incidence of training and receive more hours of training than whites. These results are in sharp contrast to other US studies (see Duncan and Hoffman, 1979; Lynch, 1988; Lillard and Tan, 1986; and Weiss, 1988) who found that blacks have a significantly lower probability of obtaining training, and to Lillard and Tan (1992) and Veum (1996) who did not find any ethnic training differentials.

Oosterbeek (1988) using Dutch data found no ethnic discrimination with respect to training. Interestingly, he argued that non-Dutch workers have higher net gains from training and have therefore a higher probability of wanting to take a training course. He also found that Dutch firms are indifferent as to whether they train indigenous or immigrant workers.

Ethnic minority workers may also be reluctant to undertake training, if a) they anticipate lower returns to training (Duncan and Hoffman, 1979); b) are likely to experience more unemployment spells in their subsequent working life (Schmidt and Zimmerman, 1996); or c) are more inclined to quit (Shields and Wheatley Price, 1998b, Loewenstein and Spletzer, 1997).

As Section 5.3 reveals the empirical findings of a number of determinants of training are not clear and many studies offer conflicting evidence. In the following section we highlight the relative merits of the WERS98 by discussing the right hand side

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62 The authors note that sample selection problems due to the fact that the sample is restricted to high school graduates may affect the quantity of training received but not the incidence.
variables utilised in the econometric analysis that attempt to explain differences in intensity and the incidence of off-the-job employer provided training.

5.4 The WERS98 sample

Given the nature of the data we merge the management questionnaire into the employee questionnaire. Our sample comprises 21,826 individuals clustered in 1,475 establishments. The weighted means of the variables used in the regression analysis are reported in the Appendix, Table A.5.1. The right hand side variables consist of three distinct types reflecting personal characteristics independent of the workplace, job characteristics, and workplace characteristics.

Personal characteristics include the gender of the individual (the omitted category is male), its ethnicity (the omitted category is white) and their interaction, six dummies for age groups (20-24 years old, 25-29 years old, 30-39 years old, 40-49 years old and 50-59 years old, the omitted category being above 60 years old), marital status (the omitted category is single), having any dependent children less than 4 years old (a 0/1 dummy), having any long-standing health problems or disabilities (0/1 dummy), and five dummies that capture the highest educational level of the individual (postgraduate degree, first degree, A-levels, high GCSE (grades A-C), and low GCSE (grades D-G), the omitted category is “no qualification”).

Job characteristics include eight dummies for the occupational attainment of the individual (manager, professional, associate professional and technical, clerical and secretarial, craft and skilled service, personal and protective service, sales, plant and machine operatives, the omitted category “other occupations” e.g. cleaner, postal worker), four dummies for the job tenure of the individual in his/her current firm (less than a year, one to less than 2 years, 2 to less than 5 years, 5 to less than 10 years, the omitted
category is 10 years or more), whether the individual has a fixed term job (a 0/1 dummy),
or a temporary job (a 0/1 dummy) (the omitted category is a permanent contract job),
whether he/she shares a full-time job (a 0/1 dummy), has a part time job (a 0/1 dummy)
and its interaction with gender, trade union membership (0/1 dummy), and the logarithm
of the working hours per week. In order to test for self-selection or sorting into training
we include some interaction terms between occupations and educational qualifications.
These are, being a manager and having a degree or an A-level, being in a professional
occupation and holding a postgraduate degree or a degree, being in a technical occupation
and having a degree or an A-level and being in sales and having an A-level or an O-level.

Other controls include if employees think that the work at the establishment is
being delivered only/mainly by women (a 0/1 dummy) and we interact this with the
female dummy and if employees think that men and women equally perform the work (a
0/1 dummy) (the omitted category is that the work at the workplace is only/mainly done
by men). We should mention that these variables come from the employee questionnaire
and capture within establishment job cell segregation rather than workplace segregation.

Firm characteristics include the proportion of employees at the establishment who
are above 50 years old, the proportion of low paid employees (i.e receiving less than
£9,000 per year), the proportion of employees who are working on fixed term contracts
but who work on a full or part time basis, the proportion of part time employees and the
proportion of each occupational group at the establishment (proportion of: managers,
professional staff, technical staff, clerical staff, craft and skilled service, operatives and
sales) and trade union density. The percentages of female and ethnic minority groups at
the establishment capture workplace segregation and their corresponding interactions with
gender and ethnicity allow for non-linearities.
The size of the establishment is captured by five dummy variables (26-49 employees, 50-99 employees, 100-199 employees, 200-499 employees, more than 500 employees, the omitted category is less than 25 employees). In addition to establishment size, we are also able to control for the size of the legal entity to which the establishment belongs by introducing 5 dummies that capture the size of the organisation (100 to less than 500 employees, 500 to less than 1,000 employees, 1,000 to less than 5,000 employees, more than 10,000, the omitted category is less than 100 employees). In addition, eleven industry dummies are included (manufacturing, utilities, construction, wholesale, hotels and restaurants, transportation, financial services, other business, public administration, education, and health services, the omitted category is “other community services”) according to the SIC 92 major groups. Our specification also incorporates variables that capture if the degree of competition in the market that the establishment operates is very high/high (a 0/1 dummy), if there are groups at the workplace that solve specific problems or discuss aspects of performance or quality (a 0/1 dummy), if there is a manager or director at a higher level and at a separate establishment in the organization in the UK that spends a major part of his/her time on personnel or employee relations matters (a 0/1 dummy), if the establishment is a supplier of goods and services to other companies (a 0/1 dummy), a dummy variable capturing if the current state of the market in which the establishment operates is declining, a dummy variable that captures whether more than 40% of all employees including managers are covered by collective bargaining either at the workplace level or at a higher level, and we interact this variable with the female dummy in order to identify gender differences.

In addition, further controls include whether over the last 5 years management introduced new technology at the workplace (a 0/1 dummy), whether the establishment conducts any type of personality or attitude tests when filling vacancies (a 0/1 dummy)
and whether the establishment (or organisation of which it is part of) has a formal written policy on equal opportunities or managing diversity (a 0/1 dummy). We also interact equal opportunities with gender and ethnicity. Finally to capture local labour market conditions, the travel-to-work area by unemployment to vacancy rate is included. 63

5.5 Econometric modelling
5.5.1 A random effects ordered probit model

In order to justify our econometric framework we re-state the training question: "During the last 12 months how much training have you had, either paid for or organized by your employer: include only training away from your normal place of work, but it could be on or off the premises". Employees were provided a six-scale option to code their responses. Those options were ordinal but were attached a cardinal measurement and running from "None" (1), "Less than one day" (2), "1 to less than 2 days" (3), "2 to less than 5 days" (4), "5 to less than 10 days" (5), to "10 days or more" (6).

Even though our dependent variable seems a natural cardinal measured variable it can only be validly treated as an ordinal measure of training intensity. Alternatively, our variable does not measure training episodes within each interval. Rather, it is a continuous variable that is divided in a small number of discrete categories. 64 As a result, it is useful to use a statistical model suitable for analysing ordinal level dependent variables rather than counts of training (i.e. training episodes). The ordered probit model we employ here

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63 Regional dummies were initially incorporated in the analysis but they failed to pass an F-test of independence, and consequently were excluded.

64 In this case, we are interested in the probability that an employee would obtain a specified amount of training, not on the number of training episodes per se. For a recent application of count data modelling techniques on training using British data see Arulampalam and Booth (2001), and for a comparison between count data and ordinal data models see Cameron and Trivedi (1986). Also, modelling the dependent variable in terms of the Tobit model would be inappropriate. The Tobit model is employed in terms of a model in which: a) the relationship between a latent variable, a set of explanatory variables and the error term is linear; and b) the dependent variable is zero if the latent variable is less than zero (Loewenstein and Spletzer, 1999). Further, an interval regression specification (see Almeida-Santos and Mumford, 2004) would be an improper modelling strategy as only an upper and lower training limit would be observed, throwing away significant information for the middle ranges.
is more flexible than a count data model since its greater number of parameters fits the data best. For instance, by construction the ordered probit model returns \( k \) coefficients plus five thresholds (6-1 thresholds obtained from the one out of six different options that employees choose) whereas a count data model (i.e. a negative binomial model) would have \( k \) coefficients plus 2 parameters (a variance parameter and an intercept). Further, in general the ordered probit model provides more robust results than count data models when the distributional form is unknown (see Cameron and Trivedi, 1986).

In this Chapter we do not describe the ordered probit model as its statistical and asymptotic properties were outlined in Chapter 4. In relation to this Chapter, the ordered probit model identifies the probability that an individual receives a specified amount of training. Thus, those who receive no training constitute the \((m=0)\) outcome; those who receive less than one day constitute the \((m=1)\) outcome; those who receive one to less than two days training constitute the \((m=2)\) outcome; those who receive two to less than five days constitute the \((m=3)\) outcome; those who receive five to less than ten days constitute the \((m=4)\) outcome; and those who receive ten days or more constitute the \((m=5)\) outcome.

In order to identify if there are any gender and/or ethnicity differences between the probability of obtaining a specified amount of training and the probability of receiving any training at all, we also employ a random effects probit model (see Greene, 2000) by collapsing the categorical nature of the dependent variable into a binary one. Thus, those individuals without any training were recoded as “0” and those with a positive amount of training were recoded as “1”.
5.6 The effects of gender and ethnic workplace segregation and equal opportunities policies upon training

Tables A.5.2 and A.5.3 in the Appendix present summary results for both the intensity and the incidence of training concentrating on the main variables of interest. Given the difficulty in interpreting the quantitative effect of an explanatory variable on the probability of receiving job training from these non-linear models we also provide the marginal effects for those individuals who received the most training ($m=5$, more than 10 days of training) in the case of the ordered probit model, and the marginal effects for those individuals who received training in the case of the binary probit model. The marginal effects are calculated at the means of the other explanatory variables setting the random effects term equal to zero.

The results from the random effects ordered probit model (Basic model) reveal that in terms of outcome “0” (i.e. those not receiving training) relative to the reference group (i.e. those who received a positive amount of training) the probability of receiving a specified period of training increases if the employee is female. However, this effect is not significant. The opposite is true for the ethnic minority group, but its coefficient is not significant either.

Interestingly, the coefficient of the female dummy changes sign but remains insignificant when we include into the specification the percentage of female employees at the establishment and we interact it with the female dummy (Extended model 1). The coefficient of the percentage of female employees is positive but insignificant, whereas the coefficient of the cross product variable although small in magnitude is positive and statistically significant (at 1% level). This finding suggests that the probability of receiving a specified amount of training for females is higher in establishments where more women work. This finding is in line with recent US results (see Bell, 2005).
suggesting that working in a headed-female firm is good for female employees independent of the characteristics of the firm.

Turning to the coefficient of ethnicity we see that its sign is unaffected by the inclusion of the percentage of ethnic minority co-workers at the workplace although its negative sign increases in magnitude. Also, its interaction with ethnicity is positive but insignificant.

In Extended model 2 which includes the equal opportunities policies dummy and its interaction with gender and ethnicity, the coefficient of the female dummy becomes negative and highly significant at the 5% level. The marginal effect indicates that the probability of receiving more than 10 days of training for a female employee in an establishment without equal opportunities policies decreases significantly by 2.4%. In contrast, being female and working at an establishment with equal opportunities policies increases the probability of receiving more than 10 days of training by 1.5%. In sharp contrast to the above results, the interaction between equal opportunities policies and being an ethnic minority worker is positive but insignificant. This result is important and suggests that equal opportunities policies have a differential impact upon gender and ethnicity.

The determinants of the intensity and the incidence of training seem to vary significantly. For instance, in contrast to the intensity of training, when we examine the incidence of training (see Table A.5.3), we find the coefficient of the female dummy to be positive and highly significant (at the 1% level of significance, Basic model). For instance, being female increases the probability of receiving off-the-job training by 4.7%. In contrast, the coefficient of the ethnic minority group is negative and significant (at the 10%). Thus, the probability that an ethnic minority employee obtains training decreases by as much as 5.4%.
In the *Extended model 1* though the female coefficient not only changes sign but changes significance as well.\(^5\) However, the cross product between the percentage of female employees at the establishment and being female is positive and highly significant (at the 1% level). This suggests that female employees have a higher probability of obtaining training in establishments with very high proportions of other female employees.

Also, the incorporation of the percentage of ethnic minority employees and its interaction with the ethnicity dummy lessens the direct negative effect of the ethnicity dummy on the probability of receiving training. The coefficient of the ethnicity dummy is not significant any more. In accordance with our results in Chapter 3, this finding suggests that workplace segregation has different effects upon gender and ethnicity. However, the estimated coefficient on the percentage of ethnic minority employees is negative and significant at the 10% level. Thus, the higher the percentage of ethnic minority employees at the establishment, the lower is the probability of receiving training for all employees.

In the third specification (*Extended model 2*), the incorporation of the equal opportunities policies dummy and its interaction with the female dummy turns the coefficient of the female dummy negative and significant at the 5% level of significance. For example, being female and working in an establishment without equal opportunities policies decreases the probability of receiving training by 7.2%. In contrast, being female and working in an establishment that has equal opportunities policies increases the probability of receiving training by 7.3%.

\(^5\) This is a very strong result despite the fact that some of the effect of the coefficient of the percentage of female employees at the establishment may be absorbed by the occupational job segregation dummies which also attain significant coefficients. We discuss their effect and their possible correlation with the workplace segregation variables in the next section.
The above results can be summarised as follows: 1) Women have a higher probability of obtaining training as opposed to men (as discussed in Section 5.3.1 there are many competing explanations for this finding); 2) There is no significant gender\textsuperscript{66} differential with respect to the intensity of training; 3) Ethnic minority employees have a significantly lower probability of training incidence. However, this lower probability is reduced when we incorporate the percentage of ethnic minority employees at the establishment; 4) We provide support to the workplace segregation argument since women who are segregated in establishments where their corresponding proportions are higher, access to training or to its volume is lower; 5) Women have a higher probability of both receiving and receiving a specified amount of training working alongside other women; 6) There is evidence of differential treatment since equal opportunities policies work only in favour of women. For instance, the interaction dummy between equal opportunities policies and being female suggests that the lower probability of obtaining training for females can be corrected through equal opportunities policies. The reasons for this preferential treatment are not clear and various interpretations of this finding are possible. For instance, employers may not believe that they can help both females and ethnic minorities simultaneously, and they may concentrate their efforts only on females.

