

Haile, Getinet Astatike

Working Paper

Men, Women and Unions

IZA Discussion Papers, No. 10438

Provided in Cooperation with:

IZA – Institute of Labor Economics

Suggested Citation: Haile, Getinet Astatike (2016) : Men, Women and Unions, IZA Discussion Papers, No. 10438, Institute of Labor Economics (IZA), Bonn

This Version is available at:

<https://hdl.handle.net/10419/161061>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.

DISCUSSION PAPER SERIES

IZA DP No. 10438

Men, Women and Unions

Getinet Astatike Haile

DECEMBER 2016

DISCUSSION PAPER SERIES

IZA DP No. 10438

Men, Women and Unions

Getinet Astatike Haile

The University of Nottingham and IZA

DECEMBER 2016

Any opinions expressed in this paper are those of the author(s) and not those of IZA. Research published in this series may include views on policy, but IZA takes no institutional policy positions. The IZA research network is committed to the IZA Guiding Principles of Research Integrity.

The IZA Institute of Labor Economics is an independent economic research institute that conducts research in labor economics and offers evidence-based policy advice on labor market issues. Supported by the Deutsche Post Foundation, IZA runs the world's largest network of economists, whose research aims to provide answers to the global labor market challenges of our time. Our key objective is to build bridges between academic research, policymakers and society.

IZA Discussion Papers often represent preliminary work and are circulated to encourage discussion. Citation of such a paper should account for its provisional character. A revised version may be available directly from the author.

ABSTRACT

Men, Women and Unions*

The paper re-examines the question of why unions might have declined despite the 'influx' of women, their risk-averse constituents, into British workplaces. It argues that given unions' role in minimising risk, membership should have been boosted. The paper reviews different strands of the literature and conducts empirical analyses using panel data from WERS. The results obtained suggest that men have been deserting unions and that there is an inverse link between membership and the share of women in workplaces. The paper ponders if better management of gender relations may improve unions' fate.

JEL Classification: J51, J16, J82

Keywords: union decline, workplace gender composition, employer-employee data, Britain

Corresponding author:

Getinet Astatike Haile
The University of Nottingham
South Building, Jubilee Campus
Wollaton Road
Nottingham, NG8 1BB
United Kingdom
E-mail: getinet.haile@nottingham.ac.uk

* The usual disclaimer applies.

1. Introduction

Unions play a number of important roles in the employment relationship. These include: providing workers a collective voice (Freeman and Medoff 1984), allocating risk between firms and workers (Malcomson 1983), inducing training and providing insurance (Acemoglu *et al.* 2001), ensuring workplace occupational health and safety (Donado and Walde 2012) and providing ‘mutual insurance’ (Waddington and Whitston 1997). Despite such important roles, however, unions have been in decline in Britain and much of the developed world since the 1970s. Structural changes in the economy, increased international competition, legislative changes and union’s failure to organise under these circumstances particularly in new establishments are thought to be some of the main reasons underpinning union decline in Britain (Blanden *et al.* 2006; Machin 2000, 2003; Disney *et al.* 1995; Freeman and Pelletier 1990). The decline is far-reaching and covers all segments of British workplaces, however; and is not restricted to sectors that took the brunt of the structural change (Blanchflower and Bryson, 2008).

As argued in a recent paper (Haile, 2016), unions are voluntary institutions whose strength depends on the degree of their success in coalition-building within the workforce. The “influx of women” into British workplaces in recent decades has changed the gender composition of the typical workplace.¹ This change and possible consequential divergent interests between men and women within unions might have frustrated coalition-building, contributing to the decline of unions. If unions play the important role of providing insurance against various employment-related risks, which seem to have increased more recently vis-à-vis union’s heyday, it is unclear why they have declined particularly when there is an “influx” of their more risk-averse constituents into workplaces in Britain. Could there be intra-union gender dynamics contributing to the decline? This paper attempts to re-examine the gender-union question and, to this end: *first*, it presents a synthesis of available evidence from different strands of the literature on: (i) unions and their role in providing insurance, (ii) gender differences in risk preferences and (iii) gender dynamics within unions. *Secondly*, it conducts empirical analyses using panel data from the 2004 and 2011 waves of the British workplace employment relations survey (WERS). The paper is unique in three respects. *First*, it establishes whether it is men or women who were more likely to have deserted

¹ The period characterised by union decline has also witnessed a significant increase in the share of women in British workplaces and unions themselves. Recent official figures reveal that the gap in the labour market participation rate between men and women has declined from 14.5 (1994) to 8.8 (2014) percentage points in favour of the latter (ONS, 2014). Parker (2002) refers to this phenomenon as “the influx of women” (p. 23).

unions. *Secondly*, it uses panel data from WERS2004 and 2011. Part of the analysis conducted also uses the full sample of workplaces as opposed to only those that took part in the employee survey. These mean that this paper is likely to enrich the analysis in Haile (2016). *Thirdly*, it provides a synthesis review covering three different strands of the literature.

The paper finds evidence from the literature of divergent interests between unions – whose power structure is still dominated by men – and women, which suggests a union environment that is possibly conflict-laden. The empirical results obtained reveal that: (a) men have been deserting unions and (b) there is an inverse link between membership and the proportion of women in workplaces. The paper mulls over if improved management of gender relations within unions and workplaces generally may improve the fate of unions. The remainder of the paper is organised as follows. Section Two, provides a review of the literature, synthesising findings in three related strands and proposing two testable hypotheses. Section Three describes the data and variables used in the empirical analyses conducted. Section Four sets out the empirical framework used. Section Five discusses the results obtained before the final section concludes the paper.

2. Review of literature

(i) Unions as providers of insurance

Unions are voluntary organisations with the traditional role of organising workers for collective voice and bargaining power in the spirit of Freeman and Medoff (1984). They are also shown to provide insurance against various risks in the employment relationship, which are thought to be efficiency and productivity enhancing. Malcomson (1983) showed that unions can yield productivity gains that may result from risk sharing between a firm and its employees. They do so using state-contingent contracts in situations where employment contracts are otherwise unenforceable. Such gains are thought to be greater the more risk averse employers (and hence employees) are. Employers are generally more risk averse when monitoring employees' productivity in an objective and legally enforceable fashion is difficult.

Acemoglu *et al.* (2001) emphasize the relationship between technology and workplace organisation to demonstrate union's role in providing efficiency-enhancing insurance to employees. Workers generally face uncertainty in the labour market, for example concerning their skill type/match, and insurance markets are often incomplete. In

such circumstances, union endorsed equilibrium wage contracts provide some insurance for risk-averse workers. The union recognised equilibrium wage contracts entail some level of wage compression between skilled and unskilled workers, however; with the former paid less than their marginal product while the latter receives more. Therefore, depending on the degree of skill bias arising from technological change, there are benefits and costs associated with wage compression, which determine the membership composition of workers. If the degree of skill bias from a new technology were low (high), then the benefit provided by unions would be more (less) than the costs associated with the wage compression for skilled workers, who would be willing (unwilling) to unionise. Deunionisation can happen if technical change leads the more skilled/productive workers to seek improved outside opportunities and quit unions. Such a change makes sustaining wage compression difficult and therefore renders the insurance role of unions impractical. Thus, barring technological changes that may threaten their very existence, unions do play the role of providing insurance to employees and employers alike.

Donado and Walde (2012) noted that historically worker movements have played a vital role in ensuring that workplaces are safer, which firms may not necessarily ensure of their own accord given cost considerations, even though doing so would increase aggregate labour supply. They argue that a laissez-faire approach where firms set occupational health and safety standards on their own – for example following the introduction of a new technology that may have side-effects – may not be optimal given that employees may not be fully informed of the health risks associated with their occupations. On the other hand, safety standards endorsed by better informed unions may become output and welfare augmenting. Thus, once again, unions provide insurance against health and safety risks and, in doing so, they enhance efficiency. In Britain, reported stress and mental health problems continue to escalate even though there has been a general decline in workplace accidents and musculo-skeletal disorders (Vickerstaff *et al.*, 2012; HSE, 2009). This makes the role of the union as provider of insurance in the form of union endorsed occupational health and safety provision even more important today.

Unions are traditionally thought to provide ‘mutual insurance’, as reflected in the commonly held view that unions provide ‘*support if I have a problem at work*’. Moreover, unions are also viewed as providers of insurance against discrimination and disadvantage at work for women and minority groups in particular (see, for example, Waddington and Whitston 1997; Healy and Kirton 2013), which reinforce the insurance role of unions. In labour economics literature it is well recognised that women’s labour market histories are

characterised by interruptions due to shouldering child care and domestic responsibilities more than their male counterparts (Hotchkiss and Pitts 2007; Phipps *et al.* 2001; Blau and Kahn 2000). Such interruptions – or perceptions thereof – are likely to make women more vulnerable to the risk of ‘*problem at work*’. If so, women are expected to embrace unions better than men as they seek unions’ safeguard against various employment risks.

(ii) Men, women and differences in risk preference

A number of recent studies have highlighted that women are generally more risk- and competition-averse than men. Gneezy *et al.* (2003) run controlled experiments to test if men and women, when competing against one another, react differently to competitive incentive schemes. Their findings highlight differences in ability/propensity to perform in competitive settings with men outperforming women on average, even though women are able to perform similarly in noncompetitive settings. They attribute the observed gender differential in performance to women being more risk-averse. Croson and Gneezy (2009) review experimental evidence on gender differences in preference. They focused on three areas that have been widely studied in this regard, viz., risk preference, social preference and reaction to competition. They report that the weight of the lab and field studies they reviewed indicate that women are more risk and competition averse than men; but their social preferences are more malleable with women being more sensitive to social cues than men.

