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**LABOUR MANAGED FIRMS, EMPLOYEE PARTICIPATION
AND PROFIT SHARING - THEORETICAL PERSPECTIVES
AND EUROPEAN EXPERIENCE**

by

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This study has been undertaken in connection with the Research Project on "The impact of workers' participation schemes on enterprise performance in Western Europe", directed by Prof. D.M. Nuti at the E.U.I..

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Summary

The rapid growth in recent years in the number of workers' cooperatives in Western Europe, and the development of various schemes for workers' participation in business decision-making has been paralleled by an equally dramatic increase in the number of academic publications on the subject. To date this literature has been very largely theoretical or descriptive, but some significant empirical studies on West European producer cooperatives are beginning to emerge.

This survey consists of two broad sections: a review of the literature on the labour-managed firm, and a bibliography. The review gives a general sketch of the material contained in the bibliography, and is divided into two sections, covering first the theoretical literature and thereafter West European experience.

The bibliography on the labour-managed firm is divided into sections broadly parallel to those of the review. It is arranged in two sections, covering articles and books separately. The large theoretical literature which has appeared in article form has been classified by broad subject grouping. Material available on European experience is arranged first by region and then by individual country.

Preface

The rapid growth in recent years in the number of workers' cooperatives in Western Europe, and the development of various schemes for workers' participation in business decision making has been paralleled by an equally dramatic increase in the number of academic publications on the subject. To date this literature has been very largely theoretical or descriptive, but some significant empirical studies on west European producer cooperatives are beginning to emerge, and the case of the Yugoslav self-management system has been fairly well documented and has provided a fruitful ground for applied research. With regard to the economics of labour-management and employee participation the emphasis of this literature on microeconomic issues and a partial equilibrium approach is clearly apparent. However, it may be expected that in the future this imbalance will be rectified as the larger context of economy-wide inter-relations attracts more interest. The recent debate on the macroeconomic effects of profit-sharing schemes represents a valuable contribution to the literature which should stimulate further work at the macro-level. At the other extreme, an area of growing interest lies in the internal organization of the firm and issues surrounding the degree of participation or conflict, within differing forms of work organization, and the impact of intra-enterprise variables on enterprise performance. Most of the recent empirical work has focused on these issues, and is helping to broaden our understanding of the small but rapidly growing producer cooperative sector

in Western European mixed economies. In our review of the literature on the European experience therefore, we have concentrated our attention on studies of the labour-managed firm in its various forms, rather than the more diffuse experience with employee participation and profit sharing schemes within the private sector. In the introductory review we have tried to give a general sketch of the material contained in each section, and we do not refer to every item in any section. The reader should therefore use the bibliography, which is divided into sections broadly parallel to those of the review, as a tool to broaden and deepen his or her understanding of issues of particular interest.

An extensive bibliography on cooperatives of all types can be found in Hill, McGrath and Reyes (1981)*, and the literature on employee participation in private firms has already benefited from an excellent bibliographical treatment by Pettman (1979)**, and we have therefore concentrated our search on these topics on subsequent years. The bibliography is arranged in two sections, covering articles and books separately. The large theoretical literature which has appeared in article form has been classified by broad subject grouping. The monographic literature has tended to be largely of an applied and case-study nature, and material of this type is arranged first by region and then by individual country.

*Patricia M. Hill, Maryjean McGrath and Elena Reyes (1981), Cooperative Bibliography - an Annotated Guide to Works

in English on Cooperatives & Cooperation, University Centre for Cooperatives, University of Wisconsin, Madison.

**Barrie O. Pettman, (1978), Industrial Democracy: A Selected Bibliography, MCB Publications, Bradford, West Yorkshire, Bibliography no. 11 from the Institute of Scientific Business.

Explanation

The form of citation we have used throughout is as in the following examples (where full information is available):

1) Articles:

Author	Title	Journal
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CARSON, R.G.

"A theory of cooperatives", Canadian Journal of Economics,
(1977), 10, 4, 565-89

Year	Volume	Number	Page reference
------	--------	--------	----------------

2) Books

1st author	2nd author	Title	Publisher
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DUMAS, A. DAURES, N.

"Theorie Economique de l'Autogestion", Faubourg,
Paris, 1977

Place of publication	Date
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The bibliography has been prepared using the POWER+ programme of the EUI's Prime Computer and we are grateful to Bob Danziger for his patient assistance and explanation in the setting up and implementation of the programme. We are also grateful to Maren Ipsen and Michael Tegelaars of the EUI Library for their advice and cooperation in our search for the items contained in the bibliography, and to Sheila Marnie for research assistance.

The research was undertaken within the EC-funded research project: "The impact of workers' participation schemes on enterprise performance in Western Europe", directed by Prof. D.M. Nuti at the European University Institute, 1984-1986. We would like to thank Professor Nuti for his encouragement and support, although we are alone responsible for any errors or omissions in this review.

Part 1. Theoretical perspectives.

1. Theory of the labour managed firm - the basic model

The theory of the labour managed firm has been developed to describe the behaviour of both producer cooperatives in mixed economies such as those of western Europe, and the self-managed socialist firms which are today found exclusively in Yugoslavia, although the introduction of similar organizational structures is an ostensible aim of recent economic reforms in Hungary also. Traditionally, the labour-managed firm has been distinguished through the specification of its 'objective function' which is taken to be the maximization of income per head of the labour force, (where income is given by revenue less depreciation and interest costs of capital and any fixed costs or taxes). This contrasts with the objective imputed to the privately owned 'entrepreneurial' or 'capitalist' firm which is the maximization of absolute profit. The assumption of income-per-head maximization derives from a fundamental feature of the labour-managed firm, namely that it is the workers themselves, either directly or through a workers' council, who exercise control over all areas of the firm's activities. In contrast, the assumption of profit maximization derives from the decision making control exercised by an owner-manager, or by a hired manager acting on behalf of external owners. The theory of the labour managed firm was initially elaborated by Ward(89) and Vanek(428,429). Equilibrium levels of output and employment in such firms are found to be identical to

that of 'twin' capitalist firms (defined on the same technology and market conditions) so long as competition has driven economic profits (revenue less opportunity costs of factor inputs) down to zero. However, whenever economic profits are positive, the labour managed firm will employ less labour and produce less output than its profit-maximizing twin (and conversely when economic profits are negative). Moreover, as demand conditions improve, and prices rise, the labor managed firm will, in the short run with capital stock fixed, reduce output by dismissing some workers. The reason is that an equilibrium is found at a point where the cost of employing an additional worker (average income per head) is just equal to the amount he contributes to total revenue (the value of labour marginal product). Any addition to employment then reduces the value of the labour marginal product due to diminishing returns, which in turn pulls down average income, but not by so much. This opens up a gap between average income and marginal product which is the measure of the loss in income to existing members of admitting a new member-worker. As prices rise, a similar gap is opened between average income and marginal product, since due to the presence of fixed capital costs, average income rises more than proportionately to the rise in the value of labour marginal product. At the existing level of employment, marginal members are inflicting a net cost on the firm in the sense that income per head could be higher at a lower level of employment. If the labour-managed firm takes this fact into account, and were to apply the income per head maximization rule ruthlessly, it would

dismiss workers and reduce output - a 'perverse' response to a market signal indicating an increase in demand for the product.

In the long run, with capital inputs adjustable too, the increase in the value of the marginal product of capital above its rental, or opportunity cost, would induce an expansion of the capital stock. If there were strong complementarity between capital and labour inputs, so that the increase in the capital stock (given labour input) raised labour marginal productivity sufficiently (a feedback effect), then this may be sufficient to offset the 'short run' effect, and cause labour marginal productivity to rise by more than average income per head (at the initial level of employment). Marginal workers would then have a net value for the firm and employment and output would rise along with capital stock. Thus in general the long run supply response is indeterminate - output rising or falling with product price according to the relative strengths of the various 'short run' and 'long run' effects involved. In any event, however, due to the unambiguously restrictive 'short run' effect, the supply response of the labour-managed firm will be less elastic than that of a privately owned private firm, which takes labour remuneration as a cost in its profit-maximization programme. The technical aspects of these processes are worked out in detail by Ward(89) and Vanek(428) and subsequently elaborated by Maurice and Ferguson(59), Landsberger and Subotnik(55), Estrin (30,31) Fukuda(36) and Ireland and Law(48).

Since the labour-managed firm, even in the long run does not adjust fully to market price signals, entry of new firms (and exit of less productive firms) is necessary to fully eliminate

economic profits and losses, and bring about an efficient allocation of resources throughout the economy. As Meade (62,63,64) has forcefully emphasised, however, this requires some mechanism whereby unemployed workers, and workers in less productive enterprises may associate to set up new cooperatives, which would require extensive state involvement. Meade regards the involvement of the state in the entry process with a sort of horror. However as Conte(19) has observed the obstacles to the formation of new firms are essentially problems of information and uncertainty as to the legislative climate. In countries where specific legislation and quasi-state support organizations have been established, such as in Italy and the United Kingdom, formation of new cooperatives appears to be a reasonably straightforward matter. Indeed even for private enterprise such 'state intervention' is a normal requirement for new entry of small firms. Examples are the small-firm information services and enterprise development schemes in the United Kingdom. It should be emphasised therefore, that if this problem were to be solved satisfactorily, a competitive labour-managed economy would be just as efficient and give rise to the same 'general equilibrium' allocation of resources as a competitive economy operating under private ownership and pursuing profit-maximization as an enterprise goal (Vanek, 429; Dreze, 26,27,28; Pearce, 72); with however the important difference that the general equilibrium so attained may be unstable and require central intervention in the form of offsetting adjustments of capital charges or rentals, should an inflationary process

develop, (Greenwald, 41; Bartlett and Weinrich, 8). The recent experience of the self-managed economy of Yugoslavia with rapid and accelerating inflation indicates the importance of stability considerations of this type. In addition Greenberg (40) and Ichiishi (45, 46, 47) show that a more general equilibrium concept is required to fully account for the fact that labour, unlike other 'commodities' is not infinitely divisible. Developing the concept of a coalitional equilibrium they explore the ways in which the general equilibrium of a labour managed economy differs from that of a private ownership economy when a more realistic treatment of labour input is considered.

Given appropriate macroeconomic policy to maintain effective demand and aggregate employment, and to offset any inflationary tendencies, the major problems with the labour-managed economy relate essentially to the problem of short run adjustment to price signals (and to problems of finance and investment which we consider below). Despite the long run efficiency of the system, in the short run (before offsetting entry and exit has had a chance to take effect), labour may well be directed away, rather than towards, its most productive uses. This would be a particularly serious problem for a producer cooperative sector in an expanding mixed economy since the cooperative sector would suffer a continuous loss in market share relative to its capitalist competitors (Montias, 66).

A large component of the theoretical literature has therefore been devoted to a critical examination of this fundamental paradox of the Ward-Vanek labour-managed firm. The first and

most obvious point is that members of any reasonably well specified cooperative work community would naturally be most unlikely to sack fellow members for the sake of a marginal monetary gain to remaining members (Robinson, 74; McCain, 60; Jossa, 53). This point has been formalized in two distinct approaches. Firstly, when dismissals take place randomly, so that at the moment of taking a decision on labour force adjustment no individual member knows exactly who will be fired, it is natural that each member takes into account the probability that he himself will be among those to be dismissed. In these circumstances the appropriate objective of the decision makers will be the expected utility of income per worker. Steinherr and Thisse (83, 84) demonstrate that such a procedure will lead to no labour force adjustment at all taking place following a small increase in price, a result which has been extended to the case of a diversified firm by Brewer and Browning (14). Secondly, if following Meade's (62) proposal, equal treatment requires that no member would be dismissed against his will, then some form of compensation would have to be paid to dismissed workers to persuade them to quit voluntarily. However, Ireland and Law (48), Steinherr and Thisse (83, 84), and Bonin (12) demonstrate that such compensation is not feasible. This is due to the fact that total enterprise income would be reduced by the possible membership reduction, and the compensation payments required would reduce the income of remaining members below that which could be achieved in the absence of a membership reduction. In either case the firm would not reduce employment following a price increase and the perverse supply response

vanishes, although not the problem of supply inelasticity. However, the labour-managed firm is then left in a situation of disequilibrium, and Nuti(68,69) has suggested that a process of merger between 'labour surplus' and 'labour hungry' cooperatives would ensue in order to take advantage of the gains available from a feasible reallocation of labour through the internalization of the adjustment process, leading to a steady increase in industrial concentration. (A process of this type appears to have recently taken place among the construction sector cooperatives of the Emilia-Romagna region in Italy). New firm formation would then be continuously necessary to restore long run competitive equilibrium. Alternatively, enterprise equilibrium would be achieved through natural wastage, and the Ward-type short run supply perversity would persist.

