Solidarity, Cooperation and Collective Action:

The Economic Theory of Social Customs with Particular Applications to the Labour Market.

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"In general, the critical mass level of strike solidarity is likely to exceed one member."

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Dedication **To my parents:**

For both their infinite generosity and their intellectual curiosity.

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Much of the work in this thesis has been published in one form or another. An abbreviated version of Chapter 2 is to be published as "Social Conventions" in The Handbook of Radical Political Economy, edited by Malcolm Sawyer and Paul Arestis (Naylor (1993a), forthcoming, Edward Elgar). Chapter 3 draws on both "Strikes, Free Riders and Social Customs," Quarterly Journal of Economics (Naylor (1989)) and "A Social Custom Model of Collective Action," European Journal of Political Economy (Naylor (1990)). Chapter 4 is based on "The Economic Theory of the Open Shop Trade Union," European Economic Review (Naylor and Cripps (1993), forthcoming), presented at the conference of the European Association of Labour Economists in Madrid (September, 1991), an earlier version having been presented at the Econometric Society European Meeting in Munich (September, 1989). Chapter 5 stems from "The Open Shop Union, Wages and Management Opposition," Oxford Economic Papers (Naylor and Raaum (1993), forthcoming) presented at both the European Economic Association Meeting in Dublin, (August, 1992) and at the European Association of Labour Economists in at Warwick (September, 1992). Section 1 of Chapter 6 represents the author's original paper, "Tax Evasion and the Effects of Conformity and Conscience," subsequently revised as "A Model of Tax Evasion with Group Conformity and Social Customs," with Gareth Myles and to be presented at the Royal Economic Society Conference in York (March, 1993).

Chapters 4 and 5 represent joint work and thus each counts as a half-chapter for inclusion in this thesis. The thesis is thus based on the equivalent of four substantive chapters.

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Background and Summary.

Economic theory is capable of explaining the development and persistence of social conventions, such as conventions of cooperation, in the face of circumstances characterised by the Prisoners' Dilemma. Such conventions can arise either because of labelling and the iterated nature of the playing of the game or because of related overlapping activities. A social convention becomes a social norm or custom when it acquires moral forces such as guilt and resentment at its violation. Consider the following example. I am in line for a ticket for the next train from my local station. The other people in the queue are hoping to catch the same train, the departure of which is imminent. The local social convention is one of respecting the order of arrival in the queue, but late-comers to the line have an incentive to jump the queue. If the queue breaks up into a melee, then the resulting crush around the ticket booth causes delay and implies that fewer people will catch the train. Do I jump line? If this is a repeated game played every day by the same people, then I'm likely to stay in line: in the longer run I have a vested interest in the survival of the social convention. However, if then I'm abroad on holiday and find myself in exactly the same position but amongst strangers whom I will never expect to meet again, will I respect equally their local social convention of respecting the order of the queue? If I'm narrowly rational I will not. But if for me the social convention which I recognise and respect at home five days a week has acquired some moral force, then I will feel too guilty to break out of line and consequently I will risk missing my train. The social convention has become a social norm or custom which I follow because of my experience and my socio-psychological characteristics against my narrowly rational judgement.

In this thesis we shall be developing a model in which agents' actions are influenced by the utility they derive from two related sources. The first is the utility derived from conforming with the behaviour of others. We shall refer to this as solidarity-derived utility. The second is the utility gained from obeying a social norm or custom (or the disutility suffered from breaking that custom). We take the existence of the social custom as given. This is why we

distinguish between a social convention which is derivable from the postulates of rationality and a social custom which we treat as given (as are preferences) by non-rational information. This is discussed more fully in Chapter 2.

Thereafter our chief concern is to integrate the treatment of social customs into more mainstream economic analysis. Our main focus is on the question of what our analysis contributes to the economic theory of the trade union. There are a number of reasons for the choice of this context as the medium for discussion of the model. First, union membership is a classic example of a collective action in which the public good provided is characterised by non-exclusion. Second, empirical evidence points to the widespread existence of the union open shop in which membership is not compulsory. Third, survey and other evidence suggests the relevance of social custom forces as determinants of union membership by individuals. Fourth, union membership is an important topic in its own right, especially in the light of quite dramatic changes in aggregate union density in the UK and elsewhere, and yet not one satisfactorily addressed in the theoretical literature on trade unions. Finally, union membership is likely to be an important influence on labour market outcomes and therefore on macroeconomic performance.

Chapter 1 Social Customs and the Labour Market: an 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 customs in various labour market contexts. Jones (1984) develops an economic model of conforming behaviour in which an individual's work effort is determined partly by tradition and by the behaviour of other workers. A central theme of this 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. Simon (1983, pp. 75) expresses this theme particularly persuasively: "Why," he asks, "talk about social decision making? Isn't it enough to talk about individual decision making?. . .Today there is abroad in the land the libertarian delusion that individuals are some sort of Leibnizian monads . . ., each with a consistent independent utility function and each interacting with its fellows only through its knowledge of market prices. Not so. We are not monads because, among many other reasons, our values, the alternatives of actions that we are aware of, our understanding of what consequences may flow from our actions - all this knowledge, all these preferences - derive from our interaction with our social environment. Some of our values and knowledge were sucked in with our mother's milk; others were taken, often quite uncritically, from our social environment. . .but few indeed, surely, in complete independence of it."

Nonetheless, the dominant mode of economic analysis largely neglects such considerations. Economists frequently dismiss the relevance for economic analysis of social norms with the retort that these are in the domain of enquiry for other social science disciplines. It is, they argue, for sociologists and social psychologists to be concerned with the derivation of individuals' preferences. The economists can then take these as given and consider what economic outcomes will follow from them. If, however, individual preferences are constantly changing in response to the economic environment which they themselves largely shape, then the assumption of exogeneity is invalid. Similarly, if individual preferences are not independent, then economists have to revise their thinking.

The starting point of this thesis is the observation that, in important economic contexts, individuals' actions appear to be influenced by the actions and beliefs of others. Evidence on this is presented at relevant stages through the thesis (see for example, the evidence cited in Chapter 4 on why individuals join trade unions). It could be argued that there is no need to model this interaction between individuals' beliefs and actions, and therefore no need to refine the orthodox economic approach, were it the case that this approach provided a satisfactory framework in such interactive contexts. However, this argument cannot be maintained: not even by the traditional "as if" defence of methodological positivism. This is because the predictions of the

orthodox model do not sit comfortably with actual outcomes. For example, as Olson (1965) has argued, economic logic militates against successful collective action in large numbers contexts. Yet it is apparent that this logic does not describe real behaviour in the many situations where the free-riding option is spurned. Albeit to a differing degree - and one which varies over time and across individuals and societies - individuals vote, pay taxes, take their litter home, give blood, donate to charities, pay extra for environmentally-friendly products and join in demonstrations. The issue at the centre of this thesis revolves around the question of how, if at all, we can reconcile this behaviour with the assumptions of economic rationality.

There have been many attempts to refine the definition of economic rationality in such a way as to be able to explain how the problem of the Prisoners' dilemma is overcome. In this thesis, however, we focus on a social custom approach which has its origins in the work of Akerlof (1980) and which has been developed in various contexts by a growing variety of researchers (see, for example, Cowell (1990), Gordon (1989), Booth (1985) and Booth and Chatterji (1991)). It can also be argued that the work of Elster (1985), Jones (1984) and Sugden (1986) is sympathetic to the relevance of the social custom approach. We shall be careful to define, develop and apply this approach in subsequent chapters. For now we merely note that the major justification we offer for adopting the social custom analysis is based on the claim that in

this way we are able to explain various otherwise puzzling features of economic behaviour.

The outline of the rest of this thesis is as follows. In Chapter 2 we review the literature relevant to the economic analysis of social customs. In particular we are concerned with the related issues of the optimality and the evolution of social customs. One key question is whether social custom analysis is necessarily behaviouralist in its methodological heritage or whether social customs can be given a foundation within an orthodox neoclassical framework through the insights of evolutionary game theory.

In Chapter 3 we provide a formal derivation of the social custom model in the general context of explaining the logic of collective action. We demonstrate the close relationship between our model and the work of Schelling on the micro-motives of macro-behaviour. We consider applications of the model to the issues of explaining trade union membership density and strike-solidarity levels. The original feature of our work is the relaxation of the assumption that all individuals are identical. The assumption of heterogeneity enables us to explain important 'stylised facts' of behaviour in these contexts.

In Chapter 4 we argue that the social custom approach developed in the previous chapter will remain of limited significance in the wider domain of economic analysis until it can be shown how the approach can be integrated into more

mainstream analyses of economic behaviour. This is the task set for Chapter 4 where we combine the social custom model of trade union density with the more mainstream microeconomic theory of the trade union. We argue that this is an important step to take as the predominant approach has been to assume that wage bargaining takes place between a firm and a trade union which has closed shop powers. Instead, open shop arrangements characterise the majority of bargaining cases and therefore motivate an analysis of the causes and consequences of intermediate union representation within the establishment. A second novel feature which chapter 4 shares with the subsequent chapter is the treatment of union density in the disagreement payoff to the firm when bargaining takes place.

In Chapter 5 we pursue the themes developed in Chapter 4, but adopt the assumption of a role for management opposition to trade union organisation in the determination of union density and therefore of relative bargaining power. In both these chapters we develop the comparative static properties of the model, identifying the ways in which they differ from more conventional analyses.

In Chapter 6 we consider two further labour market applications of the general approach with which we are concerned. The first is to the issue of the credibility of the threat of harassment in the insider-outsider approach which explains the decision by outsiders not to underbid as resulting from threats

made by insiders to harass new entrants, thereby raising the entrants' disutility of work [see Lindbeck and Snower (1988)]. It has been argued [Elster (1989) and Fehr (1990)] that the harassment threat is not credible, at least in the one-period case. We explore this claim, concluding that some social convention is necessary for the validity of the harassment argument in the Lindbeck and Snower (1988) one-period insider-outsider model. Hence, we are in agreement with both Akerlof (1980) and Elster (1989). However, we find the addition of a role for a social convention to be otherwise consistent with the insider-outsider framework and, in particular, (i) to add further weight to the claim that insider-outsider models can provide a rationale for the presence of trade unions and (ii) to suggest an important role for discrimination.

The second application is to the question of tax evasion. In this context, Cowell (1990) has shown that empirical evidence suggests the importance of taking into account the influence on taxpayers' behaviour of, *inter alia*, morality and the attitudes and actions of community. In particular, Cowell cites evidence from Baldry (1986, 1987) that some individuals choose not to evade, 'apparently on moral grounds,' and from Schwartz and Orleans (1967) indicating that, 'Social devices that appeal to conscience and civic responsibility may be more effective than legal sanctions.' In the current context we argue that our understanding of the impact of morality and conformity on tax evasion can be

enhanced by the application to this problem of the social custom model. Finally, in Chapter 7 we offer some concluding remarks.

Chapter 2 The Economic Analysis of Social Customs.

2.1 Background

It is well known that orthodox neoclassical economic theory does not provide a satisfactory logic with which to explain the many and important instances of collective action involving many persons and therefore characterised by the Prisoners' Dilemma and the associated free-rider incentives. Various authors have attempted to broaden the definition of rational economic agency to provide a role for such arguments as sympathy and altruism within individuals' utility functions. But the focus remains on an individual whose tastes are independent of the actions and beliefs of other individuals. Indeed, the exogeneity of individual preferences is a crucial assumption within the framework of neoclassical analysis. An alternative approach to the explanation of collective action has been built on the concept of social customs, developed originally by Akerlof (1980) to provide a micro-foundation for a theory of unemployment. Akerlof defines a social custom 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 approach is grounded in utility theory but introduces the possibility of interdependence across individuals' actions and beliefs. No man (nor woman) - not even an economically-rational one - is an Island. In this chapter we shall be examining the extent to which social customs can be motivated and analysed within traditional economic theory. First, however,

we describe the type of collective action problem which will provide the focus for much of our subsequent analysis.

2.2 The Logic of Collective Action and the Prisoners' Dilemma.

The greatest marketing strength of an economic system based on market exchange is its claim to channel the pursuit of rational self-interest towards the promotion of general economic welfare. As Adam Smith famously expressed, when an individual intends only his own gain he is, ". . . led by an invisible hand to promote an end which was no part of his intention. . . By pursuing his own interest he frequently promotes that of society more effectually than when he really intends to promote it." Much of the most brilliant research work in economics in modern times has been conducted to investigate the precise conditions under which this hypothesis is valid. As is well-known, these conditions are very strict and demanding and, consequently, there is a plethora of cases of market failure requiring extra-market mechanisms for the achievement of economic efficiency. One such case occurs when the provision of a good has the characteristics of a collective action.

It is often the case in economics that a good can be provided only if a collective action can take place. For example, a firm-level trade union is unlikely be able to raise workers' wages in a firm if no-one joins the union. So, collectively, workers are likely to have

an incentive to form a trade union, each worker contributing to the organisational costs but in return receiving a higher wage than otherwise. So long as the wage increase exceeds the subscription cost, then each worker is better off as a result of the collective action. However, this logic which points towards collective action is vulnerable to the free-rider incentive which arises because the good which the union provides is a public good whilst the cost of membership is a private cost. The union-provided good is a public good because of the impossibility (or, at least, the infeasibility) of excluding non-members from receiving the bargained wage. Thus, each worker is likely to have a dominant strategy to free-ride. In this way the collective action does not take place and hence the public good is not provided. The problem is characterisable as a Prisoners' Dilemma: as Hardin has put it, ". . . the individual effort to achieve *individual* interests will preclude their achievement, because if the *collective* good is not provided, the individual member fails to receive a benefit that would have exceeded the individual's cost in helping purchase that good for the whole group."

Olson (1965) argued that the problem of achieving collective action was unlikely to thwart action among small groups where cooperation and collusion is more feasible. Monitoring costs are lower in such cases and it is more obvious that each individual's contribution can make some real difference to the success of the collective action. Where groups are larger, however, they are likely to remain only latent with free-riding undermining the

prospects for successful collective action. Olson argued that to overcome this problem participation must be either compulsory or rewarded by an incentive private benefit, as we shall discuss more fully in later chapters. Elster (1985) has argued that collective action might come about because of the in-process benefits of participation. For example, contributing to public life might be just a way of life for some people, not an action undertaken only after careful cost-benefit calculation. Alternatively, if individuals are motivated by the 'Kantian Imperative', then collective action will succeed as each individual will do that which if universalised would lead to the optimal collective outcome.

In searching for explanations of successful collective action, and therefore solutions to the Prisoners' Dilemma, one must distinguish between one-shot and repeated plays. It is well-established through game theory that iterated games are likely to lead to succesful cooperation. For example, Axelrod (1984) has demonstrated that Tit-for-Tat is likely to emerge as a successful evolutionary strategy in a multi-person environment and pair-wise plays of the Prisoners' Dilemma. In one-shot games, however, the strategy of not cooperating would appear, at first sight, to be dominant. However, an incentive to cooperate might develop even in such circumstances. Hardin argues that, "The assimilation of one-shot efforts to the ongoing life and cooperative activities of a particular group can be generalised across efforts of overlapping groups. The overlapping nature of various activities and groups

allows cooperative conventions to arise and, more importantly, to be enforced. . . various members of a large class of related or similar games may be faced more or less sequentially by substantially overlapping groups. In this manner. a convention covering the behaviour of a very large class of people, none of whom interacts personally with more than a fraction of the class, can be built up out of smaller sub-group interactions in a large class of situations." We shall return to the question of the origin and persistence of such social conventions later in this chapter. First, however, we consider the social custom approach.

2.3 The Social Custom Approach to Explaining Collective Action

In recent years, the social custom framework has been applied to the problem of collective action. Booth (1985) is concerned with providing an explanation for the existence of the open shop trade union. Booth observes that UK workplaces are often characterised by union membership in the absence of closed shop agreements compelling membership and argues that such membership is costly to the individual and yet cannot be explained by incentive private goods. As all workers in these unionised establishments are paid a uniform wage independent of the individual worker's union status, any gains secured by the union have the characteristics of a public good. Therefore, union membership shares the features of the general collective action problem. Booth is able to show how a simplified version of Akerlof's social custom

model is able to provide an explanation for the existence of voluntary union membership. Membership is driven by each individual's sensitivity to 'reputation' effects: individuals derive utility from conforming with the behaviour of others. Thus, both zero and 100% membership are stable equilibria. Hence we could say that, theoretically, there are two possible and stable social norms of behaviour within the population described by this model: one in which everyone joins the union and the other in which no-one joins.

Naylor (1989) develops a more general social custom model to explain the existence and persistence of collective action. In this approach, an individual chooses whether or not to join in a collective action not only according to reputation (or 'solidarity') effects, but also according to whether the individual is a believer in the social custom or not. The model is therefore a closer relative of the original Akerlof model. In the context of collective action, the social custom is best thought of as the appeal to individuals within the community to refrain from free-riding. For any given level of belief in the social custom, and given other parameter values such as the cost of action to the individual and the extent of individual sensitivities to reputation effects, there will be some level of adherence to the social custom. So far the approach is based firmly in the principles of individual optimisation. But the outcome is defined to be stable only if the resulting level of adherence to the social custom is equal to the initial and given level of belief in the social custom. If this condition is not satisfied,

then it is assumed that the proportion of the population believing in the social custom changes until it generates an equal level of adherence. This is then the steady-state self-supporting equilibrium. The assumption that, out of equilibrium, it is the proportion of the population believing in the social custom which changes is an arbitrary one, but one which can be justified in various ways. For example, a cognitive dissonance argument would be consistent with a shift to belief in the social custom by those individuals previously not believing but nonetheless joining in the collective action on the strength of the reputation or solidarity effects.

In this approach, then, individuals choose optimally whether or not to adhere to the social custom but they do not make an optimising decision regarding their belief in the social custom: this depends both on their own adherence decision (itself influenced by the actions and beliefs of others) and on such other socio-psychological characteristics as those relating to the cognitive dissonance argument. In sum, an explanation of the degree of support for a given social custom - or of the existence of a particular social norm - rests on neither 'structureless agency' nor 'agentless structure'. The social custom approach incorporates important elements of rational choice theory but is not based exclusively on the assumption of optimising agents with exogenous preferences: the socio-economic environment, itself only partly explained within the model, and the pyschological responses of individuals are other crucial features of the model.

2.4 The Origin of Social Norms: Rationality versus Extra-Rationality

The foregoing begs an important question: 'What is the origin of the social customs whose existence we have so far taken as given?' As examples, why might there be social customs evoking individuals to join unions, to pick up litter, to give blood, to pay taxes, or more generally to refrain from free-riding?

Let us consider, then, the issue of the emergence of social norms. Within rational choice theory, we have already distinguished between, on the one hand, an economic agent whose preferences are given and self-regarding and, on the other, what we might call a socio-economic agent whose goals and choices are likely to be influenced by the actions and beliefs of others. We shall now argue that it is possible to explain the emergence of what Sugden terms a 'social convention' within a model built on the assumption of rational economic agency. But we shall argue, with Sugden, that a social convention is different from a social norm and that the emergence of the latter takes us outside the narrow scope of rational economic agency.

Sugden (1986) develops a game-theoretic explanation of the emergence of social conventions. He presents conventions as rules regulating social life and as evolving spontaneously to become self-enforcing once established. More formally, a convention is

defined as any stable equilibrium in a game that has two or more stable equilibria. Sugden shows that this concept is more general than that of Lewis (1969) for whom:

> A regularity R in the behaviour of members of a population P when they are agents in a recurrent situation S is a *convention* if and only if it is true that, and it is common knowledge in P that, in any instance of S among members of P,
>
> (1) everyone conforms to R;
>
> (2) everyone expects everyone else to conform to R;
>
> (3) everyone prefers to conform to R on condition that the others do, since S is a coordination problem and uniform conformity to R is a coordination equilibrium in S. (1969, p. 58)

Sugden distinguishes between three broad categories of conventions (conventions of coordination, of property and of reciprocity) only one of which (the convention of coordination arising out of a pure coordination game) is consistent with the third clause in Lewis's definition. The convention of reciprocity is the most relevant to our foregoing discussion of collective action problems as Sugden shows how repeated public-good games provide one context for the evolution of such conventions. In such games individuals choose between strategies of cooperation (e.g. of joining a collective action) and defection (free-riding) and whilst cooperation is not in individuals' immediate interests, a stable strategy (such as Tit-for-Tat) of cooperating with other

cooperators can arise under appropriate circumstances. One condition for this is that the probability of the game finishing after any given round is sufficiently small. The crucial assumption here is, of course, that the game is not being played anonymously. If a fellow player is either unlikely to meet you again, or unlikely to either recognise you or remember your deed in the future, then there is little scope for the evolution of a convention of cooperation.

Kandori (1992) has argued that enforcements can be classified into two categories. In the repeated game literature, the Folk Theorem provides a formal model of personal enforcement occurring when the same set of agents frequently play the same stage game ad infinitum. A second mechanism is community enforcement which can generate social norms of cooperation when facilitated by labelling of defectors. Yet cooperation does exist in circumstances under which labelling is not feasible. There are a number of possible reasons for this. The first is often dismissed as tautological. It is the argument of the in-process benefits of giving: this widening of the interpretation of utility can always be offered in defense of rational choice theories. A second answer adds some psychological flesh to the bones of the rational economic agent, suggesting that individuals have basic emotional responses of resentment and guilt to the breaking of established conventions. This argument is developed by Sugden (1986 ch. 8). In this way it could be argued that an apparently unsustainable social norm of cooperating in a one-shot Prisoners' Dilemma can evolve from a

social convention of reciprocal cooperation when the latter acquires a moral force through the psychological reactions of individuals. As a corollary of this view, one could justify the social custom approach discussed earlier.

Economic rationality, then, can explain the evolution of social conventions, but some socio-psychological structure is needed to explain the development of the social norms which are capable of sustaining cooperation in the face of a dominant free-rider incentive. The inclusion of a role for social norms is likely to be most relevant in circumstances favourable to the evolution of social conventions. This is more likely when a group of individuals is homogeneous and highly interactive. This is consistent with Axelrod's (1984) discussion of the evolution of cooperation. It also provides an economic underpinning for the sociological argument deriving from Kerr and Siegel (1954) who distinguish between the 'isolated mass' and the 'integrated individual'. The isolated mass is said to possess its "own codes, myths, heroes and social standards," and consequently to be the more capable of sustaining collective action. It might be argued that individuals whose social development has been within such an environment are more likely to contribute toward pubic good provision. Thus, in some sense apparently altruistic behaviour is a backward-looking or learned response. The argument which started out as a rational choice micro-foundation for social conventions has acquired a behaviouralist element through the inclusion of a role for psychological responses such as guilt and resentment.

It would appear, then, that traditional rational-choice economic theory can explain the evolution of social conventions of reciprocal cooperation. Unreciprocated or altruistic cooperation is then explicable as the behaviour of an individual who has attributed a moral force to those social conventions through the individual's proneness to guilt or resentment, amongst other psychological responses. Thus evolve social norms or customs. Importantly, we should note with both Akerlof and Sugden that there is no reason to suppose that the particular convention or the norm which becomes established will be the one which maximises social welfare. So what does determine the selection of a particular convention? Sugden argues that versatility is an important criterion in the selection of conventions. Schelling (1960) argues in favour of prominence which 'depends on time and place and who the people are.' One is, 'dealing with imagination as much as with logic.' This leaves an important role for the analysis of how individuals interpret their environment within which they then make their choices over behaviour.

