

## **JOB INSECURITY AND WAGE OUTCOMES IN BRITAIN**

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### **Abstract**

In 1996 and 1997, approximately 1 in 10 British workers thought that it was either likely or very likely that they would lose their job within 12 months. Increased job insecurity has been touted as a possible cause for the decline of equilibrium unemployment in Britain and the United States during the 1990s. We investigate whether perceptions of job insecurity contribute to lowering wages. First, we examine the validity of subjective questions about unemployment expectations, using longitudinal data. We find that workers' fears of unemployment are increased by their previous unemployment experience and by other household members' unemployment experiences, and are associated with other objective indicators of insecure jobs. The measure of unemployment fear also helps to predict future unemployment, above and beyond conventional objective variables. We then show that high fear of unemployment is associated with significantly lower wage levels. OLS estimates of the downward impact on average wages of an increase in this expectation by just one half of a standard deviation are approximately 1½ percent. Instrumental variable estimates suggest that 1½ percent is likely to be an underestimate. We conclude that increased job insecurity, relative to aggregate unemployment, has contributed in part to wage restraint in Britain.

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## JOB INSECURITY AND WAGE OUTCOMES IN BRITAIN

### 1. Introduction

The aim of this paper is to investigate the extent to which the perceptions of job insecurity held by workers contribute to lowering the level of wages. This issue is of interest for theories of wage determination offered by labour economists, but may also be relevant to macroeconomic questions surrounding the source of the inward shift of the Phillips curve, which has been observed on both sides of the Atlantic. Since the early 1990s, Britain has witnessed a period of low inflation, combined with falling unemployment. In early 2001, the underlying rate of inflation stood at 1.9%, having remained below 5% since 1992. In addition, the aggregate rate of unemployment, measured by the ILO method, fell to 5.2%, continuing its long and barely interrupted decline from 11% in 1993. This record of low inflation and low unemployment has generally exceeded expectations, based on the experience of the 1980s. The experience within that decade suggested that unemployment could not be reduced much below two million without re-stoking inflation, and formal estimates of the NAIRU appeared to confirm that unemployment rates of approximately 8% were the minimum that were sustainable without increasing inflation (Layard *et al*, 1991). In this light, the experience of the last ten years would appear to be an unexpected success. In every year from 1993 to 1999, unemployment was observed to be lower than generally predicted, and in most of these years, average earnings growth was also below the forecasted value (Wadwhani, 1999). A simple way of re-stating this experience would be to say that we have witnessed an inward shift in the short run Phillips curve. In the United States, a similar record was observed where low unemployment rates were sustained for several years, while inflation remained low.

At the individual level, there is now evidence emerging from research that job insecurity is deleterious for the welfare, including the mental health, of employees and their families (see the review in Green *et al*, 2000). Consistent evidence also exists that more secure workers record higher levels of job satisfaction (Blanchflower and Oswald, 1999). Some theoretical models of the economic consequences of job insecurity show that the effects of insecurity on unemployment are ambiguous (Groenewold, 1999), but all generate the intuitive prediction that raised insecurity causes lower equilibrium wages.<sup>1</sup>

There are two studies of which we are aware that empirically examine the effects of perceived insecurity on wages in the labour market (Blanchflower, 1991; Aaronson and Sullivan, 1998). Firstly, Blanchflower (1991) showed, using pooled cross-section data from successive British Social Attitudes Surveys (BSAS), that the fear of job loss through redundancy or plant closure was associated with significantly lower pay. Blanchflower's findings relate to the 1980s and since it is the impact of insecurity on wages in the 1990s which may be relevant when considering Phillips and/or wage curves, it is important to examine the role of insecurity in more recent years. In addition, only a very small proportion (around 5%) of Blanchflower's sample reported that they expected to leave their employer through redundancy, and even less (1%) feared the closure of their plant. With these proportions reporting insecurity, it is difficult to infer any substantial macroeconomic effect. It is also possible that measuring insecurity in terms of the fear of redundancy or plant closure understates the extent of insecurity relative to a measure derived from the fear of becoming unemployed. Finally,

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<sup>1</sup> Empirical evidence on the link between job security regulations and aggregate unemployment is also mixed. On balance there is found to be little or no impact, though job security provisions may raise the proportion of long term unemployed within the total (Addison and Grosso, 1996; Buchele and Christiansen, 1998; OECD, 1999).

Blanchflower was unable to examine whether the fears expressed by BSAS respondents were correlated with their subsequent experience.

In contrast to estimating a wage levels equation similar to that of Blanchflower, Aaronson and Sullivan (1998) use regional data to estimate a Phillips curve equation for the US which is augmented with a measure of average security (defined in terms of unemployment expectations). They find a negative point estimate for the relationship between nominal hourly wage growth and insecurity, although the effect is statistically insignificant. As stated by the authors, part of the reason for this imprecision may arise from using regionally averaged data.

In this paper, we utilise the first eight waves of the British Household Panel Survey (BHPS) in order to investigate the effect that perceived job insecurity has on wages at the individual level. Our approach is similar to that of Blanchflower (1991) in that we estimate a conventional wage equation that is augmented with a subjective measure of insecurity. In general, such subjective data has rarely been used in empirical analyses of the workings of the labour market. Although subjective data on product market expectations, businesses' investment intentions and consumer optimism have been used when modelling and forecasting economic performance, labour economists have typically concentrated almost entirely on objective data. There is, however, evidence to suggest that subjective data does have predictive power for explaining objective labour market variables (Clark, 2000).

The remainder of this paper comprises two main sections. In Section 2, we describe the subjective measure of job insecurity offered by the BHPS and then assess its suitability for inclusion in an individual earnings function. We present the results obtained from estimating ordered probit models designed to analyse the determinants of insecurity. These results

highlight the importance of past unemployment experiences and characteristics of the current job for the responses given by individuals to the question of insecurity. We then analyse the extent to which the expectation of unemployment is persistent from one year to the next, and also explore whether these expectations are consistent with actual unemployment experience in the future. Section 3 then presents the regression analysis relating to the impact that the measure of insecurity has on wages, while Section 4 concludes the study.

