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# Option or obligation?

## The determinants of labour supply preferences in Britain

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**Abstract:** We examine subjective data on desired hours of work from the BHPS and investigate which individuals are able to work their desired number of hours at the prevailing wage, which individuals are under-employed and which are over-employed. Our evidence suggests that about 40% of men and women in paid employment prefer to work a different number of hours at their current wage, and the majority of these prefer to work fewer hours. Multivariate analysis shows that differences in work time preferences depend on observed job and employer related characteristics, individual demographics, local labour demand and unobserved individual specific effects.

**JEL classification:** J22; C23

**Keywords:** Labour supply; Panel data; BHPS

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## Non-technical Summary

The standard theory of labour supply is based on the assumption that individuals choose their optimal number of working hours when faced with the attainable choice set of hours and earnings. It is traditionally assumed that any number of hours can be chosen up to a maximum equal to the time endowment. There are however both theoretical arguments and empirical evidence that working hours cannot be freely varied within jobs and are instead influenced by employer preferences and institutional factors. As a result, individuals may be required to change jobs in order to attain their utility maximising combination of hours and earnings. Job changes can be costly and employment opportunities are unlikely to be evenly distributed across the hours distribution. Therefore many individuals are likely to be out of equilibrium with respect to their labour supply at any point in time, and observed working hours cannot be strictly interpreted as revealed preferences.

Our aim in this paper is to examine subjective data on desired hours of work from the British Household Panel Survey. In particular, we investigate profiles of workers who are able to work their desired number of hours at the prevailing wage, who are under-employed and who are over-employed. This is of interest given that many reforms in the British tax and benefit system (such as the Working Families Tax Credit) have been aimed at encouraging individuals to increase their work time, and that recent reports suggest that British employees work the longest hours in Europe.

Our evidence suggests that 40% of workers are constrained in their labour supply, and that one third of employees in Britain prefer to reduce the length of their average working week at the prevailing wage. Men and women employed on a part-time basis have very different preferences to those working full-time. Although on average both men and women working part-time are under-employed, we find that a greater proportion of women than men are working part-time through choice. Workers with longer job tenure have a higher probability of over-employment, supporting the firm-specific human capital hypothesis. We also provide evidence suggesting that inter-dependencies exist in the labour supply preferences of family members – married men and women are more likely to be over-employed if their spouse is also over-employed. A higher local unemployment rate is associated with under-employment, suggesting that low labour demand results in job uncertainty with workers wanting to work longer hours perhaps because of a fear of redundancy and few alternative employment opportunities. Our results have implications for the possible redistribution of work-time between workers in Britain.

## Introduction

“It is impossible to enjoy idling thoroughly unless one has  
plenty of work to do”

*The Idle Thoughts of an Idle Fellow*, Jerome K. Jerome (1889).

The standard theory of labour supply is based on the assumption that individuals choose their optimal number of working hours when faced with the attainable choice set of hours and earnings. It is traditionally assumed that any number of working hours can be chosen up to a maximum equal to the time endowment. There are, however, long-standing theoretical arguments and empirical evidence suggesting that working hours cannot be freely varied within jobs, and are instead strongly influenced by employer preferences and institutional factors (early examples include Rosen, 1969; Barzel, 1973; Deardorff and Stafford, 1976). Firms, for example, generally do not offer jobs with low hours of work (for reasons associated with the fixed costs of workers) and therefore workers who wish to reduce their work hours may be faced with a choice of stopping work altogether or not changing their hours at all.

Some individuals may be required to change jobs in order to attain their utility maximising combination of hours and earnings (Altonji and Paxson, 1992). Job changes can be costly, and employment opportunities are unlikely to be evenly distributed across the hours distribution. Incomplete information and/or imperfect mobility are likely to result in many workers out of equilibrium with respect to their labour supply at any point in time. The implications of this are that observed working hours cannot be strictly interpreted as revealed preferences, and that workers will gravitate towards those

employers who fix working hours close to their preferences. Employers stipulating unpopular working hours will experience difficulties recruiting and retaining workers.

Working hours, and the length of the working week, have received much recent attention from the media, with reports suggesting that British employees now work the longest hours in Europe.<sup>1</sup> Further, many reforms in the British tax and benefit system have been aimed at encouraging individuals to increase their work effort.<sup>2</sup> With this in mind, our aim in this paper is to examine subjective data on desired hours of work from the British Household Panel Survey (BHPS). In particular, we model labour supply restrictions conditional on demographic, educational, and local labour market characteristics as well as productivity to investigate which individuals are able to work their desired number of hours at the given wage (and are unconstrained), which individuals prefer to work more hours (and are under-employed) and which prefer to work fewer hours (and are over-employed). As well as providing important information on the determinants of labour supply restrictions, this has implications for the traditional assumption that hours can be freely chosen. The focus of the paper is on how, in the 1990s, the desire to work more, fewer or the same number of hours varies across demographic and job related characteristics.

Various economic theories predict that workers will be constrained in the hours they can work (for a summary see Kahn and Lang, 1995). Imperfect competition in the labour

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<sup>1</sup> See, for example, an article entitled “Can you work late again” in the Independent 22/12/99.

<sup>2</sup> Examples of these reforms include reducing the number and level of higher tax brackets, and the increasing use of in-work benefits such as the Working Families Tax Credit to encourage low income families to expand their work time.

market (monopsony is the extreme case) implies that firms have greater bargaining power over hours-wage packages than the worker, and that the worker will have fewer outside options. Therefore workers will be forced into working more hours at a given wage than is optimal resulting in over-employment. In Lazear's (1981) agency model, newly hired workers are paid less than their marginal value of leisure to encourage loyalty, and are therefore over-employed. Workers with longer tenure are paid more than their marginal value of leisure to reward loyalty, and are under-employed. The specific human capital model, however, predicts the reverse. The wage for workers with greater seniority (in terms of tenure) is set below their marginal product to discourage the firm from terminating the contract in later years, and to allow it to benefit from firm-specific human capital investments. For recent hires, the wage is set above marginal product. Although we do not explicitly test between these competing theories, our results support the firm-specific human capital model.