A further possibility, frequently observed in practice, is that the cooperative could hire salaried workers, whenever average incomes in the cooperative were above the going wage, thus augmenting the incomes of the full time members by the excess of the additional net revenue over the salaried workers wage bill (Dubravcic, 29; Gal-Or et. al., 93; Sapir, 78 - see also de Meza, 21). Supply response would then be identical to that of a private firm employing wage labour as a price increase would raise the value of labour marginal product above its marginal cost (the wage rate) and employment would be increased. However this solution may tend to undermine the institutional features of the cooperative over time, since, as Ben-Ner(9) and Miyazaki(67) argue, there would be a temptation to substitute hired workers for full member-workers

over time as natural wastage took place. The cooperative would 'degenerate' into a firm owned privately by the remaining members. However, hired workers could presumably not be kept out of the decision making process indefinitely (Meade, 64), and would eventually have to be admitted to full membership. Indeed, open access to membership for hired workers is a feature of most western European cooperatives (see Part 2 below), and in Italy for example, one often hears that the cooperatives would like more hired workers to take up membership than currently do so, and not that there is any attempt to restrict membership size within the existing workforce. The economic analysis of this case is a complicated dynamic problem and remains to be fully analysed in the theoretical literature, although Sapir(78) provides a thorough treatment of a related case where members and non-members are distinguished by their level of training, however wage-workers are not free to become full members until a preliminary period of basic training has elapsed..

Various solutions to the adjustment problems of a labour-managed economy have been proposed in addition to the promotion of exit and entry. They essentially involve either some form of indirect state intervention through fiscal policy or decentralized planning mechanisms, or a modification of the principle of egalitarian distribution within cooperative firms themselves. Examples of fiscal policies - lump-sum or ad valorem taxes - which would induce efficient responses to price signals have been discussed by Suckling(86) and Vanek, Pienkos and Steinherr(116). However the efficacy of this measure would require

a large amount of information on individual firms cost and production conditions and so there would be obvious problems of implementation. A more decentralized mechanism which would take advantage of the operation of market forces is the 'Enterprise Incentive Fund' proposal of Ireland and Law(48). A central authority would estimate a shadow price for labour which would approximate the market-clearing wage rate, and establish a fund which would make payments to firms which were making an accounting profit in terms of the shadow wage so long as they took on new member-workers; and to firms who were making an accounting loss and displacing member-workers. Firms which took the opposite actions would make a payment to the Incentive Fund. The major difficulties with the proposal are that the fund would not necessarily be self-financing, especially in view of the fact that displaced workers would require compensation, and so lump sum taxes would be required to make up any financial short-fall. If these were to be firm-specific the same information problems that apply to the use of direct fiscal instruments would arise. Secondly, the scheme requires truthful revelation of the each firm's accounting profits and losses, a procedure which is commonly found to be open to abuse even in centrally planned economies. Some aspects of the truthful revelation of enterprise performance in the context of labour-managed nationalized industries have been discussed in Guesnerie and Laffont(42). A more direct planning method would involve a state employment agency directing workers from low productivity to high productivity cooperatives (Meade,104), but this would clearly undermine the

autonomy of the individual cooperative and turn it into something approaching a nationalised industry. Nevertheless, something similar appears to have taken place in Yugoslavia, where 'self-management planning agreements' stipulate target rates of growth of employment by self-managed firms (Bartlett,361). However, since these targets are neither firm- nor sector-specific it would appear that the system is intended more as a broad employment creation measure in conditions of high unemployment than as a means of overcoming the allocation problem itself.

A second possibility is to abandon the egalitarian distribution principle and so take advantage of the intra-marginal producer surplus available from expanding employment beyond the cooperative equilibrium, where marginal productivity is held above the market clearing level of worker remuneration in order to maximize income per head. Meade(62,64) has proposed a system of remuneration on the basis of differentiated individual shareholding by worker-members, allowing the possibility of discrimination against new members by established members, and Sertel(426) has extended this approach by suggesting that such shares could be saleable on a 'membership market' in much the same way as financial shares in a private enterprise may be saleable on a capital market. Some potential obstacles to this solution have been pointed out by Furubotn(192), who argues that if membership shares are sold directly to a new member by a departing member, the new member may not be acceptable to the cooperative; whereas if the membership share is sold to the cooperative who is then free to select a new member of its choice, and who is willing to pay the

price of membership, there will be an incentive for the cooperative to understate the share-value to the departing member.

It is clear that the problems which have been identified in the preceding literature depend sensitively upon the realism of the imputed aims of the labour-managed enterprise. Were the firm to be concerned about employment matters per se, a more realistic maximand would be a utility index of income and employment levels (Law, 56; Smith, 80); or where, in large labour-managed firms management exercised some discretionary power, then growth objectives might enter directly into the firm's decision strategy (Atkinson, 6; Golden, 39; Stewart, 85 - see also Steinherr and Peer, 82 and Atkinson, 7). Horvat (43, 44, 200), basing his arguments on observations of the Yugoslav experience, suggests that worker-members would be content with achieving an 'aspiration wage' and maximizing residual profit, although the logical consistency of this approach has been criticised by McCain (61). Nevertheless, although these possibilities modify the behaviour of the labour-managed firm they do not appear to alter significantly the underlying set of issues and problems indicated by the simple income-per-head maximization model (with the exception of Horvat's model which behaves identically to that of a private firm).

2. Imperfect competition and oligopoly.

The basic model is easily extended to cover the cases of imperfect competition and oligopoly. Meade (104) shows that under these market conditions an equilibrium is reached where average income is equated to marginal revenue product. In the case of a pure monopolist where positive profits are earned, the labour-managed firm will employ less labour and produce less output, for reasons similar to those outlined above for the case of a competitive firm earning short-run positive profits. Where entry is feasible and market and technological conditions give rise to an oligopolistic or imperfectly competitive industrial structure, Vanek (428) argues that the smaller size of cooperatives compared to capitalist firms would give rise to a more competitive environment in industries where cooperatives predominate. Where product diversification is valued, this may lead to an improvement in overall welfare under a cooperative system than a corresponding private ownership system (Neary, 109), even though total output may be lower. Further issues relating to market size and structure have been covered extensively by Hill and Waterson (95), Neary (108) and Laffont and Moreaux (99, 100).

In the short-run variable membership case an 'elasticity-preserving' increase in demand again induces the cooperative to dismiss members, but of course all the caveats to this proposition raised in the previous section still apply. However, if the elasticity of demand were to rise sufficiently as demand rose, the increase in marginal revenue product due to this

effect may be sufficient in itself to offset the underlying tendency to reduce labour input, and employment and output could rise. Therefore, although the relative inelasticity of supply would still be observed, we have one more example of a case in which the Ward-type short run 'perverse' effects do not hold. Moreover, as in the competitive case, the long run supply response is indeterminate, although it is likely that the supply elasticity would be lower than that of a profit-maximizing firm (Ireland and Law, 1980; Estrin, 1981).

An important issue in the consideration of monopoly is that of appropriate mechanisms by which such industries may be regulated by a central authority. Meade (1964) suggests that where there are economies of large scale production and an industry is served by a single monopoly, for example the railways, then the organization of such a monopoly as a producer cooperative would be simply inappropriate. However, various schemes for the regulation of private monopolies, and oligopolies have frequently been proposed as an alternative to outright nationalization, and it is not surprising that a variety of schemes for the regulation of labour managed firms have been devised, ranging from combinations of price ceilings and lump-sum taxes (Vanek, Pienkos and Steinherr, 1986) and of excise and lump-sum taxes (Guesnerie and Laffont, 1994), to the indexation of workers' earnings to total revenue (Landsberger and Subotnik, 1981). Ireland and Law (1980) propose that their Enterprise Incentive Scheme could be linked to a system of lump-sum taxation to eliminate monopoly profits, whilst at the same time ensuring efficient adjustment to demand

variations. The implications of various regulatory devices for incentives in a model in which effort as well as employment is allowed to vary are discussed in Kleindorfer and Sertel (1988). In general lump-sum taxes are found to have superior incentive effects to price ceilings which restrict rewards for increased effort, and the indexation of incomes are to be preferred to direct wage controls for similar reasons.

Further issues in the analysis of imperfectly competitive markets have been discussed in the literature. Price discrimination has been the subject of attention in Suckling (1984), Clarke and Else (1992), Katz and Berrebi (1997) and Mai and Jun-Ji (1983). Issues relating to advertising expenditure are discussed in Ireland and Law (1980), to duopoly in Vanek (1988) and Law and Stewart (1982), and to labour market discrimination by Chiplin (1991). There are to a certain extent side issues and do not require detailed discussion in this review; however, Chiplin's study of labour market discrimination is of particular interest in that it presents a rationale for the special promotion of cooperative enterprises among particular marginalized sectors of the labour force who may otherwise be disadvantaged by the exercise of unfavourable preferences of private employers.

3. Risk and uncertainty

It has long been recognized that in the real world economic agents have less than perfect information concerning the environment within which their economic decisions are made. For example the actual prices at which output produced today may be sold tomorrow may be somewhat uncertain, the availability, or price, of supplies of key inputs may not be fully assured. In other words, risk and uncertainty are pervasive features of modern industrial market economies where production and consumption decisions are only coordinated ex post through the invisible hand of the market, and this goes beyond the uncertainty caused in traditional agricultural economies by, for example, unpredictable weather conditions.

The effects of simple price uncertainty upon the performance of labour managed firms has been analysed independently by several authors. The case of a firm producing in a competitive market with single variable input has been examined by Taub(145), Muzondo(139), Pestieau(142), Hawawini and Michel(125,127), Ramachandran, Russell and Seo(143), and Paroush and Kahana(141). The principle finding is that risk averse labour managed firms produce more, and employ more labour, than risk neutral labour-managed firms, and may even produce more than risk averse conventional firms. The basic reason for this result is that under uncertainty, the equilibrium balance between the desire to reduce employment so as to spread revenues over a smaller workforce and the desire to increase employment so as to spread

fixed costs over a larger workforce, is affected unevenly. The impact of uncertainty is to reduce the weight of the former consideration since under risk aversion the expected utility of an uncertain net revenue is less than the expected utility of a certainty-equivalent net revenue. In other words, due to risk aversion the utility value of a given increase in revenue away from the mean is not balanced by the utility value of an identical decrease of revenue above the mean. However the backward bending supply curve (specified in terms of expected price) is still a feature of the labour managed firms reaction to changes in (expected) output price. These, and associated results have been the subject of extensive commentaries of a critical and clarificatory nature. Bonin(117) disputes an associated conclusion of Muzondo's paper that under decreasing absolute risk aversion the supply response is ambiguous, and is able to show that even in this case, the backward bending supply curve of the certainty case is replicated, a correction which is accepted by Muzondo(140). Hawawini(123), (commenting on the paper of Paroush and Kahana), Hawawini and Michel(126), and Horowitz(133) (commenting on Muzondo's paper), extend the results to the case of more than one variable input. They show that although the labour managed firm employs more workers under price uncertainty than under price certainty, since non-labour inputs may be substituted for labour inputs their use may fall sufficiently under uncertainty so as to render the net impact on output levels indeterminate. Further, Hawawini and Michel(126) show that the basic results are substantially unchanged in the case of an imperfectly competitive market

environment. Even in the case of price instability, where production decisions are taken after prices become known, as opposed to the case of uncertainty where production decisions are taken *ex ante*, the main results still hold in the case of risk aversion (Hawawini, 124). Finally, the case of uncertainty in future prices (futures markets) has been tackled by Hey (132) and Taub (146).

