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**Unions and Workplace Performance
in Britain and France**

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Abstract

Using nationally representative workplace surveys we examine the relationship between unionization and workplace financial performance in Britain and France. We find that union bargaining is detrimental to workplace performance in Britain and that this effect is larger when unionization is endogenized. In France, union bargaining is associated with poorer workplace performance but the effect disappears once unionization is treated as endogenous. However, high levels of union density do have a negative impact on workplace performance in France. In Britain the union effect does not rise with union density.

Key words: Trade union; firm performance; France; Britain
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1. INTRODUCTION

In theory, unions have countervailing influences on firm performance. If they are successful in bargaining for above-market wages or in capturing quasi-rents (for example, through restrictive practices that reduce labour productivity) unions will reduce firm profitability, other things equal. On the other hand unions can enhance firm performance through voice effects which can raise labour productivity and improve managerial decision-making (Freeman and Medoff, 1984), or by acting as an agent for the employer in monitoring workers, or in assisting with organizational change (Vroman, 1990). The empirical literature indicates that the negative effects prevail. However, this evidence is almost exclusively Anglo-American (Metcalf, 2003). It is unclear whether this empirical regularity extends to other countries. This paper addresses this issue by investigating union effects in Britain and France using comparable workplace-level data.

Britain and France are advanced industrialised West European economies of comparable scale. However, their employment relations systems vary in ways that imply rather different union effects on firm profitability. Private sector union density is around three times higher in Britain than it is in France. But the hurdles that employees have to jump in order to trigger union representation at the workplace and workplace-level collective bargaining are much lower in France than they are in Britain. In France, a worker simply needs endorsement from the national union in order to serve as a lay union representative in her workplace. Employers are legally obliged to negotiate in good faith with such representatives, irrespective of whether there are other union members on-site, and the resulting agreements apply to all workers. Organization-level or workplace-level bargaining often take place alongside sectoral or national bargaining which is very widespread. As a consequence, the vast majority of French workers have their pay set via collective bargaining, whether or not they are union members. In contrast, it is difficult for British workers to achieve collective bargaining coverage, even if a union has support among the workforce, since the extent of involvement and degree of influence of the union is more heavily determined by the employer. A statutory procedure giving bargaining rights to workers where a majority of workers want them has rarely been called upon since it was introduced in 1999.

These institutional differences imply different union effects on firm performance in Britain and France. We address this issue by conducting directly comparable analyses of the associations between unions and workplace performance in Britain and France using data from two equivalent surveys conducted in 2004: the British Workplace Employment Relations Survey (WERS) and the French *Relations Professionnelles et Négociations d'Entreprises* (REPONSE). We undertake directly comparable analyses to draw inferences about the role of unions in the differing institutional contexts.

The remainder of the paper is organised as follows. Section 2 describes employment relations in Britain and France, pointing to the institutional differences as they relate to unionisation. Section 3 outlines the theory linking unions to performance, and hypothesises about the different effects unions will have in Britain and France. Section 4 presents the data and estimation approach. Section 5 presents results and Section 6 concludes.

2. UNIONISATION IN BRITAIN AND FRANCE

Britain has a largely voluntarist system of workplace union representation and collective bargaining. Although the 1999 Employment Relations Act introduced a statutory union recognition procedure, granting negotiating rights to unions in firms where they had majority worker support, the procedure is intended as a last resort and has rarely been invoked (Gall, 2004; Kersley et al, 2006). In practice, there are thus no requirements for employers to recognise unions for the purpose of collective bargaining and no stipulations over the scope of bargaining. Instead, the degree of employee support for workplace union representation is key. Over the last two decades there has been a reduction in the extent of union involvement in workplace regulation (Millward et al, 2000). Although governments have been more supportive of their role in the last decade, employee perceptions of union effectiveness have remained unchanged (Bryson, 2007a). Union membership density and union recognition for collective bargaining have both fallen by around a half since the mid-1980s, with just 16 per cent of private sector employees now belonging to unions and 20 per cent having their pay set by a collective agreement (Mercer and Notley, 2008). Unions are typically involved in workplace regulation only where traditions remain sufficiently strong among employees and market conditions facing the employer remain sufficiently benign. Even then, the scope of bargaining tends to be limited to core terms and conditions, such as pay, hours and holidays. Few industries retain national or sectoral pay bargaining so that, where bargaining occurs, it typically takes place at organisation or workplace level (Kersley et al., 2006).

The institutional setting in France is quite different. Union density has been decreasing among private sector employees in France for decades and currently stands at around 5 per cent. Yet sectoral-level national bargaining is common. Furthermore, provided the firm has at least 50 employees, French legislation allows any of the five national union confederations (CGT, CFDT, CGT-FO, CFTC and CGC) to designate a representative at workplace or company-level with whom the employer must negotiate once a year over specific terms and conditions including pay, working time, pensions and training. (In firms with fewer than 50 employees only elected worker representatives can serve as union delegates but, subject to this restriction, they have the same rights to bargain with the employer). Any collective agreement that results from these negotiations automatically applies to all employees in the firm, even if very few employees belong to or support the union. Until 2004, this workplace union representative did not require the support of the establishment's workforce in order to take up the role. The *Loi Fillon* passed in 4th May 2004 replaced this rule of 'presumed representativeness' with another stating that agreements can henceforth be signed only with unions representing a majority of employees in the firm.

There are three consequences arising from these differing legislative frameworks. First, workplace- or organization-level collective bargaining is much more common in France than in Britain: this seems to be the case whether the workplace is covered by the legislation or not. Thus in 2004, 52% of French private sector workplaces with 20 or more employees had workplace or organization-level collective bargaining, compared to 9% in Britain. Among private sector workplaces in organizations with 50 or more employees the figures were 73% for France and 17% for Britain. Second – at least until the passing of the *Loi Fillon* – French unions could obtain negotiating rights at workplace or organisation level even in the absence of widespread union membership among the workforce. In 2004, union density was below 20 per

cent in over four-fifths (86 per cent) of French workplaces with 20 or more employees in which unions had negotiating rights. In Britain, on the other hand, union density was below 20 per cent in only one quarter (27 per cent) of workplaces with recognised unions. Third, despite the low level of union density in France, more than 90 per cent of employees are covered by national or company-level agreements – over four times higher than in Britain. Coverage often entails coverage by both a national bargaining agreement and a workplace or organisation level agreement, something that is uncommon in Britain (Brown et al, 2008) but often occurs in Continental Europe (Bryson, 2007b).