Our evidence reveals that on average 40% of men and women in paid employment prefer to work a different number of hours at their current wage, and the vast majority of these prefer to work fewer hours. Stewart and Swaffield (1997) and Euwals et al (1998) report similar numbers for the UK and the Netherlands. Biddle (1988) and Ball (1990) conclude that there are important restrictions on working hours in the US, while Altonji and Paxson (1988) and Stratford et al (1995) also use US data and find under-employment to be more common than over-employment among men. Kahn and Lang (1991) and Drolet and Morissette (1997) report similar results for Canada, as does Wolf (1998) for

Germany. Ilmakunnas and Pudney (1990), using Finnish data, find a shortage of part-time employment opportunities for women.

Variations in hours worked reflect not only labour supply decisions but also employers' preferences, technology, industrial relations and the business cycle. Several empirical labour supply studies suggest that models which do not allow for hours restrictions strongly over-predict the number of part-time jobs (van Soest et al, 1990; Dickens and Lundberg, 1993; van Soest, 1995). Other work suggests that introducing hours restrictions into labour supply models produces better approximations of the actual hours distribution (Tummers and Woittiez, 1991).

The long-term decline in average weekly working hours in Britain is well documented. In the late 1950s, each man in full-time work supplied an average of 48.4 paid hours per week to the labour market. This had fallen to 43 hours in the early 1980s (Pencavel, 1986, Table 1.9, p.16). For women, the picture is similar, with average weekly full-time hours falling from 48 in 1938 to 43 in the early 1980s (Killingsworth and Heckman, 1986, Table 2.11, p.112).<sup>3</sup> Since then, there have been increases in average weekly hours for both men and women, especially among the highly educated (Blundell and MaCurdy, 1999). Stewart and Swaffield (1997) report that more than one third of men in Britain work longer hours than they wish at the prevailing wage. Further, the authors find that the minimum hours constraints set by firms are an increasing function of the unemployment

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<sup>3</sup> Note that these averages, for both men and women, refer to full-time manual workers only. The decline in average weekly hours for women has of course to be considered alongside the secular increase in women's participation rates.

rate. The authors hypothesise that this results from increased job insecurity, fear of redundancy and reduced alternative job opportunities.

We also find that one third of employed men and women in Britain would like to reduce the length of their average working week at the current wage. Multivariate analysis shows that differences in preferences towards hours supplied to the labour market depend on both observed and unobserved individual and job related characteristics. Men and women employed on a part-time basis have very different preferences to those working full-time. While both men and women working part-time are more likely to be under-employed than full-time employees, our evidence suggests that women are more likely than men to work part-time out of choice. Workers with longer job tenure have a higher probability of over-employment, supporting firm-specific human capital theory. A higher local unemployment rate is associated with under-employment, suggesting that low labour demand results in job insecurity, the fear of redundancy and reduces alternative employment opportunities.

## **Data**

Our analysis uses data from the British Household Panel Survey (BHPS), a nationally representative survey providing detailed information on individual, household and job related characteristics on an annual basis from 1991 to 1998. Panel data are preferable to cross-sectional data as they allow us to control for changes in job and individual circumstances and unobservable characteristics. The relevant questions in the BHPS are



asked of all those in employment (full-time, part-time, or self-employment) at each date of interview. In particular, respondents are asked:

“Thinking about the hours you work, assuming that you would be paid the same amount per hour, would you prefer to work fewer hours, work more hours, or the same number of hours?”

The answer to this question provides important information on individuals’ preferred working hours.<sup>4</sup> Note that respondents are asked to assume that their wage would remain unchanged, absolving them from making hidden assumptions. Individuals who say they prefer to work fewer (more) hours at the prevailing wage are considered to be over-(under-)employed. Those that prefer to work the same number of hours are unconstrained in their labour supply. We exclude the self-employed from our analysis as by definition they have greater freedom to determine their labour supply. We also exclude men and women employed in agriculture, the armed services, and those who hold second jobs. Analysis is restricted to those of working age at the time of the annual interview, that is men aged 16 to 65 and women aged 16 to 60. We use an unbalanced panel, individuals are not required to be interviewed at each wave to be included in the sample.

Table 1 shows how the preferred working hours of men and women have changed across the eight currently available waves of BHPS data, from 1991 to 1998. For men, more

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<sup>4</sup> Subjective data, as opposed to objective data, are rarely used in empirical economics as the reliability of the respondents’ answers is unclear. There is no guarantee that the answers to a survey question reflect the “true” value as respondents are not penalised for giving a wrong value, be it unconsciously or intentionally. Although the same can be said of all survey data, objective data can be compared against information from other sources to check accuracy. Recent empirical studies that use subjective data include Kooreman and Kapteyn (1990), Clark (1996), Clark and Oswald (1996), Stewart and Swaffield (1997) and Oswald (1997).

than one third of employees prefer to work fewer hours than they currently do at the prevailing wage, while approaching 8% prefer to work more hours. Therefore 43% of men in employment in Britain are constrained in the hours they supply to the labour market. This has not varied significantly across the period. An average of 40% of women are constrained in their labour supply, and there is evidence that this proportion has increased. At wave 1 in 1991, 28% of women in employment wanted to work fewer hours at the prevailing wage, while 10% wanted to work more hours. By wave eight (1998), 34% wanted to work fewer hours, while only 7% wanted to work more hours. Therefore the period has seen a convergence in the work time preferences of women towards those of men. There is evidence that women are becoming more constrained in the hours they work, and in particular, are working more hours than they wish.<sup>5</sup>

Table 2 shows that, with the exception of women employed on a part-time basis, those who prefer to work fewer hours earn higher hourly wages. This suggests that high wage earners are willing to accept a fall in their labour income in exchange for more leisure time (they have a backward bending labour supply curve), and may be able to sustain a reduction in their labour supply without jeopardising their standard of living. Men working full-time who prefer to reduce their work hours have the highest average hourly earnings (at £7.44), while women working full-time who prefer more hours have the lowest hourly earnings (at £4.36).<sup>6</sup>

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Euwals et al (1998) conclude that subjective data on preferred working hours contain important information, helping to explain future changes in actual hours for women.

<sup>5</sup> These changes in preferences may be caused by increases in actual hours worked, or by changes in tastes.

<sup>6</sup> These wages are deflated to January 1998 prices.