Hey (131) reproduces the more important results of this debate results using an alternative methodological framework based upon the 'duality' approach, which simplifies the mathematical manipulations involved and yields direct comparisons between the cases of labour managed and conventional firms. Hey and Suckling (128, 129, 130) attempt to illustrate this claim through directly reworking the paper of Hawawini and Michel (125), Muzondo (139) and Ramachandran et. al. (143). In their replies Ramachandran et. al. (144), and Hawawini and Michel (126) vigorously dispute the more general applicability of the Hey and Suckling approach. However, Wang and Bowles (147) find Hey and Suckling's approach useful in proving that the labour managed firm will decrease output when price uncertainty decreases. (A similar version of this proposition is available in the literature described above, but is only demonstrated for the more restrictive case of decreasing absolute risk aversion.)

Whilst the case of simple price uncertainty which is dealt with in the above models is of some interest, the context of the analysis could just as well be that of a traditional agricultural economy. Many of the distinguishing aspects of the problem of risk and uncertainty as they impinge upon complex industrial

societies are glossed over; for example, the possibility of self-insurance and the relationship between outside financial institutions and the firm, are not addressed. These issues are taken up in a more sophisticated analysis developed independently by Bonin (118, 119), McCain (135), Miyazaki and Neary (138) and Wolfstetter, Brown and Meran (148). Miyazaki and Neary characterize the labour-managed firm as a contract-based production coalition of workers, and distinguish between a short run in which the firm's membership is fixed by contract - but in which short run layoffs are permitted in response to price fluctuations - and a long run in which membership itself is variable. In the absence of compensation payments to laid off workers, they show that the short run supply curve of the firm is positively sloped, so long as income per head is above the reservation wage, i.e. that income level which could be earned in alternative activities. However, should compensation payments be allowed (self-insurance) then efficient risk-sharing is possible, and the short-run supply curve is positively sloped throughout its range. In this way it is shown that the labour managed firm could indeed make efficient use of its labour resources. Wolfstetter et. al. (148) and Miyazaki and Neary (137) consider the case in which both hours and short run employment are variable and find that although essentially the same results apply, the level of optimal compensation depends upon the exact form of the workers' utility function assumed; in particular whether leisure is a normal, neutral or inferior good. It should be noted that the insurance aspects of such arrangements implies that workers incomes would be invariant to layoffs, with

all workers paying internal insurance contributions; this is why compensation is feasible in this case, whilst it was not in the Steinherr-Thisse scheme discussed in section 1. Moreover in the context of uncertainty, prices are supposed to move in both an upwards and a downwards direction, and so the issue of once-for-all variations in price reflecting an underlying shift in preferences or technology, which was the focus of the earlier discussion, is not addressed here. Finally Wolfstetter et. al. consider the long run case when membership is variable given efficient risk-sharing contracts for any membership size. They show that the variable-membership supply curve would be upward sloping and hence efficiency ensured only in the case where new members could be discriminated against by the requirement that they pay a membership fee, as in Meade's 'inegalitarian cooperative' (Meade, 62).

Although income uncertainty for each price realization (within states of nature) would be eliminated by such means, workers would remain exposed to income fluctuations as prices varied from period to period (across states of nature). This problem could be overcome if firms were financed externally by risk-neutral creditors and debts were repaid in a state-contingent fashion, i.e. repayments being high(low) when prices are relatively high(low). This may only be possible, however, where a central bank in a socialist economy, or a specialized bank dealing directly with the cooperative sector in a mixed economy acts as a risk-neutral creditor. Ordinary commercial banks may be unwilling to extend loans to labour managed firms, where by definition they have no control over, or voice in, production decisions, and due to

asymmetric information cannot easily monitor the firm's true performance (Buck and Chiplin, 120; Schlicht and Von Weizsaecker, 207; Gui, 199). An alternative possibility would be for the firm to issue non-voting 'risk-participation' shares (McCain, 203; Sertel and Steinherr, 111; Wolfstetter et al, 148); however the feasibility of this suggestion rests upon the existence of a perfectly competitive capital market and a lack of asymmetric information concerning the actual performance of the firm. To deal with this problem investors would need to be given some say in the running of the firm and optimal risk-shifting would then require the institutional form of a participatory nature rather than a pure cooperative. Such forms have been referred to as a hybrid labour managed/capitalist firm (Meran and Wolfstetter, 136), a participatory 'internal bargaining' firm (Miyazaki and Neary, 137) or a 'capital-labour partnership' (Meade, 64).

4. Incentive structures

As we have seen a fundamental criticism of the basic model of the labour managed firm has been that workers would be reluctant to dismiss their colleagues for the sake of a marginal gain in income that could be attained following a price increase. Apart from the issue of solidarity among members of the work community, the problem is also due to the self interest of the workers when there is an equal chance that any worker who votes for dismissals may find him or herself among those to be dismissed. Then adjustments to demand fluctuations are then taken in the form of income rather than employment variations.

It is clear however, that changing the number of employed workers is not the only means available to a firm to alter the amount of work done, since it is always open to the firm to institute a system of incentives which would influence the number of hours performed, or the effort supplied, by each worker. This possibility was first formally analysed by Sen(175) who distinguished between two basic forms of remuneration systems by which revenues could be shared among the firm's members: 'distribution according to needs' where the resulting net revenue is shared equally among the members of the firm; and 'distribution according to work', where net revenue is shared according to hours of labour actually contributed by each member (the latter only being appropriate where effort, or hours of work, are observable). Such remuneration systems differ in the optimal responses which they induce from individual members of the firm, in other words

they provide different incentives to work. Under the 'Cournot' assumption that each worker imagines that a change in his own supply of effort or hours of work will not induce a change in anyone else's, Sen is able to demonstrate that within a system of distribution according to needs, there will be an undersupply of effort; each worker will be tempted to 'free ride' on the labour of others when personal incomes are related to the total labour income of the group of members rather than to individual effort. On the other hand, distribution according to labour input induces an oversupply of effort, since each member will try to lay a claim to as large as possible a share of total net revenue by increasing his recorded labour input beyond the point at which the marginal disutility of effort is equated to the marginal product of labour. One solution to this paradox is the use of mixed payment systems composed of appropriate mixes of straight share distributions and payments related to hours contributed, in such a way that an efficient level of effort supply is attained from the group, efficiency being defined as a position in which the value of labour marginal productivity in terms of hours worked is equated to the individual's marginal rate of substitution between income and leisure. Sen also shows that when utilities are interdependent so that there is perfect altruism within the group then, again, an efficient outcome can be attained. Bennnett(149) and Browning(155) explore some difficulties with Sen's approach when the model is generalized to consider the case where the members of the firm do not all have identical preferences; and Bental and Ben-Zion(150)

discuss the case where preferences differ between managers and workers.

An alternative approach has been to abandon the Cournot assumption and allow for mechanisms through which the effort supply decisions of the workers become linked, so that each worker imagines that any adjustment he or she makes in effort supplied or hours worked will be matched by similar responses of all other workers in the firm. Under these circumstances it is easy to show that either remuneration system leads to efficiency in levels of individual labour supply, as is shown by Putterman(172), on whose important survey we have drawn for many of the points raised in this section. Bradley(153), Bonin(152), and Menconi(169) argue that whenever all workers have identical preferences, then they would surely imagine that any stimulus which caused them to increase their own labour input would likewise act upon the decisions of all other group members, whilst Cameron(156) takes an intermediate position, arguing that such an effect will be only partial. However, the sources of such a speculation are, as Putterman notes, left unclear. Other authors have suggested mechanisms whereby simultaneous linkages in effort supply may be induced. Berman(151) points to the possibilities for direct coordination which exists in the participatory environment of a labour managed cooperative, an argument reflected also in Sertel(426) and Vanek(428). Markusen(284,167) makes a similar argument in terms of bargaining mechanisms, whilst Chinn(157) relies upon the effect of ideological commitment as a mechanism which would promote group solidarity. A summary and integration of these various strands of

thought, including an analysis of supply response under different remuneration schemes, is provided by Ireland and Law(164). They demonstrate that although the various revenue sharing schemes provide a sufficient incentive to efficient labour supply under non-Cournot assumptions, the short run supply response depends sensitively on the structure of workers preferences, although it is unambiguously positive when income effects are absent.

Perhaps the most consistent proposal, however, which does not depend upon ad hoc assumptions on the degree of group solidarity is due to Israelson(166) and Putterman(171) who develop a model of 'rational conjectures'. Whenever one worker changes his effort supply or hours of work, that affects the overall net revenue available for distribution. This will naturally lead to a reassessment by all other members of the group of their own effort input, and there will thus be a sort of multiplier effect with successive rounds of adjustment taking place. Whilst the final outcome of such a process is unclear, calculations by Putterman and DiGiorgio(173) show a convergence to equilibrium under a variety of specifications of the model.

A further development has been in the use of the 'repeated game' approach, in which the protracted repetition of the same situation over time allows workers to learn about the responses of other workers to their own effort supply decisions. An efficient outcome to such a process might be supported by 'strategic precommitment'(Putterman,172) so that each worker agrees to match any adjustment by other workers. When the repeated game is supported by some form of penalty for shirking Radner(174)

shows that the equilibrium levels of effort supply will only be efficient in the unlikely case that there is no discounting of future utilities. With discounting, either continuous monitoring of team performance or some similar mechanism which maintained team cohesiveness and group morale would be required to maintain the cooperative equilibrium in effort supply (McLeod, 1968). However, the advantage of these formulations of the repeated game approach over the bargaining or coordination mechanisms described above is not great, as they are essentially formalizations of those earlier ideas.

Holmstrom (1962) argues that a general implication of these models is that whenever linkages between effort supply decisions are of the Cournot type and incomes are formed on the basis of revenue sharing, efficiency in effort supply can only be established when the budget constraint of the group is broken, and an outside agent, for example an owner of a private firm, or the state in the case of nationalized industries or the Soviet type system, claims any residual profit or loss. In criticism of this view, Haller (1961) argues that social welfare may nevertheless be increased under a cooperative system since the outside agent provides no labour contribution at all, and an enlarged partnership would provide a greater level of output, albeit inefficiently, than that (efficiently) available from the initial group plus an owner. Moreover, the applicability of Holmstrom's argument rests entirely upon the assumption of Cournot reactions and a system of distribution according to 'needs', i.e. pure revenue sharing; it ignores the various possibilities of linked

effort supply decisions of the non-Cournot type reviewed above, or the mixed payments systems suggested by Sen. In these cases it has been established that when workers preferences are alike, the various revenue-sharing schemes, whether based upon equal sharing or on work points may provide sufficient incentives to an efficient supply of effort from cooperative members.

5. Investment and finance.

The discussion of the previous sections took place on the explicit assumption that the capital stock was fixed in the short run; or that where long run considerations were taken into account and adjustments to the firm's capital stock was considered, it was on the implicit assumption that costless and instantaneous adjustment to the long run equilibrium capital stock was feasible. However, in practice adjustments from one equilibrium level of the capital stock to another following parameter change (say in prices or the level of demand) takes time and requires a process of net investment. The analysis of the determinants of investment and the time path of adjustment to new equilibria is therefore a subject of attention in its own right, and requires tools of dynamic economic theory in contrast to the 'comparative statics' approach which is only appropriate to the comparison of equilibria and assumes away adjustment costs and adjustment times - a point emphasised by Horvat(200).

Two distinct approaches to this problem have been identified, schools of thought to which Stephen(427) refers to as the "Texas" school associated with the work of Furubotn and Pejovich, and the "Cornell" school associated principally with the work of Vanek. An extensive and not entirely fruitful debate has been conducted within the framework of these two approaches, which has not been assisted by the tendency of the protagonists to obscure some of the fundamental issues, which relate to the

problems of efficient risk-shifting and appropriate financial institutions to support investment in labour managed firms, whether they be pure cooperatives or hybrid organizations of the type indicated in section 3.

