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The Role of Trust in Determining the Propensity to Join Unofficial Strikes

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Abstract This paper offers a contribution to the literature on labour strikes by analysing the effect of trust in labour disputes. We maintain that the higher (or lower) the level of confidence that workers place in unions (or firms), the more likely it is that they will be willing to participate in an unofficial strike. A very simple model is presented to clarify this idea. Using the World Value Survey data, we also empirically show that the probability of having or being willing to participate in unofficial strikes increases (or decreases) as the level of confidence placed in labour unions (or firms) increases, with the effect of confidence in labour unions being larger than that of confidence in firms.

Keywords Unofficial strike, trust, labour union, collective bargaining, self-serving bias
JEL classification J01, J52

1. Introduction

As noted by Holden and Moene (1998), modern game theoretical approaches are based on the Godfather principle, namely: "I made him an offer that he couldn't refuse."

In fact, as long as the relevant information in a bargaining process is common knowledge to the participants, a bargaining impasse can be seen only as a random error caused by mistakes made by those bargaining. In spite of this prediction, strikes are not rare occurrences and there exists empirical evidence showing that strikes and lock-outs seem to follow a predictable pattern (Kennan 1986; Hibbs 1978; Ingham 1974).

This problem is known in the economics literature as the "Hicks Paradox", whereby if both sides of the bargaining table are rational and able to predict the outcome of a strike or lockout, they would tend to reach an agreement without engaging in a costly conflict (see Hicks 1963). In this ambit, the occurrence of unofficial strikes is even more paradoxical, because workers could be subjected to legal sanctions which increase the cost of strike for them. According to Eldridge and Cameron (1964) an unofficial strike (also known as wildcat strike) is a strike which is not recognized by the Executive Committee of a Union.

Although it is difficult to have detailed international statistics on unofficial strikes, the Department of Labour of South Africa, for instance, reported that in 2012, 44% of total strikes were wildcat strikes with a peak of 57.5% in the mining sector. In

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the 2014 annual report to the Italian Parliament, the president of the "Commissione di garanzia contro gli scioperi nei servizi pubblici essenziali" complained that the number of wildcat strikes was increasing with respect to the previous years, leading to a total of 150 workdays lost in the sector of local public transports.[1]

A well-known explanation for bargaining impasses provided by the economics literature (Cramton and Tracy 1992; Ashenfelter and Johnson 1969; Card 1990) is the absence of complete information. If a bargainer has no information on the reservation value of his counterpart, a costly delay in negotiations can be necessary in order to signal this to the other participant and so to reach an agreement.

However, in behavioural economics, alternative explanations have been proposed, which do not necessarily require the absence of complete information. For instance, according to Badcock and Loewenstein (1997), if bargainers operate on a self-serving bias, they might tend to over-evaluate their alternatives to negotiations, to refuse offers that conflict with impartial judgement, and to classify the behaviour of their counterparts as cynical and opportunistic.[2]

In this paper we maintain that, especially in situations of incomplete information, the degree of trust that workers have in the parties of the labour negotiations place a crucial element in determining the onset of labour disputes. The economics literature has often indicated trust as a key element in economic exchanges since an absence of trust among trading partners severely hampers market transactions (Guiso et al. 2003, 2009; Tabellini 2010; Fehr 2010). Kim and Kim (2012), using data from 1,355 firms in Korea, found that reciprocal trust between managers and employees has a negative and significant relationship with the probability of the occurrence of labour disputes. From an empirical point of view, trust among team members has been found to be a significant moderating effect on conflict arising among them (Simons and Peterson 2000; Han and Harms 2010).

This paper focuses on the role that trust plays in the individual decision of a worker on whether or not to join unofficial strikes. The basic idea is the following: workers do not know exactly what the profitability of the firm for which they work is and, therefore, they do not know exactly what "the size of the pie" is that the union and firm are bargaining over. Then, especially when uncertainty is large and the state of the world depicted by the union is different from that depicted by the firm (maybe because

[1] Although in Italy, unofficial strikes are not considered illegal, the Italian law no. 146/1990 established a rigid procedure to legitimately call a strike for the workers occupied in the ambit of some essential public services. The "Commissione di garanzia contro gli scioperi nei servizi pubblici essenziali" is the public organ entitled to the vigilance of the respect of the law dispositions. The commission is entitled also to dispose pecuniary and disciplinary sanctions for the workers who are responsible of violations.

[2] Danitioso, Kunda and Fong bring back self-serving bias to a problem of imperfect information processing:

> People attempt to construct a rational justification for the conclusion that they want to draw. To that end, they search through memory for relevant information, but the search is biased in favour of information that is consistent with the desired conclusions. If they succeed in finding a preponderance of such consistent information, they are able to draw the desired conclusion while maintaining an illusion of objectivity (Danitioso et al. 1990, p. 229).

This can lead to a bargaining impasse. Other possible explanations are to be found in outcome-based models (Fehr and Schmidt 1999; Bolton and Ockenfels 2000; etc.) and/or in models of reciprocity (Cox et al. 2007, 2008).

of problems of self-serving bias) the decision of the workers as to whether to call or not a unofficial strike (bypassing official negotiations) relies on how much they trust the statements concerning profitability made by their representatives and by the firm. In particular, if the degree of trust that workers have in unions is higher than that placed in firm, they will tend to classify the behaviour of the firm as iniquitous. Therefore, the willingness to punish this kind of behaviour might induce workers to call a strike even if union has discarded this option.

In the next section, we will present a simple model to clarify this idea while in Section 3 we will provide some empirical evidence supporting this view. Section 4 is devoted to the conclusion.

2. The role of trust in determining the occurrence of unofficial strikes: a theoretical model

2.1 The baseline model

Suppose that a firm and a labour union are playing a modified version of the ultimatum game where the size of the pie can be either a large (H) with probability p or a small value (L) with probability $1-p$, with $H > L > 0$. These probabilities are common knowledge, however only the firm knows the true size of the pie and can propose its own division. The union can accept or reject (and call a strike) that proposal without knowing what the true size of the pie is. In particular, if the pie is small, the firm can offer a slice of the pie equal to $b \in [0;L]$ to the union and retain $L-b$ for itself. If this offer is rejected, a strike is called and, therefore, both union and firm receive a payoff equal to 0. When the pie is H, the firm can offer $h \in [0,H]$ with $H > L$ to the union and retain $H-h$ for herself. If the offer is rejected and the strike is called, both the firm and the union receive a payoff equal to $L/2$. The goal of the labour union is to maximize the slice of the pie going to workers.

In this case, the optimal strategy for the firm is to always offer $h = b = pL/2$ to the union regardless of the effective state of the world. It is straightforward to demonstrate that this offer is the lowest offer that the union is willing to accept. The uncertainty concerning the real state of the world allows the firm to "hide behind some small cake" (Güth et al. 1996) when the state of the world is good, but at the same time prevents the firm from making an offer equal (or close) to 0 in the bad state.

Introducing uncertainty on the probability of the state of world

Now suppose that the probabilities associated with each state of the world are not known by both the union and the firm and that the offer made by the firm is made before the real level of profitability is revealed. The firm and the union can only contemporaneously announce what the probability that they attach to each state of the world is. However, because of the problem of self-serving bias (from hereon, SSB) the prediction made by the firm can be different from that made by the union. For instance, assume that the firm (or the union) believes that state H will happen with probability q

(or k, respectively) while state L will happen with probability $1-q$ (or $1-k$, respectively). Therefore if both firm and union operate on SSB, the prediction made by the firm will tend to be lower than that formulated by the union, $q \leq k$.