Eckel and Grossmann (2008) make extensive review of the literature relating to results from experimental measures of risk aversion to establish if there are systematic differences in the behaviour of men and women in this respect. They concluded that findings from field studies overwhelmingly indicate that women are more risk averse than men. The findings from laboratory studies are not as conclusive; but the preponderance of the results in this category does also support those from the field studies. Niederle and Vesterlund (2007) use a laboratory experiment involving solving a real task to examine whether, for a given level of performance, more women than men prefer to work under a noncompetitive piece rate than under a competitive tournament competition scheme. They find that 73 percent of men select the tournament competition while only 35 percent of women make a similar selection. They attribute the observed gender gap in tournament entry between men and women to two factors: men being substantially more overconfident than women, and to gender differences in preferences for performing in a competition. They argue that women shy away from competition while men embrace it.

Booth (2009) questions the evidence in the recent experimental economics literature, which attributes differences in competitive behaviours between men and women to psychological differences between them. She argues that even if psychological differences might have contributed to differences in competitive behaviour, they cannot be considered innate given that such (psychological) differences “can be shaped by the environment in which individuals are placed” (p. 605). In a more recent study Booth and Nolen (2012) use controlled experiment to examine if nature, i.e. psychological differences between men and women, explains whether women shy away from competition. Using a sample of students under 15 years of age they attempted to answer whether the competitive behaviour of a student may be affected by: (i) the gender composition of the group to which the student is randomly assigned to and (ii) the gender mix of the school the student attends, which could either be publicly funded single-sex or coeducational schools. They find that there are robust differences between the competitive behaviour of girls from single-sex and coeducational schools; and that girls from single-sex schools behave more like boys. On the basis of these findings they reject the evidence that the average female avoids competition vis-à-vis her male counterpart and also noted that observed gender differences might reflect social learning rather than being inherent gender traits. The overarching evidence in this strand of the literature thus points to the existence of some gender differential in competition and risk preferences although such differences may be the result of nurture rather than nature.

(iii) Men, women and gender dynamics within unions and workplaces

In Britain, there is evidence of widespread gender discrimination in workplaces (see, for example, Booth, 2009, Arulampalam, *et al.* 2007, Berthoud and Blekesaune 2007, Riach and Rich 2006). Perhaps unsurprisingly, gender discrimination is also reported to be a feature of the internal life of unions, with union power structures still largely dominated by men. There has been recent progress in gender representations within the union power-structure, which seems to be rendering the long held view of ‘institutional sexism’ and gender discrimination within unions less relevant. However, translating improvements in such representations into actions directed at enhancing women’s experience within unions and workplaces remain a challenge. In fact, there are calls that gender democracy become an integral part of the union renewal process rather than being secondary to the union survival agenda (Kirton 2015; Healy and Kirton 2013; Cobble 2007; Healy and Kirton 2000, Dickens 1997).

Union's exclusive focus on improving basic terms and conditions of employment, without paying much attention to the specific concerns of women (such as child care related provisions) or other diverse minority groups (such as matters of religious observance and leave) has long been criticised (Metcalf 2000). However, the significant increase in women's share of the labour force more recently seems to have taken such criticisms to another level. Parker (2006) highlights this issue by pointing to the complexity of relations between unions and women's groups who challenge elements of the union and the status quo, which is thought to be hindering the full representation of constituencies such as women's groups.

There is broad consensus that some progress has been made towards union gender proportionality and the role played by unions in addressing women's concerns since the 1970s, the early period when unions were described as 'male, pale and stale'. However, many maintain that there is still a long way to go in addressing women's concerns, with the largely male-dominated power structure still thought to be less responsive – if not entirely unresponsive – to women's needs (Kirton 2015; Healy and Kirton 2013; Kirton 2006; Kirton and Greene 2002, Healy and Kirton 2000, Dickens 1997). The women and unions literature highlights that this is in part due to particular difficulties women face – or are perceived to face – in balancing union participation and/or leadership with other areas of life (see, for example, Bradley and Healy 2008; Kirton 2006). Regardless, there are reasons to suspect that the within union environment may be conflict-laden along gender lines, which may not necessarily bode well with consensus-building that the union needs.

(iv) A synthesis of the available evidence and testable hypotheses

The reivew in the preceding paragraphs shows that unions still have important roles to play in today's world in providing insurance, reducing risk and augmenting economic efficiency. In fact, it can be argued that the need for unions' insurance service has deepened today than during unions' heyday for several reasons. *First*, there has been an 'influx' of women – unions' more risk-averse constituents – into workplaces in Britain in recent decades. Women are not only more risk-averse than men, but they also face more employment risks due to shouldering more domestic and child care responsibilities than men. This makes them demand unions' service more. *Secondly*, the service sector has dominated the British economy for some time now.² One can reasonably assume employee productivity to be generally harder to monitor in the service sector than in the manufacturing sector,

² The services sector now account for up to 80% of the economy (ONS, various)

which used to be the bedrock of unions. Consequently, and given Malcomson (1993)'s argument, employers are likely to be more risk averse, which should have made unions more relevant to employers (and thence employees) today than in the past making state-contingent contracts more relevant today. *Thirdly*, the 'influx' of women into the labour market, which has taken the form of services sector employment, has also been linked to the parallel increase in 'atypical' employment (Greene and Kirton 2006; Howell 1996). That women are mostly in 'atypical' employment signifies that they bear additional risks linked to the type of employment contracts that many of them are on. Once again, this makes unions more relevant today. *Fourthly*, the reported increase in incidents of workplace stress and mental health problems in Britain today should mean higher demand for union endorsed occupational health and safety provisions than perhaps during unions' heyday. *Fifthly*, globalisation has generally brought about increased product market (and up to a point factor market) competition. Although increased international competition has already been attributed to the decline of unions, globalisation and its consequent employment uncertainties must have made union provided insurance for employees more attractive now than in the past.

All together, these factors should make women embrace unions better than their male counterparts as they seek union provided insurance against greater employment risks they face, their very nature of risk-aversion and their drive to tackle labour market disadvantage and discrimination, which afflict women more than men. Indeed, available evidence shows that women do embrace unions better. Kirton and Healy (2013) report that women constitute more than 50 percent of union members in Britain currently; and more women than men are joining unions. If the share of women in workplaces in Britain has been increasing and women are embracing unions more than ever before, then it is highly likely that the decline in union membership is the result of men abandoning unions.

Hypothesis 1: Men, rather than women, have been abandoning unions.

This hypothesis will be tested based on employee-level empirical analysis, which determines whether men were more or less likely to have abandoned union membership vis-à-vis their women counterparts.

If, as proposed by hypothesis 1, men are found to have been abandoning unions, what could the reason for this be? As pointed in Croson and Gneezy (2009), men's relative disposition towards risk-taking could be one explanation. Also, men might have been leaving

unions in search of better outside opportunities rather than the union endorsed compressed wage (Acemoglu *et al.* 2001). Though appealing, however, such explanations do not seem to provide sufficient explanation since the same risk-taker and enterprising men used to be champions of unions in the past. This makes explanations related to the internal environment of unions and the gender dynamics within a potentially plausible explanation. There is extensive evidence showing workgroup identity and gender composition influencing various worker-level outcomes (see, for example, Akerlof and Kranton 2010, 2000; Alesina and La Ferrara 2000; Blalock 1967). It has also been argued that identity – or the desire to act as members of one’s own group – is one of the three fundamental reasons why people join a union movement (Klandermans 2009; Healy and Kirton 2013). Given these group identity based explanations linked to the within union gender dynamics and the possibly conflict-laden union environment may be valid. If so,

Hypothesis 2: The decline in union membership should become more severe as the share of women in workplaces, and hence unions, increases.

This hypothesis will be tested using workplace-level empirical analysis that examines if there is an adverse link between workplace union membership and the share of women.

3. Data and variables

3.1 Overview of the Data

The data used come from the 2004 and 2011 British Workplace Employment Relations Surveys (WERS), the most authoritative source of information on employment relations in Great Britain. The data offer linked employer-employee data representative of all workplaces in Britain with five or more employees. That the data come from a large number of demographically varied workplaces provides ample opportunity to examine possible link between workforce gender composition and union decline. The surveys covers a whole host of issues relating to both employers and employees, allowing the employee- and workplace-level analyses the paper aims to conduct as well as permitting controlling on a battery of individual- and workplace-level characteristics. The data also have geographic information, which the empirical analyses use, thus permitting controlling for regional variations in the link between gender and union decline. The employer surveys solicited responses from managers through management questionnaires, which were administered in a face-to-face

interview with managers in charge of the day-to-day task of employment relations. The employee surveys, on the other hand, used self-completion employee questionnaires, which were completed by up to 25 employees in participating workplaces (Kersley *et al.* 2006; van Wanrooy *et al.* 2013).

The 2004 and the 2011 WERS surveys monitored 2295 and 2680 workplaces, respectively, and 22,451 and 21,981 employees in each wave. 989 of the establishments were surveyed in both waves, so offering a panel data on a sub-set of the WERS establishments. The employee-level analysis conducted uses the full samples of employees surveyed in both waves net of those with missing values on relevant variables, yielding a final sample of 21,779 and 21,099 employees in 2004 and 2011 respectively. Because the WERS surveys are not panel in employees, the main employee-level analysis conducted relies on the pooled sample of 42,878 employees from the two waves.³ Similarly, the workplace-level analysis conducted relies on the original sample of establishments less those with missing values on relevant covariates. This yielded 2050 and 2330 workplaces in 2004 and 2011, respectively, of which there were a panel of 773 workplaces surveyed in both waves.

