A Cross-section Analysis of the Fairness-of-pay Perception of UK Employees

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Abstract

This paper aims to contribute to the understanding of individuals' fairness perceptions by using cross-section data from the British Social Attitudes Survey to estimate what seem to be the first fairness perceptions-of-pay equations in the literature. The results suggest that, consistent with the existence of discrimination in the labour market, non-white workers perceive their pay as disadvantageously unfair. In contrast, a rather interesting finding is that women's fairness-of-pay perceptions are higher than that of men. The findings suggest that tackling pay alone will not eliminate feelings of underpayment. There is also evidence that with age, workers feel less fairly paid.

Key words: Fairness perception; pay.
JEL Classification: C21; C23; C25; J28; J71; Z13

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1. Introduction

Fairness has mainly been used in economics in an objective sense to describe an outcome. As a subjective evaluation, its role in generating outcomes has only recently been acknowledged though its value in informing individual behaviour has long been advanced in the other social sciences. Certainly, as a social being, an individual's behaviour may be affected by societal factors of which fairness perceptions are a part[1].

The implication that fairness considerations are an ever-present feature of economic exchanges, operating alongside the maximisation of pecuniary gains, is substantiated by results from social psychology experiments, ultimatum games, and reciprocity experiments (see Andrews (1967), Rabin (1993), Fehr *et al* (1997) and Clark and Sefton (2001) *inter alia*). The main tenet of these results is aptly summarised by Adams (1965) who states 'men do not simply become dissatisfied with conditions they perceive to be unjust. They usually do something about them'[2].

With compelling evidence that fairness is a valued good, it is possible to make sense of the many market 'anomalies' that are not adequately accounted for by the standard model[3] such as the rejection of positive offers in ultimatum games, voluntary contribution to public goods and involuntary unemployment (see for example Isaacs *et al* (1985), Dawes and Thaler (1988), Akerlof and Yellen (1990), and Fehr *et al* (1993), Fehr and Gächter (2000)). So, given the possible prevalence of fairness considerations and insofar as agents act on their perceptions, fairness as a behavioural motive may not be an epiphenomenon as traditional economists contend.

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[1] Some neurological studies (see for example LeDoux (1996)) argue that emotions are sometimes a better guide to action than are rational thought processes.

[2] Adams, J.S (1965), 'Inequity in Social Exchange' in Advances in Experimental Social Psychology, L. Berkowitz (ed.), Vol. 2, New York: Academic Press. Pg. 276

[3] The standard model here refers to the model in which the modus operandi of the individual is that of selfish maximisation of pecuniary gains.

Of the studies that have examined the effects of fairness considerations on individual behaviour, none have investigated the *determinants* of the fairness perceptions of non-hypothetical individuals[4]. For that reason, it is not possible to understand or to tell why individuals hold the perceptions they do. Hence, the evidence in the British Social Attitudes (BSA) survey which show that 36.89 percent of the sampled employees perceive their pay as unfairly low and 7.71 percent perceive their pay as unfairly high, an outcome that violates the fundamental welfare theorems and deviates from standard theoretical predictions[5], cannot be accounted for by the existing literature. Consequently, if economists are to properly predict or explain economic behaviour there is a need to understand what influences fairness perceptions. In this respect, this paper attempts to make a contribution to the study of the role of fairness in economics.

The focus of this paper is workers fairness perceptions of their pay. The objective is that by explaining the determinants of perceptions of fairness vis-à-vis pay, the way will be paved towards a better understanding of the effects of fairness perceptions on individuals' labour market behaviour. Important in the contribution of this work is the use of attitudinal data, which is sourced from the British Social Attitudes Survey (BSA). This data set facilitates the first ever known estimation of fairness perception equations. The perceptions of women and ethnic minorities are considered against the backdrop of discrimination in the labour market. Similarly, the relationship between fairness perceptions and age and fairness perception and comparison wage are looked at in relation to the negative correlation suggested in both cases by theory and evidence.

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[4] Alves and Rossi (1978) and Shepelak and Alwin (1986) both studied how the characteristics of computer generated households entered in respondents' judgement of how fair they perceive the income of these households to be.

[5] Assuming as is done in the social psychology literature that individuals prefer a fair outcome to an unfair one, it is possible to make both an individual who feels his pay is too low and one who thinks his pay is too high, better off. By redistributing some of the rewards of the individual who perceive his pay as too high to the other who thinks it to be too low a Pareto improvement can be achieved.

At this juncture, it is necessary to stress that fairness perceptions of pay are likely to be different from the expression of satisfaction of pay, for it is possible that an individual is (completely) satisfied with his pay but yet think it to be unfair (as could be the case of someone who thinks his pay is more than he deserves). Also, by no stretch of the imagination, an individual can be unsatisfied with his pay but yet claim that it is a fair reward for the work rendered (as could be the case with someone who believes his pay reflects the work done but who nonetheless wishes to do better in terms of income).

The rest of the paper is structured as follows. Section 2 presents the concept of fairness perception employed and reviews what the literature has to say about the role of fairness considerations in economic outcomes. The hypotheses to be tested are developed in section 3 and the empirical analysis is taken up in section 4. Section 5 concludes.

2. Pointers from Economic Theory

2.1 Understanding Fairness perceptions

According to the theory of fairness postulated by social psychologists, most notably Homans (1961) and Adams (1965), the individual compares his reward-to-investment ratio to that of some relevant other. If the individual perceives his reward-to-investment ratio to be smaller than that of the comparison other, he will feel relatively deprived. If he believes it to be otherwise, he will feel relatively advantaged[6]. Individuals however, can reduce or eliminate the cognitive dissonance by altering their investments[7] or their perceptions of their investments (for evidence and discussions see Adams and Rosenbaum (1962), Adams (1962), Adams (1965), Andrews (1967), Pritchard *et al* (1972), Austin and Walster (1974)).

[6] Adams (1963) states 'if two individuals receive the same pay, but are unequally qualified, then both parties may suffer cognitive dissonance, even the man who is relatively overpaid'. However, how the individual feels about the dissonance is not per se germane to the definition of fairness. What matters is simply the presence of (unjustified) inequality.

[7] The altering of inputs indicates that fairness is characterised by acts of reciprocation.

However, a longstanding and unresolved issue is that of the identity of the comparison other. In some cases the 'other' can be easily identified as in exchanges involving two actors. Empirical evidence may also help pinpoint the relevant 'other'. For instance, Willman (1982) cites evidence that suggest manual workers compare themselves with other manual workers when evaluating the fairness of their pay-effort bargain. On the other hand, Graham and Pettinato (2002) present evidence that individuals may compare themselves to others who are in a higher social or income bracket. In other cases, it is quite unclear with whom comparison takes place. For example, in determining the fairness of pay, does the individual compare himself with his peers or those in a different position? Is comparison restricted to those within the firm or does it extend to others working in a different firm, different industry, *et cetera*? Does the worker evaluate the fairness of his pay in light of the profitability of the firm or is it instead a combination of many of these possible 'others'?[8]

Furthermore, where the fairness judgement is that of neutral agents as in the studies of Kahneman *et al* (1986a, 1986b) and Charness and Levine (forthcoming), in which respondents are asked to evaluate the fairness of certain policies of the firm, it is not apparent that any 'other' is involved. Yet, individuals do make fairness judgements. The following example from Kahneman *et al* (1986a) may help illustrate this.

