REPUTATION, SOCIAL CUSTOM AND TRADE UNION MEMBERSHIP

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No. 307

WARWICK ECONOMIC RESEARCH PAPERS

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I.   INTRODUCTION

Recent years have seen major developments in the microeconomic analysis of the trade union. Much of the work has been concerned with the specification of union objective functions and the study of their implications for wage and employment outcomes in models of union and firm bargaining. However, there has been surprisingly little attention given to the problem of explaining the determinants of union membership in the workplace. Most models assume either fixed membership or a closed shop. Yet the level of membership is likely to be an important factor influencing the union's bargaining power. For example, in the extreme case where membership is close to zero it is likely that the union will be unable to influence the wage outcome.

Given that any union-negotiated wage accrues both to union members and to non-members in the workplace, the wage outcome is a public good and hence the individual's dominant strategy is to free-ride. Olson (1965) argues that collective action will occur only if there is either compulsion or an incentive private good. Booth (1985) develops a social custom model in which unions can be shown to exist through reputation effects in the absence of either compulsion or a private good. The social custom approach derives from Akerlof (1980). A social custom is defined as, "an act whose utility to the agent performing it in some way depends on the beliefs or actions of other members of the community".

The objects of the current paper are twofold. First, we

demonstrate not only the existence of unions but also the existence of stable equilibrium levels of union membership between zero and one. This is important given the large number of establishments, in Britain at least, in which union membership is at some intermediate level (see Naylor and Gregg (1988)). Booth's (1985) results emerge as a special case within our model. Second, we attempt to offer a generalised social custom model and examine rigorously its properties. It is argued that the comparative static results contain a number of important insights and predictions. The context of this paper is the individual's union membership decision, but in principle the framework is applicable to other problems involving the logic of collective action in the presence of the free-rider incentive.

The plan of this paper is as follows. Section II develops the basic model and demonstrates the possibility of a stable intermediate level of union density in the workplace. Some simple comparative static results are given. Section III considers the stability properties of the model and Section IV examines extensions of the basic model. Section V concludes with suggestions for the direction of further work.

II. THE BASIC MODEL AND COMPARATIVE STATISTICS

The model attempts to explain how the union membership decisions of individual workers are influenced by reputation effects. Reputation-derived utility accrues to workers who adhere to a social custom invoking workers to join a trade union rather than to free-ride. Individual workers are assumed to be heterogeneous with respect to

their sensitivity to reputation effects. We are able to show stable equilibrium levels of union membership in a workplace. The model used is a generalisation of that used in Akerlof (1980). Here we allow for a flexible functional form and for the possibility that individuals acquire reputational benefits from non-union membership.

Let an individual's preferences be described by;

$$U_i = U(y) + V(\phi, \epsilon_i)$$

The preferences are separable, the first term is a strictly increasing concave function of income y . The second term represents utility gained from conforming to a social custom, whether the custom is membership or non-membership is immaterial. The utility gained is dependent on a taste parameter ϵ_i , which describes an individual's benefits from conforming to customs, we assume $V(.,0) = 0$ and $V(.)$ increases in ϵ_i . The parameter ϕ represents the proportion of the population who believe in such a social custom, so we also assume $V(.)$ increases in ϕ . Using subscripts to denote derivatives we also aassume $V_{12} \geq 0$, that is an increase in ϕ generates a large increase in utility the larger ϵ_i.

