

## THE LONG TERM PAY-OFF FROM WORKING LONGER HOURS

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### Abstract

Using data from the first six waves of the British Household Panel Survey, we estimate the impact of working longer hours over 1991 to 1995 on 1996 wages. We find that there are positive but diminishing long-term returns, with the returns becoming negative beyond 47 hours for women and 59 hours for men. The returns are greater at the margin for “unpaid” hours than for “paid” hours. Evaluated at the mean, an extra unpaid hour over 1991 to 1995 raised 1996 pay by 4 percent, an extra paid hour by 1 percent. It also pays off to work longer hours than the norm for the industry. While there are no significant differences between the marginal effects for men and women, conditional on hours worked the incentives are greater for women than for men. These findings are consistent with the possibility that increasing UK wage inequality is associated with an upward impact on work hours.

**JEL Classification:** J22, J31

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## NON-TECHNICAL SUMMARY

- The working week in Britain, after falling over the previous century and a half, ceased its decline at the start of the 1980s. Within Europe, the longest average workweek amongst men is now found in Britain (45 hours in 1998). Nearly one in four employees does unpaid overtime, up from only 13% in 1983. This paper starts from the possibility that working longer hours could be a response to long-term incentives that have grown with rising wage inequality. We investigate whether there are any long-term incentives and if so compute their magnitude. In particular, we examine how far working longer hours is rewarded in later years with higher wages.
- We find that working longer in hours is indeed rewarded, but only up to a point. For women, the most substantial incentives are to work a normal full-time work week, rather than part time. For a woman working average hours each week between 1991 and 1995, one extra past hour raises pay in 1996 by 1½ percent.
- For men, most of whom work at least 40 hours, the future loss from working only 35 hours instead of the average 45 hours is substantial. For a man working average past hours, one extra past hour raises pay by 1 percent.
- There are no long-term incentives for working very long hours, either for men or for women. We can only deduce that working, say, 70 hours rather than 60 hours a week is driven by compulsion, by very low wages, or by a remarkable lack of aversion to work.
- An additional hour of unpaid overtime each week between 1991 and 1995 would increase 1996 earnings by approximately 4 percent, quite a lot more than the 1 percent marginal impact of paid overtime hours. This difference is to be expected, and explains why some workers are prepared to work a certain number of hours for no contemporaneous pay.
- For both men and women, those who work more hours than the norm for their industry are rewarded with higher pay in later years.
- The findings are relevant to any decision by governments to try to influence the length of the working week. Any such policies need to take account of underlying incentives as well as any hours rigidities.

## THE LONG TERM PAY-OFF FROM WORKING LONGER HOURS

### 1. Introduction

For the last century or more, the increasing affluence of nations has largely been accompanied by rising leisure time and declining work hours for the average worker. In Britain, apart from an interwar plateau, the average workweek declined fairly steadily from around 55 to 60 hours in the mid-19<sup>th</sup> century to around 37 hours at the start of the 1980s. But since then, in a number of countries including Britain, the decline in hours has been halted and in certain cases reversed. Within Europe, the longest average workweek amongst men is now found in Britain (45 hours in 1998)<sup>1</sup>. The stability of average hours since 1983 in Britain also conceals a distributional change in which the proportion of individuals working “long hours”, defined as over 48 hours per week, rose from 17 percent in 1983 to 20 percent in 1998 (Green, 2001). Four out of five “long hours” workers are men. A notable additional feature of the workweek trend in Britain is the rising proportion of employees who report working overtime hours for no extra pay – 12.8 percent in 1983, increasing to 23.7 percent in 1998.<sup>2</sup> Long hours have become again an area for public concern and intervention, with the Department for Education and Skills having recently published a report on the work-life balance (Hogarth *et al*, 2000), and since the introduction of the European Directive on Working Hours.<sup>3</sup>

Yet, if public policy is to be effective in enhancing welfare, there arises a need for better understanding of the reasons why some people work relatively long hours. This paper examines the possibility that working longer hours could be a response to long-term

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<sup>1</sup> *Social Trends*, 2001, no. 31, p84.

<sup>2</sup> Authors' calculations, derived from the U.K. Labour Force Survey. For those who did any, average hours unpaid overtime was 7.9 in 1983, and 7.1 in 1998.