Until this point we have stayed within the tradition of methodological individualism in discussing the spontaneous evolution of social conventions and norms pertaining to the logic of collective action. However, a further possible influence on the selection of social conventions is the exertion of power by groups of agents with both influence and vested interests in the arrangement of social conventions. For example, by capturing

political power groups or classes can seek to shape the environment in which social conventions evolve. Our analysis would suggest that governments wary of the development of communities capable of organising effective collective action would have an incentive to avoid the generation of 'isolated masses' of individuals. To the extent that collective provision is an alternative to market provision, the interests of profit-seekers would imply the same incentive. More generally, the argument that individuals' preferences are influenced by social and psychological factors provides a channel through which commercial forces originating in the objectives of producers can be seen to shape individual behaviour. Once it is established that the wants to which capitalist production is responding are, at least in part, determined directly or indirectly within a capitalist system of production, then the whole structure of that system is invertible.

2.5 Conclusion

To conclude, then, it is argued that social attitudes such as those captured by social conventions are likely to influence individual economic behaviour in the spheres of both public good and private good provision. To some significant extent the persistence of social conventions can be explained by rational individual behaviour: although there need be no presumption that the conventions which survive will be the most efficient. We have drawn a distinction between social conventions and social norms,

arguing that the latter are not wholly explicable in a rational choice analysis, but motivate the social custom framework for the economic analysis of collective action problems. Finally, we have considered different explanations for the emergence of particular social norms in response to the perennial question, 'Where do social norms come from?' Perhaps the most salient reply to this question stems from the argument that men and women do not live atomistically, but in social groups and communities. No two communities will be identical: some will be highly cooperative, others quite non-cooperative. In the latter case, individuals are more likely to resemble the neoclassical stereotype of the self-regarding rational economic agent. But social norm analysis can claim to encompass such a case within a more general framework: as the social custom model predicts, there are likely to be multiple social equilibria of which zero cooperation is just one possibility.

Chapter 3 A Social Custom Model of Collective Action.

3.1 Introduction

As we have discussed in Chapter 2, the logic of collective action, because of its public good and Prisoners' Dilemma characteristics, has defied satisfactory explanation within the framework of conventional economic analysis. Olson (1965) argued that in large group contexts collective action would be impossible in the absence of compulsion. This is because there is a dominating free-rider incentive not to join if joining is costly and the benefits of collective action accrue to joiners and non-joiners alike. Booth (1985) showed in the context of trade union membership that collective action can be explained if individuals are sensitive to reputation effects - or group solidarity efects as we shall prefer to call them. Booth's work represents an application to the collective action literature of the social custom model developed by Akerlof (1980). As we demonstrate in the course of this chapter, Booth's model is essentially equivalent to the discrete choice analysis suggested by Schelling (1978). In each of Booth's and Schelling's models individuals are treated as identical and therefore as homogeneous with respect to their sensitivities to solidarity effects - or, in Schelling's terms, to their critical mass points.

In the current chapter we offer a model closely akin to Akerlof's social custom model and which encompasses the

Schelling model by generalising the analysis of collective action to the case where individuals are heterogeneous with respect to their 'cross-over' points. This, we shall argue, is the major contribution that this chapter attempts to make. We then argue that this more general formal model is in fact closer to the spirit and substance of much of Schelling's discussion than is the special case in which individuals are assumed to be identical. We show however that the results derived in the latter model do not hold for the case in which individuals differ. We find that many of Schelling's formal results follow from the particular assumption of homogeneous individuals. Much richer possibilities arise when we relax this assumption.

Furthermore, we believe that the model yields important insights into a number of issues relating to the explanation of collective action. These are discussed in Section 3.3 of this chapter. In particular, we address the issues of; the origin and persistence of social norms, the sustainability of collective action, the role of Kantian behaviour and the significance for economic analysis and methodology of the interdependence of individual and collective behaviour. In Section 3.4 we highlight the empirical content of the model, focussing on the application of our framework to the issues of union membership and strike solidarity. In Section 3.5 we draw together our general conclusions. The next Section of the paper develops the formal model.

3.2 The Formal Model

Our concern is with situations in which the individual has a choice between participating in collective action or of free-riding. The outcome of the action is assumed to be a public good. Whether or how the provision of the public good depends upon the degree of support for - i.e. the proportion of the potential population participating in - the collective action is not relevant to our concern. As we shall see, this item drops out of our analysis. Conversely, much of Schelling's analysis of participation in collective action is focussed on the sensitivity of participation to the nature of the dependence on participation of the provision of the public good. We are able to abstract from this issue because of the way in which we set up the social custom model in this chapter. In chapter 4, however, we shall return to this discussion in the context of the influence of union density on the union's ability to raise the level of wages. In this chapter, we are interested in identifying the factors which determine the level of participation. For ease of exposition we specify initially simple payoff functions, but show later that our results are readily amenable to a greater degree of generalisation.

Let the payoff or reward, U_i, to an individual i be written as:

$$U_i = w - dQ + \varepsilon_i \mu Q, \qquad (3.1)$$

where

U_i = individual i's payoff or utility.

w = the value of the public good provided as a result of the collective action. We assume that the population is sufficiently large that the individual disregards the marginal contribution his/her membership makes to the magnitude of w.

d = the private cost to the individual of participating in the collective action and, for simplicity, is independent of the level of membership.

μ = the degree of support for the collective action, i.e. the proportion of the population who join.

Q = 1 if the individual joins
0 otherwise.

ε_i = the solidarity-derived benefit to the individual of participating in the collective action and depends upon the degree of support.

We are asssuming, then, the possibility of the existence of solidarity-derived utility. There is in this no necessary role for a social custom of membership. Individuals are assumed to have a sort of herding instinct but not a social conscience at this point. This is an important distinction often missed in the literature. Of course, one might want to argue that a social custom invoking cooperation might lie behind the solidarity-derived utility obtaining more strongly among the group of cooperators. In sub-section 3.3.(ii) we discuss this further. In 3.3.(iii) we then add a more explicit role for the social custom to influence behaviour directly. We follow Akerlof in defining a social custom as, "An act whose utility to the agent performing it in some way depends upon the actions or beliefs of fellow agents in the community." For our purposes in studying collective action, the social custom is best thought of as an implicit moral edict urging individuals to refrain from free-riding.

It is necessary to say more about the characteristic ε_i, as different interpretations are possible in different contexts. In our work we are interested essentially in the impact on collective action of social norms. In particular, we investigate the consequences that stem from the assumption that there is a social norm or custom which invokes individuals to join collective action rather than to free-ride. We shall have more to say later about the origin of such norms. We interpret ε_i as a measure of the valuation by individual i of the solidarity effects that derive from acting with others in the manner prescribed by the social custom. In this

the model follows Akerlof (1980). Alternatively, we could have specified ε_i to proxy the shame effects derived from non-membership. There is, however, no formal difference between the two. The latter would have been closer to the view espoused by Elster (1989, pp. 105.) of a social norm as generating, "...the propensity to feel shame and to anticipate sanctions by others at the thought of behaving in a certain, forbidden way."

Nevertheless, our model is close to the spirit of the argument made by Elster (1989, pp. 151.) that, "Actions are shaped jointly by norms and self-interest." In equation (3.1) the payoff represents a single function valuing both pecuniary factors (w, d) and non-pecuniary ones (ε_i). From (1.1) it follows that,

$$U_i^J = w - d + \varepsilon_i\mu ,$$

and

$$U_i^{NJ} = w ,$$

where U_i^J and U_i^{NJ} are the payoffs from joining and not joining, respectively. We assume that the individual will join the collective action so long as $U_i^J \geq U_i^{NJ}$,

i.e., $w - d + \varepsilon_i\mu \geq w$, or, $\varepsilon_i \geq d/\mu$. (3.2)

The fact that w drops out of the inequality justifies our earlier statement that the current chapter will not address the determinants of w. We can represent diagrammatically the

relationship described in (3.2) above by the decision schedule in Figure 3.1.

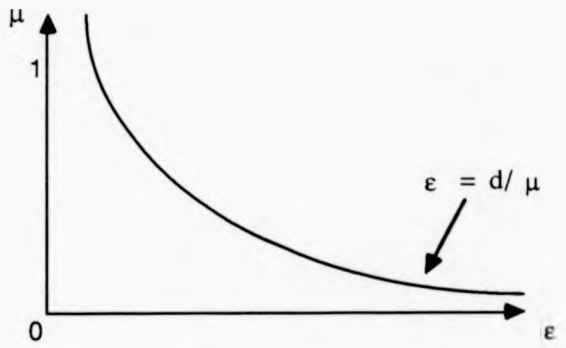


Figure 3.1. The decision schedule

To determine possible levels of participation in the collective action we need to specify how the ε_i characteristic is distributed across the population. In the course of this chapter we shall consider different possible distributions as the sensitivity of collective action to this distribution is of central interest to us. Initially, however, we consider the case of a uniform ε-distribution. We assume that ε is distributed uniformly between a lower bound, say zero, and an upper bound, ε_1. This distribution schedule is depicted in Figure 3.2.

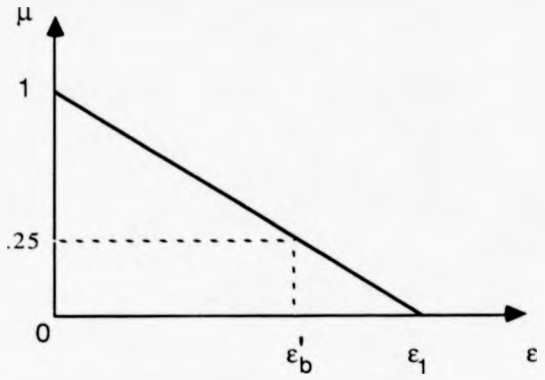
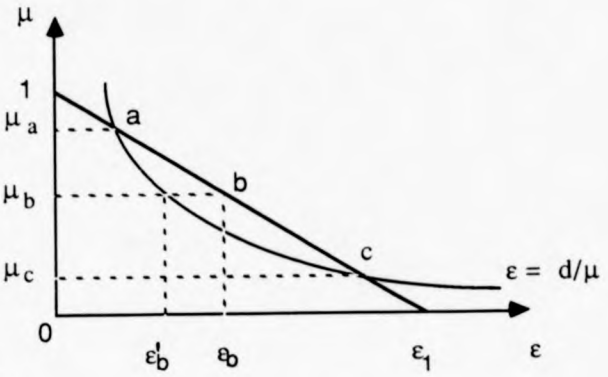
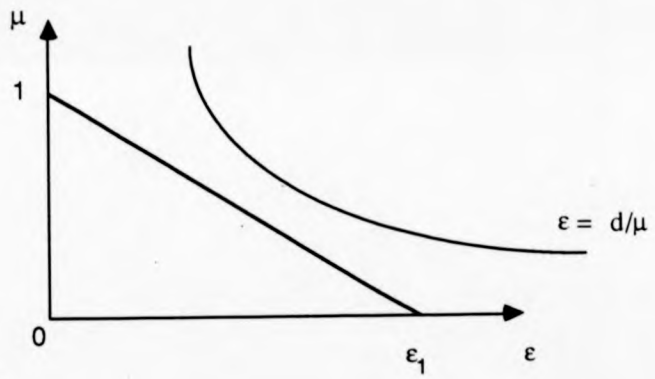


Figure 3.2 The distribution schedule

One property of the model is that if $\mu = 0.25$ these joiners will be those individuals in the upper quartile of the ε-distribution, as depicted in Figure 3.2. We can now integrate the two schedules to consider the possible equilibria in the model. An equilibrium occurs at μ^* when condition (3.2) is satisfied for the value of $\mu = \mu^*$ for just μ^* of the population. More simply, a necessary, though not sufficient condition, for equilibrium is that those joining (not joining) cannot make themselves better off by not joining (joining). Consider Figure 3.3 below;



(a)



(b)

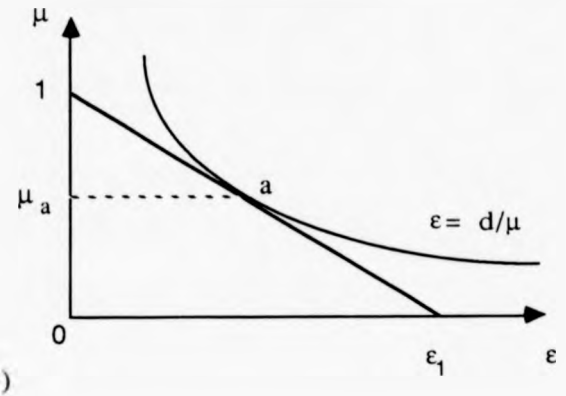


Figure 3.3. (a) Critical mass and a stable intermediate equilibrium. (b) Zero membership. (c) Unstable non-zero equilibrium.

At point b in Figure 3.3(a), μ_b of the population is joining the collective action. These are the individuals for whom $\varepsilon_i \geq \varepsilon_b$. The decision schedule tells us that any individual with $\varepsilon_i \geq \varepsilon_b'$ will join. This condition is satisfied for all those joining and, additionally, for those others with $\varepsilon_b' \leq \varepsilon_i < \varepsilon_b$. From this we assume that membership will grow: depicted by the arrow at b. Conversely, for $\mu > \mu_a$ some joiners have insufficiently large ε_i (are insufficiently sensitive to the solidarity effects of membership) to sustain their participation and so μ falls towards μ_a. For $\mu < \mu_c$ membership is too small to generate sustainable interest even amongst individuals with relatively high levels of ε_i, i.e. who are highly sensitive to the solidarity effects derived from joining. If, in the context of Schelling's famous example, fewer than μ_c of the faculty attend the first seminar, then attendance will drop to zero in the

future. In the case of Figure 3.3(a), there are three equilibria: $\mu = 0$, $\mu = \mu_a$, $\mu = \mu_c$. The first two are (locally) stable, the third is unstable. If any proportion of the faculty greater than μ_c attends the first seminar, membership will settle at μ_a. μ_c, then, is the critical mass or threshold level of membership. For a given ε-distribution, Figure 3.3(a) represents one of three possible outcomes consistent with equation (3.1). The other two cases are depicted in Figures 3.3(b) and 3.3(c). In each of these two cases the only stable equilibrium is at $\mu = 0$, where no collective action occurs. In the case of Figure 3.3(b) there is an additional equilibrium at $\mu = \mu_a$, but this is clearly unstable.

The existence of stable equilibrium levels of collective action, therefore, depends upon the relative positions of the decision and distribution schedules. We can demonstrate this with some simple comparative static exercises.

(i) The more sensitive are individuals to solidarity effects the further to the right is the ε-distribution with the consequences that the stable equilibrium level of non-zero membership is higher and the critical mass level is lower. This is shown in Figure 3.4 where we see that 100% membership is now a stable equilibrium.

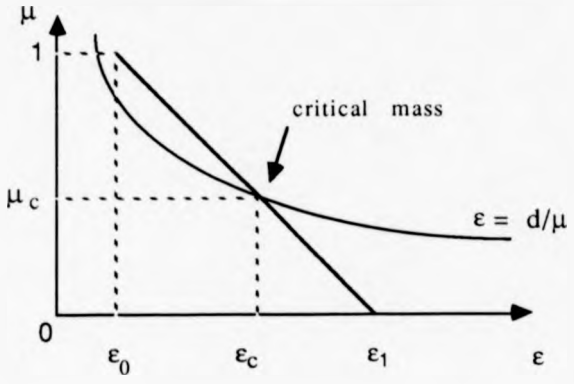


Figure 3.4 Full participation equilibrium

(ii) If the cost to the individual of joining in collective action, d, rises then the decision schedule shifts to the right taking us from Case 3(a) to Case 3(c) through Case 3(b). The stable equilibrium level of μ falls - eventually to zero.

(iii) If the slope of the distribution schedule changes, reflecting a different degree of heterogeneity in ε_i across individuals, then the possible outcomes change. Let us consider what happens to collective action if, instead of individuals varying with respect to ε_i, all individuals are identical with $\varepsilon_i = \hat{\varepsilon}$ This is shown in Figure 3.5. The decision schedule still derives from equation (3.1) above.

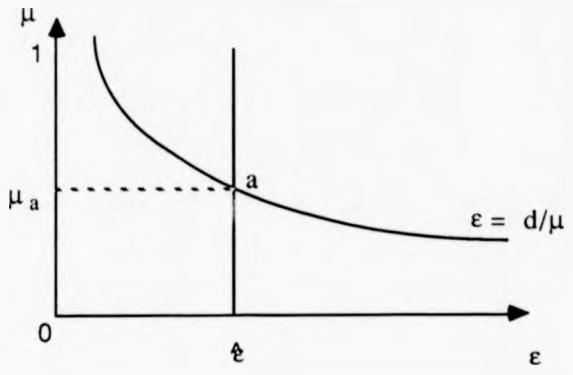


Figure 3.5 Homogeneous individuals.

We have assumed so far that an individual will join in collective action so long as the payoff from doing so is at least as great as that from not joining. In other words, if the two options have the same payoff the individual will join in the action. Thus when $\mu=\mu_a$ in Figure 3.5 each individual has $\hat{\varepsilon} = d/\mu$ and so all will join. Hence, $\mu=\mu_a$ is not an equilibrium. For later purposes it is useful to note now that point a would be described as an (unstable) equilibrium had we adopted the assumption that individuals change their behaviour only if they can improve their payoff. That is, when the two payoffs are equal, individuals chose to maintain their previously selected behaviour instead of, when indifferent, opting to join the collective action. With such an assumption, when $\mu=\mu_a$ in Figure 3.5 and individuals are just indifferent between joining and not joining, it becomes the case that the proportion μ_a will continue to join. μ_a is unstable,

however, because if just one more individual joins (leaves) then the consequently stronger (weaker) solidarity effects cause everyone to join (leave) the collective action. This outcome occurs because individuals are insufficiently heterogeneous with respect to the ε_i characteristic. The result is described aptly by the aphorism, 'Birds of a feather flock together.' Each individual has the same critical mass. This explains the result found by Booth (1985), as we shall explain in 3.4.(ii) below. It also enables us to understand better the properties and limitations of the model associated with Schelling. We turn now to show formally how the latter model is encompassed within the one we have developed in this section of the current chapter.

3.2.(i) *Schelling's model of collective action.*

Schelling's model is common currency in explanations of collective action (see Schelling (1978), Hardin (1982) and Elster (1989)). The model provides a cogent method for understanding more clearly various important determinants of collective action. To illustrate the model we consider the following example depicted in Figure 3.6.

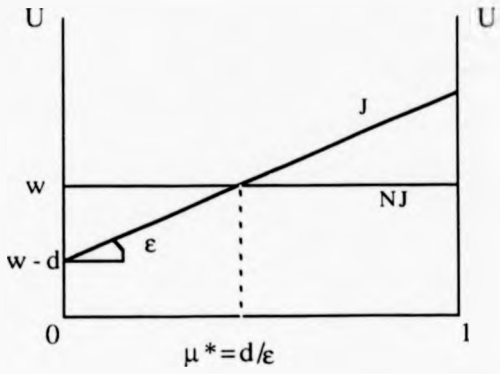


Figure 3.6. The Schelling diagram.

The J-schedule represents the payoff to an individual who participates in the collective action. NJ refers to the non-participation payoff which is dependent on the level of participation through the solidarity effects. The two payoffs are equivalent to those in equation (3.1) above. The diagram shows us that if participation exceeds μ^* then joining is preferable to not joining and so the level of collective action tends to unity. Conversely, if $\mu < \mu^*$ activity atrophies to zero. Following Schelling's assumption that individuals do not change their behaviour if they are indifferent between two actions, then $\mu = \mu^*$ is an equilibrium. However, it is unstable given the foregoing argument.

This model informs us, therefore, that if the payoffs to each individual are as represented above and if individuals are identical then the only stable equilibria occur when either everyone cooperates in collective action or when no-one does. We have shown in our more general model however that this

conclusion follows directly from the assumption of identical individuals. If instead individuals are sufficiently heterogeneous with respect to ε_i (or μ^*, in terms of the Schelling diagram) then stable intermediate equilibria are indeed possible. See Figure 3.3(a) for such an example. The Schelling diagram can be seen as a special case within the more general model, occurring when $\varepsilon_i = \hat{\varepsilon}$. In his less formal analysis of critical mass models Schelling (1978, pp.91-110) discusses the cases in which different people have different cross-over points (or ε_i's, or μ^*'s in the more formal models above). As demonstrated, our model is able to offer a rigorous framework for the discussion of these cases.

Our analysis shows how the possible types of equilibrium level of collective action depend not only on the relative payoffs, but also on both the degree of heterogeneity within the population with respect to the cross-over point and the relative magnitudes of the distribution and decision schedule parameters. In particular, we have shown that, ceteris paribus, an increase in heterogeneity reduces the size of the critical mass required to sustain collective action. This is consistent with the results obtained by Marwell, Oliver and Prahl (1988).

In the next section of this chapter we consider ways in which the simple model which has been developed so far can be extended to cover other issues in the analysis of collective action.

3.3. Extensions of the model

3.3.(i) *Generalising the distribution and decision schedules*

So far we have assumed that the decision schedule can be represented by a simple hyperbolic function and that the distribution schedule is linear. The former assumption follows from the linearity of U_i^J and U_i^{NJ} in μ, and the latter from the assumption of uniformity in the distribution of ε_i. The model is robust to changes in these assumptions. This has been shown elsewhere by Naylor and Cripps (1988) for the particular application to the issue of trade union membership. For example, if we assume that ε_i has a distribution described by the general continuous density function $f(\varepsilon_i)$, then we can see from Figure 3.7 that the properties of the model are unaltered.

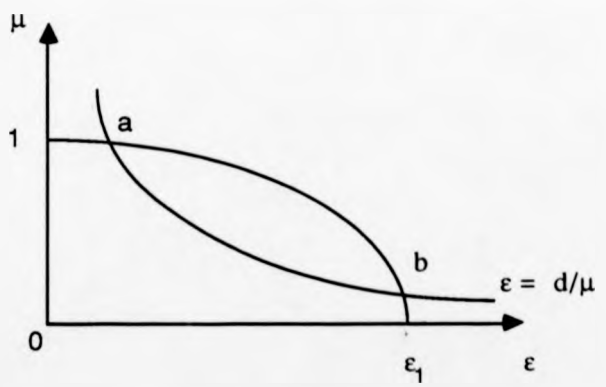


Figure 3.7. A non-uniform ε-distribution.

The case represented in Figure 3.7 has the same properties as that depicted in Figure 3.3(a) for the uniform ε-distribution.

3.3.(ii) *Symmetric reputation effects*

When solidarity effects accrue equally to both joiners and non-joiners then we find that positive equilibrium levels of collective action below 0.5 are not possible. The critical mass exceeds one-half. We represent symmetry of solidarity effects by amending equation (3.1) to:

$$U_i = w - dQ + \varepsilon_i\{\mu Q + (1-\mu)(1-Q)\}$$

Hence,

$$U_i^J = w - d + \varepsilon_i\mu$$

and

$$U_i^{NJ} = w + \varepsilon_i(1-\mu),$$

from which it can be seen that the utility from not joining is increasing in the proportion $(1-\mu)$ of non-joiners within the population.

The individual will join if:

$$w - d + \varepsilon_i\mu \geq w + \varepsilon_i(1-\mu)$$

i.e., $\varepsilon_i \geq d/(2\mu-1)$.

