



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

CYCLICAL VARIATIONS IN THE LABOUR INPUT:
COMPARISON OF CAPITALIST AND LABOUR-MANAGED FIRMS*

by

Geoff Stewart
University of Warwick

NUMBER 226

WARWICK ECONOMIC RESEARCH PAPERS

DEPARTMENT OF ECONOMICS

UNIVERSITY OF WARWICK
COVENTRY

CYCLICAL VARIATIONS IN THE LABOUR INPUT:
A COMPARISON OF CAPITALIST AND LABOUR-MANAGED FIRMS*

by

Geoff Stewart
University of Warwick

NUMBER 226

ABSTRACT

An important question is whether the responses to cyclical variations in demand are different for a capitalist firm (CF) and a labour-managed firm (LMF) within a particular economy. The focus of this paper is how a given change in the labour input would be divided between its three components: employment, hours, and effort. The existence of a bilateral monopoly in the F employment relation, together with a differing response to a deterioration in the labour market, leads us to conclude that, relative to the CF, the LMF will reduce effort more and employment less in a downturn.

*I am grateful to Keith Cowling, Ben Knight and Peter Law for valuable comments.

This research was undertaken during the tenure of an SSRC Studentship.

This paper is circulated for discussion purposes only and its contents should be considered preliminary.

March, 1983

1. INTRODUCTION

In a recent paper, Gordon (1982) looks at the effects of changes in nominal aggregate demand in three capitalist economies; the U.S., U.K. and Japan. Given that profits will not absorb all of the variation, the particular question he addresses is how changes in the wage bill will be divided between wage rate, hours and employment fluctuations. Data for the post-war period reveal significant differences in this division across the three countries and this, Gordon argues, can only be explained by taking account of the role of sociological, historical and institutional factors in defining the relationship between workers and (capitalist) firms.

The aim of this paper is to suggest a further determinant of the cyclical adjustment process within a capitalist economy. It will be argued below that there will be significant differences between the behaviour of capitalist firms (CF's) and labour-managed firms (LMF's) over the cycle. Since LMF's account for a very small fraction of total employment in capitalist economies the intention is not to contribute to the analysis of inter-country differences. However, the comparison of enterprise types remains of interest both because the size of the LMF sector is increasing in a number of capitalist economies and because there is a growing debate on the desirability of otherwise of further expansion. We will not attempt

to cover all aspects of IMF and CF behaviour over the cycle but rather, as a first-step, focus solely on the labour input. In particular we shall attempt to identify differences between the firms in how a given change in the labour input would, in response to an endogenous output fall, be divided between its three components: employment, hours and effort per hour. As will be seen, major differences do emerge and would therefore need to be incorporated into a general comparison of the cyclical behaviour of the two enterprise types.

We begin, in section 2, with the CF. Given our particular focus of interest it is assumed that a cyclical downturn impinges upon both types of firm in the form of an identical exogenous reduction in output and that labour is the only variable input. The aim will not be to develop a model capable, using marginal analysis, of precise predictions of the CF's response, but rather to describe the firm in such a way that the major differences between the two modes of production are brought out. As Simon has observed, comparative institutional analysis commonly involves an examination of discrete structural alternatives for which marginal analysis is not required: "In general, much cruder and simpler arguments will suffice to demonstrate an inequality between two quantities than one required to show the conditions under which these quantities are equated at the margin" (1978, p.6). Recent work on labour hoarding and

implicit contracts in CF's differs from traditional neo-classical analysis by emphasising the costs involved in adjusting employment, hours (and the wage rate). We make use of elements of this literature but differ in arguing, in Section 3, that a fundamentally important characteristic of the CF is the existence of struggle between firm and workers.

Section 4 then aims to identify the major respects in which the behaviour of a LMF would differ from a CF. This is followed by a brief concluding section.

2. THE CAPITALIST FIRM: LABOUR HOARDING AND IMPLICIT CONTRACTS

The question to be answered is how will a cost-minimising CF adjust its labour input in response to a cyclical downturn in demand. A downturn comprises both a reduction in demand for the firm's product and a deterioration, from workers' point of view, in the external labour market.

For reasons set out above we assume that the fall in product demand takes the form of a reduction in output. The labour input comprises the number of workers, hours per worker and the level of effort expended per hour. Workers receive an hourly wage rate. In order to focus on the labour input it is further assumed that labour is the only variable input over the cycle. The problem for the firm is then how to adjust employment, hours and

effort given the exogenous reduction in output.

