The added value of trade unions

New analyses for the TUC of the Workplace Employment Relations Surveys 2004 and 2011

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The views in this report are the authors' own and do not necessarily reflect those of the Trades Union Congress.

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Section 1

Introduction

Background to the analysis

To inform debate over the 2016 Trade Union Act the TUC commissioned UCL/NIESR to undertake a three-pronged investigation on the nature of unions and their effects on employers and employees. This comprised:

- a review of existing literature on union effects

- new analyses of the Workplace Employment Relations Surveys (WERS)

- a more detailed investigation of the links between unionisation and work/life balance.

This report focuses on the second element, namely the new analyses of WERS.

The review of existing evidence focused on quantitative research for Britain. The review – which is summarised in the Appendix to this report – found that unions still deliver observable benefits to the average union member, in terms of higher wages, more extensive fringe benefits, higher levels of workplace training and the more effective resolution of individual workplace disputes. At the same time, the negative effects on employers, once a common feature of empirical studies, have largely dissipated in recent years.

However, some of the evidence is dated and, because different authors make different choices when analysing data, it is difficult to form an overall impression of union effects based on this evidence.

We have therefore undertaken new analyses of the 2004 and 2011 Workplace Employment Relations Surveys (WERS) to update the evidence on unions' influence on employers and employees. We have chosen a common set of variables to characterise workplace unionisation – membership, density, union recognition, the presence of an on-site union representative, and a summary union strength scale – and we have sought to isolate the independent effect of unions on outcomes of interest using a common set of control variables. This allows the reader to compare union effects over time between 2004 and 2011, and across different outcomes.

Our contribution

Our contribution focuses on the economic impact of union representation within workplaces in Britain. We begin by briefly setting out the current state of workplace union representation in the UK. We introduce our key measures of unionisation at the individual and the workplace level. We show the change in union incidence between 2004 and 2011 across the key dimensions of workplace unionisation that enter our subsequent multivariate analyses of outcomes for employers and employees.

We then go on to present the micro-economic analysis of the impact of unions on a variety of outcomes of primary interest to workers, such as pay, before turning to their impact on outcomes of primary interest to employers, such as productivity and profitability. We introduce our methodology before presenting the results.

We cannot claim that our results definitively capture the causal effects of unionisation. Instead, we present point-in-time comparisons between union and non-union workers (or their workplaces), with account taken of the differences between them on other observable characteristics. Nevertheless, this is the standard approach adopted in much of the literature and, since we also know a great deal about the factors that influence unionisation in Britain, we can make reasonable inferences about unions' effects on outcomes such as wages and workplace performance.

Section 2

Data and methodology

The Workplace Employment Relations Surveys 2004 and 2011

We analyse linked employer-employee data from the Workplace Employment Relations Surveys (WERS) for 2004 and 2011. Appropriately weighted, both waves of the survey are nationally representative surveys of workplaces in Britain with five or more employees, covering all sectors of the economy except agriculture and mining (Van Wanrooy et al., 2013).

The analysis exploits three elements of the survey. The first is the management interview, conducted face-to-face with the most senior workplace manager responsible for employee relations. Interviews for the 2011 survey were conducted in 2,680 workplaces between March 2011 and June 2012 with a response rate of 46 per cent. The 2004 survey conducted management interviews in 2,295 workplaces between A and B with a response rate of 64 per cent.

The second element is the survey of employees, distributed in workplaces where a management interview was obtained. In 2011 self-completion questionnaires were distributed to a simple random sample of 25 employees (or all employees in workplaces with 5-24 employees) in the 2,170 workplaces (81 per cent) where management permitted it. Of the 40,513 questionnaires distributed, 21,981 (54 per cent) usable ones were returned. The 2004 survey had adopted the same procedure, distributing self-completion questionnaires in the 86 per cent of workplaces where management permitted it. Of the 37,012 questionnaires distributed, 22,451 usable ones (61 per cent) were returned.

The third element is the survey of worker representatives, carried out in those workplaces with on-site employee representation. The survey sought interviews with the most senior union representative at the workplace, and also with the most senior non-union representative, although we only use the former in our analyses. Among the 1,153 workplaces with union representatives, 797 generated a productive interview, giving a response rate of 69 per cent. These data are used to derive a measure of union facility time, as indicated by the number of hours that senior union representatives devoted to their function every week.

Weights are provided with the survey data to correct for the sample design and any observable non-response biases.

Methodology

In Section Three we present simple descriptive analyses on the incidence of trade unionism in WERS in 2004 and 2011. Because these and all other analyses presented are based on weighted data we can extrapolate from our analyses to the population of all workplaces in

Britain with at least five employees, and to employees in those workplaces. Analyses are presented at the employee level and the workplace level.

We then move onto multivariate analyses of the associations between unionisation and outcomes of interest. In all cases we present linear regression estimates weighted by the survey sample weights so that results can be extrapolated to the population of workplaces with at least 5 employees and the employees who work in those workplaces.

For all outcomes we run separate analyses for 2004 and 2011, for the whole economy and the private sector. First we present raw correlations between unionisation and the outcome of interest. Then we present regression-adjusted estimates having controlled for a standard set of control variables. Both the workplace and employee-level analyses control for the following workplace characteristics:

- number of employees (6 categories)

- single-establishment organisation

- total size of organization (4 categories)

- single-digit industry (12 categories)

- age of establishment (6 categories)

- region (11 categories)

- largest single-digit non-managerial occupation at the workplaces (8 categories)

- foreign owned.

The employee-level analyses also control for the following set of employee-level observable features:

- sex

- age (seven categories)

- marital status (five categories)

- dependent children

- disability

- ethnicity

- highest academic qualification (nine categories)

- highest vocational qualification (10 categories)

- single-digit occupation (nine categories)

- usual hours worked (six categories)

- workplace tenure (six categories)

- type of employment contract (four categories)

Our union variables are described in the next section. Outcome variables are discussed when we present the results in Sections Four and Five.

The tables that follow only present the coefficients for the union variables, though full models are available from the authors on request. Only one union variable enters each model: each emboldened heading in the left hand column of the tables indicates a separate regression. The statistical significance of any union effect is indicated with asterisks as noted in the footnotes to the tables. Since the models are Ordinary Least Squares (OLS), model coefficients can be interpreted as indicating the absolute difference in the dependent variable when comparing across categories of the union indicator. In the bottom row of each table is the number of unweighted observations appearing in the model.

Section 3

Incidence of unionisation in 2004 and 2011

As reported in Section 2 of our literature review (Bryson and Forth, 2016), there has been a decline in the incidence of union membership and union recognition in Britain in the last few decades. This has taken place in both the private and the public sectors, though the public sector remains much more heavily unionised. The rate of decline has not been uniform everywhere, but there are few industries or occupations which have seen growth in union presence. In the last decade or so, the rate of decline has slowed somewhat. This is reflected in Table 3.1 which shows the incidence of unionisation, variously defined, in 2004 and 2011 for the whole economy and for the private sector only. The table has three panels: Panel A presents the incidence of unionisation at the workplace level; Panel B presents employee-level estimates shows employees' exposure to unionisation; Panel C records the unweighted sample sizes used to construct Panels A and B.

See table 3.1 in appendix B.

The first row of Panel A shows the percentage of workplaces recognising at least one trade union for pay bargaining remained static over the period. Across the economy just over one-fifth (22 per cent) of workplaces recognised a union, compared to only 12-13 per cent in the private sector. Because it tends to be larger workplaces that recognise trade unions, employee coverage is higher than workplace coverage: row 1 of Panel B indicates that almost half (48-51 per cent) of employees work in a workplace with at least one recognised trade union, but this falls to one-third (32-35 per cent) in the private sector.

In 2004 around three-quarters of workplaces had no union members, but this had risen to nearly four-fifths by 2011 (Panel A, row 2). The percentage of workplaces that were heavily unionised (50 per cent+ density) fell from 13 per cent in 2004 to 10 per cent in 2011. Individual union membership was roughly stable at a little under one-third of employees in the whole economy and one-fifth of those in the private sector (row 2, Panel B). But the proportion of employees in workplaces with substantial union density fell a little. This all implies that union members are increasingly concentrated in a smaller set of workplaces.

Only a small minority of workplaces in Britain have a recognised union with an on-site union representative – 7 per cent in the whole economy and 3 per cent in the private sector (Panel A, row 3). Very few workplaces (1 per cent) have a union representative spending at least 15 hours per week on union rep work; indeed, workplaces with union reps that spend at least five hours a week on their role are rare, particularly in the private sector (Panel A, row 4). However, the time union reps spend on their function rises with workplace size such that around one-in-ten employees work in a workplaces with a full-time union representative on-site (Panel B, row 5), while 14-15 per cent work in workplaces with a union representative spending at least 15 hours per week on representative duties.

The final measure of unionisation appearing at the bottom of Table 1 is a count measure of union strength ranging from 0 (no union presence) to 6 where workplaces score a point for:

- having a recognised union

- having an on-site union lay representative

- union density of at least 25 per cent

- union density of at least 50 per cent

- union density of at least 75 per cent

- union density of 100 per cent.

The mean score on this (0,6) summary index fell from 0.72 in 2004 to 0.57 in 2011. It also fell in the private sector, from 0.38 to 0.25. But it is noteworthy that, even at the 75th percentile in the workplace distribution of this variable the union strength score was zero. The decline in union strength over time is not quite so apparent at the employee-level, suggesting the decline in union strength was more apparent in smaller workplaces. Although the median score for union strength among employees was zero, those at the 75th percentile in the distribution were exposed to unions scoring 3 on the index (2 in the private sector).

