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The Incidence and Outcomes of Industrial Action: New Evidence from the 2019 European Company Survey

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The Incidence and Outcomes of Industrial Action: New Evidence from the 2019 European Company Survey

Abstract

Using the 2019 ECS, we investigate the relationship between union organization, workplace representation, industrial relations quality and strike incidence. We also consider some six issues behind the most recent instances of industrial action or threatened industrial action and their outcomes. Strike incidence is found to be elevated in establishments where union density is higher and where workers are covered by mixed-level collective agreements. Distrust and strained workplace relationships are associated with increased strike incidence, and the converse for an employee-focused business strategy and heightened employee motivation. In discussing the outcomes of different types of industrial action or threatened industrial action specific to the establishment, a distinction is drawn between worker wins, worker retractions/losses, and win-win outcomes, where the default is unresolved outcomes. Higher union density is associated with worker wins, collective bargaining with balanced agreements, and there is now some suggestion that works councils may play a moderating role.

JEL-Codes: J510, J520, J530.

Keywords: strikes, areas and outcomes of conflict, union organization, worker representation, employee-focused strategies, trust, quality of industrial relations.

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1 Introduction

Although strikes have long been topics in industrial relations and labor economics, empirical interest in them has waned with the withering away of the strike, even if strike models can be tasked with explaining strike evanescence as well as resurgence (Kaufman, 1982; Campolieti, 2021). Meantime, there has been heightened interest in the potential contribution of the quality of labor relations to firm performance outcomes (Laroche, 2021) and indeed unemployment (Blanchard and Philippon, 2004). One aim of the present treatment is to seek to narrow this ‘gap’ by taking advantage of the most recent European Company Survey (ECS) for 2019. This fourth edition of the survey contains information supplied by over 21,000 human resources managers and more than 3,000 employee representatives in the 27 Member States of the European Union and the United Kingdom. In addition to providing data on industrial action, the survey covers a wide range of establishment practices and strategies having to do with work organization, human resource management, skills utilization and development, and employee involvement in organizational decision-making. In addition to providing data on industrial action, the latter topic of workplace social dialogue also identifies management opinions, preferences, and trust, as well as distinct types of formal workplace representation.

Use of the 2019 ECS permits a number of innovations to be introduced into the analysis of worker representation and strike incidence beyond the standard focus on union organization (Kaufman, 2004; Jansen, 2014). In the first place, it permits a distinction to be drawn between works councils and analogous bodies on the one hand and union agencies on the other. Secondly, we can introduce a broader and more practical distinction between type of workplace representation based not on a particular institutional form but rather on organizational dysfunction, proxied for example by a lack of trust on the part of management in the worker representation body and vice-versa. Relatedly, we can also examine the recent argument that an *employee-focused business strategy* is a moderating variable in the relationship between union density and organizational outcomes by signaling management’s intentions to cooperate, eliciting a response in kind on the part of the workforce. Finally, we can exploit information on the outcomes of the most recent episode of localized industrial action (or threat of industrial action) both by issue and outcomes to explore commonalities with and departures from the strike incidence model.

2 Backdrop to Strikes and Workplace Representation

2.1 Strike Incidence

One obvious theme in addressing strikes has been organization, since without organization workers lack the ability to undertake collective action. Organization has traditionally been linked

to the presence of unions (e.g. Wheeler, 1984) and the capacity to strike has been held to be increasing in union membership (Kaufman, 1982). However, the association between union membership and strike incidence is mediated by a range of factors. We earlier identified one such factor as an employee-focused business strategy (Pohler and Luchak, 2015). It has also been reported that higher membership is associated with higher strike incidence only when interunion union competition or multi-unionism is low (but see Machin et al., 1993, and Akkerman, 2008, on the importance of independent bargaining authority in his regard).¹ Nevertheless, the general point about union organization being a prerequisite for strikes holds, although a distinction between different types of workplace representation has yet to be made (see the discussion in the next subsection).

There are a number of distinct economic theories of strike activity. Our priors have a basis in bargaining models and in particular Pareto optimal accident theories that incorporate asymmetric information and imperfect information.² Of these the best-known treatment is that of Hicks (1963), who argued that the employer's tendency to make concessions in wage bargaining and the union's resistance to offering concessions are respectively directly and inversely related to the expected duration of a strike. If both parties are equally well informed about the other's concession curve there will be no strike, and a determinate solution will be found in wage-expected length of strike space where the two curves intersect. The existence of strikes in the model is attributed to asymmetric information and incomplete information and hence miscalculation on the part of either or both sides as to the location and shape of the other's concession curve, namely to the difficulty in gathering information about the other side's intentions. Hicks' insights on misjudgments of the bargaining parties as to the shape and location of the other's concession curve have been expanded upon by Mauro (1982), who specifically argues that such miscalculations may stem from the parties using the same variables to derive their own schedule *and*, incorrectly, that of the other party. Specifically, he gives the example of employers (unions) using the product (consumer) price in deriving their concession (resistance) curve, where these choices reflect product demand and labor supply considerations, respectively. The result is that the employer anticipates a downwardly shifted union resistance curve and the

¹ Additional complications in this union organization framework include differences in union membership effects across countries and the interplay between the characteristics of national union systems and establishment or company-level effects of union organization and the trend towards decentralization (see Jensen, 2014).

² Note that the well-known political model of strikes of Ashenfelter and Johnson (1969) is not a bargaining model but rather a case of firm profit maximization subject to a given union concession curve that incorporates the unrealistic expectations of union members that are only eroded by the loss of wage income attendant upon a strike. Nevertheless, Card (1990: 410) has observed that this lack of information among union workers lays "the framework for later one-sided asymmetric information models" where there is unequal access of the parties to the same information

union an upwardly shifted employer concession curve. The larger the disparity between the two equilibrium wages, as it were, the more likely are strikes.

In similar vein, it has also been argued that strike incidence can be linked to traffic accidents in the sense that although any single accident is unforeseen the probability of having an accident is anticipated and is a consequence of rational choice. Just as drivers balance the costs of time savings against the cost of an accident, Siebert and Addison (1981) argue that negotiators will choose a negotiating period and with it an associated wage increase and strike probability that maximizes incomes net of negotiating costs and expected strike losses.

In addition to the basic prediction that strikes should be higher when density is higher – and the more extensive organizational strength arguments of Jansen (2014: 62-67) – some predictions of the accident model(s) are as follows. First, intervals or firms in which there are cheaper channels of communication should evince lower strike probability. Smaller firms should have a lower strike risk because it is easier for the parties to communicate. Here the contrast is with the greater number of communication links in large firms. Second, periods or firms in which there is less to communicate should exhibit lower strike probability. An example would be intervals of above-average unemployment when the bargaining options are more narrowly defined. Similarly, pay systems that reward workers by time rather than by piece put a lower strain on the communications apparatus. Negotiations over piece rates not only tend to be complicated, involving setting of standard times, learning periods, and allowances for interruptions in supply. Third, there is the suggestion that an increase in the costs of striking should lead to reduced strike activity, insofar as both parties are affected, because of the incentive to acquire more information in these circumstances. Finally, periods or firms in which there are surprising deteriorations in power should be associated with greater strike probability because the habitual allowance made for bargaining mistakes will be too small.

2.2 Workplace Representation

Economic models have been criticized for their restricted focus and notably for ignoring behavioral factors (Godard, 1990). As noted by Campolieti et al. (2005: 611) models in the behavioral tradition see strikes as “sometimes involving the mobilization of workers by appeals to their conceptions of fairness and legitimacy,” citing as cases in point issues of suspicion and hostility stemming from management decisions and practices. Interestingly, the collective voice model has been interpreted in this connection as offering an integration of economic and behavioral interpretations of strikes, while continuing to be used by economists to make an efficiency case for unionism.

Contrary to the view of *unions* as combinations in restraint of trade, developments in contract theory were to make an efficiency case for unions in labor markets characterized by long-term relations in which contracts are often incomplete and open ended. Specifically, the

characterization of the union as a commitment device was first advanced by Malcomson (1983) in discussing a situation in which uncertainty in the form of product market demand shocks encourages the use of *contingent* contracts to allocate risk between risk-averse employers and workers. Although such contracts are unenforceable because neither the courts nor the workers can observe the state of the world, unions can provide workers with more accurate information about the state of nature. Coordinated action via the union may thus permit workers to enforce an efficient, state contingent contract.³

The better-known theoretical construct in examining the union role is provided by the collective voice model of Freeman and Medoff (1984). Before addressing some specifics of the model, however, its wider context should be noted. In particular, the model is more properly described as a *collective voice-institutional response* model. The potential gains pointed to by the model can be thwarted by an unfavorable response on the part of management to collective bargaining, or by an adverse reaction of the union to any consequent reorganization of the work process.

A key aspect of collective voice is the union role in providing information on worker preferences and sources of discontent. Collective voice may outperform individual voice for a variety of reasons. One is the public goods aspect of the workplace. Non-rival consumption of shared working conditions and common workplace rules create a public goods problem of preference revelation. Without some collective form of organization, there will be too little incentive for the individual to reveal his or her preferences since action of the part of others may produce the public good at no cost to that individual. Unions collect information on the preferences of all workers and *aggregate* them to determine the social demand for such goods. Substituting average preferences for marginal preferences and arbitraging them may be efficient: any reduction in quits will lower hiring and training costs and increase firm-specific capital and may also occasion less disruption in the functioning of work groups.

The other principal aspect of collective voice is *governance*, which refers to the policing or monitoring of incomplete employment contracts containing employer promises that are not explicitly spelled out. Freeman and Medoff (1984) contend that the presence of a union specializing in information about the contract and in the representation of workers can make it easier to engage in long-term efficient contracting by preventing employers from engaging in opportunistic behavior. For example, workers may withhold effort and cooperation when the employer cannot credibly commit to take their interests into account. Fearing dismissal, they may be unwilling to disclose information facilitating pro-productive innovations at the workplace. The

³ More concretely, in the idiosyncratic exchange variant of contract theory a specific role is reserved for unions in discussing monitoring and auditing procedures (Riordan and Wachter, 1983). See also Hogan (2001).

formation of a union and the introduction of a system of industrial jurisprudence is one means of protecting employees and generating worker cooperation. The link with contract theory is explicit.

Although employer malfeasance can be deterred by a union with credible threat power, the solution necessarily poses a potential hold-up problem. Against this backdrop, Freeman and Medoff (1984) embark on a comprehensive empirical analysis of unionism's economic effects. In both their own empirical analysis and that spawned by *What Do Unions Do?* little emphasis has been accorded the strike outcome. Interestingly, however, the issue of how unions and management interact at the workplace is nicely illustrated in the macroeconomic performance model of Blanchard and Philippon (2004), where it is argued that the more unions and firms share a common economic model the faster learning and adjustment are likely to be. The authors instrument industrial relations quality by strike intensity and report that countries with one standard deviation better quality had about 1 percentage point lower unemployment than the average OECD country over 1965-74, improving to about 2-2.5 percentage points less in 1995-2002.

As a matter of fact, subsequent development of the collective voice model has sought to accommodate rent seeking behavior. Freeman and Lazear (1995) argue that although codetermination (specifically, the institution of the works council and its joint governance power at the workplace) is the exemplar of collective voice, it will be underprovided by the market because institutions that give power to workers will affect the distribution as well as the size of the joint surplus. It is therefore argued that some means of third-party regulation limiting bargaining power has therefore to be found if the societal benefits of worker voice are to be realized. Examples might include 'peace obligations' and formal restrictions on wage bargaining unless authorized by the relevant industry-level or regional collective bargaining agreement.

In the light of the above, the potential decoupling of production from distribution issues is suggestive of a more positive role for works councils than their union workplace counterparts, and the German *Betriebsrat* in particular has increasingly been credited with having a favorable impact of firm performance (Mueller and Stegmeier, 2017; Addison et al., 2017). However, this outcome would seem to depend on a variety of moderating factors to include sectoral collective bargaining, firm management that evinces a positive attitude toward employee participation, a qualified labor force, and the passage of time (i.e. a learning process).

