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ABSTRACT

The Employment of Temporary Agency Workers in the UK: With or Against the Trade Unions?*

A firm's decision to employ agency workers may be perceived as a replacement of directly employed workers or as way to curb union power, which trade unions would oppose. Alternatively, trade unions may encourage the (temporary) employment of agency workers in a firm, if they manage to bargain higher wages for their members. We estimate the relationship between hiring agency workers and trade union activity at the workplace, in particular, the type of collective bargaining agreements. We use British data from the Workplace Employment Relations Surveys (WERS) of 1998 and 2004. The empirical association between the employment of agency workers and union strength is weak, but positive. Furthermore, workplaces with collective bargaining have lower wages in the presence of agency workers, suggesting that agency workers are hired against the unions.

JEL Classification: D21, J31, J40

Keywords: work agency, trade union, collective bargaining, flexibility, Workplace Employment Relations Survey

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1 Introduction

Several studies have investigated firms' demand for agency workers and have stressed the importance of cost reduction (e.g., Abraham and Taylor, 1996; Gramm and Schnell, 2001) and the increase in flexibility (Autor, 2003; Houseman, 2001).[1] Houseman (2001) and Gramm and Schnell (2001) estimate a negative relationship between the percentage of trade union members and the likelihood of a firm's employment of agency workers. In contrast, Autor (2003) finds that agency employment experienced a higher growth in US states where unionization levels declined more slowly than in states where unionization declined more rapidly.

British trade unions are known for their resistance to temporary work agencies and the perceived weakening of pay and conditions (Heery, 2004; TUC, 2003).[2] British trade unions have engaged with the question of agency work since the 1920s and the British Trade Unions Council (TUC) rejected 'fee-charging employment agencies' and advised its affiliates to withdraw from all collective agreements with agency suppliers (Heery, 2004). In the 1980s, the TUC changed the policy from demanding the abolition of agencies to improved regulation, however, agencies were still considered "parasitic" and agency workers were seen as workers without legitimate interest in obtaining such employment.

While trade unions seem to be most critical of the use of agency workers (TUC, 2003), their stance in a given firm on hiring agency workers is not clear *a priori*. Agency workers may replace directly hired workers, which trade unions will clearly oppose. However, if temporary agency workers are an important means to gain flexibility, to save cost and to increase profits, trade unions should be able to extract higher rents in firms that employ agency workers (Cahuc and Zylberberg, 2004). A firm that employs agency workers, either to save on labor costs or as an attempt to weaken the union's bargaining power, may need to compensate (the remaining) directly hired workers for their cooperation. Fehr (1990*b*) shows that insiders (directly hired workers) will cooperate with outsiders (agency workers) if they receive a wage premium for their cooperation. The correlation between the employment of agency workers and union power will thus be positive, rather than negative as suggested by union rhetoric. Fehr (1990*a*) observes, "It is, however, not clear why insiders (union

[1] Other reasons include the response to shortage of (skilled) workers (Autor, 2003), the role of human resource strategies (Purcell et al., 2004), or the extent of family-friendly work practices Heywood, Siebert and Wei (2006).

[2] Trade union opposition to temporary work agencies is not restricted to British unions, e.g., Coe, Johns and Ward (2008) discuss the Australian situation, Olsen and Kalleberg (2004) compare Norway and the US.

workers) should object to the employment of some outsiders at a market clearing wage if they are guaranteed their jobs and get a wage premium which gives them a higher total income than they would have received through collective bargaining" (p629).

A firm's decision to hire agency workers will depend, at least in part, on the unions' bargaining power, which stems from labor turnover costs. These costs determine the extent of substitution between directly hired and agency workers (Lindbeck and Snower, 2002). The greater the union's bargaining power, the less profitable it is for firms to hire agency workers. The employment of agency workers permits firms to realize higher profits because of a direct effect of lower wages for the agency workers and an indirect effect that operates through the trade union's reduced bargaining power, which reduces their wages. Agency workers will reduce the trade unions' bargaining power, if only because agency workers are more difficult to recruit.[3]

These are the main hypotheses which we investigate below. Based on Fehr's arguments, we expect to find a positive correlation between the probability of hiring agency workers and indicators of union activity. In the case that unions do not object to the employment of agency workers, we expect to find greater wages in workplaces where there are both strong unions and agency workers than in unionized workplaces with no agency workers. In contrast, if firms use agency workers to weaken the union's bargaining power, we expect that (insiders') wages are lower in workplaces with both strong unions and agency workers than in unionized workplaces with no agency workers. As Fehr (1990*b*) argues, we also expect insiders' wages to be greater in firms with agency workers than in firms where no agency workers are hired.[4] As shown by e.g., Willman and Bryson (2007), firms should also pay higher wages if they bargain with trade unions over wages.

We use British data from the Workplace Employment Relations Surveys 1998 and 2004 (DTI, 2005) to analyze the relationship between the employment of agency workers and trade union activity at the occupational level. The data provide information for all occupations of a workplace on the type of bargaining structure and whether or not temporary agency workers are employed in this occupation. These, among with other detailed information at the occupation-, workplace- and worker-

[3]The most extreme example is probably the hiring of replacement workers during a strike—which is legal in the US—, although the use of replacement workers does not occur often (Singh and Jain, 2001).

[4]While we would like to compare the wages of directly hired workers and agency workers, no such information is available in our data, because we observe only the using firm, but not the agency where agency workers are paid.

level, allow a unique assessment of the reasons for the hire of temporary agency workers and the association with trade union activity.

Our main result from the empirical analyses is that the employment of agency workers is, depending on the empirical specification and year, either not at all, or positively associated with indicators of union activity. In particular, we find that in competitive sectors, where cost aspects are arguably more important than in less competitive sectors, the employment of agency workers is positively associated with union activity. This positive association is most likely the outcome of an attempt to reduce union power as we find that wages for workers are lower in workplaces where we observe both collective bargaining and the employment of agency workers than in workplaces with collective bargaining and no agency workers.

