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Reservation Wages, Expected Wages and Labour Market Outcomes: Analysis of Individual Level Panel Data

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Abstract:

Using individual level panel data, we analyse the divergence between an unemployed individual's reservation wage, as well as their expected wage, and their predicted market wage, focusing upon how job search activities influence the potential divergences. In addition, using propensity score matching techniques, we explore the implications of such divergences for future employment and wages. Our findings, which are consistent with job search theory, suggest that reservation wages (and expected wages) that are high relative to the predicted market wage influence both future employment and future wages.

Key Words: Employment; Job Search; Reservation Wages
JEL Classification: J13; J24

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I. Introduction and Background

The reservation wage, the lowest wage at which an individual is willing to work, plays an important role in labour market theory. In particular, the reservation wage plays a key role in theoretical models of job search, labour supply and labour market participation (see, for example, Mortensen, 1986, Mortensen and Pissarides, 1999, and Pissarides, 2000). Despite the important theoretical role played by the reservation wage in labour market theory, there is a scarcity of empirical research which explores the setting of reservation wages at the individual level, with much of the existing literature focusing on how reservation wages affect the duration of unemployment, see, for example, Lancaster and Chesher (1983), Addison *et al*. (2008) and Blackaby *et al*. (2007). Little is known, however, about how individuals set their reservation wages and, in particular, about the relationship between reservation wages and the mean distribution of market wages. The lack of empirical research into how realistic the reservation wage is relative to wages prevailing in the economy is surprising: the level of the reservation wage relative to market wages clearly influences the probability that an individual will receive a 'suitable' job offer. According to job search theory, an individual exits unemployment once he/she receives a wage offer equal to or in excess of the reservation wage, see, for example, Mortensen (1986). Hence, from a theoretical perspective, the level of the reservation wage relative to the market wage plays a crucial role in the transition from unemployment to employment.

In this paper, we aim to redress this gap in the existing literature by focusing on the potential divergence between an individual's reservation wage and their predicted market wage, conditioned on the individual's characteristics such as human capital and labour market experience. In particular, we focus on how job search activity influences this relationship. Using propensity score matching techniques, we also explore the implications of such a divergence for future employment and wages.

Thus, we aim to build on the scarce empirical literature exploring the setting of reservation wages at the individual level. To be specific, our focus is on whether individuals' reservation wages are realistic given their human capital and the prevailing economic climate. In addition to exploring the reservation wage, we investigate the relationship between the wages that unemployed individuals (and those out of the labour force) expect in a given job and the corresponding wages prevailing in the labour market. Hence, we conduct comparative analyses of the reservation wage and the expected wage. Empirical analysis of reservation wages and the expected wages of unemployed individuals and those currently out of the labour market will shed light on whether such individuals have realistic labour market aspirations and how job search activities shape such aspirations and expectations.

II. Data

Our empirical analysis is based on panel data drawn from the *British Household Panel Survey* (*BHPS*). The *BHPS* is a random sample survey, carried out by the *Institute for Social and Economic Research*, of each adult member from a nationally representative sample of more than 5,000 private households (yielding approximately 10,000 individual interviews). For wave one, interviews were conducted during the autumn of 1991. The same individuals are re-interviewed in successive waves – the latest available being wave fifteen, collected in 2005. Our empirical analysis is, however, restricted to waves 6 to 15 given data availability relating to key variables, which provide information on job search activities.[1]

The defining feature of the *BHPS* for our empirical analysis is that if the respondent 'is not currently working but has looked for work in the last week or last four weeks or has not looked for work in the last week or last four weeks but would like a job', he/she is asked to

[1] Our period of study coincides with the introduction of the Job Seekers Allowance in the UK, which tightened the job search requirements for benefit eligibility. As detailed by Manning (2005), all claimants had to sign a Job Seeker's Agreement indicating: the type of job sought; when the claimant is able to work; and the steps taken to identify and apply for jobs.

specify: '*what is the lowest weekly take home pay you would consider accepting for a job?*'[2] In addition, unemployed individuals and those out of the labour market are asked: '*are you looking for a particular kind of job or any sort of job you can find?*' If individuals indicate that they are looking for a particular kind of job then they are asked: '*what sort of job are you looking for? Could you give me a possible job title and describe the sort of work you will be doing?*' The respondents are then asked: '*what weekly take home pay would you expect to get for that job?*' Hence, responses to the first question reveal the reservation wage, whilst responses to the last question yield information pertaining to expected wages.[3,4] We analyse an unbalanced panel of data which comprises 6,202 (5,431) individuals when focusing upon the reservation (expected) wage,[5] where the maximum number of times an individual can be in the sample is 10 years, the minimum is 1 year and the average is 2 years. Furthermore, we are able to distinguish between those who are unemployed and those individuals who are out of the labour market by the individual's response to questions about their current economic status: 59% of our sample is reported to be out of the labour market.[6]

[2] Given the reference to 'weekly take home pay' in the question, it seems reasonable to assume that respondents would refer to the net (i.e. after tax) wage. Hence, throughout the forthcoming analysis we focus on weekly net pay. We have also conducted the analysis based on hourly pay, the results of which are available on request.

[3] Hofler and Murphy (1994), who use stochastic frontier techniques to estimate reservation wages for a sample of employed individuals, argue that the reservation wages declared by individuals in surveys may be measured inaccurately. For example, individuals may not be well-informed enough to provide an accurate answer or it may be difficult to factor in non-wage characteristics of jobs, which may entice individuals into accepting job offers. However, this is at odds with evidence provided by Dominitz (1998) and Hogan (2004) where subjective measures of earnings are, on average, found to be relatively accurate.

[4] The reservation wage and the expected wage are highly correlated at 0.89, which is statistically significant at the 1 per cent level. Gorter and Gorter (1983) in their analysis of the Dutch Socio-Economic Panel, 1985 to 1987, report 44.17% of total observations where the reservation wage equals the expected wage. In the *BHPS*, for our sample of individuals who are unemployed or out of the labour market, 7.9% specify a reservation wage equal to the expected wage (8.4% for the unemployed and 5.9% for those out of the labour market). Hence, in contrast to the findings of Gorter and Gorter (1983), this suggests that individuals do distinguish between the two concepts.

[5] The sample size is smaller for the expected wage due to the question routing of the *BHPS* where individuals are only asked about their expected wage if they give a specific job title (see above).

[6] We define being out of the labour market as: maternity/ paternity leave; family care; full time student; long term sick or disabled; government training scheme; and other unspecified non labour force activity. We have also conducted our analysis on a restricted sample of unemployed individuals. The key results, which for brevity are not reported here, accord with those based on the larger sample containing the unemployed and those classified as out of the labour market.