In an important postscript, it has recently been argued by Pohler and Luchak (2015) that the insights of the collective voice model are limited by its failure to recognize that both faces of unionism – monopoly and voice – are rooted in the strength of the union itself, a duality from which it is implied that union impact must be subject to the moderating effect of some third factor. The authors focus on the dilemma of cooperation given uncertainty as regards the intentions of the other party. In a world of bounded rationality and imperfect information, a management (union) that, say, cooperates with a union (management) that chooses to 'compete' risks its very

survival. They propose that the stronger is a union the greater its ability to deliver a solid and consistent message of either competition or cooperation on the part of its membership. Further, a management which signals a clear intention to cooperate meaningfully will encourage the union to respond in kind, thereby lessening the prospect of observing negative outcomes and heightening the prospect of positive effects. What is meant by a clear intent to cooperate is, as noted earlier, the adoption of an *employee-focused business strategy*.

Pohler and Luchak deploy a measure of this intention to cooperate that is constructed from scale questions seeking to establish the strategic commitment of management to making one-sided or asymmetric investments in its labor force. A factor analysis of all such questions yielded a set of three items that when clustered together displayed a high level of internal consistency. These items were *increasing employees' skills*, *increasing employees' involvement /participation*, and *enhancing labor-management cooperation*. The next step was to examine the relationship between union density (and union density interacted with this clustered measure of an employee focused business strategy) and workplace conflict. The results of this exercise suggested that while union density was positively associated with the level of workplace conflict the interaction term between density and the intention to cooperate variable was strongly negative, consonant with the proposition that an employee-focused strategy can mitigate the negative effects of unions and enhance their positive effects.

In the present analysis, in addition to considering the role of the works council we shall construct our equivalent of an employer-focused business strategy based on a composite measure of employee influence over the organization and efficiency of work processes, training and skill development, and working time arrangements.

3 The Data

Our data were extracted from the fourth wave of the European Company Survey (ECS), with the two relevant responses – from management (the MM survey) and employee representative (the ER survey) – being generously supplied in a single file by the Eurofoundation research team. The two component surveys offer a detailed inquiry on a wide array of company/establishment policies and practices across all European Union countries and the United Kingdom, including the type and functioning of employee representation at plant level.

We have in practice three distinct original samples: sample A, made up of establishments with responses from management *and* the employee representative (1,814 observations); sample B, comprising establishments with ER responses only (1,246 observations); and sample C, containing establishments with MM responses only (20,063 observations). Our analysis will focus on the merged sample, A, as the key variables described below require information from both respondents.

Management responses were obtained from a human resource manager, where the respondent is typically the most senior person in charge of human resources in the establishment. The ER respondent is a senior member of the leading employee representation body present at the establishment. Clearly, the number of original responses in the ER survey is lower than in the MM survey. Firstly, and most obviously, employee representation is not present in all workplaces. Secondly, it may be the case that management fails (or refuses) to identify the employee representative in question. Finally, the employee representative may fail or refuse to answer the questionnaire due to new rules on data privacy and security under the General Data Protection Regulation (GDPR).⁴

The information on the type of workplace representation is based on the ER questionnaire and on a pre-defined grid that classifies employee representation as ERTYPE_A through ERTYPE_H (see Eurofound and Cedefop, 2020, Annex, pp. 151-153). Based on this grid an establishment is then defined as having a formal trade union (works council) body if the respondent (i.e. the ER interviewee) is a member of ERTYPE_A or ERTYPE_B (ERTYPE_C or ERTYPE_D). According to this rule, if there is a unique union (works council) representation at the workplace, then the respondent is necessarily from the union (works council); and if the union and works council agencies coexist at the workplace and the employee representative respondent is from former (latter) body, then the union (works council) is adjudged to be more influential and the correspondingly status allocated. This interpretation is based on the fact that interviews are conducted with the employee representative who represents the largest number of employees in the establishment. Finally, if the respondent is a member of ERTYPE_E through ERTYPE_H the establishment is classified as having an informal body that is either essentially ad hoc or deals with purely occupational health and safety issues. The latter classification comes at a cost because its use further reduces the sample. As we prefer to focus on establishments with formal representation, we discard these latter cases.

From the ER questionnaire we also extracted information on establishment union density, as well as a variety of aspects related to employee representation, namely the quality of information provided by and frequency of meetings with management, as described in Appendix Table 1. In the interest of avoiding an excessive reduction in the estimation sample we will in practice use only a restricted set of ER-based variables, although the key information on strike incidence is taken from the ER Survey as well. Specifically, we generate the strike incidence variable based on question #65/actstrike, defined as a 1/0 dummy, taking the value of 1 if there has been a stoppage or strike in the establishment (since the beginning of 2016), 0 otherwise.

⁴ We also note that sample B (i.e. establishments with ER responses only) arises from situations where although management has failed to answer the MM survey, it was possible to obtain the contact point of the ER respondent (who then responded to the ER survey).

An interesting aspect of the 2019 ECS survey is its inquiry into the reasons for and outcomes of industrial action. Thus, in question #72/actreason, for the subset of establishments “threatened with industrial action over an issue that was specific to the establishment since the beginning of 2016,” the ER respondents were asked about both the reasons and the corresponding outcomes. The reasons were grouped into six mutually exclusive categories: *wages*; *planned restructuring resulting in closure of the establishment or staff reductions*; *pension and retirement rights*; *occupational health and safety*; *working time arrangements*; and *other*. The outcomes (or *destinations*) were, in turn, coded into five mutually exclusive categories (question #73/actout): *management (largely) met the demands of the employees*, *the employees (largely) dropped their demands*; *a balanced agreement was reached*; *the action ended or the threat was withdrawn, but the issue remained unresolved*; and *the action is still ongoing or the threat still stands*. For estimation purposes, and following Campolieti (2021), we treat the fourth and fifth outcomes as a single category to obtain four separate outcomes, labeled a *win*, a *loss*, a *compromise*, and a *censored* or *unresolved case*, respectively. For the six reasons and four outcomes, the corresponding variables are coded as 1/0 dummies, as described in Appendix Table 2.

The MM questionnaire provides information on establishment characteristics such as industry affiliation, establishment size, establishment age, whether an establishment belongs to a single or a multiple establishment entity, as well as whether the establishment is covered by collective wage agreements (at company, sector, or mixed level). There is also information on the profit situation, presence in export markets, and the degree of market and price competition. Other establishment-level characteristics include a variety of workforce characteristics and work arrangements. A full description of all such included variables is provided in Appendix Table 1.

From the MM survey we also extract the information required for the construction of our *employee-focused business strategy* variable. Specifically, we use question #57 and the items *mmepinorg*, *mmepintrain*, and *mmepintime*, denoting the extent to which employees directly influenced management decisions in (a) the *organization and efficiency of work processes*, (b) *training and skill development*, and (c) *working time arrangements*, respectively. Based on these three items, we then relied on the Cronbach alpha command in Stata to generate a three-item composite, an index intended to measure the extent to which management is favorable to enhanced *employee* influence in decision making. Using question #58, an alternative again based on items (a) through (c), this time measuring the influence of *employee representation* in decision making, is also provided.

Finally, the quality of industrial relations at the workplace is assessed by both the management and ER respondents. We are interested in the extent to which the two parties deviate in their assessment of the quality of industrial relations so as to obtain measures of *distrust* and a *strained climate* at the workplace. We define *distrust* as a 1/0 dummy, taking the value of 1 if there is no mutual trust, 0 otherwise. For its part, the *strained climate* dummy is set equal to 1 if

there is no mutual good climate, 0 otherwise. The former variable is based on questions #58/mantrust (the employee representation trusts management) and #52/ertrus (management trusts the employee representation), extracted from the ER and MM surveys, respectively. The latter variable is based on the relation between management and employees in general using questions #64/manrelat (the representative view) and #63/qwprel (management view), also from the ER and MM surveys, respectively.

Crucial in our dataset construction is, then, the combination of information from both the MM and ER surveys. The richness of the resulting MM-ER merged dataset (i.e. sample A, as described earlier) does however come at the cost of a reduced sample size. This in turn raises the question of whether the merged sample and the sample of establishments with ER responses only (i.e. sample B), for example, are distinct in any obvious manner. Specifically, we test the possibility that management failed to complete the MM survey (in sample B) because it was somehow unhappy with, say, the quality of industrial relations in the latter. Under this hypothesis we conjecture that industrial relations quality – here proxied by the ER variables *actstrike*, *mantrust*, and *manrelat*, described above – might be expected to be lower in sample A than in sample B. We therefore ran a means test using the three variables at a time and found that the null hypothesis of the equality of means was never rejected at conventional levels. In other words, the mean is virtually the same in samples A and B for all three selected variables. We also ran a similar exercise across samples A and C. In this case, we can only use the MM variables to conduct the equality of means test; the conjecture being that is that a management unhappy with, say, the profit situation will be less inclined to provide the contact point of the ER representative, presumably because there is the judgement that employee representation is blamed for the outcome. Using the profit situation (question #69), we found no evidence of any statistical difference in means. Using the quality of industrial relations variable as perceived by management (i.e. *qwprel*) as an alternative, the null of equality of means was again comfortably not rejected.

Based on these exercises, then, there seems is little reason to believe that the selected MM-ER merged sample is the product of any obvious bias on the part of the management respondent with respect to the provision of contact information on the ER representative. There is, however, one inevitable shortcoming arising from the use of merged sample: we will be unable to exploit any country breakdowns/country-specific issues across the 28 European countries as the number of observations per country is rather small in (too) many cases. As described in the next section, we circumvent this limitation by grouping countries according to a commonality of industrial relations practices.

4 Modeling

We use a logistic model to examine the determinants of strike incidence, which (omitting subscript i for establishment) is specified as follows:

$$p = \Pr[y = 1|X] = F(X\beta), \quad (1)$$

where y is a binary outcome; p is the probability of outcome $y = 1$, which is assumed to be dependent on the vector of observables, X ; β is the parameter vector to be estimated; and $F(\cdot)$ is the cdf of the logistic distribution. As intimated above, given the size of the MM-ER sample, we make no attempt to model strikes using a multilevel mixed effects approach that controls for country (random) intercepts, as in Addison and Teixeira (2019). Instead, country heterogeneity is handled by introducing country clusters in a manner suggested by van den Berg et al. (2013), who designate five country subsets: the Germanic cluster (Germany, Austria, and the Netherlands); the Scandinavian cluster (Denmark, Finland, and Sweden); the French cluster (Belgium, France, Luxembourg, Portugal, Spain, Italy and Greece); the Anglo-Saxon cluster (Ireland and the United Kingdom); and the Transition cluster (Bulgaria, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, and Slovenia).⁵

The first block of regressors comprise aspects of labor organization and workplace representation, which are assumed to be of key importance in influencing strike incidence. Beginning with the level of union density, and as hypothesized in section 2, we anticipate a positive relationship with strikes on the grounds that higher density enhances the capacity to strike. We preface our remarks on the role of formal workplace representation by noting that our estimation sample is by construction made up of establishments with formal workplace representation. This means that the comparison drawn is necessarily restricted to establishments that have such representation (i.e. works councils and union bodies), and not between establishments with and without representation. Based on their higher consultative and participative stance, underscored by legal restrictions in some jurisdictions, we anticipate that works councils will be associated with a lower strike incidence than union bodies, subject to the relationship between works councils and union density at the workplace.