The decision schedule now has an asymptote at $\mu = 1/2$, as in Figure 3.8 below.

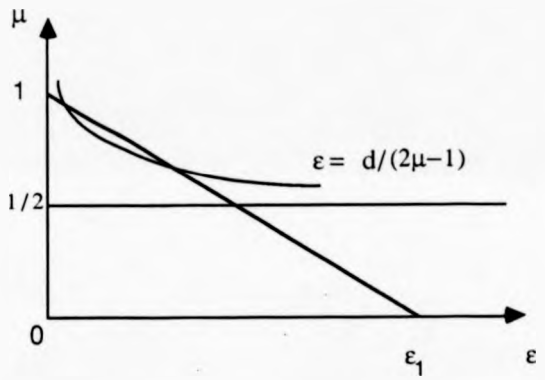


Figure 3.8. Symmetric solidarity effects.

Consequently, the critical mass for membership exceeds one-half. More generally, whenever the payoff for non-membership is increasing in $(1-\mu)$ we observe a membership threshold strictly greater than zero.

3.3.(iii) *Believers and Non-Believers*

In this sub-section we introduce into the analysis a more explicit role for belief in the social custom. Whereas so far the model has rested on solidarity-derived utility, there is now an influence of belief in or commitment to the edict of the social custom. Arguably, this is consistent with Sen's (1977) argument that the concept of commitment might offer a solution to the free-rider problem. Individuals derive utility not only from conforming with the behaviour of others, but also from conformng to the moral dictate of a social custom: our rational economic agents have acquired a conscience to go with the herding instinct by which we have previously characterised them.

Following Akerlof (1980) we can distinguish between believers and non-believers in the social norm or custom. Here we continue to specify the social norm as invoking individuals to join in the collective action, rather than free-riding. We re-write equation (3.1) as :

$$U_i = w - dQ + \varepsilon_i\mu Q - g(1-Q)b - h(1-Q)(1-b) \qquad (3.3)$$

We now interpret μ as the proportion of individuals in the population who believe in the social custom.

$b = 1$ for an individual who is a believer

0 for a non-believer

g = the loss suffered by a believer who breaks the social custom, where $g \geq 0$.

h = the corresponding loss suffered by a non-believer, where $g \geq h \geq 0$.

This approach is consistent with Elster's discussion (1989, pp. 105) where he argues that, "... one can define, discuss and defend a theory of social norms within a wholly individualistic framework. A norm, in this perspective, is the propensity to feel shame and to anticipate sanctions by others at the thought of behaving in a certain forbidden way." In Elster's terms we could think of ε_i as an indicator of shame and g or h as reflecting guilt which is independent of the actions of others as it is more deeply internalised.

From equation (3.3) we can derive the joining condition for a believer:

$b = 1 \quad \Rightarrow \quad U_i^J = w - d + \varepsilon_i\mu, \quad$ and

$\Rightarrow \quad U_i^{NJ} = w-g.$

Hence,

$$U_i^J \geq U_i^{NJ} \text{ iff } \varepsilon_i \geq (d-g)/\mu.$$

That is, an individual who believes in the social custom will join if $\varepsilon_i \geq (d-g)/\mu$. Similarly, a non-believer will join if $\varepsilon_i \geq (d-h)/\mu$. We can now derive the equilibrium levels of collective action and belief in the social norm. Consider the case represented in Figure 3.9.

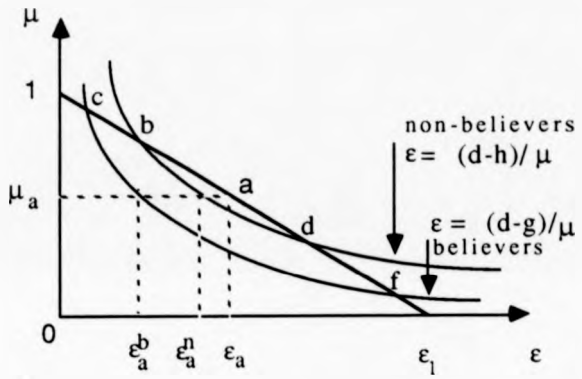


Figure 3.9. Believers and non-believers.

If $\mu = \mu_a$, then the believers are the individuals for whom $\varepsilon_i \geq \varepsilon_a$. Any believer with $\varepsilon_a \geq \varepsilon_a^b$ will join the collective action and as $\varepsilon_a > \varepsilon_a^b$ this condition is satisfied for all believers. Additionally, there are some non-believers for whom $\varepsilon_i \geq \varepsilon_a^n$ and hence who will join. Thus the proportion joining, say τ, exceeds the proportion believing and, following Akerlof, we assume that the proportion believing rises: this can be justified by various arguments - in chapter 2 we discussed briefly the role of cognitive dissonance in this regard. In equilibrium $\mu = \tau$. Hence, point a is not an equilibrium as $\tau > \mu$ and μ rises. In this way we can show that

there is a stable equilibrium at $\mu = \tau = 0$ and two ranges of stable equilibria occurring between c and b and between d and f. The ranges of equilibrium occur because of the distinction between believers and non-believers in the social custom. If, by setting g=h, we collapse the model to the previous one where no such distinction is made, then the ranges reduce to single point equilibria. Conversely, as the difference between g and h grows then the ranges of stable equilibria widen. If h is sufficiently small, i.e. if non-believers suffer little or no disutility from free-riding, then the interval b-d disappears and there is just one wide range of stable intermediate equilibria. The implication of multiple ranges of equilibria is that we can become locked into lower levels of collective action than is otherwise achievable. A further implication is that there is no guarantee that the outcome will in any sense be socially optimal.

This extension of the model offers a possible escape from the charges of 'structureless agency' or 'agentless structure' (see Carling (1986)), or of reduction to either homoeconomicus or homosociologicus (Elster (1989)). This is because within the model it is clear that individuals' actions are influenced both by self-interest and by social norms and that the pervasiveness of the social norm is itself affected by the actions of individuals. We do not have yet a theory of how social norms come into existence, but we do have a framework within which to study the endogeneity between individual actions, social norms and collective action.

3.3.(iv) *The origin of collective action*

There are two important and related aspects of collective action which have not yet been addressed in this chapter. The first concerns the motivation of latent collective action when $\mu = 0$ is a stable equilibrium. Even if there exists a $\mu^* > 0$ which is a potential stable equilibrium, such as point a in Figure 3.3(a) above, how might the outcome jump from $\mu = 0$ to $\mu = \mu^*$? Secondly, where does the social norm itself originate? One answer to the first question is given in 3.3.(v) below and involves Kantian behaviour by a subset of the population. Here we offer a different solution which we believe also goes part of the way towards an answer to the second question.

Suppose that in some collective action context there is an initial payoff given by:

$$U_i = w + dQ\mu.$$

Then the individual will join, independent of the level of μ, so long as $d \geq 0$. In other words, the individual has a dominant preference for joining independent of the actions of others. There is no free-rider incentive. The result is that all will join. An example of this is where a trade union is set up as a friendly society providing a private benefit which exceeds the private cost of membership, and which rises with μ. Over time, however, the union might change its role to one of providing only a public good

(e.g. higher wages) and therefore risking the free-rider problem. [This could be plausibly argued to have characterised the historical development of the British trade union movement during the period of the evolution of the welfare state. Neumann and Rissman (1984) have described this as a substitution effect on union membership.] In the absence of either reputation or social custom effects or of compulsion, membership will fall to zero as now each individual has a dominant preference to free-ride. The public good will not be provided because of the failure of collective action.

However, in the former regime in which the union is rewarding workers with private benefits there will be an incentive for the union leadership to anticipate the free-rider problem and hence inculcate members with a sense of duty to join in collective action rather than to free-ride. If the union is successful workers will internalise the emotions of shame or guilt associated with not joining and so the payoffs will come to correspond to those capable of sustaining membership or collective action at some positive level.

This argument justifies the assumption that it might be possible to start at $\mu = 1$ rather than at $\mu = 0$. This would mean settling on an equilibrium at $\mu = \mu_a > 0$ in Figure 3.3(a), for example, rather than being locked in at $\mu = 0$. As well as offering an explanation of the growth and persistence of organisations potentially susceptible to the free-rider problem, the model also

suggests a mechanism by which an identifiable and far-sighted group has an incentive to generate a particular social norm of group loyalty. What is lacking is an explanation of why individuals are amenable to any such edict or norm. This, however, is more the domain of social psychology.

3.3.(v) *Kantian Behaviour*

Consider again the simple model represented in Figure 3.3(a). It is clear that if we start at any level of $\mu > \mu_c$ then the outcome will tend towards μ_a. However, as $\mu = 0$ is a stable equilibrium, if we start with zero membership (or any value of $\mu_a < \mu_c$) there will be no tendency for collective action to develop. There is scope here for collusion amongst $\mu > \mu_c$ individuals to initiate collective action. Alternatively, $\mu = \mu_a$ will occur so long as a proportion $\mu \geq \mu_c$ of the population consists of individuals whose participation is not conditional on participation by others. Such behaviour might be described as Kantian. This acts as a catalyst for cooperation by others and takes the outcome to μ_a. Such a trigger for collective action appears in a number of discussions (see Elster (1985, 1989) and Hardin (1982)).

3.4 Empirical content and applications

We have argued that the formal model presented here offers a more rigorous and richer framework within which to analyse the logic of collective action than do previous models. We also suggest that its capacity to generate empirically testable predictions is correspondingly larger. The model also bridges some of the gaps that have traditionally divided economics from other analyses within the social sciences. For example, sociological literature has distinguished between the 'isolated mass' and 'integrated individuals' (see Kerr and Seigel (1954)). The more isolated the mass the more we expect individuals to be influenced by group norms and reputation effects. Within particular empirical contexts we can identify different groups and rank them with respect to these characteristics and from our model make testable predictions about their behaviour. For instance, we would expect workers in industries like coal-mining to have stronger norms of group solidarity than workers in agriculture who are traditionally more integrated into their wider local communities. In terms of our model we translate this as meaning that the ε-distribution schedule lies further to the right the more 'isolated' is the 'mass' with stronger group norm effects pushing the decision schedule to the left. The results vary according to the specification of the parameters but generally predict higher levels of collective action, such as union membership or strike solidarity, amongst miners than amongst farmworkers. See Naylor (1989) for a fuller application of the model to strike activity and Naylor and Cripps

(1992) for the case of trade union membership. In Sections 3.4.(i) and 3.4.(ii), respectively, we review the application of the model which we have developed in this chapter to these two labour market contexts.

3.4.(i) *Strike solidarity*

An approach based on the analysis of social norms promises the possibility of an escape from the free-rider problem which, as we shall investigate throughout the course of this thesis, can be argued to have a number of labour market applications. The social custom model which we have developed in this chapter would seem to offer a useful framework for developing an explanation of a number of important aspects of workers' behaviour towards industrial conflict. In part this is because 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 accrue to strikers and non-strikers alike. This begs the question, "Why, when a strike is called, 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 invoking workers not to cross picket lines and of the often 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. The credibility of the union's strike call will depend on the parties' perceptions of the likely solidarity rate (see Varoufakis (1989) for an exploration of this idea).

Naylor (1989) represents an application of the social custom model developed in this chapter to the issue of strike solidarity. In terms of equation (3.1), we can think of w as representing the income received by a non-striking worker, w-d as the income of a striker (e.g. strike pay by the union), μ as the proportion who strike, ε as the measure of individual sensitivities to solidarity-derived utility and s as equal to one if the worker strikes and zero otherwise. Thus, the results derived in Section 3.2 of this Chapter carry over for the case of strike activity. 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 w-d) will be likely to reduce the level of support for a strike: in terms of Figure 3.3(a) the decision schedule shifts to the right producing an increase in the critical threshold level of strike

solidarity, μ_c, and a reduction in the stable equilibrium level of solidarity, μ_a, as discussed in 3.2.(ii). It would, of course, be surprising if an economic model failed to make this prediction. Second, and less banal, it is likely that attempts to challenge the moral 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 our formal model, loss of legitimacy is interpreted as a fall in g or h, with the consequence of a fall in equilibrium solidarity as examined in 3.3.(iii), above. Where the social custom is, as here, the invocation to strike, the employer or government might attempt to challenge the moral right to strike - as is often the case for workers in the 'caring' professions.

Third, the model predicts that a policy of exaggerating the numbers of workers ignoring the strike call will reduce support by weakening the perceived solidarity effects. During the 1984-85 British coal dispute it was claimed on the strikers' side that many of the passengers on 'buses breaking through night-time picket lines were in fact 'mannequins' or cardboard-cutouts and not strike-breakers at all. But then, according to our model, they would say that, wouldn't they? Similarly, it follows from the model that the striking unions would have incentives to both maximise strike pay and reinforce the sense of duty incumbent on members in rejecting the path of the free-rider.

Finally, it follows that the values of such parameters as ε, g and h, inter alia, will vary both over time and across different groups of workers. In this way the social custom model can be seen as providing a potential meeting point with sociological theory and debate. For example, Kerr and Seigel's (1954) well-known distinction between the 'isolated mass' and the 'integrated individual' can be translated into the language 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 Seigel, that: "(a) industries will be highly strike-prone when the workers (i) form a relatively homogeneous group which (ii) is unusually isloted from the general community and which (ii) is capable of cohesion; and (b) industries will be comparatively strike-free when their workers (i) are individually integratred 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 g and h, consequently generating typically high equilibrium values of μ and ϕ.

These predictions of the model are useful from the point of view of testing the model empirically. Given appropriate data from a lengthy strike conducted at a number of establishments between a union and a firm, our model could be tested against a

number of predictions. The theory suggests that both high and quite low initial solidarity rates are sustainable over time, while intermediate initial rates will induce increasing support to some limit, and, conversely, very low rates will tend to atrophy. Furthermore, suitable information about the individual establishments would enable predictions about which establishments will be characterised by which type of equilibrium. For example, μ will be predicted to be higher in establishments characterised by close worker interactions (both at work and in terms of residence or social intercourse), by high strike pay and by a less paternalistic management, less able to establish social customs that compete with codes of union loylaty.

3.4.(ii) *Union membership*

Booth (1985) develops a social custom model of union membership. In this model, Booth is able to explain for the first time in an economic model the existence of union membership in the absence of either compulsion or a *pecuniary* private incentive good. This is an important development because it explains all those cases of 100% union membership in the absence of closed shop regulations. It probably also goes some way to explaining the conditions under which closed shop provisions might have evolved. Booth assumes that workers are identical with respect to their sensitivities to solidarity effects of the social custom, and hence we can represent that model in terms of Figure 3.5. Thus, we can see that the only stable equilibria in the Booth set-up

(and in many other European economies) are characterised by intermediate levels of union membership - which would appear to be stable equilibria. This is clear from, for example, data from the Workplace Industrial Relations Surveys (WIRS). Table 3.1 presents WIRS (1984) information on union density for manual workers in private sector establishments.

Table 3.1 Union Density by Bargaining Arrangement. (*Manual Workers in Private Sector Establishments*).

Union Density (D)	Non-Recog[3]	Recog	Manrec	Shop	Total
D=0	185	0	0	0	185
0<D<10	20	14	0	1	35
10≤D<20	10	8	2	0	20
20≤D<30	11	12	1	1	24
30≤D<40	2	10	2	2	16
40≤D<50	4	21	4	1	30
50≤D<60	2	16	1	1	20
60≤D<70	4	28	4	3	39
70≤D<80	1	31	11	7	50
80≤D<90	0	10	6	9	25
90≤D<100	2	37	31	30	100
D=100	4	14	74	217	309
	---	---	---	---	---
	245	201	136	272	854
	---	---	---	---	---

Source: WIRS[4], 1984.

[3]Non-Recog refers to establishments in which unions are not recognised, Recog to est.s in which there is merely recognition, Manrec to those union-recognised est.s in which management recommends workers to join a union and Shop refers to the existence of closed shop provisions.
[4]WIRS refers to the Workplace Industrial Relations Survey.

The final column in Table 3.1 shows that of the 854 private sector establishments selected from the 1984 WIRS data set, union density among manual workers was either zero or 100% in 185 and 309 establishments, respectively. Thus in 42% of cases union density is at some intermediate level. There are a number of interesting aspects to the Table calling for closer attention. First, the presence of a closed shop does not imply that union density is necessarily close to 100%. In the case of very low membership, at least, this is likely to be attributable either to the closed shop explicitly covering only some groups of an establishment's manual workers, or to part-time workers not joining the union. Second, the Table demonstrates how density can be high [in some cases up to 100%] even in establishments where unions are not recognised for bargaining purposes. Third, for manual workers across establishments where there is union recognition but neither a closed shop nor a recommendation by management that workers join a union, the modal level of union density is over 90% and the median is over 50%, but each density level is well-represented in the distribution.

For non-manual workers, it is also true that each density level is well-represented across establishments where unions are merely recognised. However, mode and median density levels are lower than for manual workers. Table 3.2 shows the data for non-manuals.

Table 3.2 Union Density by Bargaining Arrangement. (*Non-Manual Workers in Private Sector Establishments*).

Union Density (D)	Non-Recog	Recog	Manrec	Shop	Total
D=0	393	0	0	0	393
0<D<10	11	20	1	0	32
10≤D<20	14	21	2	3	40
20≤D<30	5	31	4	2	42
30≤D<40	6	22	6	1	35
40≤D<50	5	41	7	1	54
50≤D<60	3	38	16	8	65
60≤D<70	1	26	9	8	44
70≤D<80	0	30	15	16	61
80≤D<90	0	13	15	13	41
90≤D<100	2	14	3	9	38
D=100	5	10	18	27	60
	---	---	---	---	---
	445	266	106	88	905
	---	---	---	---	---

Source: WIRS, 1984.

We conclude from this evidence that it is not valid to depict the British labour market as dichotomised neatly into union and non-union sectors. Nor, from the data, does it seem reasonable for economists to develop economic theories of trade unions under the exclusive assumption of the closed shop, as is typically the case. If we take the open shop to include establishments where unions are recognised and where there may or may not be a management recommendation on membership, but where there is no closed shop, then we can see from Table 3.1 that for manual

workers 55% of union shops are open and 45% are closed. For non-manual workers, 81% of union shops are open and 19% closed. The challenge for the economist, then, is to develop a theory of the trade union which allows for the possibility of the open shop union recruiting voluntary members and recording stable intermediate levels of membership. This is given greater importance as legislation is passed to limit the extent of the closed shop. It is on the basis of its ability to explain these phenomena, as we have seen in this chapter, that we feel the social custom model provides important insights into the determinants of individual union membership and establishment union density. We defer further discussion of union membership until the next chapter, as that chapter will build further on the social custom model of union membership.

3.5 Conclusions

We have developed a formal model of collective action which brings together features associated in particular with the work of Elster, Schelling and Akerlof. We would argue that the model is capable of application to a wide range of empirical contexts involving issues of collective action where the free-rider problem renders conventional economic analysis inadequate. Chapters 4, 5 and 6 will be chiefly concerned with exploring such applications. The approach offers insights into the historical development of such groups as trade unions and could be empirically tested against such processes. As Hardin (1982) has

shown the results obtained here can carry over from the issue of collective action to that of the multi-person prisoners' dilemma.

A number of aspects of the model deserve further development. Here we indicate two such aspects. First, we have treated the ε_i distribution as determined exogenously. Alternatively, we could follow Jones (1984) and make our ε_i parameter endogenous within the model. One way of doing this would be to make ε_i itself dependent upon the individual's decision with respect to membership of collective action. Or we could think of the individual as influenced by a vector of social norms with his/her attitude to each affected through ε_i by his/her behaviour with respect to the others. Second, we have abstracted from the economic structure or game in which the collective action is, or is not, taking place. Clearly, a complete model needs to specify the interactions between the economic parameters and the social custom influences on collective action. In subsequent chapters we shall be concerned with the task of integrating the social custom model with more traditional approaches within economic analysis. In chapter 4 our context will be the determinants of trade union density.

Chapter 4 An Economic Theory of the Open Shop Trade Union.

In this chapter we attempt to build on the social custom model developed in Chapter 3. In Section 3.4.(ii) of that chapter we offered an application of the collective action social custom model to the issue of union membership. The model we developed however was essentially devoid of economic structure. It could be depicted as a (rather crude) sociological story written in the language of orthodox economics. In the current chapter we aim to apply our social custom analysis to the more traditional concerns of economists focussing on the impact of trade unions on wage determination through bargaining. We argue that this integration of our model with the more mainstream economic theory of the trade union enables us to address various issues usually outside the scope of economic analysis.

4.1 Introduction

There has been significant interest in recent years both in the empirical investigation of the determinants of trade union membership, in the UK and elsewhere, and in the theoretical analysis of the economic effects of the closed shop trade union.

However, there is little rigorous microeconomic explanation of union membership which is relevant for much of the UK and similar labour markets where the 'open shop' union is prevalent, as we saw from Tables 3.1 and 3.2 in the previous chapter. This chapter attempts to overcome the free-rider problem of explaining union membership in the open shop in a context of union-firm bargaining. We argue that both private pecuniary gains and social influences affect the individuals' union membership decisions, citing evidence in support of these basic assumptions. We show that stable intermediate union density is a possible equilibrium outcome in a generalised social custom model in which we analyse the simultaneous determination of wages and union membership, deriving a number of comparative static results. In particular, we find that both wages and union density depend upon, *inter alia*, the level of strike pay, the net cost of union membership and the individuals' sensitivity to social custom and associated solidarity effects. We argue that the approach is consistent with various stylised facts concerning both wage bargaining and union membership and is able to explain a number of otherwise puzzling features of union membership.

The behaviour of aggregate union density both over time and across countries has been the subject of much economic debate in recent years. This is not surprising given the extensive evidence, both theoretical and empirical, of the key importance of unions in the determination of wages, employment and economic

performance. Freeman (1989) analyses the divergence in aggregate union density across developed countries over time, whilst Dickens and Leonard (1985) and Neumann and Rissman (1984) study the decline in union membership in the US which was so marked in the period 1955 to 1980. For the UK, there has been a vigorous debate on the causes of the quite dramatic fall in aggregate union density through the 1980s [see Freeman and Pelletier (1990), Disney (1990) and Carruth and Disney (1988)]. In addition to this empirical focus on aggregate union membership, there have been important micro-econometric studies both at the level of the individual worker [for the UK, see Bain and Elias (1985), Booth (1986) and Green (1990)] and at the establishment level [see Bain and Elsheikh (1980)].

Despite this large empirical literature, microeconomic theories of the trade union have had relatively little to say about the determination of union density among the firm's workforce. Most models adopt the implicit assumption that the firm confronts a trade union which carries the force of a closed shop and which bargains on behalf of a fixed level of membership which always exceeds the employment level in the bargained outcome. Carruth and Oswald (1987) have shown that if employment exceeds membership then union preferences, and hence wage-employment outcomes, are affected. In the present chapter we move away from both the fixed membership and closed shop assumptions to develop a model in which the level of union

membership at the establishment is determined endogenously with the wage.

There have been previous theoretical attempts to explain the level of union membership at the level of the aggregate macroeconomy. Grossman (1983) develops a theoretical model to explain the simultaneous determination of wages and aggregate union membership. This model has been adapted by Disney and Mudambi (1990) and provides the basis for their empirical work on aggregate UK union density. The Grossman model, however, is built on the assumption of an aggregate labour market which can be dichotomised neatly into a union and a non-union sector.