We compare both the reservation wage (rw_{it}) and expected wage (ew_{it}) with individuals' predicted wages, $\hat{w}_{it}^{U}$, which are based upon the predicted wages for individuals who are unemployed or out of the labour market, *U*. This is constructed following Hogan (2004) and Prasad (2003), by estimating a standard wage equation for employees who have less than one year of current firm tenure. Tenure is restricted to one year or less since the wages of these employees are more likely to reflect current labour market conditions than if all employees, regardless of tenure, were used. The wage equation is estimated as a semi log model where w_{it}^{E} represents the wage of employees, *E*, H_{it}^{E} is a vector of employee characteristics,[7] and ν_{it} is a random error term, $\nu_{it} \sim \text{IN}(0, \sigma_{it}^{2})$:

$$\begin{aligned} w_{it}^{E} &= \gamma' H_{it}^{E} + \nu_{it} \\ \hat{w}_{it}^{U} &\equiv \hat{w}_{it} = \hat{\gamma}' H_{it}^{U} \end{aligned} \qquad (1)$$

The estimated coefficients $\hat{\gamma}$ are then used to predict a wage for each individual who is unemployed or out of the labour market based upon their characteristics, H_{it}^{U} ($H_{it}^{U} = H_{it}^{E}$), as shown in equation (1). Figure 1 presents the distributions of the logarithm of the reservation wage, the logarithm of the expected wage, and the logarithm of the predicted market wage, where each wage distribution appears normally distributed and the mean of the predicted market wage is lower than that of either the reservation wage or the expected wage.[8]

[7] We control for sample selection into employment by including an inverse mills ratio term in the wage equation. Covariates included in the wage equation are: gender, a quadratic in age; highest educational attainment; ethnicity; marital status; and regional and year controls. The over-identifying instruments used to control for sample selection bias are: whether the respondent has any dependent children aged less than 5; whether the respondent has any dependent children aged 5-16; and whether the respondent's partner is the primary child carer. The estimated wage equation accords with the existing literature with, for example, a positive estimated relationship between education and earnings and a concave relationship between earnings and age.

[8] We have also compared the reservation wage and the expected wage to actual wages calculated from the Labour Force Survey (*LFS*) and also the New Earnings Survey (*NES).* We calculate average wages for each occupation for each year in each region from both the *LFS* and *NES*. We then compare the individual's reservation wage, as well as the wage that the individual expects to receive in this particular occupation, with the average regional wage that individuals in employment actually receive in this occupation. The correlation between the *LFS* or *NES* net wage and the predicted net wage from the *BHPS* is around 0.55 and is statistically significant at the 1 percent level. The empirical findings which follow are generally consistent with this alternative definition of the market wage.

III. Reservation Wages, Expected Wages and Market Wages

Focusing on the sample of unemployed individuals and those out of the labour market, we firstly explore the relationship between individual *i*'s reservation wage at time period *t* (rw_{it}) and their predicted wage at time *t* ($\hat{w}_{it}$) by specifying a multinomial logit model as follows:

$$P_{it} = \begin{cases} 0 \quad if \quad rw_{it} > \hat{w}_{it}(1-d) \\ 1 \quad if \quad rw_{it} \in \left[\hat{w}_{it}(1-d), \hat{w}_{it}(1+d)\right] = X_{it}\beta_1' + JS_{it}\lambda_1 + \varepsilon_{it} \\ 2 \quad if \quad rw_{it} < \hat{w}_{it}(1+d) \end{cases} \tag{2}$$

where ($d \times 100$) represents the percentage point differential between rw_{it} and $\hat{w}_{it}$. To be specific, P_{it} equals 1 if rw_{it} lies within plus or minus ($d \times 100$) % of $\hat{w}_{it}$ where we explore three differentials: 3%, 5% and 10% to see whether the extent of the differential is important, i.e. $d = 0.03$, $d = 0.05$ and $d = 0.10$, respectively. In our sample, 63.2%, 62% and 59.1% of individuals have a reservation wage which lies within plus or minus 3%, 5% and 10%, respectively, of the predicted market wage, whilst the corresponding figures for the expected wage are 59.3%, 58.1% and 54.9%. In addition, X_{it} is a vector of individual characteristics (time varying and non time varying) and ε_{it} is a random error term, $\varepsilon_{it} \sim \text{IN}(0, \sigma_{it}^2)$. We repeat our analysis replacing rw_{it} with ew_{it}, the expected wage of individual *i* in time period *t*. Our focus is on a categorical variable in order to define the treatment in the propensity score matching analysis presented in Section IV.

The explanatory variables in equation (2), denoted by the vector X_{it}, include: gender; ethnicity; aged 25 to 34; aged 35 to 44; aged 45 to 54; aged 55 to 65 (with aged 18 to 24 as the omitted category); number of children; number of individuals in the household; married or cohabiting; highest educational attainment (first or higher degree, teaching or nursing, A levels and GCSE, with no education as the omitted category); the logarithm of household labour income; the logarithm of household asset income; the logarithm of household benefit income; following Falk *et al*. (2006), the logarithm of the wage in the previous or last job, which is set

to zero if there is no previous job; the logarithm of monthly rent or mortgage repayments to proxy housing costs; the regional unemployment rate, which is included to control for regional differences in the job offer distribution; whether the respondent is currently out of the labour market; and a quadratic in the number of years in unemployment or out of the labour market.

In addition, our empirical analysis is focused on waves 6 to 15 of the *BHPS*, since these waves provide detailed information on an unemployed individual's job search activities, which we control for since such activities may influence the reservation wage and the expected wage. For example, Lancaster and Chesher (1983) argue that the reservation wages of unemployed job seekers are influenced by their knowledge of the wage offer distribution as well as job availability. It is apparent that job search may serve to inform individuals about the wage offer distribution. We define job search intensity (JS_{it}) as an index of whether they have over the past four weeks: applied directly to an employer; studied or replied to an advertisement; contacted a private employment agency or job centre; asked friends or contacts; or taken steps to set up a business. The index takes the maximum value of five if the individual has carried out all such job search activities. Thus, the *BHPS* provides an opportunity to explore the implications of differences in job search activity for the setting of reservation wages.[9]

Summary statistics for the explanatory variables are presented in Table 1 Panel A, where on average individuals undertake one form of job search and have been unemployed or out of the labour market for 5 years.[10] We also report summary statistics for the job search variable across the unemployed and out of the labour market samples separately, as presented in Table 1 Panels B and C. It is apparent that job search activity is higher for those individuals who have greater labour market attachment, i.e. the unemployed, who undertake, on average, two types of job search.

[9] Although our focus lies on analysing the effect of the pre treatment covariates in equation (2), rather than on identifying causal relationships, it is important to acknowledge the potential for reverse causality with some of the covariates.

[10] All monetary variables have been deflated with 2005 as the base year.

