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Rebellion against Reason? A Study of Expressive Choice and Strikes

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Abstract

In this paper we challenge the conventional view that strikes are caused by asymmetric information regarding firm profitability such that union members are uninformed. Instead, we build an expressive model of strikes where the perception of unfairness provides the expressive benefit of voting for a strike. The model predicts that larger union size increases both wage offers and the incidence of strikes. Furthermore, while asymmetric information is still important in causing strikes, we find that it is the employer who is not fully informed about the level of emotionality within the union, thereby contributing to strike incidence. An empirical test using UK data provides support for the predictions. In particular, union size has a positive effect on the incidence of strikes and other industrial actions even when asymmetric information regarding profitability is controlled for.

1 Introduction

There is a general consensus in the literature on strikes that they are caused by asymmetric information. The union overestimates the profitability of their employers and demands too high a wage. This leads to a strike, which lasts until the union settles for a lower wage. The strike serves an economic function because if the union were never to strike, the employer would always offer the lowest possible wage. This consensus view is reflected in the dictionary review of the topic by Kennan (2008), and it is also the prevailing explanation given in the brief textbook discussion by Borjas (2006) and the survey by Cramton and Tracy (2002).

The literature that these surveys refer to tends to be much older and started to fade in the early 1990s (key references are Ashenfelter and Johnson 1969, Kennan 1986, and Card 1990). Two reasons could reasonably be posited for the decline in interest in strikes. First, they are rare events and have become increasingly rare from the 1990s onwards.[1] Second, asymmetric

[1]See e.g., Simms and Charlwood (2010) on unions and industrial action in the UK, and Bennett and Kaufman (2007) for the United States.

information seemed to provide the clearest answer to the Hicks paradox (i.e., the paradox of inefficient lost surplus) so that the theoretical debate appeared settled. The work on the origins of strikes can also be tied to more general work on the causes of conflict. Fearon (1995) famously argued that (if we ignore irrationality) there are only three factors which can bring about inefficient conflict: commitment problems, indivisibilities, and asymmetric information. The first two potential explanations are not really plausible as features of strikes, which leaves asymmetric information as an explanation.

This paper takes a fresh look at strikes theoretically and empirically by incorporating developments in economics and political economics that have taken place since the 1990s. These developments are the theory of expressive voting in political economics, and the theory of fairness within behavioural economics. We believe that the literature on strikes was dying before the emergence of these theories, and that it is now time to revisit strikes in the light that they provide. These concepts broaden the traditional narrow view of rationality and thus could be viewed as rationalising a possible fourth explanation for conflict given by Fearon, namely irrationality. We still argue that asymmetric information is crucial in causing strikes, but in a very different way to the standard explanation: in our approach, *the employer* is not fully informed about the level of emotionality or expressiveness among union members.

Expressive voting acknowledges the fact that when voting in elections (and a union ballot is, of course, in effect an election), the probability of being decisive in determining the outcome is less than one, and as the size of the electorate becomes larger the probability of being decisive approaches zero. This matters because it may undermine the standard idea that union members vote purely out of indirect instrumental interest. Union members may in fact receive a greater *direct expressive* benefit of voting for a strike. This direct expressive benefit can outweigh the potentially significant costs of strikes occurring, because these costs are discounted by the very low probability of being decisive in determining the outcome.[2] The link between expressiveness and strikes was recognised by Glazer (1992) in a paper that clearly influences the analysis conducted here. He argued that if union members are emotional, they may vote for a strike on emotional grounds, even though they would not have done so if they were choosing purely instrumentally. They are free to choose emotionally because their vote is highly unlikely to determine the outcome of a ballot.

While Glazer bases his expressive theory of voting for strikes on emotional payoffs, he does not provide a formal foundation for them. The analysis presented here aims to do that by tying the emotional payoff from voting for a strike to the theory of fairness developed by Rabin (1993).[3] In Rabin's theory, as long as the costs are not too high, individuals will be

[2]The literature on expressive voting spans several decades and is both theoretically and empirically rich. Although the idea was not new, its significance for democratic decision-making reached a wide audience with the publication of Brennan and Lomasky (1994). For a discussion and comprehensive survey, see Hamlin and Jennings (2011).

[3]Godard (1992) informally also makes the point that strikes can be due to perceptions of unfairness.

willing to hurt individuals that hurt them or, more positively, make sacrifices for individuals that make sacrifices for them. This can explain cooperation in a one-shot prisoners' dilemma, but also, from a negative welfare perspective, the failure to coordinate in the Battle of the Sexes. A key feature of Rabin's theory is that the stakes must be low. As soon as they become high, 'psychological' payoffs will be swamped by material payoffs and the standard predictions would apply. Decisions made by voting (or collective action more generally) turn high material stakes into low material stakes. Therefore, it could be that a collective decision leads to a highly inefficient decision being made (for example a strike) because *ex ante* the union members correctly perceive that their probability of determining the outcome of the election is very small. Thus, for each individual union member the decision in the ballot concerns low material stakes, although *ex post* the material stakes may be extremely high in terms of lost income and other effects. The material stakes *ex ante* will become smaller the larger the size of the union, as this further reduces the probability of being decisive, and fairness concerns will play a larger relative role in the calculus of voting.

In our theoretical model combining fairness concerns (following Rabin) and expressiveness, we demonstrate how fairness concerns are incorporated into two-person employer/employee bargaining over a wage. We see that the equilibrium wage will be higher than if the fairness concerns were absent. That is, the employee would be willing to hurt him or herself to hurt the employer through a strike, but only if the wage offered by the employer is close to the employee's reservation wage. At higher wage offers, although the employee may find the offer unfair, the costs of striking are too high and a strike will therefore not occur. We then extend the analysis to group voting on whether to strike or not. As the union size becomes larger and psychological payoffs receive greater weight relative to material payoffs, the model makes two predictions. First, wages will grow with union size. Second, strikes are more likely with increasing union size.

As stated earlier, we believe that asymmetric information still lies at the heart of the explanation for strikes, but we argue that it now acts in the opposite direction: from the employer towards the employees. If the employer had full knowledge about the exact level of emotionality within the union, she would set the wage at the lowest level that would avoid a strike. However, she is likely not to have this knowledge, and as a result may underestimate emotionality and offer a wage which is too low, such that union members vote for strike action. This can happen even though there is no asymmetric information regarding the profitability of the firm, as is the case for example for publicly listed companies.