3. THEORY AND EVIDENCE ON UNIONS' EFFECTS ON FIRM PROFITABILITY

One of the most well established effects of unions is their ability to increase wages above competitive levels (Lewis, 1986; Booth, 1995). Other things equal, this will have a detrimental impact on firm profits unless the firm is able to pass on the cost increase to customers in the form of higher prices. The size of the union's impact on financial performance depends on the scale of potential rents, which is related to the market structure facing the firm, and also on the bargaining power of the union. Rent-sharing with unions appears most likely where firms have surplus rents, as may occur where the product market is less competitive, and where unions have substantial bargaining power due to their ability to mobilize workers in pursuit of wage grievances (Hirsch and Addison, 1986). Unions may indirectly reduce profitability if their rent-extraction reduces shareholders' desire to invest in new capital (Grout, 1984).

Unions may also have a positive impact on firm performance. Freeman and Medoff's (1984) collective voice and institutional response model draws on the exit-voice dichotomy of Hirschman (1970). In a workplace context "voluntary quits become the labor market expression of exit and unions become the institution for the expression of (collective) voice" (Turnbull, 1991: 137). By providing workers with a means of expressing discontent at the workplace, unions can reduce quits and absenteeism; this may benefit the workplace since high labour turnover can reduce productivity through a direct loss of firm-specific training (Addison and Barnett, 1982). Unions can also enhance productivity by improving communication between workers and management (Freeman and Medoff, 1984). The opening of communication channels between management and workers can result in integrative rather than distributive bargaining. Unions may provide additional information to a firm about the preferences of employees, thus permitting the firm to choose a better mix among working conditions, workplace rules and wage levels. These can result in a more satisfied, cooperative and productive workforce. In addition, unions may be responsible for a 'shock effect' whereby unions induce managers to alter methods of production and adopt more efficient personnel policies.

Theoretical predictions about union effects on firm performance are thus ambiguous. However, empirical evidence points to a negative effect of unions on profitability (Addison and Hirsch, 1989; Metcalf, 2003; Doucouliagos and Laroche, 2009). This arises because, in general, unions are successful in extracting a union wage premium whereas their effects on productivity tend to be zero or negative (Hirsch, 2003). There are some important caveats to these empirical findings, however. First, union effects differ over time. For example, Blanchflower and Bryson (2008) find unions' negative effects on firm financial performance diminished over the last quarter century. Second, the evidence is almost exclusively Anglo-American. It is unclear

whether this empirical regularity extends to other countries. The only study for France, for instance, finds no association between union presence and firm financial performance even in establishments facing few or no competitors in their main product market (Laroche, 2004). It is unclear whether one can extrapolate from this single study. However, other recent comparative studies of union effects point to the importance of the institutional environment in explaining differences in union effects across countries.¹

How might we expect the institutional differences to influence union effects on firm profitability in Britain and France?

Our first hypothesis is that union bargaining will be detrimental to workplace performance in both Britain and France since employers in both countries are restricted to some degree in their ability to resist unionisation and thus protect profits. In France, the restriction is primarily legislative in origin; in Britain it derives from a union being able to demonstrate substantial support among the workforce.

Our second hypothesis is that any negative effect of union bargaining on performance may be more apparent in Britain than in France. There are two justifications for this hypothesis. First, the costs of organizing are greater in Britain than they are in France. This implies that the incentive needed to encourage employees to shoulder these costs needs to be greater in Britain than in France. One might therefore expect to observe a larger union wage premium in Britain, an expectation confirmed by Blanchflower and Bryson (2003). Assuming no substantial union-induced productivity differential across the two countries this larger union wage premium in Britain should translate into a greater negative impact on performance in Britain compared with France. Second, since national and sectoral bargaining are so widespread in France few firms are untouched by union pay bargaining, even if they have no on-site union. Consequently, collectively bargained outcomes are liable to affect most French firms similarly. Britain, on the other hand, has fragmented bargaining and low bargaining coverage so that many firms will be untouched by union bargaining. Union firms must thus compete with a number of domestic competitors who do not face the higher labour costs that unions bring, resulting in a competitive disadvantage which will affect their profitability.

Thirdly, we hypothesise that any performance penalty associated with union presence in either country will vary according to the level of workplace union density, but that this effect will be stronger in Britain since union membership can be expected to be more salient in determining union bargaining power within British workplaces. In France union representatives can engage in pay bargaining at workplace level without substantial worker support for the union. Legal rights to bargain mean French unions do not have to rely solely on worker support to retain some bargaining power. In Britain, on the other hand, unions' bargaining strength is enhanced by the percentage of all workers they represent and leads to a higher union wage premium (Stewart, 1987; Forth and Millward, 2002).² If union bargaining strength is more dependent on

¹ For example, see Bryson and Dale-Olsen's (2008) study of union effects on employment growth and workplace survival in Britain and Norway.

² The same is true for other countries with fragmented workplace-level bargaining such as the United States (Freeman and Medoff, 1981; Lewis, 1986; Schumacher, 1999).

union density in Britain than in France, one might also expect it to have a stronger link to firms' profitability in Britain.

4. DATA AND METHODS

The data used are derived from the REPONSE Survey, a nationally representative survey of all private sector workplaces in France with 20 or more employees, and the Workplace Employment Relations Survey (WERS), a nationally representative survey of all workplaces in Britain with 5 or more employees. For comparability with the REPONSE sample, we restrict our attention to those private sector workplaces in WERS with 20 or more employees. The two surveys employed similar methodologies and both collected information, through face-to-face interviews, with the senior manager at the workplace with responsibility for personnel issues. These interviews collected comparable data on many establishment characteristics, the employment practices in place at the establishment and the environment in which the establishment was operating, thereby enabling us to compile equivalently-specified models in both countries. The surveys also gathered objective and attitudinal data on union presence and perceptual indicators of workplace performance. For some measures, such as workplace performance, respondents were asked to provide their perceptions on Likert-type scales. For other measures, such as establishment size, informants provided factual data.