Table 3 examines labour supply preferences by whether men and women work full- or part-time.<sup>7</sup> 36% of men employed full-time want to work fewer hours at the prevailing wage, while 7% want to work more hours. These proportions are almost exactly reversed for men in part-time jobs, with only 9% of male part-time workers wanting to work fewer hours, while 34% want to work more hours. A large proportion of male employees who work part-time are under-employed. Over 40% of women employed full-time prefer to work fewer hours at the prevailing wage, while only 4% prefer to work more hours. However, almost three quarters of women who work part-time are unconstrained in their work hours, 10% prefer to work fewer hours and 19% prefer to work more hours.<sup>8</sup> Women in part-time work are on average least likely to be constrained in their supply of paid hours to the labour market, while those in full-time work are most likely. It is likely that a greater proportion of part-time employment is voluntary among women than men because of home or family care responsibilities. Part-time work may better correspond with the time preferences of mothers and for some, such employment is the optimal choice. Our figures are similar to those reported by Wolf (1998) who finds that 50% of men employment part-time in Germany are unhappy with their working hours, compared with 20% of similarly employed women. This may be a conditioning effect, with men expected to work full-time while part-time employment is more common among women.

Table 4 summarises actual hours worked by whether individuals prefer to work more or fewer hours. This reveals a consistent and logical pattern, with men and women who are

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<sup>7</sup> Part-time workers are defined as working less than 30 hours per week.

<sup>8</sup> It is possible that part-time workers believe that they are constrained in their choice set. That is, they may not have the option to work more hours due to employer and/or family constraints, and therefore express their preferences within their attainable choice set.

over-employed on average working the most hours a week, while the under-employed supply on average the least number of hours to the labour market. Altonji and Paxson (1988) report similar findings for the USA. Employers may use incentive schemes to elicit greater effort from their workers. Data presented in Table 5 suggest that this is the case. Men and women who have opportunities for promotion and who receive regular bonus payments are least likely to be under-employed and most likely to be over-employed. Promotion and bonus schemes encourage men and women to work more hours than they wish.

Table 6 examines the dynamic nature of the data by investigating transitions between labour supply preferences from wave to wave. In particular, it provides the average year on year transition rates between wanting to work fewer hours, more hours, or continue to work the same number of hours at the prevailing wage for men and women. This shows a large degree of persistence in wanting to work fewer hours and wanting to work the same number of hours. On average, two-thirds of men and women who want to reduce their labour supply at wave  $t$  continue to have the same preferences at wave  $t+1$ , while one third appear to be able to adjust their hours to meet their preferences. This suggests that a large proportion of workers are restricted in reducing the number of hours they supply to the labour market. This could be caused by employers being unwilling to reduce hours of work, due to the fixed costs of workers for example, or other institutional or contractual factors. Almost three-quarters of men and women who prefer to continue to work the same number of hours at wave  $t$  have the same preferences at wave  $t+1$ . However, men and women who prefer to work more hours at the prevailing wage at wave  $t$  are more

able to adjust their hours accordingly. Some 49% of men and 52% of women who want to work more hours at  $t$  want to work the same number of hours at  $t+1$ .<sup>9</sup> Therefore the majority of workers who want to increase their labour supply are able to do so, upper boundaries on working hours are more flexible than lower boundaries.<sup>10</sup>

## Analytical Framework and Estimation Procedure

To illustrate the interaction between actual hours, preferred hours, wages and job, employer and worker characteristics, we use a standard labour supply approach. The number of hours an individual  $i$  wishes to supply to the labour market ( $H_i$ ) is a function of the wage ( $w_i$ ), and the tastes, preferences and characteristics of the individual ( $X_i$ ) at time  $t$ :

$$H_{it} = f(w_{it}, X_{it}) \quad (1)$$

The vector  $X_{it}$  contains variables which capture individuals expectations of future income – workers make their labour supply choices in an environment in which they face uncertain future income streams. Individuals choose their hours of work for a given wage rate, either with one employer or selecting across employers offering different hours-wage packages. As firms differ with respect to production technology, the hours-wage package for a certain type of job may vary across firms. However, it is possible that

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<sup>9</sup> This could also reflect a change in preferences.

<sup>10</sup> Examining which workers are able to adjust their working hours to correspond with their preferences is an avenue for future research.

individuals are not free to choose the number of hours they work at a given wage, either because of institutional factors, employer preferences, the high costs of job search and job change, or family constraints. In practice, therefore, we observe  $H_{it}^*$  rather than  $H_{it}$  where:

$$H_{it}^* = H_{it}^U \text{ if } H_{it} \geq H_{it}^U$$

$$H_{it}^* = H_{it}^L \text{ if } H_{it} \leq H_{it}^L$$

$$H_{it}^* = H_{it} \text{ if } H_{it} \leq H_{it}^U \text{ and } H_{it} \geq H_{it}^L$$

$H_{it}^U$  and  $H_{it}^L$  are the maximum and minimum available number of hours at a given wage. The desired number of hours of work are only observed for those whose labour supply is unconstrained and who wish to work a number of hours in the range  $H_{it}^L$  to  $H_{it}^U$ . Unless these restrictions are accounted for in estimating labour supply models, any estimation results will be biased.<sup>11</sup>

To proceed, we follow Drolet and Morissette (1997) and return to a standard labour supply function where desired hours,  $H_{it}$ , are specified as a function of the prevailing wage,  $w_{it}$ , and worker characteristics,  $X_{it}$ :

$$H_{it} = f(w_{it}, X_{it})$$

Observed hours depend on both firm and job-related characteristics,  $E_{it}$ , and worker characteristics,  $X_{it}$ :

$$H_{it}^* = g(E_{it}, X_{it}) \quad (2)$$

Essentially, the data enable us to observe the sign of the difference between the actual and desired hours:

$$H_{it}^* - H_{it} = h(w_{it}, X_{it}, E_{it}) \quad (3)$$

If this term is negative, then the worker is under-employed and supplies too little labour. If positive, the worker supplies too much labour and enjoys too little leisure time. If zero, the worker is in equilibrium in the sense that his/her actual hours of labour equal preferred hours. As observed hours help define the dependent variable, they are not used as an explanatory variable.

