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NOT SO DISSATISFIED AFTER ALL? THE IMPACT OF UNION COVERAGE ON JOB SATISFACTION

Not So Dissatisfied After All?:

The Impact of Union Coverage on Job Satisfaction

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Abstract

The links between unionisation and job satisfaction remain controversial. In keeping with the existing literature we find strong statistically significant negative correlations between unionisation and overall job satisfaction. However, in contrast to the previous literature we find that once one accounts for fixed unobservable differences between covered and uncovered employees, union coverage is positively and significantly associated with satisfaction with pay and hours of work. Failure to account for fixed unobservable differences between covered and uncovered employees leads to a systematic underestimate of the positive effects of coverage on job satisfaction for both union members and non-members. It seems union coverage has a positive impact on job satisfaction that is plausibly causal.

1.   Introduction

There is a well-established negative correlation between union membership and overall job satisfaction. The association is apparent in most data sets, across country and time. This has puzzled analysts who anticipate union efforts to improve members' wages and working environment should, if anything, lead to an improvement in employee job satisfaction. However, there are a number of reasons why we might anticipate a negative correlation. First, since it is costly to unionise, it is likely that those who do so are among those most dissatisfied with their jobs and, perhaps, other aspects of their life. If this worker heterogeneity is unaccounted for it could bias the estimates of union effects on job satisfaction downwards. Second, unions may be better able to gain a foothold in workplaces where the working environment is most disadvantageous to workers: it is these poor conditions that trigger unionisation. If this workplace (or job) heterogeneity is not fully accounted for in analyses this will also downwardly bias the relationship between unionisation and job satisfaction. Third, it is conceivable that the union effect is a true causal effect arising from unions' voice function. This function, as described by Freeman and Medoff (1984) and others, leads unions to foment dissatisfaction with a view to strengthening the bargaining hand of the union in negotiations with the employer.

Many efforts have been made to isolate the causal effect of unionisation on job satisfaction. The majority of these have sought to account for fixed unobservable differences across unionised and non-unionised workers by estimating panel models which identify the impact of individuals switching in and out of union membership status. Results from these papers, which are discussed in Section Two, are mixed. A second group of papers tends to use cross-sectional data and instrument for unionisation so as to account for the potential endogeneity of union status. Some of these papers find that the negative association between membership and job satisfaction disappears when this is done (eg. Bryson et al., 2004). Until recently the literature focused almost exclusively on union *membership* as the measure of unionisation. This is problematic since in countries like Britain it is not very strongly correlated with coverage by a trade union that has bargaining rights at the workplace. As such, it does not capture the potential causal impact of union bargaining coverage. Recognising this, some recent papers have sought to distinguish between members in covered and uncovered environments, comparing them both to non-members. Again, results are contested.

In this paper we take union coverage, rather than union membership, as our point of departure, in recognition of the fact that any causal impact of union bargaining on employees' job satisfaction will arise through the bargaining process leading to alterations in employees' terms and conditions of employment. The causal effect arising from voice-induced complaining is also

unlikely to be present unless the union is engaged in bargaining. Collectively bargained terms and conditions of employment are normally extended to non-members in a covered environment, and so we might not anticipate differential effects of union coverage on the job satisfaction of members and non-members (unless non-members derive added satisfaction from receiving the benefits of coverage without paying union dues). Nevertheless, cognisant of the literature on differences between members and non-members, we consider whether – having accounted for the fixed unobservable differences between covered and uncovered employees – there remain significant differences in the coverage effects on members' and non-members' job satisfaction.

In keeping with the existing literature which uses membership as a proxy for unionisation, we find strong statistically significant negative correlations between union coverage and job satisfaction in an OLS regression framework. However, in contrast to the previous literature we find that, having accounted for fixed unobservable differences between covered and uncovered employees, union coverage is positively and significantly associated with satisfaction with pay and hours of work. These effects are apparent for covered members and non-members. Furthermore, shifting from OLS to fixed effects estimates results in the union coverage coefficients becoming more positive for job satisfaction across a range of job satisfaction measures, something that happens for both union members and non-members. It seems reasonable to conclude, therefore, that union coverage has a positive impact on some aspects of job satisfaction that is plausibly causal. At the same time, coverage is associated with lower satisfaction with job security, although this is partly accounted for by the nature of jobs undertaken by covered employees.

Section Two reviews the existing literature and how this paper seeks to contribute to it. Section Three describes the estimation strategy. Section Four presents the data and our empirical approach. Section Five presents the results. In Section Six we reflect on these findings and discuss why they appear to be at odds with most of the existing literature.