The predictions of both the union and the firm are public information. Suppose that after the union has accepted an offer, the workers can vote on whether to accept or reject and call an unofficial strike. The workers are homogenous and their shared beliefs about the probability of there being a bad state are given by

$$p_L = 1 - q^{1-\beta} k^{\beta} \quad \text{if } q,k > 0,$$

where $0 \leq \beta \leq 1$ represents the degree of trust that workers have in their union and $1-\beta$ the degree of trust in statements made by the firm. The associated probability of the good state is $p_H = 1 - p_L$. Trust is like a weighting assigned by the workers to the credibility of the two alternative statements. These probabilities are the private information of the workers. For simplicity's sake, we will consider a one-shot game and therefore we will assume that the β is exogenously determined by cultural factors. See Guiso et al. (2003, 2009) and Tabellini (2010) for some empirical evidence supporting the view that trust is, at least in part, culturally determined.

We assume also that when $q = 0$, and $k > q$, the workers will formulate their beliefs in self-serving way, discarding the bad news coming from the firm and taking in consideration only the good news coming from the union. However also in this case, workers will attach a weight to the prediction of the union equal to their level of trust so that $p_L = 1 - \beta k$ and $p_H = \beta k$.

Assuming that SSB is affecting firm and union' estimations, we exclude the case of $k = 0$ and $q > k$. While, when $q = k = 0$, workers have no reasons to cast doubts on the estimations carried out by the firm or by the union, therefore will be $p_L = 1$.

First of all, we will define the optimal strategy for the firm, after we will analyze the decision of calling an unofficial strike. The firm knows that the offer $h = b = k\frac{L}{2}$ is the lowest offer that the union is willing to accept. However the firm, will make an offer equal to $k\frac{L}{2}$ only when

$$\underbrace{q\left(H - \frac{kL}{2}\right) + (1-q)\left(L - \frac{kL}{2}\right)}_{\text{expected payoff of the offer}} \geq q\frac{L}{2},$$

where $q\frac{L}{2}$ is the expected payoff for the firm in the case of a strike.

From which, after some simple algebraic passages, we have

$$q \geq \frac{kL - 2L}{2H - 3L}. \tag{1}$$

The last condition is always satisfied when the size of the pie is sufficiently larger in the good state than in the bad state, that is, when $H > 1.5L$, since the numerator of (1) is negative. This result is in line with the "total cost theory" (Reder and Neuman 1980; Kennan 1980). In particular, this theory suggests that strikes are most costly for firms

in boom periods when sales are high and so the cost of a suspension of the production is very high. Therefore, also in the simple context of our model, the firm will always find it convenient to avoid a strike when H is large.

If, instead $L < H < 1.5L$, the inequality (1) is never satisfied, because it will require $q > 1$. When the pie is also small in the good state, a strike is preferable to "being too generous" for the firm because the cost of the strike is relatively low.[3]

Now, let us suppose that $H > 1.5$. Is it possible that an unofficial strike will occur in this case?

Suppose that, in the case of an unofficial strike, the payoff for the workers is given by $c+\beta-\theta\left(\frac{\beta}{1-\beta}\right)\pi_L^f$ if the state is L, $\frac{L}{2}-c-\theta\left(\frac{\beta}{1-\beta}\right)\pi_H^f$ if the state of the world is H. π^f is equal to firm's payoff in the case of a strike. Hence, given that $\pi_L^f=0$ and $\pi_H^f=\frac{L}{2}$ the payoff is $-c$ in L, and $c+\frac{L}{2}-\theta\left(\frac{\beta}{1-\beta}\right)\frac{L}{2}$ if the state is H. $c\geq 0$ is a parameter capturing the cost of calling an unofficial strike (e.g. the legal sanctions) for the workers.[4] Workers are characterized by an utility function similar to that proposed by Rotemberg (2006) in the case of ultimatum game with receiver's altruistic preferences. In particular, workers' utility depends both on their own payoffs and on π^f. The weight with which π^f enters in workers' payoff depends on a function $\theta(\cdot)$ which on turns depends on the ratio between the degree of trust in union and the degree of trust in firm. In particular, if $\frac{\beta}{1-\beta}\leq 1$ then $\theta(\cdot)=1$, that is, workers suffer a loss in the payoff from striking against a firm that they trust more than union. Following Grechenig et al. (2010) we are then implicitly assuming that workers in case of doubt about other players' actions, dislike committing type I error (i.e., punishing an innocent). At the opposite if they trust more union than firm $\frac{\beta}{1-\beta}>1$, $\theta(\cdot)=-1$, so that workers receive an extra payoff in striking against the latter.

Let us focus on the case when both firm and union have given an estimates of the probability of the good state greater than zero ($q>0$, $k>0$, $k\neq q$). The firm knows that $k\frac{L}{2}$ will be accepted by the union, however, for the workers it is optimal to accept this offer only when:

$$k\frac{L}{2}\geq \underbrace{q^{1-\beta}k^{\beta}\left\{\frac{L}{2}-c-\theta\left(\frac{\beta}{1-\beta}\right)\left(\frac{L}{2}\right)\right\}-[1-q^{1-\beta}-k^{\beta}]c}_{\text{expected payoff of rejection}}$$

[3] Supporting this view, Ingram et al. (1993) found that the incidence of strikes in Great Britain was countercyclical in the 1980s.

[4] We remind that not in all countries unofficial strike are considered *per se* unlawful. Considering for instance Europe, according to Eurofound (www.eurofound.europa.eu), there is large heterogeneity in the ways of dealing with unofficial strike: in some countries (Italy, France, Spain) unofficial strikes are not deemed as unlawful, in others unofficial strikes are considered unlawful when a contract agreement is in force and workers could incur in severe consequences (Sweden, Finland). Furthermore, there are countries where there is not a clear distinction between official and unofficial strikes (Austria, Netherlands). In UK, a worker who takes part to an unofficial strike may be dismissed. In Germany all the strikes not called by unions are deemed as unlawful.

which may be rewritten as

$$c \geq q^{1-\beta} k^{\beta} \frac{L}{2} \left[1 - \theta \left(\frac{\beta}{1-\beta} \right) \right] - k \frac{L}{2}. \tag{2}$$

So when $\beta/(1-\beta) \leq 1$, inequality (2) is always satisfied. Therefore, when workers trust more firm than union, they do not have reason to reject the firm's offer. Instead, in the opposite case when $\beta/(1-\beta) > 1$, a cost c greater than zero maybe required for avoiding an unofficial strike. In particular, we have that c must be

$$c \geq q^{1-\beta} k^{\beta} L - k \frac{L}{2}. \tag{3}$$

Therefore to avoid the occurrence of unofficial strike, c must be at least equal to the difference between the workers' expected size of the pie in the case of unofficial strike and the offer made by the firm. Let us indicate $\underline{c}$ as the minimum level of sanctions at which an unofficial strike is avoided.

Note that the derivative of the r.h.s. of (3) with respect to β is:

$$\frac{\partial r.h.s.}{\partial \beta} = \underbrace{-q^{1-\beta} k^{\beta} \ln(q) L}_{+} + \underbrace{q^{1-\beta} k^{\beta} \ln(k) L}_{-}$$

So when the probability estimated by the union is larger than that estimated by the firm, $k > q$, an increase in β implies that the first term of the derivative will be higher than the second term, causing an increase in $\underline{c}$. Indeed, workers will be more prone to believe that the firm is opportunistically *"hiding behind some small cake"* and this in turns causes an increase in the level of $\underline{c}$, given that they receive an extra payoff if they punish a firm in which they have a low level of trust in comparison to the union In other words, as the degree of trust in union increases, the estimation of the probability carried out by workers will be more close to that proposed by the union (in particular p_H will go up). This, in turn, increases the expected payoff of an unofficial strike. Hence, if $\underline{c}$ is not so high to compensate the extra payoff received from firm's punishment, calling an unofficial strike becomes the optimal strategy for workers.

