STRIKES, FREE RIDERS AND SOCIAL CUSTOMS

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University of Warwick

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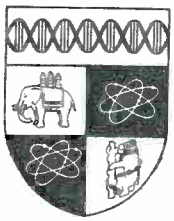

DEPARTMENT OF ECONOMICS

UNIVERSITY OF WARWICK
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1. Introduction

In recent years there has been a growing literature on the role of social customs in the labour market. Marsden (1986), for example, has emphasised the importance of group norms and social custom in various labour market contexts. Jones (1984) develops an economic model of conformist behaviour in which an individual's work effort is determined partly by tradition and by the behaviour of other workers. A central theme of the literature is that a rational economic agent does not inhabit a social vacuum and hence that individual behaviour is influenced, to some extent, by the actions of others. The approach promises the possibility of an escape from the free-rider problem, which, as we shall investigate, might have a number of labour market applications. Such a potential has been suggested by a number of writers in different fields. Elser (1978), writing from a socio-psychological perspective, has stressed the role of social norms in producing cooperative outcomes in the theoretical context of the prisoner's dilemma. Such an emphasis is consistent with Sen's (1977) argument that the concept of commitment might offer a solution to the free rider problem.

The more formal models of social custom are derivative of that of Akerlof (1980), in which the social custom was captured in the principle that labour should trade at a "fair wage". Akerlof was able to show that, "Social customs which are disadvantageous to the individual may nevertheless persist without erosion, if individuals are sanctioned by loss of reputation for disobedience of the custom". Booth (1985) develops a related model in which workers acquire utility

from the reputation they derive from joining a union. Should this utility offset the positive costs of union membership then the free rider problem is averted and the model is capable of explaining the existence of trade union membership without compulsion. Hence, it can be seen as an improvement on Olson's (1965) discussion.

The social custom model would seem to offer a particularly useful framework for developing an explanation of strike behaviour by trade unionists. A union strike call is highly vulnerable to the free rider problem: a strike is expensive to individual workers in terms of forgone earnings, yet the benefits derived from any wage increase derive to strikers and non-strikers alike. This begs the question, "Why do workers strike?" One possible answer would focus on compulsion or intimidation; but this would not seem plausible for the majority of peaceful strikes. An alternative is to hypothesise the existence of a social custom in the workplace discouraging workers from free riding when a strike is called. This is consistent with the casual observation and sociological evidence of workplace mores inciting workers not to cross picket lines and of the cultivated disapprobation of the values of the free rider.

The issue of what determines an individual's behaviour with respect to a strike call is not simply of academic interest per se. The expectations held by both unions and employers regarding individual workers' responses to a strike call are likely to be a key factor in the bargaining process. Economic models of union decay functions (see, for example, Ashenfelter and Johnson (1969)) attempt

to incorporate such information. Furthermore, adherence by individual workers to social customs has implications for collective goals, and hence for models of wage and employment effects of trade unions (see, for example, McDonald and Solow (1981) and Oswald (1982)). If the specification of a union's objectives include scope for social custom considerations, it might begin to be possible to explain such phenomena as sympathetic strike action in the framework of economic theory.

This paper attempts to develop a social custom theory of strikes which, by incorporating socio-psychological factors into the conventional utility-maximising model, offers: (i) to provide an explanation of the economic incentive to strike, (ii) to show short- and long-run equilibria in which workers choose to strike and (iii) to demonstrate that the model applies equally well to the trade union membership decision and, hence, to build on Booth's (1985) results. The outcome is consistent with Akerlof's result that social customs that are costly for the individual to follow persist nonetheless. The present paper distinguishes between those who do and those who do not believe in the specified social custom, and assumes that individuals are heterogeneous in their preferences. Hence, this paper represents a closer application of the assumptions of Akerlof's model to the union/strike public goods problem than was implicit in Booth (1985), and it is claimed that the approach here offers novel and significant insights into the social and economic behaviour of rational individuals in this context.

2. The model

The model is concerned with investigating the impact on individual behaviour of a social custom invoking workers to support a strike when one is called. The solution method has no precedent in this context. It is assumed that social custom affects utility in a manner equivalent to that postulated in Akerlof's model. As there, a social custom is the innovation to "an act whose utility to the agent performing it in some way depends on the beliefs or actions of other members of the community".

Assumptions

(i) In our context, an individual's utility is assumed to depend upon five arguments:

$$u = u(M, R, s, b, \varepsilon) \qquad (1)$$

where

M is money income. $M = \begin{cases} d & \text{if the individual strikes} \\ w & \text{otherwise} \end{cases}$

R represents reputation enjoyed by the individual.

s is a dummy variable representing obedience or disobedience of the social custom. Hence,

$$s = \begin{cases} 1 & \text{if the individual strikes.} \\ 0 & \text{otherwise.} \end{cases}$$

b is a dummy variable representing the individual's belief or disbelief in the custom.

$$b = \begin{cases} 1 & \text{if the person is a believer.} \\ 0 & \text{otherwise.} \end{cases}$$

ϵ represents an individual's personal tastes.

(ii) The population consists of some fraction, μ, of believers and of $(1-\mu)$ nonbelievers, where $0 \leq \mu \leq 1$ and μ is given in the short-run.

(iii) Individuals choose to strike if the utility from so doing is at least as great as the utility derived from not striking. λ represents the proportion of individuals who strike, where $0 \leq \lambda \leq 1$. If $\lambda < \mu$, i.e. if some believers do not stike this period, then the proportion of believers falls next period.[1] Hence,

$$\dot{\mu} = f(\mu, \lambda) \qquad (2)$$

If $\lambda < \mu$, f is negative; if $\lambda > \mu$, f is positive.