2.   Individual Differences and Their Implications for Union Status and Job Satisfaction

In their review of the psychology literature Diener and Lucas (1999: 226) conclude "subjective well-being reports do not completely reflect arbitrary decisions based on temporally unstable factors. Instead, the affective and cognitive components are consistent across time and across situations and can be reliably predicted from a number of personality traits and constructs". Twin studies confirm that a large proportion of inter-individual variation in subjective wellbeing (SWB) ratings is attributable to genomic variation (Lykken and Tellegen, 1996). These fixed

differences across individuals in SWB can bias estimated relationships between SWB outcomes (of which job satisfaction is an instance) and other variables of interest. For example, when Ferrer-i-Carbonell and Frijters (2004) compared their OLS estimates of factors affecting life satisfaction with those accounting for fixed differences across individuals they found that the latter were substantially smaller (closer to zero) for important variables such as income and family composition. Similarly, Gerlach and Stephan (1996) analysed the negative effect of unemployment on happiness ratings and found that estimates shrank toward zero when accounting for fixed differences across individuals, possibly because people with unhappy dispositions are more likely to lose their jobs. When analysing the influence of financial capability on psychological wellbeing Taylor et al. (2011) argued for the use of a fixed effects estimator on the basis that unobserved personality traits such as internal versus external locus of control could confound their estimates.

Similar considerations apply in relation to the link between job satisfaction and union status. To our knowledge there is no empirical evidence regarding personality traits and individuals' propensity to be unionised. However, it seems reasonable to argue that workers are more likely to organise the more dissatisfied they are with their jobs and this may be a part of a systemic tendency to dissatisfaction for the reasons just noted. It is those who are least satisfied with their job who will perceive the greatest net returns to unionisation, leading them to organise or join an existing union while others may be less prepared to incur the costs. Put another way, those with a higher propensity for job dissatisfaction are more likely to desire unionisation for a given level of "poor" working conditions. There is undoubtedly a time-varying component to this dissatisfaction. Consistent with this, using the data used in this study Powdthavee (2011) finds evidence of a dip in job satisfaction in the period just prior to union coverage - a bit like the Ashenfelter Dip in the evaluation literature - followed by a bounce back on becoming unionised.[2] However, there is also likely to be a time invariant component to this job satisfaction differential between covered and uncovered employees. The hypothesis is that fixed unobservable differences across covered and uncovered employees are liable to downwardly bias the effects of unionisation on job satisfaction such that, once one accounts for those differences, the underlying association between coverage and job satisfaction is likely to be more positive.

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[2] Powdthavee (2011) uses waves 5-15 of the British Household Panel Survey and confines his analysis to those in the private sector who do not switch workplace arguing that he wishes to avoid confounding job changers and the newly organised. His model specification means he focuses on the subset of respondents with at least 4 years of data before unionisation and 3 years afterwards.

It is nevertheless uncertain a priori whether the coverage effect conditional on fixed individual differences will be positive and statistically significant since unionisation may have its own causal impact on job satisfaction and this effect may be either positive or negative. The positive effect will dominate where union bargaining has improved workers' terms and conditions relative to what they might have achieved in a non-union environment. The negative effect will dominate where bargaining relies on voice-induced complaining to strengthen the bargaining hand of the union, where union information provision improves employees' knowledge about managerial failings, where unions "over-sell" what they can achieve to employees in an effort to increase or maintain membership levels, or where unions prove ineffectual in a bargaining setting. Equally unions may have no discernible impact on employees' job satisfaction where the union wage premium simply compensates employees for poorer conditions than those they might face in a non-union setting.

The empirical literature remains split as to whether there is a negative effect of unionisation on job satisfaction. In one of the first studies for Britain Bender and Sloane (1998) find the negative association between unionisation and job satisfaction disappears when accounting for the industrial relations climate, leading them to argue that union dissatisfaction may be genuine and arises from the poorer working environment in a unionised setting. Using cross-sectional linked employer-employee data Bryson et al. (2004) find a negative association between union membership and job satisfaction but this effect becomes statistically non-significant when they instrument for union status, leading them to argue that the effect is driven by selection into union status. In a follow up study using the same data they seek to account for selection into both union membership and union coverage (Bryson et al., 2010). In doing so they find a negative relationship between unionisation and job satisfaction which is confined to uncovered union members. They suggest membership may increase the 'taste' for coverage, leading to member dissatisfaction in an uncovered environment.

A further set of studies for Britain are more directly linked to the current study because they use longitudinal panel data to account for fixed unobservable differences across unionised and non-unionised workers. All use various waves of the *British Household Panel Survey* (BHPS). These studies also come to different conclusions about the underlying link between unionisation and job satisfaction. In an early study using the first four waves of the BHPS which pooled data for the private and public sectors Heywood et al. (2002) found links between union membership and job dissatisfaction persisted controlling for person fixed effects. Indeed, contrary to expectations outlined above, the negative union membership coefficient became much larger in the fixed effects model estimates compared with their OLS equivalents (op. cit.: 603).

Powdthavee (2011) finds the initial positive impact of being newly unionised dies out quickly, a finding he argues is consistent with the voice-induced complaining needed to support union bargaining, an effect that counters the initial positive effect of becoming unionised.[3] Nevertheless, his results are sufficient for him to raise questions as to whether there is really any job dissatisfaction "puzzle" associated with unionisation. In contrast, Green and Heywood (2010) find that, having accounted for both fixed individual and job effects, covered members are significantly less satisfied with their jobs than uncovered employees, though the effect is confined to satisfaction with "the work itself" and job security.