> A hardware store has been selling snow shovels for $15. The morning after a large snowstorm, the store raises the price to $20. Please rate this action as:
>
> Completely fair Acceptable
>
> Unfair Very unfair

It was found that 82 percent of the respondents rated the actions of the firm as unfair. Nevertheless, it is not obvious whom or what respondents use as the reference other in

[8] See Merton (1967), Parducci (1995), and Ordóñez *et al* (2000) for an in-depth discussion on the nature of comparison groups.

forming this judgement. It may be argued that the respondents use a hypothetical comparison other but there is no self-evident reason that necessitates this. From the above example, it is quite plausible that the respondents simply believed that such an unfortunate incident does not justify a hike in price.

From the forgone, it can be summarised that an individual's fairness judgement is not likely to be based solely on a direct comparison of reward-to-investment ratios. His innate characteristics and his values and beliefs may also along with this ratio, play an important role. It is this testable conceptualisation of fairness perceptions that occupies this paper.

2.2 The importance of fairness concerns – Theory and Evidence

Probably the most illustrative examples of the role of fairness concerns in individual behaviour are that of ultimatum games. The basic bargaining game involves two players one who is entrusted the task of dividing a good between himself and the other player, say player 2. Player 2 must decide whether to accept the proposed division or to reject it, in which case both players receive nothing. According to standard competitive theory of income maximisation, player 1 will give player 2 the smallest possible division of the good and player 2 will accept since a positive amount is better than none at all. However, many observed outcomes refute this prediction.

Several experiments in Kahneman *et al* (1986b) revealed that in such bargaining games, a large number of individuals are willing to award generous amounts. In the experiments, this behaviour was observed even when there was complete anonymity and no possibility of retaliation. Results showed that the majority of the allocators divided $20 evenly and that receivers rejected positive amounts they perceived to be unfair even though the refusal meant a lost both to themselves and to the allocator. Similarly, receivers were prepared to reward fair behaviour with most willing to give up money to punish (reward) an unfair (fair) allocator and nearly all preferred to share a sum of money with those who had a reputation of

being fair as opposed to being unfair. This inclination of individuals to punish those reputed to be unfair and even so in cases where they are not themselves victims of the unfair outcome, is supported by results in Kahneman *et al* (1986a) and Thaler (1985). Other experimental evidence show that neither the complexity of the pay off system (see Güth *et al* (1982)) nor an increase in the stakes (see Hoffman *et al* (1996)) eliminated players desire to offer egalitarian divisions[9].

As one would imagine, it is not only individuals that are guided by fairness considerations. There is also evidence which suggests that in constructing wage policies, firms take into account workers' concern for fairness (see Blinder and Choi (1990), Campbell and Kamlani (1997) and Fehr *et al* (1998)). For instance, Campbell and Kamlani (1997) found that on average over 69 percent of employers think cutting wages would reduce effort primarily because workers would then perceive their wages as unfair. Interestingly, less than 5 percent thought effort would fall because of a reduction in the cost of shirking.

This seemingly prevalent belief of employers is further supported by the arguments in Akerlof and Yellen (1990) and later evidenced in Fehr *et al* (1993), that if workers do not receive what they perceive as a fair wage they will reduce their effort levels, and if they believe they are fairly treated, they will provide effort greater than or equal to the minimum.[10] This implies that fairness considerations can have consequences for the level of productivity in the economy.

This is somewhat echoed Rotemberg (1996) who claims that changes in individuals' perceptions of the fairness of their wage can be crucial for the distribution of income in a country. This is based on the argument that the equilibrium distribution of income is less unequal when employees believe they are unfairly paid than when they perceive otherwise

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9 Such results are used to counter the claims that simple experiments and small amounts such as $20 are inadequate in soliciting typical economic behaviour of individuals

10 The experimental studies of Adams and Rosenbaum (1962), Adams (1963), Andrews (1967), Pritchard *et al* (1972), and Austin and Walster (1974), found that given no other means of eliminating cognitive dissonance, when workers perceive their pay to be unfair, whether advantaged or disadvantaged, they respond by changing their effort levels. However, as discussed in Lawler (1968), there is contention over whether those benefiting from unfairness are motivated at all to reduce the cognitive dissonance.

insofar as they are likely to quit to realise the true value of their productivity elsewhere. In support of this conjecture, he cites evidence that the distribution of income is found to be more equal in countries where people perceive large income inequality to exist.

Therefore, based on the surveyed literature, it can be surmised that individuals treat fairness as a normal good for which they are willing to pay a 'price'. They act on fairness considerations and these actions at times diverge from that predicted by the standard model and could have wide-ranging economic consequences. Accordingly, concern for fairness should be part of the economists' toolbox when undertaking the task of explaining economic behaviour and so, it is then of paramount importance to know what influences fairness perceptions. The following hypotheses are drawn up to help illustrate how fairness-of-pay perceptions are shaped.

3. Hypotheses

Several hypotheses about the fairness-of-pay perception of workers can be inferred from labour market theories and evidence and a few are put forward to test whether perceptions are in line with what these theories and evidence suggests.

3.1 Race and Gender Discrimination

Discrimination, which is characteristically unfair, occurs when two workers who have observationally equal productivity-related characteristics are paid differently. It is a well-documented fact that ethnic minorities and women face persistent discrimination in the labour market (see for instance Chiswick (1973), Wright and Ermisch (1991), and Neumark (1998))[11]. Their earnings are normally lower than that of their white and male counterparts respectively. For example, using data from the Multi-City Study of Urban Inequality for employers in the

[11] Reasons for the persistence of wage differentials between men and women and black and whites have been extensively investigated by Goldberg (1982), Blau and Kahn (1992), Hellerstein *et al* (1997), Neumark (1998), *inter alia*.

USA, Neumark (1998) finds a 10 to 14 percent mean hourly wage differential between men and women and a 19 percent difference between whites and blacks. Between whites and Hispanics, the difference was found to be 4 to 8 percent.

Becker (1971) argues that this discrimination should be unsustainable in the long run. He proposes that if firms discriminate against a particular group of workers, then in a competitive market, non-discriminatory firms will attract all the labour of this unfavoured group. The prejudiced firms would consequently face higher costs and in a bid to maximise profits, would be forced to cease discriminatory practices.

Presumably, the realisation of Becker's prediction that discrimination will be eliminated in the long run relies partly on the victims' recognition that they are unfairly treated and their subsequent pursuit to eliminate the unfairness. If individuals do not perceive their situation to be unjust, they will do nothing to alter what others see as unfair. It is only by recognising and redressing the inequity that more equal pay can be achieved (Rotemberg (1996))[12]. Moreover, if ethnic minorities and women do not believe their pay to be unfair, welfare and efficiency loses may not be as great as thought. Given that discrimination against non-whites and women exists in the labour market (see Chiswick (1973), Goldberg (1982), Wright and Ermisch (1991), and Neumark (1998) *inter alia*) and supposing that they are aware of this discrimination, they will be more inclined to have a downward bias in the fairness evaluation of their pay. Based on this, the following hypotheses arise:

Hypothesis 1: *Comparing fairness perceptions, female workers will perceive their pay to be less fair than male workers. Moreover, the fairness-of-pay perceptions of non-white female (white female) workers are comparatively lower than that of non-white male (white male) workers.*

[12]Thus, the persistence of discrimination could be the result of individuals not perceiving their pay as unfair and hence failing to act against it.

Hypothesis 2: *Comparing fairness perceptions, non-white workers will perceive their pay to be more unfair than whites workers. Moreover, the fairness-of-pay perceptions of non-white male (non-white female) workers are comparatively lower than that of white male (white female) workers.*

3.2 Age

There is evidence that older workers face some discrimination in the labour market. However, this is not likely to be related to earnings (Johnson and Neumark (1996)). In fact, older workers appear to be better off where earnings are concerned even taking into account that wage growth is quadratic with age (Lazear (1979)). It is normal for employers to start employees on wages below the value of their marginal product and subsequently increase the wage with tenure as a means of enticing them to remain with the firm. Hence, it is usual that younger workers are paid less than their marginal product while older workers receive wages in excess of their marginal product and reservation wage. This is supported by the empirical findings of Hanoch and Honig (1985) and Neumark and Stock (1999). Aware of this, it is probable that relative to older workers, younger workers are more likely to undervalue their pay.