A second block of conditioning variables comprises profits, presence in export markets, and indicators of market competition. We may conjecture in these cases that increased market pressure might perhaps persuade workers to be more realistic in their demands, while accepting that the effect of the profit situation on strikes is arguably more difficult to anticipate. It is also expected that recent reductions in the workforce and the increasingly common practice of linking pay to productivity might lead to heightened worker dissatisfaction and a likely positive correlation with strike incidence. In contrast, policies aimed to enhance worker commitment are expected to moderate industrial action. For their part, machine-paced work and the presence of skill mismatches can be considered as aggravating factors, while conceivably a higher share of

⁵ Three countries in our dataset are not included in this classification: Malta, Cyprus, and Croatia. We treat these *missing* observations by creating a sixth group. Also observe that in our regression tables the reported robust standard errors are clustered by country.

open-ended contract workers may moderate strike activity. Finally, the subset of labor-management relations contains the distrust and strained climate variables described in section 3. They are taken as proxies for poor quality of industrial relations at the workplace and as such flagging enhanced strike incidence.

Given the expected impact of union density on strike incidence, we also address the possible endogeneity of the argument within the framework of a multivalued treatment effects model. The concern is that the included regressors in model (1) are correlated both with the level of union density and the outcome indicator, in which case a positive correlation between union density and strikes may well be misleading as an indicator of a causal relationship. We obtain the multivalued treatment effects (ATEs) by using the augmented inverse-probability weighting-aipw estimator (Cattaneo, 2010; Cattaneo et al., 2013). In practice, the method amounts to calculating for each observed outcome three potential outcomes assuming four possible treatments (that is, union density levels of less than 20%, 20 to 40%, 40 to 60%, and at least 60%). Thus, for an establishment with the lowest density, for example, we have the observed outcome and three missing outcomes or predicted probabilities associated with the counterfactual union densities (here, 20 to 40%, 40 to 60%, and at least 60%) which are then weighted according to the inverse sample probabilities. Intuitively, the inverse probability weighting is used to ensure that actual outcomes are compared with a proper counterfactual; that is, to ensure that the difference in means across different treatments is not simply a difference between observed outcomes that would necessarily generate a bias in the presence of an endogenous variable. The multivalued treatment effects model also serves to inform both the relationship between union density and employee representation *and* between strikes and employee representation at different union density levels.

The multivalued implementation requires the specification of two models: first, a model that explains the outcome (strike incidence); and, secondly, a model for the multivalued treatment. For the outcome model we assume a logistic framework similar to model (1). For the treatment model we assume a standard multinomial. The selected observables are the same as in model (1), with the restriction that the country clusters and the collective agreements variables are only included in the treatment model. In other words, we assume that national idiosyncrasies (in collective bargaining regimes as well as more generally) are expected to be mostly reflected in trade union density heterogeneity rather than in strike incidence level.

Finally, given that the ER respondents are asked to offer an assessment of *the last instance of industrial action or threat of industrial action*, we specify the following multinomial model (again omitting subscript i for establishment):

$$p_j = \Pr[y = j|X] = \frac{\exp(X\beta_j)}{\sum_{l=1}^J \exp(X\beta_l)}, \quad j = 0, \dots, J \quad (2)$$

where j is an index indicating the mutually exclusive industrial action outcomes/destinations, and $0 < p_j < 1$ and $\sum_{j=0}^J p_j = 1$. Now setting $j = 0$ as the base category, normalization of the parameters requires that all the betas in β_0 are equal to zero, in which case we have:

$$p_j = \Pr[y = j|X] = \frac{\exp(X\beta_j)}{1 + \sum_{l=1}^J \exp(X\beta_l)}, \quad j = 1, \dots, J$$

$$\text{and } p_0 = \Pr[y = 0|X] = \frac{1}{1 + \sum_{l=1}^J \exp(X\beta_l)}.$$

As mentioned in section 3, from the original five outcomes, we derive four possible outcomes, to obtain $j=0, 1, 2, 3$, where $j=1$ denotes a *win*, $j=2$ a *loss*, and $j=3$ a *compromise*. $j=0$ denotes the omitted category (i.e. a *censored* or *unresolved* case).

For model (2) we confront a further restricted sample, made up of establishments in which some industrial action or threat of industrial action occurred since 2016. Establishments without any industrial action (or threat) are therefore discarded, as well as all cases in which industrial action was not confined to the establishment. In exchange, as it were, we can now include as regressors the reasons of industrial action which, as described in the data section, are coded in six mutually exclusive categories, $g1$ through $g6$, according to the main issue at stake: $g1=1$ if wages; $g2=1$ if planned restructuring that resulted in closure of the establishment or staff reductions; $g3=1$ if pension and retirement rights; $g4=1$ if occupational health and safety; $g5=1$ if working time arrangements, and $g6=1$ if other reasons (the omitted category). In our multinomial, we therefore examine the determinants of the different types of industrial action outcome controlling for some industrial action *characteristics*, since the type of outcome is expected to depend on the type of dispute.

Among other things, we expect union density to be positively associated with the probability of a win, while neither mutual distrust between management and the employee representation body nor an insufficient provision of information to employees is expected to be correlated with a balanced outcome. In turn, the existence of factors such as recent workforce reductions are unlikely to be associated with a favorable outcome for workers.

5 Findings

In our 2019 ECS estimation sample strike incidence (since the beginning of 2016) is approximately 17 percent. By construction, all establishments in the sample have a formal employee representation body, either a works council (in 45 percent of the cases) or a trade union agency (55 percent of the cases). For this subset, trade union density is also very high, at approximately 44 percent. Collective bargaining coverage is extensive at 88 percent. Some 12 percent of establishments have a company agreement, 31 percent are covered by a sectoral agreement, and 45 percent have a mixed-level agreement.

[Table 1 near here]

Table 1 presents the results from our logistic strikes model. To facilitate interpretation of the findings, we provide marginal effects rather than coefficient estimates. Also, at the base of the table we provide the corresponding diagnostic statistics to assess the quality of fit of the model. Specifically, we present the overall rate of correct classifications – that is, the ratio of correctly classified responses to the total number of responses – as well as the Hosmer-Lemeshow goodness-of-fit test. In column (1), for example, the overall rate of correct classifications is 87 percent. (The response is classified as correct if the predicted probability of strike is greater than or equal to 0.5 and a strike is observed.) The goodness-of-fit test is a test of the observed against expected responses, and on the basis of the chi2 statistic our model (1) is comfortably not rejected.

The covariates are grouped into subsets. The latter include workplace representation, labor organization, and type of collective agreement ('none' is the omitted category); labor-management relations; profits, presence in export markets, and market competition; worker characteristics and work arrangements; and other establishment characteristics. All variables are discrete, that is, they are either 1/0 dummies or ordered variables on a 0 to 2 or 0 to 3 increasing scale, and therefore the reported marginal effects give the effect on the probability of strikes of a discrete change in the regressor (from 0 to 1, for example), evaluated at the sample means of the regressors.

It can be seen from column (1) of the table that both the union density and sector level and mixed level bargaining arguments are associated with significantly higher strike incidence. Observe that mixed-level bargaining is associated with a 0.21 higher probability of strikes vis-à-vis the situation of no collective agreement (the reference group). In turn, a one-unit change in union density (equivalent to a 20 percentage point increase in union density) is associated with a smaller change in the probability of strikes of 0.02 on average. A strong statistically negative association is also reported for the quality of information and worker commitment arguments. However, there is no obvious distinction between works council and union representation at the establishment level, while the quality of industrial relations climate (as proxied by the distrust variable) is positive and only marginally statistically significant.

The marginal effect of the declining employment variable is highly statistically significant and large in magnitude, at 0.118. Highly significant but with a smaller positive marginal effect on strike incidence are the payment by results and price competition variables. Highly significant but of opposite sign are variables signifying a single establishment employment and the share of workers with an open-ended contract.

In column (2) we replace the distrust variable by the alternative strained climate measure. We confirm (although this time at the 0.05 level) the result obtained in column (1) for distrust. Observe that our results are insensitive to the particular indicator of industrial relations quality chosen as both the sign and significance of the marginal effects of all the other included variables are virtually unchanged.

[Figure 1 near here]

The results in columns (1) and (2) show that the marginal effects of union density are more significant than the type of workplace representation. We therefore exploit in column (3) the notion that management might be tempted to be more favorable to enhanced *employee* influence in decision making in order to alleviate a conflictual relationship, especially in situations where trade union density is high. We test this hypothesis by introducing the employee-focused strategy variable described earlier. The result, in the form of a significantly negative marginal effect of -0.034, confirms this expectation. According to the underlying hypothesis, we also expect that a higher absolute magnitude of the marginal effect should be associated with the highest levels of union density. This association is examined in panel (a) of Figure 1, where we plot the marginal effect of the employee-focused strategy variable on the probability of a strike across different union density groups. As can be seen, there is a downward sloping relationship that is in line with our expectations. However, in sharp contrast, column (4) shows that management policies favoring a greater influence of *employee representation* (rather than *employee* influence), are associated with higher, not lower, strike incidence. The marginal effect is now +0.040 versus -0.034 in column (3), with the same level of statistical significance. (See also the corresponding plots of this alternative involvement variable on union density in panel (b) of Figure 1.) There is no clear-cut explanation for these opposing results other than employer ‘co-operation’ being more fraught if involving ‘more competitive’ worker representation.

In the multivalued treatment effects model in Table 2 we control for the possible endogeneity of the trade union density argument, that is, the possibility that the determinants of union density are also correlated with strikes. In this case, as described in the modeling section, we model union density as taking a value in the range {0, 1, 2, 3} and use a weighting scheme (specifically, the estimated inverse-probability weights) to compute weighted averages of the outcomes for each treatment level. The differences across these weighted averages then give the estimates of the average treatment effects.

[Table 2 near here]

As shown in the first row of column (1) of the table, there is no evidence of any statistically significant difference in strike incidence between group 1 and group 0; nor between groups 2 and 0, groups 2 and 1, and groups 3 and 2 (in the second, fourth, and last rows, respectively). However, it does matter whether an establishment is in group 3 and 0 or in groups 3 and 1 (in the third and fifth rows). In these two cases, the average treatment effect is 0.103 and 0.090, respectively, which means that a trade union density of at least 60 percent, as opposed to less than 20 percent, is expected to increase the probability of strikes by 10 and 9 percentage points. This is a large (and significant) effect, given that in the estimation sample the mean strike incidence is approximately 17 percent. We also note that, as in columns (3) and (4) of Table 1, columns (2) and (3) of Table 2 show that the average treatment effects reported in column (1) are

insensitive to the inclusion of our indicators of an employee-focused strategy, measuring the respective influence of employees and employee representation on management decisions.

[Figure 2 near here]

The results obtained in Table 2 depend on our ability to find the proper counterfactuals. After all, we rely on the assumption that it is possible to construct three reliable counterfactual outcomes for, say, establishments in group 3, from which we can then evaluate for instance whether the probabilities of an establishment in group 3 being in group 1 and an establishment in group 1 being in group 1 *overlap*. Figure 2 illustrates the extent to which the overlap assumption is satisfied. Clearly, although the probability that an establishment in group 3 is in 1 is not large, there is sufficient overlap in the corresponding propensity distributions (labeled Union_d=3 and Union_d=1 in the plot). (To illustrate, an obvious violation of the overlap assumption would require the existence of a mass of cases around the zero probability in one group and a mass of cases around the unit probability in the other group.)

The auxiliary equations for the outcome model are also instructive. For example, for the group of establishments with union density lower than 20 percent we have the result that works council representation is also associated with a lower strike incidence. In turn, when union density is high (at least 60 percent) the relationship is insignificant. It seems therefore that the evidence on the role of works council representation as a peace-enhancing device might only be evident in situations where union density is not too high.

The auxiliary equations for the treatment are also revealing. For example, the association between collective bargaining (either at company, sectoral, or mixed level) and union density is also stronger for the high-union density groups than in the case of the lower-union density groups. The evidence is therefore that union density and collective bargaining work in tandem, with minor distinction across company, sectoral, or mixed levels of collective bargaining. (Full results from the auxiliary equations are available in the online appendix.)