As we indicated in the previous chapter, this segmentation is unsatisfactory in labour markets, such as that in the UK, where it is not the case that establishments can be partitioned into those, on the one hand, in which unions are not recognised and there are no union members [a non-union sector] and those, on the other hand, in which there is a union closed shop with full membership [a - monopoly - union sector]. Evidence from the Workplace Industrial Relations Surveys [WIRS] of 1980 and 1984 [see Millward and Stevens (1986) for details of the surveys] suggests that it is not valid to depict the British labour market in this way. Using WIRS 1984 and focussing on private sector establishments, Gregg and Naylor (1991) show that, for manual workers, fewer

than half of establishments in which a union is recognised are characterised by closed shop arrangements. For non-manual workers, more than four-fifths of recognised-union establishments are 'open shops', in the sense of management recognising a union for the purposes of bargaining over pay and other conditions of work but where there is no closed shop. Furthermore, within open shops the evidence is that union density varies quite evenly between zero and 100% membership.

The challenge for the economist, then, is to develop a theory of the trade union which allows for the possibility of the open shop trade union with intermediate levels of union density. This is given greater importance in the UK as legislation is passed to limit the extent of the closed shop.

The specific problem for the economist is to explain why any individual would join an open shop trade union in the face of the free-rider incentive not to join the union. 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. Yet, while free-riding certainly does occur, as the WIRS information implies, open shops do exist and are characterised by varying degrees of union density. Given this variation it is surprising that economists have had relatively little to say about the union open shop. This

concern is likely to be relevant for a number of European economies, especially for those in which coverage of union-negotiated pay deals exceeds membership. Further, wherever there is local negotiation, the level of union density in the establishment is likely to have important implications for union bargaining power and thereby influence the union wage mark-up and the pattern of union strike activity, amongst other things. 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. We return to this point in Section 4.4 of the chapter.

Summarising the discussion in the previous chapter, we saw how, in order to escape the free-rider paradox in circumstances characterised by the prisoners' dilemma, Olson (1965) argued that collective action will occur only if there is either compulsion [analogous in our context to the closed shop or to intimidatory pressure to join] or an incentive private good. Booth (1985) interprets the incentive private good as being the 'reputation' utility that derives from complying with a social custom of membership. This idea stems from Akerlof (1980) who defines a social custom 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." In the context of union membership the social custom can be best thought of as urging workers not to take a free-ride. The Booth model is able to show that a union can exist despite the potential free-rider problem. However, the only stable

non-zero level of union density occurs when everyone joins the union. There is no stable intermediate equilibrium level of density, which means that most open shop cases remain unexplained. The reason for this result lies in the assumption that workers are homogeneous with respect to their sensitivity to the solidarity effects. In the previous chapter we demonstrated the formal equivalence of the Booth model and the 'critical mass' or 'tipping' models developed by Schelling (1978). The purpose of the current chapter is to extend previous work in two directions. First, we examine union membership in a critical mass framework in which individuals are assumed to be heterogeneous and in which (a) the utility function is more general than that specified in Chapter 3 and (b) the distribution schedule is more general. We show that this enables us to explain not only the existence of the open shop but also of intermediate membership densities and generates a dependence of membership on the wage level. Second, we attempt to integrate the social custom approach with more traditional economic arguments in a model in which union density and wages are determined endogenously. We then derive comparative static results and consider the empirical content and implications of the properties of the model.

The plan of the rest of the chapter is as follows. In the next Section we review the empirical evidence on why workers join unions and argue for the relevance of the social custom approach. In Section 4.3 we develop a generalised social custom model of

trade union membership and, in Section 4.4, we analyse the effect of union density on the wage outcome. Section 4.5 then brings together the analyses of union density and the wage and considers the properties and empirical content of the model. Section 4.6 summarises our main conclusions.

4.2 Why workers join unions: some evidence

There are a number of reasons why, for some workers, the free-rider incentive is overcome by the presence of private incentive goods associated with membership, in the way suggested by Olson. For a number of unions in Western Europe, trade union members receive: better protection against unfair dismissal and against other grievances, better access to information about employment rights and, in parts of Scandinavia, receive supplementary unemployment insurance through the trade union. Private incentive goods are an increasing feature in the US, where there has been an emergence of associate membership programmes encouraging workers not represented by unions in collective bargains to join union schemes offering private consumer benefits only. Jarley and Fiorito (1990) argue that this raises fundamental questions about the producer role and the group orientation of labour unions and runs contrary to

the view of early theorists - such as Perlman (1928) - who argued that; "unionism serves the wants and needs of individuals and groups at the same time." According to Perlman, argue Jarley and Fiorito, " 'real unionism' recognised the need for collectivism, or solidarity, and the need to stress 'shop rights' rather than the interests of indivduals as consumers." Associate membership schemes represent a move in the direction of the latter.

A large number of studies and surveys have indicated, however, that both private benefits and social custom effects are at work in inducing union membership. This is consistent with our model - even if private benefits provide the dominant motivation for joining, so long as it is not the case that private benefits alone exceed the costs of joining. So long as there is some, at least marginal, role - and we believe the evidence below suggests there is a strong role - for social custom effects to influence the individual's membership decision, then worker's decisions will be interdependent and our framework will be a relevant one.

In an early and classic study, Rees (1962), citing the evidence for the US of Seidman, London and Karsh (1951), observes that grievance procedures provide a primary motive for union membership, but includes as important factors the worker's background of union or radical activity in the family or in previous employment. He detects the influence of a "general

pressure for conformity" with workers often reporting that, "they joined largely because it was the normal thing to do in this plant - because almost everyone else was a member." Maranto and Fiorito (1987) examine the determinants of NLRB certification election outcomes between 1972 and 1980 and find that "benefits provided directly to members by unions significantly increase, and higher dues significantly reduce, white-collar organising success, whereas the same factors have no significant effect on blue-collar organising." Montgomery (1989) cites early studies by Chamberlin (1935) and Bakke (1945) which found that normative influences [how workers thought that others, such as co-workers and family, wished them to behave and how strongly they were inclined to satisfy these wishes] played a strong role in the union membership decision. This finding was re-inforced by later studies of government employee union membership decisions conducted by Gordon and Long (1981). Montgomery's study investigates determinants of union representation election voting decisions - as opposed to the membership decision which is more public and therefore potentially more susceptible to normative influences - and finds that normative pressures are still influential.

In Britain, too, a variety of sources confirms the importance of both private and collective motivations behind union membership. The British Social Attitudes 7th Report by Jowell, Witherspoon, Brook and Taylor (1990) indicates the prevalence of

the open shop - over two-thirds of the union members surveyed were not covered by any closed shop arrangements - and examines the reasons given for belonging to a trade union. They report that the two most widely endorsed reasons are; "to protect me if problems come up" [rated as important by over 90% of members] and "to get higher pay and better working conditions" [80%]. Of course, the latter motive is potentially vulnerable to the free-rider incentive and indicates that the survey question does not rigorously disentangle 'reasons for belonging' from 'reasons why one should belong'. Nevertheless, the results are informative and underline the significance of private benefits in the membership calculation. Indeed, 71% of members responded that "to get members' benefits" was an important reason for joining. Less self-regarding reasons for membership also emerge from the report as important and suggest the significant influence of peer pressure to adhere to the collective principles of trade unionism. "To help other people I work with" was regarded as an important reason for membership by 76%, with "I believe in them in principle" [67%] and "Most of my colleagues are members" [55%]. Furthermore, 15% felt that "It's a tradition in my family" was an important reason for membership. This latter finding is consistent with other studies [e.g. de Witte (1989), Gallie (1989) and van der Vall (1970)] which have found that union members are more likely to have had union-active parents. Hartley (1991) argues that social influences are important and cites van der Vall's conclusion that, "Many workers join the union in order to occupy a psychologically safe position among the members of their group,

i.e. in order not to be isolated or despised as a 'parasite' [a free-rider, in our terminology]. Evidence of this is that 82% of blue-collar and 81% of white-collar workers mentioned persons in their immediate environment who had influenced their decision to join. Since 32% and 38%, respectively, gave such influence as their basic motive, it may be concluded that at least one-third join mainly on account of the convictions of others." Hartley adds that social influence can be more benign than might be inferred, involving exposure to arguments about the role and purpose of trade unions, or increasing the attractiveness of social group membership and social identity.

Our main argument, then, is that whilst private incentive goods might provide an important - and for some workers the single-most important - reason for an individual worker to belong to a trade union, the evidence suggests an important role for the influence of social customs in the workplace. So long as this influence affects the individual worker's membership decision - even if only at the margin, as we shall explain more fully in the next Section - then workers' decisions will be interdependent and hence the 'critical mass' arguments that we shall develop will be appropriate. In focussing on the social context of the individual's membership decision, our model differs from explanations of union membership which are based solely on an individualistic calculation of financial costs and benefits [see Hirsch and Addison (1986) ch. 2]. In this latter tradition Blanchflower, Crouchley,

Estrin and Oswald (1989) have argued that workers pay the certain cost of joining unions in order to receive the uncertain benefits of, for example, protection from unfair dismissal. Consequently, it is differing personal characteristics, such as attitudes to risk, which explain membership status. Against this, we regard as indirect support for our approach the common finding from econometric studies of union membership that the individual's observed personal characteristics are surprisingly insignificant determinants of union status [see Bain and Elias (1985), Booth (1986) and Green (1990)]. Similarly, Guest and Dewe (1988) conclude that the extent of union organisation depends less on personal characteristics and more on the characteristics of the job and other workplace features. Furthermore, in their classic study of why workers vote for union representation in NLRB elections in the US, Farber and Saks (1980) found that after controlling for the effects on unionisation of various aspects of the employment relationship, individual characteristics such as sex and education have little relationship with voting behaviour. We would argue that these findings are consistent with the theory that it is the social customs and related workplace characteristics which shape the individual's union membership decision. Further support for this approach comes from Green (1990) who finds that region, after controlling for industrial composition, is an important determinant of union presence because it, "...is the region of work which reflects the histories and politico-economic cultures of each part of the country." Our own work can, perhaps, be best thought of as an

attempt to provide a theoretical framework which encompasses both traditional economic arguments and the empirical observations surveyed briefly above.

4.3 A generalised social custom model of union membership

The model in this chapter represents an attempt to explain how the union membership decisions of individual workers are influenced by social custom effects in the workplace as well as by private cost-benefit considerations, including the wage level. We assume that there is a social custom which invokes workers to join a trade union rather than to free-ride. A worker who conforms with this invocation derives a utility from doing so which depends positively upon the proportion of all workers who conform. Individual workers are assumed to be heterogeneous with respect to their sensitivity to this solidarity-derived utility. With this assumption, we are able to show stable equilibrium levels of union membership in the workplace. This part of the model is a generalisation of that developed in Chapter 3. Here we allow for a flexible functional forms and for the possibility that individuals acquire solidarity benefits from non-union membership. We then

consider how the results of the model vary when we relax this latter assumption.

Let an individual's preferences be described by:

$$U = U(y) + \alpha V(\mu, \varepsilon)$$

where we have kept the notation as consistent as possible with that in the previous chapter.

The individual's preferences are separable and the first term is a strictly increasing concave function of income, y; hence $U_y>0$, $U_{yy}\leq 0$. As will become apparent, preferences over W and d are no longer separable This is a considerable departure from the equivalent assumption in Chapter 3 - the implication this will be that W no longer necessarily drops out of the analysis of union membership. The second term represents utility gained from conforming to a social custom; whether the custom is membership or non-membership is immaterial as, initially and for generality, we allow for solidarity effects to accrue within both conforming and non-conforming groups. The utility gained is dependent on a taste parameter, ε, which describes an individual's benefits from conforming to group behaviour. We assume $V(.,0) = 0$ and $V(.)$ increases in ε, $V_\varepsilon > 0$. The parameter μ represents the proportion of the population conforming to the social custom and we assume also that $V(.)$ increases in μ; $V_\mu > 0$. We will also assume $V_{\mu\varepsilon} \geq 0$;

that is, an increase in μ generates a larger increase in utility the larger is ε and a form of Inada condition which says that as the taste parameter ε becomes arbitrarily large so the marginal benefit from an increase in the proportion of the population abiding by the custom also becomes large ($\varepsilon \to \infty$ implies $V_\mu \to \infty$). The parameter α on the second term will facilitate later comparative statics analysis on varying the strength of social custom effects. As we are concerned with union membership, let μ be the proportion of the population who join the trade union at the establishment and, hence, $1-\mu$ do not join. Let w be the wage rate (which is independent of the individual's union status because of the large numbers public goods characteristics of the wage) and let d be the net pecuniary cost of union membership. If d is negative then there is no free-rider incentive and the social custom arguments of our model are superfluous. We assume that d is positive and hence that solidarity effects, at least at the margin, influence the membership decision. Notice that this is quite consistent with any empirical evidence that private incentive goods are more important than solidarity/social custom motivations for membership. The payoffs from membership and non-membership are as follows.

$$U^J = U(W - d) + \alpha V(\mu, \varepsilon) \qquad \text{(membership)}$$

$$U^{NJ} = U(W) + \alpha V(1 - \mu, \varepsilon) \qquad \text{(non-membership)}$$

An individual is indifferent between joining and not joining a union if $U^J = U^{NJ}$, or

$$0 < U(W) - U(W - d) = \alpha[V(\mu, \varepsilon) - V(1- \mu, \varepsilon)] \qquad (4.1)$$

i.e.,

$$Z = U^J - U^{NJ} = 0.$$

Define $\mu(\varepsilon,a,d,W)$ to be the value of μ which satisfies equation (4.1) for given values of ε, a, d and W. From our assumptions on V(.) it is clear that the solution to (4.1) defines a strictly decreasing schedule in (μ, ε) - space. As μ tends to 0.5 from above the RHS of (4.1) tends to zero, hence successively higher values of ε are necessary to preserve equality. The RHS of (4.1) increases in ε because as $V_{\mu\varepsilon} \geq 0$ and $\mu \geq 1 - \mu$ it must be the case that as ε increases the first term rises by more than the second declines (these assertions are proved formally below). We can graph this relationship, as demonstrated by the $Z = 0$ schedule (henceforth, the Z-schedule) in Figure 4.1.

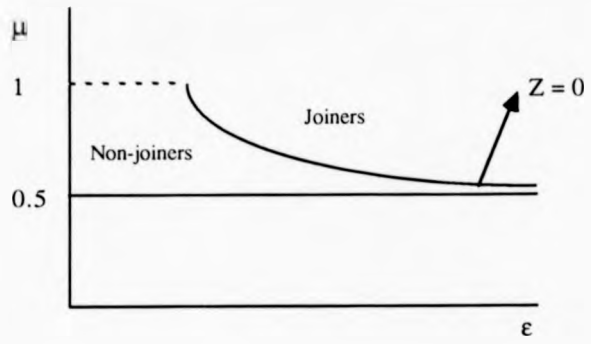


Figure 4.1 The Z-schedule $\mu(\alpha,\varepsilon,d,W)$

By differentiating (4.1), the equation defining the Z-schedule, implicitly with respect to the parameters ε, α, d and W, we can calculate precisely how the decision schedule shifts in response to a change in each of these parameters,

$$\frac{d\mu}{d\varepsilon} = \frac{V_\varepsilon(1-\mu,\varepsilon) - V_\varepsilon(\mu,\varepsilon)}{V_\mu(1-\mu,\varepsilon) + V_\mu(\mu,\varepsilon)} > 0, \text{ if } \mu > .5 \qquad (4.2)$$

$$\frac{d\mu}{d\alpha} = \frac{V(1-\mu,\varepsilon) - V(\mu,\varepsilon)}{\alpha V_\mu(1-\mu,\varepsilon) + \alpha V_\mu(\mu,\varepsilon)} < 0 \qquad (4.3)$$

$$\frac{d\mu}{dW} = \frac{U_W(W) - U_W(W-d)}{\alpha V_\mu(1-\mu,\varepsilon) + \alpha V_\mu(\mu,\varepsilon)} < 0 \qquad (4.4)$$

$$\frac{d\mu}{dd} = \frac{U_W(W - d)}{\alpha V_\mu(1 - \mu, \varepsilon) + \alpha V_\mu(\mu, \varepsilon)} > 0 \qquad (4.5)$$

In the figure the Z-schedule is shown as a convex function. This need not in general be true. However, to simplify the analysis we will assume henceforth that $\mu(\varepsilon)$ is a convex function. This can be sustained if, for example, $V(\mu,\varepsilon)=\mu\varepsilon$. Workers are heterogeneous with respect to their sensitivity to solidarity-derived utility. We assume that the characteristic ε has a distribution described by a twice continuously differentiable distribution function, $f(\varepsilon,\theta)$, on the interval $0 \leq \varepsilon \leq \varepsilon_1$. The parameter θ is used to represent shifts in the distribution of ε, and we will assume that as θ increases so the distribution function $f(\varepsilon,\theta)$ shifts to the right; $f_\theta < 0$. Thus, an increase in θ represents an unambiguous shift in the distribution of the characteristic towards those who are more inclined to value social customs. To ensure a unique interior equilibrium we will also assume for simplicity that $f_{\varepsilon\varepsilon}>0$ if $f < 1/2$, thus the distribution function is convex in its lower regions. In Figure 4.2 we give the ε-distribution schedule. It emerges as a property of the model that if there are both members and non-members in the population (i.e., $0 < \mu < 1$), then the latter group consists of individuals with the lower values of ε. When $\mu = 0.25$, for example, the group of joiners is represented by the highest quartile in the $(0, \varepsilon_1)$ interval. We can now investigate the equilibrium properties of the model. Consider points m, n, p and q in Figure 4.2.

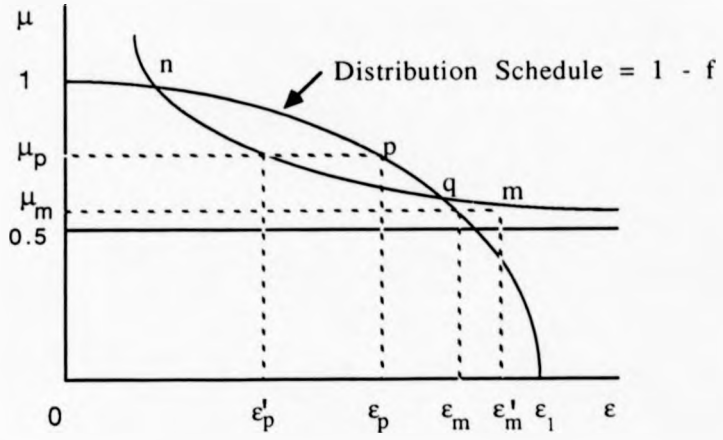


Figure 4.2 Distribution and Z-schedules: $\mu(\varepsilon,\alpha,W,d)$ and $1-f(\varepsilon,\theta)$

At point p in Figure 4.2 there are μ_P joiners in the union, for whom $\varepsilon_P \leq \varepsilon \leq \varepsilon_1$. The position of the Z-schedule tells us that any individual with $\varepsilon \geq \varepsilon'_p$ will prefer to join the union. Point p, then, does not represent an equilibrium, as those non-joiners for whom $\varepsilon > \varepsilon'_p$ would prefer to join the union. Our assumption is that membership will grow in this situation. Similarly, point μ_m does not constitute an equilibrium level of union membership: of the μ_m joiners there is a proportion for whom $\varepsilon < \varepsilon'_m$ i.e., less than the density level needed to sustain their membership. From point m, then, we would expect membership to fall. It becomes clear that the [locally] stable equilibria in Figure 4.2 are at point n, to which membership falls from unity and rises from levels such as μ_P, and

at $\mu = 0$, to which membership falls from levels such as μ_m. Point q also represents an equilibrium, in the Nash sense that no-one would have an incentive to change their behaviour if, for some reason, membership happened to be at this level. But it is not a stable equilibrium as only a small drop in membership is necessary to induce density to unravel to zero, and only a small rise would generate increasing membership to point n. The membership level at point q, μ_q say, represents a threshold level of membership which a union must achieve in order for union membership to be self-sustaining. If this threshold level is exceeded then membership will rise to reach the level, μ_n say, associated with point n in Figure 4.2. For these reasons we will call point n the solidarity-equilibrium level of membership and point q the threshold level of membership. Both the equilibrium and the threshold levels of membership are therefore defined by the intersection of the Z-schedule and the distribution schedule, these two points are therefore characterized as the two solutions (ε^*,μ^*) to the equations

$$1 - f(\varepsilon^*,\theta) = \mu(\varepsilon^*,\alpha,d,W), \qquad \mu^*=\mu(\varepsilon^*,\alpha,d,W).$$

From this it is clear that both the solidarity equilibrium and the threshold levels of membership will depend upon the parameter values in the Z- and distribution schedules. We now consider how the equilibrium and threshold levels are affected by changes in the parameters.

Property 4.1a ***Effects of changes in W and d.***

From equation (4.4) it is clear that the Z-schedule shifts to the right as the wage decreases. Hence, point n in Figure 4.2 moves down the distribution schedule implying a lower solidarity equilibrium membership level. If wages fall sufficiently the Z-schedule will lie everywhere to the right of the distribution schedule and the only equilibrium will be at $\mu=0$. From this we can see that there will be some critical wage level, W_{crit}, which, ceteris paribus, will be just sufficient to induce an intermediate solidarity equilibrium, μ_{crit}. This will occur at the tangency point of the distribution and Z- schedules. The relevant derivatives are calculated below. Notice again that for the threshold level the denominator will be positive and for the equilibrium level the denominator will be negative. As the wage rises above W_{crit} the Z-schedule shifts to the left and the solidarity equilibrium density level increases. This is shown in Figure 4.3. Changes in d, the net cost of membership, have the opposite effects to those for changes in W. An increase in d will cause an upward shift in the $\mu(W)$ schedule.

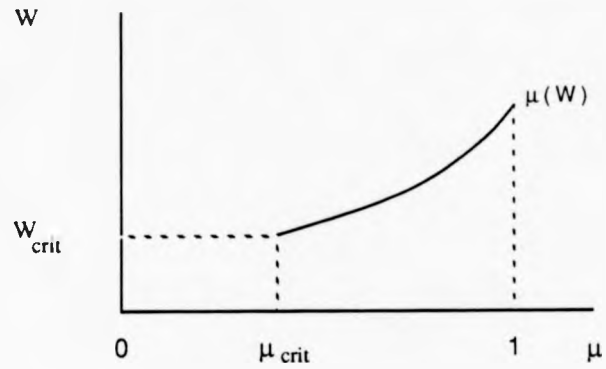


Figure 4.3 Solidarity-equilibrium union density increases with the wage above the critical level.

Property 1b ***Asymmetry of solidarity effects.***

It is clear from Figure 4.2 that the critical level of union membership exceeds 50% membership. This follows from the assumption that non-members derive utility from the solidarity effects within the group of non-members, to the same extent that solidarity effects accrue within the group of members. This is perhaps an extreme case. The moral sanction associated with breaking the social custom of not free-riding is likely to generate stronger solidarity effects for union joiners and this would push down the asymptote on the membership decision schedule below the 50% mark. In the limit, it will fall to zero if there are no

solidarity effects within the group of non-members. Even with no solidarity effects amongst non-joiners, the zero asymptote on the decision schedule would produce some positive value for the threshold density level and therefore in a qualitative sense our results are not sensitive to the assumption of symmetry or asymmetry. We adopt the initial assumption of symmetry in solidarity-derived utility for the purpose of generality and to be able to establish this point.

Property 1c ***A change in*** θ.