(iv) An individual who strikes acquires utility from the reputation derived from obeying the social custom. This utility depends positively upon the proportion of believers (μ) and upon the individual's personal tastes. Hence,

$$R = R(s, \mu\, \epsilon) \qquad (3)$$

Utility derived out of reputation accrues to believers and nonbelievers alike.

(v) A person who disobeys the social custom forgoes reputation-derived utility. In addition to this, it is assumed that a believer who disobeys suffers disutility $\bar{c}$ consequent upon the act of disobedience.[2] This sets up an asymmetry between the actions of believers and nonbelievers. More generally, we assume that nonbelievers who disobey suffer a utility loss $\bar{g}$ as a repercussion of disobedience, where $\bar{g} < \bar{c}$.

(vi) ε is assumed to be distributed uniformly between ε_0 and ε_1 , where $\varepsilon_1 > \varepsilon_0 > 0$. It is assumed further that if there are both believers and nonbelievers in the population (i.e. $0 < \mu < 1$), then the latter group consists of the individuals with the lower values of ε . For example, if there is just one believer, he or she is the individual, i , with $\varepsilon_i = \varepsilon_0$. An assumption of this sort is necessary for the construction of our model, but it anyway has some intuitive plausibility. It implies that the individuals who derive most utility from the reputation effects (assumption (iv)) are most likely to be believers in the social custom, in any short-run equilibrium.

Specification of the choice criteria

Let the utility function be specified as

$$u = w(1-s) + ds + \alpha\varepsilon\mu\bar{r}s - b(1-s)\bar{c} - (1-b)(1-s)\bar{g} \qquad (4)$$

where α is the coefficient on the reputation term, $\bar{r}$ is the coefficient on μ, and the other terms are as specified above. Consider the behaviour of a believer, i. If he or she strikes, then $b=1$ and $s=1$. Hence,

$$U_i^s = d + \alpha\varepsilon_i\mu\bar{r} \quad .$$

If he or she does not strike, then $b=1$ and $s=0$. Hence,

$$U_i^{ns} = w - \bar{c}$$

Thus, the believer i will strike iff

$$d + \alpha\varepsilon_i\mu\bar{r} \geq w - \bar{c}$$

$$\text{i.e.} \qquad \varepsilon_i \geq \frac{w - \bar{c} - d}{\alpha\mu\bar{r}} \qquad (5)$$

Similarly, a nonbeliever j will strike iff

$$\varepsilon_j \geq \frac{w - \bar{g} - d}{\alpha\mu\bar{r}} \tag{6}$$

The relationships

$$\varepsilon = \frac{w - \bar{c} - d}{\alpha\mu\bar{r}} \tag{7}$$

and

$$\varepsilon = \frac{w - \bar{g} - d}{\alpha\mu\bar{r}} \tag{8}$$

can be represented graphically as below;

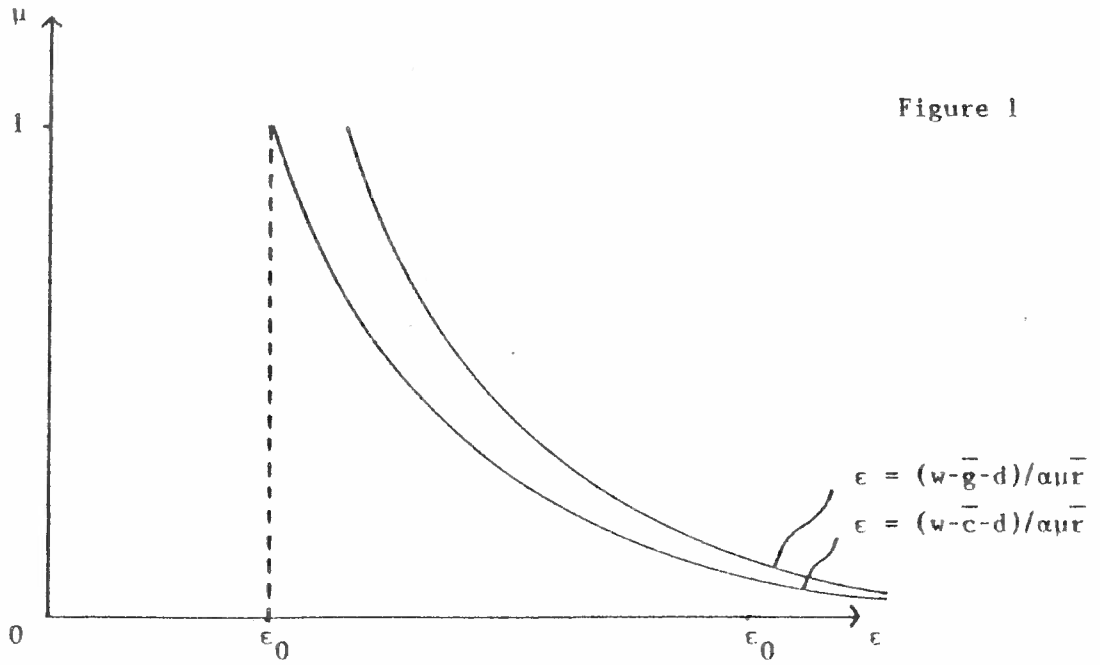

Figure 1

In the diagram, ϵ_0 is depicted as that value of ϵ satisfying equation (7) for $\mu=1$. When $\mu=1$ everyone is a believer. Hence, we are assuming implicitly that when $\mu=1$ the believer with lowest ϵ is just indifferent between striking and not striking. This assumption is convenient for expositional purposes but will be relaxed later. By assumption (v) the proportion of believers (μ) can be mapped onto the (ϵ_0, ϵ_1) interval by the downward sloping linear schedule connecting $(\epsilon_0, 1)$ and $(\epsilon_1, 0)$ in ϵ-μ space, as below.