The overall picture is one of gently declining unionisation between 2004 and 2011, from an already fairly low incidence level, particularly in the private sector.

Section 4
Union effects on employees

Introduction

We begin our analysis of union effects by considering outcomes that are primarily of interest to workers, that is:

- pay

- pay satisfaction

- pension contributions from the employer

- off-the-job training

- satisfaction with training.

As explained in Section Two we go through each outcome in turn presenting results in tables that follow the same format. We run separate regression estimates by year for the private sector then the whole economy. In each case there are two model specifications. The first is simply the raw correlation between the union variable and the outcome of interest. The second model specification controls for the potentially confounding observable differences between union and non-union workers using the variables described in Section Two and again at the footnote to each table.

Pay

Historically, one of the principal benefits for union members in Britain has been the delivery of a wage premium over similar non-members through collective bargaining. The union wage premium has historically been seen as a measure of union power since, although such a premium relies on the availability of economic rents (and is hence to some extent dependent on product markets), higher union wages are also predicated on unions having sufficient power to force employers to give away a higher share of these rents than they would in the absence of unions.

See table 4.1 in appendix B.

Across the whole economy the raw gross hourly wage gap between union members and non-members halved between 2004 and 2011 from around 19 per cent to 11 per cent (Table 4.1, row 1). However, the regression-adjusted difference fell only marginally from 8 per cent to 6.5 per cent. This is roughly equivalent to the union wage premium Forth and Bryson (2015) estimated for union membership in the 2014 QLFS. The raw wage gap between members and non-members in the private sector also fell by around one-half but, again, the regression-adjusted differential did not change very much, falling from around 5.3 per cent to 3.8 per cent.

Row 2 in Table 4.1 shows the gross hourly wage difference between employees in unionised and non-unionised workplaces, regardless of their membership status. Although there is a raw union wage differential of about 14-15 per cent in the whole economy in both years, the regression adjusted union recognition premium is only statistically significant in 2011, rising from a non-significant 2.3 per cent in 2004 to 5.1 per cent in 2011. A similar story is apparent in the private sector.

Row 3 differentiates between three types of workplace: those with no union members, those with union density of less than 50 per cent and those workplaces where a majority of employees are union members. After accounting for other observable differences across workplaces, the union wage premium is only statistically significant in workplaces where a majority of employees are union members. This is the case in both years for both the whole economy and the private sector.

Row 4 differentiates between workplaces without union recognition and those with a recognised union with and without an on-site union representative. In the whole economy a union wage premium emerges after accounting for observable differences across workplaces and it is of the same magnitude, whether or not the union has an on-site representative. However, this is only true in 2011: in 2004 there is no significant union rep premium. In the private sector, the union wage premium in 2011 is around 5 per cent and is identical, whether the union has an on-site representative or not. By contrast, in 2004 the union premium was only apparent where there was a union representative on-site.

The final row of Table 4.1 shows the wage returns to union strength, as captured in the (0,6) additive scale described earlier. In both the whole economy and the private sector, a 1 point increase in the union strength scale equates to about a 1-2 per cent rise in the regression-adjusted gross hourly union wage premium in 2004 and 2011.

Pay satisfaction

If unions raise employees' wages one might expect union members to be more satisfied with their pay compared to "like" employees who are not unionised. Recent evidence from British panel data for employees through to the Crash in 2008 suggests this was the case (Bryson and White, 2013). But this is not unequivocally the case in WERS in either 2004 or 2011. In the whole economy, union members appeared less satisfied with their wages than their non-member counterparts in 2004, whereas there was no association by 2011. In the private sector the association was not significant in either year (Table 4.2).

See table 4.2 in appendix A

However, there are signs of a positive association between union density and pay satisfaction: in the whole economy having majority membership was positively associated with pay satisfaction in 2011, but not in 2004. In the private sector the positive association was statistically significant in both years.

There is no clear association between on-site representation and pay satisfaction controlling for observable differences between union and non-union workplaces. However, the composite measure of union strength indicates pay satisfaction rises with union strength. The association is statistically significant in the whole economy only in 2011 whereas in the private sector it is statistically significant in both years but becomes quantitatively more important by 2011.

Pension benefits

As part of negotiations over wages and work effort, unions can also affect non-wage components of the reward package. In 2011 only, employees were asked whether they received contributions from an employer to a pension scheme. Union members were 17 per cent more likely to say yes than non-members, but the differential falls to 5 per cent having controlled for observable differences between members and non-members in their demographic, job and workplace characteristics (Table 4.3, row 1). The union premium is similar in the private sector and is in line with the union wage premium.

See table 4.3 in appendix B.

The union pension premium is large and statistically significant for employees in workplaces recognising a trade union (row 2). The effect rises with union density, with the presence of an on-site union rep, and with our union strength indicator.

Off-the-job training

One might expect a positive association between unionisation and training for a number of reasons. In order to offset the cost-increasing impact of any union wage premium, employers will want to increase worker productivity via training and skills acquisition. Second, if union voice reduces voluntary quits, thus raising worker tenure, this creates an additional incentive for firms to invest in their workers' human capital. Third, members will look to unions to assist them in skills acquisition, whether firm-specific or general. Fourth, as noted in the literature review, jobs in the union sector have had greater learning requirements than those in the non-union sector.

See table 4.4 in appendix A.

Analyses in Table 4.4 are in keeping with recent evidence suggesting a clear positive association between employees' receipt of off-the-job training and union coverage. Union members are around 3-5 per cent more likely to have received off-the-job training in the past 12 months than observationally equivalent non-members, a figure that has remained roughly constant over 2004-2011 (row 1). The effects are broadly similar when using union recognition to proxy union effects. However, the effects are confined to workplaces where a majority of employees belong to a union (row 3) and where they are identified as strong according to our union strength index (row 5).

See table 4.5 in appendix A.

Employees in the union sector also appear to have longer durations of off-the-job training than their non-union counterparts. Table 4.5 estimates the probability that an employee has received at least five days off-the-job training in the last 12 months. In the whole economy, union members were more likely to receive 5+ days of training in the previous 12 months than observationally similar non-members in both 2004 and 2011. However, the association appears more dependent on union strength in 2011 than in 2004: indeed the union effect is absent for weaker unions in 2004. In the private sector there are no union effects on longer durations of training in 2004 but positive statistically significant associations emerge in 2011 where unions are strong and, specifically, when they have majority membership at a workplace.

See table 4.6 in appendix B

The increased amount of off-the-job training received by unionised employees compared to similar non-unionised employees does not appear to translate into greater satisfaction with training (Table 4.6). Indeed, if anything, the association is a negative one.

Summary

In this section we have added to the existing literature on the links between unionisation and benefits to employees in the form of wages, pensions and training by running new estimates for union effects in 2004 and 2011. We find unions continue to procure benefits for those in the union sector relative to observationally equivalent non-union workers in the form of pay, pensions and off-the-job training. In the main, these effects are apparent in the whole economy and the private sector and existed in both 2011 and 2004. The effects are sometimes absent where unions are organisationally weak. Whereas the union wage premium translates into greater satisfaction with pay this is not the case when it comes to off-the-job training.

Section 5

What do unions deliver for employers?

Introduction

Reading much of the literature on trade unions one might be forgiven for thinking that they are solely focused on their members' interests. In fact, partly because Britain has a largely voluntarist employment relations framework, they are heavily reliant on employers' good will to gain access to the workplace and its union members. Furthermore, even when unions are focusing on their members' interests, there can be positive spill-overs to employers because union bargaining can help to arrive at efficient outcomes. In addition, by aggregating worker preferences and communicating them with a single voice to the employer, the union can save an employer the time and money involved in setting up alternative voice arrangements. Finally, the union can also perform what might be termed an agency role for employers, intervening in disputes and providing a disciplining and monitoring role over their members.

Below we present new evidence on the effects of unions at the workplace, ranging across 10 dimensions, namely:

- workplace performance, including financial performance, labour productivity, quality of product/service, and an additive scale combining all three

- workplace closure

- innovations, including product and service innovation

- fringe benefits

- off-the-job training

- absenteeism

- injury rates

- illness rates

- voluntary quits

- the climate of employment relations.

Workplace performance and workplace closure

Early studies using WERS and other data suggested unionisation adversely affected workplace performance but, as discussed in Bryson and Forth (2016), these adverse effects dissipated in the 1990s and early 2000s. We revisit the issue using the three measures of managerial perceptions of workplace performance contained in WERS 2004 and 2011.

The managerial respondents to the survey were asked: 'Compared with other workplaces in the same industry how would you assess your workplace's...financial performance; labour

productivity; quality of service or product?'.   For each of these three items, the managerial respondent chose one of five responses presented to them on a show card ranging from 'a lot better than average' to 'a lot below average'. On each of the three items, the percentage of managers saying their workplace performance was 'a lot below average' was very small, so these responses were combined with those saying 'below average' to form a four-point scale (1,4). The three subjective workplace performance measures are positively and significantly correlated, such that those scoring high (low) on one indicator tended to score high (low) on the other two; thus, although distinct, these three measures may relate to a single underlying workplace performance scale. We therefore constructed an additive scale from three performance items, summing the items then subtracting 3, such that the scale ran from 0 ('below average' performance on all three items) to 9 (performance 'a lot better than average' on all 3 items).