The framework set out by the Texas school, has been conducted on the assumption of a fixed labour force, (Furubotn and Pejovich, 194, 195, 196; Furubotn, 186, 187, 190; Pejovich, 205, 206), or a fixed decision making group with an upper limit to the labour force (Furubotn, 188 - see also Berman and Berman, 179; Furubotn, 189). This, not on the basis of any of the considerations which were indicated in section 1, but purely as a convenient ad hoc assumption, presumably to focus attention on the problems of capital stock adjustment. However this procedure changes the nature of the problem entirely, away from the income-per-head maximization paradigm (whose peculiarities result largely from the fact that it is a ratio maximand) to a value-added maximization paradigm, the properties of which differ qualitatively from those of the basic model. Having performed this sleight of hand, various real world features of cooperative and labour managed institutions are then reintroduced in a somewhat bewildering array of combinations, in an effort to demonstrate that labour-managed enterprises will undertake less investment than comparable privately owned firms. Thus, it is alleged that labour-managed firms undertake investment decisions on the basis of a relatively short planning horizon; that the collective ownership of assets, by precluding the private recovery of the principal of an investment, deters enterprise self-financing; that a requirement to maintain the book

value of assets once installed deters both internal enterprise finance and recourse to outside sources of funds where they are available. Certainly all of these problems, were they to actually be of relevance to any existing labour-managed firm would no doubt reduce investment levels below the level which would be achieved in their absence, and quite naturally so, since they are all mechanisms which impose constraints upon the investment decision. However, it is also equally clear that they are not problems intrinsic to labour-managed firms as such and would be equally restrictive in any institutional context. To take each issue in turn, we first observe that the length of the planning horizon is essentially an empirical issue and is not easily determined from theoretical considerations alone. Whilst the planning horizon may be limited to the expected length of tenure of the average worker-member. This could well be, on average, say twenty years, especially considering the high probability that turnover will be lower in the representative labour-managed firm precisely due to the financial and firm-specific human capital investments which are made in such a firm by the average worker. Typical lengths of planning horizons for investment decisions based on the payback-period criteria in large privately owned corporations are, by contrast much lower, say around five years on average (Uvalic, 213). Secondly, the collective ownership of assets may well act to discourage internal financing of investment, but it would not discourage the demand for external finance where this is available; and since the Texas school allows for a mix of internal

and external finance, this should present no obstacle to investment as such, but only alter its structure. Moreover, existing cooperatives in western Europe are entitled to raise internal finance on the basis of loans from the worker-members, which are returnable on quitting the enterprise; a feature of the Basque cooperatives at Mondragon, among other examples, which is emphasised by Gui (198) and Ellerman (1985). Thus, that part of the debate which has been focussed on the issue of the absence of private property rights in enterprise assets, and the corresponding disincentive to self-finance investment, has effectively sidestepped the critical issue of the overall level of investment, whether from internal or external sources. Finally, the issue of capital maintenance requirements is relevant only in the context of a socialist labour-managed economy such as that of Yugoslavia. Since there, enterprise capital is considered to be 'social property', the individual firms are forbidden to profit from its 'consumption' through non-replacement of the financial value of the enterprise assets. However, even in that case, if this regulation is interpreted as applying to the historic value of assets, high inflation effectively limits its disincentive impact on investment levels.

The Cornell school on the other hand, starting directly from the premises of the basic model of section 1 above, does take into account the optimal level of employment which would accompany any programme of capital accumulation. However, the analysis is still conducted mainly on the basis of the comparative statics methodology, and so, again, sidesteps some of the crucial issues

of the investment decision, in particular the characterization of the path taken by the firm between equilibria. The essence of the Cornell school approach is to make comparisons between the long-run equilibrium which would be attained under exclusively internal financing, and that which would be attained under exclusively external financing. The analysis is conducted consistently on the basis of the income-per-head maximization assumption, and although a number of the 'real world' frictions so important to the Texas school are taken into consideration, the Cornell school is able to derive its results even in the absence of such considerations, (indeed, the comparative static method implicitly assumes an infinite horizon, since by its nature it involves a comparison of long run stationary equilibria achieved after all intermediate adjustment phases have worked themselves out). Not surprisingly, the main conclusion of this school of thought is that capital stock and output will be lower under a regime of self-financing than under the alternative regime of external financing. This 'underinvestment effect' derives from the fact that a self-financed investment requires an act of immediate restriction of current consumption, whereas an externally financed investment can be paid off in a series of instalments over time. In other words, the imposition of self-financing alone, imposes a restriction or constraint on the investment decision by denying the enterprise access to a broadly based capital market.

Whilst a fully developed dynamic model of the investment problem for a labour-managed firm has not yet been fully worked out, some steps in this direction have been attempted. Bonin(180)

presents an analysis of an externally financed firm using the technique of dynamic programming. On the assumption of costly adjustment of both membership and capital, he finds that the sensitivity of optimal policies to parameter shifts depends upon the direction of adjustment, i.e. whether the firm is expanding or contracting. Litt, Steinherr and Thisse(202) and Bartlett(178) employ the technique of optimal control to analyse a self-financed labour-managed firm's investment decisions. They derive optimal paths of capital accumulation and confirm Vanek's 'underinvestment' conjecture. However, an integration of the internal and external financing cases in a dynamic framework has still to be achieved.

6. Employee participation and codetermined firms

Traditional theories of the firm of the standard type found in microeconomic textbooks rely upon a relatively unsophisticated treatment of the employment relationship, in which workers passively supply just the amount of labour input demanded by the firm at a given market determined wage rate. Even where labour unions are able to raise the wage rate above its competitive level the employers ability to choose the optimal level of labour input is usually treated as unproblematic. Recent criticisms of this theory (eg. Aoki, 252, 432), have recognized that the relative permanence of a firm-specific 'labour-pool' may give rise to intra-firm bargaining over the division of the 'organizational rent' which derives from the existence of indivisible, firm-specific human and capital inputs. In such a situation there is room for worker participation in the decisions which govern the production and distribution of the economic surplus. In this section therefore, we survey the literature on employee participation in the context of 'codetermined' firms, an analysis which has a bearing on aspects of the hypothetical 'capital-labour partnerships' mentioned at the end of section 3.

The theoretical work on the performance of 'labour-managed' firms which was described in section 1, indicates that where workers participate in decisions on levels of factor utilization then both employment and capital may be reduced below the level which a similarly placed pure profit maximizing (entrepreneurial) firm would choose. At the same time the work of

industrial sociologists has shown that there is scope for dispute over levels of work performance and methods of work organization at the shop floor. By focusing on these two levels of decision making it is possible to give economic content to the distinction often made between 'higher level participation' which refers to decisions that relate to the running of the whole enterprise, such as those on investment and output and 'lower level participation' which refers to those management decisions relating to the control of day-to-day shop floor activity. In West Germany for example participation at these two levels is formalized through codetermination legislation. "At the business enterprise level, codetermination is secured institutionally through the right of workers to send representatives of their interests to the Committees of Decision (Entscheidungsgremien); at plant level, however, there is a works council with an independent organization for representation of the workers" (Roberts, 550, p37). The works council for example enables worker participation "in matters which can affect the technically organized design of the job, work flow, and the working environment; the right to codetermine short-time working and overtime; and the possibility of establishing a codetermined social plan for the enterprise" (Ibid, p41). In the United Kingdom lower level participation has been more informal, and Poole (549) has pointed out the extension of participation through the shop steward system which accompanied the productivity agreements of the 1960's and 1970's.

Much of the recent literature on codetermined or participatory firms has focused upon essentially distributional

issues. In Svejnar's (87) participatory firm, for example, shareholders, managers and workers codetermine the firm's overall objectives. A 'variable power' bargaining model is used which formalizes the practice of codetermination as a solution to a bargaining game. The firm then acts so as to maximize a multiplicative function of shareholder's utility, managers utility and workers' utility. In 'model I' the utilities are specified as the simple unit prices of the relevant factor input, net of reservation price. The utilities are defined exactly over the equilibrium sets of factor inputs, so that only the interests of those agents actually employed within the firm are taken into account; the system of participation is company-specific. This is held to be relevant to the German system of Mitbestimmung where "employee representatives to the board of directors and works council represent the interest of employees in the given enterprise" (Svejnar, p316). The solution to the maximization problem indicates that factors are employed up to the point at which their marginal productivity is equal to the sum of the reservation wage and a share in the enterprise profits determined by the participants' relative bargaining power. This is an inefficient equilibrium however since factor input use is restricted relative to the benchmark case of perfectly competitive profit-maximizing private firm, (where marginal productivity is pushed down to the market price of a factor), unless a mechanism exists such as unrestricted entry and exit of firms into an industry to ensure zero (economic) profits. In this sense the short run behaviour of the codetermined firm is similar to that of the

labour-managed firm which we characterized in section 1. In addition, as has been emphasised by Furubotn (256), where workers' earnings include a share in enterprise profits the reinvestible surplus will be lower and hence growth and future employment may be adversely affected. In an extension of the model, Ireland and Law (259) show that a codetermined firm of this type would react to price fluctuations through adjustments of factor prices rather than levels of factor employment. They regard this as a favourable outcome since the codetermined firm can then be viewed as a type of 'work community' where "the preference for factor price adjustments over quantity adjustments fosters solidarity and the identification of the worker with his or her enterprise". Allocative and distributional efficiency then relies heavily on open entry and exit of firms into and from production sectors, a process which Ireland and Law see as being achievable through a confederation structure of codetermined firms, and they point to the Mondragon cooperatives as a possible example. Certainly one may imagine that many of the social costs of disruptive labour mobility which have been attendant features of the capitalist market system throughout its development, and which have been eloquently described by Seabrook (551), may be mitigated through such a system, but the associated problems of planning and coordination which would be involved to ensure macro-economic efficiency are still open questions.

An alternative formulation, Svejnar's 'model II', recognizes that it would often be unrealistic to limit the interests which are represented in the codetermination process only to those

currently employed or associated with the firm. The wider constituency of union members both within and outside the firm for example might be regarded as interested parties in the codetermination process, although it is difficult to imagine a similar story being told for shareholders and managers in the context of a private ownership economy. The case of a nationalized industry or of a decentralized planned economy with codetermination and genuine trade union representation might be of relevance. In model II therefore the utilities which are the subject of model I are augmented by an amount x/\bar{x} where x is the firm's equilibrium employment level of a factor, and \bar{x} the membership of the broader constituency. In this case the solution to the maximization problem gives equality between the factor marginal product and its reservation price, and codetermination is allocatively efficient. Actual remuneration still embodies elements of profit sharing according to relative bargaining power (as total revenue is fully distributed) so long as economic profits are positive, but this fact no longer plays an important role in resource allocation. Of course it is important to be able to distinguish empirically between the two models so as to determine "whether the union's influence over these representative bodies is sufficient to propagate the broader perspective of model II" (Svejnar, 87, p324), especially since in the German case there are "important institutional features which might make model II more applicable" (p316). However, empirical analysis of a number of German industries with and without codetermination institutions

yielded results consistent with either interpretation, and failed to refute either model (Svejnar, 412).

Svejnar's model II however, although more favourable to the case for codetermination could equally well, as he himself notes, be considered as a model of collective bargaining between a union and a profit maximizing firm. McDonald and Solow (263) have presented a model of union-firm collective bargaining in just this spirit. Traditional collective bargaining models have been based upon a scheme in which the union is free to determine the wage and the firm reacts by selecting a level of employment to maximize profits, which yields a wage-employment solution 'on the demand curve'. MacDonald and Solow show, however, that when the union's utility function includes both wages and employment as arguments, then both parties can be better off by selecting a wage-employment solution 'off the demand curve'. This contrasts with Svejnar's efficient factor pricing result, mainly because of the more realistic assumption that it is in practice only Labour which has a 'wider constituency' to represent. Miyazaki (264) has rescued the efficiency properties of 'internal bargaining' however, by considering a case in which labour and management codetermine the levels of employment and wage rates, in an environment of uncertainty, and in which efficient risk-sharing is achieved by means of compensation payments to (temporarily) laid off workers. An example is the institution of the Cassa Integrazione in Italy which pays up to a certain percentage of the full wage to temporarily laid off workers, although this is essentially an external rather than an internal insurance scheme. The interesting feature

of this result is that marginal product factor pricing is achieved under maximization of simple (expected) individual worker utility, on the side of labour, and (expected) profits on the side of capital, rather in the fashion of Svejnar's 'model I'. Models of this type generally rely upon the idea of a fixed 'labour pool' from which temporary layoffs and rehires are achieved as market demand fluctuates. Miyazaki(264) is able to make an extension into the longer run analysis of the determination of optimal labour pool size and capital stock, and in this case he shows that the stronger is labour's internal bargaining position the higher will be equilibrium wages and the lower long run capital-labour ratios and growth. Thus although codetermination achieves efficient allocation and distribution given appropriate risk-sharing mechanisms, Furubotn's criticism that growth will be lower under such a system still stands.