As we are concerned with union membership let μ be the proportion of the population who believe in union membership as a social custom, and $1-\mu$ who do not so believe. Let w be the wage rate, which is independent of union status and let d be the net pecuniary cost of union membership. The payoffs from membership and non-membership are as follows.

$$U_i^j = U(w-d) + V(\mu, \epsilon_i) \qquad \text{(membership)}$$

$$U_i^{nj} = U(w) + V(1-\mu, \epsilon_i) \qquad \text{(non-membership)}$$

Clearly an individual is indifferent between joining and not joining a union if $U_i^j = U_i^{nj}$;

$$U(w) - U(w-d) = V(\mu, \epsilon_i) - V(1-\mu, \epsilon_i) \qquad (1)$$

From our assumptions on $V(.)$ it is clear that the solution to (1) defines a strictly decreasing schedule in (μ, ϵ) space. As μ tends to $\frac{1}{2}$ from above the right of (1) tends to zero, hence successively higher values of ϵ_i are necessary to preserve equality. The right of (1) increases in ϵ_i , because as $V_{12} \gtrless 0$ and $\mu \gtrless 1-\mu$ it must be the case that as ϵ_i increases the first term goes up by more than the second declines. We can graph this relationship;
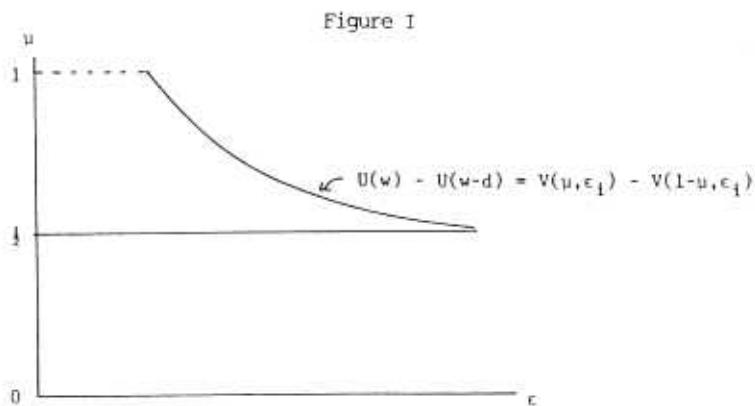
Figure I

We will assume that the characteristic ε_i has a distribution described by a continuous density function $f(\varepsilon_i)$ on the interval $0 \le \varepsilon_i \le \varepsilon_1$. Then we can represent on Figure II the ε-distribution schedule. It is assumed that if there are both believers in unions and non-believers in unions in the population (i.e. $0 < \mu < 1$), then the latter group consists of the individuals with the lower values of ε. When $\mu = 0.25$, for example, the group of believers is represented by the highest quartile in the $(\varepsilon_0, \varepsilon_1)$ interval. This is shown in Figure I.

We can now investigate the equilibrium properties of the model. Consider points m, n and p in Figure II below.

Figure II
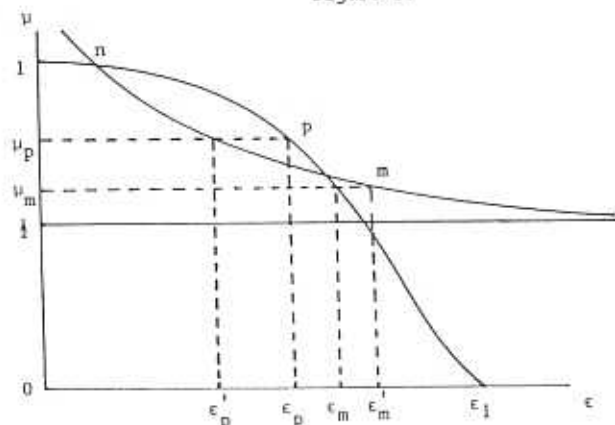
At point p there are μ_p believers in unions for whom $\varepsilon_p \le \varepsilon_i \le \varepsilon_1$. The position of the decision schedule tells us that any individual with $\varepsilon_i \ge \varepsilon'_p$ will join the union. This condition is satisfied for all believers in unions, as $\varepsilon_p > \varepsilon'_p$, and hence all believers in unions will join. Additionally, those non-believers for whom $\varepsilon'_p \le \varepsilon_i < \varepsilon_p$ will be sufficiently sensitive to the

reputation effect at μ_p to choose to join. Thus μ , the proportion believing the social custom of union membership is less than the proportion, say λ , who join. Whilst, in the converse the proportion of people believing in the social custom of non-membership is more than the number of people who do actually join a union. We follow Akerlof and argue that this will cause the proportion μ to rise next period. This assertion can be modelled by proposing some sort of dynamic adjustment process with the following properties:

$$\dot{\mu} = h(\mu,\lambda) \qquad s.t. \qquad \lambda < \mu \quad \text{implies} \quad h(\mu,\lambda) < 0$$
$$\lambda > \mu \quad \text{implies} \quad h(\mu,\lambda) > 0$$