On the whole, the results from Tables 1 and 2 indicate that the idea that trade union density matters for strike incidence, especially in situations of very high density, is firmly anchored in the data. Less certain perhaps is the magnitude of the corresponding marginal effects and the role of works council versus union representation as a moderating influence in the presence of high union density at establishment level.

The 2019 ECS Survey also offers a unique opportunity to discuss different outcomes of industrial action arising from issues that were specific to the establishment. It will be recalled that in this case our data comprise four possible outcomes: management (largely) met the demands of the employees; employees (largely) dropped their demands; a balanced agreement was reached; and the default of unresolved outcomes. We denoted these scenarios as *win*, *loss*, *compromise*, and *unresolved*, respectively, for which the corresponding sample frequencies are 13, 7, 44, and 36 percent. There is therefore a large proportion of either compromise or unresolved cases.

Given the set of possible outcomes, our ability to find key determinants of each outcome rests ultimately on the richness of our dataset, that is, on the variability of establishment and workforce characteristics, type of workplace representation, and the quality of the dialogue between the parties. Fortunately, we do have detailed information at both establishment and workplace representation level.

Of particular interest is our information on the specific reasons underpinning the observed industrial action events. For example, in our sample wage issues represent 34 percent of the total. What kind of settlement is most often found for this particular source of dispute? It transpires that if wages are the reason, the unadjusted (i.e. not controlling for observables) shares of balanced and unresolved cases are 49 percent and 28 percent, respectively. In purely descriptive terms, then, the suggestion is that a balanced settlement is somewhat more likely than an unresolved outcome if wages issues are in dispute.

Our fully specified multinomial implementation (with controls for reasons for industrial action) contains a limited number of observations ($n = 289$) so that sample size is an issue. That said, all industry and establishment size groups are represented in both the strikes and multinomial estimation samples, while the means of the common included variables, reported in Appendix Tables 1 and 2 are approximately the same. Exceptions are the presence in export markets variable, indicators of industrial relations quality at the establishment, and the percentage of establishments covered by a collective agreement, the means of which are all higher in the multinomial sample.

[Table 3 near here]

The diagnostic tests for the multinomial model (3) are reported at the base of Table 3. The Wald chi2 test in column (1), for example, easily rejects the null that there is no distinction between a *win* (the first outcome) and an *unresolved* settlement (the default); that is, outcomes 1 and 4 are significantly distinct. A similar conclusion obtains in respect of columns (2) and (3). The alternative L-R test also rejects the null in all cases, at the 0.05 level or better.

Table 3 again reports the marginal effects, computed at the sample means of the regressors. The first panel of the table contains the set of dummies denoting the *reasons* for the industrial action. For example, *wage issues* (vis-à-vis *other issues*, the omitted category) in the first row, increase the average probability of a balanced outcome by 0.120, a sizable 28 ($=0.120/0.43$) percent change. The Wald test comfortably rejects the null that the wage coefficient is zero in all three columns of the table. In turn, occupational health and safety issues are associated with a 0.126 higher probability of a *win*, while working time arrangements and pension and retirement rights are associated with a significantly lower probability of a *loss*.

In the second panel of the table, collective bargaining presence and the quality of information are each significantly associated with a compromise or balanced outcome. In the case of collective bargaining, it can be seen from column (3) that the marginal effect is quite sizable at

0.340, while the corresponding marginal effect in columns (1) and (2) is either much smaller or insignificant. There is therefore evidence that, all else constant, in the presence of collective agreements the average probability of compromise strongly increases and, equivalently, that the probability of an unsettled outcome strongly decreases. The quality of information is associated with a higher probability of a balanced outcome as well, although the magnitude of the relationship is smaller. As expected, the marginal effect of mutual distrust of -0.129, shown in the third column, is significant and sizable, indicating that distrust is strongly negatively associated with compromise.

[Figure 3 near here]

By way of further illustration, in panel (a) of Figure 3 we plot the predicted probability of compromise against the two possible levels of collective bargaining (i.e. covered and uncovered). Thus, the predicted probability of a compromise is 0.15 (0.45) if an establishment is uncovered (covered) by a collective agreement, the corresponding slope giving the magnitude of the marginal effect. A similar exercise is carried out in panel (b) of the figure, where the predicted probability of compromise is plotted against the (binary) distrust variable. In this case, the slope is negative, confirming that distrust between the parties is associated with a lower probability of compromise.

[Figure 4 near here]

We can also examine in detail the role of the trade union density argument across the different types of industrial action outcomes. According to the reported marginal effect, a 1-unit rise in union density (approximately a 20 percentage point increase in union density) is associated with a 0.033 increase in the mean probability of a *win*. In this case, we can alternatively deploy four union density dummies (0, 1, 2, and 3, 0 denoting the omitted group) and plot the corresponding predicted probabilities of a win. As can be seen from Figure 4, the highest density level (of at least 60 percent) is most associated with a win. (A similar exercise conducted for a balanced outcome shows that the probability of compromise is the highest when union density is the lowest.) The marginal effects of works council presence (rather than union presence) are never large, although there is the suggestion in the second panel of the table that the institution is associated with a lower probability of a loss. Arguably, this result might reflect a holding the ring or peace-keeping function of councils that nips potentially serious disputes in the bud.

Finally, the marginal effects of the subset of regressors shown in the last three panels of Table 3 are mostly small and statistically insignificant. The principal exceptions are payment by results, profitability, declining employment, and the pace of skill change. The share of workers paid by results is clearly not associated with compromise or balanced agreements, unlike higher profits which are associated in almost equal measure with reduced worker losses and more compromise solutions. In promoting wins, a changing knowledge and skill base at the establishment clearly seems to favor employees. For its part, declining employment is associated

with fewer disputes that result in workers having to drop their demands. Rather than indicating fewer employee losses, however, this latter result most probably reflects reduced uncertainty over bargaining outcomes in bleaker economic circumstances. In this latter connection, and returning to the works council variable, which is of the same sign and similar in magnitude to declining employment, we would offer a slightly different interpretation. Arguably, the reduced losses associated with works councils are an indication of their moderating role in the process of channeling worker concerns.

On net, the outcomes of this multinomial exercise, seem solidly associated with institutional aspects, namely the strength of union power (proxied by union density at the establishment level), collective bargaining, and the quality of information provided by management. Compromise is a not unlikely outcome in the presence of collective agreements, dialogue, and mutual trust.

6 Conclusions

This paper investigates the relationship between union organization, workplace representation, and the quality of industrial relations and strikes using establishment data on all EU countries and the U.K. from the most recent European Company Survey. In addition to strike incidence, we also consider some six subjects of recent industrial action or threatened industrial action and their outcomes.

Strike incidence is found to be elevated in establishments where union density is higher and where workers are covered by mixed-level collective agreements. On the other hand, there is little to suggest that a predominant works council presence significantly moderates strike incidence when compared with its union counterpart at the workplace. But emphatically the quality of industrial relations does matter. Specifically, an absence of mutual trust or the presence of a strained workplace relationship is associated with heightened strike incidence, while an employee-focused strategy and heightened employee motivation can have the opposite effect. These results are robust to a multivalued treatment effect estimation and also to the deployment of *a posteriori* country clusters.

In discussing the outcomes of different types of strikes/threatened strikes, a distinction is drawn between subjectively assessed (by the worker side) worker ‘wins,’ worker ‘losses,’ and ‘win-win’ outcomes in which a balanced agreement is reached. The default comprises those bargaining situations where the outcome is unresolved. The antecedents of industrial action, to include the principal issues at stake, and the bargaining outcomes are linked via a multinomial logit analysis. We report inter al. that mutual distrust and the share of workers on payment-by-results schemes characterize movements away from a balanced agreement in favor of the default(s), whereas collective agreement coverage, improved profitability, and substantive information provision encourage movement in an opposite direction. There is also every

indication that higher union density is associated with employee wins and now some suggestion that works councils may play a moderating influence in the process of channeling worker concerns.

References

- Addison, John T., and Paulino Teixeira. 2019. "Strikes, Employee Workplace Representation, Unionism, and Industrial Relations Quality in European Establishments." *Journal of Economic Behavior and Organization* 159(C): 109-133.
- Addison, John T., Paulino Teixeira, Katalin Evers, and Lutz Bellmann. 2017. "Collective Bargaining and Innovation in Germany: A Case of Cooperative Industrial Relations?" *Industrial Relations* 56(1): 73-121.
- Akkerman, Agnes., 2008. "Union Competition and Strikes: The Need for Analysis at the Sector Level." *Industrial and Labor Relations Review* 61(4): 445-459.
- Ashenfelter, Orley, and George E. Johnson. 1969. "Bargaining Theory, Trade Unions, and Industrial Strike Activity." *American Economic Review* 59(1): 35-49.
- Blanchard, Olivier, and Thomas Philippon. 2004. "The Quality of Labor Relations and Unemployment." NBER Working Paper No. 10590. Cambridge, MA: National Bureau of Economic Research.
- Campioletti, Michele. 2021. "Strikes in British Coalmining, 1893-1940: Testing Models of Strikes." *Industrial Relations* 60(2): 243-273.
- Campioletti, Michele, Robert Hebdon, and Douglas Hyatt. 2005. "Strike Incidence and Strike Duration: Some New Evidence from Ontario." *Industrial and Labor Relations Review* 58(4): 610-630.
- Card, David. 1990. "Strikes and Bargaining: A Survey of the Recent Empirical Literature." *American Economic Review, Papers and Proceedings* 80(2): 410-415.
- Cattaneo, Matias. D. 2010. "Efficient Semiparametric Estimation of Multi-Valued Treatment Effects Under Ignorability." *Journal of Econometrics* 155(2): 138-154.
- Cattaneo, Matias. D., and David M. Drukker, and Ashley. D. Holland. 2013. "Estimation of Multivalued Treatment Effects Under Conditional Independence." *Stata Journal* 13(3): 407-450.
- Eurofound and Cedefop. 2020. *European Company Survey 2019: Workplace Practices Unlocking Employee Potential*. European Company Survey 2019 Series. Luxembourg: Publications Office of the European Union.
- Freeman, Richard B., and James L. Medoff,. 1984. *What Do Unions Do?* New York: Basic Books.
- Freeman, Richard B., and Edward P. Lazear. 1995. "An Economic Analysis of Works Councils. In: Joel Rogers and Wolfgang Streeck (Eds.), *Works Councils: Consultation, epresentation and Cooperation in Industrial Relations*, pp. 27-52. Chicago, IL: University of Chicago Press.
- Godard, John. 1992. "Strikes as Collective Voice: A Behavioral Analysis of Strike Activity." *Industrial and Labor Relations Review* 46(1): 161-175.
- Hicks, John R. 1963. *The Theory of Wages*. London: Macmillan.
- Hogan, Chad. 2001. "Enforcement of Implicit Employment Contracts through Unionization." *Journal of Labor Economics* 19(1): 171-195.