2 Data

We use British data from the Workplace Employment Relations Surveys (WERS) 1998 and 2004 (DTI, 1999, 2005) to analyze the relationship between trade union activity and the use of agency workers. WERS is a nationally representative survey of private and public sector firms. The 1998 survey sampled firms with ten or more employees and the 2004 survey additionally covered firms with five to nine employees. We only use firms with ten or more employees in the 2004 sample and restrict our sample to private sector firms in both years. WERS provides data on employment relations and working life in Britain from three different perspectives, that of the workplace manager's, from employee representatives and from a random sub-sample of up to 25 employees per workplace. Our analysis is based on two cross-sectional samples.[5] These cross-sections provide information at the 1-digit occupational level, allowing a unique assessment of the association between trade union activity and the employment of agency workers at the occupation-level.

Descriptive evidence in Table 1 shows that in both years workplaces where managers confirm to have collective bargaining with trade unions in at least one occupation were more likely to hire agency workers than those where pay has been set by management without consultation.

Figure 1 gives a view on the relative frequency of agency workers by occupation and year. In 1998, agency workers were most frequently employed in clerical occupations,

[5] A random sub-sample of workplaces that have participated in the 1998 survey of workplace managers were re-interviewed in 2004, providing two waves of panel data. However, the cross-sections have larger sample sizes and managers were asked fewer questions in the panel than in the cross-sectional survey in 2004.

about 15 percent of workplaces with workers in the clerical occupation employed agency workers in that occupation. Moreover, agency workers worked predominantly as process, plant and machine operatives (10 percent), as associate professional or technical workers (5 percent) and in elementary occupations (6 percent). By 2004, the percentage of workplaces using agency workers in clerical occupations had dropped to 9 percent, whereas occupations related to personal services and sales or customer services as well as professional occupations increased their use of agency workers substantially.

3 Estimation strategy

Our estimation strategy consists of two parts: First, we estimate linear probability models of hiring agency workers at the occupation-level. Second, we investigate different hypotheses concerning this relationship by estimating wage regressions at the individual level where we control for trade union activity, the employment of agency workers, and the interaction between these variables at the occupation-level.

3.1 The probability of hiring agency workers

The occupation-level sample consists of 966 and 855 workplaces in 1998 and 2004. We observe each workplace j-times, depending on the number of non-managerial occupational groups j in the workplace f and end up with 2,664 (2,082) observations for 1998 (2004). On average, each workplace has about three different occupational groups, with a minimum of one and a maximum of seven observed occupational groups per workplace. The linear probability model can be written as follows:

$$TAW_{fj} = \alpha + \beta\, Z_{fj} + \gamma\, TU_{fj} + \delta_j + \zeta_f + \epsilon_{fj}, \tag{1}$$

where TAW_{fj} is workplace f's probability to employ temporary agency workers in occupation j, Z_{fj} is a vector of characteristics measured at the occupational level, TU_{fj} is an indicator of trade union activity in a given firm and occupation, δ_j is an occupation-fixed effect, ζ_f is a workplace-fixed effect and ϵ_{fj} is the error term. Since there is no unconditional parametric estimator for fixed-effects probit or logit models that yields consistent results (Wooldridge, 2002), we estimate linear probability models with workplace-fixed effects. As the majority of our regressors are binary variables, OLS should provide the best linear approximation to the conditional expectation function (Angrist and Pischke, 2009; Wooldridge, 2002).

We use two different indicators of trade union activity, (i) whether wages in a given occupation are determined by collective bargaining (at the industry-level, at the organization-level or at the workplace-level) or not, and (ii) whether or not there are union members in a given occupation in the worker's workplace. Note that the information on trade union activity and agency workers is obtained for each of the occupational groups in the workplace. Following Böheim and Booth (2004), we consider managers' responses on trade union activity to be the better indicator than workers' responses because workers might be less aware of whether or not there is a recognized union at their workplace, particularly if they are non-members.

Firms may use temporary agency workers for various reasons, such as to increase flexibility, to reduce cost or to adjust staffing levels to peaks in demand. We employ workplace-fixed effects to control for unobserved factors that make some firms more likely to hire agency workers than others. Additionally, we control for a vector of characteristics Z_{fj} measured at the occupation-level in a given firm, such as the importance of an occupational group as measured by the share of total employees in the group, and the composition of the workforce as measured by the share of female employees and the share of part-time employees.[6] We also include variables that measure the presence of fixed-term contract employees in the same occupation and workplace, the existence of work or joint consultative councils and the existence of a policy of guaranteed job security, which may imply higher labor turnover cost. [7] Furthermore, we use variables that describe the payment scheme, such as whether employees participate in a profit-related pay scheme, an individual or group performance-related pay scheme, and whether they are eligible for an employee share ownership scheme. We use two variables to control for the importance of specific versus general human capital in an occupational group, these indicate whether the firm conducts personality tests or performance tests when recruiting new workers.[8]

We have no plausible instrument to model the potential endogeneity of trade union activity. There may be unobserved workplace or occupation-level characteristics that make trade union activity and the employment of agency workers more likely in a

[6] We expect that the relative number of female (part-time) workers might be associated with the decision to hire agency workers because of higher absence rates due to family responsibilities (Ichino and Moretti, 2009).

[7] Work or joint consultative councils aim at discussing work- and pay-related issues between managers and employees. Since work councils also exist in non-unionized firms, we expect that this variable mainly captures the effect of employee involvement in non-unionized firms.