An increase in θ, the group's propensity to value solidarity effects - that is a general shift to the right of the ε-distribution - would raise the solidarity-equilibrium level of membership [point n in Figure 4.2] and reduce the threshold level of union density. Hence, an increase in θ will shift the $\mu(W)$ schedule down and to the right, implying a higher solidarity equilibrium level for a given W, and a lower W_{crit}. If the shift to the right of the distribution schedule is sufficiently great then the model would predict 100% membership. Conversely, a sufficiently large shift to the left, reflecting low importance of solidarity effects, could produce an outcome in which the only equilibrium is at zero membership.

Property 1d ***A change in*** α.

The effects of changes in the parameter α, which represents individual sensitivity to social custom or solidarity effects, are similar to the effects of a change in θ. As α increases this will in general shift the Z-schedule downwards, hence the threshold value for stable union membership will decrease as the solidarity-equilibrium level increases, producing a downward shift in the $\mu(W)$ schedule. If the variance of the distribution diminishes, but with constant mean, the position of the equilibria will also change. In the limit, as individuals become identical, the stable intermediate equilibrium vanishes and the only stable equilibria imply that everyone behaves identically - either everyone joins or no-one does. This is the special case of identical individuals discussed by Booth (1985) and can explain the existence of a union but does not provide an explanation of the intermediate density levels characterising the open shop trade union which is a part of the focus of our analysis.

In this Section, then, we have shown how in our model union density in the establishment depends, ceteris paribus, upon the wage level: there being a minimum critical wage necessary to induce a solidarity equilibrium, with the level of union membership in such an equilibrium increasing with the wage

above the critical level. The membership schedule, $\mu(W)$ in Figure 4.3, showing the dependence of the solidarity equilibrium on the wage level, shifts with changes in the other parameters of the social custom model which we have developed, as discussed above. We turn now to examine the influence of union density on the wage level.

4.4. Wage determination

We have shown in Section 4.3 how union membership in the establishment is likely to vary with the wage. In this section we consider how the wage level might be affected by the level of union density.

There is a class of theoretical models which attempt to model union membership and wage determination endogenously, but these tend to assume a closed shop trade union. A common assumption is that membership equals employment. Thus, whilst there is, in these models, a rigorous microeconomic explanation of the wage choice by the union, usually generated in a median voter

model of union behaviour, the explanation of union membership is more *ad hoc*.

In order to generate a relationship for wages as a function of membership, there are two main alternative approaches one might take. First, one could develop a median voter monopoly union model relating how the union's preferred wage varies with membership. This would be consistent with Grossman (1983) and Booth and Chatterji (1992). However, the monopoly union assumption that the union is free to set the wage level would seem more appropriate to the case of the closed shop. For our purposes, we prefer to follow an alternative approach. We argue that in the open shop trade union context it is more appropriate to adopt the more general right-to-manage framework (of which the monopoly union model is, of course, a special case) in which the union and the firm bargain over wages, before the firm then sets employment to maximise profits. Within this approach, we view the level of union membership in the establishment as an important determinant of the union's bargaining power relative to that of the firm in the wage bargain. In particular, we assume that as union density grows then the firm is able to employ fewer workers in the event of a disagreement between the union and the firm. Thus, the firm's disagreement payoff is falling in union density. We show that this can generate a bargained wage which is increasing in union density. This is in marked contrast to the median-voter model in which the wage is decreasing in union

membership. Consequently, our results frequently diverge from those derived within a monopoly-union median-voter framework. The formal model in this section draws on Naylor and Raaum (1993).

We suppose that the firm pays all workers the same wage, W, which is the higher of the bargained wage, W^B, and the outside option of each worker, W^C - the competitive wage. The bargained wage is determined as the outcome of a Nash bargain between the union and the firm. Hence,

$$W^B = \underset{W}{\text{argmax}} \left[(W - s) \cdot (\Pi - \pi)\right] \qquad (4.6)$$

where s and π are the disagreement payoffs to the union and the firm respectively. s is the strike pay received by each worker and is assumed to be exogenous. The firm's profit is given by $\Pi = R[L] - WL$ and π is the firm's profit during a strike and is given by,

$$\pi = F[(1 - \mu)L^0] - (1 - \mu)W^0L^0 \qquad (4.7)$$

where F denotes the firm's revenue function, μ is union density, and W^0 and L^0 are the predetermined levels of wages and employment, respectively, during a strike. Thus, we are assuming

that in the event of a strike the firm is able to employ only that fraction of its workers who are not union members.

Implicit in equation (4.6) is the assumption that the union objective is to maximise the wage [for a discussion, see Oswald (1985)]. Flat indifference curves for the union are likely to occur if the representative union member is protected against redundancy by a seniority rule, for example. Following Moene (1988), the outcome of the wage bargain described in (4.6) can be written as:

$$W^B = \frac{1}{2}\left[\frac{F(L)}{L} - \frac{F[(1-\mu)L^0]}{L} + (1-\mu)W^0 + s\right] \qquad (4.8)$$

In steady state, when $W = W^0$ and $L = L^0$, this becomes:

$$W^B = \frac{1}{2}\left[\frac{F(L)}{L} - \frac{F[(1-\mu)L]}{L} + (1-\mu)W^B + s\right] \qquad (4.9)$$

and hence,

$$W^B = \frac{1}{1+\mu}\left[\frac{F(L)}{L} - \frac{F[(1-\mu)L]}{L} + s\right] \qquad (4.10)$$

Thus, for given L, we can show that the steady-state bargained wage is increasing in union density:

$$\frac{\partial W^B}{\partial \mu} = \frac{1}{1+\mu}\left\{F'[(1-\mu)L] - W^B\right\} > 0 \qquad (4.11)$$

as $F'(L) = W^B$, under right-to-manage assumptions, and $F''(L) < 0$. Thus, for a given employment level, higher union density raises the wage and this will then induce a move along the firm's labour demand curve. We make the usual assumption of a myopic firm which neglects the impact of today's employment on future negotiations [for a discussion of this, see Moene, Hoel and Wallerstein (1992)]. Hence, we can conclude that the bargained wage is increasing in union density. From (4.10) it is clear that the bargained wage tends to s as union density tends to zero, and consequently the wage-density schedule has the form depicted in Figure 4.4, below.

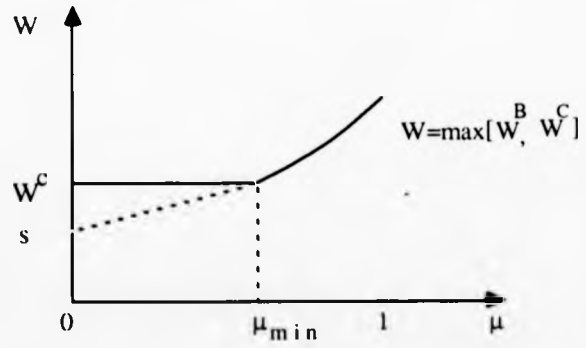


Figure 4.4 The wage schedule.

As s, the inside option, is likely to be less than W^C, the outside option, we conclude that there is some minimum union density level, μ_{min} in Figure 4.4, which the union must achieve if it is to be able to raise wages above the competitive level. In the next section, we consider the interaction of the wage and density schedules.

4.5. Wages and union membership

In this Section we bring together the analyses of the previous two Sections. Figure 4.5 illustrates the wage and density schedules of Figures 4.3 and 4.4, respectively.

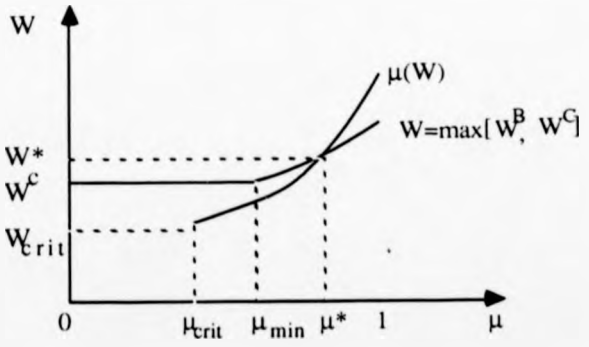


Figure 4.5 Intermediate equilibrium with a positive mark-up.

With the wage and density schedules as depicted in Figure 4.5, there is just one stable equilibrium at $\mu = \mu^*$ and $W = W^*$, where $0 < \mu < 1$ and $W^* > WC$. $\mu = 0$ is not an equilibrium as the wage conditional on this level of membership, WC, is sufficient to induce union membership toward μ^*. Beyond μ^*, union density does not generate a sufficiently high wage level to sustain membership in excess of μ^*. Thus, membership at μ^* is the equilibrium in this case and generates a wage of W^*. The special features of the case are that WC lies above w_{crit} and that the density schedule cuts the wage schedule from below and to the right of μ_{min}. For $WC > W_{crit}$, there are two other possible outcomes. The first occurs when the wage schedule lies everywhere above the density schedule and hence $\mu^*=1$. This is a possible explanation of the closed shop with 100% membership. The second possible outcome occurs when the density schedule cuts the wage schedule to the left of μ_{min} , in which case μ^* is still an intermediate density equilibrium, but one in which the union is unable to raise wages above the competitive level.

For $WC < W_{crit}$, there are a further two possible outcomes. First, there is the case in which the density schedule lies everywhere above the wage schedule, implying there is no positive level of membership capable of generating a wage level sufficient to sustain that membership level. Hence, the only stable equilibrium is $\mu = 0$. Second, if the wage schedule cuts the density

schedule from below, then the point of intersection will represent an unstable intermediate equilibrium above which density will rise to $\mu = 1$ and below which membership will fall to zero. Thus, for $W^C < W_{crit}$, there are no stable intermediate equilibria and hence the existence of the open shop trade union is compatible only with certain of those cases in which $W^C > W_{crit}$, that is in which the wage necessary to induce a solidarity equilibrium is less than the competitive wage. Additionally, for the establishment to be characterised by intermediate rather than full membership of the union, the wage and density schedules must have an intersection at $\mu < 1$. As can be seen from Figure 4.5, this will be more likely the greater is μ_{min} and the flatter is the wage schedule, i.e. the lower is the wage for any given level of union membership. As a corollary of this, we can conclude that a high and steep wage schedule, ceteris paribus, is likey to lead to 100% membership.

We now offer a summary of the comparative static and other properties of the model, focussing initially on the case depicted in Figure 4.5.

Property 2a ***A change in d, the net cost of membership.***

We know from property 1a in Section 4.3 that an increase in the net cost of membership, d, will cause an upward shift in the $\mu(W)$ schedule. Therefore, as we can see from Figure 4.5, there will

be a reduction in μ^* and W^*. There will be a non-zero or intermediate equilibrium level of union density so long as W_{crit} stays above W^C.

It should be noticed that this property is very different from that implied by the median-voter class of models. In those models any upward shift in a positively-sloped membership schedule will represent an upward movement along the negatively-sloped wage schedule, thus producing a higher wage. Hence, an exogenous change, such as an increase in subscription costs, causes a reduction in membership, but an increase in wages. This seems counter-intuitive and contrary to the result we obtain from our model.

Property 2b ***A change in*** θ.

We saw in property 1c in Section 4.3 that an increase in θ, the group's propensity to value solidarity effects [that is, in terms of Figure 4.2, a shift to the right of the ε-distribution schedule], would raise the solidarity-equilibrium level of membership [point n in Figure 4.2] and reduce the threshold level of union density. Hence, an increase in θ shifts the $\mu(W)$ schedule downward and, consequently, produces an increase in both the wage and the equilibrium level of union membership. If density reaches 100%, further increases in θ fail to raise wages further.

Property 2c ***A change in*** α.

From property 1d we have that an increase in α, which represents individual sensitivity to solidarity effects,will cause a downward shift in the $\mu(W)$ schedule, implying the same effects as an increase in θ, as described in property 2b above. Again, the implication for the wage is the opposite of that implied by the median-voter model.

Property 2d ***A change in strike pay, s.***

An increase in strike pay, s - the union's disagreement payoff - will raise the bargained wage for each level of union density, and hence cause an upward shift in the wage schedule, $W=\max[W^B, W^C]$, in Figure 4.5. This will generate increases in both the wage outcome and the equilibrium level of union density. If μ^* reaches 100%, further reductions in s will continue to raise the wage. Similarly, any industrial relations legislation which reduces the union's disagreement payoff or raises that of the firm - for example by outlawing picketing or secondary industrial action - will lower the wage schedule and thereby reduce both the bargained wage and the level of union density. The bargained wage falls directly because of the reduction in the union's relative bargaining power, and indirectly because of the consequent reduction in union density. Traditional models, focussing only on

the former argument, ignore the interactions between density and the bargained wage.

In the case depicted in Figure 4.5 the intersection of the wage and membership schedules yields a stable intermediate union density equilibrium, thereby providing an explanation of the open shop trade union with intermediate density. Properties 2a to 2d demonstrate how the density level in the open shop will either fall or rise as various parameters in the model vary and that both direct and indirect mechanisms operate. We have assumed so far that $W^C > W_{crit}$ We now consider what happens if the changes in α, θ or d are sufficient to push W_{crit} above W^C.

Property 2e $W^C < W_{crit}$

If $W^C < W_{crit}$ then, as we have seen, any intersection, μ^*, of the wage and membership schedules will represent an unstable intermediate wage-density equilibrium and there will be stable equilibria at $\mu = 0$ and $\mu = 1$. In such a case, a fall in the membership schedule, $\mu(W)$, - brought about by, for example, a reduction in d or by an increase in either α or θ - will reduce μ^*, thereby making the $\mu = 1$ outcome more likely. Conversely, an upward shift in $\mu(W)$ will increase μ^* in the limit producing a unique equilibrium at $\mu=0$. When the unstable equilibrium μ^* is high, the $\mu=1$ stable equilibrium is more vulnerable to any

exogenous temporary reduction in the wage or membership schedule. For example, if there is high labour turnover in the establishment then there is a greater risk that at any one time μ might fall below μ^* and hence that membership will unravel to the stable equilibrium at $\mu = 0$. In such cases, unions recruitment activity will have to be more intensive and this might explain the need for the union to establish a closed shop. Similarly, a reduction in s, strike pay, causes a downward shift in the wage schedule, increasing μ^* and making $\mu = 0$ more likely. Thus, the union's disagreement payoff again affects the level of union membership, a property not present in other microeconomic models of the trade union.

In the next Section, we offer a summary of the results of the model and some further remarks.

4.6 Conclusions

We have developed a model which is capable of explaining a number of apparently puzzling features about union membership. First, we have overcome the 'free-rider' problem in providing an explanation of voluntary membership of the open shop trade union. Second, the model is capable of explaining intermediate equilibrium levels of membership. Third, the model is consistent with the empirical findings that workplace and regional effects are important but that observed personal characteristics are insignificant determinants of union membership.

More importantly, we have shown how the wage outcome is likely to be influenced by the level of union density in the establishment and therefore by the parameters of the social custom model of union membership. In particular, we have argued that both union density and the wage level are likely to increase as a result of: a reduction in union membership costs, an increase in strike pay or an increase in individuals' sensitivity to the social custom of union membership and the associated solidarity effects. We have argued that these properties of the model are very different from those deriving from the monopoly-union median-voter framework in which the wage is falling in union membership and hence in which an increase in membership leads to a fall in the wage. These differing predictions suggest the possibility of testing the competing theories empirically. We have also suggested that where the union does not have a closed shop, the monopoly-union assumption that the union chooses the wage is less plausible than the bargaining framework we develop in Section 4.4.

Furthermore, we have argued that the model captures some effects not characterised in other models. For example, the increase in strike pay raises the bargained wage for any given level of union membership, but this is then likely to cause an increase in union density which will further raise wages. In

equilibrium, wages are higher because of this interaction between these direct and indirect effects of strike pay on wages. Because the wage and membership schedules are both upward-sloping, the indirect effect on the wage reinforces rather than offsets the direct effect. Finally, we have examined the case in which $\mu = 0$ is the lower of two potential stable equilibria. We have argued that such a case might be a motivating factor for the union to establish a closed shop arrangement with the firm so as to guarantee the 100% membership equilibrium. Our main concern, however, has been with the stable intermediate equilibrium associated with the voluntary-membership open shop.

Appendix 4.1

In Section 4.3 we argued that an increase in θ, the group's propensity to value solidarity effects - that is a general shift to the right of the ε-distribution - would raise the solidarity-equilibrium level of membership [point n in Figure 4.2] and reduce the threshold level of union density. To prove this one needs to implicitly differentiate the equations:

$$1 - f(\varepsilon^*, \theta) = \mu(\varepsilon^*, \alpha, d, W), \qquad \mu^* = \mu(\varepsilon^*, \alpha, d, W)$$

with respect to θ. This gives:

$$\frac{\partial \varepsilon^*}{\partial \theta} = \frac{-f_\theta}{f_\varepsilon + \frac{\partial \mu}{\partial \varepsilon}}, \quad \frac{\partial \mu^*}{\partial \theta} = \frac{-f_\varepsilon f_\theta}{f_\varepsilon + \frac{\partial \mu}{\partial \varepsilon}}$$

Note: $\partial \mu^*/\partial \theta = -f_\varepsilon \partial \varepsilon^*/\partial \theta$

The denominator is negative at the equilibrium point whilst it is positive at the threshold level of membership. For example at the equilibrium level the slope of decision schedule $\partial \mu/\partial \varepsilon$ is more negative than the slope of the distribution schedule $-f_\varepsilon$, or $\partial \mu/\partial \varepsilon < -f_\varepsilon$ so $\partial \mu/\partial \varepsilon + f_\varepsilon < 0$. The converse is true at the threshold level. Multiplying the denominator by the partial derivatives $-f\theta \geq 0$ and $f_\varepsilon f_\theta \leq 0$ gives the comparative statics effects claimed above: the derivative $\partial \mu^*/\partial \theta$ is positive at the equilibrium level and negative at the threshold level.

Chapter 5 Union Density, Wage Determination and Management Opposition.

5.1 Introduction

The purpose of this chapter is to develop a theoretical model in which the level of union membership and the union wage mark-up are determined endogenously and in which there is a role for a non-passive firm to oppose union organisation. Thus the model which we shall develop shares many of the features of that presented in the previous chapter, but adds the potentially important dimension of the impact of the firm on union membership. As in the previous chapters, our work here contrasts with most of the recent economic theory of the trade union which has assumed a union closed shop with a fixed membership level. The empirical evidence on the pattern of union density across establishments indicates the importance of explaining the existence of the open shop. Millward and Stevens (1986) report that half the private sector establishments in the WIRS[1] data set are characterised by a positive level of union density of less than 100% whilst a closed shop is present in fewer than half of the establishments in which union members are present. Furthermore, it is likely that the ability of the union to obtain a

[1]The Workplace Industrial Relations Survey (1984) for the UK

wage mark-up will depend, amongst other things, upon the level of union membership. This underlines the need to explain the determinants of density in analysing union wage effects.

As we argued in the previous chapter, a shortcoming of the early social custom models of union membership was that they tended to concentrate exclusively on the socio-economic characteristics of the workers and of the workplace with no role ascribed to market influences such as the supply and demand for labour, or the behaviour of the firm. [Booth and Chatterji (1991) is a recent exception]. This is a deficiency in the light of strong empirical evidence that employer behaviour, in the form of management opposition, is a key determinant of unionisation. Drawing on Freeman and Medoff (1984), Dickens and Leonard (1985), Freeman (1986) and Farber (1987): Freeman and Kleiner (1988) argue that, "Many have come to believe that the growth of opposition has been a major, if not the major, direct cause of the decline in private sector unionism in the U.S.." Management opposition to unions in the U.S. is most obvious during NLRB elections when either unions are attempting to unionise an establishment or the employer is seeking de-unionisation.

In the U.K., representation elections of the US kind do not occur, but firms still have the option of spending resources to deter or diminish union organisation. For example, firms can oppose unions by hiring legal advisers, instituting non-union collective voice mechanisms, laying off activists or by their choice

of technology or production process. Lazear (1983) hypothesises the firm making contributions to employee funds to appease non-unionised labour. He also includes the possible Harvard-type foregone productivity gains of opposing unions. Furthermore, there is evidence of growing management opposition to trade unions in the UK via the recent growth in union de-recognition[2] cases [see Claydon (1989)]. Gregg and Yates (1991) find from a retrospective survey of 558 UK companies that complete derecognition has been rare, but that partial derecognition has been more common[3]. Freeman and Pelletier (1990) argue that managements in the UK can affect the ability of unions to enroll members. They cite evidence of the observed lower union density in plants that do not recognise unions than in plants where a union is recognised. They conclude that a major reason for the dramatic fall in union density in the UK in the 1980s was the change in the legislative environment which, "strengthened management's hand in opposing unions." Finally, we can think of the firm's location decision as influenced by spatial differences in the probability of unionisation. At a cost, the firm can re-locate an establishment following its unionisation. We discuss this further later in the paper. Each method of management opposition is likely to be costly. The firm must balance this cost against any reduction in profits which it expects to follow from unionisation or an increase in union density.

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[2]Recognition refers to the situation in which an employer recognises a union for the purposes of bargaining over wages and other conditions of work.
[3]They report that 13% of companies with recognition in 1984 had experienced derecognition by 1990.

In this chapter, then, we allow union membership to be influenced by both social custom effects and by resources devoted by management to opposing unionisation. In our model, the wage is determined as the higher of the competitive wage and the wage predicted by a right-to-manage Nash bargaining model [see, for example, Nickell and Andrews (1983)]. This part of the model extends the analysis in the previous chapter by generalising the Nas bargain to cover the general asymmetric case. We still find that the wage is increasing in union membership when density exceeds a certain threshold level, since higher density means more workers will take part in industrial action, thereby lowering the firm's profit during a conflict. The novelty of the current chapter is that this is now seen to provide the firm with an incentive to spend resources to reduce union density. Within this set-up we are thus able to investigate the effects on wages and density of changes in the competitive wage, market power, the effectiveness of management opposition and workers' attachment to trade unions. This extends the standard model of union-firm bargaining which derives comparative static effects assuming a fixed union density.

We find that social custom effects generate a base level of union membership in the establishment and that there is a critical level which this base level of union membership must at least equal if union density in the establishment is to be at a level sufficiently high to deter management from opposing unions. If

the base level satisfies this condition then actual density will be equal to the base level and the firm will not allocate resources to oppose union membership. Consequently, the union obtains a positive wage mark-up. We can think of this as the case where the firm 'recognises' the union. If, however, the base level is less than the critical level then the firm will spend just sufficient resources to reduce membership to that level [which may be non-zero] at which the wage outcome from bargaining would be equal to the competitive outcome. The existence of a union in the establishment depends, therefore, upon the relative magnitude of the base level of membership and the critical level, and therefore upon both social custom effects and the behaviour of the firm.

The plan of the rest of the paper is as follows. Section 5.2 considers how wages are determined conditional on some level of union membership which is taken as given when the firm and the union bargain over wages, as characterised by the generalised asymmetric Nash bargain. We find that the bargained wage is increasing in union membership. In Section 5.3 we present a simplified social custom model of union membership in which some base level of union density is determined. The social custom model in this chapter is simplified to avoid repition with previous discussion. In Section 5.4 of the paper we allow for the possibility that the firm can spend resources to reduce union density and we examine the determinants of union membership, wages and employment in such circumstances. Hence, the first stage in the sequence of events which we describe consists of workers'

individual membership decisions. The second stage is the firm's decision over the allocation of resources to oppose union membership and the third stage is the wage bargain. In the ensuing analysis, we follow the practice of examining the third stage first, as the firm's optimising choice with respect to management opposition will be taken conditional on a calculation of the impact of union membership on the wage outcome. Section 5.5 then contains a discussion of the comparative static properties of the model and in Section 5.6 we offer some concluding remarks.