Results

The results of estimating equation (2) are presented in Table 2, which is split into two columns, the first column reports the results relating to the reservation wage being within plus or minus (*d×100*) % of the predicted market wage, i.e. $P_{it} = 1$, whilst the second column presents the results where the reservation wage is less than (*d×100*) % of the predicted wage, i.e. $P_{it} = 2$. The table is split into six panels: In Panels A, B and C, we present marginal effects relating to: the probability that an individual reports a reservation wage within plus or minus (*d×100*) % of his/her predicted wage (i.e. the 'same' category in Table 2); and the probability that the individual reports a reservation wage below their predicted market wage. In Panel A, $d = 0.03$, i.e. a 3% differential, in Panel B $d = 0.05$, and in Panel C $d = 0.10$. Panels D, E and F replicate the analysis of Panels A to C but focus on the expected wage rather than the reservation wage. Panel A reports the full set of marginal effects, whilst Panels B to F, for reasons of brevity, focus explicitly upon the marginal effects of whether the individual is out of the labour market and job search activity. Throughout Table 2, the base category is $P_{it} = 0$, the case where the reservation or expected wage exceeds the predicted market wage.

Focusing on Panel A, factors which are positively associated with the probability that an individual reports a reservation wage below the predicted market wage include: being male; all age categories relative to the youngest age category, 18-24 year olds; the number of children; marital status; wage in previous employment; household monthly mortgage/rental costs; and years of the current labour market spell (albeit at a decreasing rate). Conversely, factors which are inversely associated with the probability of $rw_{it} < \hat{w}_{it}(1+d)$, where $d = 0.03$, include: household size; having A levels relative to no education; and whether the respondent is out of the labour market relative to being unemployed. The latter effect is relatively large associated with a decrease in the probability that the reservation wage is more than 3% below the predicted market wage by 6.3 percentage points. We find that the effects of benefit income and income

from assets are statistically insignificant. Interestingly, there is little role for human capital operating through educational attainment rather it would appear that such effects are captured by the individual's age and length of current labour market spell.[11] Turning to job search activity, the index of job search intensity is positively associated with the probability that the reservation wage is below the predicted market wage. Based upon the mean of the job search intensity index, job search is associated with an increase in the probability that the reservation wage is 3% below the predicted market wage of 1.22 percentage points, relative to individuals who have a reservation wage which exceeds the predicted market wage.[12]

In Panels B and C, where $d = 0.05$ and $d = 0.10$ respectively, individuals out of the labour market are less likely to have a reservation wage either equal to or below the predicted wage. Job search is clearly important in explaining the probability of the reservation wage being equal to or below the predicted market wage. For the category where reservation wages are below the predicted wage, the influence of job search is relatively stable across the three values of *d*. Panels D, E and F summarise the results relating to the expected wage and the predicted wage, where noticeably for the 'below' category the magnitude of the influence of the job search index is larger and relatively stable across the values of *d*. For example, focusing on Panel D, based upon mean job search intensity the probability that the expected wage is below the predicted market wage increases by 6.2 percentage points. Hence, on average, it would appear that job search is associated with more realistic wage aspirations, i.e. not overly high. Across Panels D to E, being out of the labour market is associated with around a 28 percentage

[11] If we exclude the duration of the current labour market spell then the educational effects become statistically significant, and lower the probability of having a reservation wage (*d×100*) % below the offered market wage.

[12] Note job search has no influence on the probability that the reservation wage is within 3% of the predicted wage. It is possible that those with high job search exit unemployment relatively quickly which might influence the reservation wage. Hence, we have explored this further by interacting the job search index with the duration of unemployment. Such interactions were always insignificant. Hui (1991), exploring youth unemployment in Australia, finds that individuals, who engaged in intensive job search, as proxied by the number of job search methods used, experienced a relatively shorter duration of unemployment, although the number of search methods was found to be statistically insignificant in the reservation wage equation.

point decrease in the probability that the expected wage is below the predicted market wage, relative to having an expected wage in excess of the predicted wage.[13]

Although our focus lies on the categorical variable defined in equation (2), in order to define the treatment, we explore the robustness of the results presented in Table 2 by analysing the difference between the reservation wage and predicted market wage as a continuous variable: $\ln d_{it} = \ln\left(rw_{it} - \hat{w}_{it}\right)$ if $rw_{it} - \hat{w}_{it} > 0$, and $\ln d_{it} = (-1)\ln\left(\left|rw_{it} - \hat{w}_{it}\right|\right)$ if $rw_{it} - \hat{w}_{it} < 0$. If $rw_{it} - \hat{w}_{it}$ lies between zero and unity, $\ln d_{it}$ is set to zero. We explore the determinants of $\ln d_{it}$ by employing a quantile regression approach, which provides a full characterisation of the conditional distribution. Thus, instead of assuming that covariates shift only the location or the scale of the conditional distribution, quantile regression analysis explores the potential effects of the covariates on the shape of the distribution. The results presented in Table 3 show the effect of the covariates across each decile of the conditional distribution, where in Panel A (B) the focus is on the difference between the reservation wage (expected wage) and the predicted market wage. It is apparent in Panel A that both age and education are inversely associated with the size of the difference at the bottom end of the distribution. Noticeably, in contrast to the MNL results, there is no role for length of time out of employment with human capital effects operating through educational attainment. In accordance with the results in Table 2, job search activity (being out of the labour force) is positively (negatively) associated with the difference between the reservation wage, as well as the expected wage, and the predicted market wage, where the effects are larger below the median.

[13] To investigate the robustness of our results, we re-estimate equation (2) as a generalized ordered logit model, see Williams (2006), which is advantageous over a standard ordered logit approach in that the cut-off points are allowed to vary between individuals. This allows covariates to have a different influence upon the odds that the outcome is above a particular threshold. Our results, which are available on request, are robust to this alternative modelling approach.

IV. Reservation Wages, Expected Wages, Future Employment and Wages

A principal advantage of the *BHPS* is that the reservation wage information is available over time and the panel nature of the data means that we can trace individuals and their subsequent labour market experiences over time to explore whether unrealistic wage aspirations influence subsequent employment outcomes and wages. One might predict that if the individual has a relatively high (or even unrealistic) reservation wage, the probability of exiting unemployment, will be relatively low. Hence, we analyse the effect of an individual having a reservation wage less than the predicted market wage at time *t* on the probability of being employed in time period *t+1*. We also repeat the analysis replacing the reservation wage with the expected wage. Out of our sample of individuals who are unemployed or out of the labour market at time period *t*, 22.4% (i.e. 1,390 individuals) are either employed or self employed in the next year. Table 1 Panel D presents summary statistics relating to the sample of individuals who secure employment or become self-employed in *t+1* relating to the net weekly wage in *t+1*, w_{it+1}, the log reservation wage at time *t* and the log expected wage at time *t*. The correlation between w_{it+1} and rw_{it} (ew_{it}) is 0.48 (0.53), which is statistically significant at the 1% level. Frijters and Van der Klauuw (2006) report a correlation coefficient between reservation wages and post-employment wages in the German Socio-Economic Panel of 0.58 and argue that the observed reservation wage is a good indicator of labour market prospects (in their sample in 16% of cases, the observed reservation wage exceeds the post-unemployment wage). In our sample of individuals drawn from the *BHPS*, however, out of the sample of individuals who find employment, 62.5% of individuals end up with a wage in *t+1*, which is below their reservation wage in *t*. The corresponding figure for expected wages is 56.1%.[14] This is interesting in that labour market theory suggests that individuals will not exit unemployment unless the post-

[14] There are significant differences between those unemployed and not in the labour market at time *t*. Of those not in the labour market at time *t* around 70-75% have a reservation (expected) wage below the wage they receive when employed at *t+1*.

unemployment market wage exceeds the reservation wage, see, for example Mortensen (1986). One possible explanation for this finding might be the change in government policy in the British labour market relating to a tightening of job search requirements in order to receive benefits with the introduction of the Job Seekers Allowance.