<sup>3</sup> We say “again” because of course political and economic conflict over work hours have been centre stage at several earlier points in history, not least through parts of the 19<sup>th</sup> century.

incentives. The idea stems from another exceptional fact about Britain, namely that wage inequality has risen faster than elsewhere in the industrialised world (Machin, 1996). We draw on the analysis of Bell and Freeman (1995, 2001), who demonstrate that, in the U.S. and Germany, there is an incentive to work longer hours derived from future rewards. They argue that, since the U.S. labour market is more unequal than Germany's, U.S. workers on average choose to work longer hours than German workers because the long term rewards are greater. Using the same line of argument, in countries where wage inequality has risen, and where this is reflected in potentially steep wage profiles for those that can move up the wage distribution, it could be expected that the long-term incentives to work long hours are likely to have been enhanced in many countries since the start of the 1980s. That is, rising inequality could be associated with new incentives to devote long hours, and the break in the downward trend in the workweek and the rise in inequality would be causally linked.

To see whether such an explanation is plausible, this paper takes a first step by investigating whether there are any substantive long-term incentives in Britain for working long hours, and if so how strong they are. We also examine whether such incentives might have been affected by the above-mentioned distributional changes in hours and the rising importance of "unpaid" hours. We estimate how the marginal pay-off from extra work hours varies between part-time, full-time and very long hours workers, and according to whether those hours are rewarded contemporaneously (i.e. "paid" or "unpaid" hours). To the extent that long hours are driven by the prospect of future rewards, a rising wage profile (associated with greater inequality) then emerges as a potential source of greater hours, and hence a potential explanation for why the historical trend towards less working time has been arrested in the current era.<sup>4</sup>

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<sup>4</sup> We make no attempt, however, to model hours trends explicitly, something beyond the scope of this paper.

Theory suggests at least two reasons why current work hours may yield future, as well as current, rewards. First, longer work hours in the present permit greater investment in work-based learning and hence greater human capital. Second, unequal rewards linked to labour supply can be the outcome of optimal incentive contracts. For example, working long hours may deliver a signal to employers and to the wider labour market of greater commitment, including a greater propensity to work hard (Landers *et al*, 1996; Rebitzer and Taylor, 1995). Such a propensity is especially valued in circumstances where individual outputs are not easily identified and separately rewarded, as for example in partnerships or in jobs requiring high trust. Tournament models provide an alternative contract-theory based explanation for a link between current hours effort and future rewards. The theories are thus united in their implication that an extra hour of work is in part an investment with a future pay-off. Indeed, some hours of work need deliver no current rewards and yet still be chosen, if the future return exceeds the personal discount rate. Assuming that workers are, in the main, not in the long-run compelled to work for no current pay, we may expect to find that there is a substantive future return to these seemingly “unpaid” hours.<sup>5</sup> Under competitive conditions, the present value of the marginal unpaid hour will converge to that of the marginal paid hour. Then, since by definition the contemporaneous return to unpaid hours is zero, the future return to unpaid hours would be predicted to exceed the future return to paid hours. The differential may also be augmented by a risk factor associated with the chance that for some people unpaid hours might turn out to have no long-term rewards.

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<sup>5</sup> The alternative would be to assume that the marginal disutility of work for unpaid hours had fallen to zero – plausible perhaps for workaholics, but not as a general explanation.