5.2 Wage determination and union membership

The firm pays all workers the same wage, W, given by:

$$W = \max\{W^C, W^B\}$$

where W^C is the competitive wage which is taken to be each worker's outside option and W^B denotes the outcome of wage bargaining at the firm level. The outcome of wage bargaining can be described formally by the Nash bargaining solution:

$$W^B = \underset{w}{\text{argmax}} \{(W - s)^{\beta}(\Pi - \pi)^{1-\beta}\} \qquad (5.1)$$

where

s = strike pay ≥ 0

$\Pi = F(L) - WL$, $F'(L) > 0$, $F''(L) < 0$

L = number of workers

π = profit during a strike = $F((1-\mu)L^0) - (1-\mu)W^0L^0$

μ = union density

β = union bargaining power

W^0 = the wage paid to non-striking workers

L^0 = total labour force when a strike takes place.

The union objective is to maximize the wage. This utility function reflects the interests of the representative union member if she is protected against redundancy by a seniority rule or insulated from layoffs by a sufficiently high turnover [see Oswald (1985)]. The outcome of the wage bargain can then be written as:

$$w^B = \beta\frac{F(L)}{L} + (1-\beta)s - \beta\frac{\pi}{L} \qquad (5.2)$$

Equation (5.2) shows that the wage depends on employment (in the contract period) as well as the labour force during a strike (through π).

Consider first the outcome for a given employment level, where W^0 and L^0 are predetermined. The wage is increasing in μ as long as the marginal revenue during a strike exceeds the predetermined wage;

$$\frac{\partial W^B}{\partial \mu} = \beta \frac{L^0}{L}\left[F'\left[(1 - \mu)L^0\right] - W^0\right]$$

When unionisation increases, the firm's net loss during a strike is the marginal revenue of strike employment minus the reduction in labour costs (equal to the going wage, W^0).

We consider the traditional right-to-manage model where employment is adjusted unilaterally by the firm such that:

$$F'(L) = W$$

Following Moene, Hoel and Wallerstein (1992), it can be shown that this description corresponds to the usual assumption of a myopic firm which neglects the impact of today's employment on future wage negotiations [see Raaum and Naylor (1992)]. The steady state solution, where $L^0=L$ and $W^B=W^0$, is then determined by the two equations:

$$W^B = \frac{1}{1 - \beta(1 - \mu)}\left\{(1 - \beta)s + \beta\left[\frac{F(L)}{L} - \frac{F[(1 - \mu)L]}{L}\right]\right\} = G(L,\mu) \qquad (5.3)$$

$$W^B = F'(L)$$

Figure 5.1 illustrates the outcome, where $G(L,\mu)$ denotes the right hand side of equation (5.3).

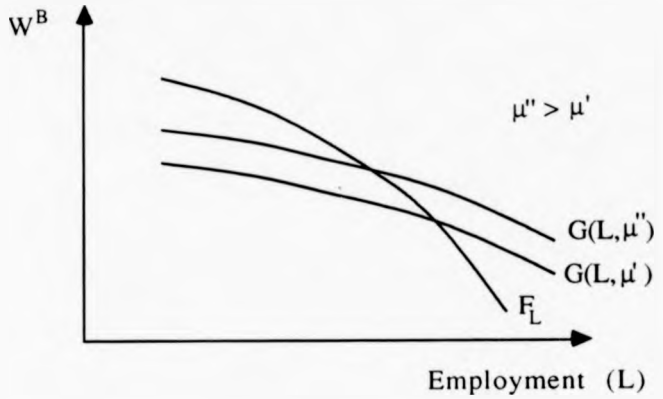

Figure 5.1. Union Density and Wage-Employment Outcomes.

The wage function, $G(L,\mu)$ in (5.3), shifts if unionisation in the firm increases;

$$\frac{\partial W^B}{\partial \mu} = \frac{1}{1 - \beta(1 - \mu)} \left[F'[(1 - \mu)L] - W^B \right] > 0$$

since $F'(L) = W^B$ and $F''(L) < 0$. Thus, a higher union density raises the wage for a given employment level. Higher labour costs reduce employment which induces a further increase in the wage, as illustrated in Figure 5.1.

It follows directly from (5.3) that

$$\lim_{\mu \to 0} W^B = s$$

The relevant strike pay, s, is the income per member received by the local union from outside sources and we assume that this income is lower than the competitive wage. Hence, there will be a positive level of unionisation, called μ^+, such that $W^B = W^C$ at μ^+ and $W^B > W^C$ if $\mu > \mu^+$. We assume throughout the paper that the firm earns a positive rent even at $\mu = 1$, implying $\mu^+ < 1$.

The wage-membership function, then, can be illustrated as in Figure 5.2. The wage is an increasing function of union density, μ, provided that μ exceeds a positive level μ^+. The union density level determines the fraction of the workforce which would take part in a potential industrial action (strike). The firm's profit during a strike is reduced if the number of non-striking workers decreases as a consequence of higher unionisation. As the firm's conflict payoff declines, the union obtains a higher wage. However, the outcome of the bargain will not exceed the workers' outside option, W^C, unless union density is above a certain level, μ^+.

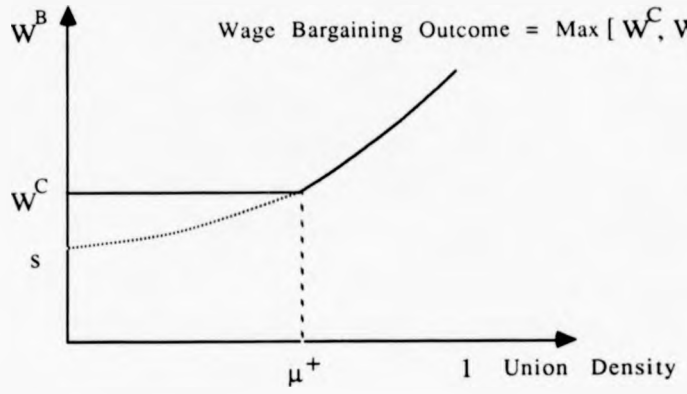

Figure 5.2 The Bargained Wage as a Function of Union Density

We have now established a positive relationship between union density and the wage[4], based on the idea that higher unionisation raises the power of the union through more effective strikes. However, the credible industrial action might in many cases be go-slow or work-to-rule practices by the workers, see e.g. Moene (1988). It can be shown that even these regimes give a wage which depends positively on the union density (equal to the fraction of the labour force taking part in an industrial action). We now turn to the analysis of the determinants of union density.

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[4]Empirical support for this result can be found in Reilly (1991) who reports from US data that, "The results suggest that the union is able to increase wages over the nonunion establishment only after it has organised 25% of the individuals in the establishment. **All** individuals in an establishment with a union density between 26% and 50% achieve a wage gain...of 13%. The wage gain for the 51% to 75% union density category is 21%...Individuals working for an establishment with a greater than 75%...density achieve a wage gain of 54%."

5.3 Union density in a social custom model

In the open shop context which we are addressing, a worker joins the union - voluntarily - if she finds it in her own interest to do so. In the spirit of Akerlof's (1980) social custom model - elaborated in a union membership context by Booth (1985) and Naylor (1990) - workers derive utility from the reputation effects of belonging to the union. Members conform with the social custom invoking workers not to free-ride on the collective action of their colleagues.

The worker's utility (U_i) is, following the approach by Naylor (1989),

$$U_i = W - dQ + \varepsilon_i Q/(t - V\mu)$$

where Q=1 for a union member and Q=0 if the worker does not join the union. W is the wage, d represents the net costs[5] to the worker of membership, ε_i is the individual i's sensitivity to reputation effects of membership and $1/(t-V\mu)$ is the "reputation

[5]The model is consistent with the existence of private incentive benefits for members so long as these are less than the individual membership fee.

function" (assuming $t-V\mu>0$). Our speficification implies that the difference in utility between joining and non-membership is increasing in union density (given ε_i). In other words, it is assumed that the cost of free-riding rises when union density increases. The specification is chosen to yield just one stable equilibrium solution. This is evident in Figure 5.3 which shows the decision schedule to be linear.

The workers are heterogeneous with respect to their sensitivity to reputation effects. ε is distributed uniformly between ε^0 and ε^1.

The individual joins the union if:

$$W - d + \varepsilon_i/(t - V\mu) \geq W$$

i.e. $\varepsilon_i \geq d(t - V\mu)$

An equilibrium density (μ^0) is defined such that no individuals want to change their membership status, given $\mu=\mu^0$. Full membership represents an equilibrium if sensitivity to reputation effects are sufficiently strong relative to the membership fee, i.e.,

$$\mu^0=1 \qquad \text{if } \varepsilon^0 \geq d(t - V) \qquad (5.4)$$

and no workers join the union if reputation effects are sufficiently weak, i.e.,

$$\mu^0 = 0 \qquad \text{if } \varepsilon^1 < dt \tag{5.5}$$

Equilibrium unionisation may also involve less than full membership. Let D(x) be the fraction of workers with $\varepsilon_i > x$. Since ε is uniformly distributed:

$$D(x) = \frac{\varepsilon^1 - x}{\varepsilon^1 - \varepsilon^0}, \text{ if } \varepsilon^0 < x < \varepsilon^1.$$

Define ε^* as the critical level of ε where all workers with $\varepsilon > \varepsilon^*$ join the union. Thus,

$$\varepsilon^* = d(t - V\mu)$$

An equilibrium μ^0 between zero and unity is then defined by:

$$\mu^0 = \mu = D(x) \text{ and } x = \varepsilon^*$$

Thus, the equilibrium unionisation is equal to:

$$\mu^0 = \frac{\varepsilon^1 - dt}{(\varepsilon^1 - \varepsilon^0) - dV} \tag{5.6}$$

This equilibrium is shown in Figure 5.3

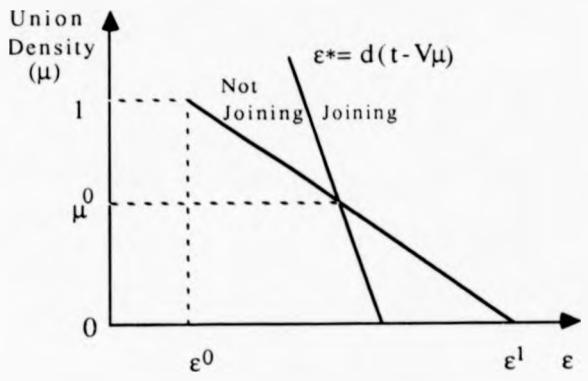

Figure 5.3 Equilibrium density when $\varepsilon^0 < d(t-V)$ and $\varepsilon^1 \geq dt$.

From Figure 5.3 it is clear that a reduction in ε^0 and ε^1 (i.e. in the sensitivity to reputation effects for all workers) will lower μ^0 and imply that the equilibrium with no membership [full membership] is more [less] likely. Similarly, a higher net membership fee will reduce equilibrium density.

The next section considers the firm's ability and incentive to influence unionsation of its work force.

5.4 Management opposition, wages and union density

We argued in Section 5.1 of this chapter that there is empirical support for the hypothesis that firms will be prepared to spend resources to deter or diminish trade union membership in the

establishment. In this Section of the chapter we investigate this further, hypothesising that the firm's expenditure weakens the social custom effects which drive membership. In a US context, this might be picking up the effect of management efforts to reduce the NLRB election vote for the union. An alternative interpretation would be to think of the firm spending resources to improve the working environment and hence diminishing the demand for union representation.

In Section 5.1 we suggested a number of ways in which firms might spend resources to oppose unionisation. A further illustration of such expenditure is the investment by the firm in a screening device at the point of recruitment aimed at providing the firm with information about individual applicants' propensities to join trade unions. Applicants might be screened on the basis of noisy signals such as previous workplace, industry or occupation, or such personal characterisitics as age, gender, experience, education or previous union activity. In this way the firm can reduce the likelihood of employing those workers who are more likely to join a union. Essentially, this means that the management's allocation of resources to oppose unionisation shifts the ϵ-distribution to the left.

It could be argued that we should allow for the symmetric possibility of expenditures by the union to enhance membership. It would be straightforward to allow for exogenous lump-sum expenditures on recruitment by a union at, for example, the

industry or occupational level. Indeed, we could interpret the very existence of the social custom as being due to some exogenous expenditure by a trade union. We would defend our decision not to allow for simultaneity between union expenditures and union density by the observation that union recruitment campaigns are generally organised out of unions' central budgets rather than at the establishment level. Similarly, net costs of membership are determined centrally. In support, we cite Kelly and Heery (1989) who conclude that, "...research suggests that local union officials have devoted relatively little time to recruitment and have been mainly occupied with negotiation, administration and general servicing." Nevertheless, one might wish to model a 'recruitment game' in which the firm and the local union make strategic decisions about allocating resources to influence the level of membership. We leave such considerations for further work.

We have shown in Section 5.2 that unless unionisation in the establishment exceeds a certain level (μ^+), the workers obtain the competitive wage (W^C). Thus, the firm is passive and spends no resources to fight unionisation if $\mu^0 \leq \mu^+$. Throughout this section we consider the case where $\mu^0 > \mu^+$, i.e the firm faces workers who will unionise and obtain a wage higher than the competitive level if the management takes no action.

The management can attempt to reduce unionisation among its labour force by spending resources, R. We model this in a simple way, assuming that R influences the distribution of individual sensitivity to reputation effects of membership:

$$\varepsilon^1 = \bar{\varepsilon}^1 - rR, \quad \varepsilon^0 = \bar{\varepsilon}^0 - rR \tag{5.7}$$

where $\bar{\varepsilon}^1, \bar{\varepsilon}^0$, and r are constants. and r denotes the effectiveness of management opposition. Replacing (7) in (6) yields the equilibrium density with management opposition (μ^m)

$$\mu^m = 1, \qquad \text{if } \bar{\varepsilon}^0 - rR \geq d(t-V) \tag{5.8}$$

$$\mu^m = \frac{\bar{\varepsilon}^1 - rR - dt}{\bar{\varepsilon}^1 - \bar{\varepsilon}^0 - V} \qquad \text{if } \bar{\varepsilon}^0 - rR \leq d(t-V) \tag{5.9}$$

Hence, μ^m is a linear function of μ^0 and R:

$$\mu^m = \mu^0 - \frac{r}{(\varepsilon^1 - \varepsilon^0) - dV} R = \mu^0 - \phi R \tag{5.10}$$

where $\phi = \frac{r}{(\varepsilon^1 - \varepsilon^0) - dV}$ is constant.

The (net long-run) profit of the firm is given by:

$$\Pi = F(L) - WL - R \tag{5.11}$$

where $W = W(\mu^m),\ F_L = W$ (5.12)

and $\mu^m = \mu^0 - \phi R$ (5.13)

We now allow the management to choose R to maximize profits, taking into account the effects on unionisation and the wage bargaining outcome. This sequence of decision-making is chosen to emphasise how firms can affect unionisation. It seems natural to consider unionisation as given when wages are negotiated since campaigns by the firm to affect union membership are unlikely to cause immediate changes in workers' attitudes towards unions. Changing the importance of social customs and reputation effects is likely to be a long-term process for the firm.

Inserting (5.12) and (5.13) in (5.11), and differentiating the profit function with respect to R yields:

$$\frac{\partial \Pi}{\partial R} = \Pi_R = W_\mu \phi L - 1$$

where $\frac{\partial W}{\partial \mu} = W_\mu$

The second derivative of the profit function is given by:

$$\Pi_{RR} = \phi^2 \frac{L W_\mu}{L} \left[-\hat{L}\hat{W} - \hat{W_\mu} \right] \qquad (5.14)$$

where

$$\hat{L} = \frac{\partial L}{\partial W}\frac{W}{L} < 0$$

$$\hat{W} = \frac{\partial W}{\partial \mu}\frac{\mu}{W} > 0$$

$$\hat{W_\mu} = \frac{\partial W_\mu}{\partial \mu}\frac{\mu}{W_\mu}$$

The profit function is convex in R if the expression in brackets in equation (5.14) is positive. The first term is positive, as a reduction in the wage at a "low" level of μ has a stronger impact on profits due to a large labour force. The sign of the second term, however, is ambiguous and related to the convexity of the wage function. We assume that $\Pi_{RR}>0$, which certainly is the case unless both W is concave in μ and $(\hat{W_\mu})$ dominates the first positive term.

The optimal choice of R, with Π convex in R, is then a discrete choice between:

(i) R=0 (no opposition) with profit given by:

$$\Pi = \Pi^0 = F(L) - W(\mu^0)L \qquad \text{where } F_L = W(\mu^0),$$

and

(ii) $R=R^C$ (sufficient opposition to realize the competitive wage) with profit,

$$\Pi = \Pi^C = F(L^C) - W^C L^C - R^C,$$

where R^C represents the resources necessary to realize $\mu = \mu^+$.

We have, then,

$$R^C = \frac{\mu^0 - \mu^+}{\phi}$$

and since unionisation below μ^+ does not affect the wage, the firm will obviously not spend more than R^C. Thus, the firm chooses:

$R = 0$ if $\Pi^0 \geq \Pi^C$

$R = R^C$ if $\Pi^0 < \Pi^C$

The base level of unionisation, i.e. the union density without management oppsosition (μ^0), will influence Π^0 as well as Π^C. First, the profit with a passive firm, Π^0, is decreasing in μ^0 since higher union density improves the bargaining strength of the union and raises the wage:

$$\frac{\partial \Pi^0}{\partial \mu^0} = -W_\mu L$$

$$\frac{\partial^2 \Pi^0}{\partial (\mu^0)^2} > 0 \qquad \text{when } \Pi_{RR} > 0 \tag{5.15}$$

Second, the base level, μ^0, affects how expensive it will be for the firm to avoid unionisation above μ^+ ;

$$\frac{\partial R^C}{\partial \mu^0} = \frac{1}{\phi} \Rightarrow = \frac{\partial \Pi^C}{\partial \mu^0} \cdot \frac{1}{\phi} \tag{5.16}$$

We then have two possible cases illustrated in Figure 5.4.

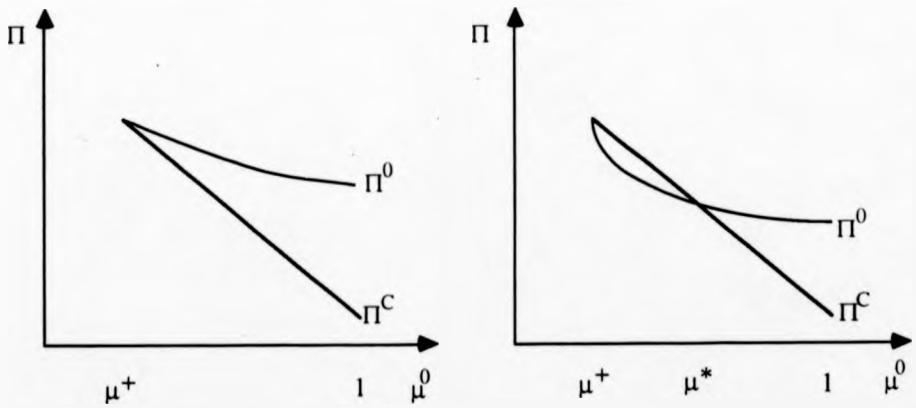

Figure 5.4:

Case 1. Ineffective Management Opposition

Case 2. Potentially Effective Management Opposition

Case 1 can be labelled the case of 'ineffective management opposition' and corresponds to a situation where[6]:

$$W_\mu L \leq \frac{1}{\phi} \qquad (5.17)$$

i.e. the necessary marginal costs to hold μ at μ^+, when μ^0 rises, exceed the increase in labour cost caused by higher union density.

Case 2, on the other hand, is a situation in which it pays the firm to fight unionisation when μ^0 is low:

$$W_\mu L > \frac{1}{\phi} \quad \text{for } \mu^0 = \mu^+ \qquad (5.18)$$

There is, however, a critical level of μ^0, say μ^*, where the firm is indifferent between opposing and not opposing unionisation (which means that $\Pi^0 = \Pi^C$). Thus,

$$R = 0 \text{ if } \mu^0 > \mu^* \quad \text{and } R = R^C \text{ if } \mu^0 \leq \mu^*.$$

Note that these results also hold if the base level of unionisation is higher than unity, i.e. a situation in which the firm must spend a certain amount of resources before it obtains lower unionisation. Similarly, of course, $\mu^* > 1$ is a possibility.

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[6]If (17) holds for $\lambda^0=\lambda^+$, it follows from (15) and (16) that Π^0 exceeds Π^C for all $\lambda^0>\lambda^+$.

Our main argument, then, can be summarized as follows. The union obtains a positive mark-up on the competitive wage with a membership μ^0 if both:

(i) $W(\mu^0) > W^C$,

and either,

(ii) $W_\mu L \leq 1/\phi$, for $\mu^0 = \mu^+$ (management opposition is ineffective - Case 1)

or

(iii) $\mu^0 > \mu^*$ (the base level is sufficiently high to induce passivity by the firm - under Case 2).

Conversely, the firm spends resources to fight unionisation, such that $\mu^0 = \mu^+$, if three conditions hold simultaneously:

(i) $W(\mu^0) > W^C$,

(ii) $W_\mu L > 1/\phi$, for $\mu^0 = \mu^+$ (management opposition is effective)

(iii) $\mu^0 < \mu^*$ (the base level is sufficiently low).

The next section considers the comparative static properties of the model.

5.5 Comparative statics

The wage and the union membership predicted by our model are affected in various ways as parameters describing the wage formation and the unionisation process change.

(i) *Reputation effects and the cost of membership*

The implications of parameters which describe unionisation are reasonably straightforward. The base level, μ^0, will differ across establishments as either reputation and social custom effects or costs of membership vary (see Section 5.3). A reduction in μ^0 reduces the bargaining strength of the union, possibly to a level where the wage equals the competitive level. A lower base level of union membership may also induce the firm to spend resources to push union membership down to the base level. This will occur provided that opposition is "effective" and that μ^0 has become

lower than μ^*. The negative wage effect of a lower μ^0 will be strengthened by this change in management policy.

(ii) ***Effectiveness of management opposition.***

The effectiveness of management opposition, measured by ϕ, has intuitively reasonable implications for unionisation and wages. A higher ϕ makes it more likely that spending resources is "effective". Moreover, an increase in ϕ reduces the steepness of Π^C and a lower μ^* follows, as would be evident in Figure 5.4. It is therefore more likely that a firm finds it advantageous to spend the resources to fight unionisation and therefore realize $\mu=\mu^+$.

(iii) ***Market power***

Like most wage bargaining models, our set-up predicts that the workers obtain a share of the rents created by a higher product market power - see the appendix for details of the case in which market power is interpreted as the inverse of the product demand elasticity. The implications for wages and unionsation are as follows. The workers obtain a positive mark-up on the competitive wage at a lower level of unionisation when market power is high, i.e. μ^+ is low in firms with strong market power. However, this mark-up is obtained by the workers only if the base level, μ^0, exceeds μ^*, given that management opposition is

otherwise effective. The size of market power has an ambiguous effect on μ^*. Since more market power reduces μ^+, it becomes more expensive for the firm to keep unionisation at the level which yields W^C as the outcome of the wage bargaining. Thus, the necessary R^C increases and Π^C falls for any level of μ^0. This effect contributes to a lower μ^*. On the other hand, the firm keeps all the rent from more market power if unionisation beyond μ^+ is avoided, but has to share the higher profits if it does not spend resources to fight union membership. This provides the firm with stronger incentives to fight unionisation and therefore contributes to a higher μ^*. Thus the overall effect on μ^* is ambiguous.