We present results for labour productivity, quality of product/service, financial performance and the additive scale combining responses to all three in Tables 5.1, 5.2, 5.3 and 5.4 respectively.

See tables 5.1, 5.2 and 5.3 in appendix B.

None of the four unionisation measures are significantly linked to labour productivity, either in 2004 or 2011, having accounted for observable differences between unionised and non-unionised workplaces (Table 5.1). This is the case for the whole economy and the private sector. The only exception is the negative association with union recognition where there is an on-site union rep in 2004, an effect that is no longer apparent in 2011.
The picture is similar in relation to the quality of product/service. Across the whole economy none of the union measures are significantly associated with quality of product/service in either year (Table 5.2). In the private sector there are indications of a negative association with union recognition, especially in the absence of an on-site union representative, in 2004, but again these are no longer significant by 2011.

With no evidence of a clear union effect on productivity, coupled with a clear positive union effect on labour costs through the wage premium and pension provision, it is possible that unions might have an adverse effect on workplace financial performance. There is no evidence for this in the whole economy and, in the private sector, while union recognition was negatively associated with financial performance in 2004, this effect had disappeared by 2011 (Table 5.3).

If one accepts that these three measures of performance - labour productivity, quality of output/service, and financial performance - all relate to an underlying latent performance measure, and that each is captured with some measurement error by the individual measures, one might get a clearer picture of the links between unionisation and workplace performance using the additive scale. Across the whole economy workplaces recognising unions performed more poorly than observationally similar non-unionised workplaces in 2004, but this was no longer the case in 2011 (Table 5.4, row 1). In the private sector unionised workplaces with on-site union representation were performing more poorly than "like" non-unionised workplaces in 2004 but, again, the effect was absent by 2011.

We use the panel component to the 2004-2011 WERS to establish whether unionisation in 2004 affected the probability of workplace closure in 2011, conditional on characteristics of

the workplace in 2004 as captured by the same set of control variables as appear in the rest of the analyses presented here. We find union recognition increases the probability of closure by about 10 percentage points in the whole economy and the private sector, but the effect is only on the margins of statistical significance and is not apparent using other unionisation measures.

Taken together these results confirm earlier research in showing that any negative association between unionisation, variously defined, and workplace performance which might have been apparent in the past, was no longer evident by 2011.

Innovation

As in the case of workplace performance, there has been a recent reappraisal of the links between unionisation and innovation in Britain. The earlier literature finding negative associations between unionisation and innovation has been challenged with new findings suggesting that in the private sector there is a positive link between unionisation and product innovation and a non-significant association with process innovation (Bryson et al., 2016). We investigate this issue with analyses for 2004 and 2011.

Our innovation measures are based on managerial responses to the following question: "Over the past two years has management here introduced any of the changes listed on this card? PROBE: Which others? UNTIL 'None':

1) Introduction of performance related pay

2) Introduction or upgrading of new technology (including computers)

3) Changes in working time arrangements

4) Changes in the organisation of work

5) Changes in work techniques or procedures

6) Introduction of initiatives to involve employees

7) Introduction of technologically new or significantly improved product or service

8) NONE of these"

We construct: an additive scale running from zero to seven based on these items; a measure of process innovation based on new production technology (a dummy taking the value of 1), which is defined directly from item 2 above; and a measure of product innovation identifying new or significantly improved products or services based on item 7. Similar questions were asked in 2004 and 2011, the only difference being that, in 2004, item 2 above was split into two items, namely "introduction or upgrading of computers" and "introduction or upgrading of other types of new technology". We therefore run analyses which combine the two and additional analyses which drop the item "introduction or upgrading of computers" from the 2004 innovation measure. Results using both measures are similar: the results we present here exclude the additional computer item in 2004.

See table 5.5 in appendix B.

Table 5.5 presents the associations between unionisation and the count measure of innovations. In the whole economy the raw correlations between unionisation and innovation are positive and statistically significant, but these generally become non-significant when controlling for observable differences between unionised and non-unionised workplaces. Union density remains negatively associated with the innovation count in 2004 but it is not significant in 2011. Indeed, the only statistically significant effect apparent in 2011 once controls are added is the positive association between recognition with on-site union representation and innovation, though the effect is only apparent in the 'whole economy' analysis and is weakly statistically significant at a 90 per cent confidence level. In the private sector union recognition becomes positively statistically significant in 2011 but, again, only at a 90 per cent confidence level.

See table 5.6 in appendix B.

Focusing in on product or service innovation, Table 5.6 finds no evidence of a significant ceteris paribus union effect in the whole economy, but there is a positive association between union recognition and product innovation in 2011 which appears to be driven by unionised workplaces without on-site union representation. The association holds when controlling for observable differences between union and non-union workplaces, but the association is only statistically significant at a 90 per cent confidence level.

See table 5.7 in appendix B.

Union associations with technological process innovation are largely absent after controlling for observable differences across workplaces, although there does appear to be a positive association between process innovation and workplaces with minority union membership, both in the whole economy and the private sector.

Fringe benefits

In Section Four, the employee-level analyses indicated that unionisation continues to be associated with pay and non-pay benefits for employees. A similar finding emerges based on analyses of the fringe benefits that managerial respondents say their core non-managerial employees receive. We construct a five point additive scale based on managerial responses to the following question: "Looking at this card, are [employees in the largest non-managerial occupational group] entitled to any of these non-pay terms and conditions....employer contributions to a pension scheme; company vehicle or vehicle allowance; private health insurance; more than 28 days of paid annual leave (including public holidays); sick pay in excess of statutory requirements?"

See table 5.8 in appendix B.

In workplaces across the whole economy the fringe benefits score is higher in unionised workplaces compared with observationally equivalent non-unionised workplaces (Table 5.8). The union effect rises with union density and with the union strength index. Furthermore, the union effect has grown between 2004 and 2011. For instance, in 2004 workplaces with a recognised union scored 0.45 points higher on the 0–5 scale than similar non-union workplaces, but by 2011 the differential had grown to 0.55 points (row 1, whole economy). A similar picture emerges for the private sector, with union effects larger where

density is higher and union representatives are present. The coefficient on the union strength index almost doubles between 2004 and 2011.

Off-the-job training

Are the positive associations between unionisation and off-the-job training incidence identified among employees replicated when investigating the same issue using information provided by managerial respondents? We address this issue using responses to two questions asked of HR managers. First "What proportion of experienced [largest non-managerial occupation] have been given time off from their normal daily work duties to undertake training over the past 12 months?" Response codes are ordinal ranging across seven categories from none though to 100 percent. We recode the responses into a (0,7) scale where 7 corresponds to 100 percent.

In the whole economy, higher percentages of core non-managerial employees received off-the-job training in unionised workplaces than in observationally equivalent non-union workplaces in 2004 (Table 5.9). The effect was apparent regardless of whether the union had an on-site union representative. By 2011 the union recognition effect was not significant and neither was the presence of an on-site union representative. However, union density remained positively associated with the proportion of core non-managerial employees receiving training. Furthermore, the positive association with the union strength measure was statistically significant in both 2004 and 2011.

In the private sector the average effect of unionisation, captured in union recognition, became non-significant by 2011 but both union density and the presence of an on-site union representative were strongly and statistically significantly linked to greater access to off-the-job training. The union strength index was positively significantly linked to greater off-the-job training in both years.

See table 5.9 in appendix B.

Managers were also asked "On average, how many days of training did experienced [employees in the largest non-managerial occupational group] undertake over the last 12 months with responses?" with ordinal responses ranging between "None" (code 1) and "10 days or more" (code 6). The results, presented in Table 5.10, indicate no association between unionisation and the duration of training, either in the whole economy or the private sector in either year, once control variables are introduced.

See table 5.10 in appendix B.

Absenteeism

As noted in the literature review, there is surprisingly little evidence on the associations between unionisation and absenteeism. From a theoretical perspective union effects are ambiguous. Where workers feel protected from arbitrary dismissal by unions they may be prepared to take absence when ill, thus reducing 'presenteeism'. This insurance effect may also encourage shirkers to take time off to which they are not entitled. Conversely, if unions help improve working conditions through bargaining or voicing worker concerns this may reduce the causes of absence.

Managers are asked "Over the last 12 months what percentage of work days was lost through employee sickness or absence at this workplace? Please exclude authorised leave of absence, employees away on secondment or courses or days lost through industrial action". Although there is a positive raw correlation between absence rates and various union measures these are no longer apparent when controlling for observable differences between union and non-union workplaces (Table 5.11).

See table 5.11 in appendix B.

Injury and illness rates

Managerial respondents are asked to look at a card identifying seven specific types of injury and a catch all "any other injury leading to unconsciousness or requiring resuscitation or admittance to hospital for more than 24 hours". If there are any injuries they are then asked "During the last 12 months how many employees in all have sustained any of these types of injury?" We express this as a percentage of all employees at the workplace. Injury rates are not associated with unionisation in either 2004 or 2011, a finding that holds for the whole economy and the private sector (Table 5.12).

See 5.12 in appendix B.

Managers are then asked "In the last 12 months, have any employees suffered from any of the following illnesses, disabilities or other physical problems that were caused or made worse by their work?" The card they are asked to look at identifies eight different categories. If they identify any they are then asked "how many employees have been absent owning to these problems over the last 12 months?" We express this as a percentage of employees at the workplace. There is some evidence of a positive association between unionisation and higher illness rates in 2004 for the whole economy, though the effects are only statistically significant at a 90 per cent confidence interval (Table 5.13). Furthermore, the association is not apparent by 2011. Union effects are not apparent in the private sector in either year.