## **2. Subjective Perceptions of Job Insecurity: What do they measure?**

### **2.1 The BHPS Insecurity Measure**

The main source of data used within this study is the British Household Panel Survey (BHPS) which is a continuing longitudinal survey of a nationally representative sample of adults within 5,000 households. The first wave of the BHPS was undertaken in 1991, with subsequent interviews being held every year since. For the measure of job insecurity included within the wage equations estimated in Section 3, we refer to a specific question which was asked only in waves 6 and 7 (1996 and 1997) of the BHPS. In these two waves, individuals who are currently in either employment or self employment are asked:

“In the next twelve months how likely do you think it is that you will become unemployed?”

Individuals are required to respond on a four-point scale, ranging from “very likely” to “very unlikely”. The frequencies of responses on the four-point scale for each of the two waves are presented in Table 1. It may be seen that approximately 11% of workers in 1996 thought that it was either “likely” or “very likely” that they would become unemployed in the following

year, while in 1997, this figure declines to 10%.<sup>2</sup> This slight fall is in line with a similarly small decrease in the aggregate unemployment rate from 8% to 7% between these two years.

## **2.2 The Persistence and Determinants of Unemployment Expectations**

In this section of the paper, we consider the extent to which an individual's insecurity is persistent from one year to the next, the factors determining the reported value of insecurity, and the extent to which expectations of unemployment are realised in the following year. The first of these issues is important because if high levels of job insecurity are confined to a relatively small and static proportion of the population, the effect of fear of unemployment on wages would be limited to this minority group. The corresponding impact on overall wage restraint would then be minor. If, however, a fear of unemployment is held by different workers from one year to the next, then the wider impact on wages could be greater. Table 2 presents evidence on the extent to which fear is persistent from 1996 to 1997 (the only two years in which the job insecurity variable is available in the BHPS). Although four levels of fear may be reported (see Table 1), we define workers as being associated with "high fear" if they believe unemployment is "likely" or "very likely", and "low fear" if unemployment is believed to be "unlikely" or "very unlikely".

The figures presented in Table 2 suggest that there is a degree of persistence in unemployment expectations. Of those associated with high fear in 1996, 32% also report having high fear in the following 1997 interview. For those with low fear in 1996, 94% retain their low fear status

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<sup>2</sup> These figures are roughly comparable with responses to a similar but not identical question posed in The Skills Survey in Britain in 1997 (Green *et al*, 2000). In that survey, approximately 16% of employed persons felt that the chances of becoming unemployed within the following year were evens or greater than evens.

in 1997. The non zero off diagonal elements in Table 2, however, suggest that there is a substantial transition from one state of fear to another between 1996 and 1997. For example, 68% of those reporting high fear in the first year switch to having low fear a year later.

The important conclusion to be drawn from Table 2 is that the fear of unemployment is not simply confined to a small and constant proportion of workers. In any given year, a relatively high proportion of workers are fearful of becoming unemployed and there exists a degree of movement from one state of fear to another across years. With these dynamics, insecurity appears to be an issue that is potentially relevant to all workers in the labour force. It remains possible, however, that insecurity is most common in particular industries or occupations, and that the transition of workers from one state of fear to the other observed in Table 2 simply reflects mobility across these industries or occupations. Under these circumstances, an analysis of the effects of insecurity on wages may be more relevant to certain sectors of the economy, rather than to the economy as a whole. In order to investigate this possibility, we looked at the distribution of “high fear” and “low fear” workers across industry and occupational groups, as well as across various job characteristics and personal characteristics. In doing this, we found no evidence that high fear workers were disproportionately represented in any occupations or industries, relative to low fear workers. In addition, the incidence of fear is found to be similar according to firm size, gender, age, and educational attainment. There is some evidence, however, that workers fearing unemployment are located within jobs involving seasonal or fixed term contracts. For example, 23% of high fear workers do not hold permanent contracts, compared to only 5% among the group of low fear workers.<sup>3</sup>

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<sup>3</sup> These figures were produced by pooling the responses given in the 1996 and 1997 waves of the BHPS and examining the proportion of workers in the high and low fear categories associated with a range of job and personal characteristics.

Our subjective measure of job insecurity may be treated as more reliable if it is found to be related to certain personal experiences and objective characteristics in the expected way. Hence, the second issue we address is the factors that may be important in determining the level of unemployment fear reported by individuals in the 1996 and 1997 waves of the BHPS. Similarly, Green *et al* (2000) report the existence of a link between individual unemployment fear and regional unemployment rates. In this study, we seek to explain contemporaneous levels of fear in terms of the unemployment history of individuals since 1991 and other members of their household in the previous year, as well as a set of variables capturing the characteristics of the job currently held. Table 3 presents ordered probit estimates of the factors determining the fear of unemployment, where the dependent variable ranges from the value 1 (very unlikely) to 4 (very likely).

The first three variables included within the equation relate to past unemployment experiences and the rate of unemployment in the individual's region at the date of interview. Using the information contained within the BHPS waves prior to 1996 and 1997, it is possible to calculate the total number of weeks each individual has spent in unemployment from 1991 until the time at which they report their unemployment expectations. This variable, denoted by *WEEKUP*, is found to raise significantly the level of fear reported by workers in both waves, although the effect is only significant for men. We also tested whether a recent experience of unemployment has a greater impact on perceptions of insecurity than a more distant experience. The point estimate of the impact of a week's unemployment in the last year was

greater than the estimated impact of a week's unemployment in any of the prior years since 1991. However, the difference in the impacts was not statistically significant.<sup>4</sup>

That previous experience of unemployment should raise the subjective perception of unemployment risk is consistent with received psychological theories relating to how individuals compute subjective probabilities (Tversky and Kahneman, 1982). Previous personal experiences of an event are one of the factors that may be thought to heighten the "availability" of that option to the individual. Similarly, other close experiences of an event, such as via family or friends, are also found to raise perceptions of risk. In one example, a person's estimate of the chances of having a motor cycle accident is found to be greater, other things being equal, if a friend has recently been involved in an accident (Rutter *et al*, 1998). To investigate the analogous response in the case of unemployment risk, we calculated the number of weeks that other members of each individual's household spent in unemployment in the year prior to interview, denoted by *HOUSEUP*. This variable is likely only to be a rough proxy of the extent to which a worker comes into contact with unemployment experiences other than his or her own. In Table 3, it may be seen that recent household unemployment exerted a positive effect on fear for men in the 1996 wave, but for men in 1997 and for women in both years, the effect is insignificant. A higher rate of regional unemployment (*REGUNEMP*) at the time of interview is generally found to raise fear, which we interpret as individuals taking into consideration local labour market conditions when assessing their chances of unemployment.