In addition, according to the arguments of the social psychologists Austin and Walster (1974), age inures individuals to unfairness. They declare that '… we should not be surprised that older people become less aroused and less angry when they encounter inequitable treatment than do younger people who are psychologically unprepared for unjust experiences'. From this, it is further deduced that older ethnic minority workers should have higher fairness-of-pay perceptions than their younger counterparts. Taking the above into consideration leads to:

Hypothesis 3 *Comparing fairness perceptions, younger workers will have a greater tendency than older workers to view themselves as unfairly paid. Moreover, younger workers from ethnic minorities are more likely to perceive their pay as unfair when their perceptions are compared to that of their older counterparts.*

3.4 Wage Comparison

Ceteris Paribus, fairness perceptions of pay are more favourable as wage rises but decreases as the comparison wage increases[13]. Thus, the coefficients on the own wage variable and the comparison wage variable should be equal with opposite signs. This leads to:

Hypothesis 4a *Fairness perceptions are negatively related to the comparison wage.*

Hypothesis 4b: *If relative wage matters for fairness-of-pay perceptions, the coefficients on the wage and comparison wage variables are of equal magnitude but opposite signs.*

4. Empirical Analysis

Many economists are wary of subjective data. To them, subjective responses are not always representative of actual actions or outcomes. They argue that what an agent thinks does not necessarily translate into reality and what he proposes to do is not what he necessarily does. Undoubtedly, there is merit to this way of thinking[14] but these economists would be hard-pressed in convincing other social scientists who draw largely on such data to study human motivation and behaviour, that subjective data are void of information or are not reliable sources for understanding economic and social outcomes.

Given the bias against using subjective data in economics, it is of no surprise that its use in empirical economic analysis is still quite novel. This and the lack of much availability of

[13] See section 2.

[14] The statistical analysis by Bertrand and Mullainathan (2001) seeks to provide concrete reasons why economists are justified in their mistrust of subjective data.

subjective data sets probably accounts for the relatively few research papers on the economics of individual perceptions. Of those that have looked at issues of fairness perceptions, most have relied on experimental data[15]. It is however important to complement the conclusions from experimental data with that from non-experimental data.

Experimental data are normally small-scaled and are often fraught with the problems of effectively simulating a 'real world' environment and capturing or controlling for the many influences on agents' decision-making[16]. Moreover, being able to manipulate the thoughts of individuals to assume the intended role is extremely difficult and success can never be truly ascertained. Non-experimental data on the other hand avoid these problems associated with experimental data and are far more likely to successfully capture the behavioural characteristics of 'real' economic actors. In addition, they contain a wealth of information on various characteristics of the respondents something that does not commonly feature in data from experimental studies[17]. As such, non-experimental data are desirable for the study of fairness perceptions.

Notwithstanding, among those studies that have used non-experimental data, the importance of the role of the characteristics of an individual in shaping his fairness perceptions has not been adequately investigated. Addressing this deficiency, the aim of this analysis is to study the role of the demographic characteristics of employees and of the comparison wage in their fairness perceptions of pay and to discover how, if at all, these differ from what would ordinarily be expected given established theory and evidence. To this end, use will be made of the British Social Attitudes (BSA) survey data set, which because of the nature of the fairness question therein, is itself, a salient feature of this study.

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[15] Experimental data here includes data obtained from responses to hypothetical questions.

[16] As Manski (2000) notes, interactions observed in artificially constructed environments might, in general, lack credibility.

4.1 The Data and Sample

4.1.1 Variable description

The BSA Survey is carried out each year and is dedicated to the measure of attitudinal variables. The survey covers most major topics of modern empirical interest including the economy and labour market participation and a majority of the questions are repeated each year thus making it possible to pool the data. Unfortunately, given the lack of continuity across years for some of the variables of interest[18], the number of years pooled together is rather small. These are the years 1996 to 2000. Added to this, the survey conducted in 1997 is a scaled-down version as a result of the simultaneously conducted British Election Study and consequently, the number of observations is considerably smaller than that of the other three years. Nonetheless, the pooled sample should provide a reasonable number of observations to carry out a meaningful analysis[19].

Data is used only for those individuals aged 18 to 65, living in Scotland, England or Wales and who are employees at the time of the interview. Non-responses were dropped and so too were 'don't know' responses. The final pooled sample contains 5486 employees of which 23.44 percent are in 1996, 8.35 percent in 1997, 22.62 percent in 1998, 21.16 percent in 1999, and 24.43 percent in 2000.

The principal advantage of the BSA data set for this investigation is that it contains a specific question that captures employee fairness perception of pay. This sort of question, which addresses a real rather than a hypothetical experience of an employee[20], is not known to

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[17] Nonetheless, experimental data does have advantages over non-experimental data. Most notably, it allows the experimenter to limit the many idiosyncrasies that cannot be easily controlled for in non-experimental data. Notwithstanding, experimental and non-experimental data should generally be regarded as congruent.
[18] The problem is most acute for industry and sector classification.
[19] More information about the survey can be found at the UK Data Archive web site.
[20] This is unlike Alves and Rossi (1978) and Shepelak and Alwin (1986) who looked at the fairness perceptions of the income of hypothetical households.

be available in any other major data set for the United Kingdom. The survey question reads as follows:

> *How would you describe the wages or salary you are paid for the job you do – on the low side, reasonable, or on the high side? If low: very low or a bit low?*

Though the question does not explicitly use the term fair(ness)[21], it is taken for granted here that individuals are not likely to regard their wage as both unfair and reasonable or on the low/high side but fair. Hence, the responses are assumed respectively to be identical to very unfairly low, a bit unfairly low, fair, and unfairly high, which are correspondingly equal to less than fair, fair, and more than fair. It is this question that describes the dependent variable, fairness-of-pay perception[22]. Its distribution is as follows:

1. very unfairly low	11.41%
2. a bit unfairly low	25.48%
3. fair	55.40%
4. unfairly high	7.71%

In arriving at an answer to the above question, (it is ordinarily thought that) employees compare their pay to that of a chosen comparison other. There are no variables in the BSA data that describe the wage of possible comparison others and hence a measure must be constructed. Indeed, the problem of identifying and quantifying reference group behaviour is a perennial one that retards empirical investigation of the social and psychological aspects of

[21] Indeed, according to the Oxford English Reference Dictionary (1996), one of the synonyms for the word reasonable is the word fair and certainly, it is unlikely if not impossible to come up with a convincing example to show that an individual can claim his pay to be unfair but yet reasonable or that it is fair but nevertheless unreasonable.

[22] It is believed that this question inspires individuals to evaluate whether or not they are correctly remunerated given the perceived value of their investments. Hence, responses are assumed to adequately reflect workers fairness perceptions of their pay.

economic behaviour and regrettably, theory does not provide any definitive guide to who the comparison other is. Consequently, reference groups are usually arbitrarily chosen. However, it is commonly argued that individuals compare themselves with others who, to varying degrees, possess like characteristics (see for instance, McBride (2001) and Clark (2001)). In line with this, some studies, like that of Clark and Oswald (1996), use the fitted values from a Mincer-type wage equation to proxy the comparison wage[23]. Another approach employed by Clark and Oswald (1996) and McBride (2001), is the calculation and assignment of the average wage by particular characteristics. In the case of Clark and Oswald (1996), each individual is assigned an average wage based on their gender and weekly hours. McBride (2001) assigned each individual an average wage by age. This latter approach is adopted here.