See table 5.13 in appendix B.

Voluntary quit rates

One of the most common findings in the literature is that unionisation reduces the likelihood that employees will quit the workplace voluntarily. The finding may be due to unions' ability to voice and solve problems employees have at work, or reflect the wage and non-wage benefits associated with union jobs which may be denied to them in the non-union sector. Managers are asked how many full-time and part-time employees were on the payroll 12 months previously and "how many of these employees stopped working here because they left or resigned voluntarily?" We use this information to produce a quit rate per 100 employees for the workplace.

See table 5.14 in appendix B.

In the whole economy union recognition continues to be associated with lower quit rates, though the effect diminished between 2004 and 2011 (Table 5.14, row 1). In 2011 the effect is confined to workplaces with an on-site union representative. The same is true in the

private sector. So there appears to be a diminution in unions' ability to prevent voluntary quits over the period.

The climate of employment relations

Managers are asked "how would you rate the relationship between management and employees generally at this workplace?" responding on an ordinal 5-point scale from "very poor" to "very good". We recode responses combining "very poor" and "poor" because few managers give a "very poor" rating so the scale runs from 1 (poor/very poor) to 4 (very good).

See table 5.15 in appendix B.

Despite the positive association between unionisation and industrial action in a small percentage of workplaces, as discussed in the literature review, none of the union measures are associated with the general climate of employment relations in 2004 or 2011, in either the whole economy or private sector, once we have accounted for differences in the observed characteristics of workplaces in the union and non-union sectors.

Section 6
Summary

Union incidence and organisation

There has been a decline in the incidence of union membership and union recognition in Britain in the last few decades. This has taken place in both the private and the public sectors, though the public sector remains much more heavily unionised. The rate of decline has not been uniform everywhere, but there are few industries or occupations which have seen growth in union presence. In the last decade or so, the rate of decline has slowed somewhat.

Employee benefits

Compared to observationally similar employees in the non-union sector, those employees in a unionised setting receive a wage premium, one that in larger where union density is higher and where there is an on-site union representative. Unionised workers are more satisfied with their pay than their non-union comparators. The benefits of unionisation extend to other terms and conditions, such as occupational pensions, and a greater likelihood of receiving on-the-job training. However, the training benefits do not translate into greater satisfaction with the training they receive.

Employer benefits

In general, unionisation is not associated with employer-related outcomes. Unionisation is not associated with workplace performance – whether measured in terms of financial performance, labour productivity, the quality of service or output – and is not linked to absence, injury or illness rates at work. The climate of employment relations is no different in unionised workplaces than it is in similar non-unionised workplaces. The chief exception to this picture is the strong association between unionisation and lower employee quit rates.

Section 7
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Section 8

Appendix A: Summary of the literature review

Introduction

This appendix summarises the main findings of a literature review assessing the current research evidence on the economic impact of workplace union representation. the review focused on quantitative studies that had been conducted on good quality, nationally representative samples of British workplaces or employees, and relied where possible on results from multivariate statistical analyses which controlled for observable differences between union and non-union workplaces or employees. It utilised evidence from qualitative case studies where this served to fill in gaps in the quantitative literature.

It can be noted at the outset that the existing literature contains no robust and comprehensive evaluation of the net benefits from workplace representation. However our summary of the evidence (below) suggested that there is a good, prima facie case for supporting workplace union representation. One way in which employers may do this is through the provision of facility time.

What is the evidence on the provision of facility time?

Some 24 per cent of private sector employees work at a workplace where there are lay representatives from a recognised trade union; the equivalent figure in the public sector is 72 per cent. These figures have been stable over the past decade. Lead representatives in private sector workplaces spend an average of 11 hours per week (paid or unpaid) on their representative duties, whilst those in the public sector spend an average of 15 hours per week. However, this difference is not statistically significant and is mostly accounted for by the larger number of union members in public sector workplaces. Lead reps in the public sector are less likely than reps in the private sector to be paid by their employer for engaging in union duties, but the facilities provided to workplace union representatives in the two sectors are broadly similar.

Unions' impact on pay

Historically, one of the principal benefits for union members in Britain has been the delivery of a wage premium over similar non-members through collective bargaining. The recent evidence indicates that union members in Britain earn around 5 per cent more than equivalent non-members on average; the premium is, however, slightly higher in the public sector than in the private sector. Because unions help to raise the wages of the lowest paid and also encourage the use of more objective criteria in pay setting, wages in unionised jobs are also less widely dispersed; unions have thus historically helped to limit wage inequality.

Unions' impact on employment and hours

If unions raise employees' wages, one may expect negative effects on employment levels and thus job security. However if unions merely raise wages to the level of employees' productivity, or improve levels of workplace efficiency, the effects on employment may be zero or even positive. The research evidence in the 1980s and 1990s indicated that unionised plants in the private and public sectors grew more slowly than non-union plants, and that redundancies were more likely. However, the recent evidence on employment growth (available only for the private sector) shows no differences between union and non-union workplaces. Moreover, unionised workplaces are more likely to have job-security provisions, which imply that redundancies are more likely to be arrived at voluntarily when they do occur.

Research into unions' effects in limiting long-hours working is surprisingly limited, but quantitative research does indicate that unionised employees work fewer hours of unpaid overtime. Union members also enjoy longer paid holiday entitlements.

Unions' impact on the provision of fringe benefits

Research into the impact of unions on the provision of extra-statutory fringe benefits is less extensive than research into union wage effects, and is also a little dated. However, the few studies which have been conducted are consistent in showing that workplaces with recognised unions are more likely to provide extra-statutory sick pay, employer-provided pensions, special paid leave for emergencies and subsidized childcare.

Unions' impact on skills and training

Union Learning Reps (ULRs) positively influence training levels in a significant proportion of cases, with those effects most likely where ULRs spent a substantial amount of time on their role; were supported by a workplace Learning Centre or Union Learning Fund, were valued by managers, and were able to consult or negotiate over training. Although less positive than ULRs themselves, a significant proportion of managers nevertheless say ULRs have a positive effect on training. The most recent study using WERS 2011 finds private sector employees' likelihood of receiving off-the-job training was significantly higher if the workplace has an on-site union representative compared to a like individual in a like workplace without an on-site union representative.

Unions' impact on the work/life balance arrangements

Evidence from the late 1990s showed unionised workplaces to have higher levels of provision of family-friendly practices – notably parental leave, paid family leave, child-care and job sharing – compared with "like" workplaces without unions. Provision of parental and paid family leave rose with union density, suggesting their presence reflects union bargaining power. Unions also increased employee awareness of such practices through information provision, thus facilitating their use. However, the options to work at home or have flexible working hours were less common in a union setting. Further work is required to up-date these analyses in the light of changes in legislation.

Unions' impact on dispute resolution

It has long been argued that union representatives can serve as 'lubricants' in the workplace, facilitating the informal (and formal) resolution of grievances and disciplinary matters. Recent case studies continue to support this proposition, but emphasise that unions' effectiveness in dispute resolution is contingent on the presence of strong and skilled union representation and trusting relationships with managers. Quantitative research, for its part, has shown that disciplinary procedures are more systematic in workplaces with recognised unions, and that dismissals and disciplinary sanctions are less common where union membership density is higher.

Unions' impact on equal opportunities

Union representation and collective bargaining provides one means of promoting equality of opportunity within a firm or workplace through the formulation of centralised standards and procedures for monitoring and evaluation. Quantitative research has shown that workplaces in which unions negotiate, or are consulted, over equal opportunities (EO) issues are more likely to have EO practices in place. Furthermore, small-scale surveys of trade union equality reps and disability champions indicate that their impact on employers' equality practices is greater when such issues are subject to negotiation; their impact also rises with the amount of time spent on the role.

Unions' impact on health, safety and sickness absence

A new study finds union density is positively associated with managerial perceptions of the health and safety risks faced by employees, but union density is not associated with worker control over those risks, suggesting a limited ability for unions to mitigate those risks. However, having on-site worker representatives dealing with health and safety is associated with workers being exposed to lower health and safety risks than workers who rely on direct consultation between management and employees to deal with health and safety matters. Early studies for Britain found either positive or no significant union effects on workplace absence rates but there is no recent evidence on this issue.

Unions' impact on worker wellbeing

Studies often show that unionised workers have lower levels of job satisfaction than non-union workers but, once differences between union and non-union workers are fully accounted for, switching into union coverage is associated with higher satisfaction with pay and hours of work. Recent research also indicates that the job-related anxiety that accompanies organisational change at work is ameliorated when employees work in a unionized workplace and are involved in the introduction of the changes.

Unions' impact on labour turnover

Unions are capable of relaying and helping to resolve concerns employees have at work, resulting in them staying longer than they might have done in the absence of unionisation. This is the essence of "union voice". However, the most recent evidence suggests the effect is confined to workplaces with a union representative on-site, raising questions about the effectiveness of union recognition in the absence of a representative. Non-union forms of voice generally have no effects on voluntary labour turnover but, in one study, have a positive impact.

Unions' impact on innovation and the management of change

Evidence in the 1980s suggested union bargaining over job demarcations were a brake on labour reorganisation, while unions' ability to bargain over the additional surplus created by capital investment discouraged product and process innovation. This has since changed. Many of the craft-based and other job demarcations began to disappear in the 1980s, sometimes with unions winning wage concessions in return. This created the pre-conditions for more flexible working, such as the team working and functional flexibility, such that these high-involvement practices are more likely to be found in union than non-union workplaces today. Workplace and firm-level bargaining in Britain is now positively associated with product innovation. It is also positively associated with the introduction of new technology but not statistically significantly. It seems that early empirical studies suggesting unions may be detrimental to innovation thus offer a misleading picture of union effects today.