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<sup>4</sup> For example, in predicting the level of fear given by men in 1996, each week of unemployment between 1991 and 1995 increased the index by 0.002 ( $t=2.013$ ), and each week of unemployment between 1995 and 1996 raised the index by 0.007 ( $t=1.387$ ).

Table 3 also reveals that several variables capturing the characteristics of the job currently held affect the level of insecurity reported by individuals. Those on fixed contracts (*CONTRACT*) and seasonal workers (*SEASONAL*) are associated with higher levels of fear. For females, private sector workers (*PRIVATE*) and those working part-time (*PART-TIME*) are more insecure than their public sector and full time counterparts, but these differences are insignificant for males. The coefficient attached to job tenure has the expected negative sign, but is not significant, and is very low in magnitude for women.

Along with age and sets of dummy variables indicating establishment size and educational attainment, the ordered probits reported in Table 3 include two attitudinal variables. Firstly, respondents were asked in 1996 to what extent they were concerned about unemployment in society generally, using a four-point scale. The variable *CONCERN* is set equal to one if the individual's response was in either of the top two categories. It is hypothesised that respondents who are concerned about unemployment in general may be more aware of their own personal risk of unemployment. The causation could, however, run in the opposite direction in that the fear of personal unemployment extends to a general concern regarding unemployment. It may be seen that the variable *CONCERN* does exert a positive effect on unemployment fear, although it is only significant for males in 1996. A second attitudinal variable included is whether the individual is satisfied with their job security. The variable *JOBDISSAT* is set equal to one if the respondent replied in the lower half of a seven-point scale, and zero otherwise. This variable is strongly associated with unemployment fear in all of the regressions. We do, however, recognise that dissatisfaction with security could be both the cause and consequence of higher unemployment fears. Excluding this variable from the estimations does not alter the pattern of results for the other reported coefficients.

When analysing the factors determining fear in the 1997 wave of the BHPS, we also include a set of dummy variables capturing the individual's level of fear given in the previous wave, 1996. The estimated coefficients reveal that for both males and females, a fear of unemployment in 1996 is associated with higher fear in 1997. For women, the effect is monotonic - the greater the fear in 1996, the greater the fear in 1997. These findings reinforce the evidence presented in Table 2, where the fear of unemployment is, to an extent, persistent.

### **2.3 Are Unemployment Expectations Reliable?**

In Section 2.2, it was shown that individuals' fear of unemployment is linked to their past unemployment experiences and to the type of job characteristics usually associated with fragile employment in the expected manner. However, the regressions in Table 3 also reveal that there remains considerable variation in unemployment fear that is unexplained. This unexplained variation is presumably linked either to private information held by individuals relating to their job, or to unmeasured variations in workers' subjective responses to given job situations. For the next stage of the analysis, we assess the reliability of the respondents' unemployment fears by examining whether such responses are consistent with actual unemployment experiences occurring in the subsequent year.

The first column in Table 4 reports the percentage of workers who experienced a spell of unemployment between their 1996 and 1997 interviews, or who are currently unemployed at the time of the 1997 interview, according to the level of fear expressed at the time of their 1996 interview. The second column presents the corresponding figures for actual

unemployment experiences between the 1997 and 1998 interviews.<sup>5</sup> It can be seen that subsequent unemployment experience is monotonically related to the level of reported fear in both years. For example, approximately 18% of workers claiming to be “very likely” to become unemployed at the time of their 1996 interview actually experienced unemployment by the time of their interview in 1997. This compares to only 2% of workers in the “very unlikely” category who actually went on to experience unemployment between their 1996 and 1997 interviews. From this, we conclude that respondents do possess useful information concerning their own unemployment prospects.<sup>6</sup> Nevertheless, in normal language one might take the response “very likely” to indicate at least an above-evens chance of the event happening. Since in practice the chances are much less we may infer that workers are prone to overestimate the unemployment risks they face. It is of interest that for several other types of risk there is known to be a tendency to underestimate risk. An important factor, however, is said to be the illusion of control, which allows individuals to downplay their chances of experiencing, say, a traffic accident (Rutter *et al*, 1998). A possible inference, therefore, is that individuals feel that they have little control over their chances of becoming unemployed.

From Table 4 it would appear that workers are able to arrive at a reasonable prediction concerning their chances of becoming unemployed. It could be argued, however, that a

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<sup>5</sup> This analysis is slightly inconsistent with the responses given by individuals to the insecurity question. Individuals are asked to express the chances of becoming unemployed within the next 12 months. The time between interviews, however, is not exactly 12 months for all individuals. As a check, we repeated the analysis in Table 4, calculating the proportions becoming unemployed within 12 months of the relevant interview date, but this made little difference to the results. We therefore interpret the insecurity question as the chances of becoming unemployed by the time of the next interview.

<sup>6</sup> As an additional validity check, expectations of unemployment are also quite closely correlated with expectations about future financial position. For example, in 1996, 32% of those who thought unemployment was “very likely” also expected their financial situation to deteriorate, compared with only 7% of those who thought unemployment was “very unlikely”.

researcher could be equally proficient at predicting subsequent unemployment experiences given an appropriate set of objective indicators about the worker's previous unemployment history and current job characteristics. An issue that remains is therefore whether the subjective measure of job insecurity reported by workers is a useful additional variable when attempting to predict subsequent unemployment. If such measures of insecurity capture private information held by workers relating to their job prospects, the inclusion of the subjective insecurity variable may be justified. In order to test whether self reported insecurity contains useful information relating to the probability of becoming unemployed in the subsequent year, we estimate various probit models, the results of which are presented in Table 5.

