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ABSTRACT

Spillover Effects of Unionisation on Non-members' Well-being*

The paper investigates whether unionisation has a spillover effect on wellbeing by comparing non-members in union and non-union workplaces. To this end, it adapts the social custom model of trade unions and goes on to conduct empirical analyses using linked employer-employee data and alternative empirical strategies. The findings in the paper reveal that unionisation does have a spillover effect lowering non-members' job satisfaction. Sub-group analysis based on workplace-level collective bargaining status uncovers that the adverse effect found is specific to establishments that set pay through collective bargaining.

JEL Classification: J5, J51, J28, J82

Keywords: trade union, spillover effect, wellbeing, linked employer-employee data, Britain

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1. Introduction

The empirical evidence on unions points to reported job satisfaction being lower among union members vis-à-vis their non-member counterparts, ceteris paribus. This is a puzzle, given that unions are meant to improve the pay and working conditions of their members, thus enhancing their satisfaction and wellbeing. Considerable attempt has been made to explain this puzzling empirical regularity (see Bryson *et al.* 2010 and Green and Heywood 2010 for recent reviews). Unionisation is no longer compulsory; and membership is a choice made by employees. This 'open shop' model makes the multi-attribute good associated with unionisation to be largely non-excludable, providing employees the incentive to free-ride; and paving the way for the coexistence of members and non-members, conditional on union presence. We argue that such coexistence may lead to negative spillover wellbeing effects on non-members, an issue that has not been addressed by the existing literature.

The literature typically compares average differences in satisfaction between members and non-members. However, there may well be a link between wellbeing and unionisation that goes beyond individual membership status. Recent evidence, for example (Bryson *et al.* 2010), indicates the importance of bargaining coverage at the workplace in explaining the link between membership and satisfaction. If members' bargaining power is a rising function of union density, something much of the literature confirms, then non-members would be limiting the bargaining power of members. If so, non-members may risk being ostracised by members, which may reduce their wellbeing. Several potentially countervailing factors can have adverse effects on non-members' wellbeing. These include the exclusion of non-members from certain private goods, reputational costs, the costs of unionisation as well as collective bargaining and the workplace environment it may create, among others. Such spillover wellbeing effects may also increase with workplace union density.

The benefits from free-riding may potentially compensate for the spillover wellbeing effects of unionisation. However, the net wellbeing effect of unionisation on non-members remains an empirical question. This paper departs from the existing literature by focusing only on non-members. It attempts to adapt the social custom model of trade unions (Booth 1995) before undertaking empirical analyses to establish the spillover wellbeing effect of unionisation on non-members. The paper uses linked employer-employee data, which allow measuring workplace union status as reported by employees and employers as well as controlling for other influences extensively, and deploying alternative empirical strategies to this end.

The results obtained reveal that unionisation reduces the job satisfaction of non-members. Sub-group analysis based on whether pay is set through workplace-level collective

bargaining suggests that the adverse job satisfaction effect found is specific to workplaces that set pay through collective bargaining. This may mean that where the stake in terms of members' influencing pay is higher, non-members face some compulsion to align with the union, which may in turn affect their wellbeing adversely. If so, this explanation would lend some support to the 'voice' hypothesis. On the other hand, this paper does not find statistically significant link between unionisation and employees' job-related anxiety.

The rest of the paper is organised as follows. Section Two reviews the relevant literature. Section Three extends the social custom theory and sets out the framework for the empirical analyses. Section four describes the data and variables used in the empirical analyses. Section Five discusses the empirical models. Section Six discusses results before the final section concludes the paper.

2. Review of the literature

The negative association between job satisfaction and union membership is a puzzling empirical regularity. The puzzle stems from the expectation that unions should in general enhance members' job satisfaction and wellbeing. A number of influential studies have established a link between unions and a pay premium and/or lower pay inequality (see, for example, Freeman 1980, Booth 1995, Gosling and Machin 1995, Clark and Oswald 1996, Card 1996, Card *et al.* 2003, Budd and Na 2000, Metcalf *et al.* 2001, Hirsch 2004, Blanchflower and Bryson 2004). Unions have also been linked to a number of other welfare improving changes for members, which include access to employer provided training (Booth 1991, Acemoglu *et al.* 2001, Booth *et al.* 2003, Waddoups 2012), risk sharing (Malcomson 1983), health insurance and pension plans (Buchmueller *et al.* 2002), workplace and occupational health and safety (Donado and Walde 2012), family friendly policies (Budd and Mumford 2004), and curbing discrimination (Phanindra and Peled 1999). More generally, unions uphold members' interest in collective bargaining on issues such as transfers, promotions and grievances, among others, in the spirit of Freeman and Medoff (1984)'s "collective voice".

Notwithstanding these well-established benefits associated with membership, which would be expected to enhance the satisfaction and wellbeing of members, existing empirical evidence points to a negative association between membership and job satisfaction. The two competing explanations often used to justify this puzzle are the 'sorting' and 'voice' hypotheses. The 'sorting' hypothesis attributes members' dissatisfaction to either the characteristics of unionized workers themselves or to poor working conditions in unionised work environments: either unions attract inherently dissatisfied workers or unionized workplaces represent genuinely

worse jobs, prompting workers to join forces to confront poor working conditions collectively. These are both thought to lead to spurious negative correlation between membership and satisfaction (Schwochau 1987, Bender and Sloane 1998, Bryson *et al.* 2004, Bryson *et al.* 2010, Green and Heywood 2010). The implication is that if the analyst is able to account fully for worker sorting, union status would not be associated with dissatisfaction. Bryson et al. (2004) argue this in their paper, which found no relationship between union membership and job satisfaction having accounted for worker sorting. The 'voice' hypothesis, on the other hand, attributes the dissatisfaction of members to unions' prompting employees to express their grievances collectively (Freeman and Medoff 1984) or through promoting a mood of complaint with the ultimate goal of enhancing their bargaining power (Borjas 1979, Davis-Blake and Pfeffer 1990, Gordon and Denisi 1995, Bryson *et al.* 2010). Thus members' dissatisfaction may not reflect *genuine* satisfaction, but rather a manifestation of their strategic goal to enhance bargaining power. If this is the case, unionisation engenders dissatisfaction such that it will remain even after accounting for worker sorting.

The union literature is centred on the impact of unionisation on members. Little is known about the effect of unionisation on non-members. However, several factors, which are also a function of union density, can be thought of as having a negative spillover effects on non-members. *First*, the operation of union bargaining and voice may impact the wellbeing of non-members adversely even though they are outside of the bargaining process. This is because the workplace environment can become strained due to voice induced complaining, especially if the process is conflict-laden. As a result employees generally and non-members in particular may experience a lower wellbeing than might otherwise be the case. There is some evidence suggesting non-members in union workplaces being more likely to view the climate as poor vis-à-vis comparable non-members in non-union workplaces (Bryson, 1999). *Secondly*, unionisation may entail some additional costs to the firm, which it may try to claw back through cost-offsetting practices such as tight manning levels or the loss of autonomy. Such practices may lead to increased disutility, particularly for non-members. *Third*, unions do still procure some private benefits including legal and pensions advice exclusively for their members. Such 'discrimination' by unions may trigger envy on the part of non-members with possibly adverse wellbeing consequences. It is also possible that unions, who are keen to procure private excludable goods for members, are able to promote policies that discriminate in favour of members, perhaps with the collusion of employers, reducing the job dissatisfaction of non-members. *Fourth*, there may also be 'reputational' costs associated with being a non-member as per the social custom model. The wage standardising policies of unions may also be viewed as

adversely impacting the wellbeing of non-members. Abowd and Farber (1982) indicate that non-members with high earnings potential who end up in union workplaces are misallocated. Such non-members are likely to have a preference for greater wage inequality than members, thereby incurring some wellbeing cost as a result of union policies.

On the other hand, unionisation is no longer compulsory making membership a choice element. In the 'open shop' model, non-members may choose to free-ride in union workplaces perhaps attracted by the benefits of unionisation. Such benefits may or may not fully compensate for the potential disutility stemming from adverse spillover effects. Unions are also no longer able to procure substantial private excludable goods to members. Instead, they tend to provide public goods thus extending the benefits they confer on members to covered non-members too. In a recent paper Donado and Walde (2012) show this to be the case with respect to health and safety provisions at work. The law also prevents employers from discriminating on grounds of union membership. Other things equal, these might translate into higher levels of non-member wellbeing than might have been in a non-union environment. The net wellbeing effect of unionisation on non-members is therefore an empirical question. In this paper we first attempt to extend the social custom model of unions before deploying alternative empirical strategies to establish the wellbeing effect of unionisation on non-members. The main empirical approach involves comparing reported job satisfaction and job-related anxiety of non-members in a unionised workplace with that of their counterparts in non-union workplaces, which we model jointly using SUR setup. In addition, the method of matching is used to compare non-members in unionised workplaces with observationally 'similar' counterparts in non-unionised workplaces, thereby comparing 'like-for-like'.

3. Theoretical Model

The focus of this paper is on non-members, which necessitates adapting the social customs model of trade unions (Booth 1985), SCM hereinafter. As in the SCM, reputation enters non-members' utility function; but only as a negative construct as set out in the assumptions below.

Assumption 1: There is a closed industry, wherein there are workplaces with and without trade unions; and employment is not dependent on membership since discrimination on the basis of membership status is illegal.

Assumption 2: As in Booth (1985), there are only two goods to employees in the closed industry: wage (w) and reputation (r); but with the qualifications in assumptions 3 and 4 below.