3.2 Definition of variables

3.2.1. Outcome variables

The two types of analyses conducted use two different outcome measures. The outcome measure for the employee-level analysis comes from employees' response to the question '*Are you a member of a trade union or staff association?*' Employees would have provided any one of the following three responses: (i) "*yes*", (ii) "*no, but have been in the past*" and (iii) "*no, have never been a member*". This information is used to study the characteristics of current and past union members to establish if a systematic gender pattern in membership status emerges. The workplace-level analysis uses *union density* as an outcome measure, which is derived from employers' response to the following two questions: (i) '*how many employees at this establishment are members of a trade union or independent staff association - whether recognised by management or not?*' (n_j^u) and (ii) '*Currently how many employees do you have on the payroll at this establishment?*' (N_j). On the basis of the responses provided to these questions a percentage measure of workplace union density (*UD*) has been generated for each workplace as: $UD = (n_j^u / N_j) \times 100$. As would be expected, not all workplaces had union members, and hence the resulting density measure is left-censored at 0

³ In addition, separate analysis has been conducted on each of the two waves of WERS as can be seen from the results reported in Appendix Tables A5.

(i.e., $UD \leq 0$) for some of the workplaces. Of the retained 2050 and 2330 workplaces in 2004 and 2011 with valid information, only 56% and 54% of the workplaces, respectively, had uncensored UD . For the panel sample, the corresponding percentage of workplaces with uncensored information stands at 59%.

3.2.2. % female and other control variables

The employee-level analysis controls for the full range of employee, workplace and geographic characteristics while the workplace-level analysis controls for workplace and geographic characteristics, including the main control of ‘% female’. ‘% female’ is obtained from employers’ response to the questions: (i) ‘how many women work full-time’ (n_j^{f1}) and (ii) ‘how many women work part-time’ (n_j^{f2}). Combining the responses to these yields the total number of female employees in a workplace ($n_j^f = n_j^{f1} + n_j^{f2}$). % female is then obtained as: $\% \text{ female} = (n_j^f / N_j) \times 100$.⁴ Another workplace-level characteristic worthy of a note here is the count measure of workplace gender equality. The count measure of gender equality comes from employers’ responses to the following seven questions on whether the employer: (i) ‘has a formal equality policy that makes explicit mention of gender equality’, (ii) ‘monitors recruitment and selection to identify indirect discrimination by gender’, (iii) ‘reviews recruitment and selection to identify indirect discrimination by gender’, (iv) ‘monitors promotions to identify indirect discrimination by gender’, (v) ‘reviews promotions to identify indirect discrimination by gender’, (vi) ‘reviews relative pay to identify indirect discrimination by gender’ and (vii) ‘has special procedures to encourage returning women’. Factor analysis on the seven gender equality items in WERS2004 identified a single factor with eigenvalue above 1 (2.925) with an overall Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy of 0.822. Similarly, factor analysis on the seven items in WERS2011 identified a single factor with eigenvalue above 1 (3.047) with an overall KMO measure of sampling adequacy of 0.804.

⁴ Employers also provide similar information for men. If the sum of reported female and male employees in a workplace (both full- and part-time) does not tally with the total number of employees in the workplace, information employers also provide; the workplace would be excluded from the analysis conducted as a precaution. Only less than 0.5% of the initial sample of workplaces had such inconsistencies.

4. Empirical framework

As noted earlier, the paper undertakes two main types of empirical analyses, which are focused on employees and workplaces. As stated in the previous section, employees would provide either one of the three possible responses concerning their union membership status. As such, these constitute multinomial responses that warrant the assumption of a multinomial distribution. Given this, the first empirical approach deployed is the Multinomial Logit Model (MNL). Assuming that k indexes the three possible response categories about one's union membership status (y) described, the probability that an employee i has a membership status of alternative k , conditional on the regressors \mathbf{x}_i , is estimated as;

$$(1) \quad P_{ik} = \Pr(y_i = k | \mathbf{x}_i) = F_k(\mathbf{x}_i, \boldsymbol{\beta}) = \frac{\exp(\mathbf{x}_i \boldsymbol{\beta}_k)}{\sum_{m=1}^3 \exp(\mathbf{x}_i \boldsymbol{\beta}_m)}, \quad k = 1, 2, 3, \quad i = 1, \dots, N$$

where, \mathbf{x}_i denotes the vector of employee-specific characteristics. Estimation is performed by maximum likelihood (ML). The estimated parameters from equation (1) are not directly interpretable, thus necessitating that marginal effects (ME) are computed. The ME of a change in the l th regressor on the probability that an employee i has a membership status k is obtained as;

$$(2) \quad ME_{ikl} = \frac{\partial \Pr(y_i = k)}{\partial x_{il}} = \frac{\partial F_k(\mathbf{x}_i, \boldsymbol{\beta})}{\partial x_{il}}$$

The paper reports marginal effects computed in this way. Also, testing for the validity of the independence of irrelevant alternatives (IIA) assumption is important in estimating the MNL model (Hausman and McFadden 1984), which the paper has implements.⁵ As noted earlier, the WERS data are not panel in employees. As a result, the main employee-level

⁵ Another test is to do with whether the three response categories can be collapsed into two (or fewer) categories (Cramer and Ridder 1991). The test statistic is given as: $LR = 2\{\text{Log}L_U - \text{Log}L_R\}$, where $\text{Log}L_U$ & $\text{Log}L_R$ are the maximum log-likelihood values of the full and restricted models respectively. The statistic has an asymptotic chi-squared distribution with p degrees of freedom where p is the number of restrictions. $\text{Log}L_U$ is obtained from the full model while $\text{Log}L_R = \sum_j n_{sj} \text{Log} n_{sj} - n_s \text{Log} n_s + \text{Log} L_A$, where $\text{Log}L_A$ is the unconstrained maximum log-likelihood of the pooled model, s refers to the pooled state, j refers to the separate states within s , n_s is the number of sample observations in the pooled states, n_{sj} is the number of observations in each of the separate states j , and the $\sum_j n_{sj} = n_s$.

analysis is based on the pooled WERS2004 and 2011 sample. However, separate analysis on each of the cross-sections has also been included. Because there is more than one employee per workplace, the employee-level analysis uses cluster standard errors in all cases taking into account that more than one employees responded from each workplaces.⁶

The employer-level analysis uses the second outcome measure of interest (UD) described in the preceding section. UD is left-censored as unions are present only in a sub-sample of the workplaces in the estimation sample. The standard approaches to dealing with such censoring involve Tobit and/or Heckman two-step estimation procedures⁷. In this paper the Tobit model has been used preferentially, in part because procedures for implementing the Heckman two-step procedure in a panel setting are still not yet well developed. The random effects Tobit regression equation for UD with panel-level random effects is given as;⁸

$$(3) \quad UD_{jt} = \max(0, \mathbf{x}'_{jt}\boldsymbol{\beta} + v_j + \varepsilon_{jt})$$

where $t = 2004, 2011$; \mathbf{x}_j is a vector of workplace characteristics, j indexes workplaces; v_j are *i.i.d.* and distributed $N(0, \sigma_v^2)$, and ε_{jt} are *i.i.d.* and distributed $N(0, \sigma_\varepsilon^2)$ independently of v_j . Estimation of the model parameters $(\boldsymbol{\beta}, \sigma_\varepsilon^2)$ allows determining the partial effects of elements of \mathbf{x}_j , including the ‘% female’ regressor on UD . For the Tobit model interest often lies in the effect of the change in the variable(s) of interest on the conditional mean of the outcome variable UD . To make comparisons with other models, the marginal effects computed are on the left-censored mean of UD , which are given by;

$$(4) \quad \partial E(UD_t | \mathbf{x}_t, v) / \partial \mathbf{x}_t = \Phi(w)\boldsymbol{\beta}$$

$$\text{where, } w = \mathbf{x}'_t \boldsymbol{\beta} / \sigma_\varepsilon.$$

⁶ Multilevel analysis is another option, but coefficient estimates from multilevel modelling are identical to the MNL model with the cluster option; but the latter provides straightforward procedures for computing marginal effects. Also, nest-level variance analysis is not the focus of the paper.

⁷ OLS and linear panel regressions on censored dependent variables may deliver inconsistent parameters (Cameron and Trivedi 2005).

⁸ Fixed Effects panel procedures are not yet well developed in the context of left-censored outcomes. In any case, with only two time periods ($t = 2$) that are some 7 years apart, the WERS panel would not offer an ideal setting for implementing the FE estimator. *First*, FE procedure requires sufficient within-group dynamics in the form of repeated observations and variations in independent regressors to make sense. *Secondly*, it would be hard to justify the existence of time-invariant unobservables, which affect the dependent and control variables simultaneously, with such a time gap.