The choice of characteristics on which the comparison wage is calculated is influenced by the evidence in Willman (1982), which suggests that workers compare themselves with those in a similar occupation and by the work of McBride (2001) who finds evidence that individuals compare themselves with others within their age group. It is therefore assumed that workers compare themselves to others with the same occupation and age characteristics and hence, the comparison wage is calculated as the log average hourly wage by occupation and age for each of the years[24]. This creates 175 comparison-wage data points. To increase the precision of the estimates, the comparison wage is constructed using the much larger Labour Force Survey (LFS) data set for the years 1996-2000[25].

Descriptive statistics of all the variables used in the analysis can be found in Table 1.1. The demographic composition of the sample is reasonably representative of the population

[23] Akerlof *et al* (1988) employs the same method to derive an alternative wage measure to study the quit decision of employees.

[24] This is equivalent to a mean regression of log hourly wage on occupation, age and year. Indeed, jobs are normally posted stating occupation and in most cases age requirements. Thus, it is plausible that individuals form comparisons of their pay based on this widely available information.

[25] The years 1996-2000 were used so as to match with the years of the BSA sampled period. Moreover, it is not novel to construct such a measure form a data set separate from the principal one. For different reasons, both the studies by Clark and Oswald (1996) and McBride (2001), construct the comparison wage from data independent from the central data set.

of the United Kingdom. Over 50 percent of the sampled employees are females, only 5 percent are non-whites, and the average age is 39 years.

4.1.2 Cross Tabulations – A cursory glance at the data

Simple cross tabulations indicate that the proportion of employees holding any fairness-of-pay perception is fairly consistent across years especially 1996 to 1998 (Table 1.3a). This stability is notable since it exists for different cross-sections of workers and it suggests that the sample data is representative of the perceptions of the population and that fairness-of-pay perceptions may be a marked feature in employees' work decisions. Moreover, despite the small number sampled in 1997, the figures show no striking differences in that year. In each of the five years, the median employee perceives his wage to be fair[26] but more than 35 percent believe they are underpaid. Interestingly, and a puzzle for the standard theory, approximately 8 out of 100 employees believe their pay to be more than fair.

Looking across gender and ethnicity, it can be seen from Table 1.3b that female workers have a greater likelihood of perceiving their pay as unfairly low when compared to their male counterparts and as expected, a greater proportion of non-whites believe that their pay is unfairly low. This on a first impression is in accordance with the fact that women and ethnic minorities face discrimination in the labour market but more importantly, their perceptions suggests that they may be conscious of the discrimination and this in turn affects the way they perceive their pay.

In Table 1.2c it is noted that workers between the ages of 40 and 49 enjoy on average the highest levels of earnings whilst those aged 18-29 earn on average the least. However, as is clear from Table 1.3c it is workers between the ages of 30 and 39 that are the least likely to perceive their wage as unfairly low. Those aged 40-49 report feeling more unfairly paid than even those aged 18-29. Further, although workers 50-59 years of age earn more than

60-65 years olds there is no discernable difference between their fairness-of-pay perceptions. Thus, overall, there is slight suggestion that fairness perceptions of pay decline with age.

The tabulations across age also imply that workers perceptions are affected by much more than the absolute level of their pay. Indeed, as seen from a comparison of the data in Table 1.2a-c and 1.2a-c, the large differentials that exist in earnings are not replicated in fairness-of-pay perceptions.

Thus far, a preliminary look at the raw data sans controls show that there is some support for hypotheses 1 and 2 but not for hypothesis 3. Both female workers and non-white workers appear to have lower fairness-of-pay perceptions relative to male workers and white workers respectively. However, with age workers tend to have lower fairness-of-pay perceptions. The next section uses econometric methods to analyse the data more formally.

4.2 The Empirical Model and Estimation Strategy

Fairness-of-pay perceptions are examined in a cross-section fairness regression equation for each randomly sampled employee i at time t. The equation takes the form:

$$FAIRNESS\ PERCEPTION_{it} = \alpha_t + \alpha_1 GENDER_{it} + \alpha_2 RACE_i + \alpha_3 AGE_{it} + \alpha_4 WAGE_{it} + \alpha_5 COMPARISON\ WAGE_{it} + \alpha_6 \mathbf{Z}_{it} + e_{it} \quad (1)$$

The variables GENDER, RACE, AGE, WAGE, and COMPARISON WAGE are self-descriptive. The vector $\mathbf{Z}_{it}$ contains auxiliary control variables, which include other personal and job characteristics of the employee. These are used mainly as robustness checks on the contribution of the demographic, wage, and comparison wage variables to fairness perceptions of pay. The error term, e_{it} is assumed to have mean zero and variance s^2.

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[26] This accords with the argument that most people tend to accept the status quo as fair (Shepelak (1986) and Franciosi *et al* (1995))

The discrete ordering of the dependent variable means that it is most appropriate to use an ordered response model[27]. Following what is now a norm in the empirical literature, an ordered probit model (as developed by McKelvey and Zavoina (1975)) is employed to estimate variants of equation (1). The probability of a response being in the k^{th} response category of the fairness perception variable (f) is then given by:

$$\Pr\left[f_{itj} = k \right] = \Phi\left[m_k - \sum_{i=0}^{k} b_i \boldsymbol{X}_{itj} \right] - \Phi\left[m_{k-1} - \sum_{i=0}^{k} b_i \boldsymbol{X}_{itj} \right],$$

where the function Φ is the standard normal distribution. The restriction $0 < m_1 < m_2 < .....m_{k-1}$ is imposed to ensure that the probabilities are positive and e_{it} is assumed to be independently identically normally distributed with mean zero and $s^2 = 1$. Higher orders of f represent increasingly favourable fairness-of-pay perceptions from very unfairly underpaid to unfairly overpaid.

Parenthetically, it should be pointed out that what is of interest here is the worker's perception of the relative value of his investments and not whether he is happy or unhappy about any cognitive dissonance[28]. So, whether or not the worker believes an unfairly high pay is bad, is a separate matter from his perception that it is above what he should justifiably receive.

It is also worth noting that the ordered probit procedure does not assume that changes from one fairness perception value to another are equiproportionate. For instance, an increase in fairness-of-pay perception from very unfairly underpaid to a bit unfairly underpaid is not assumed equal to an increase in fairness-of-pay perception from a bit unfairly underpaid to fairly paid or from fairly paid to unfairly overpaid.

An unfortunate drawback in using cross-section data is that it is difficult to flesh out (the direction of) causal effects. Moreover, the nature of the dependent variable creates the

[27] A good survey of ordered response models can be found in Amemiya (1981).
[28] See footnote 5.

problem that because of individual differences and unobservable differences in the way in which the question may have been asked, different individuals may interpret the question differently. Thus, to minimise the uncertainty and to address the problem of endogeneity, estimation of equation (1) proceeds in a stepwise fashion. First, a model that includes only the purely exogenous characteristics of the worker is estimated. Other variables of interest are then added in succession to monitor how the preceding estimates change. The more general models are used for further analysis if variable additions do not significantly alter the results. The robustness of the findings is then checked by the inclusion of a range of auxiliary variables that also reduce the problem of possible omitted variable bias and by other tests that address the following econometric issues.

4.3 Econometric Issues

4.3.1 Measurement error

As alluded to earlier, the wording of survey items may mean different things to different individuals and the ordering of the questions, which may influence individuals' interpretation of successive questions and hence bias the responses given, may further exacerbate the problem. Responses can also be affected by situational factors such as mood and environment. However, it can be argued that within the same language, the wording of survey items may not pose a problem. Furthermore, in each BSA survey year, recurring questions are worded the same and are repeated in the same order. Nonetheless, some on hand measures are taken here to allow valid inferences to be made. To wit, year dummies are included to capture differences in the survey across years and a random perturbation is introduced in the dependent variable to check the stability of the estimates.