This paper contributes to the literature in five ways. First, we focus on collective bargaining coverage, rather than union membership, since it is coverage that is likely to capture any causal effect of unionisation via the bargaining process and related voice-induced complaining. Of course, we wish to test for differences between the job satisfaction of covered union members and non-members. We anticipate coverage effects to be small due to the non-excludable nature of union goods. If covered members are less satisfied than covered non-members having accounted for unobservable fixed traits across individuals, this may reflect non-members' ability to benefit from coverage without having to pay union dues.[4]

Second, we make explicit comparisons between OLS models and person fixed effects models to examine the difference made to estimated coverage effects by accounting for fixed unobserved heterogeneity across employees. Instead of focusing on the dynamics of unionisation, as Powdthavee (2011) does, we present average effects of coverage for the period individuals remain in the panel. In doing so we run a specification test to see if attrition is non-ignorable (see Section Three).

Third, we estimate union effects on five job satisfaction measures. This is important because one can anticipate trade-offs between bargaining objectives. In the traditional right-to-manage model the bargaining object is wages whereas employment is set unilaterally by the employer conditional on those wages. Although there is evidence that unions negotiate over employment as well as wages in many instances (van Wanrooy, forthcoming) the right-to-work model is usually viewed as a reasonable approximation to the British case. The implication is that the union wage premium should raise satisfaction with pay if the employee's reference point is her

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[3] In a similar study for the US using the NLSY Artz (2010) finds an initial positive impact of unionisation on job satisfaction for those with no previous union experience.

[4] The situation in Britain is quite different from that in the United States where, even in right-to-work states, non-members are often required to pay union dues if covered by collective bargaining, even if they choose to remain union non-members. Partly because of this there are relatively few union non-members in covered workplaces in the United States (Bryson and Freeman, 2006: 3 and 32).

outside market wage. However, the wage premium may come at the cost of increased concerns regarding job security since wage pressures may encourage employers to substitute capital for labour and, in extremis, threaten workplace survival.

Fourth, we compare union effects on job satisfaction in both the market and non-market sectors. This is important since the nature of unionisation and the institutional settings in the two sectors are fundamentally different. Perhaps the chief difference is that public sector bargaining occurs at national or sectoral level, as opposed to organization level, within parameters that are largely set outside the organization. As such, public sector collective bargaining is far removed from the traditional rent extraction model one might think of in a market setting. Furthermore, individuals choosing employment in the public (private) sector differ (eg. with respect to their risk preferences) such that one might anticipate potential for systematic differences in union effects across the two sectors.

Finally, we run estimates for 17 waves of the BHPS through to 2007, thus extending analyses by some years compared to previous contributions to the literature. Although we would like to extend the analysis to additional years the switch from the BHPS to Understanding Society introduced a number of data discontinuities that make this problematic. (In addition the financial crisis begins just after the end of our data, and this may have altered a number of things). It is worth reflecting on the stability of the assumed fixed effects as this may affect judgements about the length of the panel that is desirable. Soto et al. (2011) gathered data from 1.27 million respondents and found that there are cross-sectional age differences in the mean levels of three of the 'Big Five' personality domains and in facets within those domains. Neuroticism tends to be lower at higher ages, while conscientiousness (especially its 'orderliness' facet) and agreeableness (altruism, compliance) tend to be higher with age. The amount of mean-level variation across the life-course is sufficiently slight to be compatible with constancy of estimates at the individual adult level over an observation period of around 15 years, but it might be problematic for panels of much longer duration since over-time variation in personality variables would be detectable over such a period.

3.   Estimation

Panel data consist of observations on individuals, indexed by i, repeated at regular intervals, indexed by t; here the interval is one year and the years are designated t=1,....T. The outcome variables in the present case are attitudinal and are measured on 7-point satisfaction scales. In the past it was common for economists to treat such scales as ordinal, or to collapse them to binary responses, so that analysis by non-linear methods was required. Psychologists however

have generally treated the measures as cardinal (equal interval), and this has now been quite widely adopted by economists as well. The psychological case for the cardinality assumption depends on evidence suggesting individuals interpret response scales as implying an equal-spacing metric and are capable of responding accordingly. The case for adoption of the cardinality assumption in economics has been made by van Praag (1991) and by Ferrer-i-Carbonell and Frijters (2004), among others, and recent applications using this approach include Clark et al. (2008) and Taylor et al. (2011); van Praag and Frijters (1999) provide an extended discussion of well-being and welfare functions in relation to the utility concept.

Making the cardinality assumption, we obtain estimates from two kinds of models, pooled OLS and FE. Under pooled OLS, the model is usually written as

$$y_{it} = X_{it}\beta + v_{it} \qquad (1)$$

where y_{it} is the outcome, the X_{it} are the regressors, including the intercept; the existence of unobserved individual effects (heterogeneity) is not denied, but they are included within the disturbance term v_{it} that sums both the unobserved individual fixed effect (say, c_i) and the time-specific disturbance (say, u_{it}). The OLS model is appropriate if both the c_i and the u_{it} are uncorrelated with the observable regressors X_{it}; we may regard the use of OLS in panel analysis as implying this as an assumption.