The results shown in columns (1) and (3) indicate that for each of the two years, the level of fear is positively and significantly related to actual unemployment experience over the subsequent year. The effect is also found to be monotonic with the estimated coefficients increasing with the level of fear. These findings are therefore consistent with those shown in Table 4. Columns (2) and (4) then report the results obtained from including an additional set of control variables along with the level of fear expressed by the individual. These variables relate to unemployment experiences since 1991, the change in regional unemployment over the subsequent year, and characteristics of the job held at the time that the worker reports their level of fear. The main finding is that the dummy variables capturing fear remain highly significant determinants of subsequent unemployment, although the magnitude of the effect is diminished. In testing the models represented by (2) and (4) against the restricted versions that do not include the fear dummies, the  $F$  statistics reveal that including the fear dummies does significantly raise the explanatory power of the model. This suggests that the workers'

perceptions of insecurity do contain useful private information for predicting future unemployment, which are not otherwise available to the researcher.

Table 5 also shows that the probability of becoming unemployed in the following year is positively related to the total number of weeks spent in unemployment since 1991 (*WEEKUP*), seasonal contracts (*SEASON*), fixed term contracts (*CONTRACT*) and being in the private sector (*PRIVATE*). Longer job tenure (*TENURE*) and working part-time (*PART-TIME*) lowers the chances of becoming unemployed, although the latter effect is insignificant for unemployment between 1996 and 1997. These variables were shown in Table 3 to be determinants of the level of unemployment fear and so may be seen as having a direct effect on unemployment experience and an indirect effect operating through unemployment expectations. Finally, the change in the regional unemployment rate between 1997 and 1998 exerts a small impact on unemployment experiences occurring within that period.<sup>7</sup>

### **3. The Impact of Job Insecurity on Wages**

Section 2 presented a descriptive analysis of the measure of job insecurity available in the 1996 and 1997 waves of the BHPS. In particular, it was seen that the expectations of unemployment reported by workers are associated with objective indicators relating to workers' past experiences of unemployment and certain characteristics of the current job. In addition, these expectations appear to be rational in that those individuals expressing the most fear of unemployment are more likely to actually experience unemployment in the following

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<sup>7</sup> Controls for gender and for the level of unemployment were insignificantly different from zero and the other coefficients in Table 5 are robust to their exclusion.

year. This subjective measure of insecurity contains useful information since its inclusion raises the explanatory power of models predicting future unemployment relative to models which only include conventional objective variables. Given this information, the measure of insecurity would seem to be a suitable variable that could be included within a wage equation. This section concentrates on the estimation of conventional wage equations augmented with the measure of insecurity in order to determine whether perceptions of job insecurity exert any influence on wages.

### 3.1 The Effect of Insecurity on Wage Levels

There are contrasting theories regarding the effect that job insecurity is expected to have on wages. In a competitive model, greater security could be seen as a compensating differential, which is a non monetary benefit that could be traded off against wages. Workers fearing unemployment would then be expected to earn higher wages, if all else is equal. In an imperfectly competitive labour market, however, greater job insecurity may lead to workers accepting lower wages (Blanchflower, 1991). In order to analyse the effect that perceptions of job security have on wages, we estimate an augmented conventional earnings equation for both 1997 and 1998:

$$\ln w_{i,t} = \alpha X_{i,t} + \beta REGUNEMP_{i,t} + \gamma UNEMPSPELL_{i,t-1} + \delta FEAR_{i,t-1} + \varepsilon_{i,t} \quad t = 1997, 1998 \quad (1)$$

In this equation,  $w$  is the deflated gross monthly wage<sup>8</sup> and  $X$  is a vector of standard human capital and other controls. In order to capture the impact of perceptions of insecurity it is important to control for any objective indicators of unemployment risk. Hence, we first

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<sup>8</sup> Gross monthly wages are deflated using the retail price index with January 1991 as the base month. We also experimented with deflating wages with an index of regional prices, derived from Reward Regional Cost of Living Surveys. This index is by no means ideal, but it reflects to some extent the difference in housing costs across regions. Using this index made very little difference to the estimates of the impact of insecurity on wages.

incorporate a wage curve specification into equation (1) by including a measure of regional unemployment in 1997 ( $REGUNEMP_t$ ).<sup>9</sup> The coefficient  $\beta$  is expected to be negative if higher unemployment in the local labour market lowers wages. Next we control also for individuals' own recent experience of unemployment. In Section 2, it was seen how a significant proportion of workers fearing unemployment in 1996(1997) actually become unemployed during the following year. If these workers find a new job by 1997(1998), the year in which equation (1) is estimated, a negative coefficient associated with fear may simply reflect the cost of losing the initial job. There is ample evidence for the existence of a substantive initial wage penalty from becoming unemployed in Britain, in the range 10 to 20% (Bell *et al*, 2000). For this reason, we include in equation (1) a dummy variable ( $UNEMPSPELL_{t-1}$ ) that is set equal to one if the worker experiences a spell of unemployment between the previous and current interviews. Finally, we include as a determinant of wages the perception of insecurity reported by the individual for the same period ( $FEAR_{t-1}$ ). The motivation for including fear lagged by one period rather than contemporaneous fear is that the effect that insecurity exerts on wages may not be instantaneous. With this specification the coefficient associated with fear in equation (1) captures the effect that insecurity has on wages after controlling for objective unemployment indicators.