We test our theoretical predictions using UK data gathered in the Workplace Employment Relations Survey 2004 (Department of Trade and Industry 2005a). The results show that one type of asymmetric information, i.e., a lack of knowledge by managers of union members' attitude – proxied by a trust mismatch between the two sides – does tend to be linked to a higher incidence of industrial action. Most importantly, we find that even when controlling for

"classical" asymmetric information regarding profitability, union size is positively and significantly associated with higher average wages in a firm and increased industrial action incidence. While the former result could arguably also be explained by the effects of union (bargaining) power,[4] the latter is a novel finding and strongly suggests that expressive behaviour can help us understand the occurrence of strikes and other types of industrial action.

As mentioned above, strikes and industrial actions in general are relatively rare events. However, it does not follow that the analysis of their origins has become irrelevant: when strikes happen, they are often very big news. A recent high-profile example is the 2009 to 2011 dispute between British Airways (BA) and the "Unite" union. The profitability of BA was common knowledge, substantially weakening the argument for classic asymmetric information as a reason for striking. Instead, the strike seemed to have much more to do with the tough stance taken by BA's chief executive Willie Walsh, which provoked an angry emotional response within the Unite union and led to the subsequent votes for strike action. By May 2011, when agreement was reached, the replacement of Willie Walsh with Keith Williams appears to have been a central factor in achieving compromise. In terms of the model and empirical study presented here, the BA dispute represents a situation where a strike occurs despite symmetric information about the profitability of the firm, being instead triggered by a perception on the part of the union of employer unfairness. Given that an individual member's vote was unlikely to determine the outcome of the strike ballot, a majority of union members may have voted expressively for strike action. It is doubtful whether the majority would have done so if their individual vote had been decisive, given the severe consequences of strike action in terms of potential disciplinary measures and the effect on the profitability of their company. When a new employer arrived offering what was perceived by the majority as a fair offer, the strike was averted.[5]

The rest of the paper is organised as follows. Section 2 presents the model and its main predictions; Section 3 describes the data and results from the empirical analysis; and Section 4 concludes.

2 The Model

Let us consider a firm and union that undergo negotiations over a union wage. We simplify the analysis by assuming the firm to be of a fixed size in terms of the number of workers and its revenue is fixed at p per worker. The employer's profits are given by $p - w$ per worker where w is the wage paid out to each worker. The negotiation over a wage offer involves a firm selecting a wage within the interval $w \in [0, p]$, which a subset of the workers who are members

[4] See e.g., Simms and Charlwood (2010), who also offer a critique of the use of union size as an effective measure of union power.

[5] The BBC website provides a good source of information on the BA dispute. See http://www.bbc.co.uk/news/business-13373638 and the links attached within that article.

of the union decide to either accept or reject through a vote to (not) strike. If a strike does not occur, payoffs are w^* and $p - w^*$, for each worker and the firm, respectively. In the event of a strike, payoffs for all actors are normalised to zero. While we hold the size of workforce to be fixed, we allow the number of workers that are unionised to be variable. As union size becomes larger, the probability of any single union member determining whether there is a strike or not becomes smaller. This would increase the weight on expressive concerns relative to instrumental concerns, provided that expressive concerns exist. The extent to which union members are expressive is known to the members, but is not known to the employer. The model presented in this section advances the work by Glazer (1992) by being precise about the content of an expressive choice. We do this by grounding it in Rabin's (1993) theory of fairness. As an application in his paper, Rabin discusses the extent to which concerns with fairness prevent a monopolist from being able to extract the full surplus from the consumer. Above a certain price, the consumer would prefer to punish the monopolist (and herself) by not purchasing a good that would have generated positive material benefits, both for the consumer and the monopolist. We adapt this application to the setting of wage negotiations between an employer and a union.

2.1 A theory of fairness

We show how the inclusion of concerns about fairness affects wage determination in negotiations between an employer and the union, such that wage demands are higher than if there were no concern for fairness, and that the employer will agree to these higher demands. We then introduce expressiveness and demonstrate that this may amplify the concern for fairness, which in turn further increases wage demands. If the employer cannot perfectly predict the expressiveness of the union members, she may underestimate its realised value and offer too low a wage and thus cause a strike, which arises out of a sense of unfairness. When union size is small and wage demands are small, the firm is more likely to set the wage at the level demanded by potentially highly expressive union members, thus avoiding the possibility of a strike. As union size becomes larger and wage demands rise, the employer is likely to set the wage at a level that would be demanded by a more moderately expressive union. In doing so, however, the employer is more likely to incur a strike. The model gives three main predictions that can be tested empirically. First, as union size increases the average wage increases. Second, as union size increases the probability of a strike increases. Third, strikes are more likely where there is a lack of communication and trust between the employer and union members, in line with the idea that asymmetric information on the employer's side with regard to the union members' preferences plays a key role.

We first summarise the Rabin approach to modelling fairness. From a material two-player game, a psychological game is derived which will determine each player's psychological utility. This will depend on three factors. Player 1's strategy (a_1) depends on her belief about the

strategy of player 2 (b_2), and her belief about player 2's belief regarding her strategy (c_1). A similar description applies to player 2.

We derive a kindness function for player 1, $f_1(a_1, b_2)$ and player 1's perception of player 2's kindness $\widetilde{f}_2(b_2, c_1)$. These are expressed as follows

$$f_1(a_1, b_2) = \frac{\pi_2(a_1, b_2) - \pi_2^{fair}(b_2)}{\pi_2^{\max}(b_2) - \pi_2^{\min}(b_2)} \tag{1}$$

and

$$\widetilde{f}_2(b_2, c_1) = \frac{\pi_1(c_1, b_2) - \pi_1^{fair}(c_1)}{\pi_1^{\max}(c_1) - \pi_1^{\min}(c_1)} \tag{2}$$

where $\pi_2(a_1, b_2)$ is the payoff received by player 2 given that player 2 chooses strategy b_2 and player 1 chooses strategy a_1. $\pi_2^{fair}(b_2)$ is defined as $\frac{\left[\pi_2^h(b_2)+\pi_2^l(b_2)\right]}{2}$ and refers to the mid-point between the highest and lowest (Pareto efficient) payoffs player 1 could give to player 2 given that player 2 plays strategy b_2. If the numerator is positive, player 1 is being kind to player 2. If it is negative, player 1 is being unkind, and if it is zero player 1's behaviour is neutral in terms of kindness. The function f_1 is weighted by the maximum payoff player 1 could give player 2, minus the lowest possible payoff (now including possibly Pareto inefficient payoffs) that player 1 could give player 2 given their choice of b_2. A Pareto inefficient payoff obviously means playing a strategy that will make both parties worse off compared to an alternative available strategy open to player 1. The function $\widetilde{f_2}$ is analogous to f_1 and measures player 1's perception of player 2's kindness towards her, given her belief that player 2 believes she is playing strategy c_1. Analogous functions f_2 and $\widetilde{f_1}$ are derived in the same way for player 2. It will become clear below how these payoffs are depicted for the game we are analysing.