Despite this wealth of theorizing on the operation of codetermination at the broad policy levels of factor remuneration and factor employment there remain few examples of such a system in practice. In Germany, where the system is most developed, parity representation is limited to few industries, and then at the level of financial control (the Aufsichtsrat) rather than in the highest executive level (the Vorstand). As McCain(261) observes "if German Mitbestimmung constitutes a joint management, it does so despite and to some extent contrary to the intent of the law"(p68). Codetermination proposals in the United Kingdom in the form of worker-directors on the company board have been the subject of discussion at least since the time of the Donovan

Commission of 1966 and were actively promoted in the Bullock Committee report of 1977. However the only important examples were experiments in the nationalised Steel Corporation which appointed worker directors to divisional boards in 1969 and on to the main board in 1978, whilst worker directors were also introduced on to the board of the Post Office in 1978. As Brannen(434) remarks, "The paradox of boardroom participation is that if worker representatives are strong enough and willing to put forward competing rationalities they are likely to create conflict in the boardroom, and ensure that real centres of decision making move elsewhere, thus rendering themselves impotent in the director role; but if they adopt the director role then their own raison d'etre, from the perspective of the workforce disappears"(p114)

Whilst the impact of higher level participation has received considerable attention, that of lower level participation has been less extensively covered, with the notable exception of McCain(261), who argues that the effort-productivity relation is suboptimal in the absence of employee participation due to the incomplete nature of the employment contract. Employee participation at plant level could enable improvements in work organization which would result in efficiency gains, the benefits of which could be distributed between employer and employee through plant level bargaining. Simon(267) develops a similar model which provides a framework in which the economic logic of lower level participation can be understood. Focussing on the conditions of the employment contract, Simon observes that: "employees ... enter into the system in two sharply distinct roles. Initially they are

owners of a factor of production (their own labour) which they sell for a definite price. Having done so they become completely passive factors of production employed by the entrepreneur in such a way as to maximize his profit"(p293). In Simon's employment contract the employer reserves the right to select the tasks which the worker will perform. This will be advantageous to the employer when there is uncertainty as to the exact tasks or sequence of tasks which the worker should perform over the time period of the contract. It will also be advantageous to the worker in these circumstances to submit to the authority of the employer if he/she is not too concerned about which tasks he performs. (e.g. as in the case of less skilled labour). However, contrary to Simon's view of the matter, workers may be able to develop strategies of resistance to the exercise of employer authority, and may strategically vary the amount of effort which he provides. If the worker trusts that the employer will take into account his disutility in selecting tasks, then he would be prepared to sign a contract for a particular wage/effort incentive package. On the other hand once the employment contract has been signed the employer may have little incentive to take into account the worker's disutility of effort in his choice of task assignments. Thus there is an inbuilt element of social conflict in the employment relationship, with the employer attempting to extend his area of authority, and the employee attempting to reduce the amount of effort supplied. On the other hand if an atmosphere of trust can be established, a joint maximization of worker's and employers' utilities may give rise to a Pareto optimal provision of effort

and exercise of authority. Thus participation may be an important institutional device in establishing an atmosphere in which cooperative solutions to the "effort game" are feasible, a possibility suggested by Cable(255).

7. Profit sharing

One distinguishing feature of producer cooperatives and participatory firms is, as we have seen, that in contrast to the system of remuneration by a flat wage payment, incomes are formed through various types of sharing formulae. In the case of cooperatives and labour managed firms generally, value added is shared either on a per capita basis, or in relation to effort or hours contributed, or in Meade's inegalitarian cooperative on the basis of the number of shares held by each worker-member. In the participatory firm 'organizational rent' is shared on a basis determined by 'internal bargaining'. More recently a debate has emerged concerning the possible economic effects of share systems within non-participatory private-ownership firms. In such a system workers are paid a basic wage plus a share of enterprise profits, the profit sharing rate being contractually specified by the employer. Weitzman(293,294,295,296,436) and Vanek(292), (see also Atkinson,271), argue that there will be two important economic effects of this procedure. Firstly, since the marginal cost of labour to the employer is the basic wage, where labour incomes are the same in both a profit sharing and a conventional wage system, marginal labour costs will be lower in the share system, and so each individual firm will wish to employ more labour under the share system than under the wage system. Secondly, at full employment, in the share system each firm will be constrained to employ less labour than its profit maximizing objective leads it to demand. Since the full employment labour earnings are the same in

both systems, each firm in the share system would like to employ more labour since basic wages are below the value of labour marginal product (Weitzman,293). Following any 'not too large' downward shock to the system (a fall in the marginal productivity schedule), so long as the full employment value of labour marginal productivity remains above the basic wage, share firms will still be operating with excess demand for labour and full employment will be maintained. In contrast, under the wage system, any shock which leads to a fall in the value of labour marginal productivity leads to an immediate reduction in the demand for labour. In this way, it is claimed, once full employment has been attained under the share system, it will be maintained over the course of the business cycle: the system is insulated from external shocks and destabilizing contractionary multiplier effects.

Nuti(287,288) has raised doubts however as to the ease with which full employment may be reached within such a system. In a situation of prolonged slump and high unemployment the existing capital stock may be insufficient to employ all those who are seeking work even though the demand for labour of each individual firm may be increased, and in addition the Keynesian problem of insufficient aggregate demand may prevent the attainment of full employment. Should full employment be reached, moreover, the system may be institutionally unstable. Firstly employers experiencing excess demand for labour would be tempted to revise basic rates upwards, and the share system may revert to a wage system. Secondly, in conditions of aggregate excess demand for labour, it would be difficult to prevent workers from gaining influence over

the decision making process. Nuti argues that in this case the employment restrictive tendencies associated with labour-managed and participatory firms would reduce the employment expansive impact of the share system, although as we shall shortly see, this may not be a serious problem for a labour managed cooperative economy operating in a regime of full employment. Outside of full employment however, this point underlines the importance of the non-participatory nature of the share economy as proposed by Weitzman. As Brittan(274) notes: "if (profit sharing) is to work on the Weitzman model, management must retain and even strengthen its right to hire and fire. This gives the whole idea a more astringent flavour and separates it from the workers cooperative idea". Thus the scheme depends upon the unrestricted ability of employers to hire as much labour as they wish, and would be undermined if participating workers were to attempt to restrict new hires in order to boost their own incomes deriving from the profit sharing element.

At this point we should mention a similarly astringent scheme which was proposed in the nineteenth century by Hertzka(546), (see Chilosi, 223 for a full discussion) in which a mirror image share system was proposed. Here it is workers who have unrestricted rights to enter into producer cooperatives of their choice. In such an economy, earnings (but not labour marginal products) are equalized throughout the economy through free labour mobility. The full employment equilibrium, being based upon a participatory foundation, is not subject to the institutional instabilities of the share economy of Weitzman and Vanek. Finally,

it should be noted that a labour managed producer cooperative economy also enjoys some immunity from contractionary shocks at full employment. As we have seen in section 1, a fall in the value of labour marginal productivity opens up a gap between labours' marginal product and its cost expressed in terms of income-per-head. For a downward shock, average incomes fall faster than marginal product, at the given (here full employment) labour force. Consequently the marginal worker becomes more valuable to the cooperative which would then like to employ more labour, and so full employment is maintained, just as in the private ownership share economy. As far as upward shocks are concerned, by the argument of Steinherr and Thisse(83,84), labour-managed cooperatives would again exhibit employment stability. These points generalize the conclusions of Ireland and Law(259) concerning participatory firms, to the case of producer cooperatives operating in a full employment environment.

The potential incentive effects of profit sharing schemes have led in practice to their introduction on a limited scale in a number of western economies. According to Hollander and Lacroix(282), their use would be more widespread if it were not for the fact that they alter the distribution of information concerning a firm's true profitability so as to reduce asymmetries in its distribution, and this makes employers reluctant to implement such schemes in case labour's bargaining power is thereby increased. On the other hand, when profitability is low, such disclosure of information may be to management's advantage if it induces workers to revise their bargaining position in the light

of new realities. Fitzroy and Kraft(278) present some empirical evidence suggestive of a positive relationship between profit-sharing and profitability in West Germany. Various studies of the impact of profit sharing on productivity in western producer cooperatives have also emerged suggesting a similar positive relationship between profit sharing schemes and enterprise performance(see part 2), whilst the essential theoretical considerations relating to the incentive effects of various types of sharing systems and enterprise performance in a participatory context have already been described in section 4.

8. Workers' investment funds

Whilst the enterprise level profit sharing schemes have been the focus of the most recent debate, a separate set of proposals for economy-wide profit-sharing schemes have also received considerable attention in a number of western European countries, notably Denmark and Sweden, under the title of "workers' investment funds". These schemes are based upon an idea originally put forward by Keynes and propose a system in which either a share of profits (the 'profit-sharing' variant) or a share of the wage bill (the 'investment wage' variant) would be allocated to a central fund; the former being essentially performance related, the latter more in the nature of a fixed payment. The fund would allocate non-negotiable shares to employees covered by the scheme which would be redeemable at a future date at a price which would reflect the face value plus any capital gains or losses and dividend payments. Since the fund would be managed by employee representatives, it would introduce an element of economy-wide codetermination into the management of investment finance decisions, without necessarily increasing the risk to employers that their plant level managerial autonomy would be diluted through an extension of employee participation within enterprises. The main purpose of the scheme, apart from its role in diversifying capital ownership, is to separate, at a macro-economic level, the decisions over income distribution from those over accumulation and growth (Burkitt, 275, 276). Where unions are able to bargain over both wage increases and the contribution made

by employers to the workers' investment funds, they may be tempted to moderate their claims for current wage increases, in return for a deferred wage in the form of fund certificates and the promise of a degree of codetermination at the economy wide level which the existence and growth of the fund promises to them. Analysis of the economic effects of such profit sharing schemes has been conducted at the microeconomic level by Atkinson(270). He presents a model of a private firm where ownership and control are separated. Managers are interested in growth, and both unions and management may benefit (at the expense of current shareholders) from the implementation of the scheme since a lower current wage bill enables the firm to grow more quickly, whilst at the same time workers gain from the future dividends which faster growth provides. The macroeconomic implications of the scheme are analysed by Brems(272,273) who considers a standard one-sector growth model and shows through numerical simulation experiments that aggregate savings and investment would be raised by the introduction of the scheme for 'reasonable' guesses on parameter values. George(281) extends Brems' analysis to derive conditions under which the fund would grow or diminish over time. Whist Simple growth models of this type have a somewhat 'mechanical' flavour, a more sophisticated analysis is possible through the use of dynamic differential game models of the type discussed by Pohjola(289), where elements of strategic interaction between different social classes over distribution and accumulation decisions can be tackled. In the absence of the scheme, and where savings and investment decisions are undertaken by different social classes ('workers' and

'capitalists') - because, for example most corporate investment is internally financed or there is an absence of enterprise level worker participation in financial decisions - the only way workers may exercise independent control over the intertemporal distribution decision, (i.e. the only way they can make real future wage gains) is to moderate their current real claims in the hope that capitalists will reinvest their profits so as to raise the total income available for future redistribution. However, if they do not trust that the capitalists will reinvest their profits then their optimal strategy is to press for maximum current wages. Pohjola shows that the introduction of a workers' investment fund scheme would modify the dynamic behaviour of the system in such a way as to produce a higher level of savings and investment, and a higher long run rate of growth which is beneficial to both classes of society.