When estimating equation (1) for 1997 and 1998 wages, we include individuals' unemployment expectations ( $FEAR$ ) in two different ways. In the initial estimations, we

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<sup>9</sup> Monthly regional unemployment data is assigned to individuals according to their region of residence at the time of interview. At regional and aggregate levels, the dynamics of wage equations remain controversial. Evidence supporting the inclusion of lagged regional/aggregate wages is given in Bell *et al* (2000), though they equally do not support a traditional Phillips curve specification. At the individual level, however, it is normal to incorporate regional or local unemployment into a conventional earnings equation.

generate the variable *INDEX*, which ranges from the value 1 (“Very unlikely” to become unemployed) to 4 (“Very likely”). This specification implies that the relationship between fear and log wages is linear (i.e. each one unit movement along the four point scale increases log wages by the same amount). The change in log wages between “very unlikely” and “unlikely” would then be the same as that between “unlikely” and “likely”. In an alternative version of equation (1), unemployment expectations are captured by a set of dummy variables covering each of the four possible responses to the question relating to insecurity. The excluded category in these estimations is “very unlikely” to become unemployed, meaning that the coefficient on the dummy covering the “very likely” category reflects the log wage penalty for those with the greatest fear relative to those with the least fear. Introducing unemployment expectations through three fear dummies relaxes the assumption of linearity between increments to fear and log wages that is imposed when *INDEX* is used in equation (1). Table 6 reports the OLS results obtained from estimating both versions of equation (1) for male wages in 1997, including and excluding the variable capturing unemployment spells between 1996 and 1997.

Column (1) of Table 6 presents the results obtained from equation (1) when unemployment perceptions are captured by an index ranging from one to four. The significant coefficient on *INDEX* implies that a one unit increase in the fear index lowers male wages in 1997 by 5.2%. It is possible, however, that the magnitude of this coefficient is overstated due to a failure to control for unemployment spells occurring in the previous year. If those experiencing an unemployment spell in the previous year have lower wages in 1997, and such individuals reported a high level of fear in 1996, the coefficient associated with *INDEX* may be overstated. The results from re-estimating the equation with the inclusion of a dummy variable for an unemployment spell in the past year are reported in column (4). It may be seen that

following the inclusion of this variable, the coefficient attached to *INDEX* falls slightly to -0.047. Those who experienced an unemployment spell between 1996 and 1997 earn 17.9% (or 0.197 log wage points) less than those who work continuously, suggesting that the cost of job loss is substantial.

It remains possible that the coefficient associated with *INDEX* in column (4) is biased due to the endogeneity of unemployment expectations. In equation (1), the hypothesis is that the level of fear is a determinant of wages, but it is possible that the causality runs in the opposite direction. For example, it may be the case that an individual receiving a wage in excess of the value of their marginal product is more fearful of becoming unemployed in the future. Under these circumstances, the coefficient associated with *INDEX* may be biased upwards, meaning that in column (4), the negative impact that fear has on wages is being understated. In order to allow for this possibility, equation (1) is re-estimated by 2SLS, treating *INDEX* as a potentially endogenous variable. The first stage of this process involves estimating a reduced form equation for insecurity which may then be used to compute predicted values for *INDEX*. This reduced form contains all the exogenous variables within equation (1) along with a set of instruments that are determinants of fear in 1996, but which may legitimately be excluded from the 1997 wage equation. Following the analysis in Table 3, we use as instruments the total time spent in unemployment since 1991, other household unemployment in the previous year, concern over unemployment in general, overall satisfaction with job security, the type of job contract, job tenure, private sector employment, and part-time employment.<sup>10</sup> All of these variables are reported at 1996 and so may be used as determinants of 1996 fear, but not 1997

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<sup>10</sup> Unlike the ordered probit estimation presented in Table 3, however, the reduced form equation is estimated by OLS with *INDEX* as the dependent variable ranging from one to four.

wages. The second step in the 2SLS estimation requires substituting predicted values for *INDEX* in place of the actual values. The results from undertaking this method of estimation are given in column (5), where it may be seen that the coefficient associated with *INDEX* almost triples in magnitude relative to the OLS estimate in column (4). Each increment up the insecurity index is now estimated to reduce wages by 13.3%. This wage penalty exists after controlling for the effects of job loss, which are estimated to lower wages by 14%.

Columns (3) and (6) of Table 6 present the results obtained from estimating the alternative version of equation (1) where perceptions of insecurity are captured by three dummy variables. This version relaxes the assumption that the relationship between insecurity and log wages is linear. Inspection of columns (3) and (6) reveals that wages decline monotonically with the level of fear, with those in the highest fear category being associated with the lowest wages. As anticipated, after controlling for unemployment spells occurring in the previous year, the negative effect of job insecurity is diminished, although the coefficients remain highly significant. Individuals who report being “very likely” to become unemployed at the time of their 1996 interview are estimated to earn 14.6% less than those who are “very unlikely” to become unemployed. Those in the “likely” or “unlikely” categories earn around 9% and 4% less than those in the “very unlikely” category respectively. As in the previous regressions, the wage penalty arising as a result of experiencing unemployment in the past year in column (6) is relatively large. In all of the regressions reported in Table 6, regional unemployment in 1997 exerts a significantly negative effect on 1997 wages.

The results obtained from a similar exercise for women are shown in Table 7. It may be seen that the pattern of results are similar to those obtained from the sample of male employees. Using the variable *INDEX* to represent unemployment perceptions, each increment to fear

lowers wages by 4.4% after allowing for the wage effects arising from recent unemployment, which lower wages by approximately 12%. The magnitude of the effect of fear increases slightly to 4.9% when the equation is estimated by 2SLS. This increase in the estimated fear effect, however, is considerably smaller than that observed in the male regressions. Replacing the term *INDEX* with three fear dummy variables produces similar results to that for the sample of males, with wages monotonically declining with higher fear. Women who believe in 1996 that it is “very likely” that they will become unemployed in the next year earn 18% less in 1997 than women who are “very unlikely” to become unemployed. Unlike the male regressions, regional unemployment exerts a positive impact on wages, although the effect is found to be statistically insignificant.

Tables 6 and 7 above present the results obtained from estimating equation (1) with 1997 wages being regressed on 1996 insecurity. The analysis was also repeated using 1998 wages as the dependent variable and respondents’ unemployment perceptions in 1997 as the main explanatory variable of interest. For men, the results from these estimations are given in Table 8. The pattern of results across the different columns is similar to that in Table 6 with the 2SLS estimates of the *INDEX* term exceeding the OLS estimates. When fear is included as a set of dummy variables, however, it may be seen that the relationship between wages and insecurity is no longer monotonic, although the coefficients remain negative and generally significant.