Empirically, our specification differs a little from this to allow us to benefit from the panel nature of the data. We observe discrete variables indicating how preferred working hours differ from those observed for the same group of individuals over time. We estimate separate models for the probability of workers preferring to work fewer hours at the prevailing wage, preferring to work more hours at the prevailing wage, and preferring to continue to work the same number of hours. The first specification has a dependent variable coded 1 if the worker is over-employed and 0 otherwise. The second dependent variable takes the value 1 if the worker is under-employed at the prevailing wage, and 0 otherwise. The final model has a dependent variable coded 1 if the worker is

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<sup>11</sup> Taking an intertemporal approach, a worker may choose to be over-employed while young, for example, in order to accumulate savings, to gain experience, promotion etc, and to allow dissaving later in life.

unconstrained at the prevailing wage, and 0 otherwise. These models are estimated separately for men and women, and also with men and women pooled to investigate gender differences in detail.

We observe each individual  $i=1,2,...,N$  and their labour supply preferences at times  $t=1,...,T$  ( $0 < T \leq 8$ ). The propensity to prefer more hours, less hours, or the same number of hours can be written:

$$y_{it}^* = X_{it}\mathbf{b} + n_i + e_{it} \quad (4)$$

where

$$y_{it} = \begin{cases} 1 & \text{if } y_{it}^* > 0 \\ 0 & \text{otherwise,} \end{cases}$$

and  $n_i \sim \text{IN}(0, s_n^2)$  captures the individual-specific unobservable effect and  $e_{it} \sim \text{IN}(0, s_e^2)$  is random error. Further,  $n_i$  and  $e_{it}$  are independent of each other and of  $X_{it}$ , the set of explanatory variables (which here include the prevailing wage rate and job and employer related characteristics). We assume that the relationship between the covariates and the dependent variable can be described by a normal distribution, and therefore specify a random-effects panel probit.<sup>12</sup> To ensure identification,  $s_e$  is set to one and the likelihood function is parameterised in terms of the within-subject correlation,  $\rho$ ,

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Therefore over-employment while young may be an equilibrium response.

<sup>12</sup> Greene (1997) and Baltagi (1995) provide more details on the random effects probit approach.



$$\rho = s_n^2 / (s_n^2 + s_e^2).$$

This indicates the proportion of the variance that is explained by the panel-variance component,  $\eta_i$ , which captures time invariant unobserved differences between individuals. If  $\rho$  is zero, then the panel-variance level component is unimportant and the panel estimator is not different from a cross-sectional (or pooled) estimation.

## Multivariate Results

Table 7 and Table 8 present the estimates from the random effects probit models for men and women. In our multivariate analysis, we include job and workplace attributes which may determine employer preferences and other hours rigidities.<sup>13</sup> We control for various individual and local labour market characteristics which help determine worker's tastes and preferences and labour demand.<sup>14</sup> The random effects specification also captures the effects of time invariant unobservable factors. Note that in all specifications for both men and women, the estimates for  $\rho$  are relatively large and significantly different from zero. The unobserved individual specific effect is important, and accounts for between 40% and 50% of the total variance. This underlines the importance of using panel data in studying the labour supply preferences of men and women.

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<sup>13</sup> Observing an individual's preferred working hours depends on their being employed at the date of interview – selection effects may bias the coefficients of interest. To overcome this, each specification has been re-estimated as a two-step selection model along the lines of Heckman (1979). However, the coefficients on the mills term was insignificant in all cases, and the size and significance of other coefficients unchanged, even among women. We therefore only report the results without selection.

<sup>14</sup> Descriptive statistics for these variables are provided in the Appendix.

Focusing on the results for men first (Table 7), the estimates suggest that men employed on fixed-term contracts or in seasonal or temporary jobs are under-employed relative to men in permanent jobs. The coefficients are large, negative and statistically significant in the prefer fewer hours specification and large, positive and statistically significant in the prefer more hours specification. There are a number of possible reasons why workers in non-permanent jobs are more likely to desire an increase in their working hours. Such workers face more uncertainty regarding their future than permanent workers, and are less likely to enjoy fringe benefits. Men on fixed-term contracts or in seasonal or temporary employment may be willing to work more hours to offset lower job security. If temporary jobs are probationary then greater effort when employed in such jobs may increase the likelihood of permanency. Booth et al (2000) find evidence that temporary jobs are a stepping stone to permanent employment. Dissatisfaction with work hours may be exacerbated if the hours required are non-standard. Our findings support this, with men who do shift work more likely than those working a standard day to prefer to work fewer hours, and less likely to be unconstrained in their labour supply.

The prevailing hourly wage rate is an important determinant of labour supply preferences among men. In particular, over-employment is inversely related to the wage, while the probability of being unconstrained in hours increases with the current wage. Therefore men with relatively high hourly earnings have a smaller probability of being over-employed than men with low hourly earnings, perhaps preferring to take advantage of their greater earning power. Workers with higher hourly earnings are more likely to be unconstrained in their work hours, suggesting that such individuals are more able to

choose their hours of work, or are more efficient in finding employers who offer hour-wage packages that match their own preferences.

The coefficients on the occupation variable suggests that non-manual workers are over-employed relative to manual workers. Non-manual workers are more likely to prefer to work fewer hours and less likely to prefer to work more hours all things equal. Men working in large establishments have different work time preferences to those in small establishments. In particular, men employed at workplaces employing 100 or more individuals are over-employed relative to those in workplaces employing under 25 individuals, all things equal. Larger employers may be less flexible in the hours packages offered to employees.

Men employed on a part-time basis are more constrained in their working hours, and are under-employed in particular, relative to full-time employees. The coefficients are particularly large and well-determined, suggesting that men working part-time prefer to have a longer working week. It appears that they work part-time out of necessity rather than choice. Again this may reflect conditioning, with men expecting (or being expected) to work full-time.

Men with longer elapsed job tenure are more likely to be constrained in their choice of hours, and have a higher probability of preferring to work fewer hours. This suggests that such workers are over-employed, and provides evidence supporting specific human capital models. It implies that men with greater seniority receive a wage below their

marginal product to discourage contract termination by the firm in later years of an employment contract. Such contracts allow firms to benefit from accumulated firm-specific human capital.

Men that work in establishments covered by a trade union are less likely than those at non-unionised workplaces to be over-employed, and more likely to be unconstrained in the hours they work, but only if they are not members of the union. Union free-riders therefore appear to have very different work time preferences than union members, being happier with the hours of work they supply to the labour market. This may reflect greater encouragement among union members than non-members to voice their dissatisfaction with work hours (Bender and Sloane, 1998).