Part 2. European experience

9. General overview

An increasing number of firms all over Europe is being managed and controlled in a participatory manner, and these testify to the variety of institutional forms which labour-managed and participatory firms can take: from the socialist labour-managed firm in Yugoslavia, to different forms of cooperatives in western industrialized economies, and participatory profit-sharing enterprises such as the West German co-determined firm. Particularly since the recession in 1974, there has been a rapid growth of cooperative firms in many countries and a resurgence of interest in the cooperative movement, and it is producer cooperatives that have been growing much faster than any other type. In 1981, there were some 14,000 producer cooperatives in the European Economic Community, employing some 520,000 workers (Estrin, 299). If they continue to increase at the current rate, producer cooperatives are expected to constitute an important third sector alongside private enterprises and state enterprises (CEC, 440). Cooperatives have been created either by rescues of declining capitalist firms, by handovers of existing firms from public or private hands to workers, or by creations from scratch.

There is no generally accepted definition of a cooperative, as the term refers to diverse organisational forms. Nevertheless, a producer cooperative is usually considered an enterprise owned or controlled by the labour force, in which workers participate in firm management, share in the distribution of net

income, and earn a limited return on capital (Estrin, Jones, Svejnar 300, and Estrin 299). Most existing cooperatives usually conform with the principles formalised by the International Cooperative Alliance in 1966, based on those enunciated by the "Rochdale Pioneers" in 1844: 1) open and voluntary membership; 2) democratic control of the firm, on the basis of one member, one vote regardless of differences in members' individual capital shares; 3) limited interest paid on share capital; 4) equitable distribution of the surplus on the basis of work done; 5) cooperatives should devote a part of their surplus to education; and 6) cooperatives should cooperate amongst themselves.

The major shortfall of existing economic literature on the labour-managed firm is a scarcity of careful empirical work. Apart from a number of descriptive studies offering an insight into the institutional and legal characteristics of the cooperative sector, their ideological background and historical roots, little has appeared in the field of testing hypotheses from labour-management theory, and comparing the economic performance of cooperatives with private firms. Nevertheless, important contributions are beginning to appear, using highly developed techniques and formal indicators of workers participation, which estimate the impact of workers' participation on economic performance.

In our survey, we will concentrate on those countries which are most representative of producers' cooperatives in Europe today, namely France, Italy, Spain, United Kingdom and Yugoslavia, as these are the experiences of labour-management to which the

largest part of applied work refers, and on which recently emerging empirical contributions have almost exclusively been based. However, it is to be noted that some interesting empirical work has also been done on workers' cooperatives in other countries, including Denmark (George, 310) and Sweden (Thordasson, 346).

10. France

The growth of the cooperative sector in France was associated with the revolutionary upheavals of 1848 and the Paris Commune, and as such had its roots in socialist ideology. Rapid growth continued during the 20th century, and today, the French producer cooperative sector is after Italy, the second largest in the Western world. The number of workers' cooperatives has been rising steadily particularly during the 1970's: from around 20 per year in 1970, to 30 in 1975 and 120 in 1979 (CEC, 440). In 1981, there were around 1000 producers' cooperatives in France, employing about 30 thousand people, and by 1984 their number has risen further to 1,300 employing more than 40 thousand workers (see Vienney, 473, 474; CEC, 440; Defourny et. al, 315; Estrin, 299).

The first supporting organisation appeared in 1884, which in 1937 became the Confederation Generale des Societe des Co-operatives Ouvrieres de Production (SCOP). The Confederation Generale des SCOP is the sole organisation representing worker cooperatives in France. Its aims are to spread the principles of cooperation, offer advice and provide training for members of cooperatives, and to defend their interests. Within the

Confederation, cooperatives are grouped on both a geographical and a sectoral basis (see Liaison Sociales, 471).

Whereas prior to 1914 most cooperatives were in sectors with a strong central trade union organisation, since then the majority have been in the building and public works fields and other areas with weak trade union organisation (Antoni, 313). Today, most French producers' cooperatives are in construction and engineering, 44% and 16% respectively (1982 figures), and most of them are relatively small, employing less than fifteen workers: in 1982, 45% employed fewer than 9 workers, only around 7% employed more than 100 workers and almost none more than 1000 (Estrin, 299) over the period 1977-82, 60% of new cooperatives were created from scratch, whereas 29% were rescues and the remainder conversions. For further details, see Demoustier, 466, 467; Desroche, 316, 468; Estrin, 299; Oakeshott, 453; Thornley, 472, 457; CEC, 440.

Whereas the history and ideology of the French cooperative movement indicate its formal commitment to the idea of worker solidarity, Batstone (314) places French cooperatives somewhere between "solidarity collectives" and "democracies of small capitalists", as elements of both are present in the existing cooperative constitution, in spite of extreme diversity in the legal form of firms and the rules to which they are subject. On the one hand, individual shareholding is obligatory (although the minimum stake is very small), worker-members can invest personally in the cooperative via an assortment of financial instruments, outside shareholders are permitted and non-members can be hired.

On the other hand, cooperative regulations usually include important constraints. Shares may be sold only at their nominal value and may not be paid back to shareholders if this would reduce capital below one-quarter of its highest value; outside shareholders cannot represent more than one third of the board of directors; and the interest on capital paid to shareholders is limited to 6%. Collective funds are obligatory (at least 15% of profits must be allocated to the cooperatives' reserve fund), and in case of dissolution the capital is nondivisible and must be donated to another cooperative. The balance between individual and collective capital however, varies significantly across sectors; Estrin, Jones and Svejnar (300) report that individual ownership accounted for only 30% in the French construction sector, but almost 60% in the French electrical sector.

Democratic management procedures include voting among members on the basis of one-man, one-vote, irrespective of capital; the sharing in profits by all workers in proportion to work done, though a collective decision determines the actual proportion to be distributed; and the possibility for members to elect and dismiss managers at any time (see Batstone, 314; Oakeshott, 453; Thornley, 457). In practice, not all workers choose to become members of a cooperative. Until the late 1950's, the overall average proportion of members was 55% (Antoni, 313); in the post-1968 period, around 60% of total employees were members (Batstone, 314); while in 1978, only some 47% of workers in French cooperatives were members (Estrin, 299).

Batstone (314) tested a number of general hypotheses by examining the performance of a sample of 60 cooperatives relative to the industrial averages. The evidence points to superior performance of cooperatives. Value of capital equipment per worker was found to be higher, and the employment records seemed to be superior: between 1970 and 1975 construction cooperatives increased employment by 5%, while in industry it fell by over 12%. Cooperative work experience seemed to be superior (lower level of supervision and greater sense of commitment), while differentials between the highest and lowest paid wages were much smaller than in industry generally (the highest was 5:1). Finally, cooperatives were able to survive for longer periods than the typical private firm, as cooperatives are predominantly concerned with their own survival and seek to ensure an especially long-term perspective. (On issues of survival, see also Vienne, 473; and Perotin, 319).

While some of these findings are also supported by SCOP statistics, according to which cooperatives have demonstrated a superior record of output growth since 1945, the most exhaustive empirical study undertaken on French cooperatives is the one by Defourny, Estrin and Jones (315). The authors use enterprise level data from about 550 French producer cooperatives in 1978 and 1979, in the search for an association between output and various measures of the degree of participation when factor inputs and various possible determinants of the level of output have been taken into account. Value added is found to be an increasing function of participation in profits, in collective membership and in

ownership, even when a wide range of enterprise specific and environmental factors are taken into account. The results prove to be robust, surviving various statistical tests, the typical productivity effect from participation in an average French cooperative being around 5% of output in 1979.

11. Italy

The first Italian producer cooperative was formed in 1856, and by the end of the 19th century there were some 600 producer cooperatives in existence. Producer cooperatives experienced rapid growth especially in the early 20th century, with the creation of cooperatives in glass making, printing and engineering, but also during the period of reconstruction following the second world war (see Briganti, 481; Degli Innocenti, 484; Zevi, 329; CEC, 440; Jones, Zevi, 322).

However, it is since the economic crisis of the early 1970's that producer cooperatives in Italy have experienced their most rapid growth: over the 1970-78 period the number of producer cooperatives more than doubled, from 6,679 to 14,207, and by 1981, the total had increased to more than 19,000 (Jones and Zevi, 322). Today, Italy is believed to have some 20 thousand producers' cooperatives providing about 200 thousand jobs, and as such is both the largest and the fastest growing system of producers cooperatives in the industrialized western world. Not only does Italy have more workers' cooperatives than the rest of Western Europe put together, but the cooperative sector in Italy had around 80% of the total number of cooperative employees in the EEC

(CEC, 440; Estrin, 299). Although service cooperatives have during the 1970's experienced rapid growth, Italian cooperatives today are concentrated in construction and manufacturing: the Lega cooperatives alone accounted for 8% of the national market in building and construction in 1980, while in several other fields such as the manufacture of pottery, woodwork finishings, glass making and certain mechanical engineering activities, cooperatives have market shares of about 10% (Jones and Zevi, 322; for further details, see also Briganti, 481; Fabbri, 486; Stroppa 497, 498; Verrucoli, 327; and Zan, 499, 328).

The supporting structure of Italian cooperatives is the most highly developed in Europe. Italian cooperatives are affiliated to three representative bodies: the "Federazione delle Societa Cooperative Italiane", created in 1885, which in 1893 changed its name to "Lega Nazionale delle Cooperative e Mutue", supported predominantly by the Communist, Socialist and Republican Party; the "Confederazione delle Cooperative Italiane" established in 1919 and supported by the Christian Democratic Party; and the "Associazione Generale delle Cooperative Italiane" founded in 1952 and supported by the Social Democratic and Republican Party (see Thornley, 329; Zan, 499). Italian cooperatives are informally classified into "red", "white" and "green" according to their adherence to the above associations, although only one third of all Italian cooperatives belong to these associations. Cooperative Consortia, unique to the Italian system of cooperatives, are unions of cooperatives which provide cooperatives with services of

a varied nature and have local, regional, national or international responsibilities. Since 1947 a special credit institute for Italian cooperatives exists, a section of the Banca Nazionale del Lavoro.

The Lega is the most representative of the organisations as far as production cooperatives are concerned, having a membership of over 3000 producer cooperatives in 1981 (Jones and Zevi, 322), accounting for around half of all producer cooperatives in Italy affiliated to one of the associations. The Lega cooperatives have also experienced the most rapid increase in number, the annual average of new cooperatives over the 1970-79 period being around 200 per year. The two national associations for producers' cooperatives within the Lega are the ANCPL for worker cooperatives, and the ANCS for service cooperatives. The number of ANCPL cooperatives has more than doubled in 9 years, from 185 in 1970 to 391 in 1979, creating a total of 8,400 jobs, and at the end of 1979, employed 18,500 workers, mainly in the sectors of building materials, tiles, bricks, woodwork finishings, and ceramics; in prefabricated concrete products, they held 24% of the national market, while in woodwork finishings, 17%. The ANCS cooperatives are more numerous however, 1,100 in 1979, employing 55,000 workers, of which 807 are construction cooperatives (CEC, 440; Estrin, 299; Zan, 499).

Cooperatives affiliated to the Confederazione included some 2,339 producer cooperatives in 1981, or more than a third of producer cooperatives in Italy associated with one of the associations. They are organised along similar lines to the Lega.

Production cooperatives are associated with the Federlavoro national federation, which includes some 1,632 production cooperatives, of which almost half are building cooperatives. Growth here has been most marked among industrial and service cooperatives (CEC, 440; Zan, 499).

Producer cooperatives affiliated to the Associazione are the least numerous. They are found mainly in the housing sector and are mostly located in Southern Italy. Of the 1000 cooperatives belonging to this organisation in 1980, 630 were service cooperatives, 200 industrial and 170 production cooperatives (CEC, 440).

The largest part of Italian producer cooperatives (40%) are concentrated in the regions of Emilia Romagna, Campania and Sicilia. During 1972-1981, all regions have witnessed growth in the number of cooperatives, but the fastest growth was recorded in the central region of Italy (Zan, 499; Jones and Zevi, 322).