The key question we wish to examine, therefore, is how earnings may be related, not just to current work hours, but to a range of measures of the hours of work effort devoted in the past. Some evidence that working long hours does have a future pay-off in Britain is provided by Francesconi (2001), who finds that working overtime hours is a factor in determining whether a worker receives a promotion in the subsequent 12 months. He also finds that part-time workers, whether male or female, are less likely to receive promotion. Since promotion leads, unsurprisingly, to future wage growth, Francesconi's results imply that there is a long term incentive to work full-time instead of part-time, and to work overtime. Here, our focus is not on promotion but on any route through which longer hours could lead to higher wages. We also take a longer-term perspective, in examining the effects of cumulative long hours over a number of years. We consider three different ways in which the past may impinge on the present. Initially, we measure past hours effort by the average number of hours worked per week over the previous five years. This measure is similar to that deployed by Bell and Freeman (2001). Simply including the average number of total weekly hours, however, may not adequately reflect the amount of personal investment made in demonstrating commitment or acquiring skills. The number of unpaid overtime hours the worker undertakes could be an important indicator of this investment. We therefore divide the average number of total hours worked per week over the past five year period into the average number of paid and unpaid hours. Finally, we also capture past worker effort in terms of the number of hours the individual works relative to the mean quantity of hours worked in their particular industry. This definition of effort would suggest that it is not the absolute quantity of hours worked that signals commitment, but the number of hours relative to other individuals within the same industry. To anticipate, we find that all three measures give evidence of a notable impact of past hours on present earnings. Unpaid hours turn out, however, to have the greatest impact. We also find that, while there are no substantive differences between the coefficients for men

and women, the incentives differ according to gender because they vary according to the number of hours worked.

We proceed as follows. Section 2 provides a brief description of the data sources and how they are used to create differing measures of past work hours. Section 3 then presents the detailed results, and discusses some additional estimations undertaken as checks on the robustness of the findings. Section 4 concludes.

## **2. Data Source**

The main source of data used in this study is the British Household Panel Survey (BHPS), which is a continuing longitudinal study of around 10,000 individuals from 5,000 households. The first wave of the BHPS was conducted in the final four months of 1991 and collected a large quantity of information relating to individuals' jobs, earnings, education and health. In the section relating to the main job currently held by the individual, data is available relating to the usual number of hours worked each week. The worker also reports the amount of overtime hours worked each week and how many of these hours are rewarded in terms of a payment. Using this information, it is possible to calculate the total number of weekly hours worked in 1991 as the usual hours of work plus any paid or unpaid overtime hours. Repeating this for the information in the 1992-95 waves of the BHPS, we derive our first measure of past hours effort as the average number of total hours worked between 1991 and 1995, *AVHOURS*.

Although working a high number of total hours may be one way of signalling a high level of commitment to the firm, an alternative signal may be for the individual to work some

additional overtime hours for which they receive no payment. Working such unpaid hours can indicate higher commitment or acquisition of transferable skills; either can allow the individual to be promoted more quickly and move further along the wage distribution associated with their occupation or industry. In order to incorporate this possibility, we identify in each of the 1991 to 1995 waves of the BHPS the total number of paid hours the individual does each week and the total number of unpaid hours. By taking the average over this five year period, we derive as our second measure of past effort the average number of unpaid hours undertaken (*AVUNPAID*), along with the average paid hours (*AVPAID*).

Measuring worker effort in terms of the quantity of hours worked suggests that individuals who work more hours are signalling more commitment to their employer. Somebody working, on average, a total of 60 hours per week over the 1991-95 period is viewed as being more committed than another individual working 50 hours per week. This may not, however, necessarily be the case since the 60 hour per week individual may be employed in an industry where the mean number of hours worked by employees is 60 per week. This worker, therefore, would not be displaying any additional effort relative to the average for their industry. Alternatively, the individual observed as working 50 hours per week may be located in an industry with a mean weekly workload of 40 hours per week. This extra 10 hours of work could be seen as additional effort displayed by the 50 hour per week individual even though in absolute terms they work less than the individual doing 60 hours per week.

Another way of measuring worker effort in the past, therefore, involves comparing the weekly hours of the individual with the mean hours of work observed for the individual's particular industry. In order to do this, we make use of data from the first quarter of the 1992 Labour Force Survey (LFS). This provides information on the usual number of hours worked per

week of 68,387 males and females working in the industrial groups identified by the three-digit Standard Industrial Classification. From this it is possible to calculate the mean number of hours usually worked per week across all individuals within each of the industrial groups in 1992.<sup>6</sup> A value representing the mean hours worked could then be assigned to each individual in the first wave (1991) of the BHPS according to their three-digit industrial classification. By subtracting this mean industrial value from the total number of hours worked calculated from the BHPS, it was possible to derive a variable for each individual giving the amount by which their hours of work deviated from the mean value observed in their industry, *HRSDEV92*.<sup>7</sup>