[8] Autor (2003) finds that agency workers predominantly work in occupations where general skills are more important than firm-specific skills. This finding is consistent with the evidence that agency workers receive less workplace training (Arulampalam et al., 2004; Booth et al., 2002), and that temporary work agencies provide free general training and lower wages to induce self-selection of high-ability workers and to facilitate worker screening (Autor, 2001).

certain workplace or occupation. Since our indicators of trade union activity and the use of agency workers are available for each 1-digit occupation, we can use a within-firm estimator to dispel at least part of the endogeneity. The within-firm estimator only uses variation across occupations within a workplace and controls for all unobserved workplace characteristics that are constant across occupational groups. However, this strategy does not remove endogeneity that is due to omitted occupation-level characteristics. If there are unobserved occupation-level characteristics that are correlated with trade union activity and the use of agency workers in an occupational group, our estimates merely reflect correlations. For example, it might be possible that product market shocks have distinct effects on short-term labor demand depending on the occupational group. If occupational groups with more volatile labor demand are more likely to be unionized and to use agency workers, workplace-fixed effects is no solution to the endogeneity problem. Because more volatile labor demand will generate more unstable employment patterns, and workers with interrupted careers are more difficult to organize, we believe that this argument is not problematic for our approach.[9]

We expect a negative relationship between trade union activity and the employment of agency workers, if the indirect effect that operates through the trade union's reduced bargaining power outweighs the direct effect, provided that trade unions are strong enough to fend off the hiring of agency workers. A positive association may indicate that trade unions welcome the hiring of agency workers because they realize a considerable rent for their members. Any relationship may also be due to reverse causality, for example, it might well be that agency workers are hired to curb strong trade unions or, alternatively, unions are not strong enough to prevent the hiring of agency workers rather them condoning the hiring of agency workers.

Another explanation for a negative relationship between unionization and the hiring of agency workers might be that high levels of temporary agency work lead to more trade union activity. Brown, Bryson and Forth (2008) document the fall of overall trade union recognition (for workplaces with more than 25 employees) from about 24 percent in 1998 to about 22 in 2004. Table 2 shows that the percentage of workplaces where managers confirm to have collective bargaining with trade unions in at least one occupational group has decreased from 16 percent in 1998 to 12 percent in 2004. A decrease can be observed for workplaces with and without temporary agency workers, however, the fall in collective bargaining was greater for workplaces with agency workers. Table 3 presents the mean fraction of union

[9] We are not aware of any empirical analysis of the relationship between trade union membership and the variance of labor demand.

members at workplaces with and without agency workers. Again, the decrease was greater for workplaces with agency workers than for those with no such workers.[10] Given this decrease in trade union activity, we consider high levels of temporary agency work leading to more trade union activity as an unlikely explanation.

3.2 Wage regression

We further investigate the different hypotheses by estimating wage regressions at the workers' level, where we control for trade union activity and the employment of agency workers in a given occupation:[11]

$$\ln w_{ifj} = \alpha + \beta X_{ifj} + \gamma Z_{fj} + \delta(TU \cdot TAW)_{fj} + \zeta F_f + \eta_j + \epsilon_{ifj}, \tag{2}$$

where w_{ifj} denotes the hourly wage of worker i employed at workplace f in occupation j, X_{ifj} and F_f are vectors of individual and workplace characteristics, Z_{fj} is a vector of occupation-level characteristics, including TU_{fj} (which is a binary variable that indicates trade union activity in the worker's occupation and workplace) and TAW_{fj} (which is equal to one if agency workers are employed in the worker's occupation), η_j is an occupation-fixed effect and ϵ_{ifj} is the error term. We also estimate the model with workplace-fixed effects. The interaction between TU_{fj} and TAW_{fj} allows the comparison of four different workplaces, workplaces where neither collective bargaining, nor agency work takes place (the base category) and workplaces where we observe either collective bargaining, or agency workers, or both. Our estimation sample consists of 10,448 workers in 1998 and 7,636 workers in 2004. Note that the model of hiring agency workers, equation (1) is estimated only using these occupational groups for which we observe workers in the worker-level sample used to estimate the wage regressions.[12] Since we do not observe a workplace or a worker in both years, we estimate our regressions separately for each year.

If trade unions do not object to the hiring of agency workers, we expect that pay levels for directly hired staff in unionized workplaces that use agency workers are greater than in unionized workplaces where no agency workers are hired. Therefore, we expect a positive coefficient on the interaction between our indicator of trade union activity and the presence of agency workers. On the other hand, if their

[10] We do not have a measure of union strength at the occupational level and cannot provide a more detailed view.

[11] Wages are the insiders' wages, we have no information on the agency workers' wages.

[12] We also estimate equation (1) for all available occupational groups and obtain results that are qualitatively similar to these presented here, but due to a larger sample size we obtain more statistically significant coefficients. These results are available on request.

bargaining power is not great enough to resist the hiring of agency workers, we expect a negative coefficient, i.e., unionized workplaces have lower wages in the presence of agency workers. It should, however, be noted, that a clear causal interpretation of the estimated coefficients is not possible since we have no plausible instrument to model the potential endogeneity of hiring agency workers, the decision to engage in collective bargaining, and the paid wages.

We control for a wide range of characteristics measured at the individual-, the occupation- and the workplace-level. Individual characteristics include characteristics used in wage regressions, such as gender, age, ethnicity, tenure, occupation, union membership, education, marital status and the presence of dependent children. Occupation-level characteristics are those described above. We also control for the industry and the region in which the workplace operates, the size of the workplace, whether or not the workplace is under foreign ownership (51% or more), and whether it is a single independent establishment or belongs to a larger organization. We expect that the current market situation determines whether a firm is using agency workers or not and include variables in our regressions that measure the competitive environment (whether the firm has five or less competitors or faces competition from more than five competitors), the size of the market (local, regional, national or international) and the current state of the market for the main product (growing, mature, declining, turbulent).

Table 4 provides summary statistics of our sample by the type of workplace. We see that the wages are on average greater in workplaces where agency workers are hired than in those where there are no agency workers — and that no significant differences are between them if we consider collective bargaining. Average wages are lowest in workplaces where we observe neither collective bargaining nor agency workers. The union density is greatest in workplaces with collective bargaining and no agency work, about 63 percent of workers report being union members. Workers in workplaces with collective bargaining and agency workers report a union density of about 54 percent. In contrast, in workplaces where no collective bargaining takes place only about 14 percent (with agency workers) and 11 percent (no agency workers) of workers report being a union member.