To implement the FE estimator, equation (1) is first re-written in its full form

$$y_{it} = X_{it}\beta + c_i + u_{it} \qquad (2)$$

Then from each term is subtracted the mean value for each individual averaged over the t observations, viz. $y_{it} - y_{i.}$, $x_{it} - x_{i.}$, $u_{it} - u_{i.}$ (the subscript dot indicates the term over which averaging is applied). As the c_i are by definition constant, they are eliminated. If (2) is an appropriate model, then so also is this de-meaned transformation. The resulting 'within regression', i.e. the regression using the within-person over-time variation, provides estimates of the parameters β while allowing that the unobserved effects c_i can be correlated with the explanatory variables X_{it}, as is intuitively appropriate. The main assumption required is that $E(u_{it}|X,c)=0$ (Wooldridge 2002: 275-84).

The foregoing outline stresses the underlying similarity of the pooled OLS and FE methods: indeed FE is correctly described as pooled OLS on de-meaned variables. Additionally, panel analysis, whether by OLS or FE, should take account of the correlation of observations within each respondent over time, since otherwise t-statistics would be inflated. For both the OLS and

FE analyses, therefore, standard errors are computed by means of a robust variance estimator that takes account of clustering and also of heteroskedasticity.

Panel data can be either balanced or unbalanced, where balanced means that each unit is observed at every time-point. The balanced panel is easy to conceptualize and analyse, and is appropriate where there is little problem of missing data (e.g. drawing on administrative data or statutory returns). The data used here (see below) are obtained from a longitudinal survey that is affected by non-response and attrition, and analysing the balanced panel would lead to large losses in data and an unacceptable dilution of the sample's representativeness. We therefore analyse the unbalanced panel. This makes formal definition of the FE model somewhat more cumbersome (Wansbeek and Kapteyn 1989) but computation remains straightforward. More problematically, the unbalanced nature of the panel involves potential selectivity effects. An individual's leaving the panel presumably reflects varied reasons or circumstances. To model this selectivity is a very difficult task and is here not attempted. However, as suggested by Verbeek and Nijman (1992), also by Wooldridge (2002), it is possible to get some indication of the likely influence of selectivity on the estimates by including a dummy representing the out-movement of the individual in the following observation period and considering its statistical significance. The specification adopted here marks the last observation on the individual with a dummy variable (a possible psychological interpretation of this variable is in terms of moving or leaving intentions). Further details of the unbalanced panel construction are given in the next section.

A further problem arising from the unbalanced nature of the panel is that it is not possible to weight the data. However, as detailed later, as an alternative to weighting, the analysis included a range of control variables that were used by the originators in stratifying the sample and in constructing the weights for the balanced panel (see Taylor et al. 2011 and the BHPS documentation).

4.   Data set, variable and analyses

4.1   Data

The research uses the British Household Panel Survey (BHPS) dataset. The initial sample for BHPS was drawn in 1990 and consisted of 9,912 full interviews with individuals from 5,538 households drawn as a stratified sample from all British households.[5] Members are interviewed annually. Representativeness has been maintained by following individuals who set up or join

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[5] Userguide, 5151userguide_vola.pdf, Tables 16 & 17 (page A4-28).

new households and by admitting as new panel members those who form a family relationship to existing members. At various stages booster samples were added to the original sample design, e.g. to contribute to the European Community Household panel (ECHP), or to provide sufficient numbers for separate analysis of country sub-samples for Wales, Scotland and Northern Ireland. As these booster samples change the nature of the original sample, and as this cannot be corrected in the type of analysis we perform by re-weighting, we have excluded them entirely from all aspects of the analysis.

We analyse data from the first 17 waves (years 1991-2007). We analyse the unbalanced panel incorporating those who either leave or join during the observation period. However, we exclude observations on leavers if they subsequently re-join the panel; leaving is treated as an 'absorbing state' (see Wooldridge 2002). We also exclude those who were only present for one observation as they cannot contribute to the FE estimates. Only years in which individuals are employees appear, since the dependent variables are not available for the non-employed and some control variables are not available for the self-employed. Further we limit the analysis to observations when individuals are aged 20-60. This latter choice is made to reduce problems of selection and self-selection into employee status: ages 16-19 being peak student years, and ages 61-65 being peak years for (early) retirement and disability/incapacity claims. Movement out of employee status is *not* treated as an absorbing state: subsequent observations of resumed employee status are covered in the analysis. After exclusions for missing data we are left with somewhat more than 58,000 person-year observations on a little more than 8,000 individuals.

4.2   Variables

Dependent variables

Five outcome variables are separately analysed. *Overall job satisfaction* is often interpreted as a single-item measure of the subjective utility of a job. It is the most widely used measure in occupational psychology and has well established associations with behavioural outcomes including performance ratings, absence, lateness and quit (Judge et al. 2001; Harrison et al. 2006). Four further measures obtain ratings of *satisfaction with facets of jobs*: job security, the work itself, hours, and pay. Each of these relates to an area in which British trade unions have been actively engaged and also to areas that are currently discussed as aspects of deteriorating employment conditions under pressures from globalized competition and technological change (Green 2006; Gallie 2007). Satisfaction with security relates to precarious employment contracts and to risk of job loss, satisfaction with work relates to such issues as autonomy and task discretion, satisfaction with hours and pay relate to work intensification as well as to unions'

core business of negotiating a favourable effort-reward bargain for members.   All five outcome measures have 7-point response scales. Table 1 provides further descriptive details.