Assumption 3: The wage (w) is the sum of average industry wide wage (α) and a certain union wage premium (ω). The wage premium, which is only applicable to the union sub-sector, is thought to be a function of workplace union density (d) or simply $\omega = \omega(d)$. Thus,

(1) $w = \alpha + \omega(d)$

Assumption 4: The reputation good (r) reflects disutility or negative reputation associated with violating the social custom of unions. Non-membership in a union workplace is thought to entail a disutility stemming from 'ostracisation' by members, who would regard non-members as weakening their bargaining power. In other words, free-riding is assumed to entail some cost, a negative reputation. The level of disutility non-members experience is thought to increase with workplace union density. This is because members may take the liberty of imposing their will easily and/or be more confrontational as their group size increases. Let the negative reputation or disutility (r) non-members in a union workplace experience can be given by the following function:

(2) $r = 1 - e^{-\beta d}$,

or more generally as $r = r(d) \quad r_d > 0; r_{dd} < 0; r(0) = 0.$

where d stands for union density, $0 \le d \le 1,$ and the subscripts signify the first and second order derivatives.

Assumption 5: The negative reputation non-members experience depends on whether pay is set through workplace-level collective bargaining. This is because membership size may directly impact levels of pay entitlement at the workplace. If so, it may not be unrealistic to imagine members feeling aggrieved by free-riding non-member co-workers where there is workplace-level bargaining. Taking this into account, the workplace bargaining status can enter the reputation function multiplicatively as:

(3) $r = b(1 - e^{-\beta d})$

where, b represents the collective bargaining status of a workplace.

Assumption 6: Employee utility is assumed to be an increasing continuous, twice differentiable and concave function. The utility function of a non-member in a union workplace, U^1, can be given by:

(4) $U^1 = U[\alpha] + U[\omega(d)] - U[r(d)],$

A non-member in a non-union workplace would have neither pay premium nor reputation. Thus, the utility function of such a worker, U^0, would be a function of the industry-level average wage only and can be given by:

(5) $U^0 = U[\alpha],$

Equilibrium

Non-members may prefer a union workplace if $U^1 \geq U^0$, or so long as negative reputation does not make leaving unionised workplaces more attractive. In other words,

(6) $U[\alpha]+U[\omega(d)]-U[r(d)] \geq U[\alpha]$, or

(7) $U[\omega(d)] \geq U[r(d)]$

The theoretical explanation in this section posits that non-members in union workplaces choose to free-ride in unionised workplaces at least as long as the non-excludable wage premium the union confers just compensates for the disutility stemming from spillover effect of unionisation. Where this is not the case, non-members may choose to join the union to circumvent the disutility from violating the social custom of the union or seek to join non-union workplaces. Regardless of the level of the wage premium, however, non-members bear some level of disutility for being in unionised workplaces, which is thought to translate into a reduction in wellbeing for such workers. Assumption 5 means that this is likely to be the case only where there is workplace-level collective bargaining.

4. Data and variables

4.1 Overview of the Data

The data used in this paper come from the 2004 British Workplace Employment Relations Survey (WERS2004), the most authoritative source of information on employment relations in Great Britain offering linked employer-employee data representative of all workplaces with five or more employees (Kersley *et al.* 2006). WERS2004 cover whole host of issues relating to both employers and employees, allowing controlling extensively for these attributes. The estimation sample used in this paper is confined to 1034 private sector establishments involving 9213 employees who are not union members. This is obtained after the elimination of: (*i*) missing values in any one of the reported wellbeing outcomes, (*ii*) missing values in any one of the employee and workplace covariates and (*iii*) retaining only workplaces with at least two responding employees.

4.2 Definition of variables

4.2.1. Outcome variables

There are two types of employee wellbeing measure in WERS2004. The first relates to levels of satisfaction with eight different job facets. The survey asked employees to rate – on a five-point scale from 'very satisfied' to 'very dissatisfied' – "how satisfied are you with the following aspects

of your job": (*i*) the sense of achievement they get from their work; (*ii*) the scope for using their own initiative; (*iii*) the amount of influence they have over their job; (*iv*) the training they receive; (*v*) the amount of pay they receive; (*vi*) their job security; (*vii*) the work itself and (*viii*) their involvement in decision making. *Secondly*, WERS2004 also monitored job-related anxiety. Employees were asked to provide responses – on a five five-point scale from 'all of the time' to 'never' – to the question "thinking of the past few weeks, how much of the time has your job made you feel each of the following: tense, calm, relaxed, worried, uneasy, and content?"

Principal components analysis on the facets of job satisfaction identified a single factor with an eigen value above 1 (3.99) explaining 99 per cent of the variance in the eight items and with a Kaiser-Meyer-Olkin (KMO) sampling adequacy measure of 0.88. Similarly, principal components analysis on the job-related anxiety outcomes identified one factor with an eigen value above 1 (3.42) explaining 88 per cent of the variance in the six job-related anxiety measures and with a KMO sampling adequacy measure of 0.80.[1] Based on the principal components analyses, therefore, two different job-related wellbeing measures have been generated – *job satisfaction* and *job-related anxiety* – for the empirical analysis conducted in this paper. The job satisfaction measure we use in this paper excludes pay satisfaction even though our results do not change on including the pay satisfaction domain.[2]

Reported levels of satisfaction on the remaining seven facets with 5-point scores have then been recoded into (-2, 2) scales, where '-2' is "very dissatisfied" and '2' is "very satisfied". As can be seen from the descriptive statistics in Appendix Table A9, the resulting single summative job satisfaction outcome measure runs from (-14, 14). Similarly, the six facets of job-related anxiety measures with a 5-point score have also been rescaled into (-2, 2) scales, where '-2' is "never" and '2' is "all of the time" after reverse coding the positive affect items first. The resulting summative job-related anxiety measure runs from (-12, 12).[3] Figure A1 in the Appendix depicts the additive job satisfaction and job-related anxiety outcome measures for non-members disaggregated by workplace union status. The Figure depicts relatively higher level of satisfaction for non-members in non-union workplaces. In contrast, the observed difference in the level of job-related anxiety appears to be much less pronounced.

As detailed in Bryson *et al.* (2012), job satisfaction and job-related anxiety capture two distinct components of worker wellbeing. Psychological studies also emphasise the need for a broader definition of work-related psychological well-being than just job satisfaction (Warr 1990,

[1] The Cronbach's alpha for the eight facets of job satisfaction and the six job-related anxiety measures are 0.85 and 0.86, respectively. The Cronbach's alpha values are comparable to those reported in Wood (2008) and Bryson *et al.* (2009).
[2] The level of job satisfaction and/or subjective wellbeing employees report may be endogenous to the level of earning they command. Focusing on non-pecuniary measures of satisfaction may thus minimise the potential problem stemming from our use of levels of pay as control variables.
[3] The approach used here in generating the single summative scale follows that employed in Bryson *et al.* (2012)

1994, 1999). Job-related anxiety measures are considered important facets of psychological well-being (Warr 1994, Daniels 2000). Taking these into account, this paper uses both job satisfaction and job-related anxiety measures in the empirical analysis undertaken. It is also worth noting that the wording of the job-related anxiety question indicates that the job anxiety measure monitors experiences of positive and negative emotional states over a short recall period ("the past few weeks") and may offer a more 'immediate' reflection of emotional wellbeing vis-à-vis the job satisfaction measure. In addition, job satisfaction is likely to be influenced by one's prior expectation (of, for example, a pay rise or promotion) while the job-related anxiety measures may reflect actual feelings (of, for example, uneasiness) experienced over a short recall period, which may not be influenced by expectations as much.

4.2.2. Measures of workplace union status and other control variables

The paper uses two measures of workplace union status based on employee and employer responses to the question on the workplace union status. The *first* measure of workplace union status is *a binary measure* (union present), which is based on employees' response to the question "*Is there a trade union….at this workplace?*" The *second* measure is a continuum measure of *workplace union density* obtained from employers' response to the question "*How many employees at this establishment are members of a trade union…?*" The empirical analyses undertaken control for each of these measures separately as well as in combination with other employee and employer characteristics thought to influence unionisation. These other characteristics include: employee demographic and human capital characteristics, job characteristics, industry of employment as well as a range of employer characteristics that include geographic location and travel-to-work area unemployment and vacancy rates. Table A10 in the appendix reports descriptive statistics on all the control variables, including the key unionisation measures described above.

5. Empirical Models

The paper deploys two different empirical strategies for the empirical analyses undertaken. The *first* approach is the Seemingly Unrelated Regression (SUR) model (Zellner, 1962). As noted in the preceding section, we have two outcome variables of interest – job satisfaction and job related anxiety measures - representing employees' subjective assessments of aspects of their job. These outcome measures represent close conceptual relationship to each

other. Given this, using SUR, which takes into account possible correlation between the satisfaction and anxiety equations, is appropriate.[4] The SUR set up used can be given as follows:

$$(8) \qquad wb_{ij}^{k} = \mathbf{x}_{ij}^{'k}\beta^{k} + \varepsilon_{ij}^{k}, \quad i = 1,...,N;\ j = 1,...,M, \text{ and } k = 1,2$$

where wb stands for wellbeing, representing job satisfaction and job-related anxiety as indexed by the superscript k; $\mathbf{x}$ is the vector of regressors including the workplace unionisation measures; i indexes non-members and j indexes workplaces, which are both union and non-union workplaces. The error terms in (8) are assumed to be homoscedastic, independent across individuals and have zero mean. However, the errors of the job satisfaction and anxiety equations may be correlated for a given non-member, given the conceptual similarity between the two outcomes noted earlier. That is, $E(\varepsilon_{ij}^{1}\varepsilon_{ij}^{2} \mid \mathbf{x}) = \sigma^{1,2} \neq 0.$ The SUR framework accounts for this using the GLS estimator. Section 6 below, reports the Chi-squared statistics from the Breusch-Pagan test of independence for each of the equations estimated.