Finally, Table 9 reports the results obtained from estimating the 1998 wage equation for women. The estimated coefficients are essentially similar to those found in the 1997 equation (Table 7), although the 2SLS estimates of the *INDEX* term are smaller in magnitude, but still remain greater than the OLS estimates. The relationship between wages and the fear dummies

retains its monotonicity, but as in the 1997 wage equation, the coefficient associated with regional unemployment is insignificant.

### **3.2 Estimation Concerns and Robustness Checks**

The results obtained from estimating equation (1) for wages in 1997 and 1998 suggest that job insecurity exerts a negative and significant effect on wages. After allowing for the possible endogenous determination of insecurity, the magnitude of this effect increases, although the degree of significance is reduced. Tables 6-9 also indicate that the costs associated with recent job loss are large, with individuals experiencing a spell of unemployment in the previous year receiving significantly lower wages. In this part of the paper, we consider a number of factors which may generate concern over the validity of the results given in Section 3.1.

One potential problem with the results presented in Tables 6-9 arises from the use of lagged fear within the wage equation. Estimating the equation in this form requires the fact that individuals are employed not only in the year for which the equation is estimated, but also in the previous year since only those in employment are asked to give their perceptions of insecurity. It is possible, therefore, that some of the workers who are employed in the previous year, and respond to the insecurity question, are unemployed at the time of the subsequent survey. These individuals will not appear in the sample used for estimating the wage equation. The analysis in Section 2 suggests that the probability of being unemployed at the time of the following interview is greatest for those with the greatest level of perceived job insecurity. When estimating the wage equations, therefore, we may be excluding a disproportionately high number of individuals from the highest fear category relative to the lower categories of fear. This may bias the results since we are unable to observe the wages that some of those with the most fear of unemployment would have received had they remained in employment.

We therefore re-estimated the wage equations using Heckman's two-step procedure to correct for the potential selection bias arising as a result of this sampling restriction. For the first stage of this procedure, a probit was estimated for the probability of being in employment in 1997 (1998), given that the worker was also employed in 1996 (1997). The variables that are hypothesised as influencing the probability of being in employment at both dates are the amount of time spent in unemployment since 1991, the level of overall job satisfaction, highest educational attainment, and whether the respondent has any children during the year. The residuals from this probit are used to generate a selectivity term, which is then included in the wage equation. The results were not found to differ greatly from those reported in Tables 6-9. For example, in the 1997 wage equation for males that controls for unemployment in the previous year, the coefficient associated with *INDEX* was found to be -0.045 with a *t*-ratio of 3.109. This compares to a coefficient (*t*-ratio) of -0.047 (3.458) in Table 6, column 4.

In the regressions described previously, we included a dummy variable indicating whether an individual experienced a spell of unemployment between the time that their insecurity is recorded and the year for which the wage equation is estimated. This is done to ensure that any negative coefficient associated with fear is not simply capturing the fact that insecure workers become unemployed and are forced into taking a new job with a relatively low wage. An alternative approach is to focus solely on the wage behaviour of those workers who do not switch jobs, and who therefore do not experience any spell of unemployment. For the sample of 1800 males used in Table 6, 74% (1334) are not observed as switching jobs between the time of reporting their insecurity in 1996 and when their earnings are observed in the 1997 wave of the BHPS. Using this sample, the equivalent regression to that in column 4 of Table 6 yields a coefficient for *INDEX* of -0.039 with a *t*-ratio of 2.299, which is comparable to the

estimate in Table 6 using the full sample.<sup>11</sup> For women in 1997, a sample of 1374 non-switchers produces an estimated coefficient (*t*-ratio) of -0.040 (2.205).<sup>12,13</sup>

As an additional test of the findings reported in Section 3.1, we experimented with using a more disaggregated measure of the unemployment rate within the local labour market. Instead of measuring unemployment at the regional level, we included the unemployment rate within each individual's Travel To Work Area (TTWA).<sup>14</sup> This was found, however, to make little difference to the estimated coefficients presented in Tables 6-9. The pattern of coefficients associated with TTWA unemployment were found to be similar to those of the regional unemployment measure, and there were no substantial changes in any of the estimated coefficients for the variables capturing insecurity.

Finally, a possible concern is that our estimates of the impact of fear could be biased if there are unobserved individual-specific factors that are correlated with both wages and perceptions of insecurity. We are unable to eliminate such fixed effects with our data by means of panel estimates, owing to the absence of observations on perceived insecurity over a substantial number of waves.<sup>15</sup> Nevertheless our estimates of wage curve effects are not out of line with those estimated through fixed effects (Collier, 2001) and our estimates of the wage penalty

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<sup>11</sup> The variable *UNEMPSPELL* drops out of the regression since individuals who do not switch jobs do not experience unemployment in the previous year.

<sup>12</sup> The 2SLS estimate of *INDEX* for women, however, was estimated to be smaller in magnitude than the OLS estimate.

<sup>13</sup> The equivalent regressions for 1998 wages produce coefficients for *INDEX* of -0.050 (2.844) for men, and -0.026 (1.394) for women. The 2SLS estimate for males, however, was found to be -0.029 (0.618), which is smaller in magnitude than the OLS estimate.

<sup>14</sup> In a similar way to regional unemployment, monthly TTWA unemployment data was matched to individuals according to their TTWA and the month of their interview.

<sup>15</sup> Over the two waves available, relatively small numbers of respondents are switching between states of fear.

from job loss all fall in the range of previous estimates based on fixed effects models (Bell *et al.*, 2000). So there is some reason to believe that our OLS and 2SLS estimates of insecurity effects are not substantially biased through unobserved heterogeneity.