Male employees who receive regular bonus payments in their wage are more likely to be over-employed than those who do not. Employers may use such incentive schemes to compensate for stipulating a longer working week and to elicit greater effort from workers. The time spent commuting is also an important determinant of preferences with men who spend longer travelling to work more likely to be over-employed. The probability of being unconstrained is inversely related to commuting time – men who have a shorter commute are on average less constrained in their working hours. Time spent travelling to and from work is a fixed cost of employment that, in the absence of a subsidy, is borne by the worker.

A number of personal characteristics also have a significant impact on preferred working hours among men. The probability of over-employment increases until the age of 46, after which it declines. The probability of being unconstrained in work hours falls until the age of 42, after which it increases. Therefore it appears that prime-age working men are most constrained in their hours of work, and are over-employed in particular. Individuals may choose to work long hours when at the peak of their earnings potential, allowing for dissaving and under-employment in the later years of working life and retirement. Success in the formal education system has little influence on labour supply preferences, all things equal. In general, highly educated men have a lower probability of being under-employed and a higher probability of over-employment. However, these relationships are not statistically significant (with the exception of having 'O-Levels' or the equivalent in the prefer more hours specification and having a first degree in the prefer fewer hours specification).

Married – and to a lesser extent cohabiting - men have a higher probability of over-employment, and a lower probability of preferring to work the same number of hours than single never married men. The presence of older children in a family increases the probability of under-employment, which may reflect the need for higher incomes to cover the costs of raising a family. There is evidence supporting interdependence between preferences of family workers.<sup>15</sup> For example, a married man is significantly more likely to be over-employed if his wife is also over-employed. The point estimate can be calculated as  $0.27 - 0.09 + 0.35 = 0.53$ , compared to 0.27 for a married man with a non-

employed wife, 0.18 for a married man whose wife is unconstrained in her working hours, and 0.08 for a married man whose wife is under-employed. A married man with an employed spouse has a higher probability of being under-employed if his spouse is unconstrained in her hours of work (a point estimate of 0.23). An under- or over-employed spouse reduces the probability of under-employment among men (point estimates of  $-0.14$  and  $-0.33$  respectively). The probability of a married man having unconstrained working hours is especially reduced if his wife is over-employed (a point estimate of  $-0.40$ ).

Finally, men who live in travel-to-work areas with relatively high unemployment rates are under-employed, all things equal. Unemployment rates capture the local level of labour demand, and these coefficients support the conclusions of Stewart and Swaffield (1997), who suggest that a preference to increase labour supply results from increased job insecurity, fear of redundancy and reduced alternative job opportunities.

Table 8 shows that, as for men, women employed on fixed-term contracts are under-employed relative to those in permanent positions although the coefficients are not statistically significant at conventional levels. Women who work shifts are more likely to be under-employed, all things equal, and are less likely to be unconstrained in their labour supply. The probability of under-employment falls with hourly wages for women. Highly paid women may have no need to increase their work hours to attain their desired standard of living. Women in non-manual occupations are over-employed relative to

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<sup>15</sup> It can be argued that these variables are endogenous. We have estimated all models excluding the

manual workers – the coefficient is negative and significant in the prefer more hours specification. A similar relationship emerges between work-time preferences and formal education. The probability of over-employment increases with the level of education, while the probability of having unconstrained working hours falls with the level of education.

As for men, women employed on a part-time basis have a higher probability of being under-employed and a lower probability of being over-employed than full-time employees. However, in contrast for men, women in part-time jobs also exhibit a higher probability of being unconstrained in their work-time than full-time employees. This suggests that women working part-time are more likely to do so out of choice than men working part-time, and select into part-time work. We further investigate differences between the work-time preferences of men and women employed on a part-time basis later in the paper.

The relationship between job tenure and preferred working hours is the same for women than for men. Those with longer elapsed job tenure are over-employed, evidence in favour of the firm-specific human capital model. Trade union coverage and membership also have similar impacts on labour supply preferences for men and women. However, women in workplaces that recognise a trade union but who are not members have a higher probability of under-employment than non-covered workers. Again, this shows that union free-riders have very different work-time preferences than both union

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spouse's preferences, and the size and significance of other variables do not change as a result.

members and those employed in workplaces not covered by a union, or have a different propensity to express dissatisfaction.

Female employees who receive regular bonus payments in their wage are more likely to be constrained in their work hours, and be over-employed in particular. As among men, this is evidence suggesting that employers use such incentive schemes to compensate for a longer working week and to elicit greater effort. The opposite relationship emerges between work-time preferences and having regular opportunities for promotion. Promotion opportunities increase the probability of having unconstrained current labour supply for women, and reduce the likelihood of over-employment. This implies that women prefer to work longer hours if opportunities for promotion are available. Usual paid overtime is also a significant determinant of work-time preferences for women. In particular, women who work paid overtime hours are less likely to be over-employed and more likely to be unconstrained in the current arrangement. Paid overtime therefore appears to be a response to under-employment among women.

The probability of over-employment for women increases until the age of 51, after which it declines. The probability of having no hours constraint, however, falls until the age of 44, after which it increases. As for men, it appears that prime-age working women are least satisfied with their hours of work, and are over-employed in particular. The presence of young children in the family increases the probability of over-employment among women. It also reduces the probability of preferring to maintain the status quo. Child care costs and availability is an important issue that may influence the work time



preferences of mothers of pre-school age children in particular. If additional work hours require extra childcare costs, then parents may be unwilling to work longer hours. Women with larger immediate families are less likely to be under-employed, and more likely to be unconstrained all things equal.

Evidence of interdependencies among the labour supply preferences of family members emerges for women. A married woman is significantly more likely to be over-employed and less likely to be under-employed if her husband is also over-employed. Men and women take the preferences of their partners into consideration when formulating their own preferences. Women who live in travel-to-work areas with relatively high unemployment rates have a higher probability of under-employment and a lower probability of over-employment, all things equal. As for men, this suggests that work preferences are partly determined by macro-economic factors that affect perceived levels of job insecurity, fear of redundancy and alternative job opportunities.

### *Investigating gender differences*

To investigate gender differences in work-time preferences in more detail, we re-estimate the models pooling men and women and entering a gender term and several gender interaction terms. The results from this are presented in Table 9, and show that women are generally over-employed relative to men. Women have a higher probability of preferring to work fewer hours and a lower probability of preferring to work more hours. Men and women employed on a part-time basis are under-employed. The coefficients in the prefer fewer hours specification are estimated as  $-0.92$  for men and  $-0.92+0.17$ -

0.49=-1.24 for women, and in the prefer more hours specification are 1.12 and 0.77 respectively. However, women employed part-time are more likely than similarly employed men to be unconstrained in their labour supply – the point estimate for women is 0.43 compared to -0.19 for men. Therefore women working part-time are more likely than men to do so through choice.