When comparing the socioeconomic characteristics of the workers across the four types of workplaces, we find that workers in workplaces with collective bargaining are more likely to be males, they are on average married more frequently, have dependent children, are slightly older and have longer tenures than workers in workplaces without collective bargaining. Workers in workplaces with collective bargaining and no agency workers are more likely to be "blue-collar" workers (crafts, operatives)

than in the workplaces with both CB and TAW, where clerical workers are the largest group. Clerical workers are also the largest group in those workplaces where there is no CB, but TAW. Notable is the higher incidence of temporary contracts in workplaces where there is no collective bargaining compared to the workplaces with collective bargaining.

4 Results

In Table 5 we present results from linear probability models of the use of temporary agency workers in private sector workplaces estimated at the occupation-level (equation (1)).[13]

For each year, we present six different specifications to investigate the association between trade union activity and the probability of hiring agency workers. All specifications control for occupation- and workplace-fixed effects (except columns (1) and (7)). The first two specifications, columns (1)-(2) and (7)-(8) use our preferred indicator for union activity, whether or not collective bargaining is used for wage setting in the occupation. For both years, we do not find statistically significant coefficients, no matter if we control for workplace-fixed effects or not. This implies that we cannot reject the null that unions have no association with the hiring of agency workers. A different measure of trade union activity, whether there are union members in the respective occupational group, provides the same result, the association between hiring agency workers is statistically insignificant in 1998 and 2004. (See columns (5) and (11).) Note however, that in both years most point estimates are positive, i.e., we find, if not a positive statistical significant association, certainly no negative association between the trade union strength and the hiring of agency workers.

The information available in WERS allows us to look at the bargaining process in more detail. Specification 3, columns (3) and (9), distinguishes between different forms of collective bargaining by the level of centralization (industry-level, organization-level, workplace-level). Again, we find neither in 1998 nor in 2004 any statistically significant associations between the propensity to hire agency workers and the centralization level of bargaining.[14] Specification 4, columns (4) and (10),

[13] We only tabulate the coefficients on the variables central to our arguments. All other estimated coefficients correspond to earlier findings, e.g., agency work is more prevalent in larger workplaces, and are available on request.

[14] When we use all available occupational groups to estimate equation (1) we find that collective bargaining at the workplace level is statistically significantly and positively associated with the hiring of agency workers.

uses the interaction between collective bargaining and information on the competitiveness of the product market. The existence of rents in the product market is a central condition for trade unions to achieve a wage (for their members) that is above the market rate (Booth, 1995). If trade unions welcome the hiring of agency workers, we expect that the association is stronger in firms that enjoy rents due to a lack of competition in the product market. However, we find the opposite, workplaces with collective bargaining in markets with few competitors are less likely to hire agency workers than workplaces with many competitors. This could be because more competition generally results in more pressure to reduce costs. The estimated coefficients are statistically insignificant for both types of workplaces in 2004, whereas in 1998, we do find a difference in the likelihood of hiring agency workers between workplaces with five or less and those with many competitors. Using the presence of union members in an occupational group as an indicator of trade union activity yields the same results. (See specification 6 in columns (6) and (12).)

Results from the wage regressions are tabulated in Table 6 for 1998 and Table 7 for 2004.[15] The interaction between trade union activity and agency workers allows the comparison of four different workplaces, workplaces where neither collective bargaining, nor agency work takes place (the base category) and workplaces where we observe either collective bargaining, or agency workers, or both.[16]

In columns (1)-(3) we use collective bargaining as the indicator for trade union activity. We present the estimates of the model without the interaction between collective bargaining and the use of agency workers in column (1). We find a significant trade union wage premium of 3.2 percent in 1998 (statistically significant at the 10%-error level). The employment of agency workers is, however, not associated with higher or lower wages in either year. Adding the interaction term to the specification yields different results and the estimates (column (2)) indicate that, in 2004, there was a significant wage premium of 6 percent for workers in occupations where agency workers were hired but wages were not determined by collective bargaining. Collective bargaining is associated with a statistically significant wage premium in occupations without agency workers in both years (3.8 percent in 1998 and 4.7 percent in 2004). The interaction term shows how the trade union wage premium differs between occupations with and without agency workers. For 2004, we find a statistically significant negative effect of 9.1 percent, indicating that the trade union wage premium is 9.1 percentage points lower in occupations with agency

[15] Detailed regression output is available on request.

[16] Note that the information on trade union activity and agency workers is obtained for each of the occupational groups in the workplace.

workers. This last result is evidence in favor of a view that agency workers are hired to curb strong trade unions or that unions are not strong enough to prevent the hiring of agency workers.

We replace the workplace characteristics by workplace-fixed effects and find a significant trade union wage premium of 6.6 percent for occupations without agency workers only in 1998. (Results are tabulated in column (3).) Although the other estimated coefficients are quantitatively lower and not statistically significant, the signs of the associations are the same as in the model with workplace characteristics only. Columns (7)-(9) present the estimates from using the presence of union members in an occupational group as the indicator of trade union activity, this yields similar results to those obtained above.

Columns (4)-(6) take a closer look at the wage determination and we distinguish between collective bargaining at the industry-level, the organization-level, and the workplace-level. We find a clear gradient in decentralized wage bargaining for workers in occupations without agency workers. Wages are higher when collective bargaining takes place at the workplace-level than when there is industry-wide bargaining. This result is compatible with models where decentralized bargaining leads to rent-sharing between firms and (strong) insiders, and where centralized bargaining, through the union's stronger focus on employment, leads to more equalized wage distributions (Barth and Zweimüller, 1995). However, the interaction terms between CB and TAW indicate that especially workplaces with bargaining at the workplace level have lower wages in the presence of agency workers. This, again, suggests that unions did not benefit from higher wages through the employment of agency workers, contrary to Fehr's (1990*a*) arguments.

5 Conclusion

We use British data from the Workplace Employment Relations Surveys 1998 and 2004 (WERS) which provide information on workplaces, their workers and on the human resource management for two cross-sections of British workplaces. We focus on private sector firms and investigate the association between trade union activity and the employment of temporary agency workers at the occupation-level.