### 3. Empirical Findings

Having derived the variables from the BHPS and LFS capturing past worker effort in terms of total hours worked, the amount of unpaid hours undertaken and the deviation of hours from the industry mean, we attempt to determine whether higher effort in the past leads to higher current wages. As a way of presenting some initial evidence, Table 1 shows the mean wages of individuals in 1996 according to the weekly hours they worked on average over the period 1991 to 1995. To maintain large enough cell sizes we focus the analysis in this table on men currently working 40 to 48 hours, and on women currently working 30 to 40 hours. The table shows that, for both males and females, working longer hours between 1991 and 1995 is associated with earning higher wages in 1996 which offers some initial support for the idea

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<sup>6</sup> A measure of the mean number of hours worked in each industry could be computed from the BHPS itself, but the LFS measure is preferred since it is calculated from a larger sample than that available in the BHPS.

<sup>7</sup> Unlike the other effort variables (*AVHOURS* and *AVUNPAID*) which are calculated as mean values across the 1991-95 period, the industry deviation variable related to one specific year (1991) of the BHPS. This hours deviation variable could be slightly inaccurate since the total number of hours worked variable relates to the first wave of the BHPS, undertaken between September and December 1991, but the mean industry hours variable is derived from the first quarter of the 1992 LFS.

that workers with stronger commitment receive higher wages in the future. Particularly strong is the handicap experienced by female part-time employees (those working less than 30 hours) – they received approximately £54 less weekly pay compared to their peers who had worked between 30 and 40 hours.

In order to understand fully the effect that past hours of work have on current earnings, however, it is necessary to control for a variety of factors affecting earnings. Several versions of equation (1) are estimated where earnings in 1996 are regressed on a set of control variables,  $X$ , and the level of worker hours effort over the previous five years,  $HRSEFFORT$ .<sup>8</sup>

$$\ln Y_{i,1996} = \alpha + \beta X_i + \delta HRSEFFORT_i + \varepsilon_i \quad (1)$$

Equation (1) is estimated three times for two separate samples of males and females. Initially, the equation is estimated using the average number of total hours worked per week over the 1991-95 period ( $AVHOURS$ ) as the measure of effort. The equation is then re-estimated with total hours being divided into the average number of paid hours ( $AVPAID$ ) and unpaid hours ( $AVUNPAID$ ). Finally, (1) is estimated using the amount by which the worker's total hours reported in 1991 deviates from the mean associated with their industry ( $HRSDEV92$ ). In each case  $X$  is a vector of conventional controls for a weekly earnings equation, specifically age, age-squared, highest educational qualification, establishment size and the total number of hours worked per week (including overtime) in 1996. All of these variables are obtained from the 1996 wave of the BHPS, which is also used to derive the dependent variable of gross weekly pay. In addition, the rate of unemployment in the individual's current region of residence at the time of their 1996 interview is included as an explanatory variable, which is obtained from NOMIS.

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<sup>8</sup> We distinguish hours effort from work intensity (working harder in a given number of hours).

Table 2 presents the mean values for the different measures of past worker effort along with the mean number of total hours worked in 1996. The individuals contained within the samples are all employees working either full-time or part-time and with full information available for all of the other control variables in (1). It may be seen that, on average, between 1991 and 1995, men worked a total of 45.1 hours per week, while women worked 32.4 hours. Out of the total hours worked each week, men undertook an average of 2.5 hours of work that was unpaid, somewhat higher than the 1.4 hours for women. This difference only partly reflects the different proportions who worked any unpaid hours over the five years (39 percent for men, 32 percent for women). The figures for *HRSDEV92* also reveal that there is a tendency for men to work above the mean number of hours associated with their industry and women below.

Table 3 presents the detailed results obtained from estimating various versions of equation (1), separately for men and women. In all cases the coefficients on the conventional controls (not shown) had the anticipated signs. It may be seen from columns (1) and (4) that after controlling for total weekly hours worked in 1996, the average number of total hours worked per week over the period 1991 to 1995 (*AVHOURS*) exerts a positive impact on 1996 gross weekly pay. The significant negative coefficient on the quadratic term,  $AVHOURS^2$ , implies that the positive effect associated with past hours of work is diminishing. The point estimates imply a somewhat lower incentive for women than for men, but the differences are not statistically significant. The effect peaks at 47 hours for women and 59 for men, so that in either case there are no incentives for working especially long hours. The most important effect for women occurs in the incentive differences between working part-time and working

normal full-time hours. At the mean for women, one extra past hour raises pay by 1½ percent, while for men the impact at their (much higher) mean is close to 1 percent.