In order to ascertain the effect of $rw_{it} < \hat{w}_{it}(1+d)$ on the probability of future employment, we use the method of propensity score matching (Rosenbaum and Rubin, 1983). Propensity score matching methods have only become popular in economics over the last decade or so, the most common application being the analysis of labour market programmes (e.g. Heckman *et al*., 1997, and Hotz *et al*., 1999). Similarly, Jalan and Ravallion (2003) analyse an anti-poverty programme in Argentina using propensity score matching methods and Brown and Pudney (2005) apply propensity score matching techniques to ascertain the effect of under-employment on poverty. Following Rosenbaum and Rubin (1983), the propensity score (ps) is defined as the probability of receiving a treatment conditional on pre-treatment characteristics:

$$ps(X_i) = prob(P_i = 1 | X_i) = E(P_i | X_i) \tag{3}$$

where P is a binary dummy which indicates exposure to treatment, defined from equation (2) if equal to outcome 2, i.e. $rw_{it} < \hat{w}_{it}(1+d)$, and X is a vector of pre-treatment covariates. Rosenbaum and Rubin (1983) show that the average effect of the treatment on the treated (*ATT*), given by δ, can be estimated as follows:

$$\delta = E\{Y_{1i} - Y_{0i} | P_i = 1\} = E\left\{\left[E(Y_{1i} | P_i = 1, ps(X_i))\right] - E\left[Y_{0i} | P_i = 0, ps(X_i)\right] \middle| P_i = 1\right\} \tag{4}$$

where the outer expectation is over the distribution of $\{ps(Z_i) | P_i = 1\}$, and Y_{1i} and Y_{0i} denote the potential outcomes in the two states of treatment (T) and no treatment, i.e. control (C), respectively, hence $\delta = \mathrm{T} - \mathrm{C}$.

In our application, the treatment is defined as having $rw_{it} < \hat{w}_{it}(1+d)$ and the outcome we initially consider is whether the individual is employed at *t+1*. Propensity score matching techniques allow us to ascertain the average effect of treatment, i.e. $rw_{it} < \hat{w}_{it}(1+d)$, on those who are characterised by $rw_{it} < \hat{w}_{it}(1+d)$, i.e. the average effect of treatment on the treated (*ATT*). Hence, we can ascertain whether the employment rate in *t+1* of those with relatively low reservation wages in *t* is significantly different than that of the matched control group members. The second outcome of interest is the net weekly wage of employees at *t+1*, thereby allowing us to explore whether having a relatively low reservation wage at time *t* is associated with a higher actual wage in *t+1*. The main advantage of this approach over traditional sample selection approaches is that it is essentially non-parametric, i.e. this approach does not impose a particular functional form. To explore the robustness of our findings, we use three alternative matching methods: kernel matching (using the Epanechnikov kernel with a bandwidth of 0.06); radius matching (with a radius of 0.1); and nearest neighbour matching (with a random draw used to resolve ties), see Cochran and Rubin (1973) and Heckman *et al*. (1997) for further details of these methods.[15]

Results

Table 4 presents the results of the propensity score matching analysis where the outcome is subsequent employment in *t+1*, whilst Table 5 focuses upon the net weekly wage outcome of employees at *t+1*. In each table there are six rows, i.e. Panels A to C relate to the reservation wage compared to the predicted market wage. In Panels D to F of both tables, the analogous comparisons are made with respect to expected wages rather than reservation wages. Both tables are split into three columns, where T statistics from the kernel, radius and nearest

[15] We implement the routine 'PSMATCH2' in STATA developed by Leuven and Sianesi (2003). Our results are based upon standard errors, which have not been derived through bootstrapping due to the recent concern in the literature over the use of bootstrapping for matching estimators, see Abadie and Imbens (2006).

neighbour matching techniques respectively are presented in each column. The unmatched difference is shown along with the *ATT*.

Across the different matching methods the *ATT* is generally statistically significant for both employment and wage outcomes, see Tables 4 and 5 respectively. In terms of the *ATT* for employment at *t+1* there is evidence of a positive effect in the range of 2% to 4% when compared to matched control group members. Thus, in accordance with job search theory, having lower reservation wages increases the likelihood of employment in *t+1*, and the effect increases monotonically with *d*. Similarly, for expected wages, having an expected wage lower than the predicted wage increases the probability of subsequent employment by between 6% and 8.5%.

Turning to the wage outcomes in Table 5, the *ATT* is always positive and the evidence suggests that net weekly wages are between £29-£34 and £28-£36 higher when compared to the matched control group for reservation and expected wages respectively. Thus, having a reservation wage or expected wage lower than the predicted wage at time *t* is associated with actually receiving a higher wage from subsequent employment compared to the control group.

In order to shed further light on the type of employment at *t+1*, Table 6 presents a cross-tabulation between the occupation that the individual was seeking employment in at time period *t*, occ_{it}^{s}, and the actual occupation where he/she found employment at *t+1*, occ_{it+1}^{a}, based upon a sub-sample of those reporting that they are looking for a specific occupation at *t* and who indicate employment in a specific occupation at *t+1*. There are 1,108 individuals who provide information about the occupation sought at time *t* and actual occupation of employment at time *t+1*. Focusing upon the lead diagonal, it is apparent that a significant proportion of individuals, approximately 51%, match into the occupation they were seeking employment in. The highest proportion of accurate matches are for craft and related occupations where 67% of individuals seeking employment in this occupation at time *t* secured employment in this occupation at *t+1*.

Interestingly, over 21% (27.1%) of those in employment end up employed in a lower (higher) occupational group than that sought, i.e. above (below) the lead diagonal $occ^{a}_{it+1} > occ^{s}_{it}$ ($occ^{a}_{it+1} < occ^{s}_{it}$).[16]

In Table 7 we explore the relationship between reservation wages at *t*, occupational status at *t+1* and wages at *t+1*. Table 7 is split into four panels reporting the proportion of individuals who are above (column 1) or below (column 2) the lead diagonal in Table 6 for those individuals where the reservation wage is below the predicted wage for $d = 0.05$ and $d = 0.10$.[17] The analysis is repeated for expected wages. Clearly, a higher proportion of individuals are employed in occupational groups higher than expected, $occ^{a}_{it+1} < occ^{s}_{it}$, rather than jobs of a lower occupational classification. This is the case for both reservation wages and expected wages across the different comparison groups.