Numerous studies have revealed that during a cyclical downturn the reductions in both employment and person-hours are less than proportionate to the fall in output.^{1/} This phenomenon is referred to as labour hoarding and has been explained in terms of various costs and rigidities in adjusting employment and hours. Consideration of effort has been neglected in the literature but, as will be seen below, it forms a central element in our analysis. We begin however by looking briefly at the contribution to be made by the labour hoarding literature and more recent work on implicit contracts.

Following Oi, (1962), most authors have identified the costs involved in hiring, firing and training workers as a source of employment rigidity. An exception is Bowers, Deaton and Turk (1982).who argue that, in the U.K. at least, the high level of voluntary quits means that hoarding cannot be explained by such adjustment costs, and emphasise instead technical inflexibilities arising from the division of labour. A difficulty here is that the available data on separations is insufficiently detailed to enable the rate of voluntary quits to be calculated with any degree of precision. Furthermore, as will be argued below, the level of quits should be treated as endogenous rather than exogenous. In addition to these adjustment costs and technical inflexibilities, Taylor (1974) suggests that employment reductions may be limited by explicit contractual obligations, information lags and possible

detrimental effects on worker morale leading to lower efficiency. The role of contracts will be discussed below where it is argued that any contracts incorporating employment or hours are likely to be implicit rather than explicit, if they exist at all. Information lags will not be considered since they have featured little in the existing literature and, more importantly, are unlikely to be a major source of differences between CF and LMF behaviour. Taylor does not attempt a theoretical justification for including worker morale among the list of possibilities. It is in fact essentially inconsistent with the view, in this literature, of the labour input as comprising employment, hours and the extent to which the firm decides to utilize them.^{2/} As will be seen below, worker morale could only play a role within a model which admits some degree of control by workers over the labour input.

There are then a number of suggested reasons for the downward inflexibility of employment in the hoarding literature. Less attention has been paid to hours although Taylor (1974) suggests that explicit contracts and worker morale may present constraints on hours reductions. Okun (1981) argues that to reduce hours requires changes in work schedules and this is costly for firms.

On the basis of these considerations Taylor (1974) argues that, in response to a fall in output, firms will typically respond at the outset by reducing the length of the workweek. As output continues to fall a limit on hours reductions is reached and the firm

then begins to cut the workforce. However the various costs and constraints mean that neither hours or employment will fall in line with output. Thus we get hoarded person-hours or a "reduction in labour utilization".

Further justification for labour hoarding by firms is provided by more recent literature which emphasises the gains from long-term employer-employee relationships.^{3/} As we have seen, firms will incur various costs if they attempt short-run reductions in their labour force. More generally, voluntary turnover imposes costs associated with hiring and firing on the firm. Similarly, workers incur costs in moving between jobs. These might include, for example, financial costs of search, loss of earnings while unemployed and costs of moving house. Such costs to firms and workers mean that there are benefits to both sides from long-term attachments. Thus, for example, workers would accept a lower wage from a job with a longer expected period of tenure. The problem is how to create expectations of long-run attachments.

One possibility would be an explicit contract fixing levels of pay and tenure. Okun (1981) argues that such contracts would suffer from inflexibility and problems of moral hazard. Inflexibility would in principle be solved if they took the form of contingent claims contracts but these would generally be too complex to be feasible (Williamson, 1975). Okun (1981) therefore suggests that implicit contracts are more likely. These are arrangements which are not legally binding but do induce expectations, on both sides, of a continuing relationship. Okun suggests that paying experienced workers more than novices might be an element

of such a strategy. In addition, workers expectations will depend to some extent on the past performance of a firm so firms need to take account of the effect of actions on their reputation in the labour market. Another option would be for a firm to issue non-binding statements about future intentions. It is argued that firms will have an incentive to honour such implicit contracts for two reasons. First, to break a contract would lower the reputation of the firm in the eyes of potential applicants and hence a higher wage would need to be offered. Secondly, existing workers would be disappointed. Okun argues that such disappointments are likely to trigger off quits from the firm. The reason given for this is that, because of the uncertainty about alternative opportunities, a worker's decision on whether to quit will have many elements of satisficing rather than maximising behaviour. In turn, one criterion for whether the current job is satisfactory is whether it has lived up to expectations.