The *second* empirical approach used is matching estimator (Rosenbaum and Rubin 1983) involving the binary outcome measure described in the preceding section. As the matching estimator balance on observable characteristics of non-members, it is thought to permit 'like-for-like' comparison of the wellbeing of non-members in union workplaces with similar non-members in non-union workplaces. Let W^{1} and W^{0} represent the wellbeing outcomes of non-members in union and non-union workplaces, respectively. We define 'treatment' as non-members having at least one union member co-worker(s) (D=1) as opposed to not having one (D=0), which we isolate based on the combined information of employees' own membership status and their response on the union status of their workplaces.[5] We seek to recover the causal effect of working in union workplaces on the wellbeing of non-members by matching non-members in unionised workplaces to observationally comparable employees in non-unionised workplaces to obtain the *average treatment effect on the treated* (ATT). The Conditional Independence Assumption (CIA) can be invoked to generate the counterfactual wellbeing outcome of being in a non-union workplace using the method of matching as:

$$(9) \qquad E(W^{0} \mid D = 1, P(X)) = E(W^{0} \mid D = 0, P(X))$$

[4] This also provides some efficiency gain from combining the two equations of interest.
[5] Thus, if an employee reports to be a non-member but their workplace is reported to have a union, then D=1.

where $P(.)$ denote the probability scores of being a non-member in a union job, which are estimated on a rich set of employee and employer characteristics, **x**, contained in the linked WERS2004 data.[6] Matching allows constructing the comparison group of employees in non-union workplaces who resemble non-members in union workplaces. Under CIA, the average wellbeing effect of being in union workplaces on non-union workers (ATT) can be retrieved as:

$$(10) \qquad \frac{1}{N^1}\sum_{i^1\in\{D=1\}}\left((W^1)_{i^1}-\sum_{i^0\in\{D=0\}}\tau_{i^1i^0}(W^0)_{i^0}\right)$$

where $(W^1)_{i^1}$ is the wellbeing outcome of the i^1th non-member in union workplaces ($i^1\in\{D=1\}$), $(W^0)_{i^0}$ is the wellbeing outcome of the i^0th employee in non-union workplaces ($i^0\in\{D=0\}$), $\tau_{i^1i^0}$ is the weight of employees from non-union workplaces with $\sum_{i^0\in\{D=0\}}\tau_{i^1i^0}=1$ and N^1 is the number of non-members in union workplaces i^1. The counterfactual outcome is estimated using the weight function $\tau_{i^1i^0}$ in the sample of employees in non-union workplaces, i^0, relative to the predicted propensity score $\widehat{P(X)}$ of each 'treated' non-member i^1. We use gaussian kernel matching with common support. It is implemented on propensity scores from a probit model estimating the probability of being a non-member in a union environment (that is, with union co-workers). Thus, employees from non-union workplaces (the 'control' group) get weights according to their distance from non-members in union workplaces (the 'treated' group) based on estimated propensity scores. Accordingly, larger weights are assigned to employees from non-union workplaces that are 'close' to non-members in union workplaces on the basis of these scores. Table A7 in the Appendix reports coefficient estimates from the probit equation estimated, which controls extensively for employer and employee characteristics thought to determine employment of non-members in a union workplace. Estimated propensity scores from the probit model indicate a large common support, as can be seen from the covariate balance test results reported in Appendix Table A8. It is worth noting that the matching estimator controls for observable characteristics; and does not account for possible systematic differences that may relate to unobservables. Nonetheless, the use of linked employer-employee data with a rich set of covariates affecting both treatment and outcome is likely to minimise such differences.

[6] The matching estimator assumes the outcomes of interest (here wellbeing) are independent of participation status conditional on a set of observable characteristics (Heckman, Ichimura, and Todd 1998). It is thus vital that only exogenous variables liable to affect both 'treatment' and outcomes are used, excluding potentially endogenous variables. In view of this, the controls used for the matching equation in this paper exclude workplace size, workplace industry, whether union is encouraged at the workplace, level of union coverage, and individual union membership status, which are likely to be endogenous.

6. Results and discussion

The main findings from the empirical analyses conducted are reported in Tables 1 – 3 below. Tables 1 and 2 report partial regression results from SUR analysis involving the binary and density measures of workplace unionisation respectively.[7] In each case, three different specifications of the wellbeing equations are estimated to ascertain the robustness of the results obtained. The first specification controls only for the workplace union measure as reported by either employees or employers. The second specification controls for employee characteristics in addition, while the third specification controls for both employee and employer characteristics. In each case, a test of independence of the joint equations is conducted; and the Breusch-Pagan test statistic reported. In addition, tests have been conducted to establish the joint significance of the key workplace union status variables. In all cases, the test statistics confirm the union variables to be jointly statistically significant at the conventional level of significance. Also, reported standard errors are bootstrap standard errors in each case. All the estimation results reported use survey weights and account for clustering at the workplace level, which is important since there are at least two employees from each workplace in the estimation sample.

The results reported in Table 1 are based on the binary workplace union status variable generated from employees' response. As can be seen from the first block of results, all three specifications reveal that non-members in union workplaces experience negative and statistically significant reduction in job satisfaction. On the other hand, the unionisation measure is not found to be statistically significant in all of the job-related anxiety equations. This finding indicates that the spillover effect of unionisation occurs only through its effect on non-members' job satisfaction. The bottom two blocks of results in Table 1 are from sub-group analysis based on whether pay is set through workplace-level collective bargaining. The sub-group analysis reveals that the negative spillover effect of unionisation on job satisfaction identified is specific to workplaces that set pay through collective bargaining.

Table 1: SUR based estimates of the wellbeing effect of unionisation on non-members; employee response based binary measure of workplace union status.

	(1)		(2)		(3)	
	Satisfaction	Anxiety	Satisfaction	Anxiety	Satisfaction	Anxiety
	All non-members					
Union present (0/1)	-0.726***	-0.038	-0.641***	-0.034	-0.711***	-0.067
	(0.165)	(0.126)	(0.157)	(0.113)	(0.158)	(0.124)
Employee characteristics	No	No	Yes	Yes	Yes	Yes

[7] The full estimation results corresponding to each block of partial results reported in Tables 1 and 2 are provided in Appendix Tables A1 to A6.

Employer characteristics	No	No	No	No	Yes	Yes
Constant	4.613***	1.458***	3.453***	2.717***	3.898***	2.943***
	(0.101)	(0.084)	(0.435)	(0.417)	(0.465)	(0.469)
No. of non-members	9213	9213	9213	9213	9213	9213
R-squared	0.005	0.000	0.077	0.093	0.103	0.099
Chi2(1)	1817.562		2011.140,		1974.323	
Non-members in workplaces without collective bargaining						
Union present (0/1)	-0.307	0.110	-0.338	-0.055	-0.385*	-0.089
	(0.227)	(0.213)	(0.217)	(0.182)	(0.207)	(0.204)
Employee characteristics	No	No	Yes	Yes	Yes	Yes
Employer characteristics	No	No	No	No	Yes	Yes
Constant	4.558***	1.427***	3.238***	2.743***	3.466***	2.804***
	(0.122)	(0.119)	(0.639)	(0.599)	(0.652)	(0.692)
No. of non-members	4951	4951	4951	4951	4951	4951
R-squared	0.001	0.000	0.080	0.109	0.105	0.114
Chi2(1)	942.376		1034.108		1018.936	
Non-members in workplaces with collective bargaining						
Union present (0/1)	-1.034***	-0.161	-0.858***	-0.026	-0.861***	-0.062
	(0.219)	(0.200)	(0.209)	(0.179)	(0.229)	(0.204)
Employee characteristics	No	No	Yes	Yes	Yes	Yes
Employer characteristics	No	No	No	No	Yes	Yes
Constant	4.713***	1.514***	3.724***	2.546***	4.497***	3.099***
	(0.157)	(0.149)	(0.610)	(0.488)	(0.786)	(0.675)
No. of non-members	4262	4262	4262	4262	4262	4262
R-squared	0.011	0.000	0.080	0.084	0.111	0.093
Chi2(1)	874.883		978.097		957.697	

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Bootstrap std. errors from 150 replications based on 506 clusters of workplaces.

The results reported in Table 2 are based on employer reported continuum measure of workplace union density. Once again, all three specifications show that workplace union density and non-member job satisfaction are negatively and statistically significantly related. In contrast, no statistically significant link is found between workplace union density and employee job-related anxiety. This result shows once again that the spillover effect of unionisation happens only through its effect on non-members' job satisfaction. As in Table 1, the bottom two blocks of partial results in Table 2 are from sub-group analysis based on whether workplaces set pay through collective bargaining. The results from the sub-group analysis once again reveal that the

negative spillover effect of unionisation on job satisfaction is specific to workplaces that set pay through collective bargaining.

Table 2: SUR based estimates of the wellbeing effect of unionisation on non-members, employer response based continuum measure of workplace union status.