Also, company level equal opportunities policies may conflict with other strategic management goals. For instance, job contracts for ethnic minority employees may be of a shorter duration and as a result firms' willingness to make long run investments in ethnic minority employees may be limited.

\textsuperscript{66}Interestingly, this is not the case for ethnic minority employees.
5.6.1 Differences in the determinants of incidence and intensity of training

As Tables A.5.2 and A.5.3 suggest the determinants of training intensity may differ from the determinants of training incidence (full results are presented in Tables A.5.4 and A.5.5 respectively). Thus, in this sub-section we briefly comment on their differences. We start by presenting the coefficients which are significant in the binary probit model, but not in the ordered probit model. Being female and having a part-time job decreases the probability of training incidence by 4.5%. Interestingly, if the work at the establishment is mainly/only done by women, the likelihood of obtaining training for all employees is increased by 6.5%. In sharp contrast, being female and working in an establishment where the work is mainly/only done by females reduces the likelihood of obtaining training by 6.9%. Moreover, in establishments where the work is equally split between men and women the likelihood of receiving training is higher by 3.0%.

One interesting difference that arises between the cross products of being female and the percentage of female employees at the establishment, and being female and employees' views that the work is mainly/only done by women is that they attain different signs, but both coefficients are significant. The first cross product although attains a very small coefficient, is positive and significant at the 1% level, whereas the latter attains a large coefficient and is negative and significant at the 5% level. As argued in Section 5.4, this difference suggests that the percentage of female employees at the establishment captures the overall distribution of females, whereas the dummy variable captures segregation at a particular site in the establishment (e.g. at the production line). A plausible interpretation of this finding is that higher representation of women at the establishment level (i.e. in more senior jobs) leads to a higher probability of receiving training for women, whereas higher representation of women at a particular site of the establishment has the opposite effect.
In contrast, coefficients which significantly affect the intensity (ordered probit model) but not the incidence of training (probit model), are the following: having a health problem, being an operative employee, the longer are the working hours per week, the proportion of employees on fixed term contracts, the proportions of employees above 50 years old as well as the proportion of sales employees. Also, the following variables have a significant effect on the intensity but not on the incidence of training: working in the construction sector, or in financial or health sectors, if there are groups at the workplace that solve specific problems or discuss aspects of performance or quality, if the establishment supplies goods or services to other companies, and finally if the product market at which the establishment operates is declining.

In order to provide comparisons of the results provided in this Chapter with those reported in the existing literature, in the following section we report the results obtained from the random effects ordered probit model.

5.6.2 Results from the random effects ordered probit

Our results relating to the personal characteristics of the employees as well as job characteristics are in line with the empirical findings from the training literature. The highest likelihood of obtaining training is for the youngest employees (below 20 years old). As age increases, its effect on obtaining a specified amount of training decreases (Becker, 1964). The higher the educational qualification is the higher is the probability of acquiring a certain amount of training (Bartel and Sicherman, 1998). The highest

67 We also estimated the predicted probabilities for each training threshold. Our estimated predicted probabilities are very close to the observed frequencies in our sample (N=21,826). For instance, the observed frequencies of each training threshold in our final sample are: “None” 36.7%, “Less than 1 day” 9.6%, “1 to less than 2 days” 14, “2 to less than 5 days” 20.9%, “5 to less than 10 days” 9.6%, “10 days or more” 9.3%. These observed frequencies slightly differ from those reported in Table 2.5 in Chapter 2 as those frequencies refer to the raw data. Our corresponding estimated probabilities are: “None” 33.6%, “Less than 1 day” 9.6%, “1 to less than 2 days” 14.3, “2 to less than 5 days” 21.7%, “5 to less than 10 days” 10.1%, “10 days or more” 10.6%.
likelihood of obtaining training is for those employees who hold a degree. A long-standing health problem or disability that limits what employees can do at work has a negative and significant effect at the 10% level.

Turning to job characteristics, and in accordance with cross section data on training we find that the shorter is the working tenure the higher is the probability of obtaining a specified amount of training (Loewenstein and Spletzer, 1997). This finding is also consistent with the view that employers offer to newly hired employees induction programmes in order to introduce them to the workplace (see also Chapter 2, Section 2.7). For instance, job tenure of less than two years with the current firm has the largest effect among the tenure dummies. Managers as well as professional staff are more likely to obtain a specified amount of training than any other occupational group. All the other groups have lower but positive and significant probabilities of obtaining employer provided training. In sharp contrast, operative and assembly line workers have a negative and significant impact on the probability of receiving training. Of great interest are the outcomes of the interaction dummies between occupations and educational qualifications. In contrast to theoretical considerations, their cross product is negative and highly significant, despite the fact that their corresponding single dummy variables attain positive and highly significant coefficients. For instance, holding a professional job and having a degree or a postgraduate degree reduces the probability of obtaining more than 10 days of training by 1.9%, whereas being a sales employee and having a low educational qualifications (e.g. "O-level" or an "A-level") decreases the corresponding probability by 1.7%. These findings suggest that occupational status and educational achievement are not complements on the decision of how much training an employee receives.
Temporary or fixed term jobs are associated with negative likelihoods of obtaining training as opposed to permanent jobs (Arulampalam et al., 2004b). For instance, holding a temporary job decreases the probability of obtaining more than 10 days of training by 2.4%. The corresponding decrease for fixed term jobs is 1.3%. The longer the working hours per week, the probability of receiving more than 10 days of training increases by 3.7%. Intuitively, this result suggests that individuals with more working hours undertake more training as they can earn higher returns from training than employees with shorter working hours (Greenhalgh and Mavrotas, 1994).

In accordance with Stewart (1987) we find that both trade union membership as well as trade union density move the training mass points to the right. It is important to note however that the effect of union density on training is much higher than the corresponding effect of trade union membership. Consistent with the results from Chapter 3, we find that the interaction between union density and the female dummy attains a negative and highly significant coefficient. For instance, the marginal effect of this cross product variable suggests that the likelihood of receiving more than 10 days of training is lowered by 3%. This result suggests that either female bargaining power is lower in establishments with high unionisation rates, or it signifies lower unionisation rates among women. The higher the proportion of low paid employees at the establishment the lower is the likelihood of obtaining more than 10 days of training by as much as 6%. Also, the higher is the proportion of employees above 50 years old at the establishment the lower is the probability of obtaining a specified amount of training for all employees.

In sharp contrast to the rest of the literature but in line with Deloitte et al. (1989), we find that organisation size rather than establishment size has a significant effect upon training intensity. In line with existing evidence (see Shields, 1998) employees in public administration seem to enjoy the highest probability of receiving training, being followed
by employees in the utilities, financial sector, health, and employees in the hotels and restaurants industry. Employees in the construction and wholesale industries face a significantly lower likelihood of receiving a specified amount of training.

Having a manager or director at a separate establishment in the organisation who spends a major part of his/her time on personnel or employee relations' matters moves the training probability to the right. This result is in line with Whitfield (2000) who explores the relationship between such practices and training channels of communication (i.e. flexible assignment, teamworking, quality circles, briefing groups) and finds that those practices are a necessary ingredient of getting employees involved in the establishment. In contrast to the single occupational dummies, we find that the continuous variables capturing the proportions of managerial and professional staff at the establishment have an insignificant impact on the amount of training. This is in line with Collier et al. (2003) who found no gains for the establishment by increasing the proportion of managerial and administrative workers who receive training. We find that the higher is the proportion of personal service and sales employees at the establishment the higher is the intensity of training for all employees. Employees who work in establishments where a quarter or more of the proportion of all employees work on fixed term contracts either part time or full time, have a significantly lower probability of receiving any training. The existence of groups at the workplace that solve specific problems or discuss aspects of performance or quality is associated with a higher likelihood of receiving a specified amount of training. Also, the introduction of new technology at the workplace over the last 5 years has a positive but small effect upon the intensity of training.
Establishments that conduct personality or attitude tests when filling vacancies have a higher probability of providing a specified amount of training.\footnote{A dummy variable capturing if the establishment was conducting performance or competency test when filling vacancies was insignificant. This finding may suggest that since firms would provide the appropriate training to new recruits they are not interested in the cognitive skills of the individuals but rather in their personality traits. To the best of our knowledge we are unaware of such a finding in the relevant literature. According to the management questionnaire only 22\% of all the establishments in Britain in 1998 conducted personality or attitude tests prior to recruiting.} For instance, the probability of receiving more than 10 days of training for employees in establishments that conduct personality tests when filling vacancies increases by 1.7\%. If the establishment is supplying goods and services to other establishments, the probability that an employee will receive more than 10 days of training is higher by 1.1\%. Product market conditions significantly affect the training decision. For instance, if the market where the establishment is offering its goods and services is declining the probability that the establishment will offer more than 10 days of training to its employees decreases by 1.4\%. This result confirms previous studies which suggest that adverse demand conditions are negatively related to training (Acemoglu and Pischke, 1998).

The random effects ordered probit specification, in addition to providing information on the threshold parameters that are statistically significant and give support to the estimation method\footnote{Also, using an LM test to test the parallel regression assumption that is implicit in the ordered probit model, we found that the estimated cut-off points kept their original distances. For instance, setting Cut1 (threshold one, less than 1 day) equal to zero, we found that Cut3 (2 to less than 5 days of training) was equal to 2*Cut2 (1 to less than 2 days of training), Cut4 (5 to less than 10 days of training) was equal to 2*Cut3 and Cut5 (10 days or more) was equal to 2*Cut4.}, also provides extra information from the estimated unobserved firm heterogeneity term (\( \rho \)). Thus, given that the firm specific effect explains 12\% of the unobserved variance and that the firm specific effect is based on correlations across the dependent variable within firms, the findings provide evidence that the receipt of training is not independent of unobserved establishment characteristics. This gives support for using random effects estimators rather non-heterogeneous probit and ordered probit models.
5.7 A weak exogeneity test of equal opportunities policies

In this section we form a heuristic test of weak exogeneity of the equal opportunities policies in the sense of Smith and Blundell (1986). The weak exogeneity test is based on the correlation between the firm specific random effect $\hat{u}_h$ obtained from Extended model I (the model without the equal opportunities dummy and its interactions) and the generalised residuals ($\hat{v}_h$) obtained from the simple probit of equal opportunities policies on establishment characteristics (see Section 2.4 of Chapter 2). Thus, the null hypothesis we form is that $H_0: \beta_{\text{corr}}(\hat{u}_h, \hat{v}_h) = 0$, the alternative being $H_a: \beta_{\text{corr}}(\hat{u}_h, \hat{v}_h) \neq 0$. A positive and strong correlation between $\hat{u}_h$ and $\hat{v}_h$ would suggest that equal opportunities policies are indeed endogenous in the training equation. Alternatively, the unobserved firm heterogeneity term ($\hat{u}_h$) in Extended model 1 would take into account whether or not the establishment has equal opportunities policies.

We find the correlation between $\hat{u}_h$ and $\hat{v}_h$ to be positive and moderate ($\beta_{\text{corr}}=0.38$). This suggests that indeed the equal opportunities policies dummy is an endogenous variable and thus the results obtained from Extended model 2 are likely to be biased. However, we have to note that incorporating $\hat{v}_h$ into the training equation, although it attained a negative and highly significant coefficient, it did not affect the coefficients or the standard errors of the other covariates. For instance, incorporating $\hat{v}_h$ into Extended model 1 marginally changed the female coefficient from -0.073 to -0.074 but not its standard error (0.053). Thus, the above heuristic test suggests that although the equal opportunities policies may be an endogenous variable in the training equation, its effect on the coefficients of the other right hand side variables is negligible.
5.8 Conclusions and policy implications

Overall, the results indicate that there is widespread variation in access to and intensity of training, and this variation exists even when we control for a host of employee, job and workplace characteristics. In accordance with the findings in the existing literature, our Basic Model (the model that does not include the percentage of female and ethnic minority employees at the establishment as well as the equal opportunities policies dummy and their corresponding interactions with gender and ethnicity) suggests no evidence of direct disadvantage in access to training for female employees in Britain. If anything, female employees given human capital, demographic, job and workplace characteristics have a positive and significant probability of participating in training. In addition, there is no gender differential with respect to the intensity of training.

In contrast to the rest of the literature, we found that workplace gender segregation not only eliminates the higher probability of women in obtaining employer-provided training but it actually changes the sign of the coefficient of the female dummy variable from positive to negative. This is a significant contribution to the empirical literature on training and highlights the inadequacy of the previous studies in controlling for workplace segregation. Also, this result is against the traditional neoclassical economic models that rely on human capital theory to explain gender specific variation in training.

For ethnic minority employees, we found a significant negative probability with respect to the incidence of training only in the Basic model. We also found that equal opportunities policies have a strong and positive effect only on female employees but not on ethnic minority employees.

Given the importance of training for productivity and growth in general and for reducing pay differentials in particular, it is natural to ask whether there are policy
instruments to improve or fairly distribute training investments. However, which instrument is most effective in increasing training investments and overall training efficiency may depend on the nature of the problem relevant in the labour market.

Our first suggestion comes from the strong result that establishment segregation harms women. Using government sponsored training programmes to prepare women for employment in traditionally male dominated occupations may be a policy implication. However, US evidence has shown that the actual effect of these programmes on sex segregation appears to have been minimal, although individual participants may have benefited from receiving higher wages in these occupations than they would have in other areas. For instance, Seeborg et al. (1984) found that training women segregated in certain workplaces did not ensure that they would find an opportunity to apply their skills, as they were still subject to the decisions of employers regarding specific positions and the general availability of positions.