In the second set of regressions, reported in columns (2) and (5) of Table 3, the average number of total hours worked over the 1991-95 period is divided into the number of paid hours per week (*AVPAID*) and the number of unpaid hours (*AVUNPAID*). It could be argued that it is the number of additional hours worked by individuals beyond those which they receive payment for that is a stronger signal of commitment to the firm. The results indicate that after controlling for the current hours of work in 1996 and the average number of paid weekly hours between 1991 and 1995, each additional hour of previous unpaid work has a positive impact on current earnings. The magnitude of this effect is again estimated to be not statistically different between males and females. At 2.5 hours (the mean unpaid overtime for males), working an additional unpaid hour during the 1991 to 1995 period would increase earnings in 1996 by 4%. This compares with the marginal effect of raising average paid hours, which evaluated at the mean is just 0.8 percent. Thus, as predicted, the long-term pay-off from unpaid hours is, for the average worker, greater than the pay-off from paid hours.

For the final estimations of equation (1), we measure past effort in terms of the number of hours worked by the individual relative to the mean hours observed within their particular three-digit industrial group. Instead of a high absolute number of hours worked being a signal of effort, it may be the case that working more hours than the mean is a more suitable way for a worker to demonstrate their commitment to the firm. Columns (3) and (6) therefore include the amount by which the worker's total hours in 1991 deviate from the mean for their industry (*HRSDEV92*) as an alternative measure of effort. The sample sizes in these regressions decrease since *HRSDEV92* may only be calculated for those individuals who were employed,

and thus working a positive number of hours, in the first (1991) wave of the BHPS. It may be seen that working an additional hour above the mean raises earnings in 1996 at a diminishing rate. The magnitude of the effect is similar for males and females at low levels of hours deviation, but diminishes faster for females. Since women tend to work below, and men above, the industry average, the marginal effects at their respective means are greater for women (at 8 percent) than for men (at 5 percent).

### **Additional Estimations**

The results presented in Table 3 provide some evidence to support the hypothesis that working longer hours, either in terms of total hours, unpaid overtime, or relative to other workers in the same industry, exerts a positive impact on future labour market earnings. In order to check the robustness of these findings, some additional estimations were undertaken designed to address a number of issues that may alter the results. First, a significant proportion of workers switch firms or industries between the time that past effort and current earnings are observed. For example, in columns (3) and (6) of Table 3, where past effort is measured as the deviation of hours from the mean in 1992, some workers will be employed in a different industry when their earnings are examined in 1996. It could be the case that the effect of previous hours differs according to whether the worker remains in the same three-digit industrial group. According to either a signalling model or a human capital model, the effect of past hours effort may not be transferable across firms or industries. The consequence would be that any returns associated with long-hours work are limited to those who remain with the same firm. The wage equations involving the effort variable *HRSDEV92* were therefore estimated for separate samples of those who switched industries between 1991 and 1996 and those who experienced no change of industry. For men, the coefficients associated with *HRSDEV92* and *HRSDEV92*<sup>2</sup> for the separate samples of 572 non-switchers and 448

switchers were both found to be 0.006 and  $-0.0001$ , which is a comparable result to that presented in Table 3.