As well as the panel Tobit model, the paper also deploys simple Tobit and the Heckman selectivity procedure (Heckman 1979) separately on each of the WERS cross-sections for comparison purposes.⁹ The Heckman two-step procedure deals with left-censoring and potential sample selection problem by using a first-step sample selection probit regression of U_j – where U_j is a qualitative measure of whether there is a union in a workplace – on a vector of regressors \mathbf{w}_j . Since the first-step equation has the form $\Pr(U_j^* > 0) = \Phi(\mathbf{w}'_j \alpha)$, defining a new error term $\varepsilon_j^* \equiv UD_j - \mathbf{x}'_j \beta - \rho \sigma_\varepsilon \lambda(\gamma_v)$ with $\gamma_v = \mathbf{w}'_j \alpha / \sigma_v$ yields the selection corrected model that is given by;

$$(5) \quad UD_j \equiv \mathbf{x}'_j \beta + \rho \sigma_\varepsilon \lambda(\gamma_v) + \varepsilon_j^*$$

OLS estimation of equation (5) renders consistent estimates. A test of whether the estimated inverse Mills' ratio term is statistically significant informs if sample selection is an issue. A robust identification requires that exclusion restrictions be imposed in the estimation of equation (5). This requires that at least one regressor in the sample selection equation be excluded from the outcome equation (i.e., \mathbf{x}_j is a proper subset of \mathbf{w}_j). Identification in the selection correction model requires that at least one regressor in the sample selection equation be excluded from the outcome equation (see, for example, Cameron and Trivedi 2005). The exclusion restriction adopted in this paper involves two 'exogenous' variables in the form of 'workplace age' and 'whether the workplace is a sole or a multi-plant establishment'. The age of the workplace is shown to be important determinant of the presence of workplace union (see, for example, Machin 2003). On the other hand, workplace age may not have a direct bearing on the level of union density.¹⁰ Being part of a multi-plant setup may also be an important determinant of union presence in a workplace, not least because employers may find it more efficient to deal with unions and employee representatives from multi-plants rather than the employees in such multi-plants directly. On the other hand, having a multi-plant status may not necessarily have a direct bearing on the level of union membership in a particular workplace.

⁹ Results from the simple Tobit model on the cross-sectional samples are reported in Table 2 (columns 2 and 3) while those from the Heckman two-step procedure are provided in Appendix Table A6.

¹⁰ One would think that membership is more likely to depend on how active and effective a union is in recruiting and advancing members' interest, which does not necessarily relate to how old the union may be.

5. Results and discussion

Estimation results from the employee-level analysis of membership status are reported in Table 1, which are marginal effects from the MNL model specified in equation (1). The model fit, with a pseudo- R^2 of 0.17, indicates that the regressors are jointly statistically significant at the 0.01 level. Predicted probabilities from the estimated model ($\Pr[y_i = k \mid \mathbf{x}_i]$) also match the distribution of the three response categories in the raw data, which are summarised in Table A1 in the Appendix. The IIA test statistics, which is reported in Appendix Table A2, is in support of the IIA assumption.¹¹ The Wald test statistics reported in Appendix Table A3 also rejects the null hypothesis that the three alternatives can be collapsed. Finally, the Wald test statistics for the control variables in the regression conducted, which are reported in Appendix Table A4, reject the null hypothesis that the control variables have joint significance of zero at the 0.01 level. This is also the case for the key control variable ‘male’, with a Chi2(2) value of 86.41.

The estimated marginal effects provide evidence in support of the first hypothesis proposed. Thus, focusing on the key regressor of interest (male), the marginal effects computed reveal that compared with the average woman, the average man is nearly 4 percentage points more likely to have been a union member in the past (column 1). Although small in magnitude, this effect is strongly significant statistically and lends evidence in support of hypothesis 1 in that compared with women, men have been abandoning unions. On the other hand, compared with the average woman, the average man is 2.4 percentage points less likely to be a current union member, an effect that is also statistically significant. This is consistent with the evidence in the literature, which suggests that women are embracing unions better than men in the sense of being current union members. Also, the average man is found to be 1.5 percentage points less likely to have never been a union member, compared with the typical woman employee.

[TABLE 1 about here]

Table 1 also reports a number of other interesting findings. For example, compared with prime age employees aged between 40 and 49, younger workers are significantly more

¹¹ The IIA test used is the Small-Hsiao test as it is regarded as an improvement over the original Hausman-McFadden test. It is worth pointing out the growing consensus that there is no reliable test to establish if the IIA assumption is violated. Long and Freese (2007) make extensive discussions of the two tests and conclude against relying on either of them. Because of this, this paper also deployed Multinomial Probit (MNP) model as a precaution; but found similar results. The MNP based results are available on request.

likely to have never been union member while those that are 50 years or over are significantly less likely to have never been a union member in the past or, for those that are 60 or over, to be a current member. On the other hand, older workers are significantly more likely to have been a union member in the past and, for those aged 50 to 59, to be a union member currently vis-à-vis their prime age counterparts. Other intuitive findings include married employees being generally more likely to be current union members compared with their unmarried counterparts. White employees are generally found to be more likely to have been union members in the past vis-à-vis non-white/minority employees. Similarly, employees with disabilities are found to be generally more likely to be current members compared with their non-disabled counterparts.

Other notable findings in Table 1 include those relating to employees' occupation, their perception of management's attitude towards unions and the type/level of gender equality policy and practice in workplaces. Accordingly, the average employee who is in a lower-level occupation is generally more likely to be a current union member vis-à-vis a typical employee in a managerial occupation. An employee who perceives management favours unions is 31 percentage points more likely to be a current union member than someone who perceives otherwise. Similarly, an employee in a workplace with an additional element of gender equality provision is 3 percentage points more likely to be a current union member compared with their counterpart in a workplace with an average gender equality provision. The marginal effects obtained based on the pooled WERS2004 and 2011 samples is very much in line with those obtained from each of the cross-sections separately, which are reported in Appendix Tables A5.¹²

Results from the workplace-level analysis, which are designed to provide evidence relating to the second hypothesis, are provided in Table 2, where marginal effects from panel and cross-sectional Tobit regressions are reported. In addition, the paper has implemented the Heckman two-step procedure separately on the 2004 and 2011 cross-sectional samples of workplaces. In all cases, the cross-sectional analyse benefit from larger sample sizes. The first column of marginal effects is from random effects Tobit model, which is based on a balanced panel of 773 workplaces and capturing some dynamics in the relationship between workplace union density and % female. The remaining two columns, on the other hand, relate

¹² Similar diagnostic tests, including on the IIA assumption, have been conducted on each of the cross-sectional samples as for the pooled sample. The results, which are not reported in the Appendix but available on request, are favourable.

to marginal effects computed from simple Tobit on each of the relatively larger but cross-sectional samples of workplaces.

The marginal effects reveal a statistically significant and robust negative relationship between workplace union density and the share of women (% female) in a workplace across the three specifications. In terms of magnitude, the marginal effects from the three models are broadly comparable where a 1 percentage point increase in % female is found to lead to between 0.14 and 0.17 percentage points decline in workplace union density.¹³ These results thus lend support to the second hypothesis proposed in Section 2 above.

[TABLE 2 about here]

As outlined in Section 4, the paper also implemented the Heckman two-step procedure on the cross-sectional samples of workplaces from WERS2004 and 2011 to complement the findings from the random-effects Tobit model. Results from the sample selection procedure are reported in Appendix Table A6. The estimated coefficients of the inverse Mills' ratio terms are found to be statistically significant in both cases, thus suggesting that sample selection problems existed and the appropriateness of the two-step approach implemented. The selection corrected results once again indicate that there is statistically significant and robust negative relationship between workplace union density and the share of women (% female). In terms of magnitude, a 1 percentage point increase in % female is found to lead to a reduction in workplace union membership by between 0.16 and 0.19 percentage points, respectively, in 2004 and 2011 respectively.¹⁴ Once again, the magnitude of these estimated effects are broadly comparable to those obtained using the Tobit specifications.

¹³ Tests of normality and heteroskedasticity have been carried out for the Tobit models, which provided favourable results. Also, likelihood-ratio test comparing the random effects Tobit model with pooled Tobit model provided evidence in favour of rejecting the pooling of the WERS2004 and 2011 samples with at the 0.01 level (p-value of 0.000).

¹⁴ In Haile (2016) similar but marginally smaller magnitude was found for WERS2004. However, the analysis there is an employee-level analysis using the matched employer-employee data, i.e., using only those workplaces that took part in the employee survey. In contrast, the workplace-level analysis in this paper includes workplaces that did not take part in the employee survey in addition.

6. Summary and conclusion

The paper attempted to re-examine the question of whether there is a link between the increase in the workplace share of women and the decline of unions in Britain. To this end, it made extensive review of different but related strands of the literature as well as conducting employee- and workplace-level empirical analyses using panel data from the WERS2004 and WERS2011 surveys.

The review of the literature highlighted that unions do still have important roles to play in today's world in terms of providing insurance to employees, reducing employment risks and augmenting economic efficiency. There is also overarching evidence showing that women are more competition- and risk-averse than men, although such differences are thought to be the result of nurture rather than nature. Regardless of the nature of such differences, the paper argued that unions should have been boosted at a time when there is an 'influx' of women – unions' more risk-averse constituents – into workplaces in Britain in recent decades. Another point the literature dwells on, which makes the decline of unions even more puzzling, is that the 'influx' of women is mostly into the rapidly expanded services sector and often takes the form of 'atypical' employment. These represent higher degrees of employment risks, especially also due to the still dominant domestic role women play, thus making union membership more attractive to women. Indeed, the evidence in the literature shows that women do embrace unions better than men, constituting more than 50 percent of union members currently; and more of them joining unions.

The paper argued that if the share of women in workplaces in Britain has been increasing and women are embracing unions, then it is highly likely that the decline in union membership is the result of men abandoning unions. It questioned if there may be a within union gender dynamics that has led to men deserting unions thereby contributing to their decline. There is evidence in the literature that points to the traditional union agenda being challenged by women groups. The paper sought to explore this angle and proposed two hypotheses to this effect, which it then tested using panel data from the WERS2004 and WERS2011 and deploying alternative empirical approaches.