We find a weak positive association between the propensity of hiring agency workers and union activity. This result appears puzzling as trade unions have been adamant in their rejection of temporary work agencies, typically because they undercut terms and conditions, undermine collective bargaining and supply strikebreakers.

In more detailed analysis, we have documented that in workplaces without agency workers, trade unions appear strong as we find a sizeable trade union wage premiums. In contrast, wages are considerably lower in workplaces where we observe both collective bargaining and the employment of agency workers.

We find that in competitive sectors, where costs aspects are arguably more important than in less competitive sectors, the employment of agency workers is positively associated with union activity. This positive association is most likely the outcome of an attempt to reduce union power as we find that wages are lower in workplaces where we observe both collective bargaining and the employment of agency workers than in workplaces with collective bargaining and no agency workers. It should, however, be noted, that a clear causal interpretation of our results is not possible since the recognition of unions for bargaining purposes is not exogenous. An alternative interpretation of our results is that high levels of temporary agency work lead to more trade union activity, however, given the decrease of trade union recognition, we consider this to be an unlikely explanation.

The results indicate that the employment of agency workers is carried out against the unions. Verma (2007) argues that it is the difficulty of selling workplace concessions politically that is the source of the resistance to workplace flexibility. Our estimates indicate that such an argument is justified as unions do not succeed in obtaining a wage premium for their cooperation with agency workers, as suggested by Fehr (1990*a*).

Figures and tables[17]

Figure 1: Share of workplaces with agency workers by occupation and year

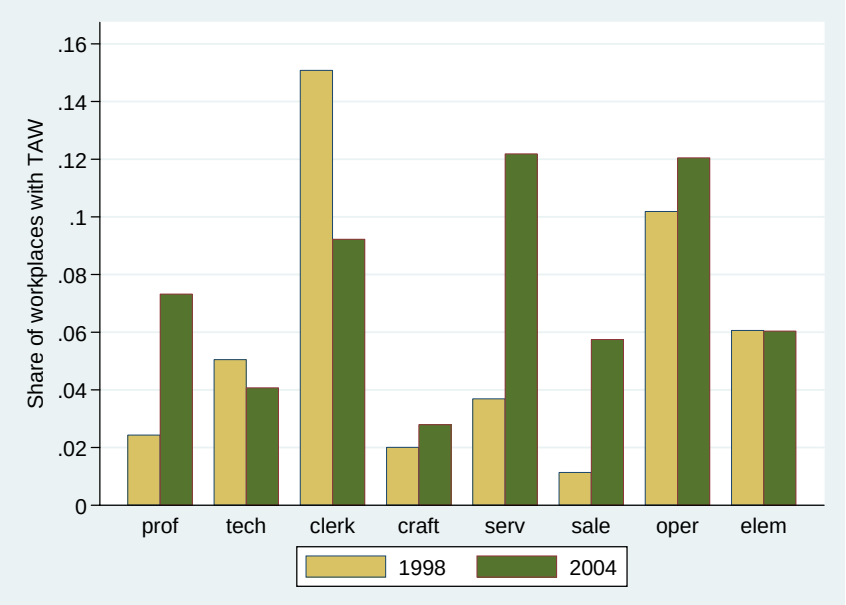

Table 1: Share of workplaces with agency workers in at least one occupation group

Year	1998	2004	Δ
All workplaces	0.16	0.14	-9%
-Without CB	0.13	0.13	0%
-With CB	0.27	0.22	-21%
N	966	855	

Note: CB=collective bargaining. Data from WERS 1998 and 2004 cross-sections. Private sector workplaces with 10 or more employees. Estimates account for complex survey design.

[17]Data from WERS 1998 and 2004 cross-sections. Only workplaces with 10 or more employees. Estimates account for complex survey design.

Table 2: Share of workplaces with collective bargaining in at least one occupation group

Year	1998	2004	Δ
All workplaces	0.16	0.12	-28%
-Without TAW	0.14	0.11	-24%
-With TAW	0.28	0.18	-38%
N	966	855	

Note: TAW=temporary agency workers. Data from WERS 1998 and 2004 cross-sections. Private sector workplaces with 10 or more employees. Estimates account for complex survey design.

Table 3: Share of union members within workplaces

Year	1998	2004	Δ
All workplaces	0.11	0.09	-16%
-Without TAW	0.10	0.09	-11%
-With TAW	0.14	0.10	-31%
N	966	855	

Note: TAW=temporary agency workers. Data from WERS 1998 and 2004 cross-sections. Private sector workplaces with 10 or more employees. Estimates account for complex survey design.

Table 4: Summary statistics.

	without CB without TAW mean (sd)	without CB TAW mean (sd)	CB without TAW mean (sd)	CB TAW mean (sd)
Individual-level characteristics (I=18,084):				
Hourly wage (log)	1.76	1.97	1.92	1.99
	(0.018)	(0.031)	(0.024)	(0.036)
Union member	0.11	0.14	0.63	0.54
Female	0.50	0.52	0.31	0.48
Married	0.62	0.62	0.72	0.70
Dependent child	0.34	0.34	0.43	0.40
Bad health status	0.05	0.04	0.07	0.05
Ethnicity:				
White	0.95	0.93	0.96	0.93
Black	0.01	0.02	0.01	0.01
Other	0.04	0.05	0.03	0.05
Age:				
Less than 20	0.07	0.04	0.03	0.03
20-29	0.25	0.29	0.17	0.22
30-39	0.25	0.24	0.29	0.28
40-49	0.20	0.22	0.25	0.25
50-59	0.18	0.17	0.22	0.18
60 or more	0.05	0.03	0.04	0.03
Education:				
Postgraduate degree	0.04	0.04	0.03	0.03
Degree or equivalent	0.14	0.17	0.08	0.13
A level or equivalent	0.13	0.16	0.10	0.14
O level or equivalent	0.26	0.27	0.26	0.32
Cse or equivalent	0.13	0.12	0.15	0.13
Other	0.03	0.03	0.03	0.03
None of these	0.26	0.20	0.32	0.21
Vocational training	0.44	0.48	0.46	0.45
Tenure:				
Less than 1 year	0.22	0.22	0.11	0.14
1 to less than 2 years	0.15	0.16	0.09	0.10
2 to less than 5 years	0.26	0.24	0.20	0.23
5 to less than 10 years	0.19	0.20	0.21	0.20
10 years or more	0.18	0.19	0.38	0.33
Temporary contract	0.07	0.07	0.04	0.03
Training in last 12 months	0.55	0.57	0.51	0.60
Occupation:				
Professional	0.11	0.10	0.06	0.06
Ass. professional and technical	0.09	0.07	0.07	0.09
Clerical and secretarial	0.18	0.42	0.11	0.41
Craft and skilled service	0.12	0.06	0.22	0.09
Personal and protective service	0.06	0.03	0.02	0.01
Sales	0.17	0.07	0.11	0.01
Operative	0.12	0.16	0.32	0.22
Elementary	0.15	0.09	0.08	0.11
Occupation-level characteristics (J=4,746):				
Collective bargaining at industry-level	0	0	0.28	0.20
Collective bargaining at organisation-level	0	0	0.45	0.48
Collective bargaining at workplace-level	0	0	0.27	0.31
Union members	0.08	0.13	0.62	0.62