Encouraging workplace integration may be another alternative. Plausible policies might be rewarding employers who act to reduce segregation. For instance, instead of concentrating on penalising firms that discriminate, the government could provide subsidies to firms that show marked improvements in integrating women into traditionally male jobs. Such subsidies could provide a marked advantage to these firms and make them relatively more profitable than firms who make no such efforts, or at least counteract any costs incurred from implementing these changes. However, one should be very careful in making claims that a particular policy will definitely either increase or decrease sex segregation (see Polachek, 1985a, 1985b and England, 1985). The answer in each case depends crucially on the particular assumptions made about labour supply and labour demand responses to the policy. In the US where hiring preferences of employers are
suppressed through the imposition of hiring rules (i.e. affirmative action), the relative supply of male and female workers effectively determines the level of segregation.

If achieving a greater degree of integration in the workplace is desired, then clearly new strategies need to be tried if the rate of integration is to be accelerated. One point to be considered in advocating particular strategies is whether the time frame for the desired change is of relatively short or long duration. Some strategies such as stepping up efforts to create a sex-blind educational environment, will take much longer for their effects to be felt in the workplace, but they may have more lasting and widespread effects than short-term policies such as retraining women already in the labour force to enter non-traditional occupations.

Additionally, such policies need to be undertaken simultaneously if the probability of success in achieving integration is to be increased substantially. A combination of policies designed to affect both hiring practices and the relative supplies of women and men to different jobs is required so that pressure on both the demand and the supply side of the labour market is tuned towards integration.

Our second major policy implication relates to the finding that the existence of equal opportunities policies does not guarantee equality of treatment. This result is in line with Booth (1993) who suggested that policies aiming to provide incentives for employer based training in the private sector might raise equity issues since certain individuals (i.e. women and ethnic minority employees) may be less likely to receive employer provided training. As we argued in Section 2.4 of Chapter 2, establishments in Britain are under no legal obligation to change their behaviour should they approve equal opportunities policies. Thus, the extent to which the employer monitors the operation of the equal opportunities policies and seeks to prevent discrimination is important. The main failure

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70 One possible source of reducing labour market segregation is through positive affirmative action (or positive discrimination in favour of female and ethnic minorities) in selected occupations and industries.
of equal opportunities policies to reflect training equality may lie in the following observation provided by Liff (1989). He suggests that once a certain approach to a problem becomes established, the success of policies is evaluated in terms of the scale and reliability of their adoption rather than in terms of their ability to achieve a particular outcome.

In addition, company level equal opportunities policies may conflict with other strategic management goals. For instance, individual contracts and pay determination make equal opportunities policies difficult to enforce. Thus, there are two important messages for policy makers. First, equal opportunities policies can make a difference in terms of ensuring equality of treatment, however they have a positive effect only on females. Second, policy makers should take conscious action to encourage equality by broadening the number of employees covered by such policies and obliging all firms to adopt and strongly monitor equal opportunities policies and establish regulatory systems to ensure equality of treatment.

Also, our results show that low pay establishments are less likely to provide training. Thus, government intervention could be useful in providing special starting subsidies to small firms that cannot afford or do not have established training programmes. Also, if the aim of the government is to increase training within firms that already provide training, policy instruments should be also directed towards particular jobs (i.e. operative employees).
## Table A.5.1 Sample Properties of Variables (Weighted, N=21,826).

<table>
<thead>
<tr>
<th>VARIABLE</th>
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<th>VARIABLE</th>
<th>MEAN</th>
<th>VARIABLE</th>
<th>MEAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Training received during the last 12 months</td>
<td>1.847</td>
<td>Professional &amp; Degree</td>
<td>0.107</td>
<td>Organisation size 100 to less than 500</td>
<td>0.052</td>
</tr>
<tr>
<td>(0.026) or Postgraduate</td>
<td>(0.004)</td>
<td>employees</td>
<td>(0.008)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Discuss training needs with supervisor/line manager</td>
<td>0.505</td>
<td>Technical &amp; Alevel or</td>
<td>0.051</td>
<td>Organisation size 500 to less than 1,000</td>
<td>0.052</td>
</tr>
<tr>
<td>(0.008)</td>
<td>Degree</td>
<td>(0.003)</td>
<td>employees</td>
<td>(0.007)</td>
<td></td>
</tr>
<tr>
<td>Encouraged to develop skills</td>
<td>3.327</td>
<td>Sales &amp; Olevel or</td>
<td>0.051</td>
<td>Organisation size 1,000 to less than</td>
<td>0.174</td>
</tr>
<tr>
<td>(0.015)</td>
<td>Alevel</td>
<td>(0.004)</td>
<td>5,000 employees</td>
<td>(0.013)</td>
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</tr>
<tr>
<td>Female</td>
<td>0.482</td>
<td>Ln(Working hours per week)</td>
<td>3.492</td>
<td>Organisation size 5,000 to less than</td>
<td>0.082</td>
</tr>
<tr>
<td>(0.010)</td>
<td></td>
<td>(0.010)</td>
<td>10,000 employees</td>
<td>(0.008)</td>
<td></td>
</tr>
<tr>
<td>Minority</td>
<td>0.028</td>
<td>Health problem</td>
<td>0.062</td>
<td>Organisation size 10,000 employees or more</td>
<td>0.339</td>
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<td>(0.003)</td>
<td></td>
<td>(0.019)</td>
<td></td>
</tr>
<tr>
<td>Ethnic minority woman</td>
<td>0.015</td>
<td>Fixed term contract</td>
<td>0.032</td>
<td>Manufacturing</td>
<td>0.234</td>
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<td>(0.002)</td>
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<td>(0.002)</td>
<td></td>
<td>(0.014)</td>
<td></td>
</tr>
<tr>
<td>Tenure &lt;1 year</td>
<td>0.160</td>
<td>Temporary contract</td>
<td>0.040</td>
<td>Utilities (electricity, gas, water supply)</td>
<td>0.008</td>
</tr>
<tr>
<td>(0.005)</td>
<td></td>
<td>(0.003)</td>
<td></td>
<td>(0.001)</td>
<td></td>
</tr>
<tr>
<td>I to less than 2 years</td>
<td>0.121</td>
<td>Part time work</td>
<td>0.241</td>
<td>Construction</td>
<td>0.031</td>
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<td>(0.008)</td>
<td></td>
<td>(0.004)</td>
<td></td>
</tr>
<tr>
<td>2 to less than 5 years</td>
<td>0.227</td>
<td>Part time &amp; woman</td>
<td>0.195</td>
<td>Wholesale</td>
<td>0.144</td>
</tr>
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<td></td>
<td>(0.007)</td>
<td></td>
<td>(0.008)</td>
<td></td>
</tr>
<tr>
<td>5 to less than 10 years</td>
<td>0.223</td>
<td>Work mainly/only done by women</td>
<td>0.332</td>
<td>Hotels &amp; restaurants</td>
<td>0.041</td>
</tr>
<tr>
<td>(0.005)</td>
<td></td>
<td>(0.009)</td>
<td></td>
<td>(0.004)</td>
<td></td>
</tr>
<tr>
<td>Age: less than 20 years</td>
<td>0.045</td>
<td>Work mainly/only done by women &amp; female</td>
<td>0.306</td>
<td>Transportation</td>
<td>0.059</td>
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<td></td>
<td>(0.009)</td>
<td></td>
<td>(0.005)</td>
<td></td>
</tr>
<tr>
<td>20-24 years old</td>
<td>0.072</td>
<td>Work is equally done by men and women</td>
<td>0.308</td>
<td>Finance</td>
<td>0.045</td>
</tr>
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<td>(0.003)</td>
<td></td>
<td>(0.008)</td>
<td></td>
<td>(0.004)</td>
<td></td>
</tr>
<tr>
<td>25-29 years old</td>
<td>0.127</td>
<td>Trade union member</td>
<td>0.416</td>
<td>Other business (real estate, renting)</td>
<td>0.077</td>
</tr>
<tr>
<td>(0.004)</td>
<td></td>
<td>(0.012)</td>
<td></td>
<td>(0.006)</td>
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<tr>
<td>30-39 years old</td>
<td>0.288</td>
<td>Trade union density</td>
<td>0.381</td>
<td>Public administration</td>
<td>0.094</td>
</tr>
<tr>
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<td></td>
<td>(0.011)</td>
<td></td>
<td>(0.007)</td>
<td></td>
</tr>
<tr>
<td>40-49 year old</td>
<td>0.250</td>
<td>Trade union density &amp; female</td>
<td>0.165</td>
<td>Education</td>
<td>0.109</td>
</tr>
<tr>
<td>(0.005)</td>
<td></td>
<td>(0.005)</td>
<td></td>
<td>(0.006)</td>
<td></td>
</tr>
<tr>
<td>50-59 years old</td>
<td>0.178</td>
<td>Percentage female</td>
<td>48.480</td>
<td>Health</td>
<td>0.132</td>
</tr>
<tr>
<td>(0.004)</td>
<td></td>
<td>(0.944)</td>
<td></td>
<td>(0.009)</td>
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<tr>
<td>Married</td>
<td>0.700</td>
<td>Percentage female &amp; female</td>
<td>31.478</td>
<td>More than 40% of the employees are covered by collective bargaining</td>
<td>0.591</td>
</tr>
<tr>
<td>(0.006)</td>
<td></td>
<td>(0.875)</td>
<td></td>
<td>(0.016)</td>
<td></td>
</tr>
<tr>
<td>Children aged 0-4</td>
<td>0.866</td>
<td>Percentage minority</td>
<td>4.421</td>
<td>More than 40% of the employees are covered by collective bargaining &amp; female</td>
<td>0.278</td>
</tr>
<tr>
<td>(0.004)</td>
<td></td>
<td>(0.279)</td>
<td></td>
<td>(0.010)</td>
<td></td>
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<tr>
<td>CSE or equivalent</td>
<td>0.118</td>
<td>Percentage minority &amp; minority</td>
<td>0.613</td>
<td>A quarter or more of the employees at the workplace work on fixed term contract, either part-time or full-time</td>
<td>0.032</td>
</tr>
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<td></td>
<td>(0.094)</td>
<td></td>
<td>(0.006)</td>
<td></td>
</tr>
<tr>
<td>O level or equivalent</td>
<td>0.269</td>
<td>Proportion of managers</td>
<td>0.082</td>
<td>Proportion of employees at the establishment earning less than £9,000 per annum</td>
<td>0.074</td>
</tr>
<tr>
<td>(0.005)</td>
<td></td>
<td>(0.003)</td>
<td></td>
<td>(0.004)</td>
<td></td>
</tr>
<tr>
<td>A level or equivalent</td>
<td>0.151</td>
<td>Proportion professional</td>
<td>0.133</td>
<td>Degree of competition in this market is very high/high</td>
<td>0.558</td>
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<tr>
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<td>(0.006)</td>
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<td>(0.017)</td>
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<tr>
<td>Degree or equivalent</td>
<td>0.166</td>
<td>Proportion technical</td>
<td>0.093</td>
<td>Quality circles</td>
<td>0.542</td>
</tr>
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<td>(0.006)</td>
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<td>(0.018)</td>
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<tr>
<td>Postgraduate or equivalent</td>
<td>0.057</td>
<td>Proportion clerical</td>
<td>0.167</td>
<td>Over the past 5 years management introduced new technology at the workplace</td>
<td>0.801</td>
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<td>(0.006)</td>
<td></td>
<td>(0.014)</td>
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<td>Managers</td>
<td>0.086</td>
<td>Proportion craft</td>
<td>0.097</td>
<td>Personality or attitude test</td>
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<td>(0.009)</td>
<td></td>
<td>(0.018)</td>
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<th>MEAN</th>
<th>VARIABLE</th>
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</thead>
<tbody>
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<td>Professional staff</td>
<td>0.139</td>
<td>Proportion service</td>
<td>0.086</td>
<td>Supplier of goods and services to other parts of the organisation to which the establishment belongs</td>
<td>0.210</td>
</tr>
<tr>
<td></td>
<td>(0.005)</td>
<td></td>
<td>(0.007)</td>
<td></td>
<td>(0.014)</td>
</tr>
<tr>
<td>Technical</td>
<td>0.095</td>
<td>Proportion operatives</td>
<td>0.134</td>
<td>The market is declining</td>
<td>0.067</td>
</tr>
<tr>
<td></td>
<td>(0.004)</td>
<td></td>
<td>(0.008)</td>
<td></td>
<td>(0.009)</td>
</tr>
<tr>
<td>Clerical and secretarial</td>
<td>0.163</td>
<td>Proportion sales</td>
<td>0.097</td>
<td>Local unemployment/vacancy rate by travel to work area</td>
<td>0.763</td>
</tr>
<tr>
<td></td>
<td>(0.006)</td>
<td></td>
<td>(0.006)</td>
<td></td>
<td>(0.016)</td>
</tr>
<tr>
<td>Craft and skilled service</td>
<td>0.098</td>
<td>Proportion aged over</td>
<td>0.159</td>
<td>Equal opportunities policies at the workplace</td>
<td>0.847</td>
</tr>
<tr>
<td></td>
<td>(0.006)</td>
<td>50</td>
<td>(0.004)</td>
<td></td>
<td>(0.012)</td>
</tr>
<tr>
<td>Personal and protective service</td>
<td>0.079</td>
<td>Workplace size 26-49</td>
<td>0.120</td>
<td>Equal opportunities policies at the workplace &amp; female</td>
<td>0.428</td>
</tr>
<tr>
<td></td>
<td>(0.006)</td>
<td>employees</td>
<td>(0.009)</td>
<td></td>
<td>(0.010)</td>
</tr>
<tr>
<td>Sales</td>
<td>0.093</td>
<td>Workplace size 50-99</td>
<td>0.152</td>
<td>Equal opportunities policies at the workplace &amp; minority</td>
<td>0.025</td>
</tr>
<tr>
<td></td>
<td>(0.006)</td>
<td>employees</td>
<td>(0.010)</td>
<td></td>
<td>(0.002)</td>
</tr>
<tr>
<td>Operative and assembly</td>
<td>0.123</td>
<td>Workplace size 100-199</td>
<td>0.217</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.009)</td>
<td>employees</td>
<td>(0.012)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manager &amp; A level or Degree</td>
<td>0.046</td>
<td>Workplace size 200-499</td>
<td>0.258</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.003)</td>
<td>employees</td>
<td>(0.017)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note: Standard errors in parentheses*
Table A.2: Heterogeneous Random Effects Ordered Probit Model: Dependent Variable: Ln5 of Tasting Frequency Estimated.