The results obtained lend support to the hypotheses proposed. Specifically, men are found to be more likely to have been union members in the past. This suggests that compared with women, men have been abandoning unions, thus contributing to their/union's demise. The paper also finds evidence showing that there is a negative and strongly significant link between workplace union density and the percentage of female employees. This suggests that where the share of women is higher, the decline of unions is more severe. If men abandoning

unions is believed to be one of the reasons for the decline of unions; and if such declines are more severe where the share of women is higher, then this seems to suggest that men's departure from unions has some link to the increase in the proportion of women in workplaces and unions and dynamics therein.

The paper is rigorous in many respects including: its extensive review of related strands of the literature, its use of panel data from the WERS surveys as well as its implementation of alternative empirical approaches to test the hypotheses it proposed. The results obtained lend support to the hypotheses proposed as well as being robust across the specifications for the workplace-level analysis. On the other hand, there are some caveats worth pointing. *First*, with just two time periods that are seven years apart, the panel of workplaces in WERS does not provide sufficient scope to examine dynamic relationship between union density and % female sufficiently. This explains why the paper implemented the sample selection procedure on the cross-sectional data in addition however. *Secondly*, the outcome variable of interest to the paper is left-censored. Unfortunately, procedures for implementing fixed-effects procedures – the gold standard of panel data analysis involving large number of workplaces – in the context of left-censored outcomes are not yet well-developed. Even though the alternative random-effects procedure adopted has passed the tests of normality and heteroscedasticity, it is still thought to be more fragile than, for example, linear models. Once again, therefore, it is worth comparing the random-effects Tobit results with those obtained from the additional cross-sectional analysis using selection correction procedures. *Finally*, even though the employee-level analysis has established that men have been deserting unions at least more than their female counterparts have done; it is worth emphasising the need for qualitative type study in the future, which will hopefully tease out precisely why men have been abandoning unions more recently.

Table 1: Marginal Effects from Multinomial Logit, pooled WERS2004 & WERS2011.

	Current member	Past member	Never member
	[Dy/dx]	[Dy/dx]	[Dy/dx]
Male	-0.024*** (0.006)	0.039*** (0.005)	-0.015** (0.006)
Age<30	-0.148*** (0.008)	-0.153*** (0.008)	0.301*** (0.007)
Age30-39	-0.073*** (0.006)	-0.062*** (0.005)	0.135*** (0.006)
Age50-59	0.025*** (0.006)	0.043*** (0.005)	-0.068*** (0.006)
Age60+	-0.033*** (0.010)	0.076*** (0.007)	-0.043*** (0.010)
Married	0.014** (0.005)	0.008* (0.004)	-0.022*** (0.005)
White	0.002 (0.011)	0.031*** (0.009)	-0.033** (0.011)
Dependent child7	0.009 (0.006)	-0.002 (0.005)	-0.007 (0.006)
Dependent other	0.042*** (0.005)	0.009 (0.005)	-0.051*** (0.006)
Disabled	0.062*** (0.007)	0.014** (0.005)	-0.076*** (0.007)
No qualification	0.000 (0.009)	-0.001 (0.007)	0.001 (0.009)
O-level	0.012 (0.007)	0.014** (0.005)	-0.027*** (0.007)
A-level	0.016 (0.009)	0.005 (0.007)	-0.021* (0.008)
Other qualification	0.015* (0.006)	0.021*** (0.005)	-0.036*** (0.006)
Weekly pay<=220	-0.110*** (0.012)	0.033*** (0.009)	0.077*** (0.011)
Weekly pay221-310	0.002 (0.011)	0.026*** (0.008)	-0.028** (0.010)
Weekly pay311-430	0.058*** (0.009)	0.020** (0.007)	-0.078*** (0.009)
Weekly pay431-650	0.072*** (0.008)	0.011 (0.006)	-0.083*** (0.008)
Permanent contract	0.081*** (0.010)	-0.035*** (0.007)	-0.046*** (0.009)
Full time	-0.018* (0.007)	0.009 (0.006)	0.010 (0.007)
48 hours or more	0.017** (0.007)	-0.004 (0.005)	-0.013* (0.006)
Training	0.040*** (0.006)	0.005 (0.004)	-0.045*** (0.005)
Skill req. same	-0.002 (0.004)	-0.019*** (0.004)	0.021*** (0.004)
Professional	0.237*** (0.012)	-0.055*** (0.008)	-0.182*** (0.011)
Technical	0.177*** (0.010)	-0.031*** (0.007)	-0.146*** (0.010)
Administrative and secretary	0.115*** (0.011)	-0.029*** (0.007)	-0.087*** (0.010)
Skilled plant & machinery	0.240*** (0.013)	-0.028*** (0.008)	-0.212*** (0.012)
Personal Services	0.191***	-0.064***	-0.127***

	(0.012)	(0.008)	(0.011)
Elementary occupation	0.235***	-0.059***	-0.176***
	(0.013)	(0.008)	(0.012)
Management favours unions	0.306***	-0.027***	-0.279***
	(0.006)	(0.005)	(0.007)
Gender equality	0.028***	-0.003**	-0.025***
	(0.002)	(0.001)	(0.002)
North East	0.004	0.020*	-0.024
	(0.022)	(0.010)	(0.020)
Yorkshire & the Humber	0.011	-0.010	-0.001
	(0.018)	(0.010)	(0.016)
East Midlands	-0.036	-0.006	0.042*
	(0.020)	(0.010)	(0.017)
West Midlands	-0.050**	0.002	0.048**
	(0.019)	(0.009)	(0.016)
East of England	-0.075***	-0.021*	0.096***
	(0.019)	(0.009)	(0.016)
London	-0.092***	-0.025*	0.117***
	(0.018)	(0.010)	(0.016)
South East	-0.120***	-0.023**	0.143***
	(0.017)	(0.008)	(0.014)
South West	-0.046*	-0.029**	0.074***
	(0.018)	(0.009)	(0.016)
Scotland	0.035*	-0.017*	-0.018
	(0.017)	(0.009)	(0.016)
Wales	0.091***	-0.009	-0.082***
	(0.021)	(0.011)	(0.019)
2011	-0.013	-0.002	0.015
	(0.009)	(0.005)	(0.008)
$\Pr[y_i = k \mathbf{x}_i]$	0.369	0.168	0.463
Wald chi2(84) / Prob > chi2	7084.48 / 0.0000		
Pseudo-R2	0.1714		
Log pseudolikelihood	-36388.153		
No. of employees	42,878		

Adjusted/clustered std. errors in parentheses with workplace clusters

Table 2: Marginal Effects from panel and cross-sectional Tobit

	Random effects (Panel) Tobit	Tobit, WERS2004 cross-section	Tobit, WERS2011 cross-section
	[Dy/dx]	[Dy/dx]	[Dy/dx]
% Female	-0.173*** (0.023)	-0.144*** (0.027)	-0.166*** (0.025)
Size 5-9	-15.126*** (2.964)	-15.362*** (3.431)	-14.819*** (3.433)
Size10-24	-10.987*** (2.581)	-12.003*** (2.753)	-10.794*** (2.685)
Size25-49	-7.165*** (2.259)	-7.379*** (2.665)	-4.796* (2.580)
Size50-99	-3.959* (2.107)	-8.251*** (2.689)	0.490 (2.062)
Size100-199	-1.270 (2.393)	-0.309 (2.454)	1.584 (2.477)
Size200-499	1.922 (2.551)	3.587 (2.820)	5.569** (2.138)
Size500-999	2.858 (2.218)	3.658 (2.873)	7.340*** (2.697)
Size1000-1999	0.557 (2.735)	0.548 (2.958)	3.260 (2.937)
Workplace age (log)	0.739** (0.364)	2.791*** (0.579)	0.858 (0.497)
Multi plant	5.959*** (0.996)	15.760*** (1.495)	10.233*** (1.478)
Private	-14.022*** (1.505)	-19.652*** (2.315)	-18.883*** (1.814)
UK owned	-1.284 (1.409)	-1.078 (1.909)	-5.746*** (1.550)
Manufacturing	10.182*** (2.816)	9.030*** (2.532)	12.646*** (2.365)
Construction	1.926 (3.213)	-0.431 (2.951)	-0.637 (3.989)
W & R Trade	3.907 (2.657)	-5.274** (2.433)	3.531 (2.382)
Hotel, restaurant & transport	9.558*** (2.452)	7.990*** (2.484)	11.641*** (2.322)
Public services	15.658*** (2.557)	11.260*** (2.497)	14.449*** (1.753)
Education	22.818*** (2.179)	19.643*** (2.640)	25.349*** (2.007)
Health	16.375*** (2.371)	13.075*** (2.757)	17.812*** (2.075)
Gender equality	0.529* (0.294)	1.586*** (0.384)	0.853** (0.346)
North East	-0.828 (2.734)	1.288 (2.643)	1.666 (2.700)
Yorkshire & the Humber	0.308 (2.737)	0.018 (2.574)	-0.482 (1.873)
East Midlands	-4.976* (2.652)	-2.966 (2.482)	-4.458* (2.716)
West Midlands	-2.584 (2.493)	-1.917 (1.968)	-3.350 (2.162)
East of England	-5.575* (2.934)	-5.741** (2.244)	-6.840*** (2.378)
London	-6.725*** (2.522)	-6.712*** (2.186)	-7.164*** (1.979)
South East	-7.191***	-8.677***	-8.459***

	(2.315)	(2.397)	(1.962)
South West	-0.351	-1.904	-5.393**
	(2.711)	(1.856)	(2.415)
Scotland	3.665	5.500**	5.105***
	(2.504)	(2.336)	(1.968)
Wales	5.827*	8.174***	4.598**
	(3.470)	(2.532)	(1.898)
Wald chi2(31) / Prob. > chi2	2250.99 / 0.000	6796.93 / 0.000	4086.57 / 0.000
Log likelihood	-4724.3519	-6265.5081	-6710.3197
Pseudo R2		0.0910	0.1118
LR test of $\sigma_u=0$ / Prob \geq chibar2	232.03 / 0.000		
No. of Workplaces	1,546 (=773*2)	2,050	2,330

*** p<0.01, ** p<0.05, * p<0.1

Bootstrap standard errors in parenthesis, with 50 replications and 2050 (2004), 2330 (2011) and 773 (pooled) workplace clusters

Uncensored and left-censored (Union density \leq 0) observations for 2004 and 2011 are, respectively, 1,155 & 895 and 1,258 & 1,072. For the panel sample, the corresponding censoring patterns are 915 & 631 observations/workplaces. There are 0 right-censored observations in all cases.