[Table 1 about here]

Explanatory variables

There are two chief explanatory variables that are used alternately in parallel analyses: union recognition and union membership. Employee respondents are first asked 'Is there a trade union or a similar body such as a staff association, recognized by your management for negotiating pay or conditions for the people doing your sort of job in your workplace?' It is notable that this question not only focuses on workplace trade union recognition, but also on recognition that covers the respondent's job or occupation at that workplace. Union recognition is a dummy variable taking value 1 when the respondent answers 'Yes' to the foregoing question, and 0 when the answer is 'No'. At waves 2 and 3, the question was only asked of employees who had changed their job (including through promotion in the same workplace), so that union recognition is missing for employees who had not changed job.

If the respondent stated that a union was recognized, she was then asked 'Are you a member of that trade union or association?'. We construct a union membership variable with three categories: trade union member with recognized union/association; non-member where there is a recognized trade union/association (sometimes referred to as 'free-rider'); no trade union recognized. Table 2 shows the frequency distributions of the union recognition and membership variables.

[Table 2 about here]

For waves 1 to 7, BHPS identified individuals as members of a union that did not provide them with representation at work. From wave 8 this question was discontinued. A more general question about union membership was also included in some subsequent waves but it cannot be regarded as equivalent to the earlier question. We therefore decided that it was not possible to construct a consistent membership variable for uncovered employees. We estimate that our membership variable, although limited to the case where the member is covered by a union recognized at the workplace, none the less represents at least 90 per cent of all union membership.

Control variables

Control variables were included in all analyses. These controls, which are listed in the note to Table 3, are commonly used in models of labour market participation and earnings. In addition we incorporate variables that were used in the original construction of the strata and weights for the survey sample. Additionally, as a variant specification, we also include certain employment conditions that are likely to affect employee attitudes. These are also listed in the note to Table 3. The inclusion of these employment conditions variables entails some risk of endogeneity bias as they may partly reflect individual choices, but if omitted the union effects may be distorted.[6]

4.3   Structure of analyses

The rationale and nature of the models used in analysis have already been described (Section Three). It remains to outline the series of analyses that were performed within this framework. There are 20 main analyses to be presented: the 5 outcome measures, times 2 alternate union explanatory variables (recognition and membership), each carried out by OLS and by FE regression. Further, analyses are conducted both with and without the employment conditions variables, to assess sensitivity of results to this aspect of the specification. As a further test of robustness, we also run some of the models for the subset of employees in the market sector rather than on the complete sample that spans the market and nonmarket sectors; the market variant is introduced because much of the literature on the effects of trade unions is confined to the market sector, and we wish to know what difference this makes. Finally, we also present a set of analyses that explore the dynamics of union coverage effects over pairs of adjacent years. These analyses are more limited in range than the main analyses but help to point the way toward future development of the research.

5.   Results

The effects of union coverage on job satisfaction in the whole economy are presented in Table 3. Coefficients from OLS estimates are presented in the left-hand columns and those from person FE models are presented in the right-hand columns. All estimates should be interpreted in terms of the proportions of the unit response on a response scale of 1-7 with 7 being high (more satisfied). The first five rows present estimates for each of the five job satisfaction measures

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[6] Working conditions might be endogenous to the extent that they are choice variables. However, this is less likely to be the case if employers fix them by virtue of asymmetric power.

using the fullest model specification. Rows 6-10 present estimates which omit the potentially endogenous job characteristics.

[Insert Table 3 about here]

The OLS estimates reveal a negative statistically significant association between union coverage and three of the five job satisfaction measures, namely overall satisfaction, job security and satisfaction with the work itself. There is no statistically significant association between union coverage and satisfaction with pay or hours. These findings hold whether one conditions on job characteristics or not.

Conditioning on person fixed effects, so that we are comparing the effects of union coverage *within* individuals over time, the effects of union coverage become more positive. This is apparent from a direct comparison of the union coverage coefficients in the last column of the table.[7] Under the FE model union coverage is associated with significantly higher satisfaction with pay and hours, which are often the subject of direct bargaining between unions and employers (van Wanrooy et al., forthcoming). However, coverage continues to be associated with significantly lower job security, although the effect is only statistically significant at a 90 per cent confidence level if one omits the job characteristics variables.

[Insert Table 4 about here]

We obtain very similar results if we confine the analysis to the market sector (Table 4). The only notable difference is that the negative association between coverage and satisfaction with job security is larger in the market sector and robust to the exclusion of job characteristics.

To establish whether coverage effects differ across covered members and non-members we run models with the same controls but this time distinguish employees according to whether they are members of the union recognised for pay bargaining. The reference category is all uncovered employees, regardless of their membership status.