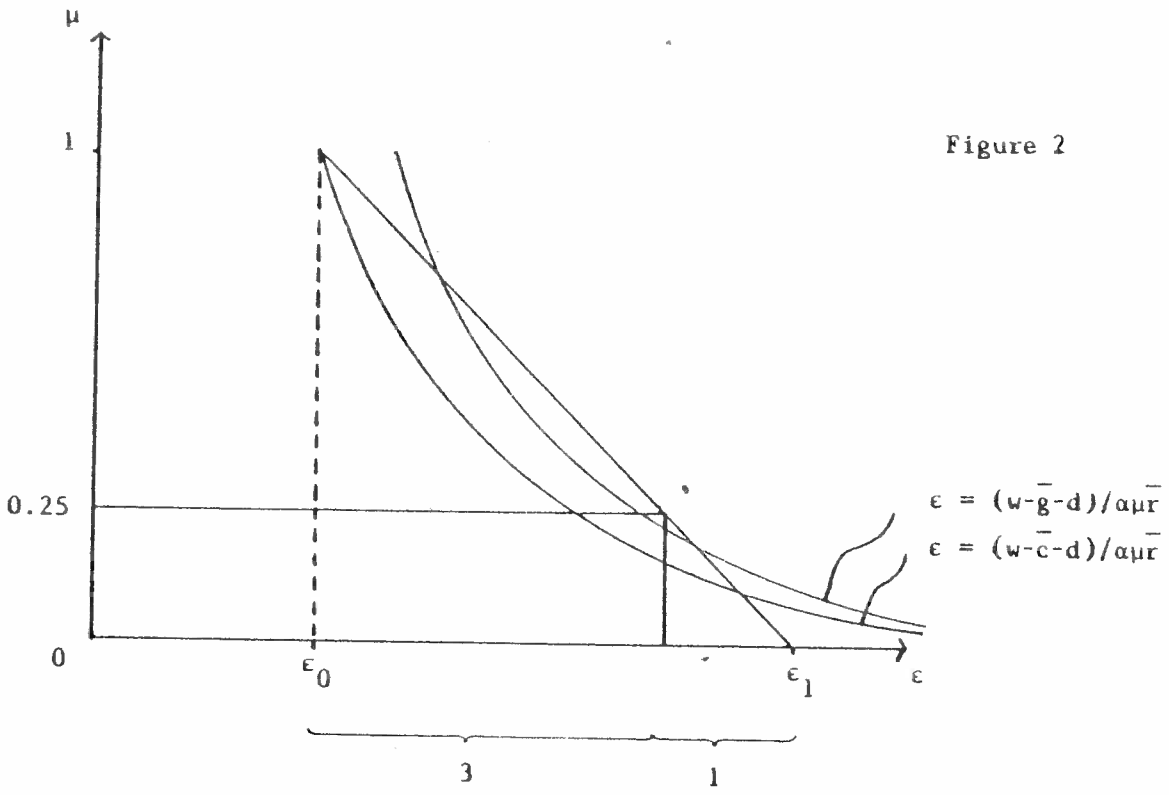

Figure 2

Recall that ϵ is uniformly distributed. When $\mu=0.25$, for example, one quarter of the population consists of believers. This group will be represented on the ϵ-axis by the highest quartile in the (ϵ_0, ϵ_1) interval, by assumption (v). The lower three quartiles represent the ϵ values of the nonbelievers.

Equilibrium

Consider points a, b, c, d, e and g below:

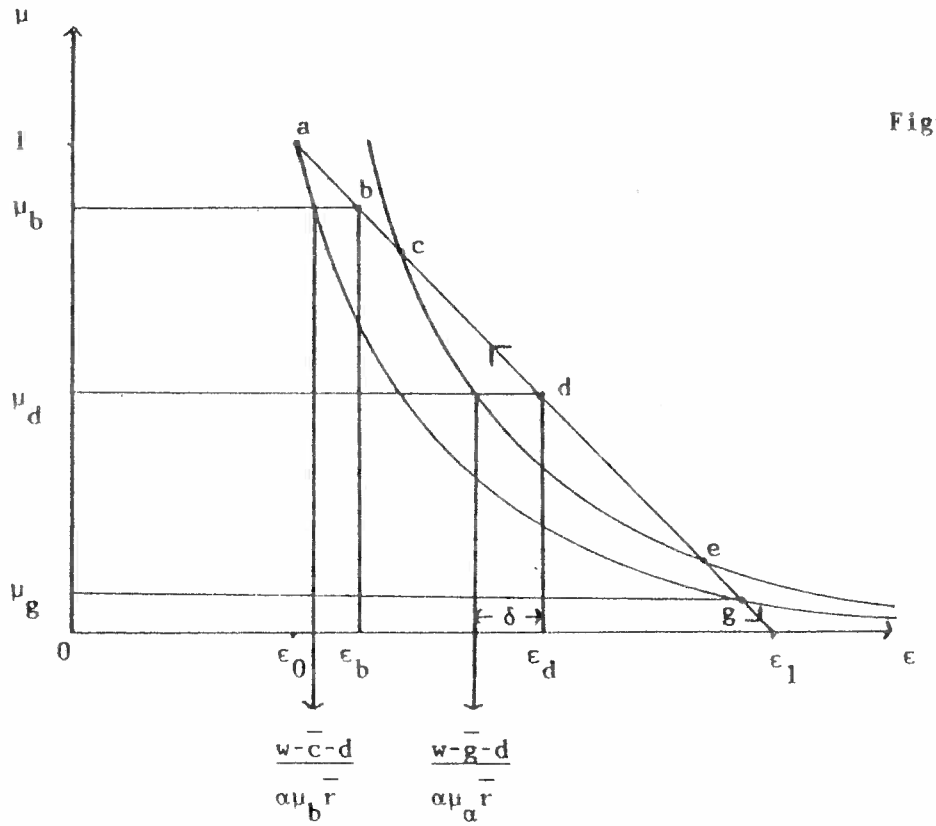

Figure 3

At a , $\mu=1$ and the individual with $\varepsilon = \varepsilon_0$ will strike as inequality (5) is satisfied by definition of ε_0 . Hence, all individuals strike and $\lambda = \mu = 1$. This satisfies the long-run equilibrium condition. There are no free riders as reputation effects and the disutility that would stem from disobedience offset the pecuniary incentive not to strike.

At b, $\mu < 1$ where the believers are those workers with ε_i such that $\varepsilon_b \leq \varepsilon_i \leq \varepsilon_1$ and nonbelievers comprise the rest. A believer i will strike iff $\varepsilon_i \geq (w-\bar{c}-d)/\alpha\mu_b\bar{r}$. From the diagram

it is clear that this is true for all believers, hence all believers strike. Similarly, a nonbeliever j will strike if and only if $\epsilon_j \geq (w-\bar{g}-d)/\alpha\mu_b\bar{r}$. From the diagram we can see that $\epsilon_b < (w-\bar{g}-d)/\alpha\mu_j\bar{r}$ and hence that no nonbeliever has ϵ sufficiently high to induce him or her to join a strike at this level of μ. Thus, $\mu = \lambda$ and the long-run equilibrium condition is satisfied. This is true for all points between a and c. No believers free ride for the reasons outlined at a, but all nonbelievers free ride because their disutilities from disobeying the social custom are not sufficient to offset the pecuniary incentive, even after allowing for the forgone reputation effect.

At a point such as d all believers will have ϵ values greater than that necessary to induce them to strike. In addition there will be a fraction of nonbelievers, depicted by δ in figure 3, who will strike. This is because for this range of values of μ, some nonbelievers have ϵ values sufficiently high to cause the product of ϵ and μ to dominate the pecuniary advantage from free riding. Hence, $\lambda > \mu$ and, by assumption (iii), μ will rise in the next period: represented by the upward-pointing arrow in figure 3. Points such as α, then, do not represent long-run equilibria: if d is a short-run outcome there will be a tendency for μ to rise towards the equilibrium range bounded by points a and c.

At e, it is simple to show that $\mu = \lambda$ and hence that we are back in long-run equilibrium. No nonbeliever has a net incentive to strike as for such low values of μ there is little reputation-derived utility to be won by obeying the social custom.

Nevertheless, believers, with stronger disutility repercussions from disobedience, are induced to strike. The same holds true for all points in the interval bounded by points e and g . However, as μ falls below the level implied at point g the erosion of the reputation effect induces some believers to disobey. We could imagine some point h between g and e , such that $\mu_g > \mu_h > 0$. At such a point there will be at least some believers for whom $\varepsilon_i < (w-\bar{c}-d)/\alpha\mu_h\bar{r}$. Hence, $\mu > \lambda$. In the next period μ falls, the process continuing until $\mu = \lambda = 0$ at which point long-run equilibrium is restored. The downward-pointing arrow in figure 3 depicts this dynamic.

This particular configuration of the parameters, then, suggests multiple equilibria with equilibrium outcomes at $\mu=0$ and in the ranges depicted by a-c and by e-g . This result is termed a 'trimodal outcome'.

Implications

In accordance with the above example, the theory suggests that in a long strike either high or quite low initial solidarity rates[3] are sustainable over time, whilst intermediate initial rates will induce increasing support to some limit, and conversely, very low rates will tend to atrophy. The precise critical values will depend upon the values of the other parameters. We have derived an hypothesis testable against empirical evidence of a longitudinal nature. As will become evident, the model is equally amenable to a cross-section interpretation.

Effects of changing parameter values

1. As $\bar{g}$ falls, the schedule $\varepsilon = (w-\bar{g}-d)/\alpha\mu\bar{r}$ shifts to the right and the interval $c-e$ diminishes, expanding the set of long-run equilibrium outcomes. Conversely, as $\bar{g}$ tends to $\bar{c}$ the model collapses to yield only three long-run equilibrium outcomes: at $\mu=1$, $\mu=0$ and at point g in figure 3. In the context of the application of this model to the trade union membership decision, this outcome corresponds to Booth's result because, in setting $\bar{c} = \bar{g}$, we have replicated her assumption that there is no distinction between believers and nonbelievers. The point g, then, represents an unstable equilibrium.