Our model predicts, then, that the standard positive relationship between the firm's product market power and the wage is not necessarily true when management opposition towards unionisation is taken into account. A firm with strong market power may find it advantageous to fight unionisation simply because the rents with low union membership are greater.

(iv) ***The competitive wage***

The competitive wage represents the outside options to the workers and is therefore the lower bound on the wage. If W^C increases, a higher union density is required to obtain a bargained wage above the competitive level. Moreover, the profit in the event of no management opposition (Π^C) is reduced for all base

levels of unionisation. The profit (Π^0) of a passive firm, however, is unaffected as long as the competitive wage does not affect W^B. As Π^C shifts and Π^0 is unaffected, the critical level of unionisation, μ^*, is reduced when the competitive wage increases An illustration is given in Figure 5.5.

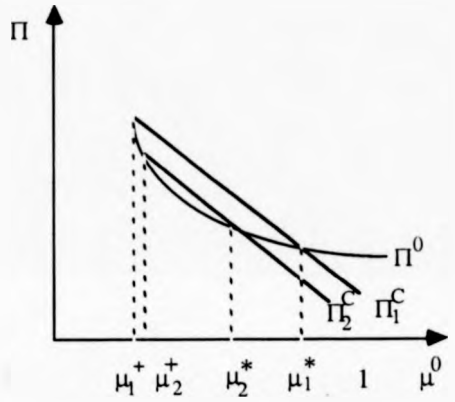

Figure 5.5. An Increase in the Competitive Wage.

A lower μ^* means that unionisation becomes more likely as a consequence of a higher competitive wage. Since the benefits from management opposition are lowered, the firm will accept the union at a lower base level of union density.

In the various microeconomic theories of wage formation, the competitive wage often affects the outcome through the union objectives or via the disaggreement payoffs. Our conclusion still holds under such circumstances so long as an increase in the

competitive wage does not raise the wage ratio (W^B/W^C). Even if W^B increases as a consequence of a higher competitive wage, the shift in Π^C will be larger than that of Π^0 and, consequently, μ^* will decrease.

5.6 Concluding Remarks.

The open shop trade union is an empirically important context for bargaining between a firm and a union and is likely to become increasingly relevant in the UK following further legislation to weaken the closed shop. Yet most theoretical models are concerned exclusively with the case of the closed shop with fixed union membership. It has been argued that empirical evidence also supports the view that management opposition can be a major influence on union membership. In this paper we offer a microeconomic model of union-firm bargaining in which union density is made endogenous through the possibility that the profit-maximising firm will allocate resources to weaken support for union representation. We show that the firm *either* spends just sufficient resources to reduce union membership to that level at which the outcome of the wage bargaining equals the competitive wage *or* accepts unionisation without allocating any resources in opposition. The comparative static properties of the model are then able to address a richer set of parameters than is true of more orthodox models. Thus, for example, our model

predicts that the standard positive relationship between the firm's product market power and the wage does not necessarily hold when management opposition is taken into account. This prediction is consistent with econometric evidence which finds that both product market conditions and the bargaining arrangements at the establishment combine to determine the capacity of the union to raise wages above non-union levels [see Stewart (1987) and (1990)].

APPENDIX 5.1

On the influence of market power

Let each firm face a product demand given by:

$$Y = \bar{Y}\left(\frac{P}{\bar{P}}\right)^{-E}, \quad E > 1 \tag{A5.1}$$

where $\bar{P} = 1$ denotes the overall price level, for simplicity. The firm has a constant labour productivity set to unity:

$$L = Y \tag{A5.2}$$

The revenue function, F, is then given by:

$$F = \bar{Y}^{1/E} L^{1-1/E} \tag{A5.3}$$

By inserting (A5.3) in the wage bargaining equations (5.3) and (5.4), we obtain a reduced form solution for the wage;

$$W^B = \frac{1}{Z}\left[(1 - \beta)s + \beta\mu W^0\right] \tag{A5.4}$$

where

$$Z = 1 - \beta\frac{E}{E - 1}\left[1 - (1 - \mu)^{1 - 1/E}\right] > 0 \tag{A5.5}$$

Z is increasing in E since

(A5.6)

$$\frac{\partial Z}{\partial E} = \frac{\beta}{(E - 1)^2}\left[1 - (1 - \mu)^{1 - 1/E} - \frac{E}{E - 1}\ln\left(\frac{E}{E - 1}\right)(1 - \mu)^{1 - 1/E}\right] > 0$$

Thus, more market power, interpreted as a reduction in E (a lower product demand elasticity), implies a higher wage for a given unionisation level.

The critical level of union density, μ^+, from which higher unionisation implies a wage above the competitive level, is therefore decreasing in the size of the firm's market power. Moreover, as long as $\mu > \mu^+$, the union captures a part of the rent created by more market power.

Chapter 6 Further Labour Market Applications of the Social Custom Model.

In this chapter, we consider two further labour market applications of the social custom approach to economic analysis. The first is concerned with the debate concerning the credibility of the harassment threat in the insider-outsider literature on involuntary unemployment. The second is concerned with the analysis of tax evasion and how the social custom model is able to offer explanations of observed behaviour which are difficult to reconcile with orthodox theory.

6.1 On The Credibility of Harassment in the Insider-Outsider Model: the Impact of Social Customs and Discrimination

6.1.1 Introduction

It is well-known that theories of long-term involuntary unemployment in free-market economies must be able to explain the absence of effective underbidding by unemployed workers. The various explanations of involuntary unemployment which are currently and widely regarded as the most powerful address the issue of underbidding directly. Efficiency wage models, for example, carry the implication that firms will not wish to recruit underbidding workers who, by the very fact of their apparent low

reservation wages, signal their low potential productivity to the firm. Hysteresis models based on the depleted human capital or scarring effects of long-term unemployment are also consistent with firms not being attracted towards the employment of workers who might be prepared to underbid the wages of employed workers. Insider-outsider models are capable of explaining both (a) why firms might not replace incumbent workers with underbidding workers and (b) why unemployed workers might not underbid even if they would be prepared to work at wages less than or equal to the wages received by insiders, ceteris paribus. The choice by firms not to recruit underbidding outsiders has a number of possible sources. First, the replacement of insiders by outsiders can be expensive because of hiring, firing and training costs [see Lindbeck and Snower (1984a)]. Second, effort might be inversely related to the labour turnover rate, giving the firm an incentive to maintain a stable workforce [see Lindbeck and Snower (1984b)]. Third, insiders might withdraw cooperation from new entrants to the firm, thereby lowering the potential productivity of workers who would be prepared to underbid incumbents' wage levels. Similarly, the decision by outsiders not to underbid could follow from the threats made by insiders to harass new entrants, thereby raising the entrants' disutility of work [see Lindbeck and Snower (1988)].

The above explanations of the absence of effective underbidding are underpinned by rigorous traditional neoclassical micro-foundations. A less traditional, but equally rigorous,

explanation was provided by Akerlof (1980) who argued that a social code invoking firms and workers to recognise a 'fair wage' could also generate involuntary unemployment without underbidding. Akerlof argued that a more sophisticated social code would be one by which insiders refused to cooperate in the training of new entrants. Clearly, Akerlof's social custom model is closely related to the cooperation-harassment variant of the insider-outsider model developed by Lindbeck and Snower.

In this part of the current chapter we are concerned with this relationship between, on the one hand, the particular insider-outsider model based on cooperation and harassment strategies and, on the other, the social custom model associated with Akerlof (1980). Lindbeck and Snower (1986) have argued that the social customs, of the sort discussed by Akerlof, do not themselves play any intrinsic role in influencing economic behaviour or outcomes: they simply reflect the optimising behaviour of individual agents. More concretely, the social norms - or mores - which appear to induce unemployed workers not to underbid the wages of the employed are merely the reflection of the futility of underbidding: "Our line of argument suggests that these mores may be traced to the entrants' anticipation of hostile insider reaction and that this reaction may follow from optimisation behaviour of insiders." [Lindbeck and Snower (1986)]. Social norms are an output of rational individual optimisation, they have no impact on economic outcomes. Elster (1989) takes issue with this view, arguing that the threat of hostile insider reaction is unlikely to be credible

given that insiders are likely to suffer disutility from hostility: "If an outsider is hired, would it then still be in the insider's interest to be unfriendly and uncooperative? Since Lindbeck and Snower believe that 'harassment activities are disagreeable to the harassers'{Lindbeck and Snower (1988)}, they ought also to assume that outsiders will recognise this fact and, in consequence will not be deterred by fear of harassment." [Elster (1989)]. That the threat of harassment is not sufficient to deter underbidding leads Elster to conclude that a social norm will be necessary to sustain the insider-outsider model.

In this chapter we explore this claim. We conclude that some social convention is necessary for the validity of the harassment argument in the Lindbeck and Snower (1988) one-period insider-outsider model. Hence, we are in agreement with both Akerlof (1980) and Elster (1989). However, we find the addition of a role for a social convention to be otherwise consistent with the insider-outsider framework and, in particular, to add further weight to the claim that insider-outsider models can provide a rationale for the presence of trade unions, as well as suggesting an important role for discrimination.

6.1.2 The Non-Credibility of Harassment

Harassment by insiders increases the entrants' disutility of work above that of the incumbent insiders and thereby, ceteris paribus, raises the outsiders' reservation wage above that of the

insiders. This enables the insiders to push their wage above their own reservation wage without risking underbidding so long as the wage level stays below the outsiders' reservation wage. Of course, the wage that insiders can set will also be subject to the firm's absolute profitability constraint. Harassment affects only the disutility of work and hence insiders and outsiders are assumed to have equal productivity if we abstract from other features of insider-outsider models, such as cooperation, effort and turnover costs. In the current paper we are interested in isolating the effects of harassment activity and therefore we shall assume that all workers are homogeneous with respect to productivity. Figure 6.1.1 represents the simple case in which, in the absence of harassment, all workers have a reservation wage of r. If there are initially $\widehat{m}$ workers, then the firm will wish to expand employment to m_1, recruiting $m_1 - \widehat{m}$ new entrants. If, however, insiders can harass new entrants and hence raise the latters' reservation wage to r_e^h, without affecting their own disutility of work, then the $\widehat{m}$ incumbents will be able to raise their wage to without risking underbidding. For simplicity, we assume that harassment is a discrete choice.

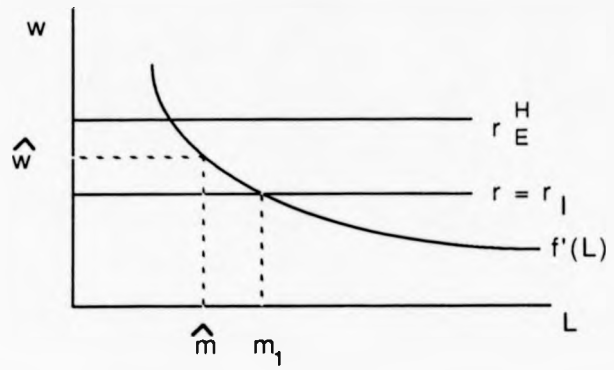

Figure 6.1.1. Reservation wages and disutilities of work.

If new entrants are recruited by the firm, then insiders will have an incentive to harass: harassment is a dominant strategy for the insiders as it is costless. Anticipating this, entrants will not offer to work for less than . The threat of harassment is credible. However, if we now allow insiders' disutility of work to be affected by their harassment activity, then the picture changes.

We now suppose that harassment activities are indeed disagreeable to the harassers. In the event that harassment still takes place, the insiders' disutility of work is higher and hence their reservation wage increases to some new level, denoted by r_I^h. So long as $r_I^h < r_e^h$, there remains some scope for insiders to bargain a wage in excess of r, without inducing underbidding. However, harassment of entrants by insiders is no longer a credible threat. As Fehr (1990) argues, if the insiders' bluff is called and new entrants are employed then, in the absence of some pre-commitment mechanism, insiders will prefer not to implement

harassment. In terms of the extensive game form representation, Figure 6.1.2 represents this argument in the manner of Elster (1989).

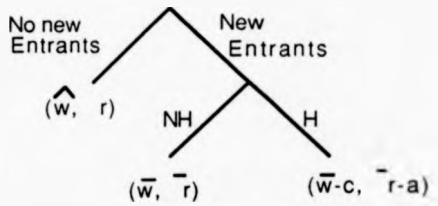

Figure 6.1.2 The credibility problem.

If the firm employs no new entrants, then this is the best possible outcome for insiders who receive a wage $\hat{w}$, as in Figure 6.1.1. Outsiders receive their reservation payoff, r. If entrants are employed at some wage, $\bar{r}$, greater than r but which underbids the previous wage of the insiders, then we assume that this lowers the insider's wage to some level $\bar{w}$. If there is no harassment, insiders receive $\bar{w} < \hat{w}$: they are worse off than had no new entrants been employed. However, they will not have an incentive to harass as doing so would lower not only the new entrants' utility from work (by some amount a), but also their own payoff (by an amount c which represents the insiders' disutility of harassment). Again, we see that the insiders' harassment threat is not credible. Elster (1989) concludes that a social norm is necessary to prevent underbidding from undermining the

harassment pillar of the insider-outsider model. We turn to the role of social norms in this context in Section 6.1.3.

The aspect of the harassment-credibility problem which has not been identified before lays in its potential free-rider characteristics. All insiders might agree that a policy of harassing new entrants would improve their wage prospects, but each insider is likely to calculate, at least when the workplace is large, that his/her own contribution to the collective harassment activity is small relative to that individual's private costs of harassment. In other words, the benefit of harassment - laying as it does in the deterrence of underbidding - is a public good to insiders. When the number of incumbents is large, provision of the public good, that is participation in the collective action of harassment, acquires the characteristics of a multi-person prisoners' dilemma [see Olson (1965) and Hardin (1982)]. Each individual has a dominatant strategy of free-riding and therefore the outcome is the failure of collective action. No-one will harass, the threat is not credible and so underbidding will occur.

Situations in which multi-person collective action fails to achieve optimal provision of a public good are well-known. Schelling (1978) offers probably the classic treatment. More recently, a number of papers have developed formal models in which collective action failures can be overcome by forces of social custom and peer pressure. These models are based on the dependence of an individual's utility on the behaviour and beliefs

of other individuals in the relevant population. Akerlof (1980) provides the seminal paper in this area. Booth (1985) develops a model showing how the existence of union membership can be explained in the social custom framework. Also in this tradition, Naylor (1989) analyses strike solidarity. Naylor (1990) demonstrates the relationship between these models and the framework associated with Schelling (1978). Additionally, Hollander (1990) develops a social exchange approach to voluntary cooperation which is capable of providing an analysis of collective action problems broadly in this tradition.

In the current application we construct a social custom model which provides an explanation for the credibility of the harassment threat in the insider-outsider model. We can imagine two ways in either of which a social custom might have a bearing on underbidding. First, if agents follow a social code which specifies a minimum fair wage, as in Akerlof (1980), underbidding might be anathema, even without the harassment threat. Second, a social norm amongst insiders invoking workers not to free-ride on the harassment activities of their colleagues could generate the collective action needed to sustain the credibility of the threat of harassment. This is the case we now turn to examine in some detail.

6.1.3 A Social Custom Solution

We write the utility function of an insider, i, as:

$$U_i = w_i(\mu) - L_i - c(H_i) - \varepsilon_i\mu(1 - H_i),$$

where
- μ = proportion of insiders who harass
- H_i = 1 if individual i harasses; 0 otherwise
- w_i = the insider's wage, which is assumed constant across all insiders and is a decreasing function of μ
- L_i = 1 if the insider is employed; 0 otherwise
- c = the insider's disutility of harassment
- ε_i = the individual's sensitivity to peer pressure.

We assume that there is social custom invoking workers to participate in harassment activity. Workers who adhere to this social custom are rewarded with solidarity-derived utility. We shall be concerned only with the case in which all incumbents remain in employment, hence we assume $L_i = 1$. We are able to ignore the effect of the individual's harassment decision on w, through μ, because of our assumption of a large incumbent workforce. If the individual chooses to harass, utility is given by

$$U_i^H = w_i(\mu) - 1 - c$$

Conversely, if the individual does not harass, utility is

$$U_i^{NH} = wi(\mu) - 1 - \varepsilon_i\mu$$

The individual will be indifferent between harassment and non-harassment if

$$F = U_i^H - U_i^{NH} = 0$$

i.e. $$\varepsilon_i = c / \mu$$

This is represented by the decision schedule in Figure 6.1.3. Also in Figure 6.1.3 we represent the distribution of the parameter ε. We assume that individuals are homogeneous and hence that there is a common value for ε across the population: $\varepsilon_i = \bar{\varepsilon}$. This follows Schelling (1978) and Booth (1985). Consequently, the existence of harassment activity depends on the relative strengths of $\bar{\varepsilon}$ and c. If c is large relative to $\bar{\varepsilon}$, then the F = 0 schedule will lay further toward the right and will not intersect $\varepsilon = \bar{\varepsilon}$ within the $0 \leq \mu \leq 1$ range. In such a case, $\mu = 0$ is the only possible outcome. As c falls sufficiently (or, alternatively, as $\bar{\varepsilon}$ rises) the decision schedule intersects the $\bar{\varepsilon} = \varepsilon$ distribution schedule. There are now multiple equilibria. We can identify three types of equilibrium when the schedules are as depicted in Figure 6.1.3. First, if $\mu = \mu^*$ then there

is a Nash equilibrium. No individual can increase his or her utility by changing behaviour. If, however, $\mu > \mu^*$ then everyone would be better off by engaging in harassment and hence μ will tend towards unity. Conversely, if $\mu < \mu^*$ then everyone will prefer not to harass and hence harassment will atrophy. Consequently, $\mu = \mu^*$ is the critical level of harassment activity which insiders must achieve. But μ^* is not itself a stable equilibrium: the only stable equilibria are at $\mu = 0$ and at $\mu = 1$. It is clear that the critical level of harassment activity, μ^*, is growing in the insiders' disutility of harassment and falling in the insiders' sensitivity to social custom or solidarism effects. If $\bar{\varepsilon}$ is sufficiently small relative to c then the only equilibrium is at $\mu = 0$. There are no values of c and $\bar{\varepsilon}$, however, which generate $\mu = 1$ as a unique equilibrium outcome: $\mu = 0$ is always a stable equilibrium. For the threat of 100% harassment to be credible, outsiders must perceive that c and $\bar{\varepsilon}$ are such that $\mu > \mu^*$.

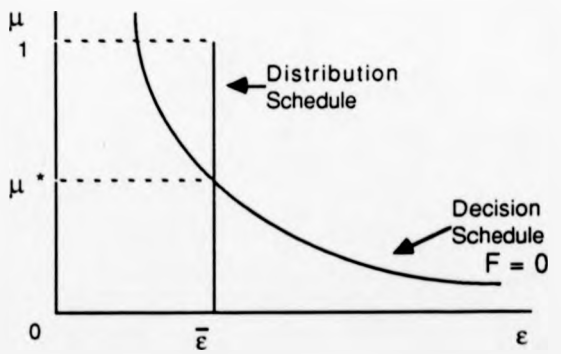

Figure 6.1.3 A Collective Action Solution.

There are various ways in which solidarity amongst insiders might be enhanced, thereby raising the value of $\bar{\varepsilon}$ and, consequently, lowering μ^*, the critical mass level of harassment. For example, it is common in the literature on insider-outsider models to regard insider power as closely related to trade union power. Indeed, Lindbeck and Snower (1986) argue that the insider-outsider model can be interpreted as providing a microeconomic rationale for the existence of trade unions. Our model is consistent with this view. A trade union is one possible social institution in the workplace which can serve to increase the solidarism of collective action amongst workers, and in the present context, to sustain the credibility of the harassment threat.

A second such social institution [or social convention, following Sugden's (1986) more general definition] is the presence of discriminatory tastes or beliefs among workers. If workers in an establishment belong to one social group and outsiders [are at least perceived to belong] to another, then a discriminatory attitude could cement collective harassment amongst insiders against new entrants. The more overt is discrimination among different groups in a society, then the more powerful is the harassment argument likely to be within the insider-outsider framework, especially if the stock of unemployed workers is not drawn randomly from the different social groups. In this light, discrimination can be seen as a device by which insiders increase their bargaining power. This means that the social convention of

discrimination is likely to be more durable than are the individuals' tastes for discrimination, conceptualised by Becker (1957), which are utility-lowering to the holders.

6.1.4 Conclusion and Further Remarks

Insider-outsider models provide an important insight into the microeconomic determinants of various key "stylised facts" of the macro-market for labour. Within this framework, there are a number of complementary explanations of why firms might not wish to recruit new entrants who are offering to underbid current job incumbents. Additionally, the harassment hypothesis suggests a reason why outsiders might not choose to underbid insiders even if the outsiders' reservation wages are below the wages received by insiders. At least for the one-period case, however, this explanation is undermined by the credibility problem confronting the threat of harassment. In the current paper we have addressed this issue, identifying the public goods nature of harassment activity and arguing that the multi-person prisoners' dilemma root of the credibility problem can be overcome by the presence of a social custom and associated peer pressure effects among the population of incumbent workers. The social custom approach allows for solidarity-derived utility which effectively acts as a private incentive benefit offsetting the private cost of

harassment. So long as participation in harassment exceeds a critical threshold, then insiders will harass unanimously. The prospects for successful collective action - unanimous harassment - are greater (i) the lower is the critical mass required and hence the lower is c, the insiders' disutility of harassment, and (ii) the greater is $\bar{\varepsilon}$, the incumbents' sensitivity to solidarity around the social convention. The latter can be enhanced through the presence of trade unions or, alternatively, is likely to be a characteristic of inter-group discrimination. Hence, the model is consistent with the idea of the insider-outsider framework providing a rationale for unionisation, and also suggests that the framework - or at least those models incorporating the harassment thesis - is likely to be more powerful when discrimination is a feature of the labour market.

In order to concentrate on the application of the social custom model to the issue of the credibility of the harassment threat in the insider-outsider model, we have made a number of simplifying assumptions. In the further development of this work a number of these assumptions should be relaxed. In particular, the social custom model should be nested in a more complete model of profit maximising behaviour by the firm. Second, we have assumed that workers are homogeneous with respect to solidarity-derived utility. Therefore the only stable equilibrium levels of harassment occur at $\mu = 0$ and $\mu = 1$. Allowing for worker heterogeneity would produce the possibility of an intermediate stable equilibrium. The effects of this on outsider behaviour are

potentially interesting but complex. Finally, we have focussed on the issue of the threat of harassment. The determinants of cooperative activity are likely to be similarly amenable to the sort of analysis we have developed in this section of the current chapter.