4.3.2 Self-selection bias

As is usually the case for many labour market problems, perceptions of pay are recorded only for individuals who are employees. Since individuals choose whether to be employed or not, it may be possible that the probability of being an employee is correlated with how the individual would perceive his pay. That is, if fairness-of-pay perception is likely to be high then the probability of working will be correspondingly high. However, plots of the data indicate that the distribution of characteristics is similar for the sample of employees and non-employees. Moreover, if it is believed that it is individuals who feel that their pay is likely to be (or is) unfairly low that will be most prone to choose not to be employees, then based on the standard theory of income maximisation, the high proportion (36.89 percent) of employees stating that their pay is unfairly low should not be noticed. Therefore, as is similarly done in the related job satisfaction literature and indeed in many other labour market analyses, it is assumed initially that being an employee or not is independent of the error term in the fairness equation. Given this, Heckman (1990) demonstrates that legitimate conditional inferences can be made. This assumption is nonetheless tested as part of the robustness checks.

4.3.4 Earnings

The data contains information on earnings rather than on wages and hence the analysis uses earnings as an approximation for the wage. Given that wages make up the majority of earnings for most workers, this seems a reasonable way to proceed.

To allow comparability with the comparison wage, the earnings variable must be recorded in a similar form. Since the true earnings variable is categorical, it is replaced by the expected values from an hourly earnings interval regression as proposed by Stewart (1983). The earnings model is assumed to have the following latent structure:

$$w_i = \boldsymbol{x}_i' b + u_i \qquad (i = 1,..., N),$$

where w_i is the hourly earnings, which falls into one of K intervals with the k^{th} being given by (I_{k-1}, I_k), which are the lower and upper limits respectively. The vector $\boldsymbol{x_i}$ is a $Jx1$ vector of explanatory variables and b_i is a $Jx1$ vector of unknown parameters. The errors, u_i are assumed to be independently identically normally distributed with mean zero and variance s^2. It is further assumed that u_i is independent of $\boldsymbol{x_i}$. The conditional distribution of w_i is given by

$$w_i \mid \boldsymbol{x}_i \sim N(\boldsymbol{x}_i'\boldsymbol{b}, s^2) \qquad (i = 1,..., N).$$

Each employee is assigned a conditional expected earnings calculated as

$$\mathrm{E}(w_i \mid I_{k-1} < w \le I_k, \boldsymbol{x}_i) = \boldsymbol{x}_i'\boldsymbol{b} + s\left[\frac{g(Z_{k-1}) - g(Z_k)}{G(Z_k) - G(Z_{k-1})}\right],$$

where g and G represent the density and cumulative distribution of the standard normal respectively and $Z_k = (I_k - \boldsymbol{x}_i'\boldsymbol{b})/s$. This method provides consistent estimates unlike the ad hoc practice of taking the midpoint of each interval as a measure[29].

There are further benefits to using the predicted earnings values two of which are that, one, the precision of the estimates of the effect of the earnings on fairness perceptions is improved since it is now continuous and two, the problem that the recorded earnings variable may not be randomly assigned[30] and hence would be correlated with the error terms of the fairness perceptions equation is counteracted.

The flip side to estimating the earnings variable is the likely endogeneity of tenure in the earnings equation. As such, a two-stage least squares (instrumental variable) estimation is conducted using housing and year dummy interactions as instruments in the tenure equation. These instruments were chosen because it is believed that whilst owning or renting a house will

[29] See Stewart (1983) for a discussion and an illustration.
[30] Those with high wages may be the ones with high fairness-of-pay perceptions.

affect how long the employee chooses to remain with his employer there is no evident reason why this would affect his earnings. The quality of the instruments was checked as recommended by Bound *et al* (1995). They were found to be valid – they were significant in the tenure equation but insignificant in the earnings equation.

A similar problem arises with earnings as a regressor in the fairness-of-pay perception equations. The fairness perception an employee holds regarding his pay is likely to influence the type of job he takes up and the level of his productivity and consequently his wage. This possible equilibrium relationship between fairness-of-pay perceptions and earnings means that to obtained unbiased estimates, earnings should be instrumented. To this end, the size of the household is used as an instrument as it is assumed to be correlated with earnings insofar as it is likely to influence whether the worker takes up full-time or part-time employment[31] but unrelated to fairness perceptions of pay. This instrument is found to be valid in that it appears statistically significant in the earnings equation but insignificant in the fairness-of-pay perceptions equations. Due to space, the tenure and earnings equations as well as the equations showing the validity of the instruments used are not presented here but are available on request.

To take into account the fact that the earnings equation and the fairness-of-pay perception equations contain the fitted values from (respective) supplementary regressions, the standard errors in these equations are bootstrapped.

4.4 Main Results

Gender

At a glance, the coefficients on the female variable in Table 2 suggest that the more similar the environment shared by men and women, the less likely women are to perceive their pay as unfair compared to men. Most notable is the finding that, while across industry women

appear to have lower fairness-of-pay perception, the reverse seems to hold once they are compared to men in like industries. This result implies that women may be concentrated in industries where fairness perceptions are generally low, possibly because these are characteristically low-wage industries. However, within these industries (as shown in column 5), they are on average comparatively more likely to believe that they are fairly paid. The higher concentration of women in low-wage industries may be linked with their need to work part-time possibly because of obligations at home.

The suggested higher fairness-of-pay perception of women is strengthened by the results presented in Table 3. With the inclusion of earnings in the equation (columns 1 – 2), the coefficient on the female variable remains positive and is now statistically significant. This further lend credence to the supposition that the negative sign on the female variable in columns 1 – 4 of Table 2 is driven by the fact that women are mostly employed in low-wage industries where fairness-of-pay perception is correspondingly low. Once these factors are taken into consideration the fairness-of-pay perception attributable to gender becomes more conclusive. This conclusion is unchanged after controlling for the comparison wage.

Further results presented in Table 4 show that regardless of their ethnicity, women seemingly have more favourable fairness perceptions of their pay. It is worth pointing out however that not much emphasis can be placed on the findings for the non-white sample (column 4) as the results are in general poorly determined, potentially due to the rather inadequate sample size. The results therefore lead to a rejection of hypothesis 1.

The finding that women are more likely than men to perceive their pay as fair is in line with the empirical evidence in the job satisfaction literature that women are normally more satisfied than men with the salient characteristics of their job including pay satisfaction (see for example Hodson (1989) and Clark (1997)). Nonetheless, it is a surprising result that given the

[31] There is evidence that full-time jobs are better paid than part-time jobs. See Ermisch and Wright (1992) for evidence as well as a list of literature on the issue.

well-established labour market fact that women are subjected to pay discrimination, they are more likely than men to believe that they are fairly rewarded for their labour.

Race

According to the results in Tables 2 and 3, non-white workers in comparison to white workers perceive their pay to be more unfair. This result is remarkably consistent and highly statistically significant for different specifications of the fairness perception equation[32].

Looking at the gender sub-samples in Table 4, the relatively lower fairness-of-pay perception of non-whites is apparently true for both men and women though for women ethnicity appears to matter most[33].

Based on these findings hypothesis 2 cannot be summarily rejected. Thus, it can be concluded that cognizant of discrimination in the market, non-white workers are more likely than whites workers to feel unfairly paid. However, what is more interesting is that the findings indicate that even after controlling for earnings, non-white workers still have a greater probability of viewing their pay as unfair. Thus, it can be argued that if non-white workers were to receive wages that are on average greater than that of their white counterparts, they would still have a greater tendency to feel underpaid. The air of discrimination that exists in the labour market may serve to bias non-white workers' fairness perception of their pay. Thus, it is this discriminatory environment rather than wages in particular that should be targeted in any policy proposal.