- Jansen, G., 2014. "Effects of Union Organization on Strike Incidence in EU Companies." *Industrial and Labor Relations Review* 67(1): 61-85.
- Kaufman, Bruce E. 1982. "The Determinants of Strikes in the United States." *Industrial and Labor Relations Review* 35(4): 473-490.
- Kaufman, Bruce E. 2004. "What Unions Do: Insights from Economic Theory." *Journal of Labor Research* 25(3): 351-382.
- Laroche, Patrice 2021. "Unions, Collective Bargaining, and Firm Performance." In: Klaus Zimmermann (Ed.), *Handbook of Labor, Human Resources and Population Economics*, pp. 1-27. Springer Nature Switzerland.
- Machin, Stephen, Mark Stewart, and John van Reenen. 1993. "The Economic Effects of Multiple Unionism: Evidence from the 1984 Workplace Industrial Relations Survey." *Scandinavian Journal of Economics* 44(1): 279-296.
- Malcomson, James M. 1983. "Trade Unions and Economic Efficiency." *Economic Journal* 93(Supplement): 50-65.
- Mauro, Martin J. 1982. "Strikes as a Result of Imperfect Information." *Industrial and Labor Relations Review* 35(4): 522-538.
- Mueller, Steffen, and Jens Stegmaier. 2017. "The Dynamic Effects of Works Councils on Labor Productivity: First Evidence from Panel Data." *British Journal of Industrial Relations* 55(2): 372-395.
- Pohler, Dionne, and Andrew Luchak. 2025. "Are Unions Good or Bad for Organizations? The Moderating Role of Management's Response." *British Journal of Industrial Relations* 53(3): 423-459.
- Riordan, Michael, and Michael L. Wachter. 1983. "What Do Implicit Contracts Do?" Unpublished Paper, University of Pennsylvania.
- Siebert, W. Stanley, John T. Addison. 1981. "Are Strikes Accidental?" *Economic Journal* 91(362): 389-404.
- Siebert, W. Stanley, Philip V. Bertrand, and John T. Addison. 1985. "The Political Model of Strikes: A New Twist." *Southern Economic Journal* 52(1): 23-33.
- Van den Berg, Annette, Yolande Grift, Arjen van Witteloostuijn, A., Christophe Boone, and Olivier van der Brempt. 2013. "The Effect of Employee Workplace Representation on Firm Performance: A Cross-Country Comparison within Europe." Discussion Paper Series No. 13-05, Jelling C. Koopmans Research Institute, Utrecht School of Economics, University of Utrecht.
- Wheeler, Hoyt N. 1984. "Determinants of Strikes: Comment." *Industrial and Labor Relations Review* 37(2): 263-269.

Table 1: Logit Model for Strike Incidence, Marginal Effects

Variables	Strike incidence			
	(1)	(2)	(3)	(4)
<i>Workplace representation, labor organization, and type of collective agreement:</i>				
Works council	-0.029 (0.035)	-0.033 (0.036)	-0.027 (0.036)	-0.024 (0.035)
Establishment union density	0.020** (0.010)	0.021** (0.010)	0.020* (0.010)	0.020* (0.010)
Company level agreement only	0.113 (0.083)	0.105 (0.083)	0.116 (0.081)	0.108 (0.086)
Sector level agreement only	0.138* (0.081)	0.130 (0.083)	0.138* (0.082)	0.134 (0.084)
Mixed level	0.210** (0.087)	0.203** (0.089)	0.211** (0.087)	0.207** (0.088)
<i>Employee representation functioning and provision of information:</i>				
Frequency of meetings with management	-0.057 (0.049)	-0.056 (0.046)	-0.053 (0.050)	-0.058 (0.048)
Quality of information	-0.039*** (0.008)	-0.044*** (0.008)	-0.039*** (0.009)	-0.038*** (0.008)
<i>Labor-management relations:</i>				
Distrust	0.059* (0.034)		0.061* (0.034)	0.064** (0.032)
Strained climate		0.058** (0.028)		
<i>Employee-focused strategy (employees/ER influence in management decisions):</i>				
Direct influence of <i>employees</i> on management decisions			-0.034** (0.016)	
Direct influence of <i>employee representation</i> on management decisions				0.040** (0.020)
<i>Profit situation, presence in export markets, and market competition:</i>				
Profit situation	0.010 (0.008)	0.008 (0.007)	0.010 (0.008)	0.010 (0.008)
Presence in export markets	0.023 (0.015)	0.020 (0.015)	0.025 (0.015)	0.025 (0.015)
Market competition	-0.008 (0.017)	-0.010 (0.018)	-0.008 (0.016)	-0.009 (0.017)
Price competition	0.055*** (0.019)	0.050** (0.019)	0.057*** (0.019)	0.053*** (0.020)
<i>Other establishment characteristics:</i>				
Establishment age	0.015 (0.042)	0.030 (0.034)	0.014 (0.044)	0.016 (0.041)
Single establishment	-0.032*** (0.010)	-0.033*** (0.012)	-0.031*** (0.010)	-0.032*** (0.010)
Declining employment	0.118*** (0.028)	0.123*** (0.030)	0.118*** (0.028)	0.120*** (0.027)
<i>Worker characteristics and work arrangements:</i>				
Workers with an OEC	-0.016*** (0.006)	-0.014** (0.006)	-0.016*** (0.006)	-0.015** (0.006)
Stimulating worker commitment	-0.044*** (0.013)	-0.047*** (0.016)	-0.039*** (0.013)	-0.046*** (0.015)
Payment by results	0.013***	0.012***	0.013***	0.011***

	(0.003)	(0.003)	(0.003)	(0.003)
Skill change	-0.006	-0.005	-0.002	-0.006
	(0.014)	(0.014)	(0.015)	(0.015)
Skill match	0.001*	0.001*	0.001	0.001*
	(0.001)	(0.000)	(0.001)	(0.001)
Pace of work	0.024***	0.024***	0.024***	0.024***
	(0.005)	(0.005)	(0.005)	(0.005)
Industry dummies	Yes	Yes	Yes	Yes
Establishment size dummies	Yes	Yes	Yes	Yes
Country cluster dummies	Yes	Yes	Yes	Yes
Overall rate of correct classifications	87%	86%	87%	87%
Goodness-of-fit test: Hosmer–Lemeshow chi2 test [p-value]	0.27 [0.9664]	0.96 [0.8116]	2.41 [0.4922]	2.78 [0.4264]
Number of observations	1,108	1,122	1,101	1,092

Notes: The dependent variable is a 1/0 dummy, 1 if there has been a stoppage or strike in the establishment since the beginning of 2016. The sample is restricted to establishments with a formal employee workplace representation. Establishments are aggregated into three sectors: Production (NACE B-E); Construction (NACE F); and Services (NACE G-N, R and S). Establishments are also grouped into three establishment size categories: with 10 to 49 employees, with 50 to 249 employees; and with at least 250 employees. Country subsets are defined as follows (after van der Berg et al., 2013): the Germanic cluster (Germany, Austria, and the Netherlands); the Scandinavian cluster (Denmark, Finland, and Sweden); the French cluster (Belgium, France, Luxembourg, Portugal, Spain, Italy and Greece); the Anglo-Saxon cluster (Ireland and the United Kingdom); and the Transition cluster (Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, and Slovenia). Three countries in our dataset were not included in this classification: Malta, Cyprus, and Croatia. We treat these *missing* observations by creating a sixth group. Robust standard errors (i.e. clustered by country) are given in parentheses. ***, **, and * denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

Source: 2019 ECS, Management and Employee Representative Questionnaires; ECS2019_merged data file (version 11-01-20).

Table 2: Multivalued Treatment Effects Model of Strike Incidence

Treatment and control groups	Average treatment effect (1)	Average treatment effect (<i>employees</i> influence on management decisions indicator included) (2)	Average treatment effect, (<i>employee representation</i> influence on management decisions indicator included) (3)
Group 1 <i>versus</i> group 0 (i.e. low union density <i>versus</i> very low establishment union density)	0.013 (0.032)	0.0077 (0.032)	0.009 (0.032)
Group 2 <i>versus</i> group 0 (i.e. medium union density <i>versus</i> very low establishment union density)	0.050 (0.035)	0.059 (0.036)	0.046 (0.036)
Group 3 <i>versus</i> group 0 (i.e. high union density <i>versus</i> very low establishment union density)	0.103*** (0.035)	0.103*** (0.036)	0.099*** (0.036)
Group 2 <i>versus</i> group 1 (i.e. medium union density <i>versus</i> low establishment union density)	0.037 (0.033)	0.052 (0.034)	0.037 (0.034)
Group 3 <i>versus</i> group 1 (i.e. high union density <i>versus</i> low establishment union density)	0.090*** (0.033)	0.095*** (0.034)	0.091*** (0.034)
Group 3 <i>versus</i> group 2 (i.e. high union density <i>versus</i> medium establishment union density)	0.053 (0.036)	0.043 (0.038)	0.054 (0.038)
Number of observations	1,131	1,101	1,092

Notes: The multivalued treatment is defined as equal to 0, 1, 2, or 3, if the establishment trade union density is less than 20%, between 20 and 40%, between 40 and 60%, or at least 60%, flagging very low, low, medium, and high union density groups, respectively. The average treatment effect is obtained using the *teffects aipw* (i.e. the augmented inverse-probability weighting) command in Stata. The outcome (strikes) model is logistic and the treatment (union density) model is multinomial. The set of observables is the same as in Table 1, column (1), with country clusters and the collective agreements variable excluded from the outcome model. ***, ** and * denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively. *Source:* 2019 ECS, Management and Employee Representative Questionnaires; ECS2019_merged data file (version 11-01-20).

Table 3: Multinomial Logit Model for Industrial Action Outcomes, Marginal Effects

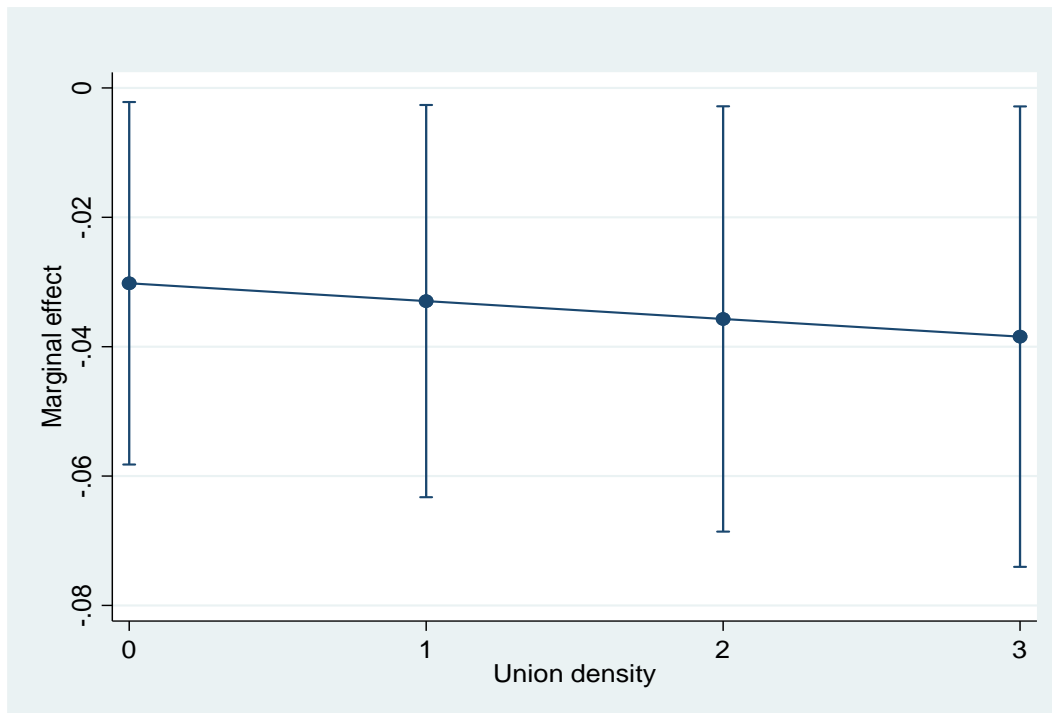
Variables	Industrial action outcome		
	<i>Win</i> [Management (largely) met the demands of the employees] (1)	<i>Loss</i> [Employees (largely) dropped their demands] (2)	<i>Compromise</i> [A balanced agreement was reached] (3)
<i>Reason of industrial action or threat of industrial action</i>			
wages	0.013 (0.077)	-0.024 (0.037)	0.120* (0.062)
Restructuring with layoffs	-0.102 (0.096)	-0.019 (0.043)	0.130 (0.123)
Pension and retirement rights	0.116 (0.085)	-0.543*** (0.109)	0.380 (0.266)
Occupational health and safety	0.126*** (0.035)	-0.003 (0.056)	-0.019 (0.143)
Working time arrangements	-0.089 (0.082)	-0.113** (0.057)	0.066 (0.090)
<i>Workplace representation, labor organization, type of collective agreement, and quality of information:</i>			
Works council	0.075 (0.052)	-0.047** (0.024)	0.011 (0.056)
Establishment union density	0.033** (0.014)	-0.002 (0.015)	-0.035 (0.025)
Any type of collective agreement coverage	0.060 (0.122)	-0.083** (0.040)	0.340** (0.172)
Quality of information	0.019 (0.015)	0.019 (0.027)	0.062** (0.029)
<i>Labor-management relations:</i>			
Distrust	-0.028 (0.036)	0.078 (0.056)	-0.129** (0.051)
<i>Profit situation, presence in export markets, and price competition:</i>			
Profit situation	-0.014 (0.029)	-0.040** (0.017)	0.054** (0.024)
Presence in export markets	0.023 (0.075)	0.022 (0.024)	-0.087 (0.099)
Price competition	-0.071 (0.083)	-0.071 (0.053)	-0.013 (0.114)
<i>Other establishment characteristics:</i>			
Single establishment	0.033 (0.038)	0.042 (0.032)	0.041 (0.046)
Declining employment	-0.073 (0.065)	-0.067** (0.027)	0.023 (0.075)
<i>Worker characteristics and work arrangements:</i>			
Stimulating worker commitment	-0.021 (0.034)	0.005 (0.031)	0.018 (0.052)
Payment by results	0.009* (0.005)	0.011* (0.006)	-0.019*** (0.006)
Skill change	0.070*** (0.021)	-0.018 (0.030)	-0.014 (0.042)
Skill match	-0.001 (0.001)	-0.001** (0.001)	-0.000 (0.001)
Pace of work	0.014* (0.008)	-0.015* (0.009)	-0.004 (0.027)
Industry dummies	Yes	Yes	Yes
Establishment size dummies	Yes	Yes	Yes
Country cluster dummies	Yes	Yes	Yes