Another possibility is that individuals may elect to work longer hours not specifically in order to secure future wage growth, but to reduce the probability of being made redundant by the firm. Workers who have displayed more commitment to the firm in the past may be the ones least likely to be laid off during a downturn in the economy. In terms of equation (1), some workers will experience an unemployment spell between 1991 and 1996, which could have a negative effect on observed earnings in 1996. A number of studies have detected the existence of wage scarring effects associated with periods of unemployment (Arulampalam *et al*, 2001). Working long hours may therefore be one way in which an individual can avoid unemployment and any negative effect that such a spell of unemployment may have on their subsequent earnings. The positive wage effects associated with past effort in Table 3 could then simply be capturing the fact that more committed workers experience less unemployment than those working fewer hours. In order to address this, equation (1) was re-estimated with the inclusion of a dummy variable taking the value of one if the individual experienced any spells of unemployment between 1991 and 1996, but who were still observed as being in employment at the time of their 1996 interview.<sup>9</sup> The coefficient on the past effort variable then gives the effect that additional hours have on current earnings for individuals with similar recent experiences of unemployment. It was found that the inclusion of the unemployment control variable had little effect on the results presented in Table 3. For example, the estimated coefficients on the variables relating to total hours of work in the

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<sup>9</sup> For the samples of 1771 men and 1871 women identified in Table 3, 374 (21%) men and 272 (15%) women experienced a spell of unemployment between 1991 and 1996.

previous five years ( $AVHOURS$  and  $AVHOURS^2$ ) were 0.050 and  $-0.00042$  for men, which compares to 0.053 and  $-0.00045$  in column (1) of Table 3.

Finally, our estimates of the effect of past worker effort may be biased upwards as a result of not controlling for the socio-economic group of individuals in (1). It would be expected that individuals who are managers in 1996 receive higher wages when all else is held constant. If these individuals also tend to work more unpaid hours over the previous 1991-1995 period, the coefficient associated with  $AVUNPAID$  will be biased upwards since it will also capture the gains arising from being a manager. For the samples used in Table 3, 24% of the male workers, and 15% of the female workers are employed as managers in 1996. Three-quarters of the male managers and two-thirds of the female managers were observed as working unpaid hours during the previous five years. In addition, the mean number of unpaid hours of managers was found to be greater than that of non managers for both males and females.<sup>10</sup> It is possible, therefore, that the positive coefficient estimated for  $AVUNPAID$  is simply capturing the effect of being a manager. To allow for this potential source of bias, equation (1) was re-estimated with the inclusion of a dummy variable indicating whether the worker was a manager in 1996. The results obtained suggested that being a manager increased the weekly earnings of males and females in 1996 by 23% and 17% respectively. Following the inclusion of the dummy variable capturing management status, the estimated coefficients associated with past effort generally fell compared to those presented in Table 3. For example, the coefficients associated with past unpaid hours and its square were estimated to be 0.037 and  $-0.0012$  for men, and 0.042 and  $-0.0021$  for women.

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<sup>10</sup> For those doing unpaid overtime, male managers work on average 8.02 hours per week, compared to 4.93 for non-managers. Female managers work 6.21 hours per week on average, compared to 3.57 for non-managers.

Our preferred specification, however, remains that given in Table 3, because job-switching, unemployment spells and being a manager are all arguably associated in part with past work hours. By excluding these variables we capture the full effects of the past hours investment, including those that work through job-switching, or reduced likelihood of an unemployment spell, or increased likelihood of being or becoming a manager.

#### **4. Conclusions**

This study finds that working longer hours in Britain is positively related to future labour market earnings. This finding adds to the existing literature that has detected similar positive returns associated with past hours of work in the US and Germany (Bell and Freeman, 2001). However, we find that the impact of previous hours on current earnings is incorrectly captured by a simple linear indicator of average past work hours. It is important to differentiate the impact of past hours in a number of ways.

Unsurprisingly, investment in hours has diminishing returns. There are no long-term incentives for working very long hours, either for men or for women. We can only deduce that working, say, 70 hours rather than 60 hours a week is driven by compulsion, by very low wages, or by a remarkable lack of aversion to work. For women, the most substantial incentives are to work a normal full-time work week, rather than part time; for men, most of whom work at least 40 hours, the future loss from working only 35 hours instead of the average 45 hours is substantial. In general, the marginal incentives are somewhat greater for most women, because of their lower average hours. By the same token, however, the higher past hours of men contributes in part to the explanation of the traditional gender gap in contemporaneous work rewards.