Instead, when $k < q$, an increase in β increases the willingness of workers to accept the output of the official bargaining leading to a lower $\underline{c}$.

However note that if union and firm are affected by SSB, the first case, $k > q$, is more likely to happen.

Note also that the solution of the particular case of $q = 0$ and $k > q$ is trivial, because the firm is sure that the state of world will be bad, however it is also sure that the expected payoff for the union in the case of strike will be $kL/2$. Hence, in this case firm will find convenient to offer $b = kL/2$ (of course if $L > 0$), and this offer will be accepted by the union and also by the workers.

3. The role of trust in determining the participation in unofficial strikes: an empirical investigation

3.1 Data and empirical strategy

In this section we will show some empirical evidence supporting the idea that trust can play an important role in determining the willingness of workers to join an unofficial strike. The analysis is conducted using World Values Survey (WVS) data. The WVS is a worldwide investigation into the basic values and beliefs of individuals in a large cross-section of countries (more than 80) conducted by the World Value Survey Association in six waves (1980, 1990, 1995, 2000, 2005, 2010). The survey contains information about demographics (sex, age, education, etc.), self-reported economic conditions, political preferences, values and attitudes, etc.

The dependent variables of the empirical analysis are obtained from the following question: "*I'm going to read out some different forms of political action that people can take, and I'd like you to tell me, for each one, whether you have actually done any of these things, whether you might do it or would never, under any circumstances, do it. Joining unofficial strikes.*"[5]

We created two alternative dependent variables: *strikedone* and *strikemight*. The first is a dummy that assumes a value equal to one when an individual has declared that he has participated in a strike. The latter is a dummy equal to one when an individual has declared that he might participate in a strike. The first question will allow us to test whether some demographic characteristics and trust affect the probability of an individual having joined a strike while the latter question allows us to test whether these variables influence the propensity of individuals to join a strike.[6]

The variables that determine the degree of trust in labour unions, firms and generalized trust are obtained from the following questions, respectively:

> *"I am going to name a number of organizations. For each one, could you tell me how much confidence you have in them: is it a great deal of confidence, quite a lot of confidence, not very much confidence or none at all? Labour unions."*
>
> *"I am going to name a number of organizations. For each one, could you tell me how much confidence you have in them: is it a great deal of confidence, quite a lot of confidence, not very much confidence or none at all? Major companies."*
>
> *"Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?"*

For the first question, we created a dummy variable for each of the possible answers. In particular, these variables are called *highconfun* (equal to one when the individual has answered "a great deal of confidence"), *medhighconfun* (corresponding to

[5] See Biggs (2014) for a discussion of the points of strength and of weakness of using this kind of Survey question.

[6] For the sake of the simplicity of presentation, we will use the terms effect of trust (or impact of trust) on the probability of an individual having joined a strike, however we are well aware that the direction of causality in our analysis has not been investigated. Therefore, to be on the safe side, the reader is invited to interpret the reported relations as correlations.

the answer "quite a lot of confidence"), *medlowconfun* ("not very much confidence") and *lowconfun* ("no confidence at all").

We will use *lowconfun* as a reference category, thus, according to the simple model presented in the previous section, the coefficients associated with *medlowconfun*, *medhighconfun* and *highconfun* should assume positive sign.

For the second question, we also created a dummy variable for each possible answer. These variables are called *highconfirm* (corresponding to "a great deal of confidence"), *medhighconfirm* ("quite a lot of confidence"), *medlowconfirm* ("not very much confidence"), *lowconfirm* ("no confidence at all"). We will use *lowconfirm* as a reference category, so, according to the theoretical predictions of the model presented above, we expect that the coefficients associated with *medlowconfirm*, *medhighconfirm* and *highconfirm* will assume a negative sign.

Unfortunately, we are not able to distinguish between the level of confidence that individuals have in big companies and in small companies. Therefore, the underlying (strong) assumption is that the level of confidence that people have in these organizations does not depend on their size.[7]

We also created a dummy variable (*union_firm*) that assumes value equal to one when the respondent attributed a higher level of confidence to union than to firm (e.g. when *confunion="a great deal of confidence"* and *confirm="quite a lot of confidence").* In this case, we expect a further positive effect, because according to the presented model, unofficial strikes are possible when $\theta(\cdot) = -1$.

The third question was used to create a dummy variable that assumes a value equal to one when an individual has declared that most people can be trusted. We decided to include this variable to exclude the possibility of there being a significant relation between confidence in unions and firms and the probability of an individual having joined a strike that is driven by the relation between these variables and the generalized degree of trust.

The two alternative dependent variables have been regressed on the trust variables described above, as well as a large set of control variables. In particular, in the control variables we have included the socio-demographic characteristics of the respondents (gender, age, the square of age, income level, level of education, type of occupation), their declared political preferences and level of life satisfaction, wave and country dummies (to capture the different institutional frameworks in which individuals live). All these control variables are defined in Table 1 and some descriptive statistics is reported in Table 2.

The main results of the empirical analysis are reported and commented upon in the next section.

[7] There are various reasons to believe that the level of trust may depend on the size of companies. For instance, the daily interactions between the manager/owner and his workers in a small company may generate reciprocal trust. However, the contrary may also be true. In particular, adopting the point of view of our model, one can argue that people may have more confidence in the accurateness of the predictions made by a big firm than those made by small companies.

Table 1. Definition of control variables

IncomeD1–IncomeD10: These are ten indicators of income level developed on the basis of the answers to the following question: *Here is a scale of incomes. We would like to know in what group your household is, counting all wages, salaries, pensions, and other income that comes in. Just give the letter of the group your household falls into, before taxes and other deductions*. Income categories are coded by decile for each society, 1=lowest decile, 10=highest decile. The reference category is *IncomeD6*.

Employment status: We used a set of dummy variables to control for employment status. In particular these variables are based on the following question: *Are you employed now or not? IF YES: About how many hours a week? If more than one job: only for the main job. 1 'Full time' / 2 'Part time' / 3 'Self employed' / 4 'Retired' / 5 'Housewife' / 6 'Students' / 7 'Unemployed' / 8 'Other'*.

The associated indicators are called *fulltime, parttime, selfemployed, retired, housewife, student, unemployed*, and *otherjob*, respectively. The reference category is *fulltime*.

Education: To take account of the level of education of the respondents we developed a set of dummy variables on the basis of the following question: *What is the highest educational level that you have attained? 1 'Inadequately completed elementary education' / 2 'Completed compulsory elementary education / 3 'Incomplete secondary school: technical/vocational type/Compulsory elementary education and basic vocational qualification' / 4 'Complete secondary school: technical/vocational type/Secondary, intermediate vocational qualification' / 5 'Incomplete secondary: university-preparatory type/Secondary, intermediate general qualification' / 6 'Complete secondary: university-preparatory type/Full secondary, maturity level certificate' / 7 'Some university without degree/Higher education – lower-level tertiary certificate' / 8 'University with degree/Higher education – upper-level tertiary certificate'*.

The associated indicators are called *noeducation, elementary, notcompvocat, vocational, notcompsecond, secondary, notcompuniv, and university*, respectively. The reference category is *secondary*. This question has been asked only starting by the third wave, hence when this variable is included among the regressors, the number of observations sensibly decreases, however we still have more than 100,000 observations.