6.2 Conformity and Conscience in the Context of Tax Evasion

6.2.1. Introduction

There are a large number of economic contexts in which the actions of individual economic agents are likely to be interdependent, either through the strategic nature of the agents' behaviour or through preference interdependency. In the context of tax evasion, Cowell (1990) has shown that the empirical evidence suggests the importance of taking into account the influence on taxpayers' behaviour of, *inter alia*, morality and the attitudes and actions of community, which we interpret as a form of preference interdependency. In particular, Cowell cites evidence from Baldry (1986, 1987) that some individuals choose not to evade, 'apparently on moral grounds,' and from Schwartz and Orleans (1967) indicating that, 'Social devices that appeal to conscience and civic responsibility may be more effective than legal sanctions.' In the current context we argue that our understanding of the impact of morality and conformity on tax evasion can be enhanced by the application to this problem of the social custom model developed by Akerlof (1980) and applied to the problem of the provision of public goods by Naylor (1989). Our approach is closely related to the model developed by Cowell (1990) and is supportive of his conclusions. In particular, we find the prevalence of both "epidemics" of evasion and "clumping"

behaviour in equilibrium. The major differences lie in our explicit treatment of heterogeneity of the relevant population with respect to the individuals' sensitivities to the actions and beliefs of others and in our explicit distinction between morality and conformity effects.

The plan of this part of the chapter is as follows. In section 6.2.2 we examine the impact of conformity on tax evasion and analyse the comparative static properties of model. In section 6.2.3 we extend the model to allow for heterogeneity with respect to sensitivity to a social custom and consider how this affects the properties of the model. In section 6.2.4 we offer some concluding remarks.

6.2.2 Tax Evasion and Conformity

Cowell (1990) describes the individual's decision about tax evasion as a two stage process in which the person first decides whether or not to evade and, secondly, decides how much tax to evade, conditional on the first stage decision. This paper addresses the first stage in such a process.

We characterise the individual by the utility function:

(6.1) $$U = U(y, t, p, f, S, c)$$

where y represents gross income

t represents the amount of tax to be paid

f represents the fine for evasion

p represents the probability of detection

S represents the utility derived from conforming with the group of tax-payers[7]

c represents the utility derived from adhering to the social custom invoking individuals to act honestly.

We follow Akerlof's definition of a social custom 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." We specify (6.1) more precisely as, without loss of generality, the additively separable utility function:

$$U = y - t(1-Q) - pfQ - RQ - cQ \qquad (6.2)$$

where $s = \begin{cases} 1 & \text{if the individual evades paying tax} \\ 0 & \text{otherwise} \end{cases}$

Hence, if the individual decides to evade paying tax, t, she has utility given by gross income, y, minus the expected value, pf, of the fine, f, minus the foregone utilities associated with adhering to the social custom and with conforming with other tax-payers. We now specify the conformity-derived utility to depend (i)

[7] It can be shown that the results of the model are not changed qualitatively if we allow for symmetric conformity effects within the group of non-payers.

positively on the proportion, μ, of the population paying the tax, and (ii) on the individual's sensitivity, ε, to the pressure to conform. Thus,

(6.3) $$S = \varepsilon\mu.$$

Hence, (6.2) becomes:

(6.4) $$U = y - t(1-Q) - pfQ - \varepsilon\mu Q - cQ$$

Accordingly, if an individual evades the tax (Q=1), the utility, U^E, of doing so is given by:

(6.5) $$U^E = y - pf - \varepsilon\mu - c$$

Whilst the utility, U^{NE}, associated with honest payment (Q=0) is:

(6.6) $$U^{NE} = y - t$$

We assume that the individual will evade the tax if $U^E > U^{NE}$. Hence, the individual evades if:

(6.7) $$t > pf + \varepsilon\mu + c$$

i.e. if, *ceteris paribus*, t is sufficiently small, or if:

(6.8) $$\varepsilon < (t - pf - c)/\mu$$

i.e. if, *ceteris paribus*, ε is sufficiently small.

In Figure 6.2.1 we graph the schedule $\varepsilon = (t - pf - c)/\mu$. We call this the evasion-schedule. To the right of this schedule we have that $\varepsilon > (t - pf - c)/\mu$, and hence for these parameter values individuals will not evade. Conversely, to the left of the evasion-schedule $\varepsilon < (t - pf - c)/\mu$, and hence individuals will evade.

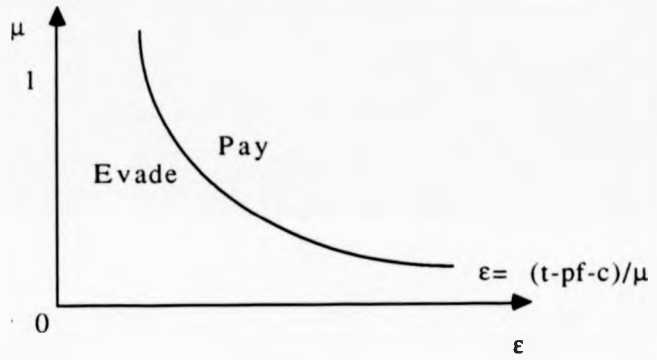

Figure 6.2.1 The Decision Schedule

The distribution of ε is assumed to be uniform with a lower bound of ε_L and an uper bound of ε^H It can be shown that the results are not sensitive to this assumption. Any non-convex distribution of ε will possess qualitatively similar properties. In Figure 6.2.2 we bring together the evasion and distribution schedules.

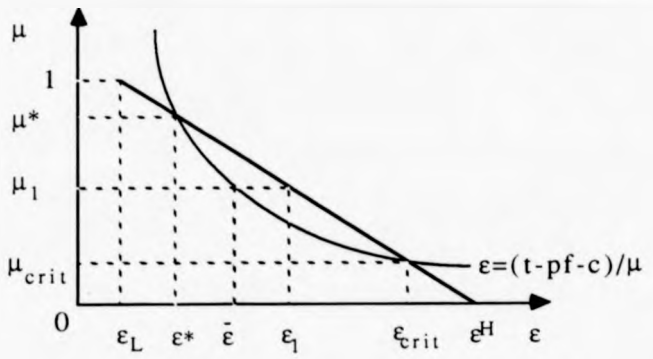

Figure 6.2.2. Decision and Distribution Schedules

Suppose the proportion of the population paying the tax is initially at the level μ_1, in Figure 6.2.2. Then these will be the individuals with the greatest sensitivity to the conformity derived utility. Hence, from the distribution schedule in Figure 6.2.2 we can identify the μ_1 payers as those individuals for whom $\varepsilon_1 \leq \varepsilon_L \leq \varepsilon^H$. All of these individuals have $\varepsilon > \bar{\varepsilon}$, the degree of sensitivity associated with indifference between payment and evasion: defined as the value of ε which satisfies equation (6.1) - the evasion schedule in Figure 6.2.2 - for $\mu = \mu_1$. Therefore, μ_1 generates sufficient conformity derived utility to be at least self-sustaining. Additionally, however, there will be individuals among the $1-\mu_1$ non-payers who will be induced to pay by the μ_1 level of payment conformity. Thus, $1-\mu_1$ is not an equilibrium degree of tax evasion. The proportion of the population paying tax will grow from a level such as μ_1. Indeed, we can see from Figure 6.2.2 that wherever the distribution schedule lies to the right of the evasion

schedule there will be this tendency for the proportion paying tax to increase. Conversely, wherever the distribution schedule lies to the left of the evasion schedule there will be a tendency for the proportion evading tax to fall.

In this way it emerges that there are three equilibria in the case depicted in Figure 6.2.2. These equilibria are at μ^*, μ_{crit} and at $\mu=0$. μ_{crit} has the properties of a critical mass level of payment: it is, for example, an unstable equilibrium. If the proportion of the population paying tax is less than this level, μ_{crit}, then there will be insufficient payers to generate the necessary conformity-derived utility to sustain payment. In this circumstance μ will tend to atrophy to zero. There is an "epidemic" of non-payment. As a corollary of this, $\mu=0$ is a locally stable equilibrium. If, on the other hand, the proportion of the population paying tax exceeds μ_{crit} then μ will tend to increase to μ^*. There will be a payment epidemic. Similarly, μ will fall to μ^* from above. Thus, μ^* is locally stable. Hence, in the case depicted in Figure 6.2.2 we are likely to observe the clumping behaviour described by Cowell (1990) at either $\mu=0$ or at μ^*. Notice that $\mu^* < 1$.

Of course, Figure 6.2.2 represents just one possible outcome. There are two other possible cases. These are both variants of the case shown above. First, suppose that the evasion schedule lay further to the left such that the two schedules intersected only once - at μ_{crit}. Then the properties of this case would be the same as above except that the non-zero stable equilibrium would be at

$\mu=1$, involving no tax evasion. Second, if the evasion schedule lay everywhere to the right of the distribution schedule then the only equilibrium would be the $\mu=0$ stable case, implying total tax evasion. We are now in a position to examine the properties of the model.

(i) Property 1 - *a change in c.*

Assume initially that the outcome is at $\mu = \mu^*$ in Figure 6.2.2. An increase in c, the disutility of breaking the social custom, will shift the evasion schedule to the left. This will cause μ^* to rise, possibly until there is 100% payment, and will lower the critical mass required to induce payment.

(ii) Property 2 - *a change in p, f.*

An increase in the expected cost of evasion, that is in either p or f, will have the same effect as an increase in c. μ^* rises and μ_{crit} falls.

(iii) Property 3 - *a change in t.*

An increase in t will cause the evasion schedule to shift to the right causing a fall in μ^* and a rise in μ_{crit}.

(iv) Property 4 - *an asymmetry.*

From an initial outcome such as μ^*, in Figure 6.2.2, a parameter change which causes the evasion schedule to lie everywhere to the right of the distribution schedule (such as an increase in t) will induce a fall in the proportion paying tax to $\mu = 0$. Should there then be a return to the previous parameter values (e.g. a restoration of the previous tax rate) then μ^* is again a potential stable equilibrium outcome. However, it is **not** the **necessary** outcome, as $\mu = 0$ is itself a stable equilibrium. Thus, we have the possibility that two otherwise identical situations (in time or place) might exhibit very different behaviour with respect to tax evasion, because of the multiple equilibria which characterise the possible outcomes. An implication is that taxing authorities must pay attention to the problems associated with inducing an epidemic of non-payment from an initial clumping such as μ^*. It may be much more difficult to induce the reverse epidemic. The difficulty is likely to depend upon the level of μ_{crit}, the critical mass.

(v) Property 5 - *changes in* ε.

An increase in the sensitivity of individuals to conformtiy-derived utility is represented by a rightward shift in the distribution schedule. This will raise the stable non-zero level of μ and lower the critical mass level. A mean-preserving reduction in the variance of ε is represented by a clock-wise rotation of the distribution schedule. In the limit, when individuals are homogeneous with respect to ε, clumping occurs at $\mu=1$ and $\mu=0$.

6.2.3 Tax Evasion and Morality

In the previous Section we considered how sensitivity of the population with respect to the degree of conformity to tax-paying creates interdependencies and therefore, *inter alia*, clumping and epidemic behaviour. We assumed that individuals were homogeneous with respect to c, the disutility of transgressing the social custom invoking individuals to honest behaviour. In this Section we allow for heterogeneity with respect to c. Initially, we assume that the population can be divided into those who believe in the social custom, and therefore experience disutility c of breaking the custom, and those who are non-believers and who therefore experience no such disutility.

Under these assumptions, the utility function becomes:

$$U = y - t(1-Q) - pfQ - \varepsilon\mu Q - cQb \tag{6.9}$$

where parameters are as before and b=1 for believers and b=0 for non-believers. Hence, we now have two evasion schedules: one for believers and the other for non-believers. For a believer, i, we have that the individual will evade tax if:

$$\varepsilon_i < (t - pf - c)/\mu \tag{6.10}$$

For a non-believer, j, we have that the individual will evade tax if:

(6.11) $\varepsilon_j < (t - pf)/\mu$.

These two evasion schedules are depicted in Figure 6.2.3.

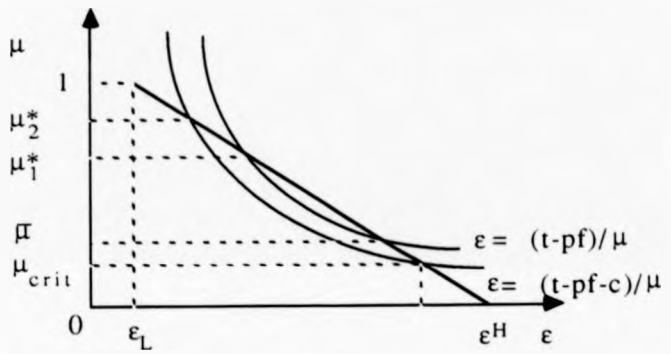

Figure 3. Tax Evasion Equilibria

From Figure 6.2.3 we see that the model has changed in an important respect. It is still the case that $\mu=0$ is a stable equilibrium and that there is a critical mass, μ_{crit}, level of μ. However, in place of single-point equilibria at μ^* and μ_{crit}, we now have ranges of locally stable equilibria. Thus, we have a richer set of multiple equilibria. Otherwise the properties of the model are unaffected by the introduction of the distinction between believers and non-believers.

At this point, however, we should introduce the new condition for equilibrium required in the extended model. In equilibrium we should now require that the proportion of the population obeying the social custom, i.e. the value of μ representing the proportion of the population paying the tax, should be equal to the proportion of the population believing in the social custom, i.e. the proportion of the population, say τ, for whom b=1. We follow Akerlof's (1980) definition of a long-run equilibrium, adopting his assumption that if τ is greater (less) than μ then τ will fall (rise). This assumption can be justified on cognitive dissonance arguments. To show the implications of this assumption, we generalise our previous interpretation of equation (6.9) by allowing b to be a continuous rather than a discrete parameter. We now think of the population as being heterogeneous both with respect to ε and with respect to b. We assume the joint distribution of ε and b to be described by a convex set. From equation (6.9), we have that the individual will be indifferent about evading tax if:

$$b = (t - pf - \varepsilon\mu)/c \qquad (6.12)$$

We depict equation (6.12) in Figure 6.2.4 along with the convex set, represented by the circle, defining the joint distribution of b and ε.

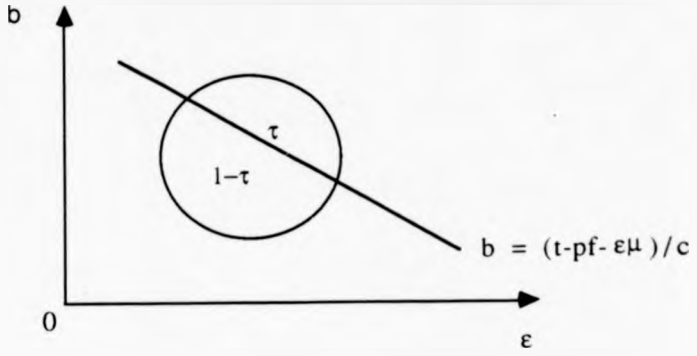

Figure 4. Joint distribution of b and ε.

From Figure 6.2.4 it is clear that as μ increases the schedule representing equation (6.12) shifts downwards and hence that the first derivative of τ with respect to μ is first increasing and then decreasing. Hence, we can show the τ(μ) schedule as in Figure 6.2.5.

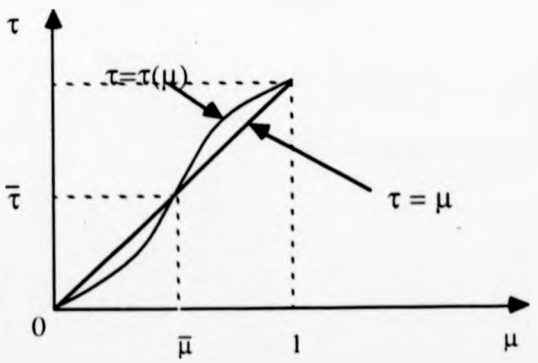

Figure 5. Long-run equilibria

From Figure 6.2.5 we can see that when the proportion paying tax is greater than $\bar{\mu}$, the proportion of the population

believing in the social custom, τ, exceeds that proportion, $\bar{\mu}$, paying the tax and hence τ will fall. We can apply the same logic to the process occurring from an intial point to the left of $\bar{\mu}$. The conclusion is that $\bar{\mu}$ is a stable equilibrium outcome. In other words, extending the model to allow explicitly for both social custom and conformity effects preserves the result that "clumping" will occur in equilibrium. The level of tax evasion at which this clumping occurs will depend, as we have seen before, on the parameters of the evasion and distribution schedules.

6.2.4 Concluding Remarks.

We have considered the roles for both conformity and social custom effects in determining the degree of tax evasion within a population. The population has been taken to refer to the reference group relevant to the individual's decision regarding tax evasion. A society is likely to be made up of various such reference groups. Each group is likely to be characterised by different values of the paramaters influencing tax evasion. Therefore, we should expect to find the different groups or sub-populations experiencing clumping behaviour at different levels of $\bar{\mu}$, implying differential rates of tax evasion across the groups. Within the society's population as a whole, then, the pattern of rates of tax evasion will depend upon both the behaviour of each group and the proportion of each group within the whole

population. This assumes that the sub-populations are independent. Any interactions between these groups will raise further issues which go beyond the scope of this paper, but which suggest a potentially fruitful agenda for further research.

Our starting point was the observation that empirical evidence on tax evasion has suggested an important role for conformity and morality considerations. We have attempted to model these influences within the social custom approach developed originally by Akerlof (1980). Our results support the arguments made by Cowell (1990) who finds that "clumping" behaviour and "epidemics" of evasion are likely to characterise tax evasion behaviour. In particular, we have shown that the influence of conformity generates a critical mass level of evasion which, if exceeded leads towards mass evasion. The stability of this non-payment equilibrium must inform the policies designed by tax authorities, given the asymmetry or ratchet effect we described in Property 4 in Section 6.2.3. So long as the level of evasion is less than the critical mass, there is a stable equilibrium level of tax evasion: which can be non-zero. The population, then, clumps either at zero payment or at the stable equilibrium with some proportion paying and the rest evading tax. When we allow for morality effects, we find that if the joint distribution of the two parameters indicating sensitivity to conformity and morality effects is convex, then there is just one stable equilibrium solution. There is not a critical mass under these circumstances, but there is clumping: with $\bar{\mu}$ paying the tax, and $1-\bar{\mu}$ evading tax.

Chapter 7 Conclusions

In recent years there has been a growing literature on the role of social customs in the labour market. A central theme of this 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. Nonetheless, the dominant mode of economic analysis largely neglects such considerations. Economists frequently dismiss the relevance for economic analysis of social norms with the retort that these are in the domain of enquiry for other social science disciplines. It is, they argue, for sociologists and social psychologists to be concerned with the derivation of individuals' preferences. The economists can then take these as given and consider what economic outcomes will follow from them. If, however, individual preferences are constantly changing in response to the economic environment which they themselves largely shape, then the assumption of exogeneity is invalid. Similarly, if individual preferences are not independent, then economists have to revise their thinking.

The starting point of this thesis has been the observation that, in important economic contexts, individuals' actions appear to be influenced by the actions and beliefs of others. It could be argued that there is no need to model this interaction between individuals' beliefs and actions, and therefore no need to refine

the orthodox economic approach, were it the case that this approach provided a satisfactory framework in such interactive contexts. However, this argument cannot be maintained: not even by the traditional "as if" defence of methodological positivism. This is because the predictions of the orthodox model do not sit comfortably with actual outcomes. For example, as Olson (1965) has argued, economic logic militates against successful collective action in large numbers contexts. Yet it is apparent that this logic does not describe real behaviour in the many situations where the free-riding option is spurned. Albeit to a differing degree - and one which varies over time and across individuals and societies - individuals vote, pay taxes, take their litter home, give blood, donate to charities, pay extra for environmentally-friendly products and join in demonstrations. The issue at the centre of this thesis revolves around the question of how, if at all, we can reconcile this behaviour with the assumptions of economic rationality.

There have been many attempts to refine the definition of economic rationality in such a way as to be able to explain how the problem of the Prisoners' dilemma is overcome. In this thesis, however, we have focussed on a social custom approach which has its origins in the work of Akerlof (1980) and which has been developed in various contexts by a growing variety of researchers. We have vlaimed that in this way we have been able to explain various otherwise puzzling features of economic behaviour in a variety of contexts.

In Chapter 3 we provided a formal derivation of the social custom model in the general context of explaining the logic of collective action. We demonstrated the close relationship between our model and the work of Schelling on the micro-motives of macro-behaviour and considered applications of the model to the issues of explaining trade union membership density and strike-solidarity levels. The original feature of our work was the relaxation of the assumption that all individuals are identical. The assumption of heterogeneity enabled us to explain important 'stylised facts' of behaviour in these contexts. In particular, we were able to make sense of the micro-econometric evidence that workplace rather than personal characteristics are important determinants of an individual worker's trade union status. We also suggested that our approach was consistent with survey evidence on individuals' reasons for union membership. Most important we were able to provide an explanation for the observed intermediate density levels in union open shops.

In Chapters 4 and 5 our concern was to integrate the social custom model developed in Chapter 3 into more orthodox economic models in order to demonstrate the relevance of the social custom approach for mainstream analysis. In Chapter 4 we combined the social custom model of trade union density with the more mainstream microeconomic theory of the trade union. We argued that this is an important step to take as the predominant approach has been to assume that wage bargaining takes place

between a firm and a trade union which has closed shop powers. Instead, open shop arrangements characterise the majority of bargaining cases and therefore motivate an analysis of the causes and consequences of intermediate union representation within the establishment. A second novel feature which Chapter 4 shared with the subsequent chapter was the treatment of union density in the disagreement payoff to the firm when bargaining takes place. Our argument has been that where we are dealing with the open shop union it is not generally valid to assume that wages are set by a monopoly union. Instead we have preferred the more general right-to-manage model in which we have specified a role for union density (endogenously determined) to affect the union's relative bargaining power.

In Chapter 5 we pursued the themes developed in Chapter 4, but adopted the assumption of a role for management opposition to trade union organisation in the determination of union density and therefore of relative bargaining power. In both these chapters we developed the comparative static properties of the model, identifying the ways in which they differ from more conventional analyses.

In Chapter 6 we considered two further labour market applications of the general approach with which we are concerned. The first was to the issue of the credibility of the threat of harassment in the insider-outsider approach which explains the decision by outsiders not to underbid as resulting from threats

made by insiders to harass new entrants, thereby raising the entrants' disutility of work. The second application was to the question of tax evasion. In this context, Cowell (1990) has shown that empirical evidence suggests the importance of taking into account the influence on taxpayers' behaviour of, *inter alia*, morality and the attitudes and actions of community. In particular, Cowell cites evidence from Baldry (1986, 1987) that some individuals choose not to evade, 'apparently on moral grounds,' and from Schwartz and Orleans (1967) indicating that, 'Social devices that appeal to conscience and civic responsibility may be more effective than legal sanctions.' In the current context we argued that our understanding of the impact of morality and conformity on tax evasion can be enhanced by the application to this problem of the social custom model.

In the approach we have been developing throughout this thesis, we have taken the existence of the social norm as given, just as utility arguments are taken as given in the standard neoclassical analysis. Just as it is not regarded as incumbent upon standard analysis to offer an explanation for the origins or nature of utility arguments, so we could evade awkward questions about the origins of social norms and customs. We prefer not to, however. In Chapters 1 and 2 we offer comments and thoughts on the origin of the sorts of social customs with which we have been dealing. Our essential argument has rested on a distinction between, on the one hand, social conventions and, on the other, social norms or customs. We have argued that the latter are likely

to develop out of the former as a consequence of social conventions acquiring a moral status commanding appropriate arational psychological behaviour. Where the social conventions might themselves be explicabe in terms of traditional economic theory (as Sugden has demonstrated very elegantly) the development of social customs transcends excplanation by narrow economic rationality.

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