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Table 4 — *continued from previous page.*

	without CB without TAW mean (sd)	without CB TAW mean (sd)	CB without TAW mean (sd)	CB TAW mean (sd)
Work council	0.12	0.28	0.22	0.38
Fixed-term contract employees	0.11	0.18	0.09	0.26
Policy of guaranteed job security	0.06	0.03	0.16	0.25
Profit-related payments or bonuses	0.25	0.34	0.43	0.45
Performance-related pay schemes	0.16	0.19	0.19	0.28
Employee share ownership schemes	0.11	0.23	0.31	0.38
Performance tests	0.22	0.30	0.31	0.36
Personality tests	0.10	0.08	0.18	0.17
Share of part-time employees	0.28	0.18	0.23	0.15
	(0.018)	(0.027)	(0.031)	(0.036)
Share of female employees	0.53	0.60	0.40	0.52
	(0.017)	(0.030)	(0.034)	(0.049)
Percentage of employees	0.33	0.38	0.40	0.41
	(0.010)	(0.024)	(0.023)	(0.033)
Workplace-level characteristics (F=1,821):				
Employment (log)	3.07	3.62	3.33	4.40
	(0.027)	(0.091)	(0.102)	(0.182)
Competition:				
Five or less competitors	0.32	0.32	0.31	0.40
Many competitors	0.56	0.55	0.55	0.51
Missing	0.12	0.13	0.15	0.09
Current state of market for main product:				
Growing	0.43	0.43	0.37	0.51
Mature	0.16	0.16	0.26	0.22
Declining	0.12	0.16	0.11	0.07
Turbulent	0.18	0.12	0.10	0.12
Missing	0.11	0.13	0.15	0.08
Market for main product:				
Local	0.42	0.19	0.46	0.16
Regional	0.14	0.13	0.08	0.08
National	0.23	0.29	0.16	0.34
International	0.10	0.28	0.16	0.34
Missing	0.11	0.12	0.15	0.08
Single independent firm	0.49	0.36	0.18	0.05
Foreign owned/controlled	0.05	0.24	0.03	0.25
Industry:				
Manufacturing	0.13	0.22	0.24	0.49
Electricity, gas and water	0.00	0.00	0.01	0.02
Construction	0.06	0.02	0.13	0.02
Wholesale and retail	0.29	0.24	0.22	0.05
Hotels and restaurants	0.10	0.04	0.02	0.07
Transport and Communication	0.05	0.03	0.07	0.09
Financial services	0.02	0.06	0.14	0.14
Other business services	0.16	0.23	0.02	0.05
Education	0.02	0.02	0.05	0.00
Health	0.12	0.14	0.04	0.05
Other community services	0.04	0.01	0.05	0.01
Non-trading sector	0.11	0.12	0.15	0.08
Region:				
North East	0.05	0.02	0.03	0.05
North West	0.12	0.08	0.14	0.10

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Table 4 — *continued from previous page.*

	without CB without TAW mean (sd)	without CB TAW mean (sd)	CB without TAW mean (sd)	CB TAW mean (sd)
Yorkshire & the Humber	0.08	0.08	0.05	0.20
East Midlands	0.06	0.06	0.08	0.07
West Midlands	0.14	0.03	0.14	0.06
East of England	0.09	0.10	0.10	0.12
London	0.08	0.22	0.05	0.06
South East	0.18	0.23	0.13	0.19
South West	0.09	0.11	0.12	0.06
Scotland	0.09	0.06	0.12	0.06
Wales	0.02	0.01	0.03	0.03

Note: CB=collective bargaining, TAW=temporary agency workers. Data from WERS 1998 and 2004 cross-sections. Workplaces with 10 or more employees. Estimates account for complex survey design.

Table 5: Estimated probabilities of hiring agency workers.

	1998						2004					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
CB	0.036	-0.026					0.018	0.031				
	(0.024)	(0.078)					(0.023)	(0.084)				
CB at industry-level			0.039						0.001			
			(0.039)						(0.072)			
CB at organisation-level			0.004						0.053			
			(0.069)						(0.140)			
CB at workplace-level			-0.124						0.014			
			(0.161)						(0.094)			
CB in firms with 0-5 competitors				-0.202						0.052		
				(0.145)						(0.067)		
CB in firms with >5 competitors				0.073+						0.007		
				(0.041)						(0.196)		
UM					0.059						0.017	
					(0.040)						(0.041)	
UM in firms with 0-5 competitors						-0.015						0.017
						(0.045)						(0.052)
UM in firms with >5 competitors						0.095+						0.014
						(0.056)						(0.068)
Observations	2664	2664	2664	2664	2664	2664	2082	2082	2082	2082	2082	2082
Number of workplaces	966	966	966	966	966	966	855	855	855	855	855	855
R-squared	0.090	0.138	0.141	0.147	0.141	0.145	0.061	0.094	0.094	0.094	0.094	0.094
Occupation-level characteristics	x	x	x	x	x	x	x	x	x	x	x	x
Occupation-fixed effects	x	x	x	x	x	x	x	x	x	x	x	x
Workplace-fixed effects		x	x	x	x	x		x	x	x	x	x