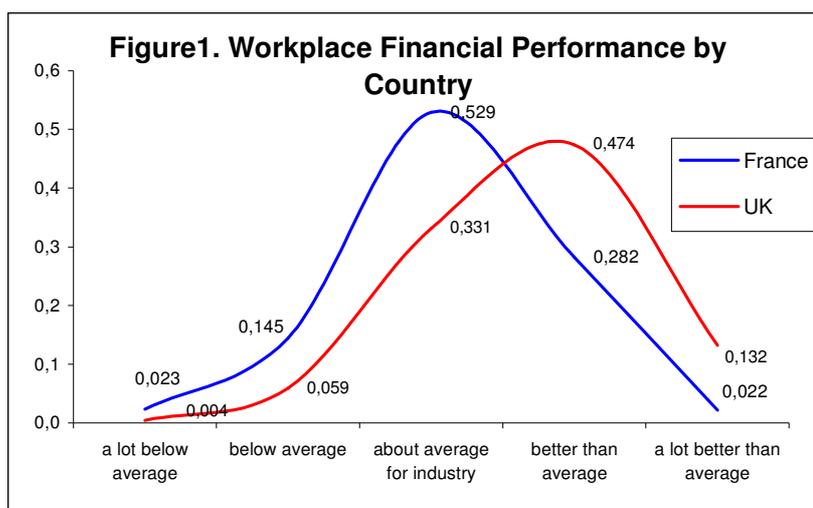
Our unit of analysis is the establishment. Objective financial measures of performance are typically only available at firm-level and, although establishment-specific data was collected among a subset of the WERS participants (see Forth and McNabb, 2008), such data are available only for those workplaces in REPONSE that equate to single-site firms. Accordingly, we rely primarily on the qualitative assessment of workplace performance that is provided by most participants in either survey. While the use of perceptual measures of performance is open to criticism, such measures are often the only ones available at the establishment level and have been used in a large number of other studies (e.g. Machin and Stewart 1990, 1996; Blanchflower and Bryson, 2008), as well as in other countries such as the United States (Voos, 1987) and Australia (Drago and Wooden, 1992). Cooke (1992) has argued that the use of perceptual measures permits comparison across establishments in a variety of industries and that informed managers should be able to provide reasonable approximations of workplace performance within a restricted response range. In addition, past evaluations of the subjective ratings in WERS have shown that managers' ratings are correlated with the subsequent probability of workplace closure (Machin and Stewart, 1990, 1996). Furthermore, Forth and McNabb (2008) have recently shown that the measure of perceived workplace profitability in WERS correlates positively with an objective measure of workplace profitability. They also demonstrate that simple regression analyses conducted on either measure lead to broadly equivalent conclusions about the impact of unions. We report similar findings for Britain below when we check the sensitivity of our results to the use of accounting measures of profitability.

The dependent variable for the REPONSE analysis was constructed from one item assessing respondents' perceptions of their workplace's profitability relative to their competitors. The equivalent item in WERS uses the more general term 'financial performance' and invites a

comparison with “other establishments in the same industry”.³ In both surveys responses are coded on a five point ordinal scale ranging from ‘a lot better than average’ to ‘a lot below average’. Table 1 presents the distribution across the relative performance categories in each country. The principal difference between the two countries is that managers in British workplaces tend to have a uniformly more positive view of their performance, with the overall distribution of responses shifting to the right in Figure 1 when compared with the distribution of responses from REPOSE. Managers in Britain seem to be more reluctant than managers in France to rate the performance of their workplace as ‘below average’. However, there is no reason to suspect that the cross-country differential in managers’ perceptions of their workplace’s performance will affect within-country estimates of union effects on that performance.

TABLE 1
Workplace Financial Performance by Country

	A lot below average	Below average	About average	Better than average	A lot better than average	Total
GB	0.4%	5.9%	33.1%	47.4%	13.2%	863
France	2.3%	14.5%	52.9%	28.2%	2.2%	1,788



To test the relationship between unionization and performance we constructed a range of unionization measures which are roughly comparable across the two countries. Our first measure concerns the extent of union negotiating rights at the workplace. In Britain the primary indicator is the presence of a recognition agreement, whether at workplace or organization-level, which permits one or more unions to bargain over terms and conditions for employees at the surveyed workplace.. In France, the primary indicator of negotiating rights is the presence

³ Managers are subsequently asked in WERS what measure of ‘financial performance’ they use, and many cite profitability (others cite the share price, productivity and so on). We do not restrict the GB analysis presented in the paper to the sub-sample citing profitability as the smaller sample results in estimates with reduced precision, but the nature of the associations remains the same.

of a union delegate (*délégué syndical*) either at workplace or organization-level. Second, in recognition of evidence indicating that some recognition agreements – in Britain at least – may be little more than ‘hollow shells’ (e.g. Kersley, 2006), we distinguish between workplaces where unions are actively engaged in pay bargaining and those where they have negotiation rights but are not actively engaged in collective bargaining (in other words, their bargaining rights are not being exercised). In Britain, the resulting three-category variable identifies: (i) workplaces with no union recognized for pay bargaining; (ii) workplaces where unions are recognized but no bargaining takes place; and (iii) those where there is active bargaining over wages. Our measure for France is very similar, but in the case of multi-site organizations the data do not allow us to distinguish between workplaces where bargaining rights are exercised and those where the bargaining rights are not exercised. Thus we use a five-category variable which identifies three scenarios for single-establishment organizations and two for multi-site organizations. In the case of single-site organizations we distinguish between those that have no union delegate, those with a union delegate but where the employer reports no active bargaining, and those with a union delegate and active collective bargaining. In the case of multi-site organizations we distinguish between workplaces with and without collective bargaining rights. Third, we employ a measure of union density at the workplace. This is computed as the proportion of all employees that belong to a trade union and, in Britain at least, can be considered a proxy for union strength. Fourth, we distinguish between different named unions since, in France, there are substantial differences across unions in their traditions of militancy and in their ability to procure a wage premium (Breda, 2008).

Table 2 shows the bivariate associations between the union measures and workplace financial performance. In Britain, performance is poorest among workplaces with active collective bargaining over wages and the association does not differ with high union density. In France, performance is slightly worse where unions have bargaining rights but it is poorest of all where those bargaining rights are exercised. In addition, workplaces with high union density are less likely than other workplaces to be high performers. Comparing different unions, performance is lowest in France where the revolutionary SUD is present. In Britain, it is lowest where the general GMB union is present.