	(1)		(2)		(3)	
	Satisfaction	Anxiety	Satisfaction	Anxiety	Satisfaction	Anxiety
			All non-members			
% Union member	-0.017***	-0.005	-0.014***	-0.002	-0.012***	-0.001
	(0.004)	(0.003)	(0.004)	(0.003)	(0.004)	(0.003)
Employee characteristics	No	No	Yes	Yes	Yes	Yes
Employer characteristics	No	No	No	No	Yes	Yes
Constant	4.512***	1.492***	3.388***	2.736***	3.828***	2.939***
	(0.085)	(0.077)	(0.423)	(0.414)	(0.463)	(0.467)
No. of non-members	9213	9213	9213	9213	9213	9213
R-squared	0.005	0.000	0.076	0.093	0.101	0.099
Chi2(1)	1808.31		2007.058		1971.111	
			Non-members in workplaces without collective bargaining			
% Union member	-0.000	0.011	0.001	0.005	0.000	0.004
	(0.007)	(0.007)	(0.006)	(0.007)	(0.007)	(0.007)
Employee characteristics	No	No	Yes	Yes	Yes	Yes
Employer characteristics	No	No	No	No	Yes	Yes
Constant	4.480***	1.404***	3.109***	2.676***	3.361***	2.745***
	(0.118)	(0.107)	(0.646)	(0.603)	(0.646)	(0.693)
No. of non-members	4951	4951	4951	4951	4951	4951
R-squared	0.000	0.001	0.079	0.109	0.104	0.114
Chi2(1)	941.238		1033.912		1019.015	
			Non-members in workplaces with collective bargaining			
% Union member	-0.022***	-0.010***	-0.018***	-0.005	-0.014***	-0.005
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Employee characteristics	No	No	Yes	Yes	Yes	Yes
Employer characteristics	No	No	No	No	Yes	Yes
Constant	4.530***	1.601***	3.680***	2.655***	4.436***	3.126***
	(0.126)	(0.110)	(0.607)	(0.487)	(0.786)	(0.671)
No. of non-members	4262	4262	4262	4262	4262	4262
R-squared	0.012	0.003	0.080	0.085	0.109	0.093
Chi2(1)	862.146		969.850		951.466	

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Bootstrap std. errors from 150 replications based on 506 clusters of workplaces.

As noted in Section Five, we also implement the alternative matching based estimator. The semi-parametric matching estimator, which enforces common support, compares the wellbeing of non-members in union workplaces with that of observationally 'similar' employees in non-union workplaces. Matching is performed on propensity scores obtained from probit regressions that estimate the probability of being a non-member in a union workplace.[8] Table 3 reports matching based estimation results relating to the effect of unionisation on the job satisfaction and job-related anxiety of non-members (ATT). The Table also reports results from sub-group analysis on whether pay is set through workplace-level collective bargaining. The reported results confirm the earlier findings that: (a) the negative spillover effect of unionisation on non-members' wellbeing occurs only through non-members' job satisfaction and (b) this effect is specific to workplaces that set pay through workplace-level collective bargaining.

Table 3: Matching based estimates of the wellbeing effect of unionisation on non-members, employee response based binary measure of workplace union status.

	Job satisfaction			Job-related anxiety		
	Observed coef.	Bootstrap Std. Err.	Z	Observed coef.	Bootstrap Std. Err.	Z
All non-members						
Union workplace (0/1)						
ATT	-0.620	0.144	-4.31	-0.008	0.132	-0.06
No. of non-members	9213					
No. of workplaces/clusters	1034					
Non-members in workplaces without collective bargaining						
Union workplace (0/1)						
ATT	-0.245	0.250	-0.98	0.148	0.224	0.66
No. of non-members	4951					
No. of workplaces/clusters	528					
Non-members in workplaces with collective bargaining						
Union workplace (0/1)						
ATT	-0.874	0.258	-3.39	-0.194	0.224	-0.87
No. of non-members	4262					
No. of workplaces/clusters	506					

Bootstrap standard errors from 150 replications based on 1034, 528 and 506 clusters/workplaces for each panel of results.

7. Conclusion

The paper examined the spillover effect of unionisation on non-members' wellbeing. It departed from the standard approach in the literature by focusing entirely on the wellbeing of non-members in union and non-union private establishments. The innovative approach deployed compares the wellbeing of non-members in union workplaces with that of employees in non-union workplaces. To this end, the paper first attempted to extend the social custom model of trade unions. It then used linked employer-employee data to establish empirically the

[8] Table A7 in the Appendix reports the results from the probit regressions. The propensity scores obtained from the probit equation use sampling weights and account for clustering. As noted in Section Five, the kernel weights signify the distance of non-members in non-union workplaces from non-members in union workplaces in terms of the estimated probability scores.

spillover effect of unionisation on non-members' wellbeing. The linked data allowed defining workplace union status based on the responses of both employees and employers; and using two different wellbeing measures in the form of *job satisfaction* and *job-related anxiety*.

The theoretical model developed suggests that non-members in unionised workplaces bear some level of disutility for violating the social custom of the union; regardless of the level of the wage premium unionisation may deliver. This was thought to translate into a reduction in wellbeing for non-members in union workplaces. The empirical analyses undertaken lend some support for the theoretical predictions. The empirical analyses carried out have several strengths including: the use of linked employer-employee data, alternative measures of workplace unionisation as reported by employees and employers, alternative econometric models, several empirical specifications and workplace collective bargaining status based sub-group analysis. The empirical results obtained are remarkably robust and reveal that: (a) there is a negative spillover effect of unionisation on non-members' job satisfaction and (b) the spillover effect found is specific to workplaces that set pay through workplace-level collective bargaining. That the negative spillover effect is specific to workplaces, which set pay through workplace-level collective bargaining, seems to point to the workplace climate of bargaining and 'voice' being the likely culprits behind the adverse effect of unionisation on non-members' job satisfaction found.

That the spillover wellbeing effect found is confined only to non-members' job satisfaction merits some discussion. Although the two wellbeing measures – job satisfaction and job-related anxiety - represent two conceptually similar subjective assessments of aspects of jobs, they are not expected to capture exactly the same thing. As noted in Section Four, the job-related anxiety outcome relates to employees' experiences of positive and negative emotional states over a period of few weeks, while the job satisfaction outcome captures the degree of employees' satisfaction on aspects of their job without any particular reference to time. More importantly, the job satisfaction outcome includes employees' subjective assessments of aspects of their jobs such as satisfaction with 'the scope for using their own initiative' and 'the amount of influence they have over their job'. These are precisely the job aspects that unionisation is likely to affect. Considering that more than 30% of non-members in the estimation sample constitute the managerial, supervisory and professional ranks, it is not entirely surprising that unionisation, which is likely to limit their customary authority, adversely affects the job satisfaction of non-members. On the other hand, it is not apparent, conceptually at least, how unionisation may affect non-members' experiences of positive and negative emotional states over a specific period of few weeks; something the empirical results seem to suggest.

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Appendix: Full regression Tables, descriptive statistics and Figure

Table A1: SUR estimates of the wellbeing effect of unionisation on non-members, based on employee reported binary workplace union status, all non-members.

	(1)		(2)		(3)	
	Satisfaction	Anxiety	Satisfaction	Anxiety	Satisfaction	Anxiety
Union present (0/1)	-0.726***	-0.038	-0.641***	-0.034	-0.711***	-0.067
	(0.165)	(0.126)	(0.157)	(0.113)	(0.158)	(0.124)
Age<30			-0.267*	-0.215	-0.095	-0.156
			(0.148)	(0.140)	(0.150)	(0.137)
Age30-39			-0.065	0.013	0.033	0.048
			(0.152)	(0.156)	(0.152)	(0.157)
Age50+			0.728***	0.851***	0.629***	0.809***
			(0.164)	(0.155)	(0.159)	(0.158)
Female			0.442***	-0.388***	0.269**	-0.426***
			(0.130)	(0.104)	(0.133)	(0.111)
Married			0.444***	0.066	0.409***	0.050
			(0.113)	(0.103)	(0.111)	(0.103)
White			-0.037	-0.115	-0.133	-0.178
			(0.263)	(0.248)	(0.262)	(0.254)
Children <7yrs old			-0.048	-0.118	-0.111	-0.142
			(0.147)	(0.143)	(0.145)	(0.142)
Other dependents			-0.180	-0.406***	-0.275*	-0.429***
			(0.154)	(0.148)	(0.151)	(0.145)
Disabled			-0.557***	-0.859***	-0.513***	-0.842***
			(0.184)	(0.168)	(0.178)	(0.166)
No academic qualification			0.882***	0.636***	0.926***	0.656***
			(0.216)	(0.193)	(0.207)	(0.194)
O-level			0.675***	0.234	0.694***	0.240
			(0.165)	(0.158)	(0.160)	(0.158)
A-level			0.312	0.140	0.394*	0.176
			(0.204)	(0.184)	(0.203)	(0.186)
Other qualification			0.395***	0.066	0.355**	0.056
			(0.148)	(0.140)	(0.145)	(0.140)
On permanent contract			0.861***	-0.339*	1.047***	-0.260
			(0.182)	(0.187)	(0.183)	(0.186)
Full-time			-0.185	-0.813***	-0.184	-0.789***
			(0.179)	(0.184)	(0.179)	(0.180)
Works over 48 hours			0.310***	-1.125***	0.200*	-1.175***
			(0.120)	(0.104)	(0.117)	(0.102)
Skill same as required			1.606***	0.448***	1.556***	0.424***
			(0.108)	(0.089)	(0.108)	(0.089)
Professional			-1.578***	0.080	-1.555***	0.128
			(0.219)	(0.188)	(0.215)	(0.187)
Associate professional & technical			-1.234***	0.227	-1.275***	0.198
			(0.188)	(0.182)	(0.184)	(0.181)
Admin. & secretarial			-1.787***	0.479**	-1.686***	0.526***
			(0.189)	(0.193)	(0.192)	(0.199)
Skilled trades plant & mach.			-1.947***	0.999***	-1.828***	1.036***
			(0.203)	(0.195)	(0.201)	(0.201)
Personal & customer services			-1.161***	0.534***	-1.555***	0.357*
			(0.206)	(0.205)	(0.209)	(0.209)
Elementary occupations			-1.685***	0.900***	-1.680***	0.915***
			(0.228)	(0.222)	(0.227)	(0.223)
Gross weekly pay <=110			0.557**	0.778***	0.468*	0.722***
			(0.268)	(0.274)	(0.258)	(0.266)
Gross weekly pay 111-180			0.210	0.223	-0.011	0.147
			(0.231)	(0.199)	(0.234)	(0.198)
Gross weekly pay 261-360			-0.279*	-0.666***	-0.117	-0.595***