Wald chi2 test [p-value]	2393.61 [0.000]	38733.6 [0.000]	3402.16 [0.000]
L-R test [p-value]	54.78 [0.026]	47.79 [0.015]	54.76 [0.002]
Number of observations	289		

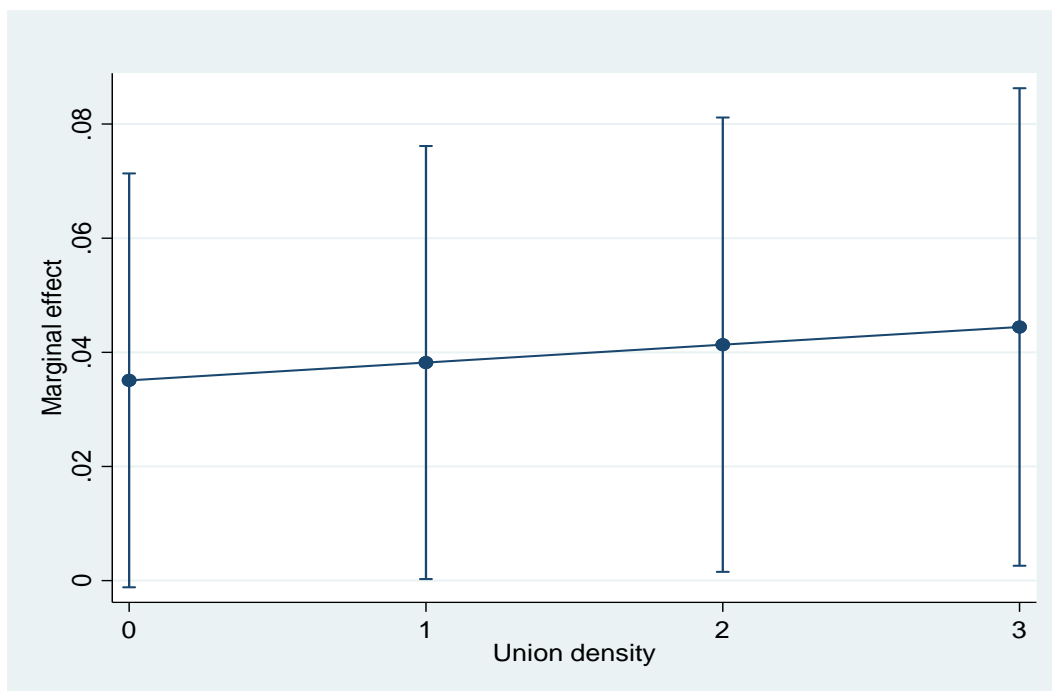
Notes: The fourth outcome (i.e. *the action ended or the threat was withdrawn, but the issue remained unresolved, the action is still ongoing, or the threat still stands*) is the omitted category. The sample comprises the subset of establishments that were ever threatened with industrial action over an issue that was specific to the establishment since the beginning of 2016. Robust standard errors (i.e. clustered by country) are given in parentheses. ***, **, and * denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

Source: 2019 ECS, Management and Employee Representative Questionnaires; ECS2019_merged data file (version 11-01-20).

Figure 1: Marginal Effects of the Employee-Focused Strategy by Union Density Level
 (a) Direct influence of *employees* on management decisions

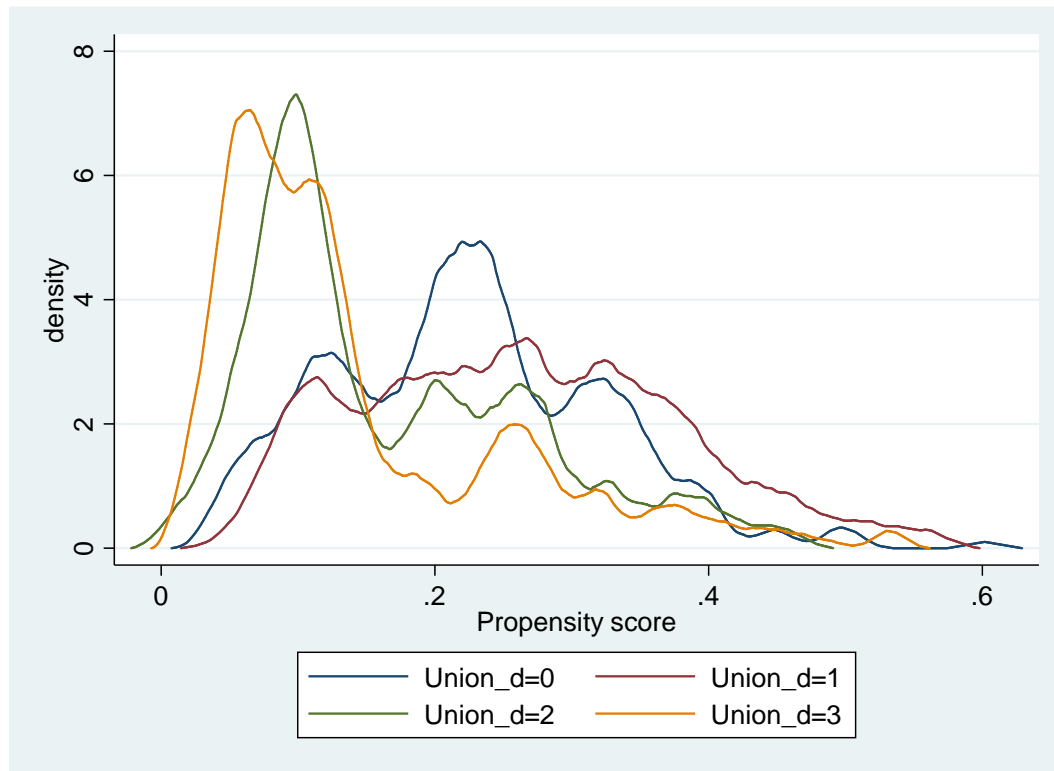


(b) Direct influence of the *employee representation* on management decisions



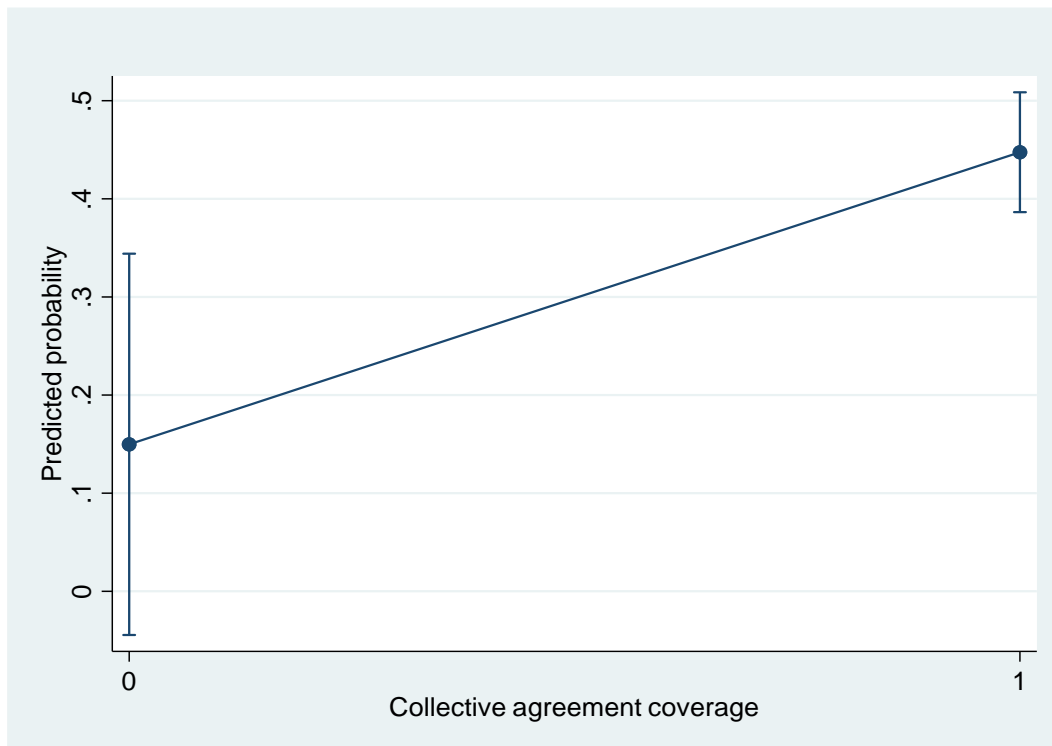
Notes: The employee-focused strategy variable in panel (a) measures the direct influence of *employees* on management decisions; in panel (b) it measures the direct influence of *employee representation* on management decisions. Union density is set to 0, 1, 2, or 3, indicating that union density at establishment level is less than 20%, 20 to 40%, 40 to 60%, or at least 60%, respectively. The vertical bar indicates the 95% confidence interval around the marginal effect point estimate.