In sum, in accordance with job search theory, those individuals with reservation or expected wages below their predicted market wage are characterised by a statistically significant higher probability of future employment. Furthermore, these individuals are likely to receive higher net weekly wages than their matched counterparts, which can be partly explained by occupational attainment, i.e. actual occupational status in *t+1* is, on average, higher than that expected at *t* for this group of individuals. We investigate this further by redefining the treatment in equations (3) and (4) as: $P = \left[\left(occ^{a}_{it+1} < occ^{s}_{it}\right) \times \left(rw_{it} < \hat{w}_{it}\left(1+d\right)\right)\right]$ or $P = \left[\left(occ^{a}_{it+1} < occ^{s}_{it}\right) \times \left(ew_{it} < \hat{w}_{it}\left(1+d\right)\right)\right]$, where $P \in (0,1)$ and the outcome as wages. The ATT is shown in each panel and is always significant across *d* where occupational attainment is higher than expected, $occ^{a}_{it+1} < occ^{s}_{it}$, i.e. such individuals receive higher weekly net wages than

[16] For both occupation sought and actual occupation obtained the occupational codes run from 1 to 9. The analysis which follows is based on a ranking of occupational groups, see, for example, Mayhew and Rosewell (1981) and Greenhalgh and Stewart (1985), which reflects the associated skill levels or arguably wages. Interestingly wages decrease monotonically across occupational categories 1 through to 9.

[17] Note there are no individuals at *d = 0.03*, i.e. 3% differential, and $occ^{a}_{it+1} < occ^{s}_{it}$ or $occ^{a}_{it+1} > occ^{s}_{it}$.

their matched counterparts, and the *ATT* is insignificant if the individual is employed in a lower occupation than predicted.[18]

V. Conclusion

In this paper, we have explored the determinants and the implications of divergences between an individual's reservation wage and his/her predicted market wage. We have focused on how job search influences divergences between an individual's reservation, as well as expected, wage and their predicted market wage. Job search activity is found to influence the probability of having a reservation wage lower than the predicted wage. Furthermore, using propensity score matching techniques, in accordance with job search theory we find that individuals, who are unemployed or out of the labour market and have a reservation wage which is below their predicted wage, have a higher probability of future employment and subsequently higher wages. Given the important role played by reservation, as well as expected, wages in future employment, earnings and occupational attainment, as highlighted by our empirical analysis, further research in this area should be of particular interest to policy makers. In particular, our findings suggest that job search activity has an important moderating influence on the probability that the reservation wage, or expected wage, exceeds the predicted market wage. Policies aimed at encouraging job search activity may serve to inform job seekers about the prevailing wage offer distribution and, hence, may lead to realistic labour market aspirations and expectations.

[18] Note that the *ATT* is based upon Kernel matching. Alternative matching criteria yielded similar results and are omitted for brevity.

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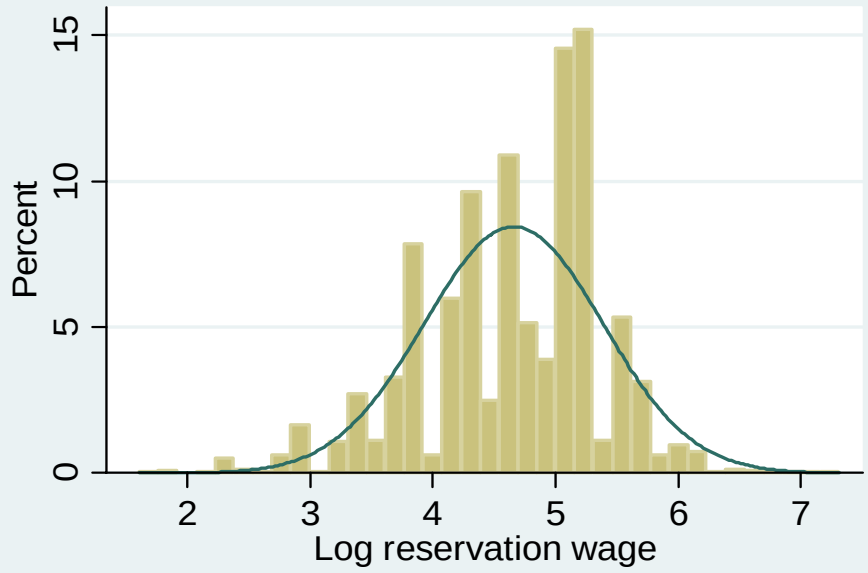
Figure 1: The Distributions of Log Reservation Wages, Log Expected Wages and Log Predicted Wages