#### **4. Conclusions**

In the mid 1990s, a British politician once referred to job insecurity as a “state of mind”. In this paper, we have attempted to investigate whether this state of mind has a real origin in that workers’ perceptions of unemployment risk are associated with a set of objectively measured variables. In addition, we attempt to determine whether such subjective measures of unemployment risk convey additional information for predicting whether workers actually experience unemployment in the future. Given the level of unemployment fear reported by workers, we then consider whether such perceptions of insecurity are associated with wage restraint. The BHPS was used in order to analyse the expectations of unemployment given by respondents and the corresponding effect that such expectations have on wages in 1997 and 1998.

The first key finding of our study is that the level of unemployment fear reported by workers is related to a set of plausible objective variables. These variables include past experiences of unemployment and certain characteristics of the job currently held which are typically associated with fragile employment. Despite this, there remains some variation in the fear of unemployment that is not explained by past unemployment and characteristics of the present job. This unexplained variation could be entirely attributable to an unpredictable “state of mind” effect, or it could reflect the fact that individuals hold private information relating to their chances of becoming unemployed in the future that are not available to researchers.

Some evidence was found to support the latter interpretation since the probability of becoming unemployed in the subsequent period was found to be significantly greater for those reporting the highest levels of insecurity. This result held even after controlling for a range of conventional variables predicting unemployment. It would seem, therefore, that workers do possess valuable private information relating to the probability of becoming unemployed and this information is partly captured by their reported perceptions of unemployment.

The second main finding of the analysis is that the fear of unemployment is significantly associated with wage restraint. By estimating conventional wage equations augmented with fear, it was found that insecurity exerts a significantly negative effect on wages for both males and females. After allowing for the potential endogeneity of fear, we find that the magnitude of the effect rises, although its statistical significance is diminished. We also find that the negative effect of fear on wages is robust to a number of alternative specifications and sample selection criteria.

Our findings do not resolve the question concerning the source of the improved trade-off between unemployment and inflation in the economy. The findings do, however, suggest that the fear of unemployment is a significant factor in restraining wages. As we document elsewhere, there is some evidence that fears of job loss have risen relative to given levels of unemployment. Together, these two conclusions are consistent with the view that reduced equilibrium unemployment may be partially associated with greater labour market flexibility, but here we are concerned with what Bennett Harrison (1989) has termed the “dark side” of flexibility. This aspect of flexibility contrasts with the more optimistic view whereby increased matching efficiency (through improved child-care or greater use of flexible working hours) and higher productivity growth are the sources of the improved performance. If

equilibrium unemployment has decreased as a result of rising insecurity, it is also important to remember that insecurity is, in itself, associated with significant psychic costs.

A further implication of our findings is that subjective labour market indicators could be of substantial value for labour market analysis. It is disappointing that the series of BHPS questions on unemployment expectations was curtailed after just two waves. Nevertheless we believe that the same question could, with little cost and great benefit, be asked in the Quarterly Labour Force Survey, either every survey or, perhaps, annually. The information would provide an additional indicator both for macroeconomic policy purposes and for labour market analysts. For macroeconomic purposes, the unemployment fear indicator could serve as a predictor of wage restraint (or lack of it); for labour analysts the indicator could assist in identifying groups liable to unemployment who may be potentially targets for intervention. Our analysis suggests that the information would be additional to that recorded in objective measures, and that this information would carry substantive implications about subsequent economic experience.

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**TABLE 1****BHPS Fear of Unemployment in 1996 and 1997**

<b>Unemployment expectation:</b>	<b>1996 %</b>	<b>1997 %</b>
Very likely	3.0	2.6
Likely	7.9	7.2
Unlikely	50.8	49.2
Very unlikely	38.3	41.0
N	5122	5962

Source: BHPS Wave 6 (1996) and Wave 7 (1997).

Note:

Samples include males and females who were either employed or self-employed at the time of the relevant interview and gave a valid response to the question concerning unemployment expectations in the next 12 months – see text for details.

**TABLE 2****The Persistence of Unemployment Expectations**

		<b>1997 Wave</b>	
		<b>High Fear %</b>	<b>Low Fear %</b>
<b>1996 Wave</b>	<b>High Fear</b> (420)	32.1 (135)	67.9 (285)
	<b>Low Fear</b> (4015)	5.9 (237)	94.1 (3778)

Source: BHPS Wave 6 (1996) and Wave 7 (1997).

Notes:

1. High Fear indicates that the respondent answered “likely” or “very likely” to becoming unemployed within the next 12 months, while Low Fear denotes respondent answered “unlikely” or “very unlikely”.
2. Row percentages are reported. The figures in parentheses give the total number of individuals within each category. Individuals are only included if they were employed at the time of both waves and if they offered valid responses to the question relating to job security in both waves.