Cooperative legislation in Italy is guided by the recognized principles of cooperatives belonging to the International Cooperative Alliance: one member, one vote; free and voluntary membership; and limited remuneration of underwritten capital. There must be no fewer than nine members (for cooperatives that participate in public contracts, no fewer than 25 members). Only workers can generally be members, and while membership is not obligatory, most workers do choose to become members. Membership fees are normally required, but may not exceed a value of 4 million lire (2 million for service cooperatives); members' shares cannot be remunerated at a rate higher than 5%, and in case of withdrawal, a member is repaid only the book value of his share.

Members may make internal loans to their cooperative, but are limited to a maximum amount of 30 million lire. Cooperatives must deposit no less than 20% of the current year's profits in a legal reserve fund; collectively owned reserves are exempt from corporate income tax, and in case of dissolution, as in France, must be handed over to another cooperative. The total of the dividends distributed must be less than half the profits made (for details, see CEC, 440; Paolucci, 494; Zan, 499).

One of the recent contributions on Italian cooperatives is the study by Jones and Zevi (322), who compared for 1975-79 the growth rate of large producers' cooperatives in construction and manufacturing, the Ravenna cooperatives, and where possible, private firms. The evidence suggests that during the late 1970's, Italian cooperatives grew at rates that sometimes outstripped capitalist firms, as they enjoyed faster rates of growth of sales, value added and fixed assets. In terms of sales 3 cooperatives, while in terms of profits 23 cooperatives ranked in the top 500 firms in Italy. Cooperatives could also be compared with the job creating abilities of private firms: for large Lega cooperatives, jobs were created at annual rates of 7.6% and 5.3% in construction and manufacturing, respectively, while corresponding private firms registered a decline of -0.7% and -0.1%. This sample of cooperatives also recorded better rates of profit and maybe higher levels of productivity, although considerable differences were found between cooperatives in construction and those in manufacturing.

An even more impressive employment record in Lega cooperatives is reported in a survey of 304 cooperatives, undertaken by the Lega Association (489): over the 1975-78 period, in manufacturing industry cooperatives, there was a 10.5% growth in the number of employees (or 16.2% of members), as compared with a sample of private firms which registered a decline of 6.1%; for construction cooperatives, a 22.4% growth of employees (or 16.7% of members) was recorded, as compared to -4.7% in private firms. The Lega has undertaken other surveys which offer rich statistical data on the Italian cooperative sector, the latest of which is on cooperatives in Emilia Romagna (Lega, 490), and some good case studies on Italian producer cooperatives have also appeared recently (see Bollini et al., 477; Peloso, 325; Modoro, 324; Nazarro, 493; Fabbri, 486).

In a recent study on Italian producer cooperatives a production function framework is used to estimate the productivity effects of worker participation in management, profit-sharing, worker ownership, worker loan capital and the size of the reserve fund, using firm-level data for Italian manufacturing and construction producer cooperatives (Jones, Svejnar, 323). The results of the regression analysis, based on data from a sample of Lega cooperatives with sales in excess of the equivalent of one million dollars, indicated that profit-sharing, workers' participation and individual worker ownership of assets have a positive or at least a non-negative effect on productivity, whilst collectively owned reserves have a negative effect on productivity.

The Mondragon group of enterprises in the Basque province in Northern Spain is often considered the most successful example of the viability of producers' cooperatives, although the Italian case is, as we have seen, equally impressive. The Mondragon group originated in technical education classes started in 1943, under the influence and inspiration of a Basque Catholic priest, and a small firm was set up in 1956. The number of cooperatives increased to 30 in 1965, and to 40 in 1970, while average employment from less than 50 in 1960, to over 100 in 1965, and to over 200 in 1970. By 1980, Mondragon had developed into a system of some 70 producers' cooperatives, with over 15,000 members, providing, in 1979, 12.5 per cent of the industrial employment in the province of Guipuzcoa. (For further details, see Oakeshott, 340, 341, 453; Gutierrez-Johnson, 337; Gutierrez-Johnson and Whyte, 338; Eaton 335; Bradley and Gelb, 330, 331, 332; Thomas, 342, 343; Thomas and Logan, 506, 507).

A key feature of the Mondragon group of cooperatives is a well developed supporting structure. The Mondragon system includes not only basic production cooperatives, but also an integrated structure of service cooperatives, such as the social insurance organisation, a research and development unit, a technical college, and others. However, the central role is played by Mondragon's savings bank, the Caja Laboral Popular (CLP), to which cooperatives are linked by a contract of association. The CLP mobilises the savings of its 300,000 members, and provides the bulk of the group's financing. It was formally constituted in 1959 in order to provide a legal guarantee for the capital received

from the community, and is permitted to give credit only to its members. Thomas and Logan (507) have presented some basic indicators on the performance of the CLP, and these figures demonstrate rapid growth over the last twenty years: the balance between capital and reserves in the CLP's own resources shifted from 0.95:0.05 in 1965 to 0.38:0.62 in 1979. According to most reports, the CLP has played an important role in Mondragon, and has contributed to its economic success.

Industrial enterprises used to account for more than 80% of all Mondragon undertakings, whereas today, around 64%, and these include Spain's leading producers of domestic appliances and machine tools. Initially, the sector of heavy machinery was the most important provider of employment, while today, it is the consumer durable sector; the machine-tool group has shown the greatest relative improvement in profitability, although the consumer-durable group is still the most profitable, in spite of a decline in its share of group profits (Stephen, 427). Most cooperatives are small to medium in size; the exception is one cooperative which employs over 3,000 workers. The largest part produce commodities that are of medium capital intensity, although highly capital-intensive products are also found (such as petrochemicals).

The contract of association stresses that all workers must be members and entries to the cooperative should not be restricted. Cooperatives must create collectively owned reserves to which a minimum of 20% of net profits must be allocated, and they must also contribute 10% of net profits to a social fund

devoted to cooperative projects in the community. Although formally all workers should also be members, in practice hiring of non-member workers does take place. A new member must put up a significant capital contribution as a membership fee, 15% of which is allocated to the cooperative's reserves, the remainder being credited to individual capital accounts on which they receive only a fixed rate of interest. In contrast with the French and Italian cooperatives, individual capital accounts are revalued annually.

The system of wages in Mondragon is based on three solidarity principles: wages are related to those in capitalist firms in their immediate environment; a common system for determining wages is used in all Mondragon cooperatives; and finally, wage differentials within a cooperative are restricted to the ratio of 3:1. Top salaries in Mondragon in 1974 were about a third of those of a director in a comparable private firm (see Gutierrez-Johnson, 337; Thomas, 342; and Thomas and Logan, 507).

Several studies have indicated that the results achieved by Mondragon cooperatives are at least as good as those achieved elsewhere in Spain. Using various indicators, Thomas (343) found that productivity and profitability were higher for cooperatives than for private firms. Thomas and Logan (506, 507) evaluated their performance in terms of sales, value added, exports, investment, productivity, profitability, and financial position, in comparison to private enterprises in the surrounding provinces in the Basque region of Spain. They conclude that in aggregate, the Mondragon group outperformed the reference group of private firms in terms of growth, productivity, and profitability. Levin (339)

reports that in 1972, Mondragon cooperatives were using capital and labour more efficiently than the average of the largest five hundred firms in Spain. Jones (304) uses more than a dozen indicators to design a typology of producer cooperatives and to evaluate their economic and social performance, and compares the Mondragon group favourably with other cooperatives in the western world. Bradley and Gelb (330, 331, 332, 500) have undertaken surveys of cooperatives in Mondragon, and found that a generally favorable picture of the Mondragon experiment emerges, as it demonstrates advantages of a cooperative economy, and especially a very impressive employment record: over the period 1975-80, the group created some 4,000 jobs, an increase in employment of some 25%. However, the same authors in a later study (Bradley and Gelb, 1985, quoted in Estrin, 299) report that since 1980, employment in the Mondragon group has been falling, by around 500 workers up to 1983.

Much of the analysis of the Mondragon experience has been undertaken in a somewhat acritical fashion however, and the current difficulties which face the group clearly point to the need for an application of the more rigorous type of economic analysis which has recently been applied to the Italian, U.K. and French experiences.

13. United Kingdom

Workers' cooperatives in the United Kingdom have their origins in the late eighteenth and early nineteenth centuries, their number peaking in 1893 at a total of 113 (Jones, 355; for

details, see also Thornley, 457). From the beginning of the 20th century their number has steadily declined, and it is only in the 1960's that new worker cooperatives began to be formed, and only after 1975 that there was a major growth in their number. Between 1976 and 1980, U.K. cooperatives had the fastest increase among cooperatives in western countries, as their number rose by almost ten times with some 250 new cooperatives established (see Estrin, 299; CDA, 511, 512). While in 1975 there were only 30 cooperatives registered with the model rules of the Industrial Common Ownership Movement (ICOM), their number had increased to over 400 by May 1982. The Cooperative Development Agency (CDA) recorded a total of approximately 329 worker cooperatives in 1980; by 1982 this total had increased to approximately 480; and by June 1984, there were 911 cooperatives in the United Kingdom, employing almost 9,000 workers (CDA, 512).

The vast majority of worker cooperatives are new firms: during the 1975-1981 period, some 90% of new cooperatives were formed from scratch, and there were practically no conversions of traditional organisational forms into cooperatives. Most of the new cooperatives are very small in terms of the number of workers employed, often not exceeding 10 workers (see Wilson, 360). According to the CDA Directory (512), more than 70% of existing cooperatives employ less than 10 workers, while only one cooperative had more than 500 workers. Cooperatives have mostly been established in the service sector, particularly in retailing, catering and food producing (over 30%), printing and publishing (around 20%), distributive trades or in craft related industries

and light manufacturing (see CDA, 511, 512; CEC, 440; Cornforth, 351).

The traditional British cooperative support organisation is the Cooperative Productive Federation (CPF), founded in 1882, bringing together both industrial cooperatives and provident societies (see Jones, 354, 355, 356; and Jones and Backus, 357). However, cooperatives affiliated with the CPF suffered a marked decline in number from the Second World War onwards, and had diminished to 17 firms employing 1,600 workers in 1970. By 1980, there were only 8 traditional producer cooperatives affiliated to the CPF, and the organisation amalgamated with the Cooperative union, which itself had only 9 members in 1981 (CEC, 440).

It is believed that the recent growth of the U.K. cooperative sector is associated with the formation of new cooperative support organisations (Estrin, 299). The new support organisations which emerged during the 1970s were ICOM, the Industrial Common Ownership Movement, and CDA, the Cooperative Development Agency, with its 40 local Cooperative Development Agencies which play an important role in sponsoring new cooperatives (Cornforth, 351; CEC, 440).

Oakshott (453) classified U.K. cooperatives into three categories. The first group are the "cloth-cap cooperatives", or long established cooperatives, with their origins often prior to 1914, associated with the Cooperative Union, and prior to its demise, the Cooperative Productive Federation. The number of these cooperatives has fallen steadily: from 71 in 1913, to 26 in 1970 (Oakshott, 453), while Jones (356) gives an estimate of 17 for

1975. The second group are those associated with the ICOM, or who have adopted ICOM-type rules, which are now enshrined in the Industrial Common Ownership Act of 1976. Whereas in 1977 there were 10 major ICOM companies with 1,200 members (Oakshot, 453), by the end of August 1981, their number had increased to 350, forming at the rate of two cooperatives a week (CEC, 440). The third group identified by Oakshot are the ill-fated Wedgewood-Benn cooperatives, formed in an attempt to preserve employment after the closure of privately owned firms in the mid 1970's; the three enterprises involved are Meriden Motorcycle, Scottish Daily News (see Bradley and Gelb, 349) and KMB.

The rules of the ICOM and the CPF differ in a number of important respects (CEC, 440). According to ICOM rules, shareholding is limited to one 1-pound share per member, while according to CPF rules, there was no maximum shareholding except for the legal maximum (5,000 pounds in 1981). The second important difference is that ICOM rules insist that only workers should be members and that all workers should be members. By contrast, only around 40% of workers in CPF cooperatives are members. The CPF rules initially allowed outside shareholding and many productive cooperatives relied on outside shareholders; however, following strong criticism, the rule was abolished in 1978 and shareholdings are now restricted to workers. The third main difference is that ICOM rules prohibit the distribution to members of any residual assets in case of closure, and these should be transferred to another common ownership, or similar organisation.