The following utility function for player 1 is assumed, which incorporates material and psychological payoffs

$$U_1(a_1, b_2, c_1) = \pi_1(a_1, b_2) + \widetilde{f}_2(b_2, c_1)\left[1 + f_1(a_1, b_2)\right] \tag{3}$$

and similarly for $U_2(a_2, b_1, c_2)$. π_1 refers to the material payoff and $\widetilde{f}_2[1 + f_1]$ refers to the psychological payoff. We can see from the psychological payoff that if player 1 believes that player 2 is unkind $\left(\widetilde{f}_2 < 0\right)$, then the psychological payoff would be maximised by choosing to be unkind towards player 2 $(f_1 < 0)$. The reverse is true if player 2 is perceived as being kind. If player 2 is perceived as being neutral $\left(\widetilde{f}_2 = 0\right)$ then the psychological payoff is irrelevant. Note though that the possibility of the psychological payoff altering behaviour is dependent upon the material payoff being relatively small. A contribution of this paper is to demonstrate how a high-stakes material game such as a strike can be converted into a game in which these stakes are reduced and psychological payoffs can change behaviour.

2.2 Nash Equilibrium

We now apply the Rabin model to a setting of wage negotiations between an employer and a union. Assume initially that the union is represented by only one member so that he or she is completely decisive in negotiations with the employer. The employer picks $w \in [0, p]$ and the union representative then picks $r \in [0, p]$. If $r > w$ then there is a strike and the payoff is zero for both parties. If $r \leq w$ the payoffs are w^* and $p - w^*$ for the workers and firm, respectively. First, let us consider what would happen in a world without fairness concerns where workers and employers are purely materially motivated. If we rule out weakly dominated strategies, choosing 0 is a dominant strategy for the union representative, so $w = 0$ is the predicted outcome of the game.

2.3 Fairness Equilibrium

We first assume only one union representative and thus no expressiveness because the representative is decisive in determining the outcome. What is the lowest wage consistent with a fairness equilibrium? Given the employer sets w, she can get $p - w^*$ or 0. If $r \leq w$ then the union representative maximises both his and the employer's payoff, and from (1) we can see that $f_{union} = 0$. By choosing any $r \leq w$ the employer receives a payoff of $p - w^*$. Thus there is only one efficient payoff for the employer, namely $p - w^*$. If $r > w$ then the union representative minimises the payoff of both parties to zero (thus choosing a Pareto inefficient payoff, given that an efficient payoff would have been available if $r \leq w$ had been chosen), so $f_{union} = -1$. The employer will never feel positively towards the employee, because even if the union asks for a wage lower than the one that the firm offers, they will still receive w and thus all offers of $r \leq w$ are in the material interest of the union as well as the employer. For this reason the employer will never offer $w > r$. So in a fairness equilibrium $w = r$. Would the union representative wish to deviate and choose $r > w$? If so,

$$U_{union} = 0 + f_{employer} [1 - 1] = 0, \tag{4}$$

and by choosing $r = w$

$$U_{union} = w + f_{employer} [1 + 0] . \tag{5}$$

To solve we need first to solve for $f_{employer}$ (how kind the firm is being towards the worker, from (2)):

$$f_{employer} = \frac{w - \frac{1}{2}(w + p)}{p} = \frac{w - p}{2p}. \tag{6}$$

$f_{employer}$ is clearly negative because the employer offers the lowest possible wage that she can that avoids a strike. Plugging (6) into (5) and setting equal to (4), we see that

$$w = \frac{p}{2p + 1} > 0. \tag{7}$$

This is the lowest wage the firm could offer that would avoid a strike. Clearly the wage in the fairness equilibrium is higher than in the Nash equilibrium, reflecting the concern for fairness. Note though that in this limited case where we assume only one union representative, so that she is completely decisive when determining whether there is a strike or not, the wage agreed is still very small as a proportion of p, as p becomes large. This makes sense: it tells us that when revenues are very high, an individual representative would find it too costly materially to fight for the same share of the revenue as when revenues are low.

We now extend the analysis to a ballot of union members where the number of union members balloted is greater than one.[6] An immediate implication of a collective ballot is that a single individual will not be decisive in determining the outcome. As the number of union members balloted increases, the probability of being decisive becomes smaller.[7] In this environment, if expressive preferences exist, their effect will be magnified the larger the union and thus the lower the probability of being decisive. We include expressiveness as being driven by the psychological payoff in such a way that union members experience a psychological payoff from their decision, even if that decision is not the one that is reached by the union overall. In other words, they may receive direct expressive utility from their choice, as well as indirect instrumental utility from the outcome. Assume there is a vote on whether to strike or not. We assume that each member's expressiveness is given by a parameter $\theta \in [0, 1]$. When $\theta = 0$ the members are not expressive, but purely instrumental in their outlook towards any wage offer. In this case, for an individual to obtain utility from choosing to hurt the employer, the employer must actually be hurt. In contrast, at the extreme $\theta = 1$, the members are fully expressive. In this case, a member will receive utility from their choice to hurt the employer even if the employer is not actually hurt.

Let us denote w^0 as the wage offer proposed by the firm. The individual worker has to decide whether to vote "yes" or "no" for a strike. Given the union member's level of expressiveness, θ, the expected payoff for the member if she votes for a strike, is given by

$$\underbrace{\pi_S \cdot 0 + \pi_N w^0 + \pi_D \cdot 0}_{\text{Material payoffs}} + \underbrace{\pi_S \cdot 0 + \pi_D \cdot 0 + \pi_N \left(\left[\frac{w^0 - p}{2p} \right] (1 - \theta) \right) + \pi_N \cdot 0\theta}_{\text{psychological payoff}} \tag{8}$$

where π_S and π_N are the probabilities of a strike occurring and not occurring, respectively, and π_D is the probability of being decisive in the voting decision. The first component illustrates the material payoffs the individual will gain, which is only positive for the case where a strike does not occur and the worker receives w^0.