			(0.157)	(0.161)	(0.154)	(0.162)
Gross weekly pay 361p			0.133	-0.732***	0.522***	-0.579***
			(0.168)	(0.186)	(0.167)	(0.187)
Log workplace age					-0.168**	-0.073
					(0.066)	(0.054)
No. of employees/1000					-0.359***	-0.130
					(0.127)	(0.104)
Manufacturing					-0.071	0.009
					(0.206)	(0.151)
Construction					1.008***	0.652***
					(0.294)	(0.230)
Wholesale & retail trade					0.510**	0.349*
					(0.222)	(0.182)
Hotel and restaurant					0.469*	0.151
					(0.277)	(0.269)
Public & community services					0.686**	0.699**
					(0.321)	(0.273)
Education					2.029***	0.784**
					(0.516)	(0.333)
Health					2.432***	0.961***
					(0.232)	(0.220)
Urban area					-0.241	-0.321**
					(0.163)	(0.140)
Unemployment to vacancy ratio					-0.066**	-0.006
					(0.030)	(0.022)
Constant	4.613***	1.458***	3.453***	2.717***	3.898***	2.943***
	(0.101)	(0.084)	(0.435)	(0.417)	(0.465)	(0.469)
No. of non-members	9213	9213	9213	9213	9213	9213
R-squared	0.005	0.000	0.077	0.093	0.103	0.099
Chi2(1)	1817.562		2011.140,		1974.323	

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Bootstrap std. errors from 150 replications based on 1034 clusters of workplaces.

Table A2: SUR estimates of the wellbeing effect of unionisation on non-members in workplaces without collective bargaining, based on employee reported binary workplace union status.

	(1)		(2)		(3)	
	Satisfaction	Anxiety	Satisfaction	Anxiety	Satisfaction	Anxiety
Union present (0/1)	-0.307	0.110	-0.338	-0.055	-0.385*	-0.089
	(0.227)	(0.213)	(0.217)	(0.182)	(0.207)	(0.204)
Age<30			-0.140	-0.080	0.027	-0.019
			(0.207)	(0.166)	(0.199)	(0.166)
Age30-39			0.068	-0.048	0.183	-0.004
			(0.207)	(0.201)	(0.209)	(0.204)
Age50+			0.777***	0.874***	0.705***	0.857***
			(0.222)	(0.240)	(0.220)	(0.240)
Female			0.334**	-0.567***	0.193	-0.584***
			(0.170)	(0.152)	(0.172)	(0.154)
Married			0.343**	-0.123	0.314**	-0.133
			(0.141)	(0.140)	(0.140)	(0.142)
White			-0.241	0.121	-0.366	0.053
			(0.412)	(0.355)	(0.399)	(0.365)
Children <7yrs old			0.005	0.015	-0.024	0.000
			(0.188)	(0.169)	(0.186)	(0.167)
Other dependents			-0.097	-0.316	-0.131	-0.326
			(0.197)	(0.204)	(0.195)	(0.206)
Disabled			-0.363	-0.466**	-0.248	-0.421**
			(0.232)	(0.216)	(0.225)	(0.213)
No academic qualification			1.321***	1.169***	1.382***	1.187***
			(0.271)	(0.288)	(0.268)	(0.291)
O-level			1.014***	0.183	1.015***	0.176
			(0.225)	(0.225)	(0.226)	(0.229)
A-level			0.565**	0.320	0.634***	0.348
			(0.241)	(0.268)	(0.240)	(0.271)
Other qualification			0.662***	0.177	0.605***	0.162
			(0.206)	(0.180)	(0.209)	(0.180)
On permanent contract			1.250***	-0.040	1.382***	0.027
			(0.267)	(0.259)	(0.257)	(0.253)
Full-time			-0.468*	-1.042***	-0.467*	-1.015***
			(0.250)	(0.211)	(0.246)	(0.210)
Works over 48 hours			0.306*	-1.398***	0.237	-1.425***
			(0.163)	(0.152)	(0.165)	(0.152)
Skill same as required			1.560***	0.405***	1.500***	0.378***
			(0.140)	(0.127)	(0.140)	(0.129)
Professional			-1.725***	0.022	-1.549***	0.090
			(0.368)	(0.261)	(0.359)	(0.251)
Associate professional & technical			-1.356***	-0.018	-1.340***	-0.016
			(0.264)	(0.241)	(0.255)	(0.244)
Admin. & secretarial			-1.815***	0.241	-1.662***	0.290
			(0.310)	(0.262)	(0.289)	(0.252)
Skilled trades plant & mach.			-1.791***	0.804***	-1.700***	0.841***
			(0.271)	(0.258)	(0.263)	(0.263)
Personal & customer services			-1.030***	0.371	-1.420***	0.225
			(0.328)	(0.287)	(0.326)	(0.285)
Elementary occupations			-1.872***	0.622**	-1.884***	0.659**
			(0.315)	(0.278)	(0.306)	(0.289)
Gross weekly pay <=110			0.623*	0.744**	0.502	0.717**
			(0.377)	(0.350)	(0.361)	(0.336)
Gross weekly pay 111-180			0.016	0.144	-0.210	0.099
			(0.270)	(0.280)	(0.285)	(0.282)
Gross weekly pay 261-360			-0.301	-0.716***	-0.119	-0.644***
			(0.240)	(0.221)	(0.233)	(0.215)
Gross weekly pay 361p			0.240	-0.735***	0.686**	-0.580**
			(0.264)	(0.228)	(0.267)	(0.229)

Log workplace age					-0.114	-0.066
					(0.078)	(0.074)
No. of employees/1000					-0.849***	-0.294
					(0.315)	(0.282)
Manufacturing					-0.051	-0.014
					(0.293)	(0.223)
Construction					0.854***	0.668**
					(0.329)	(0.290)
Wholesale & retail trade					0.711**	0.407*
					(0.302)	(0.223)
Hotel and restaurant					0.796**	0.027
					(0.328)	(0.325)
Public & community services					0.853*	0.646**
					(0.455)	(0.314)
Education					1.437*	0.866*
					(0.828)	(0.496)
Health					2.326***	0.776**
					(0.326)	(0.309)
Urban area					-0.328	-0.201
					(0.213)	(0.196)
Unemployment to vacancy ratio					-0.036	0.008
					(0.039)	(0.035)
Constant	4.558***	1.427***	3.238***	2.743***	3.466***	2.804***
	(0.122)	(0.119)	(0.639)	(0.599)	(0.652)	(0.692)
No. of non-members	4951	4951	4951	4951	4951	4951
R-squared	0.001	0.000	0.080	0.109	0.105	0.114
Chi2(1)	942.376		1034.108		1018.936	

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Bootstrap std. errors from 150 replications based on 528 clusters of workplaces.

Table A3: SUR estimates of the wellbeing effect of unionisation on non-members in workplaces with collective bargaining, based on employee reported binary workplace union status.