TABLE 2
**Proportion of workplaces with “above average” financial performance
in Britain and France**

	France			GB		
	Propn. High performers ¹	Population	Sample	Propn. high performers ¹	Population	Sample
All Workplaces	0.30		1,788	0.61		863
Collective bargaining rights						
No union(s) with collective bargaining rights	0.32	0.48	423	0.61	0.80	529
Union(s) present with collective bargaining rights	0.29	0.52	1,359	0.59	0.20	334
Collective bargaining activity (France)						
Single-site organization, no bargaining rights	0.32	0.34	297	-	-	-
Single-site organization, bargaining rights not exercised	0.27	0.03	50	-	-	-
Single-site organization, bargaining rights exercised	0.24	0.11	329	-	-	-
Multi-site organization, no bargaining rights	0.33	0.13	126	-	-	-
Multi-site organization, bargaining rights	0.31	0.38	980	-	-	-
Collective bargaining activity (GB)						
No union(s) with bargaining rights	-	-	-	0.61	0.80	529
Bargaining rights present but not exercised	-	-	-	0.67	0.07	73
Collective bargaining taking place	-	-	-	0.54	0.13	261
Union density						
None (GB) / 0-5% (Fr)	0.32	0.61	705	0.63	0.71	426
1-19% (GB) / 5-19% (Fr)	0.30	0.23	683	0.53	0.11	141
20%+	0.19	0.07	196	0.54	0.17	282
Missing	0.24	0.09	191	0.73	0.01	14
Identity of recognised union (France)						
CFDT (reformist)	0.31	0.32	1,023			
CGT (communist)	0.29	0.32	1,045			
CFTC (reformist)	0.31	0.19	655			
CGT-FO (Communist/Trotskyist : reformist)	0.32	0.27	869			
CGC (white collar executives)	0.30	0.18	746			
SUD (revolutionary)	0.22	0.02	89			
UNSA (reformist)	0.25	0.03	113			
Other unions	0.35	0.06	156			
No bargaining rights	0.32	0.48	423			
Identity of recognised union (GB)						
TGWU (general)				0.54	0.03	56
UNIFI (finance)				0.88	0.01	12
USDAW (retail)				0.54	0.02	28
Amicus (general)				0.57	0.01	42
GMB (general)				0.40	0.02	28
Other unions				0.56	0.05	95
No active bargaining				0.62	0.87	602

1. High performers are those where respondent says the workplace financial performance was “better than average” or “a lot better than average”.

To establish the independent association between unions and performance we turn to regression estimates which control for variables which may be correlated with performance and unionization. To account for the influence of size of the workplace and scale effects we included several dichotomous variables to indicate the number of employees in the workplace. A number of additional variables entered the estimates to control for the broader nature of employment practice at the establishment. These included controls for the presence of management practices such as performance-related pay, quality circles and briefing groups, controls for team working and job autonomy, and controls for the use of temporary contracts. We also control for the recent introduction of new technology. The full set of controls is presented in Table A1.

We also incorporate variables capturing the nature and state of the product market. These include direct measures of the market share for the main product or service of the workplace,

the geographical location of the market – local, regional, national or international - and whether the current state of the market for the main product or service is growing, mature, or declining (see Appendix Table A1 for details). Finally, we include dummy variables representing industries to capture any other industry characteristics associated with performance perceptions.

Since the workplace financial performance variable is an ordinal categorical variable, we use ordered probit models to estimate performance, an approach which is standard in the literature (eg. Blanchflower and Bryson, 2008; Machin and Stewart, 1996; Drago and Wooden, 1992). Because sample sizes are very small in the lower tail of the distribution we recode the 5-way variables into four categories, namely workplaces with financial performance that is ‘a lot better’ than average, ‘better than average’, ‘average’, and ‘below/a lot below’ average.

We thus assume that the financial performance of workplace i ($i=1,\dots,N$) is summarised by a continuous latent variable FP_i^* which is a linear function of workplace attributes represented by the column vector X_i , a variable U_i capturing unionization which, depending on the model specification, may be either a dummy or a series of dummies representing a categorical variable, and an error term ε_i distributed as standard normal:

$$FP_i^* = X_i' \beta + \delta U_i + \varepsilon_i \quad (1)$$

where β is a vector of coefficients associated with workplace attributes and δ is the scalar coefficient associated with unionisation. The set of controls included in X_i refers to the workplace controls noted above. FP_i^* is not observed; rather, in the data we observe FP_i , its discrete realisation, which takes a set of ordered values as FP_i^* crosses the latent cut-off points $\tau_1.. \tau_4$. Significant positive coefficients indicate variables associated with better financial performance. We adjust the estimator to account for differential sampling probabilities across establishments by applying sampling weights, and also use a robust variance estimator.

One potential concern is that unionization may be endogenous with respect to workplace performance, leading to biased estimates. Brown et al. (2008) show that the pace of union decline in Britain is slowest among workplaces with the highest profits, suggesting unions are focusing their energies on organizing highly profitable workplaces. If this is unaccounted for by controls in our models this will induce an upward bias in any positive estimates of collective bargaining effects on workplace performance in Britain. In France, on the other hand, the legal setting is such that the costs to the union of obtaining collective bargaining rights are close to zero, which means we would not expect to see the sort of positive selection effect one might expect for Britain. Instead, since around nine-in-ten private sector employees in France are already covered by national-level collective pay bargaining, it seems likely that French workers will trigger their rights to workplace- or organization-level bargaining when other concerns are prominent, such as job insecurity or where they have grievances against their employer. Since such concerns are likely to be more common among workplaces with low levels of profitability, this will induce a *downward* bias in any positive estimates of collective bargaining effects on workplace performance in France if it is unaccounted for. Different considerations come into play in relation to the selection processes underlying union density since this is largely a function of individual workers’ assessments of the costs and benefits of union membership. In Britain and France these are likely to turn on the union’s ability to extract rents from the

employer through the deployment of greater bargaining power at the workplace (Schnabel, 2003). Thus in both countries union density is likely to be correlated with high-rent firms which, if unaccounted for in our models, will upwardly bias the effects of union density on workplace performance.

To overcome these selection issues we estimate the effect of unionization on financial performance while simultaneously modelling the union status of workplaces. In this way we are able to control for the presence of unobserved correlation between unionization and performance, thus eliminating the bias induced by unobserved heterogeneity and delivering the causal impact of unionization.

We augment equation (1) with a probit equation for the probability of active collective bargaining:

$$U^*_i = Z_i' \gamma + W_i' \theta + u_i \quad (2)$$

where U^*_i is a continuous latent propensity underlying the dummy U_i , Z_i is a vector of observables, γ is the vector of coefficients associated with those observables, W_i is a variable (or variables) that have no effect on performance after unionisation has been controlled for, θ is the coefficient for this variable, and u_i is an error term distributed as standard normal. We model the link between u_i and ε_i by allowing them to be distributed as bivariate normal with unrestricted correlation $\rho = \text{corr}(\varepsilon_i, u_i)$. By simultaneously estimating equations (1) and (2) we are able to separately identify the correlation between unobservables – the coefficient ρ – and thus to remove the bias induced by unobserved heterogeneity from the coefficient δ in (1).