2. As ε_0 falls we find that $\mu=1$ is no longer a long-run equilibrium. When everyone is a believer there are now some individuals with values of ε sufficiently low to ensure the dominance of the pecuniary advantage derived from free riding. For those individuals attention to reputation is weakened. The trimodality outcome is preserved if either $\bar{g}$ or ε_1 (or both) is sufficiently large.

3. The linear relationship between μ and ε, discussed in assumption (vi), is a consequence of the assumption of a uniform distribution of ε. If, on the other hand, the distribution was assumed normal, for example, then the schedule would become concave. This would not affect the result qualitatively but would increase the probability of the trimodality outcome.

4. As d falls the hyperbolae shift to the right, reducing the width of the intervals c-e and e-g in figure 3. Furthermore, as with the case of a fall in ε_0, very high levels of μ are now incompatible with long-run equilibrium.

5. As $\bar{c}$ falls the hyperbola representing the believers' choice-function shifts to the right, reducing the widths of the intervals a-c and e-g. Again, as above, very high levels of μ are no longer compatible with long-run equilibrium. Similarly, as the lower range of the e-g interval is eroded, there is the tendency to undermine the solidarity rate in this region of μ.

3. Empirical application and interpretation

The model is able to make sense of a number of policies adopted by employers and governments to reduce the probability of support for strikes. First, action taken to reduce the income received by strikers (i.e. to reduce d) will be likely to reduce the level of support for a strike for the reasons analysed in the previous section. It would be surprising if an economic model failed to make this prediction. Second, but less mundanely, it is likely that attempts to challenge the legitimacy of a particular strike will reduce the support for a strike to the extent that such attempts reduce the disutilities incurred by disobedience. In terms of the model, loss of legitimacy is interpreted as a fall in $\bar{c}$ and/or $\bar{g}$, with the consequences examined above. Where the social custom is, as here, the invocation to strike, the employer or government might attempt to challenge the right to strike.[4] Where a strike is

interpreted as functional to the cause of, for example, 'defending jobs', government might be seen as counterposing this principle with that of the 'right to work'.[5] Either way, directly or indirectly, our model predicts that a challenge to the legitimacy of a strike might be a means of reducing the support for it, and hence makes economic sense of attempts to promote actions with the sanction of moral force. Third, the model predicts that a policy of exaggerating the numbers of workers ignoring the strike call will reduce support by reducing the perceived reputation effects.

Conversely, it follows that the model is capable of explaining union policies to:

(a) maximise strike pay,

(b) stress the legitimacy of the strike, and generally reinforce the sense of duty incumbent on members in rejecting the course of the free rider, and

(c) exaggerate the numbers of workers supporting the strike.

Finally, it follows also that the values of such parameters as ε, $\bar{c}$ and $\bar{g}$, inter alia, will vary not only over time but also across different groups of workers. In this way the model can be seen as providing a potential meeting point with sociological theory and debate. For example, Kerr and Siegel's (1954) well-known distinction between the 'isolated mass' and the 'integrated individual' can be translated into the terms of our model. In explaining the inter-industry propensity to strike the hypothesis of the location of the worker in society suggests, write Kerr and Siegel, that: "(a) industries will be highly strike prone when the workers (1)

form a relatively homogeneous group which (ii) is unusually isolated from the general community and which (iii) is capable of cohesion; and (b) industries will be comparatively strike free when their workers (i) are individually integrated into the larger society, (ii) are members of trade groups which are coerced by government or the market to avoid strikes, or (iii) are so individually isolated that strike action is impossible." The isolated mass is said to possess its "own codes, myths, heroes and social standards." We might interpret the isolated mass as consisting of workers with high ε values in groups characterised by large values for $\bar{c}$ and $\bar{g}$, generating typically high equilibrium values of μ and λ.

4. Application of the model to the union membership decision

Suppose now that:

$$s = \begin{cases} 1 & \text{if the worker joins the union.} \\ 0 & \text{otherwise.} \end{cases}$$

$$b = \begin{cases} 1 & \text{if the worker believes in the social custom.} \\ 0 & \text{otherwise.} \end{cases}$$

where the social custom is the principle that each worker should join the union.

Let

$$U = w - ds + \alpha\mu\bar{r}s - b(1-s)\bar{c} - (1-b)(1-s)\bar{g}$$

where,

w is the wage rate and is independant of union membership

d represents the pecuniary cost of union membership

μ is the proportion of workers who believe in the social custom

and α, $\bar{r}$, $\bar{c}$, $\bar{g}$ and λ are equivalent to their previous definitions.

A believer, i, will join the union iff

$$\epsilon_i \geq \frac{d-\bar{c}}{\alpha\mu\bar{r}} \tag{9}$$

A nonbeliever, j, will join the union iff

$$\epsilon_j \geq \frac{d-\bar{g}}{\alpha\mu\bar{r}} \tag{10}$$

Inequalities (9) and (10) are equivalent to inequalities (5) and (6), respectively. Hence the model is equivalent fundamentally to the foregoing strike decision application, and we could proceed in the same manner to reach analogous conclusions. Again, socio-economic factors are built into the model directly and enable economic theory to offer explanations of a number of factors likely to affect the individual's union membership decision. First, group reputation effects are likely to be important. Where workers have a primary social identity outside the workplace peer pressure at work to join a

union is likely to be relatively less effective. This might help explain lower unionisation rates among part-time employees, young workers and females. Second, the strength of social custom effects is likely to vary geographically and occupationally, producing, ceteris paribus, higher probabilities of individual membership in particular areas, for example Wales, or in particular occupations, amongst manual workers for instance.[6] Furthermore, the general finding that unionisation increases with establishment size (see, for example, Bain and Elsheikh (1980)) runs counter to the prediction that free-rider problems are exacerbated in situations of large numbers. This finding indicates the possible presence of motives other than merely a narrow pecuniary calculation.