Figure 2: Estimated Density of the Predicted Probabilities



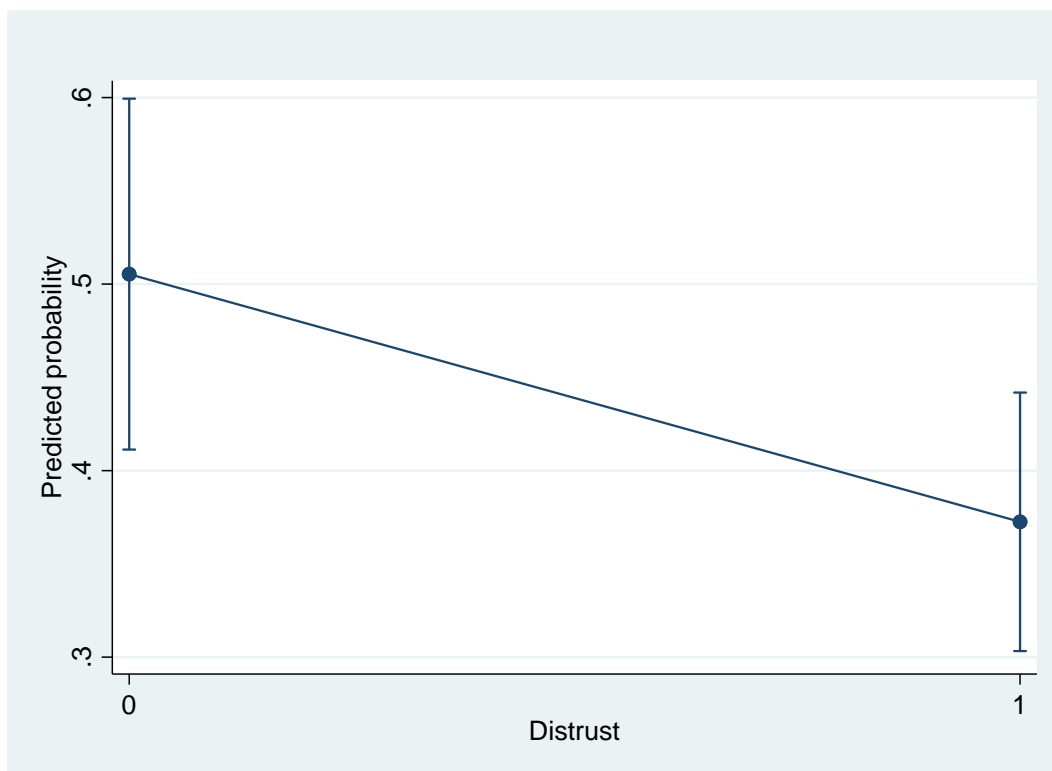
Notes: The figure gives the probability that an establishment with a high union density (i.e. with union density of at least 60%) is low density (i.e. with union density at 20 to 40%); and similarly for an establishment with a medium union density (i.e. 40 to 60%), low union density, and very low union density (i.e. less than 20%). These four cases are denoted as Union_d=3, Union_d=2, Union_d=1, and Union_d=0, respectively.

Figure 3: Predicted Probability of Compromise/Balanced Outcome
(a) By type of collective agreement



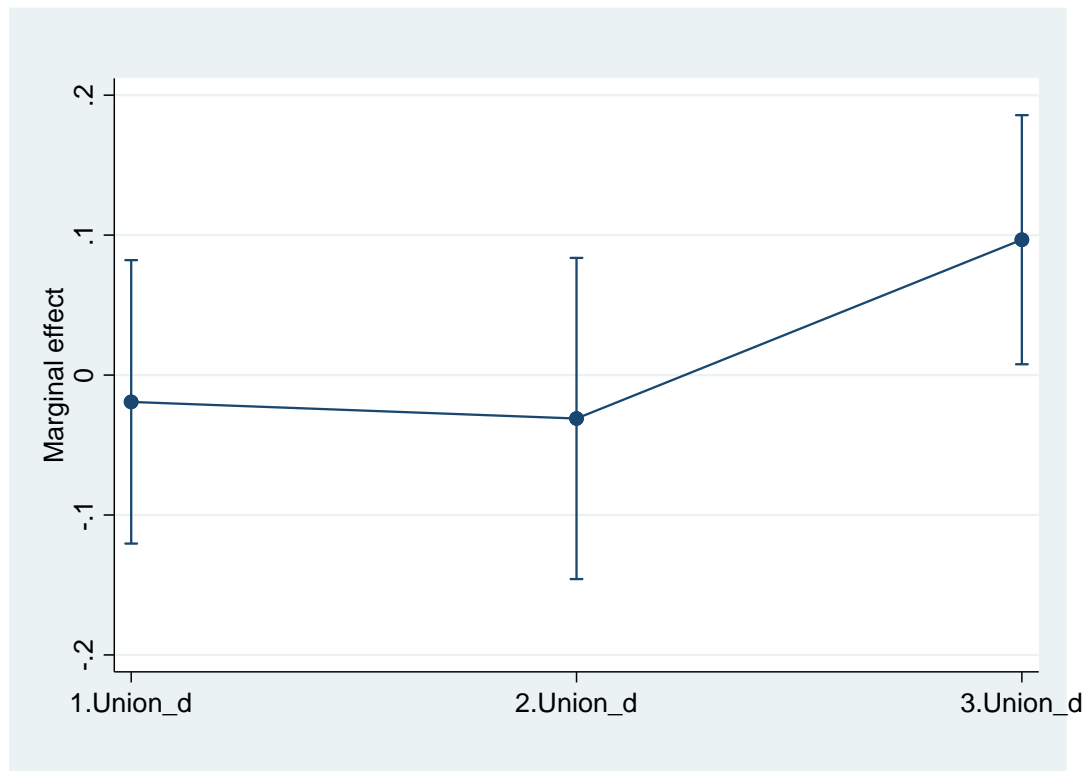
Note: Collective agreement is a 1/0 dummy, 1 if the establishment is covered by any type of collective agreement (company, sector, or mixed level).

(a) By type of labor-management relation



Note: The labor-management relation is proxied by distrust, a 1/0 dummy variable equal to 1 if there is no mutual trust between the parties.

Figure 4: Marginal effects on the Probability of a Win by Union Density Level



Notes: The multinomial logit model given in Table 3 assumes four possible outcomes: a win, a loss, a compromise, and unresolved (the omitted outcome). The picture gives the marginal effect of union density at three different levels: 20 to 40%, 40 to 60%, and at least 60%. These groups are denoted as 1.Union_d, 2. Union_d, and 3.Union_d, respectively. Union density at less than 20% is the omitted group. The vertical bar indicates the 95% confidence interval around the marginal effect point estimate.

Appendix Table 1: Variable Definition and Estimation Sample Means of Selected Variables for the Strikes Model, 2019

Variable	Definition	Mean	Min.	Max.
Strike incidence (actstrike; ER question #65)	1/0 dummy: 1 if there has been a stoppage or strike in the establishment since the beginning of 2016.	0.17	0	1
<i>Workplace representation and labor organization:</i>				
Works council (ernoconfirm; ER #2);	1/0 dummy: 1 if the respondent (i.e. the ER interviewee) is from the works council; 0 if the respondent is from the union. Note that if there is a unique works council (union) representation at the workplace, then the respondent is necessarily from the works council (union). If the works council and the union agencies coexist at the workplace and the employee representative respondent is from the works council (union), then the works council (union) is adjudged to be more influential and correspondingly the works council (union) status is allocated. This interpretation is based on the fact that the interviews are conducted with the employee representative that represents the largest number of employees in the establishment.	0.45	0	1
Establishment union density (tumemb_d; ER #6)	Union density at the establishment. (In percent.)	44	0	100
<i>Type of collective agreement: (Based on MM question # 48)</i>				
No collective agreement	1/0 dummy: 1 if the establishment is not covered by any type of collective agreement.	0.12	0	1
Company level only	1/0 dummy: 1 if the establishment is covered by a company-level agreement only.	0.12	0	1
Sector level only	1/0 dummy: 1 if the establishment is covered by a sectoral or regional-level agreement only.	0.31	0	1
Mixed level	1/0 dummy: 1 if the establishment is covered by any combination of company, sectoral/regional, national/cross-sectoral, occupation, or any other type of collective agreement.	0.45	0	1
Any type of collective agreement coverage	1/0 dummy: 1 if the establishment is covered by any type of collective agreement (company, sector or mixed level)	0.88	0	1
<i>Employee representation functioning and provision of information:</i>				
Frequency of meetings with Management (erbmeetman; ER #59)	1/0 dummy: 1 if ER body meets with management once a week or more.	0.05	0	1
Quality of information (infqual; ER #30)	Ordered variable on a 1 to 5 scale: the variable indicates how satisfied is the employee representative with the quality of information management has provided; 1 is the lowest level.	3.6	1	5
<i>Profit situation:</i>				

Profit situation (profit; MM #69)	Ordered variable on a 0 to 2 scale indicating whether the establishment made a loss, broke even or made a profit: 0 is the lowest level. Non-for-profit organizations are assumed to break even (i.e. set equal to 1). These cases are flagged using an additional 1/0 dummy variable.	1.5	0	2
<i>Presence in export markets and market competition:</i>				
Presence in export markets (salesint; MM #7)	1/0 dummy: 1 if percentage of the establishment's sales to customers in other countries was 25% or more. export_d1 Establishments for which sales to customers in other countries is not applicable are assumed to have exports equal to zero. These cases are flagged using an additional 1/0 dummy.	0.30	0	1
Market competition (competmark; MM #66)	Ordered variable on a 1 to 4 scale indicating whether the market for the main products or services provided by the establishment is competitive; 1 is the lowest level.	3.1	1	4
Price competition (pmstratlp_d; MM #65)	1/0 dummy: 1 if offering products or services at lower prices than the competition is the most important factor for the competitive success of the establishment.	0.14	0	1
<i>Other establishment characteristics:</i>				
Establishment age (yearsop; MM #3)	1/0 dummy: 1 if establishment is older than 10 years.	0.05	0	1
Single establishment (single_est)	1/0 dummy: 1 if single independent company or organization.	0.50	0	1
Declining employment (chemp_d; MM #12)	1/0 dummy: 1 if the total number of employees in the establishment has decreased by more than 10% since the beginning of 2016.	0.09	0	1
Stimulating worker commitment (motichal; MM #28)	Ordered variable on a 1 to 4 scale indicating how often providing interesting and stimulating work is used to motivate and retain employees at the establishment; 1 is the lowest level.	2.9	1	4
Payment by results (vpbres_d; MM #46)	Employees at the establishment who are paid by results (e.g. piece rates, provisions, brokerages or commissions). (In percent.)	24	0	100
<i>Worker characteristics and work arrangements:</i>				
Workers with an OEC (empperp_d; MM #14)	Employees with an open-ended contract (OEC). (In percent.)	86	0	100
Skill change (skillch; MM #33)	Ordered variable on a 1 to 4 scale indicating how quickly the knowledge and skills needed from the employees in the establishment change; 1 is the lowest level.	2.4	1	4
Skill match (skillsmatch_d; MM #32)	Employees with skills that are about right to do the job. (In percent.)	72	0	100
Pace of work (pcwkmach; MM #31)	Employees whose pace of work determined by machines or computers. (In percent.)	22	0	100

<i>Employee-focused strategy (employees/ER influence in management decisions:</i>				
Direct influence of <i>employees</i> on management decisions	Composite measure based on question MM #57 and contains the following items: mmepinorg (the organization and efficiency of work processes), mmepintrain (training and skill development;) and mmepintime (working time arrangements). The generated three-item index was obtained using the Cronbach alpha command in Stata, with a scale reliability score of 0.605.	0.63	0	1
Direct influence of <i>employee representation</i> on management decisions	Composite measure based on question MM #58 and contains the following items: mmerinorg (the organization and efficiency of work processes), mmerintrain (training and skill development;) and mmerintime (working time arrangements). The generated three-item index was obtained using the Cronbach alpha command in Stata, with a scale reliability score of 0.713.	0.47	0	1
<i>Labor-management relations:</i>				
Distrust	1/0 dummy: 1 if there is no mutual trust between the parties. The coding is based on the generated 1/0 dummy variables mantrust_D and ertus_D, denoting whether management can be trusted (ER survey, question #58) and whether employment representation can be trusted (MM survey, question #52), respectively.	0.28	0	1
Strained climate	1/0 dummy: 1 if there is no mutual good climate. The coding is based on the generated 1/0 dummy variables manrelat_D and qwprel_D, denoting whether the relations between management and employees are strained (ER survey, question #64, and MM survey, question #63, respectively).	0.08	0	1
<i>Industry affiliation:</i>				
Production	1/0 dummy: 1 if the establishment's main activity belongs to NACE 1-digit codes B through E (i.e. manufacturing, mining and quarrying and other industry).	0.41	0	1
Construction	1/0 dummy: 1 if the establishment's main activity belongs to NACE 1-digit code F.	0.05	0	1
Services	1/0 dummy: 1 if the establishment's main activity belongs to NACE 1-digit codes G through N, R and S.	0.54	0	1
<i>Establishment size:</i>				
Small	1/0 dummy: 1 if the establishment has 10 to 49 employees.	0.08	0	1
Medium	1/0 dummy: 1 if the establishment has 50 to 249 employees.	0.47	0	1
Large	1/0 dummy: 1 if the establishment has at least 250 employees.	0.25	0	1

Notes: The sample is restricted to establishments with a formal employee representation. The reported statistics refer to the estimation sample in Table 1, column (1).