Rather than just looking at total hours of work as a potential measure of worker effort, other methods for capturing long-hours work have also been explored. For example, some individuals may not work a high number of overall hours, but do a significant number of overtime hours for which they receive no payment. These additional hours of work may instead be rewarded at a later date, either directly or via promotion from their employer. The evidence presented in this paper suggests that such hours of unpaid overtime do significantly raise future earnings. When evaluated at the mean for men, an additional hour of unpaid overtime each week between 1991 and 1995 would increase 1996 earnings by approximately 4 percent, quite a lot more than the 1 percent marginal impact of paid overtime hours. This difference is to be expected, and explains why some workers are prepared to work a certain number of hours for no contemporaneous pay.

A further alternative way for measuring long-hours work involves comparing the number of hours worked by an individual to the mean value associated with their industry. Under this definition, an individual working 30 hours a week could be considered as working long hours if the mean hours of work for those in the same industry is 20 hours. On average, men are observed as working above the mean value of weekly hours for their industry, while women work less than the mean. It is found that each hour worked above the mean raises future earnings at a diminishing rate.

Although this study has detected a significant link between past hours of work and current labour market earnings, the relationship is consistent with more than one theoretical interpretation. One possibility, as discussed throughout, is that individuals work longer hours in order to signal a higher level of commitment to their employer. This may increase their

chances of securing promotion or a better job, and moving further along the wage distribution associated with their firm or industrial grouping. Such an interpretation is easily placed on the hours deviation model. A positive deviation may thus be seen as working above the expected norm. It is equally possible, however, that individuals choose to work longer hours in order to enhance their work skills, thereby raising their earnings capacity. The relationship between past hours and current earnings could therefore be consistent with either a human capital or signalling model.

In part, the significance of the findings is that they make the propensity to work long hours, and the associated cessation of the historical downward trend in average hours that used to be associated with increasing affluence of nations, consistent with the observation of radically increased UK wage inequality. The findings are also relevant for policy considerations. For example, they suggest that attempts by governments to encourage lower working time, perhaps to promote an improved work-life balance, may not be successful, unless they counteract the incentives that many employees face. We would conjecture that, where the European Directive on Working Time has had little or no impact on actual working time, this may be because employees are not prepared to give up the future returns that they expect to gain from long working. For women, the long-term cost of working short hours has implications for the continuing gender pay gap.

**REFERENCES**

- Arulampalam, W., P. Gregg and M. Gregory (2001). "Introduction: Unemployment Scarring." *Economic Journal* 111 (475): F577-F586.
- Bell, L. and R. Freeman (1995). "Why do Americans and Germans work different hours?" in Buttler, F. Franz, W., Schettkat, R., Soskice, D. (Eds.) *Institutional Frameworks and Labour Market Performance*. London: Routledge.
- Bell, L. and R. Freeman (2001). "The incentive for working hard: explaining hours worked differences in the US and Germany." *Labour Economics* 8(2), 181-202.
- Francesconi, M. (2001). "Determinants and consequences of promotions in Britain." *Oxford Bulletin of Economics and Statistics* 63 (3): 279-310.
- Green, F. (2001). "It's Been A Hard Day's Night: The Concentration and intensification of work in late 20th century Britain." *British Journal of Industrial Relations* 39(1), 53-80.
- Hogarth, T., Chris Hasluck and Gaelle Pierre (2000). *Work-Life Balance 2000: Baseline Study of Work-Life Practices in Great Britain*, Department for Education and Employment.
- Landers, R., J. Rebitzer and L. Taylor (1996). "Rat race redux: adverse selection in the determination of work hours in law firms." *American Economic Review* 86 (June): 329-348.
- Machin, S. (1996). "Wage inequality in the UK." *Oxford Review of Economic Policy* 12(1), 47-64.
- Rebitzer, J.B. and L.J. Taylor (1995). "Do labor-markets provide enough short-hour jobs - an analysis of work hours and work incentives." *Economic Inquiry* 33(2): 257-273.