References

- Acemoglu, D., Aghion, P. and Violante, G. (2001) Deunionization, Technical Change and Inequality, *Carnegie-Rochester Conference Series on Public Policy*, 55, 229-264.
- Akerlof, G. and Kranton, R. (2000) Economics and Identity, *The Quarterly Journal of Economics*, 115 (3), 715-753.
- Akerlof, G. and Kranton, R. (2010) *Identity Economics: How Our Identities Shape Our Work, Wages, and Well-being*, Princeton University Press.
- Alesina, A. and La Ferrara, E. (2000), Participation in Heterogeneous Communities. *Quarterly Journal of Economics*, 115(3), 847–904.
- Arulampalam, W., Booth, A., Bryan, ML. (2007), Is there a glass ceiling over Europe? Exploring the gender pay gap across the wages distribution, *Industrial and Labor Relations Review*, 60 (2), 163–186.
- Berthoud R and Blekesaune M (2007) Persistent employment disadvantage, Department for Work and Pensions Research Report No. 416.
- Blanchflower, D. and Bryson, A. (2008) Union Decline in Britain, CEP Discussion Paper No 846, London School of Economics.
- Blanden, J., Machin, S. and Van Reenen, J. (2006) Have Unions Turned the Corner? New Evidence on Recent Trends in Union Recognition in UK Firms, *British Journal of Industrial Relations*, 44(2), 169-190.
- Blau, F. and Kahn, L. (2000), Gender Differences in Pay, *Journal of Economic Perspectives*, 14 (4), 75–99.
- Booth, A. (2009), Gender and competition, *Labour Economics*, 16, 599 – 606.
- Booth, A., and Nolen, P. (2012), Choosing to compete: How different are girls and boys? *Journal of Economic Behaviour and Organization*, 81, 542 – 555.
- Borland, J. and Ouliaris, S. (1994) The Determinants of Australian Trade Union Membership, *Journal of Applied Econometrics*, 9, 453-468.
- Brown, W. and Nash, D. (2008), What has been happening to collective bargaining under New Labour? Interpreting WERS 2004, *Industrial Relations Journal*, 39(2), 91-103.
- Cameron, A. and Trivedi, K. (2005) *Microeconometrics: Methods and Applications*, Cambridge University Press.
- Cobble, D. (2007), *The Sex of Class: Women Transforming American Labor*, Ithica: Cornell University.
- Cramer, J. and Ridder, G. (1991), Pooling States in the Multinomial Logit Model, *Journal of Econometrics*, 47, 267-272
- Crosen, R. and Gneezy, U. (2009), Gender differences in preferences, *Journal of Economic Literature*, 47 (2), 448 – 474.

- Dickens, L. (1997), Gender, race and employment equality in Britain: inadequate strategies and the role of industrial relations actors, *Industrial Relations Journal*, 28 (4) 282-289.
- Disney, R., Gosling, A. and Machin, S. (1995) British unions in decline: an examination of the 1980s fall in trade union recognition, *Industrial and Labor Relations Review*, 48, 403-419.
- Donado, A. and Walde, K. (2012), How Trade Unions Increase Welfare, *Economic Journal*, Published Online on 09 March 2012, DOI: 10.1111/j.1468-0297.2012.02513.x
- Eckel, C. and Grossman, P. (2008), Men, women and risk aversion: experimental evidence, vol. 1, pp. 1061 – 1073, in Plott, C. and Smith V. (eds.), *Handbook of Experimental Economics Results*, Elsevier, Amsterdam.
- Freeman, R. and Medoff, J. (1984), *What do Unions Do?* Basic Books.
- Freeman, R. and Pelletier, J. (1990), The impact of industrial relations legislation on British union density, *British Journal of Industrial Relations*, 28 (2), 141-164.
- Gall, G. (2004), Trade union recognition in Britain, 1995-2002: turning a corner? *Industrial Relations Journal*, 35 (3), 249-270.
- Gneezy, U., Niederle, M. and Rustichini, A. (2003), Performance in competitive environments: gender differences, *The Quarterly Journal of Economics*, 118 (3), 1049 – 1074.
- Green, A. and Kirton, G. (2006) Trade Unions and Equality and Diversity in Konrad, A., Prasad, P. and Pringle, J. (eds.) *Handbook of Workplace Diversity*, Sage Publications, London.
- Haile, G. (2016) Union decline in Britain: does gender have anything to do with it? *Scottish Journal of Political Economy*, DOI: 10.1111/sjpe.12116.
- Hausman, J. and McFadden, D. (1984), Specification tests for multinomial logit model, *Econometrica*, 52 (5), 1219 – 1240.
- Healy, G. and Kirton, G. (2000) Women, Power, and Trade Union Government, *British Journal of Industrial Relations*, 38 (3), 343-360.
- Healy, G. and Kirton, G. (2013), The early mobilization of women union leaders – a comparative perspective, *British Journal of Industrial Relations*, 51 (4), 709 – 732.
- Heckman, J. (1979) Sample Selection Bias as a Specification Error, *Econometrica*, 47(1), 153-161.
- Hotchkiss, J. and Pitts, M. (2007), The Role of Labor Market Intermittency in Explaining Gender Wage Differentials, *The American Economic Review*, 97 (2), pp. 417-421.
- Howell, C. (1996), Women as the paradigmatic trade unionists? New work, new workers and new trade union strategies in Conservative Britain, *Economic and Industrial Democracy*, 17(4), 511-543.
- HSE (2009), Historical picture: Workplace injury and ill health trends following the introduction of the Health and Safety at Work Act 1974, <http://www.hse.gov.uk/STATISTICS/history/index.htm> (accessed 24/11/16).

- Kersley, B., Alpin, C., Forth, J., Bryson, A., Bewley, H., Dix, G. and Oxenbridge, S. (2006). *Inside the Workplace: Findings from the 2004 Workplace Employment Relations Survey*, Routledge.
- Kirton, G. (2006), 'Alternative or parallel careers for women: the case of trade union participation', *Work, Employment and Society*, 20(1): 47-66.
- Kirton, G. & Greene, A. (2002) Positive Action in Trade Unions: The Case of Women and Black Members, *Industrial Relations Journal*, 2, 157-172.
- Kirton, G. (2015), Progress towards gender democracy in UK unions 1987 – 2012, *British Journal of Industrial Relations*, 53 (3), 484 – 507.
- Long, JS and Freese, J. (2006), *Regression for Categorical Dependent Variables Using Stata*, Stata Press.
- Machin, S. (2000) Union Decline in Britain, *British Journal of Industrial Relations*, 38 (4), 631-645.
- Machin, S. (2003) Trade union decline, new workplaces and new workers (Chapter 2) in Gospel, H. and Wood, S. (eds.) *Representing Workers: trade union recognition and membership in Britain*, Routledge, London.
- Malcomson, J. (1983) Trade Unions and Economic Efficiency, *Economic Journal*, 93, 51-65.
- Metcalf, D. (2000), 'Fighting for equality', Centrepiece, The Magazine for Economic Performance.
- Niederle, M. and Vesterlund, L. (2007), Do women shy away from competition? Do men compete too much? *The Quarterly Journal of Economics*, 122 (3), 1067 – 1101.
- Office for National Statistics (2014), Participation rates in the UK labour market: 2014, Office for National Statistics.
- Parker, J. (2002), Women's groups in British unions, *British Journal of Industrial Relations*, 40 (1), 23 – 48.
- Phipps, S., Burton, P. and Lethbridge, L. (2001), In and out of the Labour Market: Long-Term Income Consequences of Child-Related Interruptions to Women's Paid Work, *The Canadian Journal of Economics*, 34 (2), 411-429.
- Riach, P. and Rich, J. (2006) An Experimental Investigation of Sexual Discrimination in Hiring in the English Labor Market, *The B.E. Journal of Economic Analysis and Policy*, 6 (2), Article 1.
- Van Wanrooy, B., Bewley, H., Bryson, A., Forth, J., Freeth, S., Stokes, L. and Wood, S. (2013), *Employment Relations in the Shadow of Recession: findings from the 2011 Workplace Employment Relations Study*, Palgrave, Macmillan.
- Vickerstaff, S; Phillipson, C and Wilkie, R (2012), *Work Health and Wellbeing*. Bristol: Policy Press.
- Waddington, J., and Whitston, C. (1997), Why do people join unions in a period of membership decline? *British Journal of Industrial Relations*, 35 (4), 515 – 546.