The latter component captures the psychological payoffs. First, there is the psychological payoff $\frac{w^0 - p}{2p}$, which incorporates the theory of fairness that was derived in Eq. (6). The

[6] The reader should not interpret the ballot too literally. The analysis we present could apply to any sort of collective action in which a threshold level of support is required to induce action.

[7] On the probability of being decisive, see Gelman, Silver and Edlin (2012).

second component is the level of expressiveness. If $\theta = 0$ the voter fully absorbs the psychological payoff associated with the group decision. In this case expressiveness is not present. In the event that the union decides not to strike, the member receives the psychological utility associated with that decision even though she chose to strike. She receives the negative psychological payoff $\left(\frac{w^0-p}{2p}\right)$ associated with choosing not to retaliate to the perceived unkindness of the employer. If $\theta = 1$ the voter receives the psychological payoff associated with his own decision even in the event that it does not actually come about. This means that the member enjoys the psychological benefit (a zero payoff as opposed to $\frac{w^0-p}{2p}$) of retaliating to perceived unkindness on the part of the employer by choosing to strike, even though the union decides not to strike. This is an expressive payoff because it is a choice that generates a payoff that is unrelated to the actual outcome of the ballot. Equation (8) can be simplified to:

$$\pi_n w^0 + \pi_n \left(\frac{w^0 - p}{2p}\right)(1-\theta). \tag{9}$$

When a union member decides to vote against a strike, her expected payoff is given by:

$$\pi_S \cdot 0 + \pi_N w^0 + \pi_D w^0 + \pi_S \cdot 0(1-\theta) + \frac{w^0 - p}{2p}\left(\pi_S\theta + \pi_D + \pi_N\right), \tag{10}$$

which can be simplified to:

$$\pi_D w^0 + \pi_N w^0 + \left(\frac{w^0 - p}{2p}\right)\left(\pi_S\theta + \pi_D + \pi_N\right). \tag{11}$$

It follows that a member will be indifferent between voting "yes" and "no", when the expected payoffs from (9) and (11) are equal. Combining (9) and (11), using that $\pi_N + \pi_S + \pi_D = 1$, and solving for the "fairness" wage offer w^0, we obtain

$$w^0 = \frac{p\left(\theta(1-\pi_D) + \pi_D\right)}{2p\pi_D + \theta(1-\pi_D) + \pi_D}. \tag{12}$$

We can see that

$$\frac{p\left(\theta(1-\pi_D) + \pi_D\right)}{2p\pi_D + \theta(1-\pi_D) + \pi_D} > \frac{p}{2p+1},$$

if $\theta > 0$ and $\pi_D < 1$. This means that if there is expressiveness ($\theta > 0$) due to the decision being made by a group, the wage claim is higher because the union members need not be as concerned that their decision to vote for a strike will actually determine whether a strike occurs or not.

From above, (12) shows the minimum wage offer union members will accept from the firm. Note that this depends on the probability of being decisive as well as on the level of expressiveness. In particular, it is straightforward to show:

$$\frac{\partial w^0}{\partial \theta} = \frac{2p^2(1-\pi_D)\pi_D}{\left(\pi_D + 2p\pi_D + \theta(1-\pi_D)\right)^2} > 0. \tag{13}$$

As expressiveness increases, then so too does the minimum level of wage offer that the union will accept. We also can show that (where n is the number of union members)

$$\frac{\partial w^0}{\partial n} = \frac{-2p^2 \frac{d\pi_D}{dn}\theta}{\left(2p\pi_D + \theta(1-\pi_D) + \pi_D\right)^2} > 0, \tag{14}$$

which is positive because the change in the probability of being decisive with respect to the number of union members $\frac{d\pi_D}{dn}$ is decreasing.

These simple findings provide the framework for one of our testable predictions: increased union size leads to higher wages. This argument is not based on the idea that increased union size means that the union is stronger; rather, we identify a different process such that the role of expressive preferences is enhanced in a strike ballot. We make two other empirical predictions, based on the theoretical findings below. First, if there is a lack of trust and communication between management and union members, strikes are more likely. Second, larger union size leads to more strikes.

If there were full trust between the employers and the union members so that the employer knew precisely how expressive the members are, we would never observe a strike. The wage would be set to equal the minimum level acceptable to union members as given by (12). In order for a strike to happen, the firm must sometimes underestimate the value of θ and set the wage at a level unacceptable to the union. This can only happen if there is a lack of trust and/or communication between union members and their employer.

When $\pi_D = 1$ such that there is only one union member, θ is irrelevant to the wage offer, which is $w^0 = \frac{p}{2p+1}$, and there will never be a strike. As the union size becomes bigger and π_D becomes smaller, w^0 increases. If all values of θ are assumed possible, the only way to prevent any possibility of a strike is for the employer to set w such that $\theta = 1$, that is

$$w^0 = \frac{p}{2p\pi_D + 1}. \tag{15}$$

Profits per worker in this case would equal

$$p - \frac{p}{2p\pi_D + 1} = \frac{2p^2\pi_D}{2p\pi_D + 1}. \tag{16}$$

If the employer were to set the wage at a value of θ such that $\overline{\theta} < 1$ and this wage offer were acceptable to the union, the realised profits per worker would be higher:

$$\frac{2p^2\pi_D}{2p\pi_D + \overline{\theta}\left(1-\pi_D\right) + \pi_D} > \frac{2p^2\pi_D}{2p\pi_D + 1} \tag{17}$$

for $0 < \theta < 1$ and $0 < \pi_D < 1$.