[Insert Table 5 about here]

Across both model specifications and all five job satisfaction measures covered non-members (sometimes called "free-riders") have higher job satisfaction than their member counterparts, though not always statistically significantly so. This member satisfaction differential among

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[7] The significance of the differences between the OLS and fixed effects estimates cannot be established but the sign of the OLS-FE difference is positive without exception.

covered employees persists in the FE models, indicating that it is not simply driven by fixed unobservable differences between members and non-members. However, the coefficients for both covered members and covered non-members become more positive when we take account of fixed unobservable differences across employees, as indicated in the final column of the table.

Focusing on the models with full controls in the top half of Table 5, the OLS estimates for covered members indicate that their job satisfaction is significantly lower than uncovered employees' for overall job satisfaction, and satisfaction with job security, work itself and hours. These effects persist but the size of the coefficients falls by more than half when introducing the person fixed effects. Furthermore, pay satisfaction becomes positive and statistically significant, as does satisfaction with hours (albeit at a 90 per cent confidence level).

In OLS estimates, free-riders have significantly lower satisfaction with job security and work itself than their uncovered counterparts, but they have higher hours satisfaction. When accounting for unobserved differences across individuals, their dissatisfaction with work itself and job security is no longer apparent, while they are significantly more satisfied than uncovered employees as measured by overall satisfaction, pay satisfaction and hours of work.

Turning to the lower half of the table, the effects of coverage on members, relative to being an uncovered employee, are similar when we exclude the potentially endogenous job characteristics, except that the effects of coverage on satisfaction with job security are no longer statistically significant in the FE model. The implication is that the significant negative association between covered membership and satisfaction with job security in the top half of the table is driven by the nature of the working environments that are organised by unions, rather than coverage per se.

Finally we present analyses which seek to capture the dynamic effects of switching into and out of union coverage, having accounted for employee fixed effects (Table 6). Since the introduction of dynamics adds considerable complexity to the results we limit the analyses here to a subset of those previously presented: to union coverage, to the full set of controls , and to the whole economy sample. Here we distinguish between four states: being covered in this year and last year; being uncovered in both years; new coverage in the last year; with leaving coverage in the last year being the reference category which is omitted from the table. Note that becoming a newly covered employee could be due to moving to a unionised workplace, or to a union-covered job in the same workplace, or through new union recognition at same workplace: the data do not permit us to distinguish reliably between these circumstances.. The analyses are run on those in employee status in consecutive years, so the number of observations declines.

[Insert Table 6 about here]

It is clear that the effect of newly being covered by a union is positive and significant for all aspects of job satisfaction.[8] The effect of being not covered by a union at both times is negative and significant for all satisfaction measures except job security, where it is approximately zero. The effects of being covered by a union now and in the previous year is negative for all job satisfaction measures, but significant only for satisfaction with the work itself and for overall satisfaction.

Tests for sample attrition bias discussed in Section Three (see the Appendix) suggest that any bias resulting from attrition has been reasonably well controlled in our specification.

6.   Conclusions

In keeping with the existing literature which uses membership as a proxy for unionisation, we find strong statistically significant negative correlations between unionisation and job satisfaction when individual fixed effects are assumed to be uncorrelated with regressors. However, in contrast to the previous literature, having accounted for fixed unobservable differences between covered and uncovered employees, union coverage is positively and significantly associated with satisfaction with pay and hours of work. These effects are apparent for covered members and non-members. Furthermore, shifting from OLS to fixed effects estimates results in the union coverage coefficients becoming more positive for job satisfaction across a range of job satisfaction measures, something that happens for both union members and non-members. It seems reasonable to conclude, therefore, that union coverage has a positive impact on some aspects of job satisfaction that is plausibly causal. At the same time, coverage is associated with lower satisfaction with job security, although this is partly accounted for by the nature of jobs undertaken by covered employees.

These results are consistent with union bargaining effects which result in higher pay and hours schedules that suit covered employees' preferences, relative to what they might have received in the uncovered sector. In keeping with the literature on the non-excludable nature of collectively bargained terms and conditions, the positive benefits of coverage are not confined to union members. On the contrary, satisfaction is higher among non-members than it is among members, even having accounted for fixed unobservable differences across individuals. This may reflect the fact that the net returns to coverage are highest for non-members who are able to avoid the

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[8] The only result that is affected by the removal of job/workplace characteristics is the significant positive effect of new coverage on job security: it becomes non-significant when these variables are removed.

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financial costs of membership and the potentially adverse effects of voice-induced complaining that members engage in to strengthen the union's bargaining hand in negotiation.

Our results are, perhaps, most similar to those of Powdthavee (2011). He also uses the BHPS. He observes an increase in job satisfaction once covered by a union, as we do, although the effect does not persist over time. However, his use of lagged job satisfaction measures means his analysis is confined to employees appearing in many years in the BHPS, so his sample is much smaller than ours. Furthermore, he excludes those switching workplace such that his analysis only captures changes in coverage within a particular workplace. Our analysis, on the other hand, includes coverage changes due both to changes within and across workplaces. We show - as do Powdthavee (2011) and others - that union coverage effects on job satisfaction differ markedly across facets of the job in a way that is consistent with union bargaining effects.