Political scale: This variable captures the political preferences of the respondents. It is based on the following question: *In political matters, people talk of "the left" and "the right." How would you place your views on this scale, generally speaking? 1 'Left', . . . , 10 'Right'*. Therefore a higher value corresponds to a right wing orientation.

Satisfaction: This variable captures the self-declared level of life-satisfaction and it is based on the following question: *All things considered, how satisfied are you with your life as a whole these days? 1 'Dissatisfied', . . . , 10 'Satisfied'*. Therefore, a higher value for this variable corresponds to a higher level of life satisfaction.

Female: A dummy variable equal to one if the respondent's sex was female.

Marital status: We created a set of dummy for each possible marital status of the respondent: *married* equal to one if the individual declares of being married or of cohabiting with a partner; *divorced* equal to one if the individual has declared of being divorced or separated; *widowed* equal to one if the individual is a widower/widow: *single* equal to one if the individual declared of not being in any stable relationship. *Single* is used as the reference category.

Dage: Age of the respondent – average age in the sample. This transformation is needed to avoid collinearity problem.

Dagesq: Square of dage.

Table 2. Descriptive statistics on control variables

Variable	*N*	Mean	Std. Dev.	Min	Max
Age	347,254	42.419	16.878	13	108
Female	345,489	0.529	0.499	0	1
Married	344,748	0.623	0.485	0	1
Divorced	344,748	0.060	0.238	0	1
Widowed	344,748	0.074	0.261	0	1
Single	344,748	0.243	0.429	0	1
Fulltime	342,427	0.381	0.486	0	1
Parttime	342,427	0.075	0.263	0	1
Selfemployed	342,427	0.088	0.284	0	1
Retired	342,427	0.152	0.359	0	1
Housewife	342,427	0.132	0.339	0	1
Student	342,427	0.071	0.257	0	1
Unemployed	342,427	0.084	0.277	0	1
Otherjob	342,427	0.018	0.132	0	1
Noeducation	262,819	0.064	0.245	0	1
Elementary	262,819	0.134	0.340	0	1
Notcompvoc	262,819	0.104	0.305	0	1
Vocational	262,819	0.157	0.364	0	1
Notcompsec	262,819	0.104	0.305	0	1
Secondary	262,819	0.198	0.398	0	1
Notcompuniv	262,819	0.094	0.292	0	1
University	262,819	0.145	0.352	0	1
IncomeD1	247,237	0.093	0.290	0	1
IncomeD2	247,237	0.116	0.320	0	1
IncomeD3	247,237	0.140	0.347	0	1
IncomeD4	247,237	0.147	0.354	0	1
IncomeD5	247,237	0.153	0.360	0	1
IncomeD6	247,237	0.118	0.323	0	1
IncomeD7	247,237	0.092	0.289	0	1
IncomeD8	247,237	0.067	0.250	0	1
IncomeD9	247,237	0.037	0.190	0	1
IncomeD10	247,237	0.037	0.189	0	1
Satisfaction	345,410	6.762	2.407	1	10
Political	267,276	5.576	2.287	1	10

3.2 Main results

In Table 3, we report the results of the regression of the variable *strikedone* on the above mentioned explanatory variables. In particular, column (a) reports the results of a probit regression where *strikedone* is regressed on the trust variables above described and on country and wave dummies; individual socio-demographic controls are added in column (b), while in column (c) we also control for declared political preference of the respondent (*political*) and declared level of life satisfaction (*satisfaction*). Finally, in column (d) the estimated marginal probability effects of the explanatory variables

included in the full model of column (c) are reported. The number of observations from one column to another changes according to the data availability on control variables. This procedure allows to evaluate if the statistical significance of the trust variables survives to the inclusion of control variables.

The same estimation has been replicated for the variable *strikemight* and this is reported in Table 4.[8]

The signs of the regression coefficients are all very reasonable and robust to the inclusion of control variables. First of all, we will comment on the results from the control variables.

With regard to demographic controls, being female is associated with a lower probability of both having participated in an unofficial strike and being willing to participate in an unofficial strike. This represents an usual findings in the literature on strikes (see for instance Biggs 2014). One possible interpretation of this result is that, especially in less developed countries, female workers are often discriminated against (also by their male colleagues) and subjected to more precarious working conditions than men (see Sap 1993). Therefore, it is plausible that in this male oriented societies, strikes are targeted to defend the right of the median male worker, implying that women are characterized by a lower expected value of participating strike than men. Obviously, other explanations are possible.[9]

The relation between age and the probability of both having participated in an unofficial strike and being willing to participate in a strike is reversed U shape. Therefore, people at the beginning and the end of their working life are less likely to join a strike. This result can be rationalized for instance by hypothesizing an outsider-insider relationship between junior and senior workers, where the workers' initiatives are often devoted to protecting the rights of the senior workers at the peak of their careers, leaving out those at the beginning or at the end of their working lives.

Since completion of secondary school is used as reference category, the results indicate a positive association between education and propensity to join an unofficial strike.

This result is quite puzzling. In particular, in line with "the total cost theory" (Kennan 1980), we may expect that those who have more to lose in the case of strike should be also those who are less likely to be disposed towards bearing the cost of a strike. Therefore, more educated people (with presumably better working positions) and people with higher income and higher life satisfaction would be less likely (and less willing) to join a strike.[10] This expectation is partially confirmed only for life

[8] In all the reported regressions, we used the sample weights as suggested by the survey's authors to ensure that our estimates are nationally representative for each country. In a preceding version of the paper we also included a variable capturing the attitude toward the equality of income distribution, however, this was not significant and furthermore due to missing observations on this variable, the sample size was reduced. Hence we decided to drop the variable.

[9] As suggested by an anonymous referee, an alternative interpretation could be that this result may be driven by a less competitive attitude of women with respect to men. Another one may be that unofficial strikes occur in male-dominated industrial sectors.

[10] From an empirical point of view, Biggs (2014) reports that the positive relation between education is a regularity in the literature on strike participation, with some authors defining this positive association as an "iron law". Despite of this, Biggs was no able to find a significant relation between education and

satisfaction. A possible explanation is that people with high level of education, are also less replaceable than low educated workers and this give them an extra source of bargaining power.

Reasonably, the analysis indicates that right wing people tend to be less prone to participate in strikes.

With respect to full time workers, part time workers are more willing to participate in an unofficial strike but at the same time they are characterized by having a lower probability of having participated in a strike (however, the relation is not statistically significant in Table 3). This could be interpreted as an evidence in favour of the idea that workers' protests are often targeted at protecting the rights of the median workers, i.e. those who are full time and are in the prime of their working lives. Interestingly, and in coherence with this idea, according to the results in Table 4, those who are outside the labour force (unemployed and students) are also more willing to participate than full time workers. At the same time, they are not characterized by having a higher probability of having taken part in a strike. Therefore, according to this interpretation, even if outsider workers are in principle willing to adhere to strike (they are also those who bear the lowest cost in participating a strike since they do not lose their wages), they do not have incentives to effectively participate in a protest for the rights of insider workers.

Finally, with regard to trust, the direction of the hypothesized relations between the variables showing both the degree of confidence in labour unions and firms are confirmed by the empirical analysis. The more (or less) confidence people place in unions (or firms) the more likely they will be to participate or be willing to participate in a strike. Furthermore, the effect of trusting labour unions seems to be larger than the effect of distrusting firms. In particular, looking at column (d) of Table 3, the empirical results suggest that an individual who has declared that he has a great deal of confidence in labour unions is about 5% more likely to have joined a strike than an individual who has answered "not at all" to the same question. At the same time an individual who has declared that he has a great deal of confidence in firms is 1.4% less likely to have joined a strike than an individual who does not trust firms. If compared to other explanatory variables, the magnitude of the effects of trust variables, seem in general to be very large.