Age

A look at Table 2 suggests that hypothesis 3 cannot be rejected. As they grow older, workers seem to have increasingly favourable fairness-of-pay perceptions. However, as is evident from Table 3 (columns 1 and 2), the positive relationship between age and fairness

[32] This is so for both those including and those excluding the wage. Although those including the wage are lower in magnitude. Also, this is true even though wage for non-whites are often thought to be higher than that of whites in the UK labour market.

perceptions is accounted for by the fact that older workers earn on average more than younger workers. Moreover, the results are no longer significant. Controlling further for comparison wage (column 3), the influence of age on fairness-of-pay perceptions is now significant at the 10 percent level. Thus, there is weak indication that, as they get older, workers do not become inured to unfairness. The results in Table 4 tell a similar story. However, it is only for male workers that the result is statistically conclusive[34]. Thus, it is only for male workers that hypothesis 3 can be rejected.

Comparison Wage

Contrary to intuition and somewhat a puzzle, the results in Table 3 to 5 show that the comparison wage has a positive and insignificant impact on workers' fairness-of-pay perceptions[35]. Admittedly, this result is perhaps an anomaly and it should not be concluded that comparison wage is unimportant in the evaluation of fairness of their pay. It may simply be the case that the average individual's comparison wage is not based on occupation and wage (see Graham and Pettinato (2002)) or possibly that measurement error has served to obscure the results.

4.5 Robustness checks

Several checks were done to establish the veracity of the results outlined in the previous section. The findings are detailed below but due to space most are not presented.

First, to ascertain that the building block results presented in Table 2 are not affected by the order in which the variables are added, the regressions are run several times,

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[33] For men the coefficient is not statistically significant while for women it is.

[34] One caveat that should be noted for the result pertaining to hypothesis 3 is that it is difficult to separate out the cohort effects.

[35] McBride (2001) also finds that a marginal change in the comparison income based on age will have a positive effect on an individual's well-being. The intuition that may be offered for the positive relationship between fairness-of-pay perceptions and the comparison wage is that upwardly mobile individuals (predominantly the young) may prefer being surrounded by higher earners as it raises their aspirations.

each time varying the order in which variables are added. Reassuringly, the results remained essentially the same.

Secondly, a full set of control variables is included in the main fairness-of-pay equation (column 3 of Table 3) to check the general stability of the findings and to address the problem of omitted variables bias. The results are shown in Table 5. The female variable maintains a positive and statistically significant coefficient and that on the non-white variable continues to display a significant negative influence on fairness perceptions of pay. The coefficient on the age variable also remains statistically significant.

The earnings variable has as usual a positive coefficient that is statistically influential and which appears, as would be expected, to have the greatest impact on fairness-of-pay perceptions. The comparison wage is still statistically insignificant but now exerts a negative influence on a worker's fairness perception of pay. This seems the intuitively correct sign. However, this result in some sense highlights the unreliability of the coefficient on the comparison wage measure.

Using data for the years 1998-2000[36], an additional regression was performed controlling for the effort and preference for hours of work. This was done to address the possibility that how hard the individual works and his length of exposure to, say an environment in which he is relatively deprived, may meaningfully alter the results. For instance, it might be argued that the positive sign on the female coefficient is probably due to the likelihood that male workers exert greater effort than female workers and to women's lower preference for hours of work, which reduces the experience of an unfavourable environment. The results from the regression yielded nothing qualitatively different to the conclusions already drawn.

Thirdly, the possible effects on the estimates of non-random self-selection into the sample of employees are investigated. First, a Heckman full maximum likelihood estimation of

the earnings equation is performed. The equation contains all the non-job variables of Table 5. The probit model for being employed includes all the variables in the earnings equation plus housing ownership and year dummy interactions. These latter variables are assumed to affect the probability of being employed but are not believed to help determine the earnings. The predicted earnings and the inverse mills ratio (?) are then included in the fairness-of-pay perceptions equation

The inverse mills ratio was found to be statistically significant which indicated that an individual's fairness-of-pay perception probably does indeed affect the decision to work as an employee. The negative sign on the coefficient of ? may *prima facie* seem counter-intuitive but it is actually not unexpected[37]. A negative coefficient on ? is frequently found in the estimation of wage offer equations (see Wright and Emrisch (1991) and Dolton and Makepeace (1986)). This arises because of the high correlation that is likely to exist between the observables that raise the reservation wage and those that raise wage offers (see Ermisch and Wright (1994) for a statistical analysis). Individuals that are most productive in jobs will tend to be more productive in non-labour market activities. Thus, since fairness perceptions of pay are tied to wages, the logic follows that as the reservation wage rises, the reservation fairness-of-pay perception rises also and consequently the individual is more likely to be either self-employed or unemployed. What is of paramount importance however is that the directions of the effects remain robust: In particular, the sign on the female, race, age, and earnings variables are unchanged. However, only the race variable remains statistically significant. Nonetheless, since this finding suggests that in relation to those who do not work, women who work have lower fairness-of-pay perceptions, the results are likely to be downward biased thus underestimating how much more fairly women regard their pay compared to men.

Next, random disturbances were introduced in the dependent variable to check the sensitivity of the results to the possible existence of measurement error. A set of transition

[36] Data for the effort and preference of hours of work variables are only available for the years 1998 to 2000.

probabilities was defined and a uniform random number was generated. The categories of the dependent variable were then altered based on the values of these probabilities and the random numbers. Several regressions were performed for varying distributions of the probabilities. Once again, the results were encouraging. The main coefficients of interest, with the exception of the age variable in one instance, remained statistically significant and the signs remained unchanged.

Finally, for the specification in Table 5 the dependent variable is regrouped. This is a simple test of stability, which is different in nature to the other tests. Given the arguably small proportion of observations in category 4, it is combined with category 3. It was found that the sign on the comparison wage was still insignificant but had moved from being negative to being positive. However, the sign on the rest of the coefficients under examination remained as before and with the exception of the race variable, were statistically significant.

5. Conclusion

This paper is the first known systematic study of employees' fairness perceptions of pay. Cross-section data for the United Kingdom were used to establish what affects the demographic characteristics of workers and their comparison wage have on how fairly they perceive themselves to be remunerated. The main results suggest surprisingly that despite facing evidential pay discrimination, female workers have higher fairness-of-pay perceptions. On the other hand, non-white workers do feel unfairly treated with respect to pay. The discriminatory environment that exists against non-white workers may account for the downward bias in their perceptions of their pay. Since these results are robust to the inclusion of earnings and other characteristic, it is possible that they may be driven by cultural and socialisation factors.

[37] ? also enters the wage equation negatively.

Unfavourable fairness-of-pay perceptions do not wane with age. Instead, workers feel more unfairly paid as they grow older. Financial pressures of career, children in school, and other responsibilities such as aging parents may account for this finding.

Surprisingly, there was no robust evidence of relative income effects. The comparison wage based on occupation and age did not have a significant impact on fairness perceptions of pay and appeared to be positively related to fairness-of-pay perceptions. This anomalous finding may simply be highlighting the need for better data on comparison income measures or a possible econometric specification problem that needs to be resolved in future research.

With the effect of the comparison wage apart, the main findings are in general statistically robust. Furthermore given that fairness perceptions of pay are affected by other individual characteristics besides earnings their policy implications may be very important.