Perhaps the biggest limitation to the existing study is our inability to account for the potential endogeneity of switches in union coverage status. Employees can move from the uncovered to the covered sector for one of three reasons. First, they may find that their existing job is organised by a union, and that union obtains bargaining rights. In such circumstances employees have usually been directly involved in obtaining coverage and, as such, are operating on the basis that they anticipate improvements to their terms and conditions via coverage. Although job satisfaction may rise in anticipation of the benefits of coverage, this is not what we capture in this paper: the FE models identify satisfaction differentials based on periods of coverage versus non-coverage for all who have switched status. The implication is that, on average, the satisfaction benefits of coverage for pay and hours satisfaction persist over time. Second, employees may become covered if they switch to a different job in the same workplace that is union covered. Some jobs are in occupations where coverage is very high, such as nursing or teaching, in which case coverage comes with the occupational choice, whereas in other cases the worker may be deliberately seeking out coverage in anticipation of benefits. Third, the worker may switch to a workplace with union coverage. Again, this may be an attribute of the new job that the worker was specifically seeking, or else it may have been coincidental to the move. It is uncertain, a priori, how this might affect employees' job satisfaction. The current analysis treats all three scenarios in the same way, averaging their effects. Future work could usefully explore how different sorts of switching might influence job satisfaction outcomes.

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Table 1: Descriptives for job satisfaction dependent variables

Satisfaction with:	security	work	hours	pay	overall
mean	5.297	5.458	5.180	4.810	5.352
standard deviation	1.568	1.344	1.469	1.588	1.324
skewness	-1.064	-1.212	-0.853	-0.731	-1.216
kurtosis	3.503	3.503	3.136	2.673	4.279
N of observations	59978	60374	60380	60316	60433

Notes: Unweighted sample statistics for employee respondents aged 20-60. All satisfaction questions are answered on a response scale scored 1 to 7: 'completely satisfied', 'very satisfied', 'satisfied', 'neither satisfied not dissatisfied', 'dissatisfied', 'very dissatisfied', 'completely dissatisfied'. The scoring has been reversed so that 1 represents 'completely dissatisfied' while 7 represents 'completely satisfied'.

Table 2: Descriptives for union recognition and union membership variables

Union or staff association recognized at workplace?	n of observations	column %
yes	27838	40.4
no	26945	39.1
missing data	14094	20.5
Total	68877	100
If union recognized, is respondent a member?		
yes	17459	25.3
no	10351	15.0
membership data missing	28	0.1
no union recognized	26945	39.1
union recognition missing	14094	20.5
Total	68877	100

Notes: Unweighted sample statistics for employee respondents aged 20-60. About two thirds of missing data for union recognition arises in waves 2-4 where respondents were only asked this question if they had changed jobs (including by promotion) since the previous wave.

Table 3 – Union Coverage Effects on Job Satisfaction, Whole Economy

model	OLS			FE			$b_{fe}-b_{ols}$
1)full controls	b (s.e.)	t	Nit	b (s.e.)	t	Ni	
- overall sat	-.11 (.02)	4.82	49996	.01 (.02)	0.46	8077	0.122
- pay sat	-.02 (.03)	0.77	49958	.12 (.03)	4.16	8071	0.136
- job security	-.25 (.03)	9.64	49779	-.07 (.03)	2.66	8050	0.180
- work sat	-.15 (.02)	6.08	49979	-.02 (.02)	0.85	8074	0.062
- hours sat	.00 (.03)	0.16	49992	.09 (.03)	3.60	8074	0.087
2) omit job chars.+							
- overall sat	-.12 (.02)	5.43	50031	.02 (.02)	0.74	8095	0.141
- pay sat	-.02 (.03)	0.63	50199	.12 (.03)	4.37	8089	0.308
- job security	-.24 (.03)	8.91	50021	-.05 (.03)	1.90	8068	0.184
- work sat	-.14 (.02)	5.99	50224	-.02 (.02)	0.71	8092	0.127
- hours sat	.00 (.03)	0.16	50235	.09 (.03)	3.70	8092	0.090

Notes: + indicates reference category in the following. Job characteristics are hours, incentive participation, and contract (permanent+/fixed-term/casual). All analyses include controls as follows: time (wave) dummies; 5 age-bands (20-29+...50-60); any professional qualification;highest educational qualification (degree/higher degree,sub-degree/a-level/equiv.,olevel/equiv.,below o-level or none+);labour income last year; non-labour income last year; have or can use car/van;housing tenure (own outright,own on mortgage,rent public housing, rent private housing+);separately for female/male respondent, marital status/spouse employment (no partner+, partner not employed,partner employed);separately for female/male respondent, age of youngest dependent child (no dependent child+,0-2,3-4,5-11,12-15,16-18); size of workplace (<25+,25-49,50-99,100-199,200-499,500-999,1000 or more), employer is in market sector,SIC group of workplace (agric.,utilities, manufcturing or extractive, distribution,transport and communications, financial and business services,government administration, health, education, other services),dummy indicating last wave present in panel=leaves panel next wave.