The set of attributes in Z_i is identical to those in X_i . In the British case the “instruments” W_i for union bargaining activity are (i) a dummy variable identifying workplaces in existence for 10 years or more (to capture the well-known cohort effect in Britain (see, for example, Millward et al, 2000; Machin 2000)) and (ii) a dummy identifying workplaces located in the North East, North West, Yorkshire and Humberside, Scotland or Wales (areas where the propensity to unionise has traditionally been, and remains, strongest (see Mercer and Notley, 2008)). The instruments for union density are (i) the region identifier just noted, (ii) a dummy identifying workplaces where women account for more than 50% of employees (since in Britain women now have a greater propensity than men to join unions (Mercer and Notley, 2008); and (iii) a dummy identifying workplaces with any workers aged 16-17 (since younger workers have a lower propensity to join unions (Machin, 2000; Mercer and Notley, 2008)). In France the instrument for union bargaining is a dummy identifying organizations with fewer than 50 employees, this being the size cut-off above which organizations are subject to the law governing worker bargaining rights. The instruments for union density are (i) a dummy identifying workplaces in which more than 10% of workers are young women and (ii) a dummy identifying workplaces with male craftsmen present. The identifying assumption in all cases is that these instrumental variables capture differences in the net benefits (to either workplaces or individuals) of union organizing but, having conditioned on the other variables in the model, they have no direct bearing on workplace performance.

5. RESULTS

Table 3 presents model specifications for Britain (columns 1-3) and France (columns 4-6) respectively.⁴ The first model specification (columns 1 and 4) is the collective bargaining variable with no controls. The second (columns 2 and 5) introduces controls for structural features of the workplace, workforce composition, and product market characteristics. The third specification (columns 3 and 6) introduces human resource management (HRM) practices.⁵ Model 1 shows the association between workplace financial performance and the simple presence of unions with bargaining rights. Model 2 distinguishes between workplaces with active collective bargaining and those with union bargaining rights but no active bargaining. In the British case unionized workplaces are associated with poorer financial performance than non-unionized workplaces, but only where unions are actively engaged in collective bargaining (Model 2). The effect is robust to the introduction of controls and strengthens having accounted for HRM practices. The marginal effect of active collective bargaining is quite sizeable: relative to no union recognition, having a union actively engaged in collective bargaining reduces the probability of having financial performance ‘a lot better than average’ for the industry by 5 percent.

TABLE 3
Union effects on financial performance by country

	GB	GB	GB	France	France	France
<i>Model 1: Collective bargaining rights (ref. no union bargaining rights)</i>	-0.055	-0.212	-0.224	-0.153*	-0.173*	-0.221**
<i>Model 2 Collective bargaining activity (Britain): (ref. no recognition)</i>						
Recognition of union but no bargaining	0.195	0.011	0.043			
Collective bargaining	-0.175	-0.335**	-0.378**			
<i>Model 2 Collective bargaining activity (France): (ref. single, no bargaining rights)</i>						
Single, bargaining rights not exercised				-0.146	-0.061	-0.193
Single, bargaining rights exercised				-0.260**	-0.208	-0.236*
Multi, no bargaining rights				0.001	-0.067	-0.097
Multi, bargaining rights				-0.121	-0.202*	-0.263**
Workplace structure		Yes	Yes		Yes	Yes
Workforce composition		Yes	Yes		Yes	Yes
Product market		Yes	Yes		Yes	Yes
HRM practices			Yes			Yes

* significant at 10% level; ** significant at 5% level; *** significant at 1% level

⁴ Other variables in the model also perform in a way that one might have anticipated: for example, workplaces with growing product markets perform significantly better than workplaces with declining, turbulent or mature product markets. See Table A2.

⁵ Although HRM practices may be endogenous with respect to unionization and workplace performance we introduce them to estimate the sensitivity of union effects to their inclusion.

Full specifications for Model 2 are given in Appendix Table A2. Other specifications are available from the authors.

In the French case, the presence of unions with bargaining rights alone is associated with poorer financial performance (Model 1).⁶ As noted above, we can only test the importance of *active* collective bargaining in single independent establishments but, among this group of workplaces, only those with active bargaining have poorer performance than workplaces without unions (Model 2). That said, the coefficient is not significantly different from single-establishment organizations where unions have bargaining rights but do not exercise them.

The association between unionization and performance presented in Table 3 may be biased by unobserved features of the workplace that affect both union presence and workplace performance. In Britain for example, as noted earlier, unions' ability to organize workplaces with higher profits may downwardly bias unions' negative effects on performance (making them appear less negative than they really are). To allow for this in our analyses of union effects in Britain, we ran an IV regression of Model 2 in column 3 using the instruments noted in Section Four. The collective bargaining variable was collapsed into a dummy variable capturing active collective bargaining.⁷ The results in Table 4 show that collective bargaining is endogenous in Britain such that treating it as exogenous understates the negative impact of unions on workplace performance, as we anticipated.

TABLE 4
Test for Endogeneity of Collective Bargaining

	GB	GB	France	France
Active collective bargaining (ref no active bargaining)	-0.384**	-1.163***		
Collective bargaining rights (ref no bargaining rights)			-0.221***	0.617
Estimation:	Ordered probit	IV ordered probit	Ordered probit	IV ordered probit
Rho		0.514**		-0.200

For France we ran IV estimates of collective bargaining using the specification for Model 1 shown in column 3 of Table 3, where the unionization variable indicates the presence of a

⁶ We note at this point that we do not compare the magnitude of the union effects across countries because the coefficients in the ordered probit model are inherently standardized; if the error variances differ across the two countries, the standardization will also differ, invalidating any comparisons. Williams (2008) has proposed the use of heterogeneous choice models as a solution in the presence of between-group differences in error variances. However, it is necessary to assume that the cutpoints are the same for both groups - an assumption that does not appear valid in our data (see Figure 1).

⁷ We focus on active collective bargaining, where the association appears strongest. It is also the case that the program we use to perform the IV ordered probit regressions permits only a single endogenous variable. As anticipated, workplaces aged 10 years or more and those located in the north of Britain were more likely to have collective bargaining (the coefficients in the probit regression of collective bargaining were 0.751 ($p < 0.001$) and 0.390 ($p = 0.022$) respectively) but neither characteristic was associated with workplace performance after controlling for other factors. Full details of the models are available on request.

délégué syndical at workplace or organization-level. When treated as exogenous the presence of a union delegate is significantly associated with poorer workplace performance. However, once we account for potential endogeneity it switches sign and becomes statistically non-significant.⁸ As anticipated, the selection process operates in the opposite direction to the British case: the negative rho in the bottom row of Table 4 for France indicates that the negative correlation between union delegates and workplace performance is driven by correlations in the unobservables influencing both union presence and poor performance, as might be the case where poor working conditions trigger worker desire for union representation.