Unions' impact on productivity and profitability

There are a multitude of channels by which unions could, in theory, affect productivity, whether measured in terms of sales per employee, value-added, or their quality-adjusted equivalents. The literature has tended to assume that unions' "voice" face can be pro-productive. For instance, it may improve the quality of information managers use to make their decisions. Equally, it is assumed that unions' "monopoly" face used to bargain for higher wages could be detrimental to firm performance, at least measured in terms of profitability. However, union bargaining over higher wages can also be positive for firm productivity since, other things equal, higher wage levels can attract and retain more productive workers, as well as motivating them to work harder. Furthermore, by creating conditions in which workers are less likely to quit, unions may create the conditions for higher employer investments in human capital, which should also lead to higher productivity.

Despite the ambiguity regarding the theoretical effects of unions on productivity and profitability the empirical literature is quite clear. The negative association between unionisation and workplace performance and productivity identified in the 1980s disappeared by the 1990s. This remains the case. The disappearance of the gap is due to an improvement in the relative position of unionised workplaces rather than any deterioration among non-unionised workplaces.

The impact of unions in the aftermath of recession

Although the recession had a profound impact on workers and firms through falling real wages and labour productivity, the impact of recession appears to have been similar, for the most part, in the union and non-union sectors, although the more unionised public sector did suffer greater job losses and workers in the public sector experienced greater job insecurity than those in the private sector. There were, however, two areas in which economic effects differed between the union and non-union sectors. First, private sector unionised workplaces were more likely to close between 2004 and 2011 than similar non-union workplaces. Second, there is some evidence of greater labour intensification in the union sector compared to the non-union sector.

Conclusions

Our review has summarised the current research evidence on the micro-economic impact of workplace union representation, covering a wide range of issues of interest to workers and employers. Such a review provides a useful reference point for discussions around the Trade Union Bill, which would inevitably place some additional restrictions on union activity in the UK. More broadly, however, reviews such as this also provide potentially useful reference points for employees - for whom the economic returns to union membership are a key factor in deciding whether to join (Charlwood, 2002) – and for employers who are largely free to decide whether to encourage or discourage union organisation within the UK's largely-voluntarist system of collective employment relations.

We find that unions still deliver observable benefits to the average union member, in terms of higher wages, more extensive fringe benefits, higher levels of workplace training and the

more effective resolution of individual workplace disputes. At the same time, the negative effects on employers, once a common feature of empirical studies, have largely dissipated in recent years.

There are two important caveats to this conclusion, however. First, it is clear that union effects are heterogeneous, and that a number of the observed effects are confined to workplaces with on-site representatives or high membership density. This contributes to heterogeneity of experience across sectors and types of worker. Second, we focus on the private returns to workers and firms. Unions also have broader potential impacts on society, such as their role in promoting democracy (see, for example Bryson et al., 2014), which are not touched on here.

Table 3.1: Union membership and organisation in Britain, 2004 and 2011

Part A: Workplaces

	Private sector		Whole economy	
	Cell percentages			
	2004	**2011**	**2004**	**2011**
Workplace has recognised unions	13	12	22	22
Workplace union density:				
Zero	81	86	73	78
1-49%	12	11	14	13
50-100%	6	3	13	10
Workplace union rep:				
No recognition	87	88	78	78
Recognition without on-site rep	9	9	15	15
Recognition + on-site rep	4	3	7	7
PT/FT rep of recognised union:				
No on-site rep of recognised union	96	97	93	93
Part-time rep	4	3	7	6
Full-time rep	0	0	1	1
Hours on union duties:				
No on-site rep of recognised union	96	97	93	93
Hours missing	1	1	1	2
0-4 hours	2	2	4	3
5-14 hours	1	0	1	1
15+ hours	0	0	1	1
Union strength index (range 0-6):				
Mean	0.38	0.25	0.72	0.57
Median	0	0	0	0
75th percentile	0	0	0	0
Number of observations (minimum)	*1,660*	*1,801*	*2,203*	*2,522*

Source: WERS Survey of Managers
Base: Workplaces with 5 or more employees

Table 3.1 Part B: Employees

	Private sector		Whole economy	
	Cell percentages			
	2004	**2011**	**2004**	**2011**
Union member	20	19	31	30
Workplace has recognised unions	32	35	48	51
Workplace union density:				
Zero	57	60	44	47
1-49%	28	27	29	30
50-100%	15	13	27	24
Workplace union rep:				
No recognition	68	65	52	49
Recognition without on-site rep	8	7	11	11
Recognition + on-site rep	24	28	36	40
PT/FT rep of recognised union:				
No on-site rep of recognised union	77	73	65	62
Part-time rep	18	20	25	28
Full-time rep	6	7	11	11
Hours on union duties:				
No on-site rep of recognised union	76	72	64	60
Hours missing	2	5	3	7
0-4 hours	8	9	10	11
5-14 hours	6	4	9	7
15+ hours	8	11	14	15
Union strength index (range 0-6):				
Mean	1.04	1.03	1.65	1.58
Median	0	0	0	0
75th percentile	2	2	3	3
Number of observations (minimum)	*14,803*	*13,094*	*21,491*	*20,481*

Source: WERS Survey of Employees
Base: Employees in workplaces with 5 or more employees

Table 3.1 Part C: Number of workplace observations (unweighted)

	Private sector		Whole economy	
	2004	**2011**	**2004**	**2011**
Workplace has recognised unions				
Yes	1,097	1,272	1,133	1,313
No	545	538	1,093	1,308
Workplace union density:				
Zero	948	1,158	968	1,183
1-49%	459	447	643	724
50-100%	253	200	592	626
Workplace union rep:				
No recognition	1,097	1,272	1,133	1,313
Recognition without on-site rep	163	149	324	358
Recognition + on-site rep	382	389	769	950
PT/FT rep of recognised union:				
No on-site rep of recognised union	1,324	1,471	1,527	1,732
Part-time rep	304	299	563	690
Full-time rep	77	84	203	245
Hours on union duties:				
No on-site rep of recognised union	1,260	1,421	1,457	1,671
Hours missing	84	117	140	271
0-4 hours	112	102	211	236
5-14 hours	84	75	163	171
15+ hours	102	95	255	272
Union strength index (range 0-6):				
Index observed	1,660	1,801	2,203	2,522

Source: WERS Survey of Managers
Base: Workplaces with 5 or more employees

Table 4.1: Log of Gross hourly pay (employee level)

	Private sector				Whole economy			
	Raw		Controls		Raw		Controls	
	2004	**2011**	**2004**	**2011**	**2004**	**2011**	**2004**	**2011**
Union member?								
Yes	0.138***	0.073**	0.053***	0.038**	0.193***	0.107***	0.081***	0.065***
Any recognised unions?								
Yes	0.120***	0.128***	0.026	0.049**	0.159***	0.137***	0.023	0.051***
Union density (ref: Zero):								
1-49%	0.017	0.024	-0.025	0.006	0.067**	0.080**	-0.020	0.007
50-100%	0.196***	0.160***	0.066***	0.086***	0.192***	0.105***	0.043**	0.057***
On-site rep (Ref. No recognition):								
Recognition without on-site rep	0.045	0.094	0.010	0.049*	0.099***	0.071	0.018	0.052**
Recognition + on-site rep	0.144***	0.136***	0.034*	0.049**	0.177***	0.155***	0.026	0.050**
Union strength:								
Index (range 0-6)	0.043***	0.032***	0.016***	0.021***	0.045***	0.027***	0.013***	0.018***
Number of observations	*14277*	*12098*	*14259*	*12064*	*20690*	*18843*	*20658*	*18773*

Source: WERS Survey of Employees

Key to statistical significance: *** p<0.01, ** p<0.05, * p<0.1

Controls: Employee level: gender, age, marital status, any dependent children, disability, white ethnicity, highest academic qualification, highest vocational qualification, occupation, hours, tenure, contract type. Workplace-level: workplace employment; single/multi-site organisation; organisation employment; foreign-ownership; industry sector, workplace age, region, largest occupational group (plus private sector dummy for whole economy models).

Table 4.2: Satisfaction with pay – 5 point scale (employee level)

	Private sector				Whole economy			
	Raw		Controls		Raw		Controls	
	2004	**2011**	**2004**	**2011**	**2004**	**2011**	**2004**	**2011**
Union member?								
Yes	-0.182***	-0.024	-0.042	0.041	-0.173****	-0.071**	-0.072***	-0.001
Any recognised unions?								
Yes	-0.150***	0.006	0.016	0.061	-0.169***	-0.031	-0.023	0.087*
Union density (ref: Zero):								
1-49%	-0.151***	-0.110**	-0.042	-0.006	-0.127***	-0.064	-0.025	0.037
50-100%	-0.128***	0.103*	0.108**	0.233***	-0.187***	-0.035	-0.009	0.131**
On-site rep (Ref. No recognition):								
Recognition without on-site rep	-0.150**	-0.041	-0.020	0.024	-0.138***	-0.015	-0.040	0.106**
Recognition + on-site rep	-0.150***	0.017	0.035	0.078	-0.178***	-0.035	-0.014	0.077
Union strength:								
Index (range 0-6)	-0.034***	0.018	0.026**	0.060***	-0.041***	-0.003	0.006	0.041***
Number of observations	*14591*	*12940*	*14572*	*12906*	*21197*	*20223*	*21163*	*20151*

Source: WERS Survey of Employees

Key to statistical significance: *** p<0.01, ** p<0.05, * p<0.1

Controls: Employee level: gender, age, marital status, any dependent children, disability, white ethnicity, highest academic qualification, highest vocational qualification, occupation, hours, tenure, contract type. Workplace-level: workplace employment; single/multi-site organisation; organisation employment; foreign-ownership; industry sector, workplace age, region, largest occupational group (plus private sector dummy for whole economy models).