The condition for long-run equilibrium is that $\lambda = \mu$ and, hence, that there is no tendency for μ to change. Point p , then, is not a long-run equilibrium. At μ_m all individuals with $\epsilon_i \geq \epsilon_m'$ will join, hence there will be believers for whom $\epsilon_m \leq \epsilon_i < \epsilon_m'$ and who will not join the union. Thus, $\mu > \lambda$ and the proportion believing will fall. In Figure II, only point n represents an equilibrium and this equilibrum is stable. The assumption made above requires social customs to adjust in response to observed individual behaviour and generates stable outcomes for this process when the ϵ-distribution and the decision schedule intersect. Hence in Section III we will generate a typology for the various types of outcome observed.

From the aforegoing discussion it is clear that the equilibrium level of membership depends upon the parameter values within the decision and distribution schedules. The membership level

will increase if either the decision schedule shifts to the left or the distribution schedule shifts rightward. Factors which cause a shift to the left of the decision schedule are a reduction in d , and an increase in w . These both generate a decline in the difference U(w) - U(w-d) on the left of (1).

A shift to the right of the ε-distribution in the sense of first-order stochastic dominance (see Milgram (1981) for a definition) would also produce higher levels of union membership. A shift to the right reflects the greater sensitivity of individuals to the reputation effect. If the variance of the distribution diminishes, but with constant mean, the position of the equilibrium will also change.

In general there are three possible types of intersection for the ε-distribution and the decision schedule. They are illustrated in the following figure.

Figure III

Case I   Case II   Case III

One can order these cases. Outcome I will tend to occur when d is high, wages are low or there is low importance attached to conforming with social customs (the distribution of ε_i is concentrated on low values). Case III will tend to occur when the population have low values of d , high wages, or a high importance is attached to conforming with social customs. Clearly, in all these cases there is a threshold on the lowest possible sustainable union membership of 50%.

We can draw some general conclusions from this discussion. Higher wages, lower union dues and the importance of conforming with social customs all tend to increase the likelihood of a stable union membership.

The model is also capable of explaining stable equilibrium levels of union membership within the $[\frac{1}{2},1]$ interval. Stable membership levels equal to zero are also quite possible within the model. For example, if d is sufficiently high case III will occur and equilibrium membership may be either zero or unity. However, contrary to previous work it is impossible to observe equilibria with less than 50% union membership if people gain benefit from the social custom of non-union membership. Even if non-union membership had less importance as a social custom we would still observe such a threshold although it would occur at a lower value.

III.   STABILITY

We now examine in greater detail the stable outcomes in each

of the three cases outlined above.

Let us begin by considering the case in which all individuals are identical, i.e. that $\epsilon_i = \bar{\epsilon}$ for all i . This replicates Booth's assumption. The distribution schedule is now vertical. This is illustrated in Figure IV.