A further concern is that the results may be biased by the use of the subjective evaluation of performance. For WERS (but not REPONSE), we have accounting-type data on workplace profitability from the Financial Performance Questionnaire (FPQ) and linked data from the Annual Business Inquiry (ABI). Focusing on the sub-sample with data on the subjective and accounting measures – so that we can directly assess the impact of switching the performance measure without interference from changes in the estimation sample - reduces the sample to only 182 cases. This is a small sample, but the pattern of results across the subjective and accounting measures is broadly the same, i.e. a negative impact of unions (albeit on that is on the borderline of statistical significance). The estimated marginal effect of collective bargaining on the accounting measure of profits is around -5% (although not statistically significant). As a further check against common-rater bias in the subjective evaluation, we introduced an additional dummy variable into the WERS models presented in Table 4, identifying workplaces in which managers agreed with the statement that “unions help find ways to improve workplace performance” (again, this data was unavailable in REPONSE). The results shown in Table 4 were substantively unchanged.

To summarise the analysis thus far, we have found support for our hypothesis that unions negatively affect firm financial performance in Britain, with the analysis indicating a negative effect arising from active union bargaining. However, the analysis thus far does not support our hypothesis that unions also negatively affect firm performance in France, since the negative association between union bargaining rights and firm performance in France disappears once endogenous selection into unionization is taken into account.

We now turn to our alternative union indicator - membership density – in order to examine whether this measure of union strength exhibits similar relationships with workplace performance. We utilize a categorical variable in order to be able to retain those cases which have missing data on union membership density for the surveyed workplace; these are more numerous in the French data (194 cases, compared with just 14 in the British data). The French data also provide no disaggregation of the category of workplaces with membership density of 20 per cent or more: a level of density which is reasonably high for France but still relatively low for Britain. Accordingly, Model 1 of Table 5 uses the most comparable variables possible for the two countries, whilst Model 2 goes on to disaggregate higher-density workplaces in Britain.

⁸ As anticipated, belonging to an organization with under 50 employees was positively associated with the likelihood that unions had collective bargaining rights at the workplace (the coefficient in the probit regression of bargaining rights was -1.863 ($p < 0.001$)) but it was not associated with workplace performance after controlling for other factors.

TABLE 5
Union density effects on financial performance by country

	GB	GB	France	France
Model 1				
<i>Union density (ref: 0%)</i>				
1-19%	-0.251			
20%+	-0.332*			
Some but % not known	-0.858**			
<i>Union density (ref: 0-5%)</i>				
5-19%			-0.062	
20%+			-0.528***	
Missing			-0.244*	
Model 2:				
<i>Union density (ref: 0%)</i>				
1-19%	-0.258			
20-59%	-0.270			
60%+	-0.502**			
Some but % not known	-0.885**			
Model 3:				
<i>Union density</i>				
1%+ (ref. None)	-0.313**	-1.101**		
20%+ (ref.<20%) ^a			-0.500***	-1.750***
Estimation:	Ordered probit	IV ordered probit	Ordered probit	IV ordered probit
Rho		0.545**		0.711***

a: missing values excluded

* significant at 10% level; ** significant at 5% level; *** significant at 1% level.

Full specifications for the models are available from the authors.

We find that in Britain having any union members is associated with lower financial performance than having none (Table 5, Model 1). There is some indication that the effect may rise with higher density (Model 2), as we had hypothesized, but the coefficient for workplaces with membership density of 60% or more is not statistically significant from the coefficient for workplaces with density of 20-59%. This might indicate that, in an environment in which employers have become increasingly reluctant to afford unions a role in workplace governance, union density now serves as a poorer proxy for union bargaining power and influence than it did in the past. In France a somewhat different pattern emerges: those with low density (<20%) enjoy similar financial performance to workplaces with no union members, whereas those with high density (20%+) have significantly lower performance than no-member and low density workplaces. In both countries, the negative effect of union density becomes more pronounced when we treat union density as endogenous using the instruments described earlier.⁹

⁹ Once again, the instruments performed well. In the British case, the variable indicting the presence of workers aged 16-17 was negative and statistically significant ($p < 0.01$) when estimating the probability of having any union members whilst the variables identifying workplaces with more than 50% female employees and workplaces

A possible reason for this unexpected link between high union density and poor workplace performance in France is that French workers are only motivated to join unions in large numbers in workplaces where their additional bargaining power allows them to share in the firm's rents. The positive and highly significant rho in the final column of Table 5 is consistent with this hypothesis since it indicates that features of the workplace that are unobservable to us generate higher workplace performance and increase workers' propensity to join the union. Recall that the selection effect determining the presence of a union delegate worked in the other direction (the rho in the last column of Table 4 is negative and significant), suggesting union delegates were present in workplaces that, for reasons we do not observe, also had lower financial performance than other workplaces.

If one compares the IV estimates for the presence of union delegates and union density in France, one finds no significant effect of delegates but a negative effect of union density. These results can be reconciled when one recalls that union delegates are present in 52% of private sector workplaces in France whereas only 7% have union density of 20% or more. Thus the union delegate effect averages union effects for both strong and weak unions whereas the union density effect is capturing the impact of unions with strong bargaining power.

This discussion clearly indicates that bargaining and density are not independent. However, the interaction differs between the two countries. In Britain, union membership is more prevalent than union bargaining. It thus seems reasonable to expect that the negative effect of union density is found only in the presence of active bargaining. Further analysis indicated this to be the case (Table 6, column 1). Conversely in France, as the previous paragraph indicates, bargaining is more prevalent than high density, and so it might be reasonable to expect that high density is the key determinant of union's negative performance effect, and this too proves to be the case (Table 6, column 2). In essence, active bargaining is the dominant factor in Britain whilst high membership is the dominant factor in France.

TABLE 6
Union bargaining and density effects on financial performance by country

	GB	France
<i>Ref: no union members</i>		
Union members but no active bargaining	-0.223	
Union members with active bargaining	-0.452**	
<i>Ref: no bargaining rights</i>		
Bargaining rights but density < 20%		-0.173*
Bargaining rights and density		-0.574***

located in the north of Britain were both positive and statistically significant ($p < 0.001$ and $p = 0.015$ respectively). In the French case, the variables indicating the presence of young female workers and male craft workers were both negative and statistically significant when estimating the probability of having union density of at least 20% ($p = 0.001$ and $p = 0.026$ respectively). None of the instruments were associated with performance after controlling for other factors.