Table 4.3: Any pension contributions received from employer (employee level)

	Private sector				Whole economy			
	Raw		Controls		Raw		Controls	
	2004	2011	2004	2011	2004	2011	2004	2011
Union member?								
Yes		0.157***		0.053***		0.174***		0.049***
Any recognised unions?								
Yes		0.200***		0.057***		0.220***		0.070***
Union density (ref: Zero):								
1-49%		0.104***		0.032*		0.154***		0.054***
50-100%		0.256***		0.123***		0.243***		0.110***
On-site rep (Ref. No recognition):								
Recognition without on-site rep		0.06		-0.013		0.121***		0.037*
Recognition + on-site rep		0.234***		0.089***		0.247***		0.088***
Union strength:								
Index (range 0-6)		0.057***		0.027***		0.057***		0.025***
Number of observations		*12587*		*12553*		*19729*		*19657*

Source: WERS Survey of Employees

Key to statistical significance: *** p<0.01, ** p<0.05, * p<0.1

Controls: Employee level: gender, age, marital status, any dependent children, disability, white ethnicity, highest academic qualification, highest vocational qualification, occupation, hours, tenure, contract type. Workplace-level: workplace employment; single/multi-site organisation; organisation employment; foreign-ownership; industry sector, workplace age, region, largest occupational group (plus private sector dummy for whole economy models).

Table 4.4: Any off-the-job training in past 12 months (employee level)

	Private sector				Whole economy			
	Raw		Controls		Raw		Controls	
	2004	2011	2004	2011	2004	2011	2004	2011
Union member?								
Yes	0.038**	0.028*	0.039**	0.027*	0.107***	0.055***	0.048***	0.037***
Any recognised unions?								
Yes	0.060***	0.061***	0.024	0.039**	0.126***	0.086***	0.031*	0.050***
Union density (ref: Zero):								
1-49%	0.049**	0.032	0.003	-0.002	0.095***	0.060***	0.021	0.007
50-100%	0.074***	0.063***	0.056**	0.073***	0.140***	0.075***	0.052**	0.057***
On-site rep (Ref. No recognition):								
Recognition without on-site rep	0.102***	0.055	0.042*	0.005	0.155***	0.081***	0.047**	0.034
Recognition + on-site rep	0.046**	0.062***	0.015	0.054**	0.117***	0.087***	0.023	0.058***
Union strength:								
Index (range 0-6)	0.015***	0.013***	0.009*	0.016***	0.030***	0.017***	0.009**	0.016***
Number of observations	*14671*	*12962*	*14652*	*12928*	*21330*	*20299*	*21296*	*20226*

Source: WERS Survey of Employees

Key to statistical significance: *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Controls: Employee level: gender, age, marital status, any dependent children, disability, white ethnicity, highest academic qualification, highest vocational qualification, occupation, hours, tenure, contract type. Workplace-level: workplace employment; single/multi-site organisation; organisation employment; foreign-ownership; industry sector, workplace age, region, largest occupational group (plus private sector dummy for whole economy models).

Table 4.5: Five or more days of off-the-job training in past 12 months (employee level)

	Private sector				Whole economy			
	Raw		Controls		Raw		Controls	
	2004	2011	2004	2011	2004	2011	2004	2011
Union member?								
Yes	0.018*	0.007	0.009	0.008	0.053***	0.017**	0.023***	0.017**
Any recognised unions?								
Yes	0.027***	0.035***	0.009	0.021	0.054***	0.032***	0.013	0.025*
Union density (ref: Zero):								
1-49%	0.008	0.033**	-0.015	0.024	0.033***	0.028**	0.001	0.021
50-100%	0.029**	0.041***	0.002	0.052***	0.058***	0.041***	0.012	0.049***
On-site rep (Ref. No recognition):								
Recognition without on-site rep	0.048**	0.055	0.030	0.032	0.071***	0.042**	0.032**	0.034*
Recognition + on-site rep	0.021*	0.030**	-0.002	0.016	0.049***	0.030***	0.003	0.020
Union strength:								
Index (range 0-6)	0.006**	0.008**	0.000	0.010***	0.013***	0.008***	0.002	0.010***
Number of observations	*14671*	*12962*	*14652*	*12928*	*21330*	*20299*	*21296*	*20226*

Source: WERS Survey of Employees

Key to statistical significance: *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Controls: Employee level: gender, age, marital status, any dependent children, disability, white ethnicity, highest academic qualification, highest vocational qualification, occupation, hours, tenure, contract type. Workplace-level: workplace employment; single/multi-site organisation; organisation employment; foreign-ownership; industry sector, workplace age, region, largest occupational group (plus private sector dummy for whole economy models).

Table 4.6: Satisfaction with training – five point scale (employee level)

	Private sector				Whole economy			
	Raw		Controls		Raw		Controls	
	2004	**2011**	**2004**	**2011**	**2004**	**2011**	**2004**	**2011**
Union member?								
Yes	-0.149***	-0.047	-0.054	0.020	-0.114***	-0.085***	-0.064**	-0.011
Any recognised unions?								
Yes	-0.164***	-0.077**	-0.037	-0.025	-0.109***	-0.088***	-0.038	-0.021
Union density (ref: Zero):								
1-49%	-0.111***	-0.033	-0.036	-0.020	-0.062*	-0.036	-0.008	-0.003
50-100%	-0.179***	-0.091*	-0.014	0.062	-0.134***	-0.115***	-0.037	0.002
On-site rep (Ref. No recognition):								
Recognition without on-site rep	0.041	0.024	0.054	-0.008	0.022	0.037	0.011	0.020
Recognition + on-site rep	-0.227***	-0.101**	-0.083*	-0.034	-0.149***	-0.122***	-0.066	-0.043
Union strength:								
Index (range 0-6)	-0.052***	-0.023**	-0.013	0.010	-0.035***	-0.029***	-0.016	-0.002
Number of observations	*14467*	*12865*	*14448*	*12831*	*21052*	*20118*	*21018*	*20046*

Source: WERS Survey of Employees

Key to statistical significance: *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Controls: Employee level: gender, age, marital status, any dependent children, disability, white ethnicity, highest academic qualification, highest vocational qualification, occupation, hours, tenure, contract type. Workplace-level: workplace employment; single/multi-site organisation; organisation employment; foreign-ownership, industry sector, workplace age, region, largest occupational group (plus private sector dummy for whole economy models).

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Table 5.1: Labour Productivity – Subjective Rating Scale (1-4)

	Private sector				Whole economy			
	Raw		Controls		Raw		Controls	
	2004	**2011**	**2004**	**2011**	**2004**	**2011**	**2004**	**2011**
Any recognised unions?								
Yes	-0.346	-0.017	-0.237	-0.13	0.156	0.246	-0.133	0.011
Union density (ref: Zero):								
1-49%	-0.062	0.188	0.115	-0.026	0.052	0.292	0.056	0.063
50-100%	0.250	-0.063	0.451	-0.042	0.429*	0.199	0.242	-0.107
On-site rep (Ref. No recognition):								
Recognition without on-site rep	-0.245	-0.104	-0.140	-0.284	0.189	0.209	-0.130	-0.031
Recognition + on-site rep	-0.574***	0.227	-0.452*	0.365	0.091	0.325*	-0.140	0.153
Union strength:								
Index (range 0-6)	-0.011	-0.003	0.042	-0.001	0.068	0.058	0.006	-0.006
Number of observations	*1660*	*1801*	*1659*	*1798*	*2203*	*2522*	*2200*	*2512*

Source: WERS Survey of Managers

Key to statistical significance: *** p<0.01, ** p<0.05, * p<0.1

Controls: workplace employment; single/multi-site organisation; organisation employment; foreign-ownership; industry sector, workplace age, region, largest occupational group (plus private sector dummy for whole economy models).

Table 5.2: Product/Service Quality – Subjective Rating Scale (1-4)

	Private sector				Whole economy			
	Raw		Controls		Raw		Controls	
	2004	2011	2004	2011	2004	2011	2004	2011
Any recognised unions?								
Yes	-0.362***	-0.074	-0.315**	0.007	-0.113	0.110	-0.195	0.072
Union density (ref: Zero):								
1-49%	0.149	0.037	0.295*	0.076	0.062	0.105	0.160	0.124
50-100%	0.235	0.110	0.516	0.143	0.127	0.195	0.267	0.080
On-site rep (Ref. No recognition):								
Recognition without on-site rep	-0.400***	-0.147	-0.371**	-0.067	-0.134	0.089	-0.214	0.069
Recognition + on-site rep	-0.277**	0.128	-0.191	0.243	-0.072	0.155	-0.150	0.084
Union strength:								
Index (range 0-6)	-0.011	0.029	0.047	0.059	-0.008	0.051	-0.012	0.04
Number of observations	*1660*	*1801*	*1659*	*1798*	*2203*	*2522*	*2200*	*2512*

Source: WERS Survey of Managers

Key to statistical significance: *** p<0.01, ** p<0.05, * p<0.1

Controls: workplace employment; single/multi-site organisation; organisation employment; foreign-ownership; industry sector, workplace age, region, largest occupational group (plus private sector dummy for whole economy models).