Also *union_firm* is strongly statistically significant and its sign is coherent with the presented theoretical model in the model with *strikedone* as dependent variable while it is not statistical significant when *strikemight* is used as response variable.

For what regards generalized trust, those who declared that they generally trust other people are 2.7% more likely to be willing to join a strike with respect to an individual that do not trust other people, but the effect on the probability of actually having participated to unofficial strike is quite reduced. This may suggest that people with a high degree of trust in others are also more willing to punish betrayal of their

participation into unofficial strike using WVS (1990) for Great Britain. However, it can be noted that Biggs uses a more imprecise measure of education given by the age at which education has been completed and this may lead to an underestimation of the effect of educational levels. See D'Orlando et al. (2011) for a brief discussion of using this measure of education.

trust (see Cox and Li 2012).[11]

Even if our results seem to be in line with the theoretical predictions of the simple model presented in Section 2, a note of caution in interpreting the presented correlations as causal relations is needed.

Because of data limitation, we are not able to control for the size (or for the industrial sector) of the firm in which workers are occupied. Given that generally workers of big companies participate in strikes, and at the same time they belong to labour unions, it is possible that employees of big companies are also more likely to trust labour union. Thus, this may cause a spurious positive association between the degree of confidence in union and the probability of striking. However, considering that we are focusing on unofficial strikes may mitigate this problem. The main difference between unofficial strikes and official strike is that the initiative in undertaken in a direct way by the same workers (bypassing official negotiation) and not by their representatives. Now, suppose that trust has not a role in the formation of the beliefs of workers as stated by the model presented in Section 2. Can the omission of the control for being an employee of a big firm cause a positive relation between trust in union and probability of joining an unofficial strike? We believe that if our theoretical model is wrong then the more trust unionized workers of big firms put in their representatives, the more they will tend to accept the output of the official bargaining, so if union has discarded the strike option, it seems reasonable that they will not organize an unofficial one. Hence, it seems difficult that the absence of the control for the size of the firm may induce an upward bias in the coefficients associated to the confidence in labour union leading to observe a positive relation between trust in union and probability of having joined to an unofficial strike.[12]

Finally, another obvious limitation of the analysis stems from the distributional assumptions on the latent variable on which probit models are based. If these assumptions are violated, the loglikelihood of probit model is misspecified and this implies that the maximum likelihood estimator is no more consistent and efficient. To overcome this limit we carried out also a semi-nonparametric estimation (the so called SNP model), originally proposed by Gallant and Nychka (1987) and applied to the binary choice models by Gabler, Laisney and Lechner (1993). The basic idea of SNP estimation is to approximate the unknown densities of the latent regression errors by Hermite polynomial expansions and use the approximations to derive a pseudo-ML estimator for the model parameters.[13] We estimated the SNP model including all the regressors reported in column (c) of Table 3 using a third order Hermite polynomial expansion.

[11] As noted by an anonymous referee, it also possible that people who trust more are simply more naive in their decision and easily being persuaded for such action.

[12] A similar argument could be applied to the unobserved bargaining ability of the union. If the bargaining ability is determining the level of confidence reported by the workers, then we may expect a negative effect on the probability of having participated to a strike, because workers will be more willing to accept the official output of collective bargaining.

[13] Gallant and Nychka (1987) show that SNP estimator is root-N consistent and asymptotically normal. The main problems of SNP estimation are that this requires large sample and its computational complexity. However, this seems to be not a problem given the size of our sample and thanks to the improvement in the computational capacity of modern elaborators. See also De Luca (2008) and De Luca and Perotti (2011) for a discussion of the SNP model and for detail on the stata package used to implement this technique.

Table 3. The effect of trust on the probability of having joined an unofficial strike

	(a)		(b)		(c)		(d)
Htrust	0.086	(0.010)***	0.041	(0.015)***	0.040	(0.016)**	0.004
Union_firm	0.110	(0.016)***	0.086	(0.022)***	0.072	(0.024)***	0.008
Highconfun	0.324	(0.024)***	0.369	(0.033)***	0.361	(0.035)***	0.047
Medhighconfun	0.148	(0.017)***	0.209	(0.023)***	0.206	(0.025)***	0.022
Medlowconfun	0.034	(0.014)**	0.080	(0.019)***	0.072	(0.020)***	0.007
Highconfirm	−0.140	(0.024)***	−0.171	(0.033)***	−0.157	(0.035)***	−0.014
Medhighconfirm	−0.184	(0.018)***	−0.177	(0.025)***	−0.171	(0.027)***	−0.017
Medlowconfirm	−0.096	(0.014)***	−0.100	(0.021)***	−0.101	(0.023)***	−0.01
Dage			0.005	(0.001)***	0.006	(0.001)***	−0.002
Dagesq			−2.7e−4	(0.000)***	−2.9e−4	(0.000)***	
Female			−0.198	(0.014)***	−0.198	(0.015)***	−0.02
Married			−0.026	(0.019)	−0.032	(0.021)	−0.003
Divorced			0.045	(0.031)	0.050	(0.034)	0.005
Widowed			−0.078	(0.038)**	−0.070	(0.041)*	−0.007
Parttime			−0.004	(0.023)	−0.010	(0.025)	−0.001
Selfemployed			−0.073	(0.022)***	−0.078	(0.024)***	−0.008
Retired			−0.027	(0.028)	−0.034	(0.030)	−0.003
Housewife			−0.306	(0.028)***	−0.291	(0.031)***	−0.025
Student			−0.007	(0.029)	−0.001	(0.031)	0
Unemployed			−0.006	(0.026)	−0.018	(0.028)	−0.002
Otherjob			−0.117	(0.052)**	−0.129	(0.055)**	−0.012
Noeducation			−0.262	(0.036)***	−0.256	(0.040)***	−0.022
Elementary			−0.187	(0.026)***	−0.166	(0.028)***	−0.015
Notcompvoc			−0.133	(0.029)***	−0.130	(0.031)***	−0.012
Vocational			−0.028	(0.022)	−0.031	(0.024)	−0.003
Notcompsec			−0.021	(0.027)	−0.025	(0.030)	−0.003
Notcompuniv			0.087	(0.025)***	0.075	(0.027)***	0.008
University			0.132	(0.021)***	0.114	(0.022)***	0.012
IncomeD1			0.007	(0.031)	−0.023	(0.033)	−0.002
IncomeD2			0.002	(0.028)	−0.016	(0.031)	−0.002
IncomeD3			−0.018	(0.025)	−0.049	(0.027)*	−0.005
IncomeD4			0.003	(0.024)	−0.019	(0.026)	−0.002
IncomeD5			0.013	(0.023)	−0.015	(0.025)	−0.001
IncomeD7			0.027	(0.026)	0.012	(0.028)	0.001
IncomeD8			0.051	(0.029)*	0.045	(0.031)	0.005
IncomeD9			0.080	(0.035)**	0.085	(0.038)**	0.009
IncomeD10			0.130	(0.038)***	0.116	(0.040)***	0.013
Satisfaction					−0.010	(0.003)***	−0.001
Political					−0.043	(0.003)***	−0.004
Country dummy	Yes		Yes		Yes		
Wave dummy	Yes		Yes		Yes		
N	275,473		135,786		114,108		
Pseudo R^2	0.066		0.105		0.111		

Notes: Standard errors in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$; the marginal effect of age is calculated at age=42; survey's authors sample weight are applied in each regression.