Finally we turn to the heterogeneity of unions in the two countries. In France, each confederation has its own strong political and/or religious tradition which may influence its attitude to workplace employment relations and pay bargaining. Table 7 (column 2) indicates that this is indeed the case since the negative effect of unions on workplace performance is confined to the Communist CGT and revolutionary SUD. There is no real parallel in the British case. Indeed, it is likely that there is more within-union variance in orientations towards employers than there is across-union variance. This hypothesis is supported by the fact that there is a degree of homogeneity across the five most prevalent unions in Britain (Table 7, column 1).¹⁰

TABLE 7
Effects of Different Unions in France

	GB	France
<i>(Ref. No active bargaining)</i>		
TGWU (General)	-0.272	
UNIFI (Finance sector)	-0.331	
USDAW (Retail sector)	-0.384	
Amicus (General)	-0.166	
GMB (General)	-0.463	
Other	-0.444**	
<i>(Ref. No bargaining rights)</i>		
Confédération Française Démocratique du Travail (CFDT)(reformist)		0.003
Confédération Générale du Travail (CGT) (communist)		-0.207*
Confédération Française des Travailleurs Chrétiens (CFTC) (reformist)		0.039
Force Ouvrière (CGT-FO)(Communist/Trotskyist : reformist)		-0.030
Confédération Générale des Cadres (CGC) (white collar executives)		0.161
Solidaires, Unitaires, Démocratiques (SUD) (revolutionary)		-0.763***
Union Nationale des Syndicats Autonomes (UNSA) (reformist)		-0.055
Other unions		0.041

* significant at 10% level; ** significant at 5% level; *** significant at 1% level.

Full specifications for the models are available from the authors.

6. DISCUSSION AND CONCLUSIONS

This paper tests the proposition that union effects on workplace financial performance vary with the institutional arrangements governing employment relations. We investigate union effects on workplace performance in Britain and France using nationally representative data for workplaces with 20 or more employees. In both countries unionization is associated with poorer workplace performance.

We anticipated that this effect was associated with collective bargaining. Clear evidence of this emerges for Britain since the effect is absent where unions are not actively engaged in collective bargaining. Furthermore, these effects are underestimated if collective bargaining is

¹⁰ One should note that some of the British unions cited in Table 7 suffer from small cell sizes (see Table 2). There are no such concerns in the regression for France.

treated as exogenous. In France, there is no such association between union bargaining and workplace performance once the endogeneity of union bargaining is taken into account.

We hypothesized that in Britain unions' negative association with financial performance would rise with union density because density proxies union bargaining strength and thus their ability to achieve their bargaining ends. However, we suspected that institutional arrangements in France would limit the impact of union density. In fact, union density in France performed much as we had anticipated union density would perform in Britain. That is to say, high union density is associated with poorer financial performance in French workplaces. One possible reason for this is that French workers only become union members in workplaces with high rents to share, a proposition supported by our instrumental variables estimates showing a positive correlation in the unobservables determining workplace performance and higher union density. In the British case, although having any union members was clearly associated with lower financial performance than having none, there was only tentative evidence that high union density was associated with lower performance than lower density. In summary, active bargaining was the dominant factor in Britain whilst high membership was the dominant factor in France.

We also explored the heterogeneity of unions in the two countries. In France, unions' negative effects on workplace performance were confined to the Communist CGT and revolutionary SUD. In the Britain, there appears to be a greater degree of homogeneity, due perhaps to the absence of strong political traditions equivalent to those seen in France.

The policy environment in France has recently moved towards a situation in which, as a result of the *Loi Fillon*, the award of bargaining rights is now more conditional upon unions having support among the workforce at an establishment. In this sense, France is moving (albeit very gradually) in the direction of more voluntarist Britain. The results presented here suggest that such moves will not necessarily ameliorate any negative effects of unionization on firm performance.

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Appendix Table A1: Definitions of variables

Variables	GB		France		
	Weighted proportion	Sample	Weighted proportion	Sample	
Dependent variable:					
Workplace financial Performance	A lot better than average	0.13	114	0.02	49
	Better than average	0.47	375	0.28	500
	About average for industry	0.33	299	0.53	872
	Below average	0.06	69	0.15	312
	A lot below average	0.01	6	0.02	42
Union indicators:	<i>See Table 2</i>				
Independent variables:					
Structural characteristics:					
Establishment size:					
	20-49	0.67	247	0.53	352
	50-99	0.19	165	0.23	255
	100-199	0.08	140	0.13	340
	200-499	0.04	153	0.08	336
	500+	0.01	158	0.03	505
Foreign ownership					
	Foreign owned	0.13	187	0.11	319
	DK			0.02	47
Industry:					
	Manufacturing	0.17	202	0.29	688
	Electricity, gas and water	0.01	29	0.02	52
	Construction	0.07	53	0.11	142
	Wholesale and retail	0.28	165	0.22	334
	Transport and communications	0.06	75	0.06	84
	Financial services	0.04	68	0.04	96
	Other business services	0.14	127	0.17	281
	Education & Health	0.08	52	0.02	50
	Hotels and restaurants & Other business services	0.16	92	0.06	61
Franchise					
		0.04	26	0.02	23
Workforce characteristics:					
Largest occupational group:					
	Lower-skilled workers	0.50	419	0.51	882
	Administrative	0.15	118	0.31	468
	Professional and technical	0.05	66	0.07	176
	Sales	0.22	186	0.01	22
	Senior managers and Skilled trades	0.08	74	0.10	240
Percentage of employees on fixed-term contracts:					
	None/1-9%	0.91	778	0.86	1539
	10% or more	0.09	85	0.12	225
	DK			0.02	24
Introduced new technology in past 2 years (Fr 3 years)					
		0.50	519	0.14	305
Introduced new product/service in past 2 years (Fr 3 years)					
		0.32	374	0.39	777
Sets targets for profits					
		0.69	651	0.81	1,504
Sets targets for sales					
		0.77	708	0.69	1,241
Sets targets for quality					
		0.51	541	0.83	1,581
Market characteristics:					
Location of market:					
	Local	0.36	232	0.23	322
	Regional	0.22	127	0.25	307
	National	0.29	295	0.27	423
	International	0.14	209	0.25	748
	DK				
State of market:					
	Growing	0.51	408	0.56	996
	Mature	0.23	208	0.28	481
	Declining	0.08	69	0.14	303
	Turbulent	0.18	178	-	-
	DK			0.02	8