However, according to both sets of rules, voting is usually on a one-member, one-vote basis, regardless of shares, and substantial part of capital is collectively owned. Whereas ICOM rules are such that practically all capital is collectively owned, and they strongly recommend collective savings without any member participation in the growth of assets, the situation is not much different in CPF cooperatives: apart from the legal requirements for minimal individual holdings, the remainder of the assets is held in collective form, and Jones and Backus (357) report that most investment is financed by retained earnings which cannot be recovered by individual employees. Estrin, Jones and Svejnar (300) found that individual ownership only accounted for around 4% of the total assets in the British CPFs in 1968.

The largest part of empirical work on U.K. cooperatives has been concentrated on long-established cooperatives (for a review of empirical work, see Cornforth, 351). A number of factors have been blamed for the failure of many of the traditional producer cooperatives in the U.K.: undercapitalisation, lack of management and business skills, lack of discipline and poor relationships between management and workers (Thornley, 457). Early works by the Webbs (517, 518) suggested that producer cooperatives would either fail as businesses or degenerate into non cooperative forms. These pessimistic claims were systematically examined only recently by Jones (303, 355), who looked at the survival rate, performance and levels of participation in traditional producer cooperatives, between 1885 and 1963. The evidence suggests that producer cooperatives can survive for long

periods of time, in a manner which compares favourably with conventional companies (Jones, 355). As to the efficiency of producer cooperatives, Jones examined the comparative performance of producer cooperatives with equivalent private firms, and concluded that no comparative advantage was apparent as there was no consistent relationship between the diverse indicators of labour efficiency and participation (Jones, 303). Nevertheless, the general conclusion of Jones' studies is that cooperatives can perform at least as well as similar private companies. Success was not necessarily achieved at the expense of degenerating into non-cooperative forms.

Jones and Backus (357) tested hypotheses derived from Vanek's (214) theory of financing for British producer cooperatives in footwear existing between 1948 and 1968, in order to examine the consequences of internal financing. Estimating production functions and using several measures of participation, support was found for the proposition that participation improves productivity (although participation coefficients varied much between classes and with functional form). However, the average footwear cooperative was smaller than the average firm in the footwear industry, and private firms were growing at a faster rate than cooperatives. These results are broadly consistent with the predictions of an underinvestment effect associated with the Cornell School approach (see section B5). However, the study has been criticized on statistical and methodological grounds by Stephen (427) and should not be regarded as conclusive.

Another recent study, by Wilson (360), based on a survey of 72 worker cooperatives in the U.K., showed that workers cooperatives suffered from the typical problems of new businesses. Obtaining finance was seen as the crucial problem both in the period of setting up the enterprise, and afterwards, while others included obtaining and keeping sales outlets, and finding and keeping the appropriate skills. These findings are also supported by a similar survey by Chaplin and Cowe (350), who however found that obtaining finance was not such an important current problem (see Cornforth, 351).

14. Yugoslavia

The theory on the labour-managed firm originally developed with the the Yugoslav labour-managed firm in mind (Ward, 89), and as the most extensive system of labour-managed firms which extends throughout the largest part of the economy, Yugoslavia has also been a common area of empirical research.

With its origins in the early 1950's when the first workers' councils in a limited number of firms were formed, Yugoslav self-management has passed through different phases of its development, each of which associated with the introduction of economic reforms: the 1952-65 period of partial self-management, the 1965-72 period of market self-management, and the period after 1972 of regulated self-management. During the first of these periods, a decentralized mechanism replaced central planning, but central government control over income distribution, prices, foreign trade transactions and investment was retained, leaving

little autonomy to enterprises. In the period following the 1965 economic reform, decentralisation was extended to other sectors, including the banking system, investment, and foreign trade, and these changes ran parallel with the adoption of a more liberal price policy, increased reliance on the market mechanism, and decline in fiscal burdens on firms so as to increase their autonomy in the distribution of income. However, economic problems after 1965 (rising unemployment, inflation, balance of payments difficulties), led to a set of economic reforms in the early 1970's, which introduced elements of regulation through the new mechanisms of 'social compacts' and 'self-management agreements', but at the same time, democratized the decision-making process by splitting enterprises into smaller economic units.

The available extensive literature on the evolution of the Yugoslav system of self-management offers an excellent insight into the differences in institutional structure, decision-making processes, role of plan and market, economic performance, and other characteristics of each of the periods mentioned above (see World Bank, 538, 539, 540; Lydall, 531; Horvat, 528; Sacks, 534; Comisso, 522; Jan Vanek, 536). Studies on the Yugoslav industrial structure and enterprise entry and exit (Sacks, 379, 380, 381; Estrin, 523) show that Yugoslav product markets are highly concentrated. There has been relatively little new entry or exit of enterprises, in spite of the increase in firm numbers; an explanation offered by Estrin (523) is considerable diversification by existing firms into new product markets, which acts to reduce industrial concentration.

Empirical testing of hypotheses from self-management theory on Yugoslav data has been limited, and has mainly concentrated on problems of capital and labour misallocation (Estrin and Bartlett, 368). Most of these studies restrict the analysis to the 1965-72 period, as it is considered the only period which closely approximates the labour-managed market economy of self-management theory - although an exception is Prasnikar (376, 377), who examines the behaviour of Yugoslav firms under the post-1974 institutional arrangements.

The bulk of empirical work on Yugoslavia has concentrated on wage determination. Wachtel (389, 537) analysed the changes in average earnings for different skill groups, republics, and sectors in the 1956-69 period. The ratio between the lowest and highest incomes in the different skill groups increased until 1961, but declined thereafter, and similar movements were observed in the dispersion of average wages between different republics; as to the average wage dispersion among sectors, it steadily increased over the entire period. This last result is supported by Estrin's (366) findings, who makes international comparisons of income dispersion in Yugoslavia and other economies for the period 1956-1975 and finds that it was higher in Yugoslavia than in other countries, and higher in the period of market self-management than during the planned period (although the statistical basis of this comparison is contested by Lydall, 531). The evidence broadly confirms however, that not only were there large differences between the incomes paid for identical jobs in different industrial sectors, and that there was considerable variation in incomes over

time, but also that there was substantial income dispersion within sectors and within industries (see also Estrin 365; Miovic, 375; Rivera-Batiz, 378; Staellerts 384). These results suggest that after 1965, incomes had become endogenous to the firm, rather than a market-determined parameter, and are therefore broadly consistent with propositions from self-management theory.

As to the primary source of Yugoslav income differentials, the hypothesis that they are associated with the long run equilibrium of a self-managed economy in the absence of entry (exit) of new (old) firms, has been characterised by Estrin and Bartlett (368) as the "labour school" view. On the other hand, the "capital school" approach places emphasis on capital market imperfections which generate long-run disequilibria due to the underpricing of capital and its inefficient non-price rationing. Different estimates of the extent to which rents imputable to the arbitrary allocation of capital are distributed in the form of personal incomes are provided by Vanek and Jovicic (388); Staellerts (382); and Miovic (375), and is found to be a significant causal factor in the explanation of income differentials. More recently, Estrin and Svejnar (369) provide econometric evidence which fails to refute either hypothesis, although capital rationing proved to be the largest single source of income dispersion. Thus, both labor and capital market immobilities in Yugoslavia appear to have been sufficient to prevent the eradication of labour marginal product differences between firms.

Tyson (386) has examined the savings behaviour of Yugoslav firms. She suggests that Yugoslav enterprise income and

savings decisions can be explained by a permanent-income hypothesis, and shows that contrary to the predictions of the Texas School, enterprises saved a substantial proportion of their net income even after the reform: around 25% or more in all but 2 of the 11 sectors that yielded statistically significant results. Although these findings have been questioned by Stephen (427), they are largely consistent with statistical evidence on savings in Yugoslavia (see World Bank 538, 539, 540), and are also indirectly supported by Gjurinek's (370) survey of 46 Yugoslav firms: whereas small firms regarded maximization of income per worker as their prime objective, medium and large firms viewed moderate accumulation and growth more important (on the issue of investment in Yugoslavia, see also Connock, 364). Recently, Bartlett (361) has considered the impact of fiscal policy on Yugoslav enterprise investment behaviour within the context of the self-management planning system which has been developed in recent years.

15. Conclusions

The early theoretical literature on labour managed firms seemed to indicate that these types of firms were prone to inherent inefficiencies, ranging from 'perverse' responses to market price signals which would place limits on the employment creating abilities of such firms to possibly fatal underinvestment effects which would put limits upon the possible emergence of a 'third sector' of producer cooperatives in mixed economies, and even inherent 'degenerative' tendencies which would frustrate the survival of such a sector if ever it were to emerge.

However, wherever there are gains to be grasped from productive activity, human institutions seem to develop ways of adapting suitable structures within which such gains can be enjoyed. This insight is not ignored by conventional 'marginalist' economic theory, which in its more sophisticated variations proposes not only that the invisible hand of the market may operate so as to maximize social welfare within given institutional constraints, but that the institutional constraints themselves are capable of adaptation through more or less transparent actions of economic agents. And indeed in this survey of the economic theory of participation in its various forms (labour-managed firms, employee participation and profit sharing schemes) we have seen repeatedly that possible alternative institutional solutions have been suggested which would overturn the more pessimistic predictions of the early rudimentary theories

based largely on overly simplistic theorizing, and on the principle of a mechanical analogy between profit-maximization and income-per-head maximization.

Moreover, the European experience with labour-managed firms, whether the producer cooperatives of western Europe or the 'self-managed' firms of the Yugoslav economy, has shown that a wide variety of institutional arrangements have been adopted in particular circumstances to suit the conditions prevailing in different countries. These experiences have shown that many of the institutional modifications suggested in the theoretical literature to improve the efficiency properties of the 'rudimentary' labour managed firm of early theory are commonly adopted in practical situations. They range from the admission of non-member workers to the charging of explicit or implicit membership fees which imply a departure from pure egalitarian principles, to the creation of supporting agencies which assist the formation of new firms, and to the implementation of internal loan schemes which support the capital accumulation programmes of existing firms. In the special circumstances of the socialist economy of Yugoslavia, decentralized planning mechanisms and extensive measures to regulate the behaviour of large labour managed industrial oligopolies have been adopted. The continued existence and growth of labour managed forms of economic organization in Europe under a variety of institutional settings therefore points to the accuracy of those developments in the theoretical literature which have sought to grapple with the tricky questions of

appropriate institutional design of these non-orthodox types of economic organizations.

At the same time there has been a curious assymetry in the development of the theoretical literature and the empirical studies, particularly in regard to the producer cooperatives. On the one hand the empirical work has hardly begun to address some of the central issues identified in the theoretical work, such as the hypotheses on supply response, on investment levels and financial structure or on entry conditions of new firms. On the other hand the main effort of empirical research, namely on the productivity-participation relationship has paid only cursory attention to the large theoretical literature on incentive systems which addresses directly the question of effort supply and which is therefore of direct relevance to the productivity issue. In the absence of an adequate theoretical reference point the findings of the empirical research in this area are rather difficult to interpret. For example, the theoretical models of incentive structures suggest that depending upon the particular type of remuneration system adopted, whether of the needs-related or work-related type, equilibrium outcomes may give rise to either an under-supply or an over-supply of effort in relation to an efficiency benchmark. Therefore the finding of a positive correlation between an participation index and a measure of productivity levels may merely indicate that members of a labour-managed firm are putting in relatively too much effort - a sweatshop effect - rather than that they are in some sense more efficient than comparable privately owned firms.

There is thus much scope for further progress in both theoretical and empirical studies of the economics of participatory systems, both at the theoretical level, so as to take on board the wide variety of experience which has been accumulated in European developments in this area, and at the empirical level so as to provide answers to the many intriguing puzzles and hypotheses which have emerged from theoretical speculation.

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