The presence of young children in the family increases the probability of over-employment more for women than for men. For men, the coefficient in the prefer fewer hours specification is 0.04 and is not statistically significant from zero. For women, it is estimated as 0.44. This suggests that young children in the household particularly effect the work-time preferences of women, and increase the probability of over-employment.

## **Conclusions**

In this paper, we attempt to establish a profile of workers in Britain who would like to change their work hours. Such workers are out of equilibrium with respect to their labour supply, in the sense that they are under- or over-employed at the current wage. Various economic theories predict this, and recent empirical evidence provides confirmation. This contradicts the basic assumption of the standard theory of labour supply, that individuals choose their optimal number of working hours when faced with the attainable choice set of hours and earnings. Other implications are that observed working hours cannot be strictly interpreted as revealed preferences, and that workers will gravitate towards those employers who fix working hours close to their preferences. Employers stipulating unpopular working hours will experience difficulties recruiting and retaining workers.

Further, working hours, and the length of the working week, has received much recent attention from the media, with reports suggesting that British employees now work the longest hours in Europe.

We find that 40% of workers are constrained in their labour supply, and in particular that one third of employed men and women in Britain would like to reduce the length of their average working week. Multivariate analysis reveals important differences in the job, workplace and individual characteristics of those who prefer to work fewer hours and those preferring more hours. Men and women employed on a part-time basis have very different preferences than those working full-time. Although both men and women working part-time are under-employed, our evidence suggests that women are more likely than men to be working part-time through choice. Workers with longer job tenure have a higher probability of over-employment, supporting the firm-specific human capital hypothesis. We also provide evidence suggesting that interdependencies exist in family labour supply preferences. Married men and women are more likely to be over-employed if their spouse is also over-employed. A higher local unemployment rate is associated with under-employment, suggesting that low labour demand results in job insecurity, the fear of redundancy and reduces alternative employment opportunities. These results have implications for the possible redistribution of work time between workers in Britain.

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## Tables

**Table 1: Preferences over hours worked**

(Column percentages)

Preferences	Wave								Mean
	1	2	3	4	5	6	7	8	
<i>Men</i>									
Work fewer hours	34.2	32.2	34.0	35.1	36.1	36.6	34.0	34.8	34.6
Work more hours	8.2	8.6	8.9	9.1	9.0	6.8	7.6	8.1	8.3
Work same hours	57.6	59.2	57.2	55.9	54.9	56.6	58.4	57.1	57.1
<i>Women</i>									
Work fewer hours	27.7	27.9	27.9	30.0	32.3	29.5	31.1	34.4	30.1
Work more hours	10.0	10.3	10.8	8.7	10.1	9.1	8.8	7.0	9.3
Work same hours	62.3	61.8	61.3	61.4	57.6	61.4	60.1	58.6	60.6

Note: BHPS. Cross-sectional weights. N(Men)=14,515, N(Women)=14,574. Men:  $\chi^2=16.9$ , Prob >  $\chi^2=0.259$ .

Women:  $\chi^2=41.6$  Prob >  $\chi^2=0.000$ .

**Table 2: Preferences over hours worked by mean gross hourly earnings**

Preferences	Men		Women	
	Full-time	Part-time	Full-time	Part-time
Work fewer hours	7.44	6.65	6.28	4.65
Work more hours	6.11	4.75	4.36	4.51
Work same hours	7.14	5.13	5.70	4.77
<i>N</i>	13,589	733	9,511	4,892

Note: BHPS: Cross-sectional weights. Part-time employment defined as working less than 30 hours per week. Includes overtime earnings calculated as 1.5 times standard earnings. Deflated to Jan 1998 prices.

**Table 3: Preferences over hours worked by employment status**

(column percentages)

Preferences	Men		Women	
	Full-time	Part-time	Full-time	Part-time
Work fewer hours	36.0	9.3	40.4	9.9
Work more hours	6.9	34.2	4.3	19.2
Work same hours	57.2	56.5	55.3	70.9
<i>N</i>	13,755	760	9,641	4,933

Note: BHPS: Cross-sectional weights. Part-time employment defined as working less than 30 hours per week. Men:  $\chi^2=569.5$ , Prob >  $\chi^2=0.000$ .

Women:  $\chi^2=2121.9$  Prob >  $\chi^2=0.000$ .

**Table 4: Mean weekly hours of work by preferences over hours worked and employment status**

Preferences	Men		Women	
	<i>Full-time</i>	<i>Part-time</i>	<i>Full-time</i>	<i>Part-time</i>
Work fewer hours	48.5	16.2	42.0	19.8
Work more hours	42.9	14.3	37.5	14.6
Work same hours	44.5	14.8	39.2	17.3
<i>N</i>	13,589	733	9,511	4,892

*Note:* BHPS: Cross-sectional weights. Part-time employment defined as working less than 30 hours per week. Hours defined as hours worked in a normal week, including overtime, but excluding meal breaks.

**Table 5: Preferences over hours worked by whether employer has incentive schemes**

Preferences	Promotion opportunities		Bonus payments		<i>N</i>
	<i>Yes</i>	<i>No</i>	<i>Yes</i>	<i>No</i>	
<i>Men</i>					
Work fewer hours	54.1	45.9	30.7	69.3	5076
Work more hours	47.7	52.3	20.3	79.7	1213
Work same hours	54.5	45.5	26.9	73.1	8406
<i>Women</i>					
Work fewer hours	46.7	53.3	20.9	79.1	4418
Work more hours	32.8	67.2	12.6	87.3	1376
Work same hours	41.9	58.1	15.9	84.1	8937

*Note:* BHPS: Cross-sectional weights.