The issue then is whether the higher profit per worker in the event that there is a strike compensates for the risk that the realisation of θ is higher than $\bar{\theta}$ and the incurrence of zero profits as a result, that is

$$pr\left(\theta \leq \overline{\theta}\right)\left(\frac{2p^2\pi_D}{2p\pi_D + \overline{\theta}\left(1-\pi_D\right) + \pi_D}\right) + pr\left(\theta > \bar{\theta}\right)0 > \frac{2p^2\pi_D}{2p\pi_D + 1}. \tag{18}$$

This can be rewritten as follows

$$pr\left(\theta \leq \overline{\theta}\right) - \overline{\theta} > \pi_D \left(2p\left(1 - pr\left(\theta \leq \overline{\theta}\right)\right) + (1 - \theta)\right). \tag{19}$$

For (19) to hold, $pr\left(\theta \leq \overline{\theta}\right) > \overline{\theta}$. This will not hold for a distribution of θ that is uniform, but it would be the case for a distribution which is normal (supposing that $\overline{\theta}$ is set at a relatively high level), for example. It is also more likely to hold the smaller is π_D (the larger the union membership). Assuming that (19) holds, if we differentiate the net expected profit per worker from setting $\overline{\theta} < 1$ rather than $\theta = 1$, we obtain

$$\frac{dpr\left(\theta \leq \overline{\theta}\right)}{d\overline{\theta}} - 1 + \pi_D \left(2p\frac{dpr\left(\theta \leq \overline{\theta}\right)}{d\overline{\theta}} + 1\right). \tag{20}$$

As union membership increases and π_D approaches zero, this expression is more likely to be negative since $0 < \frac{dpr\left(\theta \leq \overline{\theta}\right)}{d\overline{\theta}} < 1$. This implies that higher expected profit per worker will be generated if $\overline{\theta}$ is reduced. Clearly this increases the probability of a strike occurring.

3 Empirical analysis

We now test the three main predictions from the theoretical model. First, we look at whether managers' knowledge of union members' attitudes – proxied by the level of trust in unions – influences the incidence of industrial actions, including strikes. Second, we test whether larger unions are correlated with higher average wages; and third, whether greater union size is related to more industrial actions. We begin by briefly describing the survey dataset, and then discuss our methodology and present the results.

3.1 The Workplace Employee Relations Survey

The dataset used in our analysis is based on the Workplace Employee Relations Survey 2004 (WERS2004), collected by the Department of Trade and Industry (2005a) in Great Britain. This is a large, nationally representative sample survey of workplaces with five or more employees. The WERS2004 is the fifth in a series of surveys, and the first to include firms with less than ten employees (the 1998 survey included firms with ten or more employees, while the previous surveys only included firms with at least 25 employees). The firm size distribution in Great Britain is highly skewed towards smaller-sized establishments: in order to ensure a sufficient number of firms in each size category for potential analysis by firm size, larger firms were therefore over-sampled. In addition, the sample was stratified by Standard Industrial Classification 2003 (SIC 2003), where Sections A to C (Agriculture, hunting and forestry; Fishing; and Mining and Quarrying), P (Private households with employed persons) and Q (Extra territorial bodies), as well as Northern Irish firms were excluded. The Department of Trade and Industry (DTI) provides researchers with appropriate weights in order to ensure

unbiased estimations when using the WERS dataset.[8] The cross-section WERS2004 includes a Survey of Employees, a Survey of Management, and a Survey of Worker Representatives. We mainly rely on the information in the Management Questionnaire (MQ). For part of our analysis, we link the MQ and the Survey of Employees (SE), for which 25 employees from each firm were randomly chosen to respond to a short questionnaire (all employees were surveyed in firms with fewer than 25 workers). Employees from all 2295 firms included in the cross-section survey were asked to fill out the questionnaire.

For another part of the empirical analysis, we link the MQ and the Worker Representative Questionnaire (WRQ). For the latter, the interviewers sought out the senior union representative of the largest union present in a firm and the senior non-union representative. Interviews were only conducted if management of the firm agreed. Of the total sample size for the cross-section survey of 2295 firms for which we have information from management, 1203 eligible worker representatives at 1072 firms were identified, and interviews with 985 of these were achieved (note that the most common reason for a failed interview was refusal by management). We are interested only in the answers of union representatives, so we discard the answers given by non-union representatives, leaving us with 736 successful interviews. In addition to the relevant answers from the management questionnaire, this brings our sample up to a potential of 895 firms. Intuitively, union presence and therefore worker representatives are more likely to be found in larger firms: only 10.3% of the firms with 5-9 employees had eligible representatives, while over 80% of the firms with over 500 employees had eligible representatives.

3.2 Methodology and results

For our analysis, we are most interested in the information on the proportion of union membership at a workplace and in the incidence of strikes and other industrial actions. For union membership, we rely on the question in the MQ which asks "How many employees at this establishment are members of a trade union or independent staff association - whether recognized by management or not?". We relate this to the information on total employees to get a measure in percent of relative union size within each firm. Unfortunately, this question also includes non-union staff organizations, which is likely to slightly inflate the membership numbers.[9] According to the theoretical model, the size of the bargaining unit or union size

[8]The DTI also provides information on strata, although in a personal communication with the authors, a DTI staff member pointed out that the specification of strata in the statistics package STATA does not much alter results in practice. Using STATA v.11, we do not specify strata in our estimations using the Worker Representative Questionnaire because we had several singleton strata in our data subset (see below for more details on the various questionnaires used).

[9]The WRQ has a similar question ("wbpropme"), which however only considers membership in the largest union, disregarding possible smaller unions present in a firm. In addition, using the WRQ information substantially reduces the sample size. Results are similar, though statistically weaker (available upon request).

reduces the probability of being decisive and increases the emphasis on expressiveness, and is therefore a proxy for the expressiveness of employees.

We have two possible measures of industrial actions: strike is a zero-one dummy for whether or not a firm witnessed strikes of less than one day to a week or more; the dummy variable industrial action is more general and includes not only strikes, but also overtime bans or restrictions by employees; work to rule; lock outs; go slow; backing of work; work-ins and sit-ins; and other, non-specified actions. The information in the WERS 2004 relates to all industrial actions that occurred during the 12 months preceding the interview.[10]

Table 1 shows the weighted proportions (in percent) of strikes and more general industrial actions by firm size and by private and public sector. Note that the majority of firms (around 87 percent) in the sample come from the private sector. The table shows that the smallest-sized firms with less than ten employees had no incidence of strikes in the 12 months preceding the interview, although they did witness other forms of industrial action. In general, strikes are less frequent than other forms of industrial action, and both categories are found less frequently in the private than in the public sector.