Figure IV
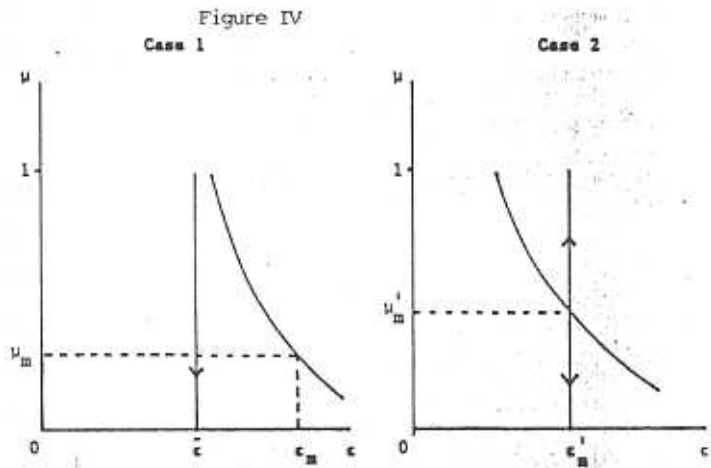
Unlike Booth's analysis we discover two possible outcomes when the individual types are concentrated on one point. In the first case when a proportion μ_m believe in the social custom of union membership, it is optimal for individuals with a characteristic at least as great at ϵ_m to join unions. There are no such individuals so union membership tends to zero. Hence, when social custom effects have relatively little signifiance in preferences, zero is the only stable level of union membership. In the second case there are two possibilities, either $\mu > \mu_m'$ and union membership tends to unity, $\mu < \mu_m'$ and membership tends to zero. Is there an intermediate equilibrium with membership of μ_m' ? At this level individuals are

indifferent between joining a union and not, if they have a
characteristic ϵ'_m and the whole population has such preferences.
The population are indifferent between membership and non-membership
provided $(\mu'_m, 1-\mu'_m)$ believe in these social customs. If by
chance we were to start at such a position then it clearly would
persist although it is highly unstable. Thus, we are able to
replicate Booth's results entirely in this model. However, we have
generated a lower bound on the level of membership of the unstable
equilibrium.

In general, stability of the equilibrium depends upon the
relative positions of the distribution and decision schedules. For a
given decision schedule, the degree of worker homogeneity with respect
to the reputation term will influence the stability properties of the
equilibrium. There are other more general statements we can make
about the stability of the model. First, in all cases outlined above
there is a stable equilibrium with zero union membership. In case (I)
this conclusion is independent of the starting point for the
population's beliefs in customs. In all other cases we observe two
qualitatively distinct stable outcomes. Either the population
converges to a belief in non-union membership as a social custom, or
to a position where some part (or even the whole) of society believes
in the social custom of union membership. There may be many different
stable levels of membership, depending on the shapes of the curves,
but there is always a range of levels of membership which can never be
observed. In this model the threshold occurs at 50% membership, but
the magnitude of the threshold will in general depend on the

importance of social customs in non-union membership, nevertheless such a threshold will be present.

The comparative statics outlined in Section II generate the following conclusions. As union dues increase, wages fall or the sensitivity to social customs falls so will the stable level of union membership and the social custom of membership. Initially, these changes will occur in a relatively continuous manner, apart from switching between multiple intersections of the schedules. However, if union dues rise sufficiently the level of unionisation will approach a threshold level and suddenly jump to zero. The reverse effect of jumping from a zero level of unionisation to some positive level may take a considerable length of time - as it will also require an education programme to convince people of the presence of a social custom of union membership. The reasons for an analagous wage effect are clear; the marginal cost of membership falls as wages increase.

IV.   EXTENSIONS

(i)   Regret Effects

Akerlof (1980) suggests that in addition to utility deriving from reputation effects there is a disutility incurred by breaking the social custom. We allow for this possibility by amending equation (1) so:

$$U_i = U(y) + V(\phi, \varepsilon_i) - W(1-\phi, \gamma_i)$$
(2)

where $W(1-\phi, \gamma_i)$ = utility loss of breaking the social custom believed by $\phi\%$ of the population, for an individual with characteristic γ_i. This change allows us to measure the regret felt by people in not being able to abide by both customs. Then the condition for individual i to join the union becomes:

$$W(1-\mu, \gamma_i) - W(\mu, \gamma_i) + (U(W) - U(W-d) \leq V(\mu, \epsilon_i) - V(1-\mu, \epsilon_i) \quad (3)$$