**Table 6: Transitions in preferences over hours worked**  
(row percentages)

Preferences at t	Preferences at t+1			<i>N</i>
<i>Men</i>	Worker fewer hours	Work more hours	Work same hours	
Work fewer hours	65.0	3.2	31.8	3,815
Work more hours	13.4	37.5	49.1	866
Work same hours	21.9	6.0	72.1	6,197
<i>Women</i>				
Work fewer hours	65.4	2.2	32.3	3,293
Work more hours	9.6	38.4	52.0	1,026
Work same hours	19.6	6.9	73.5	6,061

*Note:* BHPS: Cross-sectional weights. Men:  $\chi^2=2628.2$ , Prob> $\chi^2=0.000$ . Women:  $\chi^2=2916.3$  Prob> $\chi^2=0.000$ .

**Table 7: Random effects probit estimates of the determinants of preferred working hours: Men**

	Prefer less hours		Prefer more hours		Prefer same hours	
<i>Job characteristics</i>	Coeff	SE	Coeff	SE	Coeff	SE
<i>Contractual status<sup>a</sup></i>						
Fixed term contract	-0.3697	0.095	0.4852	0.101	0.0586	0.078
Seasonal/temporary job	-0.2241	0.099	0.1750	0.097	0.0322	0.078
Shift work	0.1157	0.043	-0.0971	0.059	-0.0747	0.038
<i>Wage</i>						
Log hourly wage	-0.3018	0.046	-0.0397	0.059	0.2494	0.040
<i>Occupation<sup>b</sup></i>						
Non-manual	0.1375	0.047	-0.2031	0.062	-0.0444	0.041
<i>Workplace size<sup>c</sup></i>						
Workplace 25-99 employees	-0.0292	0.046	-0.0514	0.061	0.0444	0.041
Workplace 100-499 employees	0.0118	0.058	-0.2428	0.084	0.0808	0.052
Workplace >500 employees	0.0919	0.048	-0.1789	0.067	-0.0138	0.043
<i>Sector of work</i>						
Charity	-0.1768	0.159	-0.2062	0.221	0.1992	0.139
Part-time job	-0.8817	0.108	1.2078	0.097	-0.2815	0.077
Industry dummies	Yes		Yes		Yes	
<i>Other job characteristics</i>						
Job tenure (years)	0.0111	0.003	-0.0076	0.005	-0.0093	0.003
Trade Union member	0.0172	0.041	0.0911	0.061	-0.0372	0.038
Trade Union coverage but not member	-0.2235	0.057	0.0787	0.075	0.1626	0.050
Receives bonus payments	0.1057	0.035	-0.1350	0.053	-0.0465	0.032
Regular promotion opportunities	-0.0547	0.034	-0.0199	0.049	0.0506	0.031
Received job-related training in last year	0.0141	0.033	-0.0720	0.049	0.0085	0.030
Usually does paid overtime	0.0190	0.038	-0.0768	0.052	0.0314	0.034
Travel to work time	0.0399	0.012	0.0010	0.018	-0.0352	0.011
<i>Individual characteristics</i>						
Age	0.1159	0.014	0.0006	0.018	-0.0868	0.012
Age <sup>2</sup> /100	-0.1252	0.017	-0.0298	0.023	0.1030	0.015
<i>Highest qualification<sup>d</sup></i>						
Degree or higher	0.2237	0.092	-0.1844	0.120	-0.1102	0.081
A Levels or equivalent	0.0752	0.069	-0.1408	0.088	0.0046	0.060
O Levels or equivalent	-0.0032	0.075	-0.1918	0.094	0.0805	0.065
Less than O Levels	0.0507	0.092	-0.0591	0.113	-0.0098	0.079
<i>Family<sup>e</sup></i>						
Married	0.2745	0.079	-0.0265	0.108	-0.2210	0.071
Cohabiting	0.1693	0.080	0.1002	0.106	-0.1611	0.071
Widowed/divorced/separated	0.1126	0.102	0.1196	0.135	-0.1296	0.091
Number of children	-0.0192	0.026	0.0722	0.036	-0.0098	0.024
Youngest child aged under 5	0.0083	0.054	-0.1123	0.077	0.0381	0.049
<i>Employment status of spouse</i>						
Spouse employed	-0.0918	0.068	0.2547	0.095	-0.0193	0.062
Spouse prefer more hours	-0.1033	0.060	-0.3703	0.084	0.2256	0.055
Spouse prefer less hours	0.3463	0.067	-0.5620	0.101	-0.1551	0.062
<i>Local labour market characteristics</i>						
Local unemployment rate	-0.2549	0.602	1.4768	0.836	-0.1470	0.536
Constant	-2.8585	0.254	-1.1429	0.316	1.6767	0.216
rho	0.4948	0.014	0.4768	0.024	0.4131	0.014
Log likelihood	-7785.8628		-3445.9465		-8865.4827	
Chi <sup>2</sup>	612.22		501.21		299.06	
N obs (individuals)			14401 (3681)			

Notes: BHPS waves 1-8. <sup>a</sup> Omitted category is permanent job. <sup>b</sup> Omitted category is manual. <sup>c</sup> Omitted category is workplace less than 25 employees. <sup>d</sup> Omitted category is no formal qualifications. <sup>e</sup> Omitted category is single never married.