	(1)		(2)		(3)	
	Satisfaction	Anxiety	Satisfaction	Anxiety	Satisfaction	Anxiety
Union present (0/1)	-1.034***	-0.161	-0.858***	-0.026	-0.861***	-0.062
	(0.219)	(0.200)	(0.209)	(0.179)	(0.229)	(0.204)
Age<30			-0.380	-0.349	-0.192	-0.277
			(0.243)	(0.232)	(0.231)	(0.229)
Age30-39			-0.213	0.093	-0.107	0.134
			(0.221)	(0.221)	(0.222)	(0.220)
Age50+			0.618***	0.809***	0.511**	0.750***
			(0.208)	(0.228)	(0.207)	(0.231)
Female			0.571***	-0.185	0.358*	-0.238
			(0.199)	(0.158)	(0.195)	(0.163)
Married			0.537***	0.288*	0.479***	0.262
			(0.169)	(0.171)	(0.168)	(0.171)
White			0.102	-0.271	0.046	-0.331
			(0.342)	(0.313)	(0.355)	(0.321)
Children <7yrs old			-0.146	-0.298	-0.223	-0.336*
			(0.217)	(0.202)	(0.210)	(0.200)
Other dependents			-0.240	-0.419*	-0.386*	-0.453**
			(0.244)	(0.234)	(0.231)	(0.228)
Disabled			-0.754***	-1.252***	-0.785***	-1.279***
			(0.255)	(0.239)	(0.254)	(0.241)
No academic qualification			0.385	0.001	0.380	0.003
			(0.310)	(0.297)	(0.289)	(0.289)
O-level			0.278	0.286	0.324	0.304
			(0.267)	(0.216)	(0.247)	(0.211)
A-level			0.007	-0.048	0.120	-0.008
			(0.303)	(0.264)	(0.299)	(0.264)
Other qualification			0.127	-0.036	0.118	-0.044
			(0.220)	(0.193)	(0.208)	(0.187)
On permanent contract			0.478	-0.665**	0.728**	-0.559**
			(0.297)	(0.271)	(0.288)	(0.266)
Full-time			0.120	-0.586**	0.133	-0.588**
			(0.261)	(0.275)	(0.252)	(0.268)
Works over 48 hours			0.279	-0.821***	0.138	-0.896***
			(0.175)	(0.165)	(0.176)	(0.164)
Skill same as required			1.641***	0.483***	1.599***	0.463***
			(0.150)	(0.141)	(0.143)	(0.139)
Professional			-1.417***	0.102	-1.599***	0.095
			(0.315)	(0.297)	(0.322)	(0.312)
Associate professional & technical			-1.112***	0.477*	-1.221***	0.368
			(0.315)	(0.277)	(0.311)	(0.279)
Admin. & secretarial			-1.738***	0.736***	-1.729***	0.739***
			(0.300)	(0.269)	(0.296)	(0.267)
Skilled trades plant & mach.			-2.051***	1.211***	-1.948***	1.212***
			(0.321)	(0.306)	(0.318)	(0.292)
Personal & customer services			-1.277***	0.747**	-1.632***	0.530*
			(0.321)	(0.296)	(0.329)	(0.299)
Elementary occupations			-1.397***	1.262***	-1.405***	1.218***
			(0.370)	(0.355)	(0.369)	(0.344)
Gross weekly pay <=110			0.499	0.843**	0.448	0.762**
			(0.326)	(0.360)	(0.329)	(0.349)
Gross weekly pay 111-180			0.432	0.301	0.215	0.184
			(0.307)	(0.302)	(0.306)	(0.290)
Gross weekly pay 261-360			-0.189	-0.564**	-0.012	-0.482**
			(0.241)	(0.230)	(0.246)	(0.233)
Gross weekly pay 361p			0.109	-0.675***	0.461*	-0.516**
			(0.275)	(0.242)	(0.267)	(0.241)

Log workplace age					-0.236**	-0.095
					(0.105)	(0.086)
No. of employees/1000					-0.325***	-0.114
					(0.121)	(0.124)
Manufacturing					-0.173	0.031
					(0.336)	(0.256)
Construction					1.038*	0.629
					(0.559)	(0.456)
Wholesale & retail trade					0.173	0.227
					(0.363)	(0.286)
Hotel and restaurant					0.085	0.256
					(0.453)	(0.353)
Public & community services					0.424	0.742**
					(0.449)	(0.327)
Education					2.313***	0.817*
					(0.490)	(0.441)
Health					2.467***	1.207***
					(0.376)	(0.326)
Urban area					-0.131	-0.500**
					(0.255)	(0.203)
Unemployment to vacancy ratio					-0.097**	-0.022
					(0.045)	(0.039)
Constant	4.713***	1.514***	3.724***	2.546***	4.497***	3.099***
	(0.157)	(0.149)	(0.610)	(0.488)	(0.786)	(0.675)
No. of non-members	4262	4262	4262	4262	4262	4262
R-squared	0.011	0.000	0.080	0.084	0.111	0.093
Chi2(1)	874.883		978.097		957.697	

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Bootstrap std. errors from 150 replications based on 506 clusters of workplaces.

Table A4: SUR estimates of the wellbeing effects of unionisation on non-members, all non-members, based on employer response on workplace union density.

	(1)		(2)		(3)	
	Satisfaction	Anxiety	Satisfaction	Anxiety	Satisfaction	Anxiety
% Union member	-0.017***	-0.005	-0.014***	-0.002	-0.012***	-0.001
	(0.004)	(0.003)	(0.004)	(0.003)	(0.004)	(0.003)
Age<30			-0.252*	-0.218	-0.083	-0.155
			(0.151)	(0.139)	(0.152)	(0.137)
Age30-39			-0.063	0.011	0.036	0.048
			(0.154)	(0.157)	(0.154)	(0.158)
Age50+			0.733***	0.851***	0.637***	0.809***
			(0.165)	(0.154)	(0.159)	(0.157)
Female			0.422***	-0.390***	0.254*	-0.427***
			(0.131)	(0.104)	(0.135)	(0.110)
Married			0.430***	0.066	0.395***	0.049
			(0.114)	(0.104)	(0.111)	(0.103)
White			-0.054	-0.118	-0.135	-0.178
			(0.258)	(0.247)	(0.257)	(0.253)
Children <7yrs old			-0.056	-0.120	-0.115	-0.142
			(0.148)	(0.143)	(0.146)	(0.141)
Other dependents			-0.184	-0.405***	-0.278*	-0.429***
			(0.155)	(0.148)	(0.152)	(0.145)
Disabled			-0.566***	-0.861***	-0.522***	-0.843***
			(0.184)	(0.168)	(0.178)	(0.166)
No academic qualification			0.888***	0.631***	0.932***	0.656***
			(0.218)	(0.193)	(0.208)	(0.194)
O-level			0.686***	0.232	0.702***	0.240
			(0.166)	(0.158)	(0.160)	(0.158)
A-level			0.311	0.139	0.379*	0.175
			(0.203)	(0.184)	(0.201)	(0.186)
Other qualification			0.400***	0.064	0.356**	0.056
			(0.148)	(0.140)	(0.145)	(0.140)
On permanent contract			0.857***	-0.342*	1.035***	-0.262
			(0.183)	(0.188)	(0.183)	(0.186)
Full-time			-0.176	-0.813***	-0.176	-0.788***
			(0.180)	(0.184)	(0.178)	(0.180)
Works over 48 hours			0.289**	-1.128***	0.186	-1.177***
			(0.120)	(0.105)	(0.117)	(0.103)
Skill same as required			1.615***	0.447***	1.570***	0.425***
			(0.107)	(0.089)	(0.107)	(0.088)
Professional			-1.574***	0.082	-1.546***	0.128
			(0.221)	(0.188)	(0.215)	(0.188)
Associate professional & technical			-1.247***	0.226	-1.290***	0.197
			(0.188)	(0.181)	(0.185)	(0.181)
Admin. & secretarial			-1.771***	0.481**	-1.678***	0.527***
			(0.191)	(0.193)	(0.193)	(0.199)
Skilled trades plant & mach.			-1.967***	1.001***	-1.840***	1.035***
			(0.206)	(0.195)	(0.202)	(0.200)
Personal & customer services			-1.206***	0.534***	-1.595***	0.354*
			(0.209)	(0.205)	(0.213)	(0.209)
Elementary occupations			-1.722***	0.900***	-1.721***	0.911***
			(0.227)	(0.222)	(0.228)	(0.223)
Gross weekly pay <=110			0.551**	0.773***	0.472*	0.721***
			(0.268)	(0.274)	(0.258)	(0.266)
Gross weekly pay 111-180			0.185	0.219	-0.023	0.145
			(0.229)	(0.199)	(0.232)	(0.199)
Gross weekly pay 261-360			-0.266*	-0.664***	-0.111	-0.594***
			(0.157)	(0.161)	(0.154)	(0.162)
Gross weekly pay 361p			0.148	-0.729***	0.521***	-0.578***
			(0.168)	(0.186)	(0.166)	(0.187)

Log workplace age					-0.163**	-0.072
					(0.066)	(0.053)
No. of employees/1000					-0.427***	-0.133
					(0.130)	(0.101)
Manufacturing					-0.173	0.003
					(0.204)	(0.147)
Construction					0.904***	0.643***
					(0.301)	(0.231)
Wholesale & retail trade					0.430**	0.341*
					(0.219)	(0.180)
Hotel and restaurant					0.400	0.147
					(0.287)	(0.269)
Public & community services					0.586*	0.692**
					(0.318)	(0.272)
Education					1.814***	0.766**
					(0.493)	(0.328)
Health					2.302***	0.951***
					(0.224)	(0.216)
Urban area					-0.228	-0.320**
					(0.169)	(0.140)
Unemployment to vacancy ratio					-0.061*	-0.006
					(0.031)	(0.022)
Constant	4.512***	1.492***	3.388***	2.736***	3.828***	2.939***
	(0.085)	(0.077)	(0.423)	(0.414)	(0.463)	(0.467)
No. of non-members	9213	9213	9213	9213	9213	9213
R-squared	0.005	0.000	0.076	0.093	0.101	0.099
Chi2(1)	1808.31		2007.058		1971.111	

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Bootstrap std. errors from 150 replications based on 1034 clusters of workplaces.

Table A5: SUR estimates of the wellbeing effects of unionisation on non-members in workplaces without collective bargaining, based on employer response on workplace union density.