Summary of Main Results

<table>
<thead>
<tr>
<th>EXTENDED MODEL</th>
<th>BASIC MODEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>COVARIATES</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>ME</th>
<th>Coefficient</th>
<th>ME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minorities</td>
<td>0.024</td>
<td>0.013</td>
<td>0.010</td>
<td>0.008</td>
</tr>
<tr>
<td>Females</td>
<td>0.026</td>
<td>0.013</td>
<td>0.010</td>
<td>0.008</td>
</tr>
<tr>
<td>Minority Women</td>
<td>0.024</td>
<td>0.012</td>
<td>0.010</td>
<td>0.007</td>
</tr>
<tr>
<td>Minority Workers</td>
<td>0.026</td>
<td>0.012</td>
<td>0.010</td>
<td>0.007</td>
</tr>
<tr>
<td>Equal Opportunities &amp; Minority</td>
<td>0.024</td>
<td>0.012</td>
<td>0.010</td>
<td>0.007</td>
</tr>
<tr>
<td>Equal Opportunities &amp; Female</td>
<td>0.026</td>
<td>0.012</td>
<td>0.010</td>
<td>0.007</td>
</tr>
<tr>
<td>Percentage of Ethnically Minority Workers</td>
<td>0.024</td>
<td>0.012</td>
<td>0.010</td>
<td>0.007</td>
</tr>
<tr>
<td>Percentage of Ethnically Female</td>
<td>0.026</td>
<td>0.012</td>
<td>0.010</td>
<td>0.007</td>
</tr>
<tr>
<td>Percentage of Females</td>
<td>0.024</td>
<td>0.012</td>
<td>0.010</td>
<td>0.007</td>
</tr>
<tr>
<td>Percentage of Minorities</td>
<td>0.026</td>
<td>0.012</td>
<td>0.010</td>
<td>0.007</td>
</tr>
</tbody>
</table>

Note: Coefficients are presented in parentheses. ***, **, and * indicate levels of significance at 1%, 5%, and 10%, respectively. The marginal effects are reported only for (m=3).
Table A.5.3: Heterogeneous Random Effects Probit Model. Dependent Variable: Incidence of DM. Equation Estimated:

$$T_1^* = \beta_0 + \beta_1X_1 + \beta_2X_2 + \ldots + \beta_nX_n + \epsilon$$

Summary of Main Results

<table>
<thead>
<tr>
<th>Model</th>
<th>LR Chi-sq</th>
<th>Log-Likelihood</th>
<th>N</th>
<th>d</th>
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<tbody>
<tr>
<td>Basic Model</td>
<td>52.30</td>
<td>2216.74</td>
<td>10</td>
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<tr>
<td>Extended Model</td>
<td>117.60</td>
<td>1929.20</td>
<td>16</td>
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<table>
<thead>
<tr>
<th>Covariates</th>
<th>Coefficient</th>
<th>SE</th>
<th>Coefficient</th>
<th>SE</th>
<th>Coefficient</th>
<th>SE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Extended Model</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table A.5.4 Heterogeneous Random Effects Ordered Probit Model: Intensity of Training.

Equation Estimated: $T_{ih}^* = \beta_1'X_{ih} + \beta_2'J_{ih} + \beta_3'W_{ih} + \epsilon_{ih}$, where $T_{ih}^*$ is a latent variable and ranges from 1 “Less than one day” to 5 “10 days or more”.

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>COEFFICIENT</th>
<th>STD ERROR</th>
<th>ME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>-0.155**</td>
<td>0.063</td>
<td>-0.024</td>
</tr>
<tr>
<td>Minority</td>
<td>-0.276</td>
<td>0.172</td>
<td>-0.034</td>
</tr>
<tr>
<td>Female &amp; minority</td>
<td>0.000</td>
<td>0.093</td>
<td>0.001</td>
</tr>
<tr>
<td>Percentage of females employees at the establishement</td>
<td>0.001</td>
<td>0.0101</td>
<td>0.000</td>
</tr>
<tr>
<td>Percentage of females employees at the establishement &amp; female</td>
<td>0.002**</td>
<td>0.0008</td>
<td>0.000</td>
</tr>
<tr>
<td>Percentage of ethnic minority employees at the establishement</td>
<td>-0.002</td>
<td>0.0015</td>
<td>0.000</td>
</tr>
<tr>
<td>Percentage of ethnic minority employees at the establishement &amp; minority</td>
<td>0.003</td>
<td>0.0026</td>
<td>0.000</td>
</tr>
<tr>
<td>Age&lt;20 years old</td>
<td>0.726***</td>
<td>0.067</td>
<td>0.147</td>
</tr>
<tr>
<td>20-24 years old</td>
<td>0.505***</td>
<td>0.057</td>
<td>0.089</td>
</tr>
<tr>
<td>25-29 years old</td>
<td>0.424***</td>
<td>0.053</td>
<td>0.071</td>
</tr>
<tr>
<td>30-39 years old</td>
<td>0.387***</td>
<td>0.050</td>
<td>0.059</td>
</tr>
<tr>
<td>40-49 years old</td>
<td>0.283***</td>
<td>0.049</td>
<td>0.044</td>
</tr>
<tr>
<td>50-59 years old</td>
<td>0.208***</td>
<td>0.049</td>
<td>0.033</td>
</tr>
<tr>
<td>Married/cohabiting</td>
<td>0.011</td>
<td>0.018</td>
<td>0.001</td>
</tr>
<tr>
<td>Having children aged 0-4</td>
<td>-0.015</td>
<td>0.023</td>
<td>-0.004</td>
</tr>
<tr>
<td>Having a health problem/disability</td>
<td>-0.060*</td>
<td>0.034</td>
<td>-0.007</td>
</tr>
<tr>
<td>Educational qualification (CSE or equivalent)</td>
<td>0.060*</td>
<td>0.031</td>
<td>0.009</td>
</tr>
<tr>
<td>O level or equivalent</td>
<td>0.110**</td>
<td>0.026</td>
<td>0.016</td>
</tr>
<tr>
<td>A level or equivalent</td>
<td>0.176***</td>
<td>0.031</td>
<td>0.026</td>
</tr>
<tr>
<td>Degree or equivalent</td>
<td>0.207***</td>
<td>0.036</td>
<td>0.031</td>
</tr>
<tr>
<td>Postgraduate degree or equivalent</td>
<td>0.154***</td>
<td>0.043</td>
<td>0.022</td>
</tr>
<tr>
<td>Job tenure at the establishment less than 1 year</td>
<td>0.238***</td>
<td>0.028</td>
<td>0.031</td>
</tr>
<tr>
<td>Job tenure at the establishment 1 to less than 2 years</td>
<td>0.258***</td>
<td>0.029</td>
<td>0.034</td>
</tr>
<tr>
<td>Job tenure at the establishment 2 to less than 5 years</td>
<td>0.094***</td>
<td>0.024</td>
<td>0.010</td>
</tr>
<tr>
<td>Job tenure at the establishment 5 to less than 10 years</td>
<td>0.003</td>
<td>0.023</td>
<td>-0.001</td>
</tr>
<tr>
<td>Manager</td>
<td>0.657***</td>
<td>0.045</td>
<td>0.120</td>
</tr>
<tr>
<td>Professional staff</td>
<td>0.654***</td>
<td>0.049</td>
<td>0.115</td>
</tr>
<tr>
<td>Technical staff</td>
<td>0.513***</td>
<td>0.045</td>
<td>0.090</td>
</tr>
<tr>
<td>Clerical staff</td>
<td>0.175***</td>
<td>0.037</td>
<td>0.027</td>
</tr>
<tr>
<td>Crafts</td>
<td>0.190***</td>
<td>0.043</td>
<td>0.024</td>
</tr>
<tr>
<td>Service</td>
<td>0.487***</td>
<td>0.042</td>
<td>0.097</td>
</tr>
<tr>
<td>Sales</td>
<td>0.443***</td>
<td>0.056</td>
<td>0.075</td>
</tr>
<tr>
<td>Operatives</td>
<td>-0.132**</td>
<td>0.045</td>
<td>-0.019</td>
</tr>
<tr>
<td>Manager &amp; A level or Degree</td>
<td>-0.124**</td>
<td>0.050</td>
<td>-0.016</td>
</tr>
<tr>
<td>Professional staff &amp; degree or postgraduate degree</td>
<td>-0.138***</td>
<td>0.051</td>
<td>-0.019</td>
</tr>
<tr>
<td>Technical staff &amp; A level or degree</td>
<td>-0.111**</td>
<td>0.050</td>
<td>-0.015</td>
</tr>
<tr>
<td>Sale &amp; O level or A level</td>
<td>-0.129**</td>
<td>0.059</td>
<td>-0.017</td>
</tr>
<tr>
<td>Ln(working hours per week)</td>
<td>0.320***</td>
<td>0.033</td>
<td>0.037</td>
</tr>
<tr>
<td>Temporary job</td>
<td>-0.196***</td>
<td>0.044</td>
<td>-0.024</td>
</tr>
<tr>
<td>Fixed-term job</td>
<td>-0.082*</td>
<td>0.045</td>
<td>-0.013</td>
</tr>
<tr>
<td>Share a full-time job</td>
<td>0.150***</td>
<td>0.022</td>
<td>0.022</td>
</tr>
<tr>
<td>Part-time work</td>
<td>-0.096</td>
<td>0.063</td>
<td>-0.016</td>
</tr>
<tr>
<td>Part-time work &amp; female</td>
<td>-0.046</td>
<td>0.057</td>
<td>-0.006</td>
</tr>
<tr>
<td>Proportion of part-time employees at the establishement</td>
<td>0.066</td>
<td>0.091</td>
<td>0.004</td>
</tr>
<tr>
<td>The work is mainly/only done by women at the establishement</td>
<td>0.021</td>
<td>0.054</td>
<td>0.006</td>
</tr>
<tr>
<td>The work is mainly/only done by women at the establishement &amp; female</td>
<td>0.026</td>
<td>0.055</td>
<td>-0.010</td>
</tr>
<tr>
<td>The work is equally done by men and women</td>
<td>0.003</td>
<td>0.025</td>
<td>0.004</td>
</tr>
<tr>
<td>Trade union member</td>
<td>0.084***</td>
<td>0.021</td>
<td>0.010</td>
</tr>
<tr>
<td>Trade union density</td>
<td>0.270***</td>
<td>0.066</td>
<td>0.035</td>
</tr>
<tr>
<td>Female &amp; trade union density</td>
<td>-0.181***</td>
<td>0.065</td>
<td>-0.030</td>
</tr>
<tr>
<td>More than 40% of the employees are covered by collective bargaining</td>
<td>-0.065</td>
<td>0.042</td>
<td>-0.009</td>
</tr>
<tr>
<td>More than 40% of the employees are covered by collective bargaining &amp; female</td>
<td>0.008</td>
<td>0.044</td>
<td>0.004</td>
</tr>
<tr>
<td>Proportion of low paid employees at the establishement (less than £9,000 per year)</td>
<td>-0.415***</td>
<td>0.121</td>
<td>-0.060</td>
</tr>
</tbody>
</table>

Continued
Table A.5.4 Heterogeneous Random Effects Ordered Probit Model: Intensity of Training.

Equation Estimated: \( T_{ih}^* = \beta_1^* X_{ih} + \beta_2^* J_{ih} + \beta_3^* W_h + \epsilon_{ih} \), where \( T_{ih}^* \) is a latent variable and ranges from 1 “Less than one day” to 5 “10 days or more”.