Note: CB=collective bargaining, UM=union members. The sample consists only of occupation groups for which we observe workers in the worker-level samples. All estimations except those in column (1) and (7) are workplace- and occupation-fixed effects linear probability models. All regressions include the following occupation-level characteristics: percentage of employees, presence of work council, fraction of part-time employees, fraction of female employees, any fixed-term contract employees, policy of guaranteed job security, profit-related payments or bonuses, employee share ownership schemes, individual or group performance-related pay schemes, use of performance tests and use of personality tests.
$**$: $p<0.01$, $*$: $p<0.05$, +: $p<0.1$. Robust standard errors (clustered at the workplace level) in parentheses.

Table 6: Wage regressions of directly hired workers in 1998.

1998	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
TAW	-0.002	0.010	0.007	-0.002	0.012	0.006	-0.004	0.018	0.022
	(0.016)	(0.020)	(0.019)	(0.016)	(0.020)	(0.019)	(0.016)	(0.021)	(0.020)
CB	0.032+	0.038+	0.066+						
	(0.018)	(0.020)	(0.038)						
CB * TAW		-0.030	-0.020						
		(0.028)	(0.031)						
CB at the industry-level				0.016	0.023	0.123			
				(0.047)	(0.050)	(0.093)			
CB at the organisation-level				0.026	0.024	0.042			
				(0.022)	(0.024)	(0.046)			
CB at the workplace-level				0.049*	0.067*	0.054+			
				(0.023)	(0.027)	(0.031)			
CB at the ind.-level * TAW					-0.056	0.065			
					(0.091)	(0.050)			
CB at the org.-level * TAW					0.002	0.002			
					(0.036)	(0.041)			
CB at the wkp.-level * TAW					-0.076*	-0.039			
					(0.038)	(0.036)			
UM							0.050**	0.056**	0.057*
							(0.018)	(0.019)	(0.026)
UM * TAW								-0.041	-0.052+
								(0.028)	(0.028)
Observations	10448	10448	10448	10448	10448	10448	10448	10448	10448
R-squared	0.597	0.597	0.721	0.597	0.598	0.721	0.598	0.598	0.721
Individual-level characteristics	x	x	x	x	x	x	x	x	x
Occupation-level characteristics	x	x	x	x	x	x	x	x	x
Occupation-fixed effects	x	x	x	x	x	x	x	x	x
Workplace-level characteristics	x	x		x	x		x	x	
Workplace-fixed effects			x			x			x

Note: TAW=temporary agency workers, CB=collective bargaining, UM=union members. All regressions include individual-level and occupation-level characteristics. Columns (3), (6) and (9) include workplace-fixed effects, the remainder includes workplace-level characteristics. Individual-level characteristics are occupation, tenure (5 groups), training, temporary contract, union membership, age (6 groups), formal educational level (7 groups), vocational training, ethnicity (3 groups), gender, bad health status, married, presence of a dependent child an missing dummies as additional regressors. Occupation-level characteristics are the percentage of employees, presence of work councils, share of part-time employees, share of female employees, any fixed-term contract employees, policy of guaranteed job security, profit-related payments or bonuses, employee share ownership schemes, individual or group performance-related pay schemes, use of performance tests and use of personality tests in each occupation group. Workplace-level characteristics are size of the establishment (log), industry dummies, region dummies, single independent establishment, foreign ownership, trading sector, competition (less than five competitors, many competitors), current state of market for main product (growing, mature, declining, turbulent), market for main product (local, regional, national, international).
**: p<0.01, *: p<0.05, +: p<0.1. Robust standard errors (clustered at the workplace level) in parentheses.

Table 7: Wage regressions of directly hired workers in 2004.

2004	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
TAW	0.030	0.060*	0.019	0.029	0.061*	0.020	0.026	0.079**	0.007
	(0.019)	(0.024)	(0.028)	(0.019)	(0.024)	(0.028)	(0.020)	(0.028)	(0.032)
CB	0.026	0.047*	0.034						
	(0.020)	(0.023)	(0.038)						
CB * TAW		-0.091**	-0.022						
		(0.034)	(0.037)						
CB at the industry-level				-0.000	0.006	-0.049			
				(0.032)	(0.035)	(0.075)			
CB at the organisation-level				0.031	0.052+	0.136*			
				(0.024)	(0.026)	(0.067)			
CB at the workplace-level				0.035	0.066+	0.013			
				(0.031)	(0.038)	(0.047)			
CB at the ind.-level * TAW					-0.040	0.053			
					(0.057)	(0.062)			
CB at the org.-level * TAW					-0.089*	-0.068			
					(0.045)	(0.052)			
CB at the wkp.-level * TAW					-0.113*	-0.009			
					(0.050)	(0.046)			
UM							0.027	0.049**	0.054*
							(0.018)	(0.019)	(0.025)
UM * TAW								-0.107**	-0.007
								(0.034)	(0.042)
Observations	7636	7636	7636	7636	7636	7636	7636	7636	7636
R-squared	0.572	0.573	0.691	0.572	0.573	0.692	0.572	0.574	0.691
Individual-level characteristics	x	x	x	x	x	x	x	x	x
Occupation-level characteristics	x	x	x	x	x	x	x	x	x
Occupation-fixed effects	x	x	x	x	x	x	x	x	x
Workplace-level characteristics	x	x		x	x		x	x	
Workplace-fixed effects			x			x			x