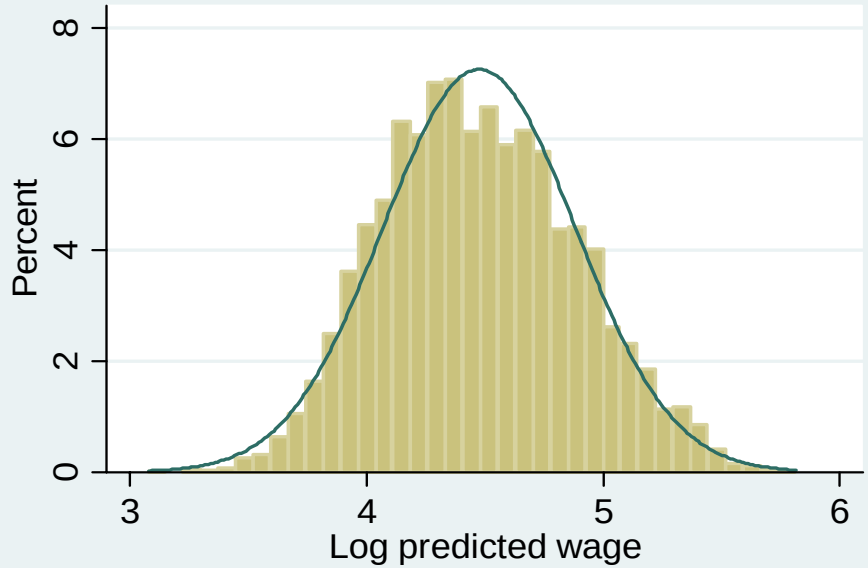


Table 1: Summary Statistics

PANEL A	MEAN.	STD.DEV	MIN.	MAX
Log Reservation Wage, $\ln(rw_{it})$	4.6456	0.7545	0	9.1049
Log Expected Wage, $\ln(ew_{it})^{\#}$	4.6004	0.7506	0	8.8441
Log Predicted Wage, $\ln(\hat{w}_{it})$	4.4715	0.4801	3.0758	5.8142
Employed in Next Period *t+1*	0.1371	0.3440	0	1
Male	0.4403	0.4965	0	1
White	0.4268	0.4947	0	1
Aged 25 to 34	0.2615	0.4395	0	1
Aged 35 to 44	0.2209	0.4149	0	1
Aged 45 to 54	0.1659	0.3720	0	1
Aged 55+	0.0808	0.2725	0	1
Number of Children	0.9805	1.1774	0	8
Household Size	3.1809	1.2782	1	5
Married/ Cohabiting	0.5472	0.4978	0	1
Degree (First or Higher)	0.0761	0.2652	0	1
Teaching or Nursing	0.1696	0.3752	0	1
A Levels	0.1506	0.3577	0	1
GCSE	0.2078	0.4058	0	1
Log Household Labour Income	6.0258	4.3927	0	12.2056
Log Household Asset Income	1.8947	2.7899	0	10.5648
Log Household Benefit Income	6.9453	2.9186	0	9.2584
Log Wage in Previous Employment	1.9838	2.9633	0	9.2584
Log Household Monthly Mortgage/Rent Costs	4.3233	2.0265	0	9.7289
Years of Current Economic Status	5.0002	8.7658	0	53
Years of Current Economic Status Squared	101.8281	316.1872	0	2809
Regional Unemployment Rate	6.0139	1.4464	3.3	11.1
Out of Labour Market	0.5855	0.4927	0	1
Index of Job Search Intensity	1.1777	1.5383	0	5
OBSERVATIONS	6,202			
PANEL B: UNEMPLOYED	MEAN.	STD.DEV	MIN.	MAX
Index of Job Search Intensity	2.1661	1.6016	0	5
OBSERVATIONS	2,571			
PANEL C: OUT OF THE LABOUR MARKET	MEAN.	STD.DEV	MIN.	MAX
Index of Job Search Intensity	0.4778	1.0221	0	5
OBSERVATIONS	3,631			

Note: $^{\#}$ based upon a sub-sample of 5,431 observations due to missing observations.

Table 1: Summary Statistics – Continued

PANEL D: EMPLOYED *t+1*	MEAN.	STD.DEV	MIN.	MAX
Log Net Wage, $\ln(w_{it+1})$	4.6763	0.7083	1.8606	7.1763
Log Reservation Wage, $\ln(rw_{it})$	4.7761	0.7347	1.0986	6.9078
Log Expected Wage, $\ln(ew_{it})$	4.7478	0.7161	3.2871	5.6585
$(w_{it+1} \geq rw_{it})$	0.3752	0.4843	0	1
$(w_{it+1} \geq ew_{it})$	0.4390	0.4964	0	1
OBSERVATIONS	1,390			

Table 2: Reservation Wages and Expected Wages Relative to Predicted Wages (MNL)

PANEL A: $\hat{w}_{it} - rw_{it}$, PROBABILITY =	SAME		BELOW	
($d = 0.03$)	M.E.	TSTAT	M.E.	TSTAT
Male	0.0230	*(4.14)*	0.1804	*(13.00)*
White	-0.0014	*(0.30)*	-0.0066	*(0.59)*
Age 25 to 34	0.0144	*(1.37)*	0.0593	*(3.14)*
Age 35 to 44	0.0241	*(1.92)*	0.1126	*(4.91)*
Age 45 to 54	0.0212	*(1.49)*	0.1337	*(5.11)*
Age 55+	0.0363	*(1.70)*	0.1169	*(3.40)*
Number of Children	-0.0012	*(0.33)*	0.0334	*(4.06)*
Household Size	-0.0065	*(0.22)*	-0.0190	*(2.91)*
Married/ Cohabiting	-0.0020	*(0.33)*	0.0236	*(2.03)*
Degree (First or Higher)	-0.0048	*(0.50)*	-0.0167	*(0.81)*
Teaching or Nursing	0.0030	*(0.50)*	0.0133	*(0.86)*
A Levels	-0.0018	*(0.26)*	-0.0387	*(2.64)*
GCSE	-0.0050	*(0.88)*	-0.0024	*(0.17)*
Log Household Labour Income	-0.0002	*(0.25)*	-0.0043	*(2.69)*
Log Household Asset Income	-0.0005	*(0.45)*	-0.0027	*(1.21)*
Log Household Benefit Income	0.0011	*(1.14)*	0.0006	*(0.30)*
Log Wage in Previous Employment	0.0006	*(0.60)*	0.0074	*(3.32)*
Log Household Monthly Mortgage/Rent Costs	0.0001	*(0.08)*	0.0052	*(1.96)*
Years of Current Economic Status	0.0004	*(0.53)*	0.0041	*(1.99)*
Years of Current Economic Status Squared	-0.0001	*(0.76)*	-0.0001	*(2.12)*
Regional Unemployment Rate	0.0025	*(1.69)*	0.0002	*(0.07)*
Out of Labour Market	-0.0183	*(3.09)*	-0.0630	*(4.71)*
Index of Job Search Intensity	0.0013	*(0.79)*	0.0104	*(2.86)*
Wald chi squared (46)	561.20 *p=[0.000]*			
PANEL B: $\hat{w}_{it} - rw_{it}$, PROBABILITY =	SAME		BELOW	
($d = 0.05$)	M.E.	TSTAT	M.E.	TSTAT
Out of Labour Market	-0.0262	*(3.32)*	-0.0554	*(4.20)*
Index of Job Search Intensity	0.0037	*(1.61)*	0.0101	*(2.84)*
Wald chi squared (46)	568.46 *p=[0.000]*			
PANEL C: $\hat{w}_{it} - rw_{it}$, PROBABILITY =	SAME		BELOW	
($d = 0.10$)	M.E.	TSTAT	M.E.	TSTAT
Out of Labour Market	-0.0605	*(5.27)*	-0.0425	*(3.56)*
Index of Job Search Intensity	0.0090	*(2.90)*	0.0099	*(3.02)*
Wald chi squared (46)	662.82 *p=[0.000]*			
PANEL D: $\hat{w}_{it} - ew_{it}$, PROBABILITY =	SAME		BELOW	
($d = 0.03$)	M.E.	TSTAT	M.E.	TSTAT
Out of Labour Market	0.0088	*(2.99)*	-0.2808	*(13.39)*
Index of Job Search Intensity	0.0014	*(3.07)*	0.0525	*(8.41)*
Wald chi squared (46)	743.82 *p=[0.000]*			
PANEL E: $\hat{w}_{it} - ew_{it}$, PROBABILITY =	SAME		BELOW	
($d = 0.05$)	M.E.	TSTAT	M.E.	TSTAT
Out of Labour Market	0.0054	*(4.75)*	-0.2810	*(13.85)*
Index of Job Search Intensity	-0.0002	*(3.08)*	0.0537	*(8.53)*
Wald chi squared (46)	742.69 *p=[0.000]*			
PANEL F: $\hat{w}_{it} - ew_{it}$, PROBABILITY =	SAME		BELOW	
($d = 0.10$)	M.E.	TSTAT	M.E.	TSTAT
Out of Labour Market	0.0123	*(6.79)*	-0.2849	*(14.32)*
Index of Job Search Intensity	0.0003	*(4.50)*	0.0526	*(8.60)*
Wald chi squared (46)	756.61 *p=[0.000]*			
OBSERVATIONS	PANELS A-C=6,202; D-F=5,431			