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>COEFFICIENT</th>
<th>STD ERROR</th>
<th>ME</th>
</tr>
</thead>
<tbody>
<tr>
<td>A quarter or more of all employees on fixed term contract, either part-time or full-time</td>
<td>-0.126**</td>
<td>0.071</td>
<td>-0.017</td>
</tr>
<tr>
<td>Proportion of employees at the establishment above 50 years old</td>
<td>-0.254**</td>
<td>0.121</td>
<td>-0.030</td>
</tr>
<tr>
<td>Proportion of managers at the establishment</td>
<td>-0.112</td>
<td>0.144</td>
<td>-0.016</td>
</tr>
<tr>
<td>Proportion of professional employees</td>
<td>0.105</td>
<td>0.096</td>
<td>0.015</td>
</tr>
<tr>
<td>Proportion of technical staff</td>
<td>0.156</td>
<td>0.103</td>
<td>0.012</td>
</tr>
<tr>
<td>Proportion of clerical staff</td>
<td>0.073</td>
<td>0.097</td>
<td>0.010</td>
</tr>
<tr>
<td>Proportion of craft</td>
<td>0.164</td>
<td>0.105</td>
<td>0.022</td>
</tr>
<tr>
<td>Proportion of personal service</td>
<td>0.210***</td>
<td>0.081</td>
<td>0.025</td>
</tr>
<tr>
<td>Proportion of operatives</td>
<td>-0.016</td>
<td>0.091</td>
<td>-0.001</td>
</tr>
<tr>
<td>Proportion of sales</td>
<td>0.210**</td>
<td>0.102</td>
<td>0.027</td>
</tr>
<tr>
<td>Workplace size (26-49 employees)</td>
<td>-0.054</td>
<td>0.053</td>
<td>-0.011</td>
</tr>
<tr>
<td>Workplace size (50-99 employees)</td>
<td>-0.025</td>
<td>0.051</td>
<td>-0.006</td>
</tr>
<tr>
<td>Workplace size (100-199 employees)</td>
<td>-0.074</td>
<td>0.053</td>
<td>-0.011</td>
</tr>
<tr>
<td>Workplace size (200-499 employees)</td>
<td>-0.009</td>
<td>0.054</td>
<td>-0.003</td>
</tr>
<tr>
<td>More than 500 employees</td>
<td>0.043</td>
<td>0.059</td>
<td>0.002</td>
</tr>
<tr>
<td>Organisation size (100 to less than 500 employees)</td>
<td>0.119*</td>
<td>0.061</td>
<td>0.012</td>
</tr>
<tr>
<td>Organisation size (500 to less than 1,000 employees)</td>
<td>0.106*</td>
<td>0.062</td>
<td>0.011</td>
</tr>
<tr>
<td>Organisation size (1000 to less than 5,000 employees)</td>
<td>0.027</td>
<td>0.042</td>
<td>0.002</td>
</tr>
<tr>
<td>Organisation size (5,000 to less than 10,000 employees)</td>
<td>0.100*</td>
<td>0.051</td>
<td>0.013</td>
</tr>
<tr>
<td>More than 10,000 employees</td>
<td>0.045</td>
<td>0.044</td>
<td>0.005</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>-0.055</td>
<td>0.078</td>
<td>-0.005</td>
</tr>
<tr>
<td>Electric</td>
<td>0.329***</td>
<td>0.088</td>
<td>0.050</td>
</tr>
<tr>
<td>Construction</td>
<td>-0.163*</td>
<td>0.086</td>
<td>-0.018</td>
</tr>
<tr>
<td>Wholesale</td>
<td>-0.163**</td>
<td>0.080</td>
<td>-0.017</td>
</tr>
<tr>
<td>Hotels and restaurants</td>
<td>0.205**</td>
<td>0.088</td>
<td>0.032</td>
</tr>
<tr>
<td>Transportation</td>
<td>-0.077</td>
<td>0.084</td>
<td>-0.010</td>
</tr>
<tr>
<td>Financial services</td>
<td>0.249***</td>
<td>0.090</td>
<td>0.037</td>
</tr>
<tr>
<td>Other business</td>
<td>-0.050</td>
<td>0.078</td>
<td>-0.006</td>
</tr>
<tr>
<td>Public administration</td>
<td>0.035***</td>
<td>0.077</td>
<td>0.047</td>
</tr>
<tr>
<td>Education</td>
<td>-0.078</td>
<td>0.078</td>
<td>-0.011</td>
</tr>
<tr>
<td>Health services</td>
<td>0.228***</td>
<td>0.078</td>
<td>0.036</td>
</tr>
<tr>
<td>High competitive firm</td>
<td>-0.051</td>
<td>0.031</td>
<td>-0.006</td>
</tr>
<tr>
<td>Groups at the workplace solve specific problems/discuss aspects of performance or quality</td>
<td>0.071***</td>
<td>0.026</td>
<td>0.009</td>
</tr>
<tr>
<td>Over the last 5 years management introduced new technology at the workplace</td>
<td>0.056*</td>
<td>0.031</td>
<td>0.006</td>
</tr>
<tr>
<td>Manager/director at a separate establishment spends time on personnel matters</td>
<td>0.077**</td>
<td>0.033</td>
<td>0.011</td>
</tr>
<tr>
<td>Personality or attitude test</td>
<td>0.138***</td>
<td>0.029</td>
<td>0.017</td>
</tr>
<tr>
<td>Establishment supplies goods or services to other companies</td>
<td>0.070*</td>
<td>0.040</td>
<td>0.011</td>
</tr>
<tr>
<td>Market at which the establishment operates is declining</td>
<td>-0.116**</td>
<td>0.052</td>
<td>-0.014</td>
</tr>
<tr>
<td>Local unemployment rate by travel to work area</td>
<td>0.005</td>
<td>0.030</td>
<td>0.000</td>
</tr>
<tr>
<td>Written policy on equal opportunities or managing diversity</td>
<td>0.074</td>
<td>0.047</td>
<td>0.009</td>
</tr>
<tr>
<td>Written policy on equal opportunities or managing diversity &amp; female</td>
<td>0.124**</td>
<td>0.053</td>
<td>0.015</td>
</tr>
<tr>
<td>Written policy on equal opportunities or managing diversity and minority</td>
<td>0.187</td>
<td>0.166</td>
<td>0.039</td>
</tr>
<tr>
<td>Cut1</td>
<td>1.913***</td>
<td>0.179</td>
<td>---</td>
</tr>
<tr>
<td>Cut2</td>
<td>2.194***</td>
<td>0.179</td>
<td>---</td>
</tr>
<tr>
<td>Cut3</td>
<td>2.661***</td>
<td>0.180</td>
<td>---</td>
</tr>
<tr>
<td>Cut4</td>
<td>3.458***</td>
<td>0.180</td>
<td>---</td>
</tr>
<tr>
<td>Cut5</td>
<td>3.994***</td>
<td>0.180</td>
<td>---</td>
</tr>
<tr>
<td>( \rho )</td>
<td>0.117***</td>
<td>0.007</td>
<td>---</td>
</tr>
</tbody>
</table>

Log-likelihood: -33752.711
LR chi2(95): 2889.41

Note: Robust standard errors in parentheses, ***, ***, 1%, 5% and 10% levels of significance correspondingly. The marginal effects are reported only for \( (m=5) \), are based on the linear prediction from the estimated coefficients and are calculated at the mean values of the explanatory variables.
**Table A.5.5 Heterogeneous Random Effects Probit Model: Incidence of Training.**

Equation

Estimated: \( T_{jh}^* = \beta_1'X_{jh} + \beta_2'J_{jh} + \beta_3'W_{jh} + \epsilon_{jh} \), where \( T_{jh}^* \) is a latent variable taking the value of 0 “No training” and 1 “Some training”.

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>COEFFICIENT</th>
<th>STD ERROR</th>
<th>ME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>-0.181**</td>
<td>0.078</td>
<td>-0.072</td>
</tr>
<tr>
<td>Minority</td>
<td>-0.268</td>
<td>0.213</td>
<td>-0.102</td>
</tr>
<tr>
<td>Female &amp; minority</td>
<td>0.050</td>
<td>0.121</td>
<td>0.015</td>
</tr>
<tr>
<td>Percentage of females employees at the establishment</td>
<td>0.001</td>
<td>0.0013</td>
<td>0.000</td>
</tr>
<tr>
<td>Percentage of females employees at the establishment &amp; female</td>
<td>0.003***</td>
<td>0.0011</td>
<td>0.001</td>
</tr>
<tr>
<td>Percentage of ethnic minority employees at the establishment</td>
<td>-0.003*</td>
<td>0.0018</td>
<td>-0.001</td>
</tr>
<tr>
<td>Percentage of ethnic minority employees at the establishment &amp; minority</td>
<td>0.001</td>
<td>0.0033</td>
<td>0.001</td>
</tr>
<tr>
<td>Age=20 years old</td>
<td>0.676***</td>
<td>0.083</td>
<td>0.188</td>
</tr>
<tr>
<td>20-24 years old</td>
<td>0.420***</td>
<td>0.070</td>
<td>0.127</td>
</tr>
<tr>
<td>25-29 years old</td>
<td>0.361***</td>
<td>0.064</td>
<td>0.116</td>
</tr>
<tr>
<td>30-39 years old</td>
<td>0.359***</td>
<td>0.059</td>
<td>0.118</td>
</tr>
<tr>
<td>40-49 years old</td>
<td>0.265***</td>
<td>0.058</td>
<td>0.092</td>
</tr>
<tr>
<td>50-59 years old</td>
<td>0.241***</td>
<td>0.058</td>
<td>0.084</td>
</tr>
<tr>
<td>Married/cohabiting</td>
<td>0.004</td>
<td>0.024</td>
<td>0.007</td>
</tr>
<tr>
<td>Having children aged 0-4</td>
<td>-0.017</td>
<td>0.031</td>
<td>-0.011</td>
</tr>
<tr>
<td>Having a health problem/disability</td>
<td>-0.069</td>
<td>0.044</td>
<td>-0.020</td>
</tr>
<tr>
<td>Educational qualification (CSE or equivalent)</td>
<td>0.093**</td>
<td>0.039</td>
<td>0.032</td>
</tr>
<tr>
<td>O level or equivalent</td>
<td>0.182***</td>
<td>0.033</td>
<td>0.059</td>
</tr>
<tr>
<td>A level or equivalent</td>
<td>0.245***</td>
<td>0.040</td>
<td>0.082</td>
</tr>
<tr>
<td>Degree or equivalent</td>
<td>0.315***</td>
<td>0.048</td>
<td>0.101</td>
</tr>
<tr>
<td>Postgraduate degree or equivalent</td>
<td>0.278***</td>
<td>0.060</td>
<td>0.083</td>
</tr>
<tr>
<td>Job tenure at the establishment less than 1 year</td>
<td>0.223***</td>
<td>0.037</td>
<td>0.063</td>
</tr>
<tr>
<td>Job tenure at the establishment 1 to less than 2 years</td>
<td>0.299***</td>
<td>0.039</td>
<td>0.085</td>
</tr>
<tr>
<td>Job tenure at the establishment 2 to less than 5 years</td>
<td>0.105***</td>
<td>0.031</td>
<td>0.025</td>
</tr>
<tr>
<td>Job tenure at the establishment 5 to less than 10 years</td>
<td>-0.009</td>
<td>0.029</td>
<td>-0.005</td>
</tr>
<tr>
<td>Manager</td>
<td>0.693***</td>
<td>0.059</td>
<td>0.189</td>
</tr>
<tr>
<td>Professional staff</td>
<td>0.698***</td>
<td>0.065</td>
<td>0.196</td>
</tr>
<tr>
<td>Technical staff</td>
<td>0.513***</td>
<td>0.058</td>
<td>0.152</td>
</tr>
<tr>
<td>Clerical staff</td>
<td>0.243***</td>
<td>0.045</td>
<td>0.077</td>
</tr>
<tr>
<td>Crafts</td>
<td>0.126**</td>
<td>0.051</td>
<td>0.033</td>
</tr>
<tr>
<td>Service</td>
<td>0.528***</td>
<td>0.055</td>
<td>0.160</td>
</tr>
<tr>
<td>Sales</td>
<td>0.558***</td>
<td>0.070</td>
<td>0.158</td>
</tr>
<tr>
<td>Operatives</td>
<td>-0.058</td>
<td>0.053</td>
<td>-0.025</td>
</tr>
<tr>
<td>Manager &amp; A level or Degree</td>
<td>-0.121*</td>
<td>0.070</td>
<td>-0.044</td>
</tr>
<tr>
<td>Professional staff &amp; degree or postgraduate degree</td>
<td>-0.083</td>
<td>0.072</td>
<td>-0.028</td>
</tr>
<tr>
<td>Technical staff &amp; A level or degree</td>
<td>-0.108</td>
<td>0.068</td>
<td>-0.044</td>
</tr>
<tr>
<td>Sales &amp; O level or A level</td>
<td>-0.065</td>
<td>0.076</td>
<td>-0.021</td>
</tr>
<tr>
<td>Ln(working hours per week)</td>
<td>0.337</td>
<td>0.040</td>
<td>0.096</td>
</tr>
<tr>
<td>Temporary job</td>
<td>-0.219***</td>
<td>0.055</td>
<td>-0.080</td>
</tr>
<tr>
<td>Fixed-term job</td>
<td>-0.208***</td>
<td>0.057</td>
<td>-0.075</td>
</tr>
<tr>
<td>Share a full-time job</td>
<td>0.164***</td>
<td>0.030</td>
<td>0.057</td>
</tr>
<tr>
<td>Part-time work</td>
<td>-0.022</td>
<td>0.077</td>
<td>-0.020</td>
</tr>
<tr>
<td>Part-time work &amp; female</td>
<td>-0.141**</td>
<td>0.071</td>
<td>-0.045</td>
</tr>
<tr>
<td>Proportion of part-time employees at the establishment</td>
<td>0.165</td>
<td>0.114</td>
<td>0.045</td>
</tr>
<tr>
<td>The work is mainly/only done by women at the establishment</td>
<td>0.185**</td>
<td>0.075</td>
<td>0.065</td>
</tr>
<tr>
<td>The work is mainly/only done by women at the establishment &amp; female</td>
<td>-0.163**</td>
<td>0.078</td>
<td>-0.069</td>
</tr>
<tr>
<td>The work is equally done by men and women</td>
<td>0.101***</td>
<td>0.033</td>
<td>0.030</td>
</tr>
<tr>
<td>Trade union member</td>
<td>0.088***</td>
<td>0.027</td>
<td>0.025</td>
</tr>
<tr>
<td>Trade union density</td>
<td>0.311***</td>
<td>0.085</td>
<td>0.105</td>
</tr>
<tr>
<td>Female &amp; trade union density</td>
<td>-0.240**</td>
<td>0.087</td>
<td>-0.095</td>
</tr>
<tr>
<td>More than 40% of the employees are covered by collective bargaining</td>
<td>-0.048</td>
<td>0.053</td>
<td>-0.015</td>
</tr>
<tr>
<td>More than 40% of the employees are covered by collective bargaining &amp; female</td>
<td>-0.044</td>
<td>0.057</td>
<td>-0.009</td>
</tr>
<tr>
<td>Proportion of low paid employees at the establishment (less than £9,000 per year)</td>
<td>-0.488***</td>
<td>0.147</td>
<td>-0.177</td>
</tr>
</tbody>
</table>

Continued...
Table A.5.5 Heterogeneous Random Effects Probit Model: Incidence of Training. Equation Estimated:

\[ T_{ith} = \beta_1 X_{ith} + \beta_2 J_{ith} + \beta_3 W_{ih} + \varepsilon_{ith}, \]

where \( T_{ith} \) is a latent variable taking the value of 0 "No training" and 1 "Some training".