Sources: 2019 ECS, Management and Employee Representative Questionnaires; ECS2019_merged data file (version 11-02-20).

Appendix Table 2: Variable Definition and Estimation Sample Means of Selected Variables for the Multinomial Model, 2019

Variable	Definition	Mean	Min.	Max.
<i>Industrial action outcome:</i> (actout; ER question #73)				
Win	1/0 dummy: 1 if management (largely) met the demands of the employees.	0.13	0	1
Loss	1/0 dummy: 1 if the employees (largely) dropped their demands.	0.07	0	1
Compromise (or Balanced)	1/0 dummy: 1 if a balanced agreement was reached.	0.44	0	1
Unresolved (Reference category)	1/0 dummy: 1 if the action ended or the threat was withdrawn, but the issue remained unresolved, the action is still ongoing, or the threat still stands.	0.36	0	1
<i>Reason for industrial action or threat of industrial action:</i> (actreason; ER #72)				
Wages (g1)	1/0 dummy: 1 if the reason is wages.	0.34	0	1
Planned restructuring resulting in closure of the establishment or staff reductions (g2)	1/0 dummy: 1 if the reason is planned restructuring resulting in closure of the establishment or staff reductions.	0.13	0	1
Pension and retirement rights (g3)	1/0 dummy: 1 if the reason is pension and retirement rights.	0.02	0	1
Occupational health and safety (g4)	1/0 dummy: 1 if the reason is occupational health and safety.	0.06	0	1
Working time arrangements (g5)	1/0 dummy: 1 if the reason is working time arrangements.	0.10	0	1
Other reasons (g6)	1/0 dummy: 1 if for other reasons.	0.36	0	1
<i>Profit situation, presence in export markets, and price competition:</i>			0	1
Profit situation (profit; MM #69)	Ordered variable on a 0 to 2 scale indicating whether the establishment made a loss, broke even or made a profit: 0 is the lowest level. Non-for-profit organizations are assumed to break even (i.e. set equal to 1). These cases are flagged using an additional 1/0 dummy variable.	1.5	0	2
Presence in export markets (salesint; MM #7)	1/0 dummy: 1 if percentage of the establishment's sales to customers in other countries was 25% or more.	0.58	0	1
Price competition (pmstratlp_d; MM #65)	1/0 dummy: 1 if offering products or services at lower prices than the competition is the most important factor for the competitive success of the establishment.	0.17	0	1
<i>Other establishment characteristics:</i>			0	1
Single establishment (single_est)	1/0 dummy: 1 if single independent company or organization.	0.42	0	1
Declining employment (chemp_d; MM #12)	1/0 dummy: 1 if the total number of employees in the establishment has decreased by more than 10% since the beginning of 2016.	0.11	0	1
<i>Work arrangements:</i>				

Stimulating worker commitment (motichal; MM #28)	Ordered variable on a 1 to 4 scale indicating how often providing interesting and stimulating work is used to motivate and retain employees at the establishment; 1 is the lowest level.	2.8	0	1
Payment by results (vpbres_d; MM #46)	Employees at the establishment who are paid by results (e.g. piece rates, provisions, brokerages or commissions). (In percent.)	30	0	1
Skill change (skillch; MM #33)	Ordered variable on a 1 to 4 scale indicating how quickly the knowledge and skills needed from the employees in the establishment change; 1 is the lowest level.	2.4	0	1
Skill match (skillsmatch_d; MM #32)	Employees with skills that are about right to do the job. (In percent.)	71	0	1
Pace of work (pcwkmach; MM #31)	Employees whose pace of work determined by machines or computers. (In percent.)	38	0	100
<i>Workplace representation and labor organization:</i>				
Works council (ernoconfirm; ER #2);	1/0 dummy: 1 if the respondent (i.e. the ER interviewee) is from the works council; 0 if the respondent is from the union.	0.42	0	1
Establishment union density (tumemb_d; ER #6)	Union density at the establishment. (In percent.)	40	0	100
<i>Type of collective agreement: (Based on MM # 48)</i>				
Any type of collective agreement coverage	1/0 dummy: 1 if the establishment is covered by any type of collective agreement (national/cross-sectoral, sectoral, regional, establishment/company, occupation and other).	0.96	0	1
<i>Quality of information:</i>				
Quality of information (infqual; ER #30)	Ordered variable on a 1 to 5 scale: the variable indicates how satisfied is the employee representative with the quality of information management has provided; 1 is the lowest level.	3.4	1	5
<i>Labor-management relations:</i>				
Distrust	1/0 dummy: 1 if there is no mutual trust between the parties. The coding is based on the generated 1/0 dummy variables mantrust_D and ertrus_D, denoting whether management can be trusted (ER survey, question #58) and whether employment representation can be trusted (MM survey, question #52), respectively.	0.5	0	1
Strained climate	1/0 dummy: 1 if there is no mutual good climate. The coding is based on the generated 1/0 dummy variables manrelat_D and qwprel_D, denoting whether the relations between management and employees are strained (ER survey, question #64, and MM survey, question #63, respectively).	0.16	0	1
<i>Industry affiliation:</i>				
Production	1/0 dummy: 1 if the establishment's main activity belongs to NACE 1-digit codes	0.56	0	1

	B through E (i.e. manufacturing, mining and quarrying and other industry).			
Construction	1/0 dummy: 1 if the establishment's main activity belongs to NACE 1-digit code F.	0.02	0	1
Services	1/0 dummy: 1 if the establishment's main activity belongs to NACE 1-digit codes G through N, R and S.	0.42	0	1
<i>Establishment size:</i>				
Small	1/0 dummy: 1 if the establishment has 10 to 49 employees.	0.15	0	1
Medium	1/0 dummy: 1 if the establishment has 50 to 249 employees.	0.46	0	1
Large	1/0 dummy: 1 if the establishment has at least 250 employees.	0.39	0	1

Notes: The sample is restricted to establishments with a formal employee representation that were threatened with industrial action over an issue that was specific to the establishment since the beginning of 2016, and the respondent is asked about the last instance of industrial action or threat of industrial action. The reported statistics refer to the estimation sample in Table 3, column (1).

Sources: 2019 ECS, Management and Employee Representative Questionnaires; ECS2019_merged data file (version 11-02-20).

ONLINE APPENDIX

Auxiliary Equations for the Strikes Model, by Treatment Group, Logit Estimates

Variables	Treatment group			
	Union density less than 20% (1)	Union density at 20 and 40% (2)	Union density at 40 and 60% (3)	Union density at least 60% (4)
Works council	-1.475*** (0.431)	0.296 (0.505)	-0.289 (0.724)	0.018 (0.378)
Frequency of meetings with management	-0.046 (1.093)	-4.988*** (0.741)	-1.012 (1.156)	-0.444 (0.604)
Quality of information	-0.431* (0.238)	-0.725*** (0.268)	-0.122 (0.318)	-0.289 (0.189)
Distrust	0.428 (0.509)	0.011 (0.515)	2.248*** (0.619)	0.975*** (0.364)
Profit situation	-0.394 (0.317)	0.294 (0.336)	-0.193 (0.365)	0.194 (0.264)
Presence in export markets	-0.332 (0.550)	0.208 (0.528)	-0.202 (0.828)	0.585 (0.406)
Market competition	0.021 (0.294)	0.235 (0.329)	0.392 (0.418)	0.112 (0.208)
Price competition	0.087 (0.634)	-0.376 (0.727)	1.786*** (0.605)	0.117 (0.454)
Establishment age	-0.006 (0.970)	2.150** (0.939)	0.471 (1.503)	-0.594 (0.704)
Single establishment	-0.929** (0.442)	-0.791* (0.451)	-0.331 (0.614)	-0.971*** (0.318)
Declining employment	1.186* (0.620)	-0.391 (1.172)	2.046** (0.945)	1.428** (0.662)
Workers with an OEC	-0.086 (0.132)	-0.033 (0.150)	0.091 (0.254)	-0.083 (0.103)
Stimulating worker commitment	0.013 (0.275)	-0.105 (0.303)	-0.349 (0.475)	-0.636*** (0.228)
Payment by results	0.067 (0.101)	0.044 (0.122)	0.087 (0.137)	0.175*** (0.063)
Skill change	0.276 (0.334)	-0.089 (0.338)	-0.407 (0.516)	-0.219 (0.308)
Skill match	0.003 (0.011)	0.012 (0.008)	-0.005 (0.015)	0.002 (0.008)
Pace of work	0.098 (0.137)	0.128 (0.120)	0.340 (0.213)	0.168* (0.086)

Notes: The auxiliary equations are based on the treatment effects model given in Table 2. The dependent variable (strikes) is a 1/0 dummy, 1 if there has been a stoppage or strike in the establishment since the beginning of 2016. See notes to Table 2. ***, **, and * denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

Source: 2019 ECS, Management and Employee Representative Questionnaires; ECS2019_merged data file (version 11-01-20).

Auxiliary Equations for the Treatment (Union Density) Model, Multinomial Logit Estimates

Variables	Union density groups (very low union density, that is, union density less than 20%, is the omitted group)		
	Low-union density (i.e. 20 to 40 %) (1)	Medium-union density (i.e. 40 to 60 %) (2)	High-union density (i.e. at least 60 %) (3)
Works council	-0.065 (0.247)	-0.471 (0.291)	-0.519** (0.255)
Company level only	1.241*** (0.357)	1.807*** (0.478)	1.829*** (0.393)
Sector level only	0.397 (0.335)	1.135** (0.441)	0.635* (0.346)
Mixed level	0.990*** (0.331)	1.806*** (0.434)	1.571*** (0.335)
Frequency of meetings with management	-0.441 (0.478)	0.383 (0.454)	0.069 (0.408)
Quality of information	-0.154 (0.104)	-0.076 (0.132)	-0.030 (0.121)
Distrust	0.059 (0.233)	0.209 (0.257)	0.338 (0.233)
Profit situation	-0.045 (0.133)	0.029 (0.166)	0.018 (0.142)
Presence in export markets	-0.025 (0.229)	0.427 (0.279)	0.136 (0.249)
Market competition	0.187 (0.128)	-0.096 (0.148)	-0.117 (0.139)
Price competition	0.123 (0.263)	0.102 (0.327)	0.226 (0.273)
Establishment age	-0.388 (0.441)	-0.444 (0.531)	-0.655 (0.516)
Single establishment	-0.170 (0.191)	0.000 (0.233)	-0.003 (0.203)
Declining employment	0.091 (0.323)	-0.180 (0.388)	0.036 (0.350)
Workers with an OEC	0.058 (0.068)	0.069 (0.070)	0.207*** (0.078)
Stimulating worker commitment	-0.175 (0.143)	0.040 (0.169)	-0.081 (0.142)
Payment by results	-0.034 (0.045)	-0.035 (0.053)	-0.030 (0.047)
Skill change	0.140 (0.160)	-0.257 (0.191)	-0.086 (0.164)
Skill match	-0.003 (0.005)	0.005 (0.005)	0.005 (0.005)
Pace of work	0.116** (0.058)	0.050 (0.069)	0.073 (0.066)

Notes: The auxiliary equations are based on the treatment effects model given in Table 2. The treatment (union density) model is multinomial. See notes to Table 2. ***, **, and * denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

Source: 2019 ECS. Management and Employee Representative Questionnaires; ECS2019_merged data file (version 11-01-20).