Table 4. The effect of trust on the willingness of individuals to join an unofficial strike

	(a)		(b)		(c)		(d)
Htrust	0.124	(0.007)***	0.077	(0.011)***	0.087	(0.012)***	0.025
Union_firm	0.039	(0.011)***	0.030	(0.016)*	0.018	(0.017)	0.005
Highconfun	0.199	(0.018)***	0.276	(0.025)***	0.284	(0.027)***	0.089
Medhighconfun	0.285	(0.012)***	0.319	(0.017)***	0.335	(0.018)***	0.101
Medlowconfun	0.182	(0.009)***	0.203	(0.013)***	0.218	(0.015)***	0.064
Highconfirm	−0.234	(0.017)***	−0.175	(0.024)***	−0.182	(0.026)***	−0.049
Medhighconfirm	−0.124	(0.013)***	−0.089	(0.018)***	−0.098	(0.020)***	−0.028
Medlowconfirm	−0.032	(0.010)***	−0.024	(0.015)	−0.034	(0.017)**	−0.010
Dage			−0.010	(0.000)***	−0.010	(0.000)***	−0.006
Dagesq			−1.3e−4	(0.000)***	−1.2e−4	(0.000)***	
Female			−0.130	(0.010)***	−0.120	(0.011)***	−0.034
Married			−0.069	(0.013)***	−0.062	(0.014)***	−0.018
Divorced			−0.048	(0.022)**	−0.039	(0.023)*	−0.011
Widowed			−0.096	(0.027)***	−0.097	(0.030)***	−0.027
Parttime			0.080	(0.017)***	0.094	(0.018)***	0.028
Selfemployed			0.011	(0.016)	0.018	(0.017)	0.005
Retired			−0.102	(0.022)***	−0.104	(0.023)***	−0.029
Housewife			−0.083	(0.017)***	−0.066	(0.019)***	−0.019
Student			0.060	(0.020)***	0.060	(0.021)***	0.017
Unemployed			0.058	(0.017)***	0.052	(0.019)***	0.015
Otherjob			−0.020	(0.034)	−0.018	(0.036)	−0.005
Noeducation			−0.083	(0.025)***	−0.047	(0.027)*	−0.013
Elementary			−0.149	(0.018)***	−0.142	(0.020)***	−0.039
Notcompvoc			−0.053	(0.019)***	−0.058	(0.021)***	−0.016
Vocational			−0.032	(0.015)**	−0.030	(0.017)*	−0.009
Notcompsec			−0.024	(0.019)	−0.008	(0.020)	−0.002
Notcompuniv			0.064	(0.018)***	0.062	(0.019)***	0.018
University			0.129	(0.015)***	0.122	(0.016)***	0.036
IncomeD1			−0.042	(0.021)**	−0.070	(0.023)***	−0.019
IncomeD2			−0.001	(0.019)	−0.021	(0.021)	−0.006
IncomeD3			−0.015	(0.018)	−0.035	(0.019)*	−0.010
IncomeD4			−0.045	(0.017)***	−0.062	(0.019)***	−0.018
IncomeD5			−0.032	(0.017)*	−0.040	(0.018)**	−0.011
IncomeD7			−0.016	(0.019)	−0.031	(0.020)	−0.009
IncomeD8			−0.028	(0.021)	−0.043	(0.023)*	−0.012
IncomeD9			−0.056	(0.026)**	−0.054	(0.028)*	−0.015
IncomeD10			−0.004	(0.028)	0.007	(0.029)	0.002
Satisfaction					−0.018	(0.002)***	−0.005
Political					−0.025	(0.002)***	−0.007
Country dummy	Yes		Yes		Yes		
Wave dummy	Yes		Yes		Yes		
N	275,473		135,786		114,108		
Pseudo R^2	0.054		0.104		0.103		

Notes: Standard errors in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$; the marginal effect of age is calculated at age=42; survey's authors sample weight are applied in each regression.

Gabler et al. (1993) show that the SNP model generalizes parametric probit if the order of the polynomial expansion is at least equal to 3. Furthermore, Gabler et al. (1993) concludes that testing the probit model against the snp model, is a more general test for normality than the test proposed by Bera et al. (1984). Following De Luca and Perotti (2011), we also estimated the model using a fourth and fifth order expansion but we chose the third order expansion model because this was the model selected by the BIC criterion.[14]

The coefficient of probit and SNP are not directly comparable because of different scale normalization, however it is possible to compare the ratio of the coefficients. Therefore, the comparison is done by dividing the coefficient of each variable by the coefficient of the dummy variable *university*. The results are reported in Table 5. In particular, column (a) of Table 5 reports the probit normalized coefficients where the dependent variable is *strikedone*, while column (b) the normalized coefficients obtained with SNP estimation, column (c) reports the normalized probit coefficients with *strikemight* as dependent variable while column (d) the normalized SNP coefficients.

In general, the direction of the relations (and their statistical significance) obtained with the SNP estimation are in line with those obtained with the probit model. Furthermore the normalized coefficients for the variables regarding the level of confidence in union and firm are larger in the SNP model than in the probit model. Therefore, the marginal effect reported in Table 3, are more conservative than those suggested by the SNP model. The likelihood ratio test of the probit model against the SNP model reject the Gaussianity assumption, therefore the SNP model seems to be more appropriated.

Finally, we want to underline that despite the fact that our results are robust to different model specifications, we do not pretend to have solved all the possible problems of endogeneity of the variables capturing the level of trust in both union and firm. Therefore, to be on the safe side, we limit to affirm that our analysis offers some correlations that go in the direction predicted by the theoretical model proposed in Section 2.

3.3 Robustness Check

In this section we check if our results are robust to inclusion of a control for union membership and political party membership. Unfortunately, we are not able to check also for the size of the firm in which interviewed individuals work.

In particular, in some of the waves of the WVS but not in all the countries, it has been included also a question that ask to interviewed individuals whether they are: active member of labour union, inactive member or not member of a labour union.[15]

We decided to create a unique group dummy named *not_member* that assumes value equal to one if an individual has declared that he is not a member of a labour

[14] We report only the results of the estimation done using a third order expansion however the result for the higher order are available upon request to the author.

[15] The controls for union membership and political party membership are obtained from the following questions: *Now I am going to read out a list of voluntary organizations; for each one, could you tell me whether you are a member, an active member, an inactive member or not a member of that type of organization? Union membership, political party.* The control for the declared level of interest for politics is obtained from the following question: *How interested would you say you are in politics? 1 'Very interested' / 2 'Somewhat interested' / 3 'Not very interested' / 4 'Not at all interested'.*