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>COEFFICIENT</th>
<th>STD ERROR</th>
<th>ME</th>
</tr>
</thead>
<tbody>
<tr>
<td>A quarter or more of the proportion of all employees at the workplace work on fixed term contract, either part-time or full-time</td>
<td>-0.135</td>
<td>0.086</td>
<td>-0.056</td>
</tr>
<tr>
<td>Proportion of employees at the establishment above 50 years old</td>
<td>-0.179</td>
<td>0.151</td>
<td>-0.061</td>
</tr>
<tr>
<td>Proportion of managers at the establishment</td>
<td>-0.092</td>
<td>0.181</td>
<td>-0.023</td>
</tr>
<tr>
<td>Proportion of professional employees</td>
<td>0.151</td>
<td>0.124</td>
<td>0.048</td>
</tr>
<tr>
<td>Proportion of technical staff</td>
<td>0.164</td>
<td>0.130</td>
<td>0.038</td>
</tr>
<tr>
<td>Proportion of clerical staff</td>
<td>0.119</td>
<td>0.123</td>
<td>0.033</td>
</tr>
<tr>
<td>Proportion of craft</td>
<td>0.128</td>
<td>0.130</td>
<td>0.031</td>
</tr>
<tr>
<td>Proportion of personal service</td>
<td>0.250**</td>
<td>0.109</td>
<td>0.073</td>
</tr>
<tr>
<td>Proportion of operatives</td>
<td>-0.105</td>
<td>0.112</td>
<td>-0.041</td>
</tr>
<tr>
<td>Proportion of sales</td>
<td>0.173</td>
<td>0.127</td>
<td>0.058</td>
</tr>
<tr>
<td>Workplace size (26-49 employees)</td>
<td>-0.036</td>
<td>0.066</td>
<td>-0.026</td>
</tr>
<tr>
<td>Workplace size (50-99 employees)</td>
<td>0.005</td>
<td>0.065</td>
<td>-0.006</td>
</tr>
<tr>
<td>Workplace size (100-199 employees)</td>
<td>-0.031</td>
<td>0.067</td>
<td>-0.018</td>
</tr>
<tr>
<td>Workplace size (200-499 employees)</td>
<td>0.016</td>
<td>0.068</td>
<td>0.002</td>
</tr>
<tr>
<td>More than 500 employees</td>
<td>0.073</td>
<td>0.074</td>
<td>0.019</td>
</tr>
<tr>
<td>Organisation size (100 to less than 500 employees)</td>
<td>0.094</td>
<td>0.075</td>
<td>0.024</td>
</tr>
<tr>
<td>Organisation size (500 to less than 1,000 employees)</td>
<td>0.072</td>
<td>0.076</td>
<td>0.016</td>
</tr>
<tr>
<td>Organisation size (1000 to less than 5,000 employees)</td>
<td>0.006</td>
<td>0.052</td>
<td>-0.004</td>
</tr>
<tr>
<td>Organisation size (5,000 to less than 10,000 employees)</td>
<td>0.110**</td>
<td>0.065</td>
<td>0.030</td>
</tr>
<tr>
<td>More than 10,000 employees</td>
<td>0.062</td>
<td>0.055</td>
<td>0.015</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>-0.125</td>
<td>0.096</td>
<td>-0.043</td>
</tr>
<tr>
<td>Electric</td>
<td>0.345***</td>
<td>0.112</td>
<td>0.101</td>
</tr>
<tr>
<td>Construction</td>
<td>-0.117</td>
<td>0.105</td>
<td>-0.036</td>
</tr>
<tr>
<td>Wholesale</td>
<td>-0.166*</td>
<td>0.098</td>
<td>-0.052</td>
</tr>
<tr>
<td>Hotels and restaurants</td>
<td>0.219**</td>
<td>0.110</td>
<td>0.070</td>
</tr>
<tr>
<td>Transportation</td>
<td>-0.129</td>
<td>0.102</td>
<td>-0.048</td>
</tr>
<tr>
<td>Financial services</td>
<td>0.125</td>
<td>0.113</td>
<td>0.039</td>
</tr>
<tr>
<td>Other business</td>
<td>-0.098</td>
<td>0.096</td>
<td>-0.038</td>
</tr>
<tr>
<td>Public administration</td>
<td>0.260***</td>
<td>0.097</td>
<td>0.076</td>
</tr>
<tr>
<td>Education</td>
<td>-0.152</td>
<td>0.097</td>
<td>-0.050</td>
</tr>
<tr>
<td>Health services</td>
<td>0.153</td>
<td>0.098</td>
<td>0.056</td>
</tr>
<tr>
<td>High competitive firm</td>
<td>-0.071</td>
<td>0.039</td>
<td>-0.022</td>
</tr>
<tr>
<td>Groups at the workplace solve specific problems/discuss aspects of performance</td>
<td>0.096</td>
<td>0.033</td>
<td>0.032</td>
</tr>
<tr>
<td>Over the last 5 years management introduced new technology at the workplace</td>
<td>0.064*</td>
<td>0.039</td>
<td>0.020</td>
</tr>
<tr>
<td>Manager/director at a separate establishment in the organisation that spends a major part of his time on personnel or employee relations matters</td>
<td>0.131***</td>
<td>0.042</td>
<td>0.047</td>
</tr>
<tr>
<td>Personality or attitude test</td>
<td>0.113***</td>
<td>0.036</td>
<td>0.038</td>
</tr>
<tr>
<td>Establishment supplies goods or services to other companies</td>
<td>0.047</td>
<td>0.049</td>
<td>0.019</td>
</tr>
<tr>
<td>Market at which the establishment operates is declining</td>
<td>-0.145</td>
<td>0.064</td>
<td>-0.047</td>
</tr>
<tr>
<td>Local unemployment rate by travel to work area</td>
<td>-0.012</td>
<td>0.037</td>
<td>-0.005</td>
</tr>
<tr>
<td>Written policy on equal opportunities or managing diversity</td>
<td>0.017</td>
<td>0.058</td>
<td>-0.004</td>
</tr>
<tr>
<td>Written policy on equal opportunities or managing diversity &amp; female</td>
<td>0.216***</td>
<td>0.065</td>
<td>0.073</td>
</tr>
<tr>
<td>Written policy on equal opportunities or managing diversity and minority</td>
<td>0.128</td>
<td>0.204</td>
<td>0.054</td>
</tr>
<tr>
<td>Constant</td>
<td>-2.133***</td>
<td>0.221</td>
<td>---</td>
</tr>
<tr>
<td>( \rho )</td>
<td>0.161***</td>
<td>(0.010)</td>
<td>---</td>
</tr>
<tr>
<td>Log-likelihood</td>
<td>-11742.204</td>
<td></td>
<td>2127.44</td>
</tr>
<tr>
<td>LR chi2(95)</td>
<td></td>
<td></td>
<td>21.826</td>
</tr>
</tbody>
</table>

Note: Robust standard errors in parentheses. ***, ***, *, 1%, 5%, and 10% levels of significance. The marginal effects are reported only for (m=1), are based on the linear prediction from the estimated coefficients and are calculated at the mean values of the explanatory variables.
Chapter 6

6.0 Conclusions

Using matched employer employee data for Britain, this Thesis examined how well female and ethnic minority employees fare in terms of wages, job satisfaction and off-the-job training compared to their male and white peers respectively. One of the main contributions of this Thesis in the literature is to incorporate the supply side of the labour market in determining the above labour market differentials as well as to model unobserved firm heterogeneity. We found that the incorporation of firm specific observed and unobserved characteristics have significant effects on determining wages, job satisfaction and off-the-job training. Thus, detailed information of firm characteristics adds a great deal to our understanding of how labour markets work.

This Thesis does possess several strengths. An important one is that it collects together the widely spread theoretical and empirical literature on labour market discrimination, job satisfaction and training in a single source. Another is that it focuses on three important issues in modern labour economics devoting three substantive empirical chapters. The advanced econometric analysis of Chapter 1 and the careful empirical analysis of Chapters 2 and 3 fill significant gaps in the existing literature. This Thesis utilises the first employer-employee matched dataset for Britain, the WERS98. The data are of high quality, thus another strength of this Thesis is that it explores the properties of the dataset.

In Chapter 1 we provided an overview of the economic theories of discrimination, and we summarised the existing empirical literature on gender and ethnicity pay differentials. Also, we provided an overview of equal opportunities
policies and we identified the determinants that affect the probability that an establishment would have equal opportunities policies. We also highlighted the advantages of linked employer-employee data (over individual or firm level data) that help to identify differential treatment at the workplace.

In Chapter 2 we described the data, we interpreted the dependent variables and we presented simple descriptive statistics on variables of interest. Thus, in Chapter 2 we set up the basis for the empirical analysis in Chapters 3, 4 and 5.

In Chapter 3 we found strong and robust evidence in support of gender and ethnicity pay differentials. However, despite these significant pay differentials we did not find evidence of firm specific indicators of disadvantage. For instance, correlations between the estimated means of the three firm specific random effects with other variables that may act as indirect indicators of discrimination did not significantly change the mean of the three firm specific random effects. Thus, we argued that it is very difficult to draw any policy implications that might help to reduce the gender as well as the ethnic pay gaps. This is because the pay disadvantage seems to vary from establishment to establishment and be uncorrelated with other important determinants of wages. Another reason is that the determinants of pay disadvantage are different for women than for ethnic minority employees. Thus, one would have to devise different policies for reducing the gender pay gap than the ethnic pay gap.

One of the main contributions of Chapter 3 to the applied econometrics literature is that the maintained hypothesis of normality in the simple interval regression is not tenable empirically when the dependent variable is observed only within ranges. We proved this by introducing two tests checking for normality when the left hand side variable is observed within ranges. Using a semi-parametric finite mixture random
effects estimator we addressed normality as well as heteroskedasticity problems by allowing for the interaction of non-normal workplace effects with individual workers’ gender and ethnicity characteristics.

Chapter 4 focused on job satisfaction. It provided an interdisciplinary literature review on job satisfaction and revisit the question why women report higher job satisfaction levels than men given that they face significant pay differentials. We found that, in spite of the gender pay gap women are happier than men in relation to all four different aspects of job satisfaction. In sharp contrast, ethnic minority employees are happy with the intrinsic aspects of job satisfaction but not with pay. Thus, one important contribution of Chapter 4 in the literature is to identify this disparity, which has important policy implications. For instance, the discrepancy between females and ethnic minority employees suggests that ethnic minority employees are convinced that are facing a significant pay disadvantage. Alternatively, institutionalised pay differentials have an impact on ethnic minority employees but not on females. We attributed these findings to social and other cultural factors.

While we believe that Chapter 4 adds to the existing empirical research on the determinants of job satisfaction we want to emphasize what we feel to be a limitation of this approach. Subjective assessments of personal well-being will depend on personal expectations which are likely to be conditioned upon social norms and personal experience. Thus, it is possible that women and ethnic minority employees may be more satisfied with their jobs because they have learned to expect less. Nevertheless, we cannot accept that the most satisfied women and ethnic minority workers should turn out to be those whose horizons are also limited and they cannot even conceive of alternatives. Unfortunately our data do not allow us to separately identify the influence of differences in expectations and differences in outcomes. An
interesting avenue for future research is to employ data from the British National Child Development Study (NCDS) (see Brown et al., 2004) and the UK Millennium Cohort Study (MCS) and look at the way women and non-white employees' expectations have been raised conditional on the opportunities or the alternatives open to them. Also, another avenue for future work in relation to Chapter 4 is to explore the relative income hypothesis and try to uncover the provocative finding that although the pay gap for women is lower in establishments where more women work, at the same time satisfaction with pay for women is lower in establishment with high proportions of women.

Chapter 5 focused on employer provided off-the-job training. It reviewed the empirical and theoretical literature on training and made the distinction between firm specific and general training. The findings of this Chapter indicate a widespread variation in both the access and the intensity of off-the-job training. This variation is true across several employee, job and workplace characteristics. We found no direct evidence of disadvantage in access to off-the-job training for female employees in Britain. In contrast, female employees, given human capital, demographic, job and workplace characteristics, have a higher probability of participating in off-the-job training than men. However, this positive differential in favour of women is not true when we examined the intensity of training.

Another contribution of Chapter 5 to the applied econometrics literature on training is the effect of workplace segregation on training. To the best of our knowledge, this is the first British study that examines exactly this. We found that female workplace segregation makes the positive female differential in terms of participating in training not only to vanish but quite remarkably to become negative. Ethnic minority employees face a significant disadvantage in access to training, but
this disadvantage diminishes when we include a measure of ethnic minority concentration in the establishment. These two contradictory findings have important policy implications and raise a number of questions about employee composition at the workplace. Thus, examining employee mixing at the workplace would be an interesting question for future research. Strikingly, equal opportunities policies work asymmetrically. For instance, we found strong evidence that having equal opportunities policies at the workplace increases the probability of training as well as its intensity for females but not for ethnic minority employees.

Despite the evidence of significant wage and off-the-job training disadvantages for women and ethnic minority employees we documented, we did not find direct evidence of discrimination in the modern British labour market. Thus, it is not obvious what sort of policies would help to eradicate these disadvantages. With respect to the pay gaps our suggestion is that unilateral implementation or further enforcement of policies, such as the Equal Pay Act cannot eliminate labour market differentials between advantaged and disadvantaged groups. For instance, in Chapter 3 we argued that one may have to devise different policies for reducing the gender pay gap and different policies for reducing the race pay gap.