Table 3: Quantile Regression Analysis of the Difference between Reservation Wages, Expected Wages, and Predicted Wages

PANEL A: $rw_{it} - \hat{w}_{it}$	**DECILE**								
	10	**20**	**30**	**40**	**50**	**60**	**70**	**80**	**90**
	COEF	COEF	COEF	COEF	COEF	COEF	COEF	COEF	COEF
Intercept	-1.8911 *	2.0449 *	2.6827 *	2.8296 *	2.6468 *	3.5829 *	4.1041 *	4.4711 *	4.7683 *
Male	-0.7131 *	-0.6712 *	-0.4192 *	-0.3137 *	-0.0410	0.1616 *	0.2347 *	0.2262 *	0.1973 *
White	0.0858	0.0320	0.1180	0.1520 *	0.0457	0.0462	-0.0290	0.0134	0.0064
Age 25 to 34	-0.6391 *	-0.4434 *	-0.2840 *	-0.2032	0.0263	0.0155	-0.0060	-0.0257	0.0249
Age 35 to 44	-0.7223 *	-0.7030 *	-0.4901 *	-0.4177 *	-0.1496	-0.0419	0.0908	0.1517 *	0.1935 *
Age 45 to 54	-0.5116 *	-0.4201 *	-0.1302 *	0.1536	0.4145 *	0.2382 *	0.2455 *	0.2683 *	0.2713 *
Age 55+	0.1408	0.5861 *	0.6387 *	0.9076 *	1.1669 *	0.6228 *	0.5672 *	0.5060 *	0.4519 *
Number of Children	-0.0072	0.0035	0.0143	0.0070	0.0397	0.0093	0.0252	0.0379 *	0.0362
Household Size	-0.0001	0.1102 *	0.0457	0.1439 *	0.1481 *	0.0840 *	0.0443	0.0055	-0.0158
Married/ Cohabiting	-0.3506 *	-0.4324 *	-0.4352	-0.4620 *	-0.5365 *	-0.3480 *	-0.3204	-0.2240 *	-0.1508 *
Degree (First or Higher)	-1.2637 *	-2.0090 *	-1.7585 *	-1.5696 *	-0.6006 *	-0.1009	0.2236 *	0.4523 *	0.4973 *
Teaching or Nursing	-1.0154 *	-1.4488 *	-1.5005 *	-1.5414 *	-0.9432 *	-0.2634 *	-0.0338	0.0457	0.1496 *
A Levels	-0.9126 *	-1.3361 *	-1.3562 *	-1.7723 *	2.6284 *	-1.1507 *	-0.6095 *	-0.2937 *	-0.0933
GCSE	-0.4215 *	-0.6000 *	-0.5093 *	-0.3373 *	-0.0759	-0.0195	-0.0089	0.0213	0.0413
Log Household Labour Income	-0.0021	-0.0343 *	-0.0439 *	-0.1240 *	-0.1103 *	-0.0617 *	-0.0427 *	-0.3069 *	-0.0195 *
Log Household Asset Income	-0.0223 *	-0.0320 *	-0.0423 *	-0.0668 *	-0.1050 *	-0.0567 *	-0.0331 *	-0.0274 *	-0.0154
Log Household Benefit Income	0.0368 *	0.0582 *	0.0791 *	0.1233 *	0.1389 *	0.0855 *	0.0434 *	0.0257 *	0.0142
Log Wage in Previous Employment	0.0267 *	0.0845 *	0.0872 *	0.1708 *	0.1700 *	0.1022 *	0.0685 *	0.0489 *	0.0312 *
Log Household Monthly Mortgage/Rent Costs	-0.0001	-0.0037	-0.0071	0.0027	-0.0037	-0.0182	0.0006	0.0022	0.0081
Years of Current Economic Status	-0.0019	0.0051	-0.0169	-0.0242	-0.0124	0.0101	0.0014	0.0056	0.0044
Years of Current Economic Status Squared	-0.0001	-0.0002	0.0003	0.0006	0.0003	-0.0002	-0.0001	-0.0003	-0.0003
Regional Unemployment Rate	0.0633 *	0.0317 *	0.0502 *	0.0542 *	0.0640 *	0.0011	-0.0198	-0.0305 *	-0.0335 *
Out of Labour Market	-1.3158 *	-4.5538 *	-4.9025 *	-4.0292 *	-2.1111 *	-0.9907 *	-0.5193 *	-0.2862 *	-0.1421
Index of Job Search Intensity	0.1481 *	0.3261 *	0.2612 *	0.2366 *	0.1909 *	0.1073 *	0.0721 *	0.0501 *	0.0287
Pseudo R Squared	0.0838	0.1686	0.2523	0.2215	0.1260	0.0696	0.0450	0.0304	0.0218
OBSERVATIONS	6,202								

PANEL B: $ew_{it} - \hat{w}_{it}$	**DECILE**								
	10	**20**	**30**	**40**	**50**	**60**	**70**	**80**	**90**
	COEF	COEF	COEF	COEF	COEF	COEF	COEF	COEF	COEF
Out of Labour Market	-0.8694 *	-2.6955 *	-4.9714 *	-5.7386 *	-5.6901 *	-4.2303 *	-1.3925 *	-0.7004 *	-0.3393 *
Index of Job Search Intensity	0.6534 *	0.6434 *	0.4548 *	0.3119 *	0.2506 *	0.2788 *	0.1551 *	0.1109 *	0.0535 *
Pseudo R Squared	0.0527	0.0871	0.1595	0.2403	0.2481	0.1386	0.0675	0.0400	0.0285
OBSERVATIONS	5,431								

Note: * denotes statistical significance at the 5% level.