Table 1.1: Sample means by gender and race (1996 – 1999)
(Standard Deviations are in parentheses)

Variable	Male	Female	Whites	Non-whites	All
FAIRNESS-OF-PAY PERCEPTION (1 – 4)	1.622	1.568	1.602	1.460	1.594
	(0.780)	(0.798)	(0.790)	(0.777)	(0.790)
FEMALES			0.520	0.491	0.518
			(0.500)	(0.500)	(0.500)
NON-WHITE	0.056	0.050			0.053
	(0.229)	(0.218)			(0.223)
AGE (18 – 65)	38.667	39.246	39.099	36.592	38.967
	(11.150)	(10.943)	(11.112)	(9.494)	(11.046)
MARRIED	0.669	0.625	0.650	0.588	0.646
	(0.471)	(0.484)	(0.477)	(0.493)	(0.478)
CHILDREN	0.391	0.423	0.404	0.484	0.408
	(0.488)	(0.494)	(0.491)	(0.501)	(0.491)
HOUSEHOLD SIZE	2.644	2.553	2.581	2.889	2.597
	(1.289)	(1.193)	(1.223)	(1.501)	(1.241)
HOUSING (1 – 3)	1.296	1.276	1.276	1.457	1.286
	(0.624)	(0.591)	(0.599)	(0.711)	(0.607)
EARNINGS	2.038	1.800	1.914	1.930	1.915
	(0.527)	(0.516)	(0.534)	(0.540)	(0.535)
COMPARISON WAGE	2.076	1.995	2.034	2.039	2.034
	(0.358)	(0.332)	(0.347)	(0.344)	(0.347)
UNION MEMBER	0.373	0.327	0.348	0.370	0.349
	(0.484)	(0.469)	(0.476)	(0.484)	(0.477)
UNION RECOGNITION	0.504	0.517	0.512	0.488	0.510
	(0.500)	(0.500)	(0.500)	(0.501)	(0.500)
SCHOOL	0.740	0.764	0.749	0.824	0.752
	(0.439)	(0.424)	(0.434)	(0.382)	(0.432)
POST-SCHOOL	0.690	0.652	0.669	0.689	0.670
	(0.463)	(0.476)	(0.471)	(0.464)	(0.470)
NON-MANAGERIAL	0.557	0.698	0.628	0.657	0.630
	(0.497)	(0.459)	(0.483)	(0.475)	(0.483)
FULL-TIME	0.968	0.624	0.787	0.837	0.790
	(0.176)	(0.484)	(0.409)	(0.370)	(0.408)
TENURE	104.632	81.865	93.769	76.004	92.833
	(55.677)	(52.590)	(55.269)	(52.757)	(55.278)
FIRM SIZE (1 – 5)	3.319	3.062	3.183	3.239	3.186
	(1.270)	(1.286)	(1.284)	(1.308)	(1.285)
RELATION (1 – 4)	2.967	3.121	3.055	2.895	3.047
	(0.832)	(0.787)	(0.811)	(0.823)	(0.812)
REGION (1 – 11)	6.241	6.337	6.187	8.152	6.291
	(3.086)	(3.149)	(3.114)	(2.575)	(3.119)
OCCUPATION (1 – 7)	3.863	3.934	3.901	3.869	3.900
	(1.692)	(1.491)	(1.592)	(1.589)	(1.592)
SECTOR (1 – 4)	1.460	1.842	1.655	1.720	1.658
	(0.848)	(1.045)	(0.971)	(1.031)	(0.974)
INDUSTRY (1 – 15)	6.982	9.331	8.179	8.564	8.199
	(3.706)	(3.607)	(3.854)	(3.542)	(3.839)
Number of observations	2643	2843	5197	289	5486

Earnings

Table 1.2a: Earnings by years

Earnings	Year					
	1996	1997	1998	1999	2000	Total
8000 and less	32.97	31.88	33.68	29.03	24.40	30.11
8001 – 18000	42.77	44.54	39.00	41.69	38.81	40.87
18001 – 29000	18.82	18.56	20.95	20.41	23.43	20.74
29001 and over	5.44	5.02	6.37	8.87	13.36	8.28
Total	100.00	100.00	100.00	100.00	100.00	100.00

Columns may not sum due to rounding

Table 1.2b: Earnings by race and gender

Earnings	White			Non-White			Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
8000 and less	12.18	46.98	30.27	19.73	35.21	27.34	12.60	46.39	30.11
8001 – 18000	45.59	36.36	40.79	44.90	39.44	42.21	45.55	36.51	40.87
18001 – 29000	28.97	12.88	20.66	25.17	21.13	23.18	28.76	13.30	20.74
29001 and over	13.26	3.78	8.33	10.20	4.23	7.27	13.09	3.80	8.28
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Columns may not sum due to rounding

Table 1.2c: Earnings by age

Earnings	Age					
	18 - 29	30 - 39	40 - 49	50 - 59	60 - 65	Total
8000 and less	33.98	26.60	29.09	31.30	39.44	30.11
8001 – 18000	49.76	39.93	34.95	39.37	42.22	40.87
18001 – 29000	13.37	23.68	25.23	20.07	11.67	20.74
29001 and over	2.90	9.78	10.72	9.27	6.67	8.28
Total	100.00		100.00	100.00	100.00	100.00

Columns may not sum due to rounding

Fairness-of-pay perceptions

Table 1.3a: Fairness of pay perceptions by year

Fairness-of-pay perceptions	Year					
	1996	1997	1998	1999	2000	Total
Very unfairly low	11.98	11.57	11.36	9.82	12.24	11.41
A bit unfairly low	25.58	24.67	24.58	25.32	26.64	25.48
Fair	55.21	56.55	56.33	56.85	53.06	55.40
Unfairly high	7.23	7.21	7.74	8.01	8.06	7.71
Total	100.00	100.00	100.00	100.00	100.00	100.00

Columns may not sum due to rounding

Table 1.3b: Fairness-of-pay perceptions by race and gender

Fairness-of-pay perceptions	White			Non-White			Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Very unfairly low	10.30	12.11	11.24	13.61	15.49	14.53	10.48	12.28	11.41
A bit unfairly low	24.80	25.84	25.34	28.57	28.57	28.03	25.01	25.92	25.48
Fair	56.37	54.61	55.46	55.78	52.82	54.33	56.34	54.52	55.40
Unfairly high	8.53	7.44	7.97	2.04	4.23	3.11	8.17	7.28	7.71
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Columns may not sum due to rounding

Table 1.3c: Fairness-of-pay perceptions by age

Fairness of pay perceptions	Age					
	18 - 29	30 - 39	40 - 49	50 - 59	60 - 69	Total
Very unfairly low	12.32	8.92	12.15	13.52	12.78	11.41
A bit unfairly low	24.56	23.97	25.38	29.01	29.44	25.48
Fair	54.19	58.12	55.54	52.13	52.78	55.40
Unfairly high	8.94	8.98	6.93	5.34	5.00	7.71
Total	100.00	100.00	100.00	100.00	100.00	100.00

Columns may not sum due to rounding

Table 2: Fairness-of-pay perception for the UK (1996–2000)
Basic specification
(Pooled ordered probit regression results)