Table 1

## Mean Current Weekly Wages according to Past Hours

| Current total weekly hours, 1996           | Average past total weekly hours   |                                   |                                   |
|--|-----------------------------------|-----------------------------------|-----------------------------------|
|  | less than 40 hours                | 40 – 48 hours                     | more than 48 hours                |
| <b>Men: 40-48 hours</b><br><i>N</i> =716   | £280.36 (119.01)<br><i>N</i> =120 | £302.81 (153.36)<br><i>N</i> =472 | £335.44 (175.85)<br><i>N</i> =124 |
|  | less than 30 hours                | 30 – 40 hours                     | more than 40 hours                |
| <b>Women: 30-40 hours</b><br><i>N</i> =759 | £148.85 (63.48)<br><i>N</i> =125  | £202.76 (89.18)<br><i>N</i> =521  | £229.13 (110.71)<br><i>N</i> =113 |

Table 2

## Summary Statistics for Current and Past Hours of Work

| Hours variable:                                       | Men           | Women          |
|---|---------------|----------------|
| Current total hours, <i>HOURS96</i>                   | 45.38 (10.48) | 33.09 (12.57)  |
| Average past total hours, <i>AVHOURS</i>              | 45.08 (8.56)  | 32.36 (12.05)  |
| Average past paid hours, <i>AVPAID</i>                | 42.58 (7.89)  | 30.94 (10.91)  |
| Average past unpaid hours, <i>AVUNPAID</i>            | 2.49 (4.66)   | 1.42 (3.40)    |
| Average past unpaid hours if <i>AVUNPAID</i> > 0      | 6.32 (5.56)+  | 4.43 (4.78)+   |
| Deviation from industry mean in 1992, <i>HRSDEV92</i> | 4.71 (10.49)* | -3.32 (12.55)* |
| <i>N</i>  | 1771          | 1817           |

## Notes:

1. Samples consist of both part-time and full-time workers.
2. Standard deviations in parentheses.
3. + denotes mean calculated from those who worked a strictly positive amount of unpaid overtime. 39% of males and 32% of females worked unpaid overtime between 1991 and 1995.
4. \* denotes mean calculated from samples of 1020 and 1006 men and women who were employed at the time of their 1991 interview and worked a positive number of hours.

Table 3

## Estimation of 1996 Wage Equation for Males and Females

| Variable                     | Men      |        |          |        |          |        | Women    |        |          |        |          |        |
|------------------------------|----------|--------|----------|--------|----------|--------|----------|--------|----------|--------|----------|--------|
|                              | (1)      |        | (2)      |        | (3)      |        | (4)      |        | (5)      |        | (6)      |        |
| <i>HOURS96</i>               | 0.012    | (7.21) | 0.011    | (6.88) | 0.011    | (7.08) | 0.031    | (17.5) | 0.030    | (17.1) | 0.034    | (17.7) |
| Past Effort:                 |          |        |          |        |          |        |          |        |          |        |          |        |
| <i>AVHOURS</i>               | 0.053    | (5.28) |          |        |          |        | 0.047    | (10.3) |          |        |          |        |
| <i>AVHOURS</i> <sup>2</sup>  | -0.00045 | (4.45) |          |        |          |        | -0.00050 | (7.73) |          |        |          |        |
| <i>AVPAID</i>                |          |        | 0.039    | (3.49) |          |        |          |        | 0.047    | (8.05) |          |        |
| <i>AVPAID</i> <sup>2</sup>   |          |        | -0.00036 | (3.04) |          |        |          |        | -0.00055 | (5.64) |          |        |
| <i>AVUNPAID</i>              |          |        | 0.050    | (5.79) |          |        |          |        | 0.050    | (7.21) |          |        |
| <i>AVUNPAID</i> <sup>2</sup> |          |        | -0.0016  | (2.89) |          |        |          |        | -0.0024  | (6.62) |          |        |
| <i>HRSDEV92</i>              |          |        |          |        | 0.006    | (3.19) |          |        |          |        | 0.006    | (3.33) |
| <i>HRSDEV92</i> <sup>2</sup> |          |        |          |        | -0.00012 | (2.86) |          |        |          |        | -0.00035 | (5.05) |
| R <sup>2</sup>               | 0.424    |        | 0.443    |        | 0.326    |        | 0.705    |        | 0.710    |        | 0.667    |        |
| N                            | 1771     |        | 1771     |        | 1020     |        | 1817     |        | 1817     |        | 1006     |        |

## Notes:

1. All regressions include controls for age, age-squared, establishment size, educational attainment and the regional unemployment rate.
2. Absolute values of *t*-statistics are in parentheses.