Table 4: Propensity Score Matching Analysis – Employed at *t+1*

TREATMENT	SAMPLE	KERNEL		RADIUS		NEIGHBOUR	
		$\hat{\delta} = \text{T} - \text{C}$	TSTAT	$\hat{\delta} = \text{T} - \text{C}$	TSTAT	$\hat{\delta} = \text{T} - \text{C}$	TSTAT
PANEL A: $rw_{it} < \hat{w}_{it}(1+d),\ d = 0.03$	Unmatched	0.03657	*(2.8)*	0.03657	*(2.8)*	0.03657	*(2.8)*
	ATT	0.02921	*(2.5)*	0.02201	*(2.2)*	0.04230	*(2.9)*
PANEL B: $rw_{it} < \hat{w}_{it}(1+d),\ d = 0.05$	Unmatched	0.03648	*(2.8)*	0.03648	*(2.8)*	0.03648	*(2.8)*
	ATT	0.03052	*(2.6)*	0.02227	*(2.3)*	0.04323	*(1.9)*
PANEL C: $rw_{it} < \hat{w}_{it}(1+d),\ d = 0.10$	Unmatched	0.03595	*(2.8)*	0.03595	*(2.8)*	0.03595	*(2.8)*
	ATT	0.03452	*(2.8)*	0.02667	*(2.5)*	0.05092	*(2.3)*
PANEL D: $ew_{it} < \hat{w}_{it}(1+d),\ d = 0.03$	Unmatched	0.11404	*(9.2)*	0.11404	*(9.2)*	0.11404	*(9.2)*
	ATT	0.07089	*(4.3)*	0.07422	*(4.7)*	0.08598	*(4.4)*
PANEL E: $ew_{it} < \hat{w}_{it}(1+d),\ d = 0.05$	Unmatched	0.11304	*(9.1)*	0.11304	*(9.1)*	0.11304	*(9.1)*
	ATT	0.06829	*(4.2)*	0.07036	*(4.5)*	0.06873	*(3.6)*
PANEL F: $ew_{it} < \hat{w}_{it}(1+d),\ d = 0.10$	Unmatched	0.11027	*(8.9)*	0.11027	*(8.9)*	0.11027	*(8.9)*
	ATT	0.06443	*(3.9)*	0.06691	*(4.2)*	0.06277	*(3.3)*

Table 5: Propensity Score Matching Analysis – Wage (£) at *t+1*

TREATMENT	SAMPLE	KERNEL		RADIUS		NEIGHBOUR	
		$\hat{\delta} = \text{T} - \text{C}$	TSTAT	$\hat{\delta} = \text{T} - \text{C}$	TSTAT	$\hat{\delta} = \text{T} - \text{C}$	TSTAT
PANEL A: $rw_{it} < \hat{w}_{it}(1+d),\ d = 0.03$	Unmatched	36.95	*(7.4)*	36.95	*(7.4)*	36.95	*(7.4)*
	ATT	30.09	*(4.4)*	31.41	*(5.3)*	33.84	*(3.8)*
PANEL B: $rw_{it} < \hat{w}_{it}(1+d),\ d = 0.05$	Unmatched	37.67	*(7.7)*	37.67	*(7.7)*	37.67	*(7.7)*
	ATT	29.55	*(4.2)*	32.11	*(5.4)*	37.11	*(4.2)*
PANEL C: $rw_{it} < \hat{w}_{it}(1+d),\ d = 0.10$	Unmatched	37.92	*(7.8)*	37.92	*(7.8)*	37.92	*(7.8)*
	ATT	28.99	*(4.0)*	30.29	*(5.0)*	33.23	*(3.9)*
PANEL D: $ew_{it} < \hat{w}_{it}(1+d),\ d = 0.03$	Unmatched	42.20	*(8.8)*	42.20	*(8.8)*	42.20	*(8.8)*
	ATT	28.29	*(4.8)*	29.21	*(5.1)*	34.60	*(5.3)*
PANEL E: $ew_{it} < \hat{w}_{it}(1+d),\ d = 0.05$	Unmatched	42.21	*(8.7)*	42.21	*(8.7)*	42.21	*(8.7)*
	ATT	27.56	*(4.7)*	29.86	*(5.3)*	29.02	*(4.2)*
PANEL F: $ew_{it} < \hat{w}_{it}(1+d),\ d = 0.10$	Unmatched	45.16	*(9.6)*	45.16	*(9.6)*	45.16	*(9.6)*
	ATT	31.55	*(5.5)*	32.53	*(5.8)*	35.70	*(5.5)*

Table 6: Occupation Sought (*t*) by Actual Occupation Employed (*t+1*)

OCCUPATION SOUGHT AT *t* (occ^{s}_{it})	**ACTUAL OCCUPATION AT *t+1*** (occ^{a}_{it+1})								
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
1	55%	2%	9%	14%	2%	6%	11%	3%	0%
2	2%	36%	16%	16%	8%	8%	2%	6%	6%
3	11%	8%	34%	6%	13%	16%	8%	3%	3%
4	10%	2%	1%	52%	2%	8%	9%	8%	6%
5	4%	1%	2%	4%	67%	4%	2%	9%	6%
6	3%	0%	5%	3%	3%	62%	6%	2%	15%
7	6%	0%	4%	5%	7%	7%	57%	4%	10%
8	5%	0%	2%	5%	13%	5%	4%	61%	5%
9	4%	3%	5%	8%	7%	13%	7%	14%	39%

Notes: OCC 1-9 refers to occupations – (1) managers & administrators; (2) professional occupations; (3) associate professionals & technical occupations; (4) clerical & secretarial occupations; (5) craft & related occupations; (6) personal & protective service occupations; (7) sales occupations; (8) plant & machine operatives; and (9) other occupations. Calculations are based upon specifying an occupation at time *t* (i.e. occupation sought by those either unemployed or out of the labour market) and *t+1* (i.e. occupation of subsequent employment).

Table 7: Reservation, Expected and Predicted Wages and Occupational Attainment

	OCCUPATION	
	LOWER THAN PREDICTED: $occ^{a}_{it+1} > occ^{s}_{it}$	HIGHER THAN PREDICTED: $occ^{a}_{it+1} < occ^{s}_{it}$
PANEL A: $rw_{it} < \hat{w}_{it}(1+d)$, $d = 0.05$	14.71%	16.52%
ATT	17.58 *(t=1.34)*	41.17 *(t=2.91)*
PANEL B: $rw_{it} < \hat{w}_{it}(1+d)$, $d = 0.10$	13.63%	17.06%
ATT	14.23 *(t=0.32)*	34.11 *(t=2.36)*
PANEL C: $ew_{it} < \hat{w}_{it}(1+d)$, $d = 0.05$	13.09%	15.61%
ATT	6.27 *(t=0.75)*	35.06 *(t=2.56)*
PANEL D: $ew_{it} < \hat{w}_{it}(1+d)$, $d = 0.05$	12.91%	14.71%
ATT	8.28 *(t=0.71)*	28.67 *(t=2.04)*

Note: the treatment is defined as: $\left[\left(occ^{a}_{it+1} < occ^{s}_{it}\right) \times \left(rw_{it} < \hat{w}_{it}(1+d)\right)\right]$ or $\left[\left(occ^{a}_{it+1} < occ^{s}_{it}\right) \times \left(ew_{it} < \hat{w}_{it}(1+d)\right)\right]$.