TABLE 3

## The Factors Determining the Fear of Unemployment

Variable:	1996 Wave				1997 Wave			
	Men		Women		Men		Women	
<i>WEEKUP</i>	0.003	(2.644)	0.002	(0.920)	0.002	(1.984)	0.002	(1.168)
<i>HOUSEUP</i>	0.005	(1.713)	-0.002	(0.655)	-0.003	(0.738)	0.001	(0.461)
<i>REGUNEMP</i>	0.042	(2.249)	0.010	(0.518)	0.032	(1.574)	0.036	(1.786)
<i>SEASONAL</i>	0.375	(2.052)	0.653	(4.907)	0.738	(2.989)	0.131	(0.819)
<i>CONTRACT</i>	0.498	(3.464)	0.053	(0.360)	0.289	(1.633)	0.075	(0.676)
<i>PRIVATE</i>	0.002	(0.019)	0.174	(1.932)	0.095	(0.853)	0.171	(1.736)
<i>TENURE</i>	-0.008	(1.670)	-0.005	(0.804)	-0.003	(0.521)	-0.006	(1.005)
<i>PART-TIME</i>	0.156	(1.094)	0.220	(3.777)	0.077	(0.469)	0.184	(2.849)
<i>AGE</i>	0.008	(2.880)	0.011	(3.897)	0.007	(2.590)	0.014	(4.378)
<i>QUAL1</i> (highest)	-0.171	(1.626)	-0.174	(1.593)	-0.118	(1.024)	-0.023	(0.189)
<i>QUAL2</i>	-0.030	(0.329)	-0.038	(0.413)	-0.044	(0.446)	-0.060	(0.592)
<i>QUAL3</i>	0.042	(0.409)	0.029	(0.277)	0.054	(0.478)	-0.072	(0.605)
<i>QUAL4</i>	0.028	(0.285)	-0.084	(0.950)	-0.093	(0.853)	0.023	(0.230)
<i>QUAL5</i> (lowest)	0.086	(0.734)	-0.023	(0.217)	0.092	(0.726)	-0.059	(0.489)
<i>SIZE2</i>	0.027	(0.433)	-0.062	(1.079)	0.003	(0.041)	0.020	(0.319)
<i>SIZE3</i> (largest)	-0.031	(0.382)	-0.243	(2.932)	-0.046	(0.532)	0.040	(0.460)
<i>JOBDISSAT</i>	0.951	(15.76)	0.928	(14.20)	0.992	(13.89)	0.835	(11.53)
<i>CONCERN</i>	0.278	(3.762)	0.114	(1.171)	0.110	(1.381)	0.075	(0.676)
<i>1996 Fear:</i>								
<i>Very likely</i>	-		-		0.643	(3.424)	1.545	(8.821)
<i>Likely</i>	-		-		1.054	(9.061)	0.960	(8.386)
<i>Unlikely</i>	-		-		0.570	(9.062)	0.601	(9.687)
<i>cut 1</i>	1.017	(3.390)	0.565	(1.305)	0.682	(2.193)	1.091	(2.398)
<i>cut 2</i>	2.863	(9.387)	2.369	(5.433)	2.681	(8.457)	3.077	(6.704)
<i>cut 3</i>	3.544	(11.47)	3.120	(7.107)	3.593	(11.09)	3.904	(8.414)
Pseudo-R <sup>2</sup>	0.0960		0.0796		0.1467		0.1241	
N	2024		2055		1862		1829	

Notes to Table 3:

1. The dependent variable ranges from 1 (very unlikely), which is the base category, to 4 (very likely) to become unemployed in the next 12 months. Estimation is by ordered probit maximum likelihood. t-ratios in parentheses.
2. *WEEKUP* is the number of weeks spent in unemployment from 1991 until the relevant survey for the individual. *HOUSEUP* is the number of weeks spent in unemployment in the year leading up to the relevant survey for other members within the household. *REGUNEMP* is the regional unemployment rate at the month of interview (using the 11 standard regions).
3. *SEASONAL* and *CONTRACT* equal one if the worker is employed seasonally or on a fixed term contract, with permanent contract workers being the excluded category.
4. *TENURE* is the number of years in the current job; *PART-TIME* indicates a part-time worker.
5. Highest educational attainment dummies are: *QUAL1* (first degree/higher degree), *QUAL2* (teaching/nursing/other higher qualification), *QUAL3* (A-levels), *QUAL4* (O-levels), *QUAL5* (Commercial qualification/CSE grade 2-5/Scottish grade 4-5) and *QUAL6* (no qualifications, excluded category).
6. Establishment size dummies are: *SIZE1* (1-24 employees, excluded category), *SIZE2* (25-499 employees) and *SIZE3* (500+ employees). All regressions also include one digit industry level dummies.
7. *CONCERN* equals one if individual reports being concerned about unemployment at 1996. This variable is unavailable in 1997, so the 1996 variable is also used for the determinants of fear at 1997. *JOBDISSAT* equals one if individual reports not being satisfied with their job security in the relevant survey year.

TABLE 4

## Unemployment Expectations and Realised Unemployment Experience

Unemployment expectation:	% unemployed from 1996 to 1997 interviews	% unemployed from 1997 to 1998 interviews
Very likely	17.6	11.4
Likely	8.3	9.5
Unlikely	2.8	4.0
Very unlikely	2.3	1.8
Mean unemployment rate	3.5	3.7
N	4842	5548

Note:

Samples include male and female employees and the self-employed.

TABLE 5

## Unemployment Probits

Variable:	Unemployment 1996 to 1997		Unemployment 1997 to 1998	
	(1)	(2)	(3)	(4)
<i>Fear:</i>				
<i>Very likely</i>	0.164 (6.85)	0.116 (6.37)	0.161 (6.05)	0.113 (5.02)
<i>Likely</i>	0.064 (4.66)	0.025 (2.93)	0.102 (6.45)	0.065 (5.14)
<i>Unlikely</i>	0.003 (0.56)	0.0002 (0.06)	0.025 (4.04)	0.019 (3.94)
<i>WEEKUP</i>		0.0002 (4.51)		0.0003 (6.54)
<i>CHNGUNEM</i>		0.002 (0.53)		-0.012 (2.27)
<i>SEASONAL</i>		0.022 (2.22)		0.039 (3.21)
<i>CONTRACT</i>		0.044 (3.60)		0.009 (0.80)
<i>PRIVATE</i>		0.012 (2.90)		0.012 (2.41)
<i>TENURE</i>		-0.003 (4.50)		-0.002 (3.08)
<i>PART-TIME</i>		-0.005 (1.10)		-0.016 (3.25)
Pseudo-R <sup>2</sup>	0.0498	0.1845	0.0431	0.1549
N	4020	4020	4540	4540

Notes:

1. The dependent variable equals one if a worker experienced a spell of unemployment in the year following the interview or is unemployed at the time of the subsequent interview. Estimation is by maximum likelihood probit.
2. Columns (2) and (4) also include additional human capital controls for age, age-squared, firm size, and highest educational attainment. See also Notes to Table 3.
3. The coefficients on the dummy variables give the discrete change in the probability of experiencing unemployment, evaluated at the means of the other variables; the coefficients for the other variables are marginal effects.





Notes to Tables 6-9:

1. Dependent variable is usual gross monthly pay deflated by retail price index.
2. Other control variables not reported are age, age-squared, weekly hours, four establishment size dummy variables and six highest educational attainment dummies.
3. Excluded category of fear in columns (3) and (6) is “very unlikely” to become unemployed.