Table 5. Probit vs. semi-nonparametric model

	(a) Probit-strikedone	(b) SNP-strikedone	(c) Probit-Strikemight	(d) SNP-Strikemight
Htrust	0.350(0.159)**	0.598(0.308)*	0.710(0.136)***	0.730(0.144)***
Union_firm	0.628(0.246)**	1.009(0.490)**	0.144(0.144)	0.119(0.150)
Highconfun	3.157(0.686)***	4.797(1.650)***	2.330(0.375)***	2.483(0.424)***
Medhighconfun	1.800(0.410)***	3.104(1.099)***	2.743(0.387)***	2.914(0.441)***
Medlowconfun	0.633(0.214)***	1.032(0.458)**	1.789(0.263)***	1.901(0.298)***
Highconfirm	−1.377(0.408)***	−1.182(0.644)*	−1.492(0.287)***	−1.572(0.312)***
Medhighconfirm	−1.492(0.373)***	−1.824(0.696)***	−0.800(0.193)***	−0.860(0.209)***
Medlowconfirm	−0.888(0.265)***	−1.002(0.452)**	−0.281(0.143)**	−0.312(0.152)**
Dage	0.051(0.012)***	0.085(0.030)***	−0.083(0.011)***	−0.089(0.013)***
Dagesq	−0.003(0.001)***	−0.004(0.002)***	−0.001(0.000)***	−0.001(0.000)***
Female	−1.729(0.366)***	−2.436(0.837)***	−0.982(0.155)***	−0.991(0.164)***
Married	−0.284(0.193)	−0.516(0.340)	−0.511(0.135)***	−0.519(0.139)***
Divorced	0.437(0.306)	0.449(0.496)	−0.319(0.195)	−0.289(0.200)
Widowed	−0.609(0.377)	−0.913(0.716)	−0.793(0.266)***	−0.876(0.299)***
Parttime	−0.085(0.222)	−0.092(0.346)	0.770(0.180)***	0.812(0.190)***
Selfemployed	−0.679(0.256)***	−1.144(0.529)**	0.151(0.140)	0.159(0.147)
Retired	−0.295(0.268)	0.047(0.464)	−0.856(0.224)***	−0.922(0.253)***
Housewife	−2.549(0.579)***	−5.132(1.901)***	−0.544(0.177)***	−0.492(0.183)***
Student	−0.009(0.270)	0.150(0.430)	0.488(0.184)***	0.498(0.190)***
Unemployed	−0.159(0.247)	−0.250(0.433)	0.427(0.161)***	0.441(0.169)***
Otherjob	−1.125(0.535)**	−1.789(1.062)*	−0.145(0.297)	−0.056(0.304)
Noeducation	−2.242(0.637)***	−3.793(1.587)**	−0.383(0.241)	−0.407(0.259)
Elementary	−2.242(0.637)***	−3.793(1.587)**	−1.161(0.263)***	−1.194(0.286)***
Notcompvoc	−1.141(0.413)***	−1.950(0.929)**	−0.478(0.204)**	−0.532(0.223)**
Vocational	−0.273(0.241)	−0.499(0.456)	−0.246(0.155)	−0.280(0.169)*
Notcompsec	−0.219(0.283)	−0.240(0.469)	−0.065(0.170)	−0.150(0.187)
Notcompuniv	0.660(0.210)***	0.727(0.314)**	0.511(0.143)***	0.525(0.146)***
IncomeD1	−0.198(0.295)	−0.752(0.612)	−0.570(0.208)***	−0.637(0.229)***
IncomeD2	−0.143(0.271)	−0.579(0.539)	−0.175(0.176)	−0.198(0.187)
IncomeD3	−0.431(0.255)*	−0.887(0.503)*	−0.285(0.166)*	−0.289(0.177)
IncomeD4	−0.168(0.231)	−0.428(0.400)	−0.512(0.169)***	−0.467(0.175)***
IncomeD5	−0.128(0.220)	−0.413(0.373)	−0.327(0.154)**	−0.287(0.160)*
IncomeD7	0.109(0.242)	0.105(0.364)	−0.255(0.167)	−0.261(0.176)
IncomeD8	0.393(0.285)	0.703(0.471)	−0.349(0.189)*	−0.355(0.199)*
IncomeD9	0.741(0.366)**	1.377(0.694)**	−0.444(0.237)*	−0.468(0.248)*
IncomeD10	1.011(0.414)**	1.145(0.674)*	−0.570(0.208)***	−0.637(0.229)***
Satisfaction	−0.091(0.034)***	−0.115(0.060)*	−0.151(0.027)***	−0.156(0.029)***
Political	−0.374(0.079)***	−0.683(0.237)***	−0.205(0.032)***	−0.216(0.036)***
Likelihood ratio test of Probit against SNP model: $\chi^2(1)$ (p-value)		190.0775 (3.06e−43)		62.87566 (2.20e−15)

Notes: Standard errors in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$; N=114,108.

union. We add this dummy variable to the model presented in column (c) in Table 3. We are merging together inactive and active members and using them as reference category with the purpose of allowing a better comparability between the sample sizes of the groups (we have only 4,000 active members and about 10,000 inactive members, in comparison to 56,000 not union members). Furthermore, Martin (1986) argues that, contrary to the common beliefs, not all the strikes are supported more by militant members than by inactive members. The results are reported in column (a) of Table 6 for

the model using *strikedone* as dependent variable.

A shortcoming of using this further control variable is that the inclusion of this dummy implies a further reduction in the number of observations from about 117,000 (column (c) of Table 3) to about 71,000 observations (column (a) of Table 6) and obviously a reduction in the cross country heterogeneity.

In column (b) of Table 6, we also add some control variables to better account for the political orientation of the respondents. In particular, we add three dummy variables capturing the declared level of interest for politics, and two dummy variable which account for membership to political party (see Table 6).

First of all, it can be noted that variable *union_firm* becomes insignificant in Table 7 (both in column (a) and column (b)). This suggests that workers involvement in union may have an important role in determining whether they trust more unions or firms, so when the latter it is included in the model *union_firm* loses its significance. However, the direct effect of trust in union and firm survives to the inclusion of the control for union membership and political involvement, and the direction of the relations is still in line with that predicted by the theoretical model presented in Section 2.

Finally, in column (c) of Table 6, we report the final model selected through the so called "Allison's test" (see Allison 1999). In particular, this test is run to verify if the coefficients associated to the variables capturing the level of trust in firm and in union are statistically different between union members and not members.[16] The Allison's test consists in a sequence of likelihood ratio test (from now, LRT), between nested models. Firstly, the pooled model for union and non members plus the inclusion of a group's dummy (model A), which allows to account only for a difference in the intercept of the model for the two groups, is tested by the mean of a LRT against a model where also residual variance is allowed to differ across group (model B). If model A is refused in favour of model B, then model B is tested against a model C where also the Beta parameters are allowed to change across groups (this is done by adding interactions between the group's dummy and all the regressors included in model A). The rejection of model B against model C, indicates that at least one parameter is different across group even after having controlled for differences in residual variation. Therefore, when model C is preferred over model B, model C could be further tested against a model where only a subset of regressors are allowed to change across group (model D). Obviously, our model D is that where the variables capturing the level of trust in both union and firm are allowed to change between union and non union members.

Considering the model reported in Table 6 column (c) and focusing on the interaction terms between *not_member* and the set of trust variables, we have that only for *medhighconfun* and *medlowconfun* there is an additional positive effect for non union members, while there are not any statistical significant differences between groups both in the coefficient associated to *highconfun* (which is still positive and statistically significant) and in the set of coefficients associated to those variables capturing the level of trust in firm (which are still negative and statistical significant at 5% level).

Therefore, our robustness checks suggest that our results are valid for both non union members and union members, at least for the highest level of trust.

[16] The test is implemented through the user written Stata's package OGLM (Williams 2006).