How does the introduction of this disutility term affect the decision schedule? We will assume in what follows that $W_1 \geq 0$ $W_2 \geq 0$ and $W_{12} \geq 0$. Hence the disutility, of not abiding by a social custom has similar properties to the function $V(.)$. We can thus deduce that the left side of (3) is decreasing in μ and decreasing in γ_i provided $1-\mu > \mu$. One can then see that such an addition preserves a downward sloping decision schedule in μ and ϵ_i for a fixed γ_i, which lies everywhere above the unamended schedule, yet continues to be asymptotic to $\mu=\frac{1}{2}$. Increases in the value γ_i will tend to decrease the LHS of (3) and hence tend to shift the decision schedule inwards.

Now suppose that individual's characteristics are distributed according to some continuous density $f(\gamma_i, \epsilon_i)$ defined on some convex support. Then an individual joins the union if his or her characteristics satisfy inequality (3) given prevailing beliefs, so provided we assume that those with high values for ϵ_i and low values for γ_i join the union we can analyse this model in essentially the same manner. The qualitative nature of the conclusions derived from such an analysis differs very little from that already obtained. The

only significant addition is the possibility of analysing the increasing, or decreasing correlation of characteristics.

(ii)   Dynamic Effects

So far we have allowed individuals' beliefs about the prevalence of a social custom to be influenced by the observed frequency of individuals abiding by such a custom in the $h(\mu,\lambda)$ function. There does seem to be another possibility; that beliefs about the importance of social customs is itself influenced by the number of individuals seen to be abiding by social customs. That is the distribution of characteristics ε_i is itself influenced by observed behaviour. For example, if a large number of individuals were seen to flout a social custom in which an individual believed strongly, the individual would reduce his or her utility weight on social customs. Hence one might argue that the distribution of ε_i's did itself change through time.

In such an analysis the discrepancy between μ and λ will be important. For example, if $\mu-\lambda>0$ individuals believe that the social custom of union membership is much more important than the observed frequency of union membership. At the same time beliefs in the social custom of non-union membership are lower than the actual proportion of non-members. So the first observation above would lead individuals to down grade the importance of social customs, whilst the second might lead individuals to upgrade this. The eventual impact of such an effect must depend on the relative size of these two shifts in the ε_i-distribution. If the first effect dominated the ε_i

shifts down when $\mu > \lambda$ and upwards when $\mu < \lambda$. Contemplation of Figure III above should convince the reader that this increases the likelihood of extreme levels of membership. If the second effect dominates intermediate levels may be more likely.

CONCLUSION

The paper develops a model of union membership capable of explaining not only the existence of the union but also that of stable intermediate equilibrium levels of membership. Given the extensiveness of the open shop in British labour markets, this is an important development. It is argued that the framework is capable of encompassing the model of Booth (1985).

The social custom approach developed in the paper represents a generalisation of the model presented by Akerlof (1980), in that we allow for a flexible functional form and for the possibility that individuals acquire reputational benefits from non-obedience of the social custom. The properties of the social custom model have been examined, especially with respect to stability, and a number of comparative static results have been derived.

In particular, we have found that if reputation accrued not only from membership but also from non-membership, then there will be a threshold level of membership below which there cannot be a non-zero stable equilibrium. This threshold generates a discontinuity which has major implications for current discussions about current and future trends in aggregate union membership. As the membership level

in an establishment declines for exogenous reasons affecting the decision or distribution schedules, it will approach the threshold level and suddenly jump to zero. This prediction can be tested using longitudinal micro-data on union membership across establishments. A further implication is that the reverse effect of jumping from a zero level of unionisation to some positive level may take considerably longer. There may need to be an education programme by the union to convince workers of the potential presence of a social custom to generate union membership. If this is correct, then whilst the aggregate union density level is clearly downwardly flexible, in the UK at least, it may well turn out to be "upwardly sticky".

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