Social customs and screening

Work by Becker (1957) and Arrow (1972) in the context of discrimination represents early attempts to incorporate the phenomena of social custom into economic analysis. Arrow developed the signalling explanation of wage differentials. Our model is amenable to a signalling interpretation. Assume, for the moment;

(i) that individuals are distinguished as before according to their belief or nonbelief in the social custom, but that otherwise they are homogeneous and

(ii) that when a strike is called workers base their decisions on an assessment of the expected duration of the strike about which all workers agree.

Let

$$U = w(1-s) + ds + \alpha\mu\bar{r}s - (1-s)b\bar{c} - (1-s)(1-b)\bar{g}$$

where $\bar{c} > \bar{g}$, $0 \leq u \leq 1$ and the parameters are as before.

A worker who strikes is now interpreted as doing so in order to signal him or herself as a believer in the social custom and hence to derive the concomitant reputation effects.

A believer will strike iff

$$d + \alpha\mu\bar{r} \geq w - \bar{c}$$

A nonbeliever will strike iff

$$d + \alpha\mu\bar{r} \geq w - \bar{g}$$

Let the condition for a signalling equilibrium be $\mu = \lambda$. Then there will be a signalling equilibrium iff

$$w-\bar{g} > d + \alpha\mu\bar{r} \geq w-\bar{c}$$

or $\bar{g} < w-d - \alpha\mu\bar{r} \leq \bar{c}$.

If this condition is satisfied, then a nonbeliever would prefer a strike not to be called as his or her utility without a strike is $U = w$, but with a strike is $U = w-\bar{g}$. A believer would derive $U = w$ in the absence of a strike, and $U = d + \alpha\mu\bar{r}$ in a strike if the equilibrium condition is satisfied. A believer would prefer a strike (and therefore vote for it, if such were the mechanism of a strike call) iff $d + \alpha\mu\bar{r} > w$, i.e. iff $w-d - \alpha\mu\bar{r} < 0$. But for $\bar{g} < 0$ this inequality is never satisfied in a signalling equilibrium and hence we conclude that each is worse off if there is a strike, although if a strike is called believers will support it. This is not an unusual characteristic of a signalling equilibrium. It gives us the Akerlof result that social customs that are costly for the individual to follow might persist nonetheless.

Conclusion

This paper offers an original model for the application of a social custom theory to the free rider problem in the context of the individual's strike decision. The model has wider applications; for example, to the worker's union membership decision. Because it incorporates not only reputation effects, but also disutility effects of disobedience of the social custom, in the tradition of Akerlof (1980), it is felt that the model is capable of generating significant explanatory power over empirical events, as well as being amenable to empirical testing of its theoretical predictions. Furthermore, the theory offers a potential interface for economic and sociological debate in this area.

It has been assumed that, as far as the workers are concerned, the strike is a public good. With individualistic utility maximisation in the absence of reputation and disobedience disutilities the public good will not be provided. The existence of the social custom allows the possibility that at least some individuals will behave cooperatively and hence possibly escape the prisoners' dilemma. Each individual is still motivated only be self-interest. The moral solution comes about because of the psychological change in individuals who are now reluctant to become free riders. The effects are channelled through the utility function. In other models the moral solution follows from the assumption that individuals become either altruistic or Kantian (see Collard (1978) and Titmuss (1970)). Parfit (1984) discusses this set of alternatives most clearly.

Appendix 1[7]

By the strong assumption (vi), we supposed a highly specific relationship between the distribution of ε and b. Now let us assume that the joint distribution of the ε and the b is defined by a convex set.

Suppose $U = w(1-s) + \alpha c \mu \bar{r} s - b(1-s)\bar{c}$

i.e. $\bar{g} = d = 0$, for simplicity.

Then, $$U = \begin{cases} \alpha c \mu \bar{r} & \text{if the individual strikes.} \\ w - b\bar{c} & \text{otherwise.} \end{cases}$$