With respect to training we found that establishment segregation has a strong and negative effect on the probability of obtaining workplace training for women. Thus, a plausible policy would be to reward employers who act to reduce segregation. For instance, the government could provide subsidies to firms that show marked improvement in integrating women into traditionally white male jobs. Such subsidies could provide a marked advantage to these firms and make them relatively more profitable than firms who make no such efforts, or, at least, counter any costs incurred from implementing these changes.
Another policy implication comes from the finding that equal opportunities policies do not guarantee equality of treatment with respect to training. For instance, we found evidence that equal opportunities policies work asymmetrically. Thus, except monitoring and enforcing equal opportunities policies, policy makers have to make sure that those policies have the same effects across ethnicities.

As outlined in Section 1.2 of Chapter 1, the economic debate about discrimination has concentrated on determinants of performance linked to individual employee characteristics and has largely ignored the influence of firm policies on individual disadvantage. Our findings suggest that the debate about labour market disadvantage should also take into account features of the work environment.

Nevertheless, an individual's inherited social situation plays a major role in determining ultimate economic success. Thus, changes in the social norms, for instance what women think is enough or fair for labour remuneration may be another useful policy. For instance, as we showed in Chapter 3, that despite facing a significant pay disadvantage women are happier than men with the pay they receive. Hence, alongside the evaluation and screening of the above policies, policies that help to change social norms and beliefs may be proved more successful. However, one has to bear in mind that social norms require several years to be changed and their effects cannot be realised in the short run.

Let us conclude by forming the agenda for future work when the next wave of the WERS is publicly available.\footnote{The fieldwork of the second WERS wave has already been completed. It is suggested that a final version of the data will be deposited at the UK Data Archive by April 2006 (source: \url{http://www.niesr.ac.uk/research/WERS98/}).} An unavoidable limitation and weakness of this Thesis is the small number of ethnic minority employees observed in the WERS98. However, we have already argued how this limitation might affect our estimates. For
instance, if it is the more able ethnic minority individuals that we observe in our data (are in employment), then our estimates are lower bounds of wages and training and upper bounds for job satisfaction. Also, the incorporation of all ethnic minority groups into a single group may mask the heterogeneity of each ethnic minority group, since the labour market performance of ethnic minority groups in Britain differs widely (Dustmann and Theodoropoulos, 2006). Therefore our estimates of the ethnic minority coefficients are a weighted average across all ethnic minority groups.

The second WERS wave will allow us to have more observations on ethnic minorities and hopefully allow us to distinguish between different ethnic minority groups. It will also allow us to implement fixed-effects models to account for time variation of workplace characteristics (i.e. percentage of female and ethnic minority employees at the establishment), thus distinguishing between workplace segregation and the sorting of employees across establishments.

In each of the three empirical Chapters we found workplace segregation to have significant and sizeable effects on wages, on job satisfaction and on off-the-job training. As we argued in Chapter 5, unlike discrimination, segregation may be the outcome of voluntary choice (i.e. differences in preferences, customs, or social networks) or the outcome of discrimination (i.e. social exclusion, or other restrictions on opportunities). Thus, in future work we would like to introduce a theoretical model of workplace segregation and thus provide some more evidence on the interaction between establishment segregation and discrimination.
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Employee questionnaire

This is a national survey of people at work. We are interested in your views about your job and your workplace.

Your name was selected randomly from a list of people who work here. Some other people here have also been picked at random. We’ve chosen people in this way so that we cover the full range of employees - from management to the most junior. There is no special reason why you were picked to fill in the survey or why others you work with were not picked. However, now that your name has come up, we would like you to fill in the questionnaire. Please do not pass it to someone else.

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The questionnaire should take no more than 15 minutes to complete. It can be done either at work or at home. It would be helpful if you could return the completed questionnaire within the next two weeks.

If you need any help or want to know more about the survey, phone Andrew O'Reilly at the DTI on freephone 0800 0680707.

Please use a black pen to complete the questionnaire and try to answer every question.

Many thanks for your help.
A. About your job

A1. How many years in total have you been working at this workplace? By workplace we mean the site or location at, or from, which you work.

<table>
<thead>
<tr>
<th>Years</th>
<th>Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 1 year</td>
<td>1</td>
</tr>
<tr>
<td>1 to less than 2 years</td>
<td>2</td>
</tr>
<tr>
<td>2 to less than 5 years</td>
<td>3</td>
</tr>
<tr>
<td>5 to less than 10 years</td>
<td>4</td>
</tr>
<tr>
<td>10 years or more</td>
<td>5</td>
</tr>
</tbody>
</table>

A2. Is your job permanent, or is it temporary or for a fixed-term?

<table>
<thead>
<tr>
<th>Type</th>
<th>Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>Permanent</td>
<td>1</td>
</tr>
<tr>
<td>Temporary</td>
<td>2</td>
</tr>
<tr>
<td>Fixed-term</td>
<td>3</td>
</tr>
</tbody>
</table>

A3. How many hours do you usually work each week, including any overtime or extra hours?

- Hours per week

A4. How many overtime or extra hours do you usually work each week, whether paid or unpaid?

- If you do not usually work overtime or extra hours, write 0

- Overtime/extra hours per week

A5. Are you normally paid or given time off later when you work overtime or extra hours?

- Tick one box only

- I never work overtime or extra hours
- I am normally paid
- I normally take time off later
- I am sometimes paid and sometimes take time off later
- None of these

A6. If you do work overtime or extra hours, what would you say is the one main reason you do so?

- Tick one box only

- I never work overtime or extra hours
- I enjoy my work
- I need the money
- I don't want to let down the people I work with
- So that I can get all my work done
- It's required as part of my job
- Some other reason

A7. Thinking about the type of work you personally do, is it done at this workplace?

- Tick one box only

- Only by men
- Mainly by men
- Equally by men and women
- Mainly by women
- Only by women

A8. Do you agree, or disagree, with the following statements about your job?

- Tick one box in each row

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Don't know

- My job requires that I work very hard
- I never seem to have enough time to get my job done
- I feel my job is secure in this workplace
- I worry a lot about my work outside working hours
A9 In general, how much influence do you have about the following?

<table>
<thead>
<tr>
<th></th>
<th>A lot</th>
<th>Some</th>
<th>A little</th>
<th>None</th>
<th>Don't know</th>
</tr>
</thead>
<tbody>
<tr>
<td>The range of tasks you do in your job</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>The pace at which you work</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>How you do your work</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

Tick one box in each row.

A10 How satisfied are you with the following aspects of your job?

<table>
<thead>
<tr>
<th></th>
<th>Very satisfied</th>
<th>Satisfied</th>
<th>Neither satisfied nor dissatisfied</th>
<th>Dissatisfied</th>
<th>Very dissatisfied</th>
<th>Don't know</th>
</tr>
</thead>
<tbody>
<tr>
<td>The amount of influence you have over your job</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>The amount of pay you receive</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>The sense of achievement you get from your work</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>The respect you get from supervisors/line managers</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

Tick one box in each row.

B1 During the last 12 months, have you discussed any of these with your supervisor/line manager?

<table>
<thead>
<tr>
<th></th>
<th>How you are getting on with your job</th>
<th>Your chances of promotion</th>
<th>Your training needs</th>
<th>Your pay</th>
<th>None of these</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

Tick all that apply.

B2 During the last 12 months, how much training have you had, either paid for or organised by your employer?

Include only training away from your normal place of work, but it could be on or off the premises.

<table>
<thead>
<tr>
<th></th>
<th>None</th>
<th>Less than 1 day</th>
<th>1 to less than 2 days</th>
<th>2 to less than 5 days</th>
<th>5 to less than 10 days</th>
<th>10 days or more</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

Tick one box only.

B3 If you personally needed any of these arrangements, would they be available at this workplace?

<table>
<thead>
<tr>
<th></th>
<th>Flexible working hours (flexitime)</th>
<th>Job sharing (sharing a full-time job with someone else)</th>
<th>Parental leave</th>
<th>Working at or from home in normal working hours</th>
<th>Workplace nursery or help with the cost of child care</th>
<th>None of these</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>
B4 If you needed to take a day off work at short notice, for example to look after a sick family member, how would you usually do it?

Tick one box only

- Use paid leave [ ] 1
- Take time off and make it up later [ ] 2
- Go on leave without pay [ ] 3
- Couldn’t take time off [ ] 4
- Some other way [ ] 5
- Doesn’t apply to me [ ] 6

B5 Do you agree, or disagree, with the following statements about working here?

Tick one box in each row

<table>
<thead>
<tr>
<th>Strongly agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
<th>Don’t know</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

- I share many of the values of my organisation
- Managers here are understanding about employees having to meet family responsibilities
- People working here are encouraged to develop their skills
- I feel loyal to my organisation
- I am proud to tell people who I work for

B6 How helpful do you find the following in keeping up-to-date about this workplace?

Tick one box in each row

<table>
<thead>
<tr>
<th>Very helpful</th>
<th>Helpful</th>
<th>Not very helpful</th>
<th>Not at all helpful</th>
<th>Not used here</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

- Notice boards
- E-mail
- Workplace newsletter or magazine
- Meetings of managers and employees

B7 How often are you and others working here asked by managers for your views on any of the following?

Tick one box in each row

<table>
<thead>
<tr>
<th>Frequently</th>
<th>Never</th>
<th>Sometimes</th>
<th>Hardly ever</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

- Future plans for the workplace
- Staffing issues, including redundancy
- Changes to work practices
- Pay issues
- Health and safety at work

B8 How good would you say managers here are at the following?

Tick one box in each row

<table>
<thead>
<tr>
<th>Very good</th>
<th>Good</th>
<th>Poor</th>
<th>Very poor</th>
<th>Don’t know</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

- Keeping everyone up to date about proposed changes
- Providing everyone with the chance to comment on proposed changes
- Responding to suggestions from employees
- Dealing with work problems you or others may have
- Treating employees fairly

B9 In general, how would you describe relations between managers and employees here?

Tick one box only

<table>
<thead>
<tr>
<th>Very good</th>
<th>Good</th>
<th>Neither good nor poor</th>
<th>Poor</th>
<th>Very poor</th>
<th>Don’t know</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>
C  Representation at work

C1 Are you a member of a trade union or staff association?64

Tick one box only

Yes [ ] 1
No, but have been in the past [ ] 2
No, have never been a member [ ] 3

C2 Ideally, who do you think would best represent you in dealing with managers here about the following issues? 65-67

Tick one box in each row

<table>
<thead>
<tr>
<th>Some-</th>
<th>Trade</th>
<th>Another</th>
<th>Myself</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>body</td>
<td>union</td>
<td>employee</td>
<td>else</td>
<td></td>
</tr>
</tbody>
</table>

Getting increases in my pay [ ] [ ] [ ] [ ]
If I wanted to make a complaint about working here [ ] [ ] [ ] [ ]
If a manager wanted to discipline me [ ] [ ] [ ] [ ]

C3 How much contact do you have with trade union or other worker representatives about workplace matters?68

Tick one box only

I am frequently in contact with worker representatives [ ] 1
I am occasionally in contact with worker representatives [ ] 2
I am never in contact with worker representatives [ ] 3
I am a worker representative [ ] 4
I do not know any worker representatives [ ] 5

C4 How would you rate the attitude of managers here towards trade unions? 69

Tick one box only

Managers here...
...are in favour of trade unions [ ] 1
...are neutral about trade unions [ ] 2
...are not in favour of trade unions [ ] 3

C5 Is there a trade union or staff association at this workplace? 70

Yes [ ] 1
No [ ] 2 Please go to D1

C6 Do you agree or disagree, with the following statements about unions or staff associations at this workplace? 71-73

Tick one box in each row

<table>
<thead>
<tr>
<th>Neither agree</th>
<th>Strongly agree</th>
<th>Strongly disagree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Don't know</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Unions/staff associations here...
...take notice of members' problems and complaints [ ] [ ] [ ] [ ] [ ] [ ]
...are taken seriously by management [ ] [ ] [ ] [ ] [ ] [ ]
...make a difference to what it is like to work here [ ] [ ] [ ] [ ] [ ] [ ]
D  Finally, about yourself

D1  Are you male or female?

- Male  □  1
- Female □  2

D2  How old are you?

- Less than 20 years □  1
- 20-24 □  2
- 25-29 □  3
- 30-39 □  4
- 40-49 □  5
- 50-59 □  6
- 60 or more □  7

D3  Do you have any dependent children in the following age groups?

Tick all that apply

- Children aged 0-4 □  1
- Children aged 5-11 □  2
- Children aged 12-18 □  3
- No dependent children □  4

D4  Which of the following describes your current status?

Tick one box only

- Single □  1
- Widowed □  2
- Divorced/Separated □  3
- Living with spouse or partner □  4

D5  What is the highest educational qualification you hold?

Tick one box only

- CSE or equivalent/ GCSE (grades D-G) □  1
- O level or equivalent/ GCSE (grades A-C) □  2
- A level or equivalent □  3
- Degree or equivalent □  4
- Postgraduate degree or equivalent □  5
- None of these □  6

D6  Do you hold any recognised vocational qualifications, such as a trade apprenticeship, NVQs, or a City and Guilds Certificate?

- Yes □  1
- No □  2

D7  Do you have any long-standing health problems or disabilities which limit what you can do at work, at home or in your leisure time?

- Yes □  1
- No □  2

D8  To which of these groups do you consider you belong?

Tick one box only

- White □  1
- Black Caribbean □  2
- Black African □  3
- Black other □  4
- Indian □  5
- Pakistani □  6
- Bangladeshi □  7
- Chinese □  8
- Another ethnic group □  9
D9 Which of the following occupation groups best describes your job at present?

Tick one box only

Managers & senior administrators
- eg general manager, marketing/sales manager, director of nursing, works manager, bank manager

Professional
- eg teacher, lecturer, lawyer, librarian, engineer, architect, doctor, accountant, social worker

Associate professional & technical
- eg technician, nurse, musician, building inspector, computer programmer, insurance underwriter

Clerical & secretarial
- eg typist, postal clerk, secretary, civil service and local government clerical officer, computer operator, bank clerk

Craft & skilled service
- eg tool maker, electrician, fitter, motor mechanic, sewing machinist, printer, carpenter, baker

Personal & protective service
- eg police officer, bar staff, hairdresser, undertaker, fire fighter, child carer, waiter

Sales
- eg till operator, sales assistant, sales representative, petrol pump attendant

Operative and assembly
- eg assembly line worker, packer, truck driver, taxi or bus driver

Other occupations
- eg cleaner, postal worker, shelf filler, kitchen hand, porter, builders labourer

D10 What are the main work tasks you do in your job? Please describe as fully as possible.