Note: TAW=temporary agency workers, CB=collective bargaining, UM=union members. All regressions include individual-level and occupation-level characteristics. Columns (3), (6) and (9) include workplace-fixed effects, the remainder includes workplace-level characteristics. Individual-level characteristics are occupation, tenure (5 groups), training, temporary contract, union membership, age (6 groups), formal educational level (7 groups), vocational training, ethnicity (3 groups), gender, bad health status, married, and presence of a dependent child and missing dummies as additional regressors. Occupation-level characteristics are the percentage of employees, presence of work councils, share of part-time employees, share of female employees, any fixed-term contract employees, policy of guaranteed job security, profit-related payments or bonuses, employee share ownership schemes, individual or group performance-related pay schemes, use of performance tests and use of personality tests in each occupation group. Workplace-level characteristics are size of the establishment (log), industry dummies, region dummies, single independent establishment, foreign ownership, trading sector, competition (less than five competitors, many competitors), current state of market for main product (growing, mature, declining, turbulent), market for main product (local, regional, national, international).
**: p<0.01, *: p<0.05, +: p<0.1. Robust standard errors (clustered at the workplace level) in parentheses.

References

Abraham, Katharine G and Susan K Taylor (1996), 'Firms' use of outside contractors: Theory and evidence', *Journal of Labor Economics* **14**(3), 394–424.

Angrist, Joshua D. and Jörn-Steffen Pischke (2009), *Mostly harmless econometrics*, Princeton University Press, Princeton: New Jersey.

Arulampalam, Wiji, Alison L. Booth and Mark L. Bryan (2004), 'Training in Europe', *Journal of the European Economic Association* **2**(2—3), 346–360.

Autor, David H. (2001), 'Why do temporary help firms provide free general skills training?', *Quarterly Journal of Economics* **116**(4), 1409—1448.

Autor, David H (2003), 'Outsourcing at will: Unjust dismissal doctrine and the growth of temporary help employment', *Journal of Labor Economics* **21**, 1–42.

Barth, Erling and Josef Zweimüller (1995), 'Relative wages under decentralized and corporatist bargaining systems', *The Scandinavian Journal of Economics* **97**(3), 369–84.

Böheim, René and Alison L. Booth (2004), 'Trade union presence and employer-provided training in Great Britain', *Industrial Relations* **43**(3), 520–545.

Booth, Alison L. (1995), *The economics of the Trade Union*, Cambridge University Press.

Booth, Alison, Marco Francesconi and Jeff Frank (2002), 'Temporary jobs: stepping stones or dead ends', *The Economic Journal* **112**, F189–F213.

Brown, Willy, Alex Bryson and John Forth (2008), 'Competition and the Retreat from Collective Bargaining', *NIESR Discussion Paper No. 318* . http://www.niesr.ac.uk/pdf/210808_110817.pdf.

Cahuc, Pierre and André Zylberberg (2004), *Labor Economics*, MIT Press, Cambridge: Massachusetts.

Coe, Neil M., Jennifer Johns and Kevin Ward (2008), 'Agents of casualization? The temporary staffing industry and labour market restructuring in Australia', *Journal of Economic Geography* .

DTI (1999), 'Workplace Employee Relations Survey, 1998: Cross-Section 1998 [computer file]. 4th ed.'. Department of Trade and Industry. Colchester: The Data Archive [distributor], 22 December 1999. SN:3955.

DTI (2005), 'Workplace Employment Relations Survey, 2004: Panel Survey 1998-2004 [computer file]'. Department of Trade and Industry. Colchester: The Data Archive [distributor], 21 December 2005. SN:5294.

Fehr, Ernst (1990*a*), 'Cooperation, Harassment, and Involuntary Unemployment: Comment', *The American Economic Review* **80**, 624–630.

Fehr, Ernst (1990*b*), 'Union power and (un)employment', *Labour* **4**(2), 77–104.

Gramm, L and J F Schnell (2001), 'The use of flexible staffing arrangements in core production jobs', *Industrial and Labor Relations Review* **54**, 245–58.

Heery, Edmund (2004), 'The trade union response to agency labour in Britain', *Industrial Relations Journal* **35**(5), 434–450.

Heywood, John S., W. Stanley Siebert and Xiangdong Wei (2006), 'Examining the determinants of agency work: Do family friendly practices play a role?', *IZA discussion papers No. 2413* . IZA, Bonn, ftp.iza.org/dp2413.pdf.

Houseman, Susan N (2001), 'Why employers use flexible staffing arrangements: Evidence from an establishment survey', *Industrial and Labor Relations Review* **55**(1), 149–70.

Ichino, Andrea and Enrico Moretti (2009), 'Biological gender differences, absenteeism and the earning gap', *American Economic Journal: Applied Economics, forthcoming* .

Lindbeck, Assar and Dennis Snower (2002), 'The Insider-Outsider Theory: A Survey', *IZA discussion papers No. 534* . IZA, Bonn, http://ftp.iza.org/dp534.pdf.

Olsen, Karen M. and Arne L. Kalleberg (2004), 'Non-Standard Work in Two Different Employment Regimes: Norway and the United States', *Work, Employment & Society* **18**, 321 – 348.

Purcell, John, Kate Purcell and Stephanie Tailby (2004), 'Temporary Work Agencies: Here Today, Gone Tomorrow?', *British Journal of Industrial Relations* **42**(4), 705–725.

Singh, Parbudyal and Harish C. Jain (2001), 'Striker Replacements in the United States, Canada, and Mexico: A Review of the Law and Empirical Research', *Industrial Relations* **40**(1), 22–53.

TUC (2003), 'Agency work in Britain today'. Trades Union Congress. http://www.tuc.org.uk/law/tuc-6676-f0.pdf.

Verma, Anil (2007), What do unions do to the workplace? Union effects on management and HRM policies, *in* J. T.Bennet and B. E.Kaufmann, eds, 'What do unions do? A twenty year perspective', Transaction Publishers, pp. 275–310.

Willman, Paul and Alex Bryson (2007), 'Union organization in Great Britain', *Journal of Labor Research* **28**(1), 93–115.

Wooldridge, Jeffrey M. (2002), *Econometric Analysis of Cross Section and Panel Data*, MIT Press.