An individual strikes iff

$$\alpha c \mu \bar{r} \geq w - b\bar{c}$$

i.e. $$b \geq \frac{w - \alpha \mu \bar{r}}{\bar{c}}$$

Graphically,

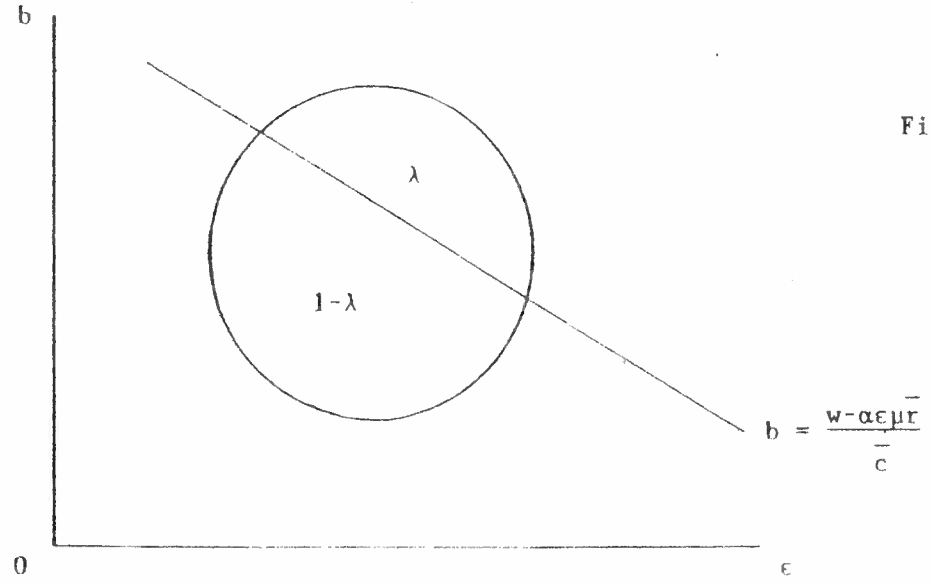

Figure 4

As μ rises, the b-function shifts down representing a higher proportion of workers choosing to strike. If the set is convex then, starting at $\lambda=0$, as μ rises λ is first an increasing function of μ, up to some point, and thereafter a decreasing function, as illustrated below:

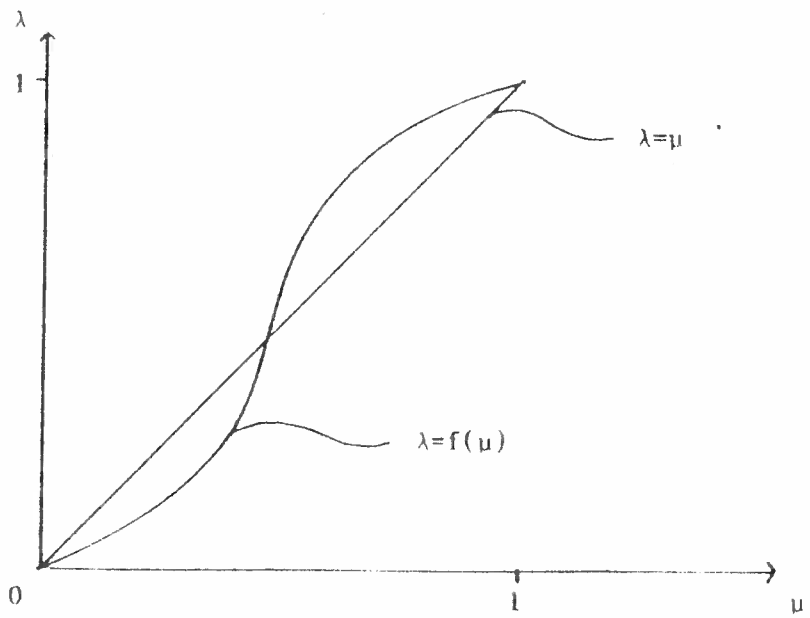

Figure 5

There are three equilibria where the λ-function intersects the equilibrium condition $\lambda=\mu$. Equilibrium points $\mu=\lambda=0$ and $\mu=\lambda=1$ are stable. Point b , however, yields an unstable equilibrium. To the right of b , $\lambda>\mu$ and so μ will increase further tending toward unity. Conversely, μ will tend toward zero from the left of b .

Appendix 2[8]

The model has assumed so far that reputation accrues only to members of the group conforming to the social custom. How is the result affected by the symmetric assumption that members of the 'recalcitrant' group derive positive reputation effects from their group affiliation?

The utility function becomes,

$$U = w(1-s) + ds + \alpha\varepsilon\bar{r}\left[\mu s + (1-\mu)(1-s)\right] - b(1-s)\bar{c} - (1-b)(1-s)\bar{g}$$

A believer i will strike iff

$$d + \alpha\varepsilon_i\mu\bar{r} \geq w + \alpha\varepsilon_i\bar{r}(1-\mu) - \bar{c}$$

i.e. iff $$\varepsilon_i \geq \frac{w - \bar{c} - d}{\alpha\bar{r}(2\mu-1)} \qquad (11)$$

Similarly, a nonbeliever i will strike iff

$$\varepsilon_i \geq \frac{w - \bar{g} - d}{\alpha\bar{r}(2\mu-1)}$$

Inequalities (11) and (12) are equivalent to (5) and (6), respectively, with μ replaced by $2\mu-1$. Graphically, the effect is to give the hyperbolae (see figure 6 below) shallower slopes with an asymptote of $\mu=\frac{1}{2}$ instead of $\mu=0$.