D11 How much do you get paid for your job here, before tax and other deductions are taken out?

If your pay changes before tax from week to week because of overtime, or because you work different hours each week, think about what you earn on average.

- Less than £50 per week
- £51 - £80 per week
- £81 - £140 per week
- £141 - £180 per week
- £181 - £220 per week
- £221 - £300 per week
- £301 - £360 per week
- £361 - £430 per week
- £431 - £540 per week
- £541 - £680 per week
- £681 or more per week

D12 Do you have any final comments you would like to make about your workplace, or about this questionnaire?
Thank you for your help

Please now seal the questionnaire in the freepost envelope provided and,

either leave it at the workplace collection point,

or if you prefer, post it directly yourself.

It would be helpful if you could return the completed questionnaire within the next two weeks.
The 1997 Workplace Employee Relations Survey

Employee questionnaire

This is a national survey of people at work. We are interested in your views about your job and your workplace.

Your name was selected randomly from a list of people who work here. Some other people here have also been picked at random. We've chosen people in this way so that we cover the full range of employees - from management to the most junior. There is no special reason why you were picked to fill in the survey or why others you work with were not picked. However, now that your name has come up, we would like you to fill in the questionnaire. Please do not pass it to someone else.

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Many thanks for your help.
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<table>
<thead>
<tr>
<th>Years</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 1 year</td>
<td>1</td>
</tr>
<tr>
<td>1 to less than 2 years</td>
<td>2</td>
</tr>
<tr>
<td>2 to less than 5 years</td>
<td>3</td>
</tr>
<tr>
<td>5 to less than 10 years</td>
<td>4</td>
</tr>
<tr>
<td>10 years or more</td>
<td>5</td>
</tr>
</tbody>
</table>

A2  Is your job permanent, or is it temporary or for a fixed-term?

<table>
<thead>
<tr>
<th></th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Permanent</td>
<td>1</td>
</tr>
<tr>
<td>Temporary</td>
<td>2</td>
</tr>
<tr>
<td>Fixed-term</td>
<td>3</td>
</tr>
</tbody>
</table>

A3  How many hours do you usually work each week, including any overtime or extra hours?

<table>
<thead>
<tr>
<th>Hours per week</th>
<th>Number</th>
</tr>
</thead>
</table>

A4  How many overtime or extra hours do you usually work each week, whether paid or unpaid?

<table>
<thead>
<tr>
<th>Overtime/extra hours per week</th>
<th>Number</th>
</tr>
</thead>
</table>

If you do not usually work overtime or extra hours, write 0.

A5  Are you normally paid or given time off later when you work overtime or extra hours?

<table>
<thead>
<tr>
<th></th>
<th>Number</th>
</tr>
</thead>
</table>

Tick one box only

A6  If you do work overtime or extra hours, what would you say is the one main reason you do so?

Tick one box only

<table>
<thead>
<tr>
<th>Reason</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>I never work overtime or extra hours</td>
<td>1</td>
</tr>
<tr>
<td>I enjoy my work</td>
<td>2</td>
</tr>
<tr>
<td>I need the money</td>
<td>3</td>
</tr>
<tr>
<td>I don't want to let down the people I work with</td>
<td>4</td>
</tr>
<tr>
<td>So that I can get all my work done</td>
<td>5</td>
</tr>
<tr>
<td>It's required as part of my job</td>
<td>6</td>
</tr>
<tr>
<td>Some other reason</td>
<td>7</td>
</tr>
</tbody>
</table>

A7  Thinking about the type of work you personally do, is it done at this workplace...

Tick one box only

<table>
<thead>
<tr>
<th>Type of work done</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Only by men</td>
<td>1</td>
</tr>
<tr>
<td>Mainly by men</td>
<td>2</td>
</tr>
<tr>
<td>Equally by men and women</td>
<td>3</td>
</tr>
<tr>
<td>Mainly by women</td>
<td>4</td>
</tr>
<tr>
<td>Only by women</td>
<td>5</td>
</tr>
</tbody>
</table>

A8  Do you agree, or disagree, with the following statements about your job?

Tick one box in each row

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Neither agree nor disagree</th>
<th>Strongly disagree</th>
<th>Don't know</th>
</tr>
</thead>
<tbody>
<tr>
<td>My job requires that I work very hard</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>I never seem to have enough time to get my job done</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>I feel my job is secure in this workplace</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>I worry a lot about my work outside working hours</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
### A9  In general, how much influence do you have about the following?  

Tick one box in each row

<table>
<thead>
<tr>
<th>Influence</th>
<th>A lot</th>
<th>Some</th>
<th>A little</th>
<th>None</th>
<th>Don't know</th>
</tr>
</thead>
<tbody>
<tr>
<td>The range of tasks you do in your job</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>The pace at which you work</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>How you do your work</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
</tbody>
</table>

### B1  During the last 12 months, have you discussed any of these with your supervisor/line manager?  

Tick all that apply

- How you are getting on with your job  
- Your chances of promotion  
- Your training needs  
- Your pay  
- None of these

### A10  How satisfied are you with the following aspects of your job?  

Tick one box in each row

<table>
<thead>
<tr>
<th>Satisfaction</th>
<th>Very satisfied</th>
<th>Satisfied nor dissatisfied</th>
<th>Dissatisfied</th>
<th>Very dissatisfied</th>
<th>Don't know</th>
</tr>
</thead>
<tbody>
<tr>
<td>The amount of influence you have over your job</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>The amount of pay you receive</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>The sense of achievement you get from your work</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>The respect you get from supervisors/line managers</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
</tbody>
</table>

### B2  During the last 12 months, how much training have you had, either paid for or organised by your employer?  

Include only training away from your normal place of work, but it could be on or off the premises.

Tick one box only

- None  
- Less than 1 day  
- 1 to less than 2 days  
- 2 to less than 5 days  
- 5 to less than 10 days  
- 10 days or more

### B3  If you personally needed any of these arrangements, would they be available at this workplace?  

Tick all that apply

- Flexible working hours (flexi-time)  
- Job sharing (sharing a full-time job with someone else)  
- Parental leave  
- Working at or from home in normal working hours  
- Workplace nursery or help with the cost of child care  
- None of these
B4 If you needed to take a day off work at short notice, for example to look after a sick family member, how would you usually do it?

Tick one box only

- Use paid leave [1]
- Take time off and make it up later [2]
- Go on leave without pay [3]
- Couldn’t take time off [4]
- Some other way [5]
- Doesn’t apply to me [6]

B5 Do you agree, or disagree, with the following statements about working here?

Tick one box in each row

<table>
<thead>
<tr>
<th>Strongly agree</th>
<th>Agree</th>
<th>Neither agree nor disagree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
<th>Don’t know</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

- I share many of the values of my organisation
- Managers here are understanding about employees having to meet family responsibilities
- People working here are encouraged to develop their skills
- I feel loyal to my organisation
- I am proud to tell people who I work for

B6 How helpful do you find the following in keeping up-to-date about this workplace?

Tick one box in each row

<table>
<thead>
<tr>
<th>Very helpful</th>
<th>Not very helpful</th>
<th>Not at all helpful</th>
<th>Not used here</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

- Notice boards
- E-mail
- Workplace newsletter or magazine
- Meetings of managers and employees

B7 How often are you and others working here asked by managers for your views on any of the following?

Tick one box in each row

<table>
<thead>
<tr>
<th>Frequent</th>
<th>Never</th>
<th>Sometimes</th>
<th>Hardly ever</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

- Future plans for the workplace
- Staffing issues, including redundancy
- Changes to work practices
- Pay issues
- Health and safety at work

B8 How good would you say managers here are at the following?

Tick one box in each row

<table>
<thead>
<tr>
<th>Very good</th>
<th>Good</th>
<th>Not good nor poor</th>
<th>Poor</th>
<th>Very poor</th>
<th>Don’t know</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

- Keeping everyone up to date about proposed changes
- Providing everyone with the chance to comment on proposed changes
- Responding to suggestions from employees
- Dealing with work problems you or others may have
- Treating employees fairly

B9 In general, how would you describe relations between managers and employees here?

Tick one box only

<table>
<thead>
<tr>
<th>Very good</th>
<th>Good</th>
<th>Neither good nor poor</th>
<th>Poor</th>
<th>Very poor</th>
<th>Don’t know</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>
C Representation at work

C1 Are you a member of a trade union or staff association?  
Tick one box only

<table>
<thead>
<tr>
<th>Yes</th>
<th>No, but have been in the past</th>
<th>No, have never been a member</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

C2 Ideally, who do you think would best represent you in dealing with managers here about the following issues?  
Tick one box in each row

<table>
<thead>
<tr>
<th>Some-</th>
<th>Trade</th>
<th>Another</th>
<th>Myself</th>
</tr>
</thead>
<tbody>
<tr>
<td>body</td>
<td>union</td>
<td>employee</td>
<td></td>
</tr>
<tr>
<td>else</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

Getting increases in my pay

If I wanted to make a complaint about working here

If a manager wanted to discipline me

C3 How much contact do you have with trade union or other worker representatives about workplace matters?  
Tick one box only

<table>
<thead>
<tr>
<th>I am frequently in contact with worker representatives</th>
<th>I am occasionally in contact with worker representatives</th>
<th>I am never in contact with worker representatives</th>
<th>I am a worker representative</th>
<th>I do not know any worker representatives</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

C4 How would you rate the attitude of managers here towards trade unions?  
Tick one box only

Managers here...

<table>
<thead>
<tr>
<th>...are in favour of trade unions</th>
<th>...are neutral about trade unions</th>
<th>...are not in favour of trade unions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

C5 Is there a trade union or staff association at this workplace?  
Tick one box only

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

C6 Do you agree, or disagree, with the following statements about unions or staff associations at this workplace?  
Tick one box in each row

<table>
<thead>
<tr>
<th>Unions/staff associations here...</th>
<th>Neither agree nor disagree</th>
<th>Strongly agree</th>
<th>Strongly disagree</th>
<th>Don't know</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

...take notice of members' problems and complaints

...are taken seriously by management

...make a difference to what it is like to work here
D Finally, about yourself

D1 Are you male or female?

Male □ 1  
Female □ 2

D2 How old are you?

Less than 20 years □ 1  
20-24 □ 2  
25-29 □ 3  
30-39 □ 4  
40-49 □ 5  
50-59 □ 6  
60 or more □ 7

D3 Do you have any dependent children in the following age groups?

Tick all that apply

Children aged 0-4 □ 1  
Children aged 5-11 □ 2  
Children aged 12-18 □ 3  
No dependent children □ 4

D4 Which of the following describes your current status?

Tick one box only

Single □ 1  
Widowed □ 2  
Divorced/Separated □ 3  
Living with spouse or partner □ 4

D5 What is the highest educational qualification you hold?

Tick one box only

CSE or equivalent/GCSE (grades D-G) □ 1  
O level or equivalent/GCSE (grades A-C) □ 2  
A level or equivalent □ 3  
Degree or equivalent □ 4  
Postgraduate degree or equivalent □ 5  
None of these □ 6

D6 Do you hold any recognised vocational qualifications, such as a trade apprenticeship, NVQs, or a City and Guilds Certificate?

Yes □ 1  
No □ 2

D7 Do you have any long-standing health problems or disabilities which limit what you can do at work, at home or in your leisure time?

Yes □ 1  
No □ 2

D8 To which of these groups do you consider you belong?

Tick one box only

White □ 1  
Black Caribbean □ 2  
Black African □ 3  
Black other □ 4  
Indian □ 5  
Pakistani □ 6  
Bangladeshi □ 7  
Chinese □ 8  
Another ethnic group □ 9
D9 Which of the following occupation groups best describes your job at present?

Tick one box only

Managers & senior administrators  
- eg general manager, marketing/sales manager, director of nursing, works manager, bank manager  

Professional  
- eg teacher, lecturer, lawyer, librarian, engineer, architect, doctor, accountant, social worker  

Associate professional & technical  
- eg technician, nurse, musician, building inspector, computer programmer, insurance underwriter  

Clerical & secretarial  
- eg typist, postal clerk, secretary, civil service and local government clerical officer, computer operator, bank clerk  

Craft & skilled service  
- eg tool maker, electrician, fitter, motor mechanic, sewing machinist, printer, carpenter, baker  

Personal & protective service  
- eg police officer, bar staff, hairdresser, undertaker, fire fighter, child carer, waiter  

Sales  
- eg till operator, sales assistant, sales representative, petrol pump attendant  

Operative and assembly  
- eg assembly line worker, packer, truck driver, taxi or bus driver  

Other occupations  
- eg cleaner, postal worker, shelf filler, kitchenhand, porter, builders labourer  

D10 What are the main work tasks you do in your job? Please describe as fully as possible.

D11 How much do you get paid for your job here, before tax and other deductions are taken out?

If your pay changes before tax from week to week because of overtime, or because you work different hours each week, think about what you earn on average.

- Less than £50 per week  
- £51 - £80 per week 
- £81 - £120 per week 
- £121 - £160 per week 
- £161 - £200 per week 
- £201 - £240 per week 
- £241 - £280 per week 
- £281 - £320 per week 
- £321 - £360 per week 
- £361 - £400 per week 
- £401 - £440 per week 
- £441 - £480 per week 
- £481 - £520 per week 

D12 Do you have any final comments you would like to make about your workplace, or about this questionnaire?
Thank you for your help

Please now seal the questionnaire in the freepost envelope provided and,

either leave it at the workplace collection point,

or if you prefer, post it directly yourself.

It would be helpful if you could return the completed questionnaire within the next two weeks.