Table 6. Estimating the probability of having joined an unofficial strike by union membership

	(a)		(b)		(c)	
Htrust	0.044	(0.021)*	0.024	(0.021)	0.031	(0.020)
Union_firm	0.058	(0.030)	0.043	(0.030)	0.000	(0.050)
Highconfun	0.317	(0.045)***	0.277	(0.045)***	0.213	(0.073)**
Medhighconfun	0.191	(0.031)***	0.171	(0.031)***	0.085	(0.055)
Medlowconfun	0.063	(0.025)*	0.053	(0.025)*	−0.065	(0.048)
Highconfirm	−0.100	(0.043)*	−0.122	(0.044)**	−0.186	(0.075)*
Medhighconfirm	−0.143	(0.034)***	−0.140	(0.034)***	−0.131	(0.058)*
Medlowconfirm	−0.081	(0.029)**	−0.081	(0.029)**	−0.049	(0.050)
Dage	0.006	(0.001)***	0.004	(0.001)***	0.004	(0.001)***
Dagesq	−2.3e−4	(0.000)***	−2.3e−4	(0.000)***	−2.2e−4	(0.000)***
Female	−0.210	(0.019)***	−0.170	(0.019)***	−0.170	(0.018)***
Married	−0.011	(0.026)	−0.008	(0.026)	−0.013	(0.025)
Divorced	0.080	(0.040)*	0.083	(0.041)*	0.050	(0.039)
Widowed	−0.040	(0.050)	−0.030	(0.050)	−0.031	(0.049)
Parttime	0.012	(0.031)	−0.002	(0.031)	0.009	(0.030)
Selfemployed	−0.030	(0.030)	−0.056	(0.031)	−0.028	(0.029)
Retired	0.042	(0.037)	0.028	(0.037)	0.047	(0.036)
Housewife	−0.234	(0.038)***	−0.238	(0.038)***	−0.240	(0.038)***
Student	0.072	(0.039)	0.051	(0.040)	0.078	(0.038)*
Unemployed	0.003	(0.034)	−0.006	(0.034)	−0.012	(0.034)
Otherjob	−0.119	(0.071)	−0.125	(0.071)	−0.102	(0.072)
Noeducation	−0.299	(0.052)***	−0.223	(0.053)***	−0.316	(0.050)***
Elementary	−0.164	(0.036)***	−0.118	(0.036)**	−0.152	(0.036)***
Notcompvoc	−0.138	(0.040)***	−0.105	(0.040)**	−0.126	(0.038)***
Vocational	−0.044	(0.029)	−0.030	(0.029)	−0.032	(0.028)
Notcompsec	−0.046	(0.036)	−0.032	(0.037)	−0.051	(0.036)
Notcompuniv	0.053	(0.035)	0.042	(0.035)	0.050	(0.034)
University	0.084	(0.028)**	0.055	(0.028)	0.073	(0.027)**
IncomeD1	0.068	(0.042)	0.077	(0.043)	0.086	(0.040)*
IncomeD2	0.036	(0.037)	0.046	(0.037)	0.048	(0.036)
IncomeD3	−0.063	(0.034)	−0.058	(0.035)	−0.043	(0.034)
IncomeD4	−0.007	(0.032)	−0.000	(0.032)	0.001	(0.031)
IncomeD5	−0.004	(0.030)	0.004	(0.030)	−0.023	(0.030)
IncomeD7	0.023	(0.033)	0.023	(0.033)	0.030	(0.033)
IncomeD8	0.070	(0.038)	0.066	(0.038)	0.057	(0.037)
IncomeD9	0.159	(0.048)***	0.142	(0.049)**	0.134	(0.049)**
IncomeD10	0.156	(0.052)**	0.120	(0.054)*	0.127	(0.050)*
Satisfaction	−0.005	(0.004)	−0.004	(0.004)	−0.009	(0.004)*
Political	−0.046	(0.004)***	−0.048	(0.004)***	−0.046	(0.004)***
Not_member	−0.495	(0.021)***	−0.435	(0.022)***	−0.727	(0.086)***
Not_member_union_firm					0.007	(0.062)
Not_member_highconfun					0.173	(0.091)
Not_member_medhighconfun					0.167	(0.066)*
Not_member_medlowconfun					0.179	(0.056)**
Not_member_highconfirm					0.064	(0.090)
Not_member_medhighconfirm					−0.059	(0.070)
Not_member_medlowconfirm					−0.054	(0.060)
Political party						
active member			0.09	(0.027)**	0.095	(0.026)***
inactive member			0.241	(0.034)***	0.249	(0.032)***
not member (reference)						

Table 6. *Continued from the previous page*

	(a)	(b)		(c)	
Interest for politics					
somewhat interested		− 0.183	(0.024)***	− 0.201	(0.024)***
not very interested		− 0.387	(0.027)***	− 0.436	(0.028)***
not at all interested		−0.456	(0.032)***	−0.515	(0.033)***
very interested (reference)					
$\ln\sigma$ not_member				0.111	(0.033)***
N	71402	71117		71117	
Pseudo R^2	0.149	0.163		0.167	

Likelihood ratio test of models	$\chi^2(k)$	k	p-value
A vs. B	7.97	1	0.0048
B vs. C	463.97	102	0.0000
C vs. D	16.18	7	0.0235

Notes: Standard errors in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$; wave and country dummies included but not reported; $\ln\sigma$ is the parameter that allows to account to the unobserved heterogeneity between groups.

4. Conclusions

This paper offers a contribution to the literature on strike activity by analysing the effect of trust in labour disputes. To our knowledge, it represents the first cross-country investigation on the role that such cultural beliefs may play in influencing the propensity of individuals to participate in unofficial strikes. We maintain that in situation where the future state of the world cannot be predicted with certainty, firms and unions offer to workers their respective vision of the state of the world. When these visions are different, workers have to formulate their idea about what is the more plausible picture. However, in formulating this idea they are biased by the degree of trust that they place in each of the two subjects.

This causes a positive (or, negative) relation between the level of confidence that people have in unions (or, firm) and the likelihood of participating in an unofficial strike. A very simple model has been presented to clarify this idea, which has received support also on the empirical side. In particular, using WVS data, it has been shown that the probability of having participated or being willing to participate in an unofficial strike decreases (or increases) as the level of confidence in labour unions (or firms) decreases. The analysis also suggests that the effect of confidence in labour unions is stronger than that of confidence in firms.

The main theoretical limitation of this paper is the extreme simplicity of the presented model, which may, for instance, be enriched by considering the effect that iterated interactions may have on the formation of beliefs about the trustworthiness of both unions and firms. However, we want to underline that our aim was mostly focused on the choice of adhering or not to an unofficial strike, which is by definition a yes/no decision of the individual workers. Therefore a one shot game seems to be not so unrealistic in this context.

With regard to the empirical analysis, the usual limitations (possible issues of omitted variables and reverse causation) of cross-country analysis apply here. The main

econometric issues briefly discussed in section 3 are difficult (if not impossible) to cope with the available data, therefore all the empirical evidences presented have to be considered as correlations, while the empirical investigation of causality is leaved as an open issue for future research.

Furthermore, all the empirical evidence is based on survey questions and therefore suffers of all possible distortions inherent to this type of empirical investigations (for a discussion see Bertrand and Mullainathan 2001).

Being aware of all these theoretical and empirical limits, one possible policy suggestion that emerges from our analysis is that a mediation intervention may be fruitful in avoiding strikes if it is able to induce the bargainers to consider possible points of weakness in their positions and to "put themselves in the shoes of the opposite party" and so to de-bias their evaluations of the "size of pie". In fact, this could reduce the need for workers to take decisions on the basis of the degree of trust that they have in the parties involved in a collective agreement. The mediator can be viewed as someone who ensures that the size of the pie has been correctly estimated by the parties.

For instance, in an experimental setting, where people have to negotiate a settlement in a simulated tort case, Badcock and Loewenstein (1997) report that de-biasing treatment, inducing people to consider the points of weakness in their positions, is able to significantly reduce bargaining impasses.

Out of the experimental setting, it has been widely recognized by Italian scholars that in 1993 (see Salvati 2000, for a discussion) the establishment of a triangular table of bargaining, the so called "Concertazione", composed by the Italian government acting as mediator, and social parties as bargainers, has produced a prolonged period of industrial peace with associated benefits for the Italian economy.

Another obvious possibility is to increase the cost of calling unofficial strikes for the workers. However, this possibility may be (depending on political preferences) more difficult than the first, because it requires to deny the right of workers to manifest their position and opinion over work-related issues without the authorization of union's leadership.

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