Table 4 – Union Coverage Effects on Job Satisfaction, market sector employees only

model	OLS			FE			$b_{fe}-b_{ols}$
1)full controls	b (s.e.)	t	Nit	b (s.e.)	t	Ni	
- overall sat	-.11 (.03)	3.98	33738	-.01 (.03)	0.33	6368	0.095
- pay sat	-.02 (.03)	0.70	33705	.09 (.03)	2.61	6363	0.109
- job security	-.26 (.03)	8.81	33585	-.12 (.03)	3.73	6342	0.145
- work sat	-.13 (.03)	4.87	33729	-.01 (.03)	0.47	6365	0.120
- hours sat	.02 (.03)	0.70	33734	.08 (.03)	2.55	6365	0.056
2) omit job chars.+							
- overall sat	-.09 (.03)	3.46	33892	.00 (.03)	0.08	6383	0.093
- pay sat	-.00 (.03)	0.14	33857	.10 (.03)	3.01	6379	0.104
- job security	-.24 (.03)	7.94	33738	-.10 (.03)	3.15	6357	0.139
- work sat	-.13 (.03)	4.65	33883	-.01 (.03)	0.29	6380	0.120
- hours sat	.04 (.03)	1.48	33887	.09 (.03)	2.97	6380	0.047

Notes: + job chars are as per Table 3. Controls are as Table 3 except for omission of market sector dummy.

Table 5: Union Membership Effects on Job Satisfaction, Whole Economy

model		OLS			FE			$b_{fe}-b_{ols}$
1)full controls		b (s.e.)	t	Nit	b (s.e.)	t	Ni	
- overall sat	mem	-.17 (.03)	6.36	49970	-.07 (.03)	2.15	8074	0.105
	fre	-.03 (.03)	1.04		.06 (.03)	2.40		0.088
- pay sat	mem	-.04 (.03)	1.49	49932	.09 (.04)	2.7	8068	0.138
	fre	.02 (.03)	0.50		.13 (.03)	4.41		0.116
- job security	mem	-.29 (.03)	9.31	49753	-.14 (.04)	3.89	8047	0.155
	fre	-.19 (.03)	6.91		-.03 (.03)	1.06		0.164
- work sat	mem	-.21 (.03)	7.29	49953	-.08 (.03)	2.51	8071	0.127
	fre	-.07 (.03)	2,41		.02 (.03)	0.67		0.082
- hours sat	mem	-.07 (.03)	2.21	49966	.06 (.03)	1.83	8071	0.124
	fre	.10 (.03)	3.71		.11 (.03)	4.23		0.011
2) omit job chars.+								
- overall sat	mem	-.18 (.03)	6.85	50004	-.06 (.03)	1.79	8092	0.127
	fre	-.04 (.03)	1.50		.07 (.03)	2.55		0.103
- pay sat	mem	-.05 (.03)	1.52	50172	.09 (.04)	2.69	8086	0.144
	fre	.03 (.03)	0.83		.14 (.03)	4.64		0.113
- job security	mem	-.24 (.03)	7.59	49994	-.06 (.04)	1.59	8065	0.185
	fre	-.24 (.03)	8.21		-.05 (.03)	1.72		0.190
- work sat	mem	-.20 (.03)	7.13	50197	-.08 (.03)	2.37	8089	0.127
	fre	-.07 (.03)	2.44		.02 (.03)	0.77		0.085
- hours sat	mem	-.08 (.03)	2.48	50208	.06 (.03)	1.74	8089	0.132
	fre	.12 (.03)	4.13		.12 (.03)	4.45		0.005

Notes: controls are those listed below Table 3.

Table 6: Dynamic Coverage Effects, Fixed Effects Models, Whole Economy

	pay		security		work		hours		overall	
union:	b	|t|	b	|t|	b	|t|	b	|t|	b	|t|
- both	-0.019	(0.45)	-0.068	(1.65)	-0.141	(3.71)	-0.047	(1.19)	-0.083	(2.20)
-neither	-0.123	(2.97)	-0.0003	(0.01)	-0.099	(2.63)	-0.088	(2.20)	-0.064	(1.69)
- new	0.271	(4.76)	0.135	(2.50)	0.262	(5.24)	0.203	(3.83)	0.243	(4.96)
Ni/Nit	5947	36050	5941	35995	5604	39464	5948	36071	5947	36077

Notes: controls are those listed below Table 3.

Appendix: Tests of sample attrition bias

As noted by Wooldridge (2002), sample attrition bias is likely to arise in analysis of unbalanced panels and its removal is very difficult. It is useful to have a simple test of the seriousness of attrition bias. Wooldridge recommends the method proposed by Verbeek and Nijman (1992) which entails inclusion of a dummy variable indicating that the respondent exits the sample in the next wave. Significance of the estimated effect indicates a serious bias. Adopting this approach, we obtain the following estimates:

Satisfaction measure	b	t
pay	0.015	0.44
security	0.059	1.89
work	0.016	0.58
hours	-0.009	-0.30
overall	-0.005	-0.19

There is only weak evidence of attrition bias affecting the results for satisfaction with job security. There is no evidence of serious attrition bias affecting results for the other satisfaction outcomes. It is reasonable to conclude that the extensive controls used in the specification have tended to compensate for sample attrition.