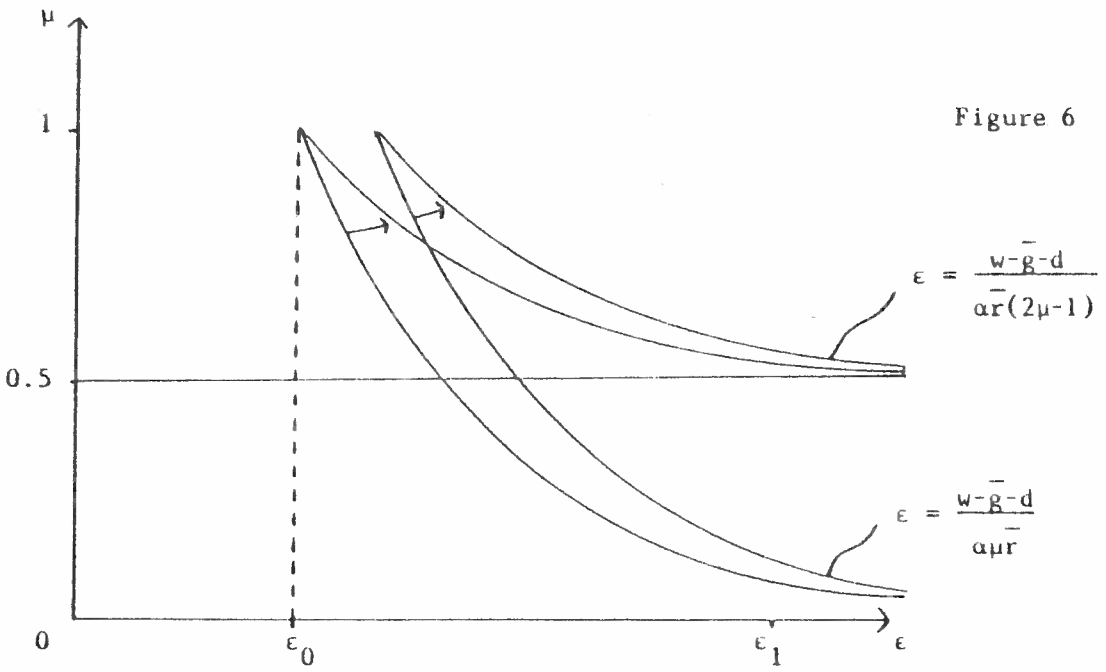

Figure 6

The major effects are; (i) a diminished probability of a trimodal outcome, (ii) an expanded lower range of equilibria characterised by $\mu=\lambda=0$, but (iii) an ambiguous impact on the extent of the upper range of equilibrium for which $\mu=\lambda>0$.

Appendix 3 On determination of belief and of the strike call.

It has been assumed that an individual chooses whether or not to strike on the basis of utility information. The same conscious calculation does not determine whether or not an individual is a believer in the social custom. If belief was a decision variable for an individual we could refute the finding that $\mu=\lambda=1$ is a long run equilibrium. Consider individual i with $\varepsilon_i = \varepsilon_0$. If all other individuals are striking believers then person i can choose between being a non-striking believer with $u_i = d + \alpha\varepsilon_0\bar{r}$ or a non-striking nonbeliever with $u_i = w-\bar{g}$. Being a striking nonbeliever or a non-striking believer are clearly inferior options. The individual will become a striking believer iff

$$d + \alpha\varepsilon_0\bar{r} \geq w-\bar{g}$$

i.e. iff $$\varepsilon_0 \geq \frac{w - \bar{g} - d}{\alpha\bar{r}} .$$

But by definition we have that $\varepsilon_0 = \frac{w - \bar{c} - d}{\alpha\bar{r}}$, and hence, for all $\bar{c} > \bar{g}$, $\varepsilon_0 < \frac{w - \bar{g} - d}{\alpha\bar{r}}$. We conclude that individual i will not strike but will choose instead to be a non-striking nonbeliever:

$\mu=\lambda=1$ is not sustainable. Accordingly, it is implicit in the model that an individual's belief or otherwise is exogenous to the individual's choice set.

It has been assumed also that the strike call is exogenous. We could relax this assumption and allow a strike to be called if a majority of workers vote for a strike call. We might assume that an individual votes for a strike if he or she would be better off under a strike regime than otherwise. By this assumption no nonbeliever would vote for a strike as $u_i = w$ if no strike is called, whereas $u_i = w-\bar{g}$, in equilibrium, if a strike is called. A believer i would vote for a strike call if

$$\alpha\varepsilon_i\mu\bar{r} \geq w \qquad \text{(where } d=0\text{)}$$

$$\text{i.e. if } \varepsilon_i \geq \frac{w}{\alpha\mu\bar{r}}, \tag{13}$$

if we assume that the individual anticipates an equilibrium outcome. We know that $\varepsilon_i \geq \frac{w-\bar{c}}{\alpha\mu\bar{r}}$ for all believers, but cannot predict precisely when inequality (13) is satisfied. This will depend upon the relative magnitudes of $\bar{c}/\alpha\mu\bar{r}$ and ε_i. If ε_i is large enough relativce to $\bar{c}/\alpha\mu\bar{r}$ then there will be some believers who are better off striking then they would have been had no strike been called. It is possible that the group of individuals for whom this is true will be large enough to form a majority and thereby instigate a strike call. This is not an intuitively convincing explanation for a strike call. Perhaps we could conclude that ε_i is unlikely to be so

high. Another inference would be to allow the individual's responses to a strike call to differ with the nature of the underlaying dispute, which might take any one of a number of forms. This takes us beyond the scope of the current model.

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Footnotes

1. It is assumed that if $\lambda<\mu$ only believers strike. Conversely, if $\lambda>\mu$ all believers strike. This is consistent with assumption (vi) about the distribution of personal tastes.

2. This assumption, together with that of the heterogeneity of individual tastes, marks the major difference between this paper and that of Booth (1985). The assumption follows Akerlof (1980).

3. A solidarity rate is one interpretation of λ .

4. For example, calling on the 'vocational' and 'humanitarian' sympathies of groups such as the nurses.

5. For example, the competing 'moral' crusades in Nottinghamshire on the one hand and Yorkshire on the other during the 1984-5 coal dispute in Britain.

6. See Bain and Elias (1985), who find region, sex and occupation to be significant determinants of the marginal probability of union membership. They also find that individuals are more likely to be union members if they work in a well unionised sector. This could be interpreted as support for a social custom effect.

7. I am grateful to Kevin Roberts for this suggestion.

8. Similarly, I thank Norman Ireland for suggesting this extension.