	(1)		(2)		(3)	
	Satisfaction	Anxiety	Satisfaction	Anxiety	Satisfaction	Anxiety
% Union member	-0.000	0.011	0.001	0.005	0.000	0.004
	(0.007)	(0.007)	(0.006)	(0.007)	(0.007)	(0.007)
Age<30			-0.115	-0.065	0.039	-0.011
			(0.209)	(0.167)	(0.200)	(0.165)
Age30-39			0.077	-0.044	0.192	-0.000
			(0.207)	(0.202)	(0.210)	(0.204)
Age50+			0.770***	0.864***	0.702***	0.850***
			(0.223)	(0.240)	(0.221)	(0.240)
Female			0.328*	-0.569***	0.193	-0.582***
			(0.171)	(0.152)	(0.173)	(0.154)
Married			0.332**	-0.127	0.304**	-0.137
			(0.140)	(0.139)	(0.141)	(0.142)
White			-0.248	0.119	-0.362	0.055
			(0.408)	(0.355)	(0.396)	(0.365)
Children <7yrs old			0.004	0.018	-0.020	0.004
			(0.188)	(0.168)	(0.187)	(0.167)
Other dependents			-0.110	-0.323	-0.139	-0.330
			(0.198)	(0.204)	(0.196)	(0.205)
Disabled			-0.359	-0.462**	-0.248	-0.419**
			(0.232)	(0.216)	(0.225)	(0.213)
No academic qualification			1.352***	1.189***	1.398***	1.195***
			(0.272)	(0.289)	(0.267)	(0.292)
O-level			1.037***	0.197	1.030***	0.183
			(0.224)	(0.225)	(0.225)	(0.229)
A-level			0.559**	0.321	0.621***	0.344
			(0.240)	(0.267)	(0.238)	(0.270)
Other qualification			0.675***	0.191	0.616***	0.171
			(0.207)	(0.181)	(0.209)	(0.181)
On permanent contract			1.275***	-0.029	1.402***	0.035
			(0.269)	(0.261)	(0.257)	(0.252)
Full-time			-0.458*	-1.036***	-0.459*	-1.010***
			(0.250)	(0.211)	(0.246)	(0.210)
Works over 48 hours			0.299*	-1.396***	0.231	-1.423***
			(0.162)	(0.151)	(0.163)	(0.151)
Skill same as required			1.569***	0.411***	1.509***	0.383***
			(0.141)	(0.127)	(0.141)	(0.128)
Professional			-1.713***	0.016	-1.530***	0.091
			(0.371)	(0.263)	(0.361)	(0.252)
Associate professional & technical			-1.355***	-0.022	-1.343***	-0.020
			(0.264)	(0.242)	(0.256)	(0.244)
Admin. & secretarial			-1.798***	0.245	-1.655***	0.292
			(0.313)	(0.263)	(0.289)	(0.253)
Skilled trades plant & mach.			-1.795***	0.799***	-1.697***	0.838***
			(0.273)	(0.258)	(0.264)	(0.263)
Personal & customer services			-1.064***	0.352	-1.439***	0.214
			(0.328)	(0.289)	(0.326)	(0.285)
Elementary occupations			-1.889***	0.613**	-1.908***	0.647**
			(0.315)	(0.280)	(0.306)	(0.290)
Gross weekly pay <=110			0.627*	0.754**	0.500	0.722**
			(0.379)	(0.351)	(0.363)	(0.335)
Gross weekly pay 111-180			0.012	0.150	-0.210	0.106
			(0.267)	(0.279)	(0.281)	(0.281)
Gross weekly pay 261-360			-0.292	-0.709***	-0.108	-0.637***
			(0.239)	(0.219)	(0.232)	(0.213)
Gross weekly pay 361p			0.253	-0.728***	0.697***	-0.573**
			(0.264)	(0.227)	(0.264)	(0.227)

Log workplace age					-0.113	-0.066
					(0.078)	(0.074)
No. of employees/1000					-1.016***	-0.368
					(0.320)	(0.282)
Manufacturing					-0.127	-0.038
					(0.296)	(0.221)
Construction					0.811**	0.665**
					(0.329)	(0.291)
Wholesale & retail trade					0.670**	0.397*
					(0.300)	(0.224)
Hotel and restaurant					0.779**	0.032
					(0.336)	(0.324)
Public & community services					0.788*	0.611*
					(0.449)	(0.316)
Education					1.251	0.776
					(0.798)	(0.484)
Health					2.209***	0.723**
					(0.311)	(0.301)
Urban area					-0.297	-0.179
					(0.213)	(0.199)
Unemployment to vacancy ratio					-0.033	0.008
					(0.039)	(0.034)
Constant	4.480***	1.404***	3.109***	2.676***	3.361***	2.745***
	(0.118)	(0.107)	(0.646)	(0.603)	(0.646)	(0.693)
No. of non-members	4951	4951	4951	4951	4951	4951
R-squared	0.000	0.001	0.079	0.109	0.104	0.114
Chi2(1)	941.238		1033.912		1019.015	

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Bootstrap std. errors from 150 replications based on 528 clusters of workplaces.

Table A6: SUR estimates of the wellbeing effects of unionisation on non-members in workplaces with collective bargaining, based on employer response on workplace union density.

	(1)		(2)		(3)	
	Satisfaction	Anxiety	Satisfaction	Anxiety	Satisfaction	Anxiety
% Union member	-0.022***	-0.010***	-0.018***	-0.005	-0.014***	-0.005
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Age<30			-0.355	-0.363	-0.169	-0.279
			(0.244)	(0.233)	(0.232)	(0.230)
Age30-39			-0.219	0.079	-0.109	0.127
			(0.223)	(0.222)	(0.224)	(0.221)
Age50+			0.612***	0.803***	0.513**	0.747***
			(0.210)	(0.230)	(0.208)	(0.232)
Female			0.529***	-0.199	0.333*	-0.250
			(0.199)	(0.158)	(0.196)	(0.164)
Married			0.520***	0.291*	0.465***	0.263
			(0.170)	(0.170)	(0.168)	(0.170)
White			0.075	-0.277	0.033	-0.338
			(0.330)	(0.308)	(0.344)	(0.315)
Children <7yrs old			-0.159	-0.301	-0.231	-0.339*
			(0.217)	(0.203)	(0.209)	(0.200)
Other dependents			-0.233	-0.418*	-0.380*	-0.453**
			(0.241)	(0.232)	(0.229)	(0.226)
Disabled			-0.775***	-1.259***	-0.796***	-1.284***
			(0.263)	(0.240)	(0.259)	(0.241)
No academic qualification			0.379	-0.023	0.372	-0.010
			(0.312)	(0.295)	(0.292)	(0.288)
O-level			0.294	0.276	0.327	0.304
			(0.267)	(0.217)	(0.249)	(0.213)
A-level			0.032	-0.052	0.122	-0.005
			(0.303)	(0.264)	(0.299)	(0.263)
Other qualification			0.156	-0.041	0.130	-0.042
			(0.218)	(0.192)	(0.206)	(0.188)
On permanent contract			0.430	-0.681**	0.667**	-0.571**
			(0.300)	(0.269)	(0.290)	(0.265)
Full-time			0.135	-0.578**	0.138	-0.585**
			(0.263)	(0.277)	(0.254)	(0.269)
Works over 48 hours			0.256	-0.836***	0.131	-0.908***
			(0.176)	(0.166)	(0.177)	(0.166)
Skill same as required			1.661***	0.475***	1.623***	0.459***
			(0.147)	(0.140)	(0.142)	(0.138)
Professional			-1.469***	0.100	-1.631***	0.085
			(0.312)	(0.296)	(0.319)	(0.310)
Associate professional & technical			-1.172***	0.470*	-1.268***	0.356
			(0.319)	(0.276)	(0.317)	(0.279)
Admin. & secretarial			-1.734***	0.747***	-1.738***	0.745***
			(0.304)	(0.270)	(0.300)	(0.269)
Skilled trades plant & mach.			-2.121***	1.230***	-2.013***	1.201***
			(0.327)	(0.304)	(0.319)	(0.290)
Personal & customer services			-1.377***	0.745**	-1.705***	0.530*
			(0.324)	(0.295)	(0.333)	(0.299)
Elementary occupations			-1.485***	1.269***	-1.484***	1.200***
			(0.371)	(0.351)	(0.372)	(0.342)
Gross weekly pay <=110			0.515	0.816**	0.489	0.752**
			(0.330)	(0.360)	(0.334)	(0.348)
Gross weekly pay 111-180			0.406	0.289	0.210	0.172
			(0.308)	(0.301)	(0.308)	(0.289)
Gross weekly pay 261-360			-0.146	-0.546**	0.008	-0.466**
			(0.238)	(0.228)	(0.244)	(0.231)
Gross weekly pay 361p			0.142	-0.652***	0.464*	-0.499**
			(0.277)	(0.243)	(0.270)	(0.242)

Log workplace age					-0.219**	-0.085
					(0.104)	(0.086)
No. of employees/1000					-0.367***	-0.093
					(0.121)	(0.118)
Manufacturing					-0.282	0.086
					(0.313)	(0.247)
Construction					0.906	0.630
					(0.561)	(0.451)
Wholesale & retail trade					0.053	0.209
					(0.370)	(0.284)
Hotel and restaurant					0.003	0.318
					(0.462)	(0.358)
Public & community services					0.253	0.756**
					(0.453)	(0.327)
Education					2.019***	0.820*
					(0.484)	(0.434)
Health					2.307***	1.229***
					(0.378)	(0.313)
Urban area					-0.124	-0.505**
					(0.264)	(0.203)
Unemployment to vacancy ratio					-0.094**	-0.023
					(0.046)	(0.038)
Constant	4.530***	1.601***	3.680***	2.655***	4.436***	3.126***
	(0.126)	(0.110)	(0.607)	(0.487)	(0.786)	(0.671)
No. of non-members	4262	4262	4262	4262	4262	4262
R-squared	0.012	0.003	0.080	0.085	0.109	0.093
Chi2(1)	862.146		969.850		951.466	

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Bootstrap std. errors from 150 replications based on 506 clusters of workplaces.