Industrial actions clearly remain a rare event in both private and public sector and in all-sized firms, with only around two percent of the firms having witnessed any type of industrial action over the previous year. This low incidence of industrial actions revealed by the survey is in line with a more general trend towards less industrial action that started in the 1980s. Both the number of strikes and other forms of industrial action, as well as trade union ballots, have been going down, though the incidence varies across industries and regions inthe UK, and there have been several short-lived positive peaks in labour disputes (i.e. in 1996, 2002 and 2007). The year 2004 however did not prove to be exceptional, but rather confirmed the decline: it had the lowest number of stoppages (130) on record at the time, though 2005 and 2009 have seen even fewer stoppages, with 116 and 98, respectively. The total of working days lost to strikes in 2004 (905000) was however above the 1990s average of 660 000, but still considerably lower than the averages for the 1980s (7.2 million) and the 1970s (12.9 million) (Hale 2010). This observation of a decreasing trend in industrial actions is echoed in the trade union membership numbers. Union membership in the United Kingdom peaked in 1979 and has been on the decline ever since, though the tendency has been less severe since the mid-1990s and varies between industries and genders (note that trade union membership among women has been increasing and recently surpassed male membership numbers). Between 2000 and 2010, trade union membership decreased by around 3 percent in England, Scotland and Northern Ireland, and by 5 percent in Wales (Achur 2010).

The first theoretical point to be tested considers employers' knowledge of union members' attitudes and trust levels. The assumption is that the more "ignorant" the employer is regarding union members' attitudes, and particularly their level of emotionality, the more

[10] According to question "gactio" in the MQ.

likely she is to make a wage offer that will lead union members to call for industrial action. It is obviously difficult to capture the level of ignorance of the employer or an attitudinal concept as challenging to define as "trust". However, the WERS2004 asks some questions that focus on the relations between management and unions and offer a unique insight into employers' information and trust levels *vis à vis* unions. The relevant question that seeks to measure the level of mutual trust between the two sides was asked both of employers (i.e., managers) and union representatives. We can therefore test the first point by looking at the response to the question: "Managers (union representatives) here can be trusted to act with honesty and integrity in their dealings with union representatives (management)." The responses were originally recorded from "strongly agree" to "strongly disagree"; we recode them into "trust" ("strongly agree" and "agree") and "mistrust" ("disagree" and "strongly disagree").[11]

An initial, straightforward way to approach the question is to simply look at mean estimates of managers' mistrust levels by type of industrial action.[12] The results are shown in the second column of Table 2. Managers' mistrust levels appear to be higher in firms where there was no strike (upper panel), and at the same time where there was some other form of industrial action (lower panel). The result is curious and may be explained by the rare-event nature of strikes; however, the difference in mistrust levels is statistically insignificant.

An alternative strategy for measuring this asymmetry in knowledge and trust levels is to explicitly compare both sides' responses. We assume that ignorance is higher where the responses do not coincide, i.e., where one side unilaterally trusts (mistrusts) the other. Such a disparity in attitudes should leave more room for misinterpretations and therefore proposals from management to unions that prove unacceptable to the latter. In turn, it should lead to more industrial action by unions. Put differently, industrial action should be more frequent in firms where there is a lack of mutual trust (or mistrust) between management and unions, with little understanding between the two sides. We can construct two simple attitude-mismatch dummy variables by taking the absolute value of the difference between the trust (mistrust) level expressed by management and union representative of a given firm. If the two attitudes coincide, the dummy will be equal to zero; if there is a mismatch, the dummy will take a value of one.[13] The third and fourth columns of Table 2 show the mean estimates of the level of mismatch in trust and mistrust levels by type of industrial action, respectively. What we see is that there is indeed a higher mismatch in the trust and mistrust levels in firms that witnessed industrial actions (lower panel). However, the difference – though seemingly large particularly for mistrust – is not statistically significant, falling within the 30% significance range. As regards the narrow category of strikes only, the upper panel shows that the trust

[11]The neutral response of "neither" is coded as "non-trust" (trust=0) and "non-mistrust" (mistrust=0), respectively.

[12]Of the 812 firm managers who responded to the question, 47 (5.8%) responded that they mistrust unions.

[13]For the 673 firms for which we have responses from both sides, 287 (42.6 %) show a mismatch in trust levels (one side unilaterally trusts the other), and 130 (19.3 %) a mismatch in mistrust levels.

and mistrust mismatches between management and unions are actually higher when there are no strikes, though again the difference is not statistically significant.

The evidence for the first prediction is suggestive for general industrial actions, but overall rather weak, possibly due to the difficulty of measuring attitudes and the small number of firms from the total sample for which we have responses from both sides.

The second question derived from the theoretical model is whether larger unions, i.e., workplaces with a larger union membership among their employees and therefore higher expressiveness, are able to generate higher wages for union members. Unfortunately, the WERS 2004 does not provide detailed wage data for all employees, but only for the 25 (or less) employees surveyed in the SE in the form of weekly wage brackets.[14] We link the SE to the MQ, take the mid-point of the weekly wage brackets, and aggregate the information from separate questionnaires from one single firm to arrive at two different firm-level average wage measures: the mean and median weekly wages within each firm. We show results for both dependent variables according to the following OLS regression:

$$W_i = \gamma \cdot unionsize_i + \delta \cdot V_i + \theta_i, \tag{21}$$

where W_i indicates the (natural logarithm of) average (i.e., mean or median) weekly wages in firm i. As described above, we construct a variable named *unionsize* based on information in the MQ. V_i is a vector of control variables. The first set of controls includes firm characteristics such as Standard Industrial Classification (SIC 2003) and firm size dummies,[15] the share of women in the total workforce, and the share of managers and senior officials (*percent managers*) as a rough proxy for the number of the most highly-qualified – and likely most highly-paid – workers. We also include the share of employees made redundant during the past 12 months (*redundancies*), which points towards possible (financial) difficulties the firm may be undergoing and the tensions these may cause among employees. Such difficulties may negatively affect the average wage levels. We also add dummy variables for private sector and stock-market listing. θ is the error term.

The results are shown in Table 3. Both measures of average wages have the expected positive relationship with union size, with the association being particularly robust for median wages (Panel B). As union size goes up, the average wage in a firm increases, as well. The

[14]The weekly wage brackets are as follows: £50 or less; £51-£80; £81-£110; £111-£140: £141-£180; £181-£220; £221-£260; £261-£310; £311-£360; £361-£430; £431-£540; £541-£680; £681-£870; and £871 or more.