Appendix

Table A1: Summary statistics on employee-level outcome and controls, WERS2004 & 2011

<i>Outcome</i>	Pooled				2004		2011	
	Mean	Std. Dev.	Min	Max	Mean	Std. Dev.	Mean	Std. Dev.
Member	0.369	0.483	0.0	1.0	0.367	0.482	0.371	0.483
Past member	0.168	0.374	0.0	1.0	0.167	0.373	0.169	0.375
Never member	0.463	0.499	0.0	1.0	0.466	0.499	0.459	0.498
<i>Controls</i>								
Male	0.454	0.498	0.0	1.0	0.466	0.499	0.441	0.496
Age<30	0.199	0.399	0.0	1.0	0.215	0.411	0.183	0.387
Age30-39	0.232	0.422	0.0	1.0	0.252	0.434	0.213	0.409
Age50-59	0.231	0.422	0.0	1.0	0.220	0.414	0.243	0.429
x_age60+	0.060	0.237	0.0	1.0	0.045	0.208	0.075	0.264
Married	0.686	0.464	0.0	1.0	0.677	0.467	0.696	0.460
White	0.935	0.247	0.0	1.0	0.942	0.234	0.928	0.259
Dependent child under 7	0.173	0.378	0.0	1.0	0.179	0.383	0.166	0.372
Dependent other	0.179	0.384	0.0	1.0	0.163	0.370	0.196	0.397
Disabled	0.108	0.311	0.0	1.0	0.120	0.325	0.096	0.295
No qualification	0.104	0.305	0.0	1.0	0.157	0.363	0.049	0.216
O-level	0.263	0.440	0.0	1.0	0.230	0.421	0.297	0.457
A-level	0.095	0.294	0.0	1.0	0.092	0.289	0.099	0.299
Other qualification	0.272	0.445	0.0	1.0	0.336	0.472	0.207	0.405
Weekly pay<=220	0.237	0.425	0.0	1.0	0.276	0.447	0.196	0.397
Weekly pay221-310	0.182	0.385	0.0	1.0	0.205	0.404	0.157	0.364
Weekly pay311-430	0.207	0.405	0.0	1.0	0.207	0.405	0.206	0.405
Weekly pay431-650	0.210	0.407	0.0	1.0	0.202	0.402	0.218	0.413
Permanent contract	0.925	0.263	0.0	1.0	0.920	0.271	0.930	0.255
Full time	0.774	0.418	0.0	1.0	0.781	0.414	0.766	0.423
48 hours or more	0.290	0.454	0.0	1.0	0.461	0.498	0.113	0.317
Training	0.678	0.467	0.0	1.0	0.655	0.475	0.701	0.458
Skill req. same	0.429	0.495	0.0	1.0	0.419	0.493	0.439	0.496
Professional	0.124	0.329	0.0	1.0	0.119	0.324	0.128	0.334
Technical	0.169	0.375	0.0	1.0	0.167	0.373	0.171	0.377
Administrative and secretary	0.178	0.382	0.0	1.0	0.188	0.391	0.167	0.373
Skilled plant & machinery	0.124	0.329	0.0	1.0	0.140	0.347	0.106	0.308
Personal Services	0.157	0.364	0.0	1.0	0.156	0.362	0.159	0.365
Elementary occupation	0.132	0.338	0.0	1.0	0.117	0.322	0.146	0.353
Management favours unions	0.177	0.381	0.0	1.0	0.183	0.386	0.171	0.376
Gender equality	2.421	1.937	0.0	7.0	2.314	1.907	2.531	1.962
North East	0.044	0.205	0.0	1.0	0.041	0.199	0.046	0.210
Yorkshire & the Humber	0.086	0.281	0.0	1.0	0.093	0.291	0.079	0.269
East Midlands	0.069	0.254	0.0	1.0	0.067	0.250	0.072	0.258
West Midlands	0.090	0.286	0.0	1.0	0.096	0.295	0.083	0.276
East of England	0.085	0.279	0.0	1.0	0.090	0.286	0.080	0.271
London	0.104	0.305	0.0	1.0	0.103	0.304	0.104	0.306
South East	0.133	0.339	0.0	1.0	0.124	0.329	0.142	0.349
South West	0.088	0.283	0.0	1.0	0.088	0.284	0.088	0.283
Scotland	0.111	0.314	0.0	1.0	0.112	0.315	0.111	0.314
Wales	0.050	0.217	0.0	1.0	0.048	0.213	0.052	0.221
2011	0.492	0.500	0.0	1.0	0.000	0.000	1.000	0.000
No. of employees	42,878				21,779		21,099	

Table A2: Small-Hsiao tests of IIA assumption (Pooled WERS2004 & 2011, N=42878)

Ho: Odds (Outcome-J vs Outcome-K) are independent of other alternatives

	LnL(full)	LnL(omitted)	Chi2	df	P>chi2
Current member	-6754.334	-3.64e+04	-5.93e+04	86	1.000
Past member	-9152.993	-1.82e+04	-1.81e+04	86	1.000
Never member	-6443.311	-1.82e+04	-2.35e+04	86	1.000

Note: A significant test is evidence against Ho.

Table A3: MNL Model, Wald tests for combining alternatives (Pooled WERS2004 & 2011, N=42878)

Ho: alternatives can be collapsed

	Chi2	df	P>chi2
Current member	2387.543	42	0.000
Past member	8166.863	42	0.000
Never member	3642.629	42	0.000

Table A4: MNL Model, Wald tests for independent variables (Pooled WERS2004 & 2011, N=42878)

Ho: All coefficients associated with given variable(s) are 0

	Chi2	df	P>chi2
Male	86.410	2	0.000
Age<30	1915.024	2	0.000
Age30-39	524.527	2	0.000
Age50-59	149.380	2	0.000
x_age60+	122.845	2	0.000
Married	20.690	2	0.000
White	19.435	2	0.000
Dependent child under 7	2.281	2	0.320
Dependent other	88.441	2	0.000
Disabled	126.691	2	0.000
No qualification	0.010	2	0.995
O-level	19.593	2	0.000
A-level	6.594	2	0.037
Other qualification	39.134	2	0.000
Weekly pay<=220	129.823	2	0.000
Weekly pay221-310	17.885	2	0.000
Weekly pay311-430	106.280	2	0.000
Weekly pay431-650	151.407	2	0.000
Permanent contract	86.229	2	0.000
Full time	7.359	2	0.025
48 hours or more	10.363	2	0.006
Training	102.922	2	0.000
Skill req. same	37.663	2	0.000
Professional	729.541	2	0.000
Technical	459.311	2	0.000
Administrative and secretary	165.636	2	0.000
Skilled plant & machinery	702.697	2	0.000
Personal Services	396.336	2	0.000
Elementary occupation	609.724	2	0.000
Management favours unions	3057.463	2	0.000
Gender equality	700.991	2	0.000
North East	6.350	2	0.042
Yorkshire & the Humber	2.527	2	0.283
East Midlands	21.139	2	0.000
West Midlands	37.484	2	0.000
East of England	118.257	2	0.000
London	184.351	2	0.000
South East	338.882	2	0.000
South West	69.661	2	0.000
Scotland	20.074	2	0.000
Wales	79.197	2	0.000
2011	9.564	2	0.008

Table A5: Marginal Effects from Multinomial Logit, WERS2004 & 2011 cross-sections

	2004			2011		
	Current member	Past member	Never member	Current member	Past member	Never member
	[Dy/dx]	[Dy/dx]	[Dy/dx]	[Dy/dx]	[Dy/dx]	[Dy/dx]
Male	-0.041*** (0.009)	0.058*** (0.006)	-0.017* (0.008)	-0.005 (0.008)	0.022*** (0.006)	-0.017* (0.008)
Age<30	-0.154*** (0.010)	-0.158*** (0.010)	0.312*** (0.010)	-0.135*** (0.011)	-0.152*** (0.012)	0.287*** (0.010)
Age30-39	-0.057*** (0.008)	-0.066*** (0.007)	0.123*** (0.008)	-0.091*** (0.009)	-0.059*** (0.008)	0.150*** (0.009)
Age50-59	0.020* (0.008)	0.032*** (0.007)	-0.053*** (0.009)	0.029*** (0.008)	0.053*** (0.006)	-0.082*** (0.008)
Age60+	-0.046** (0.015)	0.071*** (0.011)	-0.025 (0.016)	-0.028* (0.013)	0.082*** (0.009)	-0.054*** (0.013)
Married	0.018* (0.007)	0.007 (0.006)	-0.024*** (0.007)	0.010 (0.007)	0.011 (0.006)	-0.021** (0.007)
White	0.020 (0.017)	0.018 (0.013)	-0.038* (0.016)	-0.013 (0.015)	0.042*** (0.012)	-0.029* (0.014)
Dependent child7	0.013 (0.009)	-0.008 (0.007)	-0.005 (0.009)	0.004 (0.009)	0.005 (0.008)	-0.009 (0.009)
Dependent other	0.057*** (0.008)	-0.001 (0.006)	-0.055*** (0.008)	0.029*** (0.007)	0.016* (0.007)	-0.045*** (0.008)
Disabled	0.057*** (0.009)	0.011 (0.007)	-0.068*** (0.010)	0.070*** (0.010)	0.018* (0.008)	-0.088*** (0.011)
No qualification	0.008 (0.013)	-0.010 (0.010)	0.002 (0.013)	0.010 (0.014)	0.004 (0.011)	-0.014 (0.015)
O-level	0.027* (0.011)	0.002 (0.009)	-0.029** (0.011)	0.002 (0.009)	0.022** (0.007)	-0.024** (0.008)
A-level	0.029* (0.013)	0.001 (0.011)	-0.030* (0.013)	0.003 (0.012)	0.005 (0.010)	-0.008 (0.011)
Other qualification	0.019* (0.009)	0.020** (0.008)	-0.039*** (0.009)	0.014 (0.008)	0.018* (0.007)	-0.032*** (0.009)
Weekly pay<=220	-0.047** (0.018)	0.041** (0.013)	0.006 (0.017)	-0.171*** (0.016)	0.032** (0.012)	0.139*** (0.015)
Weekly pay221-310	0.053** (0.016)	0.035** (0.012)	-0.088*** (0.015)	-0.044** (0.014)	0.023* (0.010)	0.021 (0.013)
Weekly pay311-430	0.095*** (0.015)	0.027* (0.011)	-0.122*** (0.014)	0.034** (0.012)	0.014 (0.009)	-0.047*** (0.012)
Weekly pay431-650	0.108*** (0.013)	0.006 (0.010)	-0.115*** (0.013)	0.052*** (0.010)	0.015 (0.008)	-0.067*** (0.010)
Permanent contract	0.074*** (0.014)	-0.025* (0.010)	-0.049*** (0.012)	0.084*** (0.015)	-0.045*** (0.011)	-0.039** (0.014)
Full time	0.006 (0.010)	-0.001 (0.008)	-0.005 (0.010)	-0.050*** (0.011)	0.017* (0.008)	0.034** (0.010)
48 hours or more	0.016* (0.008)	0.005 (0.006)	-0.021** (0.008)	0.032** (0.012)	-0.031** (0.009)	-0.001 (0.011)
Training	0.047*** (0.008)	-0.005 (0.005)	-0.041*** (0.007)	0.032*** (0.008)	0.017** (0.006)	-0.049*** (0.008)
Skill req. same	0.003 (0.006)	-0.020*** (0.005)	0.017** (0.006)	-0.007 (0.006)	-0.019*** (0.005)	0.025*** (0.006)
Professional	0.210*** (0.016)	-0.061*** (0.011)	-0.149*** (0.016)	0.261*** (0.016)	-0.050*** (0.011)	-0.212*** (0.015)
Technical	0.155*** (0.015)	-0.028** (0.010)	-0.126*** (0.014)	0.196*** (0.014)	-0.036*** (0.010)	-0.160*** (0.013)
Administrative & secretary	0.081*** (0.015)	-0.031** (0.011)	-0.050*** (0.014)	0.149*** (0.017)	-0.028** (0.010)	-0.121*** (0.015)
Skilled plant & machinery	0.220*** (0.018)	-0.036*** (0.011)	-0.183*** (0.017)	0.254*** (0.018)	-0.024* (0.012)	-0.230*** (0.016)
Personal Services	0.149*** (0.017)	-0.053*** (0.012)	-0.095*** (0.016)	0.233*** (0.016)	-0.078*** (0.011)	-0.156*** (0.015)
Elementary occupation	0.193*** (0.019)	-0.060*** (0.012)	-0.133*** (0.017)	0.269*** (0.018)	-0.059*** (0.011)	-0.210*** (0.015)
Management favours	0.312***	-0.024**	-0.289***	0.294***	-0.030***	-0.264***