Table A7: Probability of being non-member in union workplaces

	Union workplace
Age<30	-0.243***
	(0.042)
Age30-39	-0.109***
	(0.041)
Age50+	-0.019
	(0.043)
Female	0.068**
	(0.034)
Married	0.094***
	(0.032)
White	-0.110*
	(0.061)
Children <7yrs old	0.024
	(0.040)
Other dependents	0.057
	(0.042)
Disabled	-0.012
	(0.046)
No academic qualification	-0.242***
	(0.056)
O-level	-0.169***
	(0.046)
A-level	-0.043
	(0.055)
Other qualification	-0.128***
	(0.041)
On permanent contract	-0.178***
	(0.054)
Full-time	-0.062
	(0.050)
Works over 48 hours	-0.024
	(0.032)
Skill same as required	-0.117***
	(0.028)
Professional	0.066
	(0.060)
Associate professional & technical	0.052
	(0.052)
Admin. & secretarial	0.005
	(0.053)
Skilled trades plant & mach.	0.269***
	(0.055)
Personal & customer services	0.273***
	(0.057)
Elementary occupations	0.242***
	(0.062)
Gross weekly pay <=110	-0.193***
	(0.067)
Gross weekly pay 111-180	0.013
	(0.056)
Gross weekly pay 261-360	0.035
	(0.045)
Gross weekly pay 361p	0.119**
	(0.047)
Log workplace age	0.102***
	(0.013)
Sole establishment	-0.543***
	(0.032)

Urban area	-0.267***
	(0.037)
Unemployment to vacancy ratio	-0.011
	(0.009)
North east	0.304***
	(0.101)
North west	-0.110
	(0.084)
Yorkshire & the Humber	0.372***
	(0.091)
East midlands	0.080
	(0.092)
West midlands	-0.163*
	(0.089)
East of England	-0.069
	(0.089)
London	-0.348***
	(0.108)
South East	-0.312***
	(0.085)
South West	0.004
	(0.088)
Scotland	-0.159*
	(0.092)
Constant	0.219
	(0.144)
Log likelihood	-5712.456
LR Chi2(41)	845.84
No. of employees	9,213

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table A8: Results from overall covariate imbalance test.

Sample	Pseudo R2	LR chi2	p>chi2	MeanBias	MedBias
Union workplace					
Raw	0.069	845.84	0.000	6.9	3.9
Matched	0.003	31.08	0.870	1.7	1.3

Table A9: Outcome measures, including constituent domains, non-members by workplace union status

	Non-members, full sample				Non-members, union workplaces				Non-members, non-union workplaces			
Variable	Mean	Std. Dev.	Min	Max	Mean	Std. Dev.	Min	Max	Mean	Std. Dev.	Min	Max
Job Satisfaction												
Achievement	3.798	0.909	1	5	3.689	0.942	1	5	3.826	0.898	1	5
Initiative	3.859	0.905	1	5	3.786	0.940	1	5	3.878	0.894	1	5
Influence	3.626	0.918	1	5	3.531	.9466	1	5	3.653	0.909	1	5
Training	3.338	1.068	1	5	3.234	1.100	1	5	3.367	1.057	1	5
Job security	3.613	0.964	1	5	3.435	1.019	1	5	3.662	0.942	1	5
Work itself	3.811	0.881	1	5	3.701	0.915	1	5	3.841	0.869	1	5
Decision making	3.291	0.986	1	5	3.196	0.966	1	5	3.317	0.990	1	5
Job satisfaction, additive measure	4.136	4.880	-14	14	3.572	4.878	-14	14	4.544	4.810	-14	14
Affective WB												
Tense	3.316	0.984	1	5	3.302	0.947	1	5	3.320	0.994	1	5
Calm	2.915	1.057	1	5	2.850	1.053	1	5	2.932	1.057	1	5
Relaxed	2.676	1.098	1	5	2.588	1.089	1	5	2.701	1.099	1	5
Worried	3.624	0.989	1	5	3.624	0.974	1	5	3.624	0.993	1	5
Uneasy	3.855	1.002	1	5	3.808	0.985	1	5	3.868	1.006	1	5
Content	3.058	1.071	1	5	2.933	1.072	1	5	3.092	1.069	1	5
Job-related anxiety, additive measure	1.443	4.681	-12	12	1.106	4.591	-12	12	1.536	4.702	-12	12
No. of non-members	9213				1992				7221			
No. of workplaces	1058				123				911			

Table A10: Descriptive statistics on non-members, by workplace union status

	Non-members, full sample				Non-members, union workplaces				Non-members, non-union workplaces			
	Mean	Std. Dev.	Min	Max	Mean	Std. Dev.	Min	Max	Mean	Std. Dev.	Min	Max
Workplace union characteristics												
Union workplace (employee response based)	0.216	0.412	0	1	1.000	0.000	1	1	0.000	0.000	0	0
% Union member (employer response based)	10.413	20.134	0	100	31.584	26.715	0	100	4.573	12.753	0	100
Workplace collective bargaining on pay	0.463	0.499	0	1	0.683	0.465	0	1	0.402	0.490	0	1
Employee characteristics												
Age<30	0.293	0.455	0	1	0.253	0.435	0	1	0.305	0.460	0	1
Age30-39	0.264	0.441	0	1	0.267	0.442	0	1	0.263	0.441	0	1
Age50+	0.216	0.412	0	1	0.222	0.416	0	1	0.214	0.410	0	1
Female	0.498	0.500	0	1	0.441	0.497	0	1	0.514	0.500	0	1
Married	0.643	0.479	0	1	0.688	0.463	0	1	0.630	0.483	0	1
White	0.944	0.230	0	1	0.948	0.221	0	1	0.943	0.232	0	1
Children <7yrs old	0.186	0.389	0	1	0.190	0.392	0	1	0.185	0.388	0	1
Other dependents	0.124	0.330	0	1	0.114	0.318	0	1	0.127	0.333	0	1
Disabled	0.100	0.301	0	1	0.106	0.308	0	1	0.099	0.298	0	1
No academic qualification	0.151	0.358	0	1	0.128	0.334	0	1	0.158	0.364	0	1
O-level	0.243	0.429	0	1	0.223	0.417	0	1	0.249	0.432	0	1
A-level	0.099	0.299	0	1	0.109	0.312	0	1	0.096	0.295	0	1
Other qualification	0.322	0.467	0	1	0.314	0.464	0	1	0.324	0.468	0	1
On permanent contract	0.923	0.267	0	1	0.936	0.245	0	1	0.919	0.273	0	1
Full-time	0.793	0.405	0	1	0.847	0.360	0	1	0.777	0.416	0	1
Works over 48 hours	0.486	0.500	0	1	0.527	0.499	0	1	0.475	0.499	0	1
Skill same as required	0.418	0.493	0	1	0.374	0.484	0	1	0.431	0.495	0	1
Managers & senior officials	0.153	0.360	0	1	0.183	0.387	0	1	0.144	0.351	0	1
Professional	0.085	0.280	0	1	0.101	0.301	0	1	0.081	0.273	0	1
Associate professional & Technical	0.146	0.353	0	1	0.138	0.345	0	1	0.148	0.356	0	1
Admin. & secretarial	0.193	0.394	0	1	0.181	0.385	0	1	0.196	0.397	0	1
Skilled trades plant & mach.	0.146	0.353	0	1	0.178	0.383	0	1	0.138	0.344	0	1
Personal & customer services	0.164	0.371	0	1	0.126	0.331	0	1	0.175	0.380	0	1
Elementary occupations	0.113	0.316	0	1	0.093	0.291	0	1	0.118	0.322	0	1
Gross weekly pay <=110	0.115	0.319	0	1	0.067	0.251	0	1	0.128	0.334	0	1
Gross weekly pay 111-180	0.103	0.304	0	1	0.071	0.257	0	1	0.112	0.316	0	1
Gross weekly pay 261-360	0.200	0.400	0	1	0.222	0.416	0	1	0.195	0.396	0	1
Gross weekly pay 361p	0.389	0.488	0	1	0.464	0.499	0	1	0.368	0.482	0	1
Workplace characteristics												
Log workplace age	3.072	1.072	0	6.802	3.323	1.161	0	5.858	3.003	1.035	0	6.802

Sole establishment	0.301	0.459	0	1	0.175	0.380	0	1	0.336	0.472	0	1
No. of employees/1000	0.261	0.574	.005	7.74	0.612	0.953	.005	7.74	0.164	0.355	.005	7.74
Manufacturing	0.193	0.395	0	1	0.335	0.472	0	1	0.154	0.361	0	1
Construction	0.069	0.254	0	1	0.039	0.194	0	1	0.078	0.267	0	1
Wholesale & retail trade	0.160	0.366	0	1	0.121	0.327	0	1	0.170	0.376	0	1
Hotel and restaurant	0.095	0.293	0	1	0.110	0.314	0	1	0.090	0.287	0	1
Public & community services	0.083	0.275	0	1	0.099	0.299	0	1	0.078	0.269	0	1
Education	0.032	0.175	0	1	0.075	0.263	0	1	0.020	0.140	0	1
Health	0.101	0.302	0	1	0.037	0.189	0	1	0.119	0.324	0	1
Urban area	0.819	0.385	0	1	0.776	0.417	0	1	0.831	0.374	0	1
Unemployment to vacancy ratio	3.385	2.422	0	9	3.184	2.185	.8	9	3.440	2.481	0	9
No. of non-members	9213				1992				7221			
No. of workplaces	1034				123				911			

Figure A1: Non-members' job satisfaction & job-related anxiety, by workplace union status