Table 5.3: Financial Performance – Subjective Rating Scale (1-4)

	Private sector				Whole economy			
	Raw		Controls		Raw		Controls	
	2004	**2011**	**2004**	**2011**	**2004**	**2011**	**2004**	**2011**
Any recognised unions?								
Yes	-0.422**	0.246	-0.510**	0.039	0.027	0.456***	-0.306	0.103
Union density (ref: Zero):								
1-49%	-0.045	0.074	-0.063	-0.260*	-0.027	0.268	-0.171	-0.102
50-100%	0.039	0.164	0.060	0.009	0.278	0.387**	0.054	-0.148
On-site rep (Ref. No recognition):								
Recognition without on-site rep	-0.406*	0.195	-0.456*	-0.035	-0.028	0.427*	-0.347	0.075
Recognition + on-site rep	-0.458**	0.389*	-0.630***	0.274	0.136	0.516***	-0.206	0.197
Union strength:								
Index (range 0-6)	-0.042	0.068	-0.044	0.025	0.04	0.109***	-0.017	-0.006
Number of observations	*1660*	*1801*	*1659*	*1798*	*2203*	*2522*	*2200*	*2512*

Source: WERS Survey of Managers

Key to statistical significance: *** p<0.01, ** p<0.05, * p<0.1

Controls: workplace employment; single/multi-site organisation; organisation employment; foreign-ownership; industry sector, workplace age, region, largest occupational group (plus private sector dummy for whole economy models).

Table 5.4: Workplace Performance – Additive Scale (0-9)

| | Private sector | | | | Whole economy | | | |
| | Raw | | Controls | | Raw | | Controls | |
	2004	2011	2004	2011	2004	2011	2004	2011
Any recognised unions?								
Yes	-0.458***	-0.066	-0.318	0.073	-0.530***	-0.149	-0.392**	0.158
Union density (ref: Zero):								
1-49%	-0.048	-0.053	0.029	0.037	-0.132	0.016	-0.095	0.178
50-100%	-0.325	0.244	-0.299	0.199	-0.525***	-0.26	-0.332	-0.101
On-site rep (Ref. No recognition):								
Recognition without on-site rep	-0.344*	-0.08	-0.189	0.121	-0.531***	-0.119	-0.426**	0.214
Recognition + on-site rep	-0.711***	-0.025	-0.592**	-0.095	-0.528***	-0.217	-0.309	-0.053
Union strength:								
Index (range 0-6)	-0.110**	0.027	-0.101	0.05	-0.132***	-0.062*	-0.082	-0.007
Number of observations	*1434*	*1623*	*1433*	*1620*	*1849*	*2221*	*1846*	*2213*

Source: WERS Survey of Managers
Key to statistical significance: *** p<0.01, ** p<0.05, * p<0.1

Controls: workplace employment; single/multi-site organisation; organisation employment; foreign-ownership; industry sector, workplace age, region, largest occupational group (plus private sector dummy for whole economy models).

Table 5.5: Number of Innovations Made in Past Two Years – Count Variable (O-7 excluding computers)

	Private sector				Whole economy			
	Raw		Controls		Raw		Controls	
	2004	**2011**	**2004**	**2011**	**2004**	**2011**	**2004**	**2011**
Any recognised unions?								
Yes	0.846***	0.560***	-0.013	0.369*	0.772***	0.409***	-0.171	0.263
Union density (ref: Zero):								
1-49%	0.353*	0.501**	-0.378**	0.222	0.420**	0.485***	-0.419**	0.28
50-100%	0.664**	0.747***	-0.335	0.268	0.715***	0.513***	-0.537**	0.295
On-site rep (Ref. No recognition):								
Recognition without on-site rep	0.805***	0.397	0.012	0.38	0.596***	0.193	-0.197	0.223
Recognition + on-site rep	0.941***	1.022***	-0.069	0.334	1.123***	0.871***	-0.108	0.400*
Union strength:								
Index (range 0-6)	0.214***	0.211***	-0.033	0.091	0.213***	0.135***	-0.053	0.073
Number of observations	*1653*	*1788*	*1652*	*1785*	*2189*	*2500*	*2186*	*2490*

Source: WERS Survey of Managers

Key to statistical significance: *** p<0.01, ** p<0.05, * p<0.1

Controls: workplace employment; single/multi-site organisation; organisation employment; foreign-ownership, industry sector, workplace age, region, largest occupational group (plus private sector dummy for whole economy models).

Table 5.6: Any Product or Service Innovation in Past Two Years

	Private sector				Whole economy			
	Raw		Controls		Raw		Controls	
	2004	2011	2004	2011	2004	2011	2004	2011
Any recognised unions?								
Yes	0.155***	0.145**	-0.018	0.114*	0.071**	0.059	-0.062	0.087
Union density (ref: Zero):								
1-49%	0.019	0.107	-0.065	0.054	0.015	0.072	-0.068	0.051
50-100%	0.198***	0.061	0.015	-0.021	0.086**	0.037	-0.045	0.034
On-site rep (Ref. No recognition):								
Recognition without on-site rep	0.152**	0.154*	-0.031	0.144*	0.047	0.05	-0.08	0.099
Recognition + on-site rep	0.161**	0.118**	0.012	0.019	0.118***	0.077**	-0.019	0.047
Union strength:								
Index (range 0-6)	0.047***	0.029*	0.001	0.008	0.023**	0.011	-0.006	0.009
Number of observations	*1653*	*1788*	*1652*	*1785*	*2189*	*2500*	*2186*	*2490*

Source: WERS Survey of Managers

Key to statistical significance: *** p<0.01, ** p<0.05, * p<0.1

Controls: workplace employment; single/multi-site organisation; organisation employment; foreign-ownership; industry sector, workplace age, region, largest occupational group (plus private sector dummy for whole economy models).

Table 5.7: Any New Technology Introduced in Past Two Years

	Private sector				Whole economy			
	Raw		Controls		Raw		Controls	
	2004	**2011**	**2004**	**2011**	**2004**	**2011**	**2004**	**2011**
Any recognised unions?								
Yes	0.107**	0.076	-0.065	0.051	0.085**	0.019	-0.088	0.019
Union density (ref: Zero):								
1-49%	0.076	0.164***	-0.058	0.111*	0.067	0.126**	-0.075	0.104*
50-100%	0.041	0.146*	-0.148**	0.098	0.075*	0.06	-0.134**	0.092
On-site rep (Ref. No recognition):								
Recognition without on-site rep	0.093	0.07	-0.051	0.071	0.054	0.001	-0.085	0.03
Recognition + on-site rep	0.141**	0.092	-0.098	-0.015	0.148***	0.056	-0.097	-0.017
Union strength:								
Index (range 0-6)	0.024	0.035**	-0.029*	0.02	0.025**	0.011	-0.025	0.009
Number of observations	*1660*	*1801*	*1659*	*1798*	*2203*	*2522*	*2200*	*2512*

Source: WERS Survey of Managers

Key to statistical significance: *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Controls: workplace employment; single/multi-site organisation; organisation employment; foreign-ownership; industry sector, workplace age, region, largest occupational group (plus private sector dummy for whole economy models).

Table 5.8: Number of Fringe Benefits Available to Largest Occupational Group – Count Variable (0-5)

	Private sector				Whole economy			
	Raw		Controls		Raw		Controls	
	2004	**2011**	**2004**	**2011**	**2004**	**2011**	**2004**	**2011**
Any recognised unions?								
Yes	1.410***	1.116***	0.484***	0.588***	1.265***	1.189***	0.447***	0.546***
Union density (ref: Zero):								
1-49%	0.708***	0.839***	0.159	0.399**	0.710***	0.877***	0.124	0.420***
50-100%	1.344***	1.360***	0.284**	0.751***	1.265***	1.310***	0.294**	0.598***
On-site rep (Ref. No recognition):								
Recognition without on-site rep	1.393***	0.959***	0.477***	0.526***	1.241***	1.076***	0.473***	0.539***
Recognition + on-site rep	1.449***	1.557***	0.501***	0.785***	1.313***	1.429***	0.385***	0.572***
Union strength:								
Index (range 0-6)	0.383***	0.391***	0.117***	0.208***	0.325***	0.337***	0.096***	0.146***
Number of observations	*1657*	*1799*	*1657*	*1796*	*2199*	*2517*	*2198*	*2507*

Source: WERS Survey of Managers

Key to statistical significance: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Controls: workplace employment; single/multi-site organisation; organisation employment; foreign-ownership, industry sector, workplace age, region, largest occupational group (plus private sector dummy for whole economy models).