[15]Firm sizes range from 5-9 employees; 10-24; 25-49; 50-99; 100-199; 200-499; 500-999; 1000-1999; and 2000 and over. The SIC 2003 codes include Manufacturing (D); Electricity, Gas and Water Supply (E); Construction (F); Wholesale and Retail Trade, Repair of Motor Vehicles, Motorcycles and Personal and Household Goods (G); Hotels and Restaurants (H); Transport, Storage and Communication (I); Financial Intermediation (J); Real Estate, Renting and Business Activities (K); Public Administration and Defence, Compulsory Social Security (L); Education (M); Health and Social Work (N), and Other Community, Social and Personal Service Activities (O).

economic impact fluctuates from relatively large when we consider the parsimonious specifications in column (1), to relatively small: the beta coefficients for an increase of one standard deviation in union size (around 33.7 percent) on mean wages lie between 0.07 and 0.22.[16] For median wages, they range from 0.06 to 0.19.[17] These results confirm the theoretical prediction of a positive link. We argue that at least part of this relationship is due to the effect of expressive behaviour, and not only to the traditional union (bargaining) power effect. However, it is difficult to exclude the latter effect given the absence of an alternative measure of expressiveness.

Looking at the additional variables, a higher percentage of managers in the total workforce is associated with higher average weekly wages, while a higher percentage of women is linked to lower average wages. Both findings are consistent with expectations. Interestingly, a large number of redundancies over the previous 12 months is robustly associated with higher rather than lower average wages, while private sector firms and those with a stock-market listing tend to have lower average wages.

The third and final test regards the theoretical prediction that larger unions (and therefore potentially more expressiveness) will be associated with more strikes and other forms of industrial actions. In the absence of the standard source of asymmetric information (namely regarding firm profitability), we would not expect union size – our measure for expressiveness – to have any influence on the incidence of industrial actions. If, however, union size affects the incidence of strikes and other industrial actions even once we control for the standard type of asymmetric information, then we would have evidence that "expressiveness matters". Table 4 shows a comparison in the mean union size for firms by type of industrial action. We note a remarkable difference: the mean union size is indeed significantly larger both in firms that have witnessed strikes and in firms that have seen industrial actions in general during the previous twelve months. In firms that have seen a strike, union size is roughly five times larger than in firms that have not seen any strike. Union size in firms that have experienced any type of industrial action is around four times larger. In order to further investigate this point, we perform logit estimations according to the following equation:

$$Y_i = \alpha \cdot unionsize_i + \beta \cdot X_i + \epsilon_i, \tag{22}$$

where Y_i is either strike or general industrial action in firm i. *unionsize* is the proportion of union membership among the firm's employees as described above, and X_i is a vector of control variables, including several variables conventionally used in the strike literature. These can be divided into three categories: workplace characteristics, measures of asymmetric information, and information on previous industrial disputes. In the first category we have a dummy variable for whether a firm is formally private or public; the proportion of women

[16] Calculated from $(33.7 \cdot 0.003)/0.46$ and $(33.7 \cdot 0.001)/0.46$, respectively.
[17] Calculated from $(33.7 \cdot 0.003)/0.52$ and $(33.7 \cdot 0.001)/0.52$, respectively.

in the total workforce; and controls for firm size and the SIC 2003 of the firm. The second category includes several variables that aim to control for the possible impact of asymmetric information on the profitability of a firm as an alternative explanation for the incidence of strikes and other forms of industrial action. These are a dummy variable for whether a firm is listed on a stock exchange, according to the reasoning that listed companies are required to publish more information on their financial situation and should therefore be less likely to see industrial actions; a dummy for whether a firm is part of a larger organisation with several plants in Great Britain (*multiplant*), under the assumption that multi-plant organisations have less information exchange than organisations with only one plant (see e.g., Godard 1992; Ingram et al. 1993); and whether senior managers meet with the entire workforce, for example to communicate workplace changes (*meetings*). Information on previous disputes includes a dummy for whether the firm witnessed any collective disputes over pay or conditions with any group of workers during the previous year; a dummy for significant disruptions suffered because of industrial actions in another organisation (i.e., a contagion effect termed *disruptions*); and the share of employees made redundant during the past 12 months (*redundancies*). ϵ_i is the error term.

The results are shown in Table 5. We see that union size has a positive and significant influence both on the likelihood of observing a strike (Panel A) and of witnessing any type of industrial action (Panel B). This confirms the findings from the simple means comparison in Table 4. Moreover, the magnitude of the coefficients remains relatively consistent with the addition of the control variables, suggesting that they are quite precisely estimated. However, the size of the economic impact, measured by the marginal effect, is very limited: for example, when 90 percent of a firm's employees are already unionised, adding another 10 percent to reach 100 percent unionisation increases the likelihood of a strike by at most 0.3 percent (from column (1)). Similar magnitudes apply to the case of industrial actions in general (Panel B).[18]

Regarding the control variables, a higher percentage of women in the workforce and being in the private sector are both less likely to be associated with any form of industrial action. A recent history of collective disputes, nearby work disruptions in other organisations, and a large number of redundancies tend to coincide with an increase in the incidence of strikes and other industrial actions in a firm.

Most interestingly, our proxies for the asymmetric information hypothesis suggest that this explanation still holds. Firms that are listed on a stock market tend to see less industrial action in general, though the listing has no effect on strikes in particular. Being part of an organisation with multiple plants is linked to more strike activity and industrial action in general, while meetings between managers and employees are associated with fewer industrial actions and strikes, but not significantly so. In short, these findings confirm the expectation

[18]One reason for the low marginal effects may be the rare-event nature of industrial actions in today's economy.

that better information flows reduce the incidence of strikes and other industrial actions; importantly however, the inclusion of these variables does not affect the impact of union size. This lends support to the idea that asymmetric information is not the sole explanation for the occurrence of industrial action, and that expressive behaviour is also a relevant and complementary explanatory factor.

In sum, the empirical findings generally support the predictions from the theoretical model: most importantly, they show that expressive behaviour can help explain the incidence of industrial actions, even when we consider the influence of other possible factors such as asymmetric information on the profitability of the firm.

4 Discussion and conclusions

The study of strikes has been a classical topic in labour economics. Recently however, interest in the research area has waned, on the one hand because asymmetric information theory appeared to offer a compelling explanation for strike incidence, and on the other because the number of strikes and industrial actions in general has been on a downward trend for the past two to three decades, at least in the UK and the United States. We contend that strikes and other forms of industrial action are still important, albeit rare, occurrences, and draw on developments in behavioural and political economics to offer a new explanation of why they occur: they can be interpreted as a manifestation of expressive behaviour. We argue both theoretically and empirically that a union member may gain a non-instrumental, expressive benefit from voting for a strike, and that this benefit becomes more important the larger the union (i.e., the voting group) and therefore the smaller the probability of a single vote being decisive. The intuition seems compelling, though it is admittedly difficult to operationalise a concept like expressiveness, particularly in an empirical context. In fact, we argue that expressive behaviour is not an alternative explanation for why strikes occur, to the exclusion of the standard theory of asymmetric information: the two approaches are rather complementary. In our argument, asymmetric information also lies at the root of the explanation. However, instead of workers being uninformed and the employers informed about profit levels, now the workers are informed and the employer uninformed about the degree to which the workforce is expressive. We believe that this finding offers an interesting new twist to explaining the phenomenon of industrial action, which is still far from being an issue of the past.