**Table 8: Random effects probit estimates of the determinants of preferred working hours: Women**

	Prefer less hours		Prefer more hours		Prefer same hours	
<i>Job characteristics</i>	Coeff	SE	Coeff	SE	Coeff	SE
<i>Contractual status</i>						
Fixed term contract	-0.1376	0.096	0.1171	0.114	0.0818	0.081
Seasonal/temporary job	-0.0149	0.080	0.1204	0.077	-0.1088	0.062
Shift work	0.0600	0.043	0.1558	0.048	-0.1304	0.035
<i>Wage</i>						
Log hourly wage	-0.0398	0.047	-0.1298	0.057	0.0506	0.039
<i>Occupation</i>						
Non-manual	0.0687	0.050	-0.1157	0.056	0.0070	0.041
<i>Workplace size</i>						
Workplace 25-99 employees	-0.0373	0.044	-0.0293	0.054	0.0436	0.037
Workplace 100-499 employees	-0.0653	0.061	-0.0333	0.083	0.0630	0.053
Workplace >500 employees	-0.0141	0.050	-0.0074	0.066	0.0433	0.043
<i>Sector of work</i>						
Charity	-0.2166	0.103	-0.0416	0.132	0.1627	0.087
Part-time job	-1.3755	0.052	1.1235	0.060	0.4523	0.039
Industry dummies	Yes		Yes		Yes	
<i>Other job characteristics</i>						
Job tenure (years)	0.0129	0.004	0.0048	0.005	-0.0118	0.003
Trade Union member	-0.0270	0.043	-0.1041	0.064	0.0506	0.038
Trade Union coverage but not member	-0.2708	0.054	0.1538	0.065	0.1467	0.045
Receives bonus payments	0.1532	0.042	-0.0790	0.062	-0.1045	0.037
Regular promotion opportunities	-0.0729	0.036	-0.0157	0.048	0.0689	0.031
Received job-related training in last year	0.0218	0.035	0.0314	0.049	-0.0368	0.030
Usually does paid overtime	-0.2092	0.043	0.1377	0.054	0.1277	0.037
Travel to work time	0.0247	0.015	-0.0038	0.022	-0.0266	0.013
<i>Individual characteristics</i>						
Age	0.0739	0.016	0.0184	0.019	-0.0503	0.013
Age <sup>2</sup> /100	-0.0727	0.021	-0.0486	0.025	0.0580	0.017
<i>Highest qualification</i>						
Degree or higher	0.5859	0.099	-0.2295	0.124	-0.4208	0.083
A Levels or equivalent	0.3597	0.075	-0.1641	0.084	-0.2101	0.061
O Levels or equivalent	0.2204	0.075	-0.0730	0.082	-0.1629	0.061
Less than O Levels	0.1453	0.092	0.0175	0.098	-0.1768	0.074
<i>Family</i>						
Married	0.1077	0.094	-0.1986	0.121	-0.0365	0.080
Cohabiting	-0.1123	0.094	0.1708	0.117	0.0191	0.080
Widowed/divorced/separated	-0.0146	0.088	0.1069	0.109	-0.0656	0.075
Number of children	-0.0612	0.029	0.0137	0.034	0.0473	0.024
Youngest child aged under 5	0.2785	0.059	-0.1238	0.071	-0.1180	0.050
<i>Employment status of spouse</i>						
Spouse employed	0.0894	0.079	-0.1257	0.101	-0.0060	0.067
Spouse prefer more hours	-0.1283	0.052	-0.1051	0.069	0.1401	0.045
Spouse prefer less hours	0.3237	0.056	-0.1851	0.078	-0.2203	0.049
<i>Local labour market characteristics</i>						
Local unemployment rate	-1.8330	0.631	1.9651	0.810	0.2556	0.534
Constant	-2.1466	0.280	-1.8902	0.327	1.2326	0.229
rho	0.4756	0.015	0.4324	0.024	0.3888	0.014
Log likelihood	-7024.3415		-3668.9778		-8845.0301	
Chi2	1204.48		698.90		371.56	
N obs (individuals)			14580 (3796)			

Notes: BHPS waves 1-8. <sup>a</sup> Omitted category is permanent job. <sup>b</sup> Omitted category is manual. <sup>c</sup> Omitted category is workplace less than 25 employees. <sup>d</sup> Omitted category is no formal qualifications. <sup>e</sup> Omitted category is single never married.

**Table 9: Investigating gender differences in preferred working hours**

	Prefer less hours		Prefer more hours		Prefer same hours	
	Coeff	SE	Coeff	SE	Coeff	SE
<b><i>Job characteristics</i></b>						
Part-time job	-0.9230	0.103	1.1163	0.084	-0.1875	0.070
<b><i>Individual characteristics</i></b>						
Female	0.1682	0.039	-0.3484	0.053	-0.0471	0.034
Youngest child aged under 5	0.0417	0.050	-0.0437	0.070	-0.0123	0.046
<b><i>Interactions</i></b>						
Female*						
Part-time job	-0.4862	0.111	0.0007	0.093	0.6607	0.077
Youngest child aged under 5	0.2305	0.072	-0.1255	0.092	-0.0794	0.062
rho	0.4996	0.010	0.4529	0.017	0.4042	0.010
Log likelihood	-14865.129		-7159.1848		-17751.54	
Chi2	1759.92		1170.93		605.50	
N obs (individuals)			28981 (7477)			

Notes: BHPS waves 1-8. Includes all variables as in Table 9.

**Appendix: Descriptive statistics for variables in Table 8 and Table 9.**

<i><b>Job characteristics</b></i>	<b>Men</b>		<b>Women</b>	
	Mean	SD	Mean	SD
<i>Contractual status</i>				
Fixed term contract	0.0323		0.0315	
Seasonal/temporary job	0.0394		0.0566	
Shift work	0.2140		0.2590	
<i>Wage</i>				
Log hourly wage	1.8042	0.5373	1.5510	0.5091
<i>Occupation</i>				
Non-manual	0.5186		0.7111	
<i>Workplace size</i>				
Workplace 25-99 employees	0.2696		0.2775	
Workplace 100-499 employees	0.1190		0.1014	
Workplace >500 employees	0.3476		0.2548	
<i>Sector of work</i>				
Charity	0.0136		0.0334	
Part-time job	0.0501		0.3416	
<i>Other job characteristics</i>				
Job tenure (years)	4.9287	6.2445	4.0810	5.0094
Trade Union member	0.2513		0.2279	
Trade Union coverage but not member	0.0917		0.1146	
Receives bonus payments	0.2819		0.1796	
Regular promotion opportunities	0.5453		0.4326	
Received job-related training in last year	0.3689		0.3591	
Usually does paid overtime	0.3563		0.2015	
Travel to work time	1.6536	1.4762	1.3925	1.2150
<i>Individual characteristics</i>				
Age	36.5151	11.9204	36.2479	11.1828
Age <sup>2</sup> /100	14.7544	9.2150	14.3896	8.3284
<i>Highest qualification</i>				
Degree or higher	0.1406		0.1082	
A Levels or equivalent	0.4097		0.3355	
O Levels or equivalent	0.2070		0.2829	
Less than O Levels	0.0894		0.1032	
<i>Family</i>				
Married	0.5861		0.5767	
Cohabiting	0.1136		0.1255	
Widowed/divorced/separated	0.0469		0.0975	
Number of children	0.6058	0.9603	0.5912	0.9147
Youngest child aged under 5	0.1621		0.1245	
<i>Employment status of spouse</i>				
Spouse employed	0.5365		0.6356	
Spouse prefer more hours	0.2987		0.2663	
Spouse prefer less hours	0.1564		0.1809	
<i>Local labour market characteristics</i>				
Local unemployment rate	0.0727	0.0291	0.0738	0.0290