Continued on next page

Table A1 continued

Variables	GB		France		
	Weighted proportion	Sample	Weighted proportion	Sample	
Market share					
	Less than 5%	0.44	237	0.19	247
	5-10%	0.11	102	0.34	635
	11-50%	0.25	303	0.30	601
	More than 50%	0.08	96	0.17	305
	DK	0.13	125		
Price elasticity of demand					
	Demand does not depend on price	0.26	191	0.27	446
	Demand depend partially on price	0.30	255	0.38	665
	Demand depend heavily on price	0.44	417	0.33	641
	DK/Missing			0.02	36
HR practices					
	Performance-related pay or bonuses for managers or non-managers	0.48	485	0.88	1,652
	Profit-related pay	0.45	428	0.48	1,104
	Share options	0.09	126	0.05	209
	Quality circles	0.25	327	0.50	1,055
	Briefing groups	0.76	731	0.80	1,543
	Suggestion scheme	0.33	341	0.25	544
	Appraisals for managers	0.75	725	0.79	1,572
	Appraisals for non-managers	0.76	704	0.76	1,487
	Survey of employees	0.43	492	0.18	487
Autonomous Work Team					
	none	0.58	532	0.13	258
	GB: 60%+ / Fr 50%+	0.33	266	0.06	136
	GB: 20-59% / Fr 20-49%	0.08	49	0.23	458
	1-19%	0.01	16	0.58	936
Job Rotation					
	none	0.87	768	0.48	843
	GB: 60%+ / Fr Yes	0.13	95	0.51	936
	Missing			0.01	9
Job Control					
	Occasional	0.81	736	0.32	645
	GB: A lot / Fr: Permanent Job control	0.19	27	0.68	1,143
	Missing	-			
Changed working time in last 2 years (Fr 3 years)		0.27	339	0.22	305
Changed work organisation in last 2 years (Fr 3 years)		0.37	463	0.30	670
Sets targets for labour costs		0.47	472	0.17	285

Appendix Table A2. Baseline Models of Financial Performance – detailed results

	GB			FRANCE		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
<i>Collective Bargaining Rights (ref. no bargaining rights)</i>	-0.055	-0.212	-0.224	-0.153*	-0.173*	-0.221**
<i>Workplace size (ref. is 20-49 employees)</i>						
50-99 employees		0.029	0.102		0.177*	0.175*
100-199 employees		0.148	0.256		-0.066	-0.089
200-499 employees		-0.208	-0.114		0.091	0.042
500 or more employees		0.072	0.117		0.167	0.085
Foreign owned (ref. domestically-owned)		-0.243	-0.206		0.018	-0.041
DK/NA					0.265	0.143
<i>Industrial activity (ref. is manufacturing)</i>						
Electricity, gas and water		0.451*	0.521		-0.182	-0.240
Construction		0.050	0.065		0.290**	0.253*
Wholesale and retail		0.081	0.063		0.217	0.248*
Transport and communications		0.120	0.111		0.233	0.244
Financial services		0.602**	0.576**		0.298	0.332
Other business services		0.240	0.262		0.388***	0.364***
Education & Health		0.004	0.087		0.169	0.226
Hotels and restaurants & Other services		0.305	0.305		-0.079	-0.012
Franchise (ref. not a franchise)		-0.392	-0.415		0.405	0.322
<i>Largest occupational group (ref. is blue collar)</i>						
Lower grade white collar		-0.058	-0.119		0.041	0.036
Technician/supervisor		0.035	-0.044		-0.147	-0.162
Sales		0.045	0.042		0.433	0.337
Executives		-0.187	-0.230		-0.104	-0.202
<i>Percentage of employees fixed-term contract (ref. is none/1-9%)</i>						
10% or more		0.343**	0.347*		-0.148	-0.166
DK					0.030	0.040
Introduced new technology in past 2 years (Fr 3 years)		0.100	0.131		0.108	0.120
Introduced new product/service in past 2 years (Fr 3 years)		0.078	0.096		-0.006	-0.006
Sets targets for profits		-0.084	-0.037		-0.102	-0.168
Sets targets for sales		-0.096	-0.067		-0.184*	-0.200**
Sets targets for quality		0.198	0.239*		0.229*	0.173
<i>Location of the market (ref. is local)</i>						
Regional		0.167	0.203		-0.084	-0.065
National/international		0.145	0.101		0.175	0.196
DK						
<i>Product market state (ref. is growing)</i>						
Mature		-0.397***	-0.461***		-0.047	-0.034
Declining		-0.172	-0.206		-0.509***	-0.493***
Turbulent		-0.541***	-0.592***		1.238***	1.239***
Missing						

Table A2 continued

	GB			FRANCE		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
<i>Market share (ref. is less than 5 per cent)</i>						
5-25 per cent		0.147	0.183		0.039	0.007
More than 26 per cent		0.214	0.256		0.174	0.172
DK/Missing		-0.099	-0.051		0.155	0.152
<i>Price elasticity of demand (ref. is depend partially on price)</i>						
Demand does not depend on price		0.016	0.015		0.386***	0.414***
Demand depend heavily on price		-0.152	-0.144		-0.177*	-0.175*
DK/Missing					-0.038	-0.050
<i>HR practices (ref. is none)</i>						
Performance-related pay or bonuses for managers or non-managers			0.007			0.208
Profit-related pay			0.012			0.081
Share options			0.156			0.173
Quality circles			0.111			0.210**
Briefing groups			-0.267**			-0.141
Suggestion scheme			0.001			-0.178*
Appraisals for managers			0.056			-0.183
Appraisals for non-managers			0.136			0.173
Survey of employees			0.039			0.225**
<i>Autonomous Work Team (ref. is none)</i>						
GB: 60%+ / Fr 50%+			-0.093			-0.201
GB: 20-59% / Fr 20-49%			0.210			-0.100
1-19%			-1.073***			-0.162
<i>Job Rotation (ref. is none)</i>						
GB: 60%+ / Fr Yes			-0.085			0.095
Missing						1.306***
<i>Job Control(ref. is occasional)</i>						
GB: A lot / Fr: Permanent Job control			0.228			0.122
Changed working time in last 2 years (Fr 3 years)			0.075			-0.174*
Changed work organisation in last 2 years (Fr 3 years)			-0.282**			0.094
Sets targets for labour costs			-0.111			-0.056
Pseudo-R²	0.002	0.058	0.079	0.003	0.060	0.080
Number of observations	863	863	863	1,788	1,788	1,788

Notes: * significant at 10 per cent level; ** significant at 5 per cent level; *** significant at 1 per cent level. DK/NA refers to "Don't know/Not answered" as a response.