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Tables

Table 1: Weighted proportions of strikes and general industrial actions by firm size and sector

		strike	industrial action
firm size	5-9	0	0.721
	10-24	0.8646	1.356
	25-49	1.601	3.259
	50-99	3.696	6.52
	100-199	4.072	7.997
	200-499	6.515	9.561
	500-999	4.603	6.644
	1000-1999	6.859	12.6
	2000-	15.48	17.67
firm type	private	0.2088	1.054
	public	6.073	8.418
	total percent	0.972	2.013
	obs	2295	2295

Table 2: Mean estimates of trust and mistrust (mismatch) by type of industrial action

	mistrust by managers	trust mismatch	mistrust mismatch
strike	0.02	0.299	0.124
no strike	0.041	0.353	0.15
difference	-0.021	-0.053	-0.025
industrial action	0.056	0.391	0.233
no industrial action	0.037	0.343	0.136
difference	0.019	0.048	0.097
Observations	812	673	673

Table 3: OLS estimations of union size and average weekly wages

	(1)	(2)	(3)	(4)
Panel A	lnmeanwage	lnmeanwage	lnmeanwage	lnmeanwage
unionsize	0.003***	0.001***	0.001***	0.0002
	(0.0001)	(0.0002)	(0.0002)	(0.0002)
percent managers		0.008***	0.008***	0.0081***
		(0.001)	(0.001)	(0.001)
percent women		-0.008***	-0.008***	-0.008***
		(0.0002)	(0.0002)	(0.0002)
redundancies			0.006***	0.006***
			(0.001)	(0.001)
private sector				-0.159***
				(0.02)
listed				-0.0004
				(0.006)
Constant	5.537***	6.038***	6.053***	6.252***
	(0.0081)	(0.029)	(0.031)	(0.042)
SIC 2003 dummies	no	yes	yes	yes
Firm size dummies	no	yes	yes	yes
Observations	21,102	21,021	20,009	20,009
R^2	0.028	0.476	0.475	0.481
Panel B	lnmedianwage	lnmedianwage	lnmedianwage	lnmedianwage
unionsize	0.0031***	0.002***	0.002***	0.001***
	(0.0002)	(0.0002)	(0.0002)	(0.0002)
percent managers		0.009***	0.009***	0.009***
		(0.001)	(0.001)	(0.001)
percent women		-0.009***	-0.009***	-0.009***
		(0.0003)	(0.0003)	(0.0003)
redundancies			0.008***	0.008***
			(0.001)	(0.001)
private sector				-0.175***
				(0.024)
listed				-0.016**
				(0.007)
Constant	5.422***	5.991***	5.993***	6.216***
	(0.009)	(0.036)	(0.039)	(0.051)
SIC 2003 dummies	no	yes	yes	yes
Firm size dummies	no	yes	yes	yes
Observations	21,102	21,021	20,009	20,009
R^2	0.026	0.451	0.452	0.458

Standard errors in parentheses. *, **, *** statistically significant at 10, 5, and 1 percent levels, respectively.

Table 4: Mean estimates of union size and type of industrial action

	unionsize
strike	71.426
no strike	13.909
difference	57.517***
industrial action	54.323
no industrial action	13.642
difference	40.681***

1260 observations. *, **, *** statistically significant at 10, 5, and 1 percent levels, respectively.

Table 5: Logit estimations of union size and type of industrial action

	(1)	(2)	(3)	(4)
Panel A	strike	strike	strike	strike
unionsize	0.0416***	0.0232**	0.0216	0.0234*
	(0.00583)	(0.0108)	(0.0136)	(0.0142)
percent women		-0.0072	0.0071	0.0055
		(0.008)	(0.009)	(0.009)
private sector		-0.799	-0.385	-0.142
		(1.108)	(1.235)	(1.266)
listed		0.408	0.287	0.244
		(0.424)	(0.510)	(0.401)
multiplant		1.822**	1.767*	1.363
		(0.772)	(0.948)	(0.878)
meetings		-0.181	-0.169	-0.446
		(0.619)	(0.804)	(0.645)
collective disputes			2.785***	2.768***
			(0.575)	(0.583)
disruptions			1.716***	1.529**
			(0.626)	(0.637)
redundancies			-0.0204	-0.0924
			(0.0634)	(0.110)
Constant	-6.303***	-9.974***	-11.62***	-26.80***
	(0.427)	(1.594)	(1.669)	(2.660)
SIC 2003 dummies	no	yes	yes	yes
Firm size dummies	no	no	no	yes
Panel B	indaction	indaction	indaction	indaction
unionsize	0.0301***	0.0228**	0.0205*	0.0213*
	(0.00464)	(0.0106)	(0.0107)	(0.0117)
percent women		-0.0168*	-0.00943	-0.00752
		(0.0102)	(0.0115)	(0.0128)
private sector		-0.348	-0.230	-0.005
		(0.747)	(0.795)	(0.816)
listed		-0.228	-0.378***	-0.392***
		(0.143)	(0.119)	(0.121)
multiplant		1.655**	1.686***	1.545***
		(0.696)	(0.474)	(0.493)
meetings		-0.582	-0.195	-0.334
		(0.632)	(0.601)	(0.464)
collective disputes			3.637***	3.630***
			(0.555)	(0.548)
disruptions			1.691**	1.614**
			(0.666)	(0.660)
redundancies			0.0730***	0.0742***
			(0.0215)	(0.0242)
Constant	-4.814***	-5.109***	-7.012***	-8.142***
	(0.342)	(1.526)	(1.499)	(1.784)
SIC 2003 dummies	no	yes	yes	yes
Firm size dummies	no	no	no	yes
Observations	2,160	2,151	2,044	2,044

Standard errors in parentheses. *, **, *** statistically significant at 10, 5, and 1 percent levels, respectively.

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