unions						
	(0.009)	(0.008)	(0.010)	(0.009)	(0.007)	(0.010)
Gender equality	0.032***	-0.005**	-0.027***	0.025***	-0.002	-0.023***
	(0.003)	(0.002)	(0.003)	(0.003)	(0.002)	(0.003)
North East	0.034	0.009	-0.043	-0.021	0.029*	-0.008
	(0.032)	(0.015)	(0.029)	(0.029)	(0.014)	(0.027)
Yorkshire & the Humber	0.024	-0.024	-0.000	-0.002	0.007	-0.004
	(0.026)	(0.014)	(0.023)	(0.026)	(0.013)	(0.023)
East Midlands	-0.021	0.000	0.020	-0.051	-0.013	0.064**
	(0.029)	(0.015)	(0.024)	(0.027)	(0.013)	(0.023)
West Midlands	-0.041	-0.003	0.044	-0.054*	0.009	0.045*
	(0.028)	(0.013)	(0.024)	(0.025)	(0.013)	(0.021)
East of England	-0.052*	-0.024	0.076***	-0.099***	-0.017	0.116***
	(0.026)	(0.013)	(0.022)	(0.028)	(0.013)	(0.023)
London	-0.075**	-0.020	0.094***	-0.109***	-0.026	0.135***
	(0.026)	(0.014)	(0.022)	(0.024)	(0.014)	(0.022)
South East	-0.109***	-0.027*	0.136***	-0.132***	-0.017	0.149***
	(0.025)	(0.013)	(0.020)	(0.023)	(0.011)	(0.020)
South West	-0.008	-0.038**	0.046*	-0.082***	-0.018	0.101***
	(0.027)	(0.014)	(0.023)	(0.024)	(0.012)	(0.022)
Scotland	0.058*	-0.025*	-0.032	0.011	-0.008	-0.003
	(0.025)	(0.013)	(0.023)	(0.024)	(0.012)	(0.022)
Wales	0.084**	-0.017	-0.068*	0.098***	-0.000	-0.098***
	(0.028)	(0.017)	(0.026)	(0.029)	(0.015)	(0.027)
Pr[$y_i = k \mid \mathbf{x}_i$]	0.367	0.167	0.466	0.371	0.169	0.459
Wald chi2(82) / Prob >	3848.37 /			3583.50 /		
chi2	0.0000			0.0000		
Pseudo-R2	0.1784			0.1703		
Log pseudolikelihood	-18292.23			-17962.047		
No. of employees	21,779			21,099		

Adjusted/clustered std. errors in parentheses with 1,732 (2004) and 1,916 (2011) workplace clusters

Table A6: Heckman two-step based estimates of the link between union density and % female.

	WERS2004 cross-section		WERS2011 cross-section	
	First-stage	Second-stage	First-stage	Second-stage
% Female	-0.003*	-0.163***	-0.002	-0.192***
	(0.001)	(0.044)	(0.001)	(0.043)
Size 5-9	-0.487***	19.149***	-0.608***	28.617***
	(0.185)	(6.186)	(0.174)	(7.539)
Size10-24	-0.297*	11.255**	-0.357**	16.660***
	(0.166)	(4.381)	(0.159)	(4.600)
Size25-49	-0.089	5.565	-0.154	11.975***
	(0.166)	(3.676)	(0.155)	(3.816)
Size50-99	-0.044	0.058	0.140	3.491
	(0.166)	(3.419)	(0.155)	(3.203)
Size100-199	0.331*	-5.993*	0.111	2.255
	(0.172)	(3.619)	(0.156)	(3.248)
Size200-499	0.533***	-9.702**	0.559***	-11.299***
	(0.174)	(3.916)	(0.157)	(3.988)
Size500-999	0.578***	-11.496***	0.559***	-9.472**
	(0.194)	(4.178)	(0.182)	(4.271)
Size1000-1999	0.350*	-9.553**	0.194	-3.802
	(0.205)	(4.183)	(0.188)	(3.916)
Private	-0.373***	-14.952***	-0.129	-17.303***
	(0.116)	(3.202)	(0.104)	(2.728)
UK owned	-0.102	-0.022	-0.264***	4.667
	(0.080)	(2.605)	(0.082)	(3.134)
Manufacturing	0.637***	-12.968**	0.615***	-9.347
	(0.117)	(5.072)	(0.123)	(5.790)
Construction	0.280*	-18.491***	-0.182	5.555
	(0.164)	(5.566)	(0.191)	(6.132)
W & R Trade	0.103	-17.964***	0.338***	-14.022***
	(0.112)	(4.174)	(0.120)	(4.705)
Hotel, restaurants & transport	0.393***	-3.738	0.451***	-1.358
	(0.114)	(5.005)	(0.113)	(5.388)
Public services	0.743***	-15.691***	0.823***	-19.230***
	(0.124)	(4.953)	(0.110)	(5.753)
Education	1.310***	-21.445***	0.993***	-13.556**
	(0.171)	(5.877)	(0.137)	(6.557)
Health	0.698***	-19.542***	0.763***	-19.238***
	(0.134)	(4.791)	(0.129)	(5.518)
Gender equality	0.071***	-0.652	0.048***	-1.028**
	(0.021)	(0.542)	(0.018)	(0.517)
North East	0.092	-1.958	0.193	-4.006
	(0.163)	(4.339)	(0.166)	(4.276)
Yorkshire & the Humber	-0.062	-4.434	0.299**	-16.180***
	(0.138)	(3.224)	(0.128)	(3.525)
East Midlands	-0.133	-6.118*	-0.008	-4.567
	(0.144)	(3.628)	(0.138)	(3.656)
West Midlands	-0.132	-3.410	-0.102	-5.063
	(0.131)	(3.295)	(0.134)	(3.309)
East of England	-0.154	-11.498***	-0.092	-9.481**
	(0.131)	(3.459)	(0.128)	(3.731)
London	-0.353***	0.767	-0.161	-5.588**
	(0.126)	(3.651)	(0.113)	(2.827)
South East	-0.444***	-2.824	-0.030	-14.495***
	(0.120)	(3.625)	(0.113)	(2.944)
South West	-0.101	-3.944	0.018	-12.548***
	(0.137)	(3.644)	(0.129)	(3.486)
Scotland	0.098	3.540	0.184	-2.806
	(0.134)	(3.338)	(0.124)	(3.075)
Wales	-0.123	11.567***	0.394***	-7.433*
	(0.175)	(3.831)	(0.143)	(3.994)
Workplace age (log)	0.086***		0.061**	
	(0.030)		(0.030)	
Multi plant	0.526***		0.304***	
	(0.076)		(0.071)	
Lambda (IMR)		-29.271***		-39.585***

		(6.341)		(8.769)
Constant	-0.721***	101.504***	-1.071***	113.828***
	(0.251)	(8.111)	(0.242)	(11.730)
No. of workplaces	2050	1,155	2330	1,258
R-squared		0.241		0.267

Cluster robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1