Dependent Variable	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
FEMALE	-0.060**	-0.061**	-0.045	-0.027	0.056
	(0.032)	(0.032)	(0.037)	(0.038)	(0.040)
NON-WHITE	-0.250***	-0.291***	-0.278***	-0.276***	-0.264***
	(0.068)	(0.072)	(0.073)	(0.074)	(0.073)
AGE	0.036***	0.037***	0.024***	0.026***	0.021**
	(0.010)	(0.010)	(0.011)	(0.011)	(0.011)
AGE SQUARED/100	-0.050***	-0.051***	-0.035***	-0.037***	-0.031***
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
1997	0.049	0.051	0.052	0.046	0.052
	(0.065)	(0.064)	(0.066)	(0.066)	(0.067)
1998	0.071	0.073	0.080*	0.077	0.087*
	(0.047)	(0.047)	(0.047)	(0.048)	(0.048)
1999	0.109***	0.111***	0.123***	0.119***	0.117***
	(0.048)	(0.048)	(0.048)	(0.048)	(0.048)
2000	0.027	0.030	0.035	0.034	0.050
	(0.047)	(0.047)	(0.046)	(0.047)	(0.047)
Regional dummies (1 – 11)	-	v	v	v	v
Occupation dummies (1 – 7)	-	-	v	v	v
Sector dummies (1 – 4)	-	-	-	v	v
Industry dummies (1 – 15)	-	-	-	-	v
μ_0	0.612***	0.604***	1.141***	1.124***	0.815***
	(0.206)	(0.210)	(0.230)	(0.231)	(0.276)
μ_1	0.874***	0.875***	0.893***	0.893***	0.905***
	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)
μ_2	2.654***	2.657***	2.710*	2.714***	2.751***
	(0.034)	(0.034)	(0.035)	(0.035)	(0.036)
Number of observations	5486	5486	5486	5486	5486
Pseudo R^2	0.004	0.005	0.020	0.021	0.030
Log Likelihood	-6119.251	-6114.034	-6024.850	-6018.107	-5958.060

Note: 'Robust' standard errors are in parentheses.
*** significant at the 1% level, ** significant at the 5% level, * significant at the 10% level.

Table 3: Fairness-of-pay perception for the UK (1996–2000)
Earnings and comparison wage controls
(Pooled ordered probit regression results)

Dependent Variable	**(1)**	**(2)**	**(3)**
FEMALE	0.191***	0.257***	0.260***
	(0.039)	(0.041)	(0.041)
NON-WHITE	-0.212***	-0.211***	-0.213***
	(0.071)	(0.072)	(0.072)
AGE	-0.017	-0.018	-0.026*
	(0.012)	(0.012)	(0.016)
AGE SQUARED/100	0.011	0.013	0.022
	(0.014)	(0.014)	(0.018)
EARNINGS	0.874***	0.854***	0.854***
	(0.048)	(0.050)	(0.050)
COMPARISON WAGE			0.230
			(0.253)
1997	0.028	0.036	0.034
	(0.066)	(0.066)	(0.066)
1998	0.064	0.068	0.055
	(0.048)	(0.048)	(0.049)
1999	0.034	0.037	0.014
	(0.047)	(0.047)	(0.052)
2000	-0.076	-0.063	-0.095
	(0.047)	(0.048)	(0.058)
Regional dummies (1 – 11)	v	v	v
Occupation dummies (1 – 7)	v	v	v
Sector dummies (1 – 4)	v	v	v
Industry dummies (1 – 15)	-	v	v
μ_0	0.065	-0.131	-0.527
	(0.241)	(0.286)	(0.493)
μ_1	0.953***	0.960***	0.960***
	(0.025)	(0.025)	(0.025)
μ_2	2.900***	2.922***	2.922***
	(0.040)	(0.041)	(0.041)
Number of observations	5486	5486	5486
Pseudo R^2	0.069	0.075	0.075
Log Likelihood	-5720.119	-5686.846	-5686.846

Note: 'Robust' standard errors are bootstrapped based on 1000 replications and are presented in parentheses.
*** significant at the 1% level, ** significant at the 5% level, * significant at the 10% level.

Table 4: Fairness of pay perceptions for the UK (1996 – 2000)
Gender and race sub-samples
(Pooled ordered probit regression results)

Dependent Variable	Male	Female	White	Non-White?
FEMALE			0.254***	0.427**
			(0.042)	(0.196)
NON-WHITE	-0.148	-0.266**		
	(0.099)	(0.107)		
AGE	-0.058***	-0.019	-0.024	-0.055
	(0.022)	(0.023)	(0.016)	(0.108)
AGE SQUARED/100	0.053**	0.017	0.020	0.044
	(0.026)	(0.026)	(0.018)	(0.128)
EARNINGS	1.082***	0.694***	0.829***	1.570***
	(0.076)	(0.069)	(0.052)	(0.326)
COMPARISON WAGE	0.253	0.471	0.150	1.477
	(0.349)	(0.377)	(0.259)	(1.753)
1997	0.024	0.020	0.038	0.181
	(0.090)	(0.099)	(0.067)	(0.404)
1998	0.103	-0.021	0.068	-0.233
	(0.075)	(0.071)	(0.050)	(0.372)
1999	0.004	-0.032	0.020	-0.291
	(0.076)	(0.078)	(0.053)	(0.371)
2000	-0.125	-0.121***	-0.072	-0.464
	(0.087)	(0.083)	(0.060)	(0.404)
Regional dummies (1 – 11)	v	v	v	v
Occupation dummies (1 – 7)	v	v	v	v
Sector dummies (1 – 4)	v	v	v	v
Industry dummies (1 – 15)	v	v	v	v
μ_0	-0.064	-1.472*	-0.344	-3.359
	(0.653)	(0.856)	(0.500)	(3.624)
μ_1	1.016***	0.932***	0.954***	1.152***
	(0.038)	(0.034)	(0.026)	(0.166)
μ_2	3.095***	2.829***	2.899***	4.004***
	(0.062)	(0.055)	(0.042)	(0.496)
Number of observations	2643	2843	5197	289
Pseudo R^2	0.108	0.059	0.072	0.188
Log Likelihood	-2613.369	-3026.104	-5407.678	-252.324

Note: 'Robust' standard errors are bootstrapped based on 1000 replications and are presented in parentheses.
*** significant at the 1% level, ** significant at the 5% level, * significant at the 10% level.
? For the non-white sub-sample, there is no observation for the Northern statistical region, the private household employment industry and the electricity, gas and water industry. So there are only 11 regional dummies and 13 industry dummies included in the equation.

Table 5: Fairness of pay perceptions for the UK (1996 – 2000)
(Pooled ordered probit regression results with full set of controls)

Dependent Variable			
FEMALE	0.259***	1997	0.041
	(0.047)		(0.067)
NON-WHITE	-0.167**	1998	0.077
	(0.073)		(0.052)
AGE	-0.041**	1999	0.037
	(0.017)		(0.058)
AGE SQUARED/100	0.016	2000	-0.044
	(0.023)		(0.069)
MARRIED	0.062	μ_1	-0.406
	(0.039)		(0.686)
CHILDREN	0.030	μ_2	0.984***
	(0.042)		(0.026)
EARNINGS	0.840***	μ_3	2.988***
	(0.053)		(0.042)
COMPARISON WAGE	-0.140	Regional dummies (1 - 11)	v
	(0.340)	Occupation dummies (1– 7)	v
SCHOOL	-0.018	Sector dummies (1 – 4)	v
	(0.050)	Industry dummies (1 - 15)	v
POST-SCHOOL	0.004		
	(0.059)		
NON-MANAGERIAL	0.090	Prob > ?2:	
	(0.078)	EARNINGS=-COMPARISON WAGE	0.041
UNION MEMBER	-0.194*		
	(0.112)		
UNION RECOGNITION	-0.014		
	(0.063)		
FULL-TIME	-0.114*		
	(0.062)	Number of observations	5486
FIRM SIZE	0.047***		
	(0.017)	Prob > ?2	0.000
RELATION	0.271***	Pseudo R^2	0.091
	(0.023)	Log Likelihood	-5586.229
TENURE	0.006**		
	(0.003)		
TENURE SQUARED/100	-0.000		
	(0.001)		

Note: 'Robust' standard errors are bootstrapped based on 1000 replications and are presented in parentheses.
*** significant at the 1% level, ** significant at the 5% level, * significant at the 10% level.

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