Table 5.9: Percentage of Largest Occupational Group Receiving Off-The-Job Training in Past 12 Months – Seven-Point Ordered Scale

	Private sector				Whole economy			
	Raw		Controls		Raw		Controls	
	2004	2011	2004	2011	2004	2011	2004	2011
Any recognised unions?								
Yes	1.751***	0.981***	0.566**	0.287	1.747***	1.097***	0.440**	0.207
Union density (ref: Zero):								
1-49%	1.054***	1.431***	0.102	0.694***	1.165***	1.495***	0.067	0.800***
50-100%	1.592***	1.742***	0.263	0.827***	1.779***	1.478***	0.211	0.755***
On-site rep (Ref. No recognition):								
Recognition without on-site rep	1.895***	0.789**	0.633**	0.178	1.739***	0.936***	0.451*	0.147
Recognition + on-site rep	1.417***	1.492***	0.415	0.631**	1.764***	1.424***	0.411*	0.408
Union strength:								
Index (range 0-6)	0.465***	0.438***	0.149**	0.167**	0.457***	0.351***	0.100*	0.122*
Number of observations	*1640*	*1785*	*1640*	*1783*	*2164*	*2492*	*2163*	*2483*

Source: WERS Survey of Managers

Key to statistical significance: *** p<0.01, ** p<0.05, * p<0.1

Controls: workplace employment; single/multi-site organisation; organisation employment; foreign-ownership; industry sector, workplace age, region, largest occupational group (plus private sector dummy for whole economy models).

Table 5.10: Number of Days of Off-The-Job Training Received by Largest Occupational Group – Six-Point Ordered Scale

| | Private sector | | | | Whole economy | | | |
| | Raw | | Controls | | Raw | | Controls | |
	2004	2011	2004	2011	2004	2011	2004	2011
Any recognised unions?								
Yes	0.792***	0.549***	0.113	0.214	0.892***	0.621***	0.013	0.156
Union density (ref: Zero):								
1-49%	0.545***	0.708***	-0.083	0.332*	0.649***	0.701***	-0.071	0.299*
50-100%	0.738***	0.727***	-0.091	0.182	0.936***	0.743***	-0.092	0.226
On-site rep (Ref. No recognition):								
Recognition without on-site rep	0.814***	0.512**	0.087	0.202	0.850***	0.540***	-0.011	0.127
Recognition + on-site rep	0.740***	0.647***	0.17	0.254	0.974***	0.784***	0.07	0.252
Union strength:								
Index (range 0-6)	0.213***	0.195***	0.019	0.046	0.241***	0.182***	0.006	0.044
Number of observations	*1612*	*1750*	*1612*	*1747*	*2114*	*2420*	*2113*	*2412*

Source: WERS Survey of Managers

Key to statistical significance: *** p<0.01, ** p<0.05, * p<0.1

Controls: workplace employment; single/multi-site organisation; organisation employment; foreign-ownership; industry sector, workplace age, region, largest occupational group (plus private sector dummy for whole economy models).

Table 5.11: Log of absence rate

	Private sector				Whole economy			
	Raw		Controls		Raw		Controls	
	2004	**2011**	**2004**	**2011**	**2004**	**2011**	**2004**	**2011**
Any recognised unions?								
Yes	0.016**	0.010	0.003	0.008	0.020***	0.012**	0.005	0.007
Union density (ref: Zero):								
1-49%	0.014*	0.011*	0.004	0.008	0.009	0.010*	-0.002	0.006
50-100%	0.004	0.011	-0.015	0.008	0.021***	0.015**	0.000	0.011
On-site rep (Ref. No recognition):								
Recognition without on-site rep	0.016	0.007	0.000	0.008	0.018**	0.008	0.002	0.007
Recognition + on-site rep	0.018**	0.016**	0.009	0.007	0.025***	0.018***	0.012	0.008
Union strength:								
Index (range 0-6)	0.004*	0.005	-0.001	0.004	0.006***	0.004**	0.002	0.004
Number of observations	*1384*	*1553*	*1383*	*1551*	*1820*	*2149*	*1817*	*2142*

Source: WERS Survey of Managers

Key to statistical significance: *** p<0.01, ** p<0.05, * p<0.1

Controls: workplace employment; single/multi-site organisation; organisation employment; foreign-ownership, industry sector, workplace age, region, largest occupational group (plus private sector dummy for whole economy models).

Table 5.12: Injury Rate per 100 Employees in Last 12 Months

	Private sector				Whole economy			
	Raw		Controls		Raw		Controls	
	2004	**2011**	**2004**	**2011**	**2004**	**2011**	**2004**	**2011**
Any recognised unions?								
Yes	0.561	-0.269	0.735	-0.174	0.276	-0.263*	0.544	-0.192
Union density (ref: Zero):								
1-49%	0.678	-0.101	0.623	-0.033	0.462	-0.061	0.394	0.032
50-100%	-0.089	0.229	0.118	0.255	0.022	-0.079	0.218	0.006
On-site rep (Ref. No recognition):								
Recognition without on-site rep	0.85	-0.307	1.144	-0.228	0.377	-0.316*	0.720	-0.223
Recognition + on-site rep	-0.094	-0.163	-0.176	0.001	0.076	-0.152	0.121	-0.089
Union strength:								
Index (range 0-6)	0.062	-0.020	0.102	0.014	0.027	-0.042	0.080	-0.036
Number of observations	*1660*	*1801*	*1659*	*1798*	*2203*	*2522*	*2200*	*2512*

Source: WERS Survey of Managers

Key to statistical significance: *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Controls: workplace employment; single/multi-site organisation; organisation employment; foreign-ownership; industry sector, workplace age, region, largest occupational group (plus private sector dummy for whole economy models).

Table 5.13: Illness Rate per 100 Employees in Last 12 Months

	Private sector				Whole economy			
	Raw		Controls		Raw		Controls	
	2004	**2011**	**2004**	**2011**	**2004**	**2011**	**2004**	**2011**
Any recognised unions?								
Yes	2.834*	1.27	1.923	1.481	2.858***	1.663**	1.852*	1.090
Union density (ref: Zero):								
1-49%	3.488**	0.573	2.948**	-0.274	3.220**	0.637	2.385*	0.029
50-100%	1.576	-0.177	-0.201	-0.696	2.438***	2.123**	0.726	0.649
On-site rep (Ref. No recognition):								
Recognition without on-site rep	3.47	1.805	2.423	1.889	3.281**	1.669*	2.099*	1.082
Recognition + on-site rep	1.392	-0.229	0.807	0.172	2.015**	1.651**	1.259	1.115
Union strength:								
Index (range 0-6)	0.612*	0.161	0.090	0.096	0.700***	0.554***	0.224	0.316
Number of observations	*1660*	*1801*	*1659*	*1798*	*2203*	*2522*	*2200*	*2512*

Source: WERS Survey of Managers

Key to statistical significance: *** p<0.01, ** p<0.05, * p<0.1

Controls: workplace employment; single/multi-site organisation; organisation employment; foreign-ownership; industry sector, workplace age, region, largest occupational group (plus private sector dummy for whole economy models).

Table 5.14: Voluntary Quits per 100 Employees

	Private sector				Whole economy			
	Raw		Controls		Raw		Controls	
	2004	**2011**	**2004**	**2011**	**2004**	**2011**	**2004**	**2011**
Any recognised unions?								
Yes	-4.958**	-2.827**	-7.821***	-3.580**	-7.840***	-4.685***	-7.088****	-2.903*
Union density (ref: Zero):								
1-49%	-3.066	2.076	-3.465*	2.621	-4.468***	-0.143	-3.928**	1.865
50-100%	-8.880***	-3.807	-10.022***	-2.869	-10.999****	-6.069***	-9.017***	-1.053
On-site rep (Ref. No recognition):								
Recognition without on-site rep	-3.374	-1.82	-6.429**	-2.637	-7.053***	-3.789***	-6.554***	-2.518
Recognition + on-site rep	-8.670***	-5.763***	-10.987***	-6.668****	-9.472***	-6.617***	-8.403***	-4.228***
Union strength:								
Index (range 0-6)	-2.099***	-1.235***	-2.822***	-1.357***	-2.555***	-1.616***	-2.348***	-0.927**
Number of observations	*1558*	*1705*	*1557*	*1702*	*2047*	*2361*	*2044*	*2353*

Source: WERS Survey of Managers

Key to statistical significance: *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Controls: workplace employment; single/multi-site organisation; organisation employment; foreign-ownership; industry sector, workplace age, region, largest occupational group (plus private sector dummy for whole economy models).

Table 5.15: Climate of Employment Relations – Subjective Rating Scale (0-4)

	Private sector				Whole economy			
	Raw		Controls		Raw		Controls	
	2004	**2011**	**2004**	**2011**	**2004**	**2011**	**2004**	**2011**
Any recognised unions?								
Yes	-0.126*	-0.091	-0.069	0.051	-0.139***	-0.119***	-0.099	0.062
Union density (ref: Zero):								
1-49%	-0.163**	-0.141**	-0.048	-0.016	-0.121*	-0.141**	-0.037	-0.016
50-100%	-0.019	-0.199**	0.020	-0.068	-0.109*	-0.164***	-0.056	-0.029
On-site rep (Ref. No recognition):								
Recognition without on-site rep	-0.010	-0.01	-0.008	0.088	-0.095	-0.05	-0.096	0.082
Recognition + on-site rep	-0.391***	-0.317***	-0.205	-0.07	-0.227***	-0.263***	-0.105	-0.009
Union strength:								
Index (range 0-6)	-0.026	-0.041**	-0.010	0.006	-0.028**	-0.041***	-0.007	0.004
Number of observations	*1652*	*1800*	*1651*	*1797*	*2188*	*2517*	*2185*	*2507*

Source: WERS Survey of Managers

Key to statistical significance: *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Controls: workplace employment; single/multi-site organisation; organisation employment; foreign-ownership; industry sector, workplace age, region, largest occupational group (plus private sector dummy for whole economy models).