Whereas the labour-hoarding literature focusses on those costs which fall directly on the firm, Okun's analysis suggests a mechanism through which the costs to workers in changing jobs will also be incorporated into the firm's calculation, thus providing a further rationale for hoarding. It has also been argued that implicit contracts enable less risk averse firms to insure more risk averse workers against fluctuations in their marginal revenue product. The picture presented is of firms finding it optimal to take account of the workers desire for stability of employment: the employer is seen essentially as a passive supplier of the means of production.

There are, however, a number of arguments which suggest that firms will in practice, only take limited account of workers' preferences for stability. First, workers must accept some variability if firms themselves are risk-averse. More fundamentally, we may question the strength of the link between a firm reducing employment and the consequent increase in costs. An implicit contract relates employment levels to states of the world. The problem is that workers will generally be less able to observe the state of the world than firms. This is certainly true with respect to the marginal revenue product of workers. In such a situation it is very difficult to evaluate the performance of the firm and, in addition, firms have an incentive to cheat by claiming that conditions are worse than in fact they are. Thirdly, any costs which do occur, do so only in the long-run, whereas the savings from reducing employment are immediate. Thus compliance may be profitable only if the firm has a long time horizon. Finally, a basic criticism concerns the picture of a harmony of interests of firms and workers which underlies this approach. In the following section it is argued that conflict is inherent to the employment relation in CF's. An important element in the analysis is the rate of effort which, it will be argued, could not in any case, form part of an implicit contract.

3. CONFLICT IN THE CAPITALIST FIRM

The employment relationship between a CF and workers is one of bilateral monopoly rather than competitive exchange. It is this feature which leads us to characterise the relationship as one of struggle. The existence of bilateral monopoly is clear where a labour market is dominated by few firms and workers are organised

into trade unions. However, the condition is much more general than this. As Williamson (1975 p.28) points out: "..... large numbers homogeneity conditions which obtain at the outset may no longer hold at the contract renewal interval". This is because the hiring, firing and training costs mentioned earlier convey a degree of monopoly power on the existing workers in a firm and, similarly, the costs to these workers of changing jobs gives the firm some monopsony power.

Bilateral monopoly produces a zone of indeterminacy. For example, holding all other elements of the employment relation fixed, there will be a range over which the wage rate can vary without either side wishing to terminate the relationship. Conflict ensues as each side attempts to gain an advantage. In addition each party will aim to shift the zone in its favour by increasing its relative underlying strength. For example, a shift in favour of workers would occur upon the formation of a trade union.

The struggle over shares will involve both the price and the quantity of the labour input. Our concern is with the latter and here the rate of effort will be particularly important. This is because unlike the wage rate, employment, or hours the rate of effort cannot be specified in either an explicit or implicit contract. In turn, this results from two distinguishing features. First, it is difficult to observe and measure, so firms cannot, for example, convey to workers the level of effort it would set in various states of the world. Similarly it is very difficult for potential applicants to gain an accurate impression of the level of effort in a firm.

Secondly, workers can generally exercise some degree of day to day control over the rate of effort.

We now turn to consider the implications of this view of the CF for cyclical adjustments of the labour input.

In the labour hoarding literature the labour input is defined in terms of employment and hours. The existence of a third component is however implicitly recognised in the term "underutilization of labour" which is seen as a consequence of labour hoarding. A further implicit assumption is that the employer is free to vary the rate of utilisation - presumably up to some (unspecified) maximum. However, the question of what actually happens to the underutilized labour is not examined.^{4/} We have defined the third component of the labour input as the rate of effort and hence if labour is hoarded the rate of effort will fall.

In the hoarding literature variations in labour utilization are seen as having no effect on costs and hence do not enter into the decision on how to adjust the labour input. This is no longer true in our model. The immediate effect of a reduction in the rate of effort is clearly a benefit for workers in the form of a fall in the disutility of work. It might be argued that the firm can then reduce the wage rate to restore workers utility to its previous level and hence the costs of hoarding are less than they first seem. In practice however any benefits to the firm in the form of wage reductions are likely to be small. In the first place, wage rates are often fixed for periods of a year or more to economise on negotiation costs and hence the initial benefits will all accrue to workers. Secondly, as noted above the rate

of effort is the subject of continuous struggle and not part of any contract. Thus bargains which involve a lower wage rate in return for the reduction in effort are rare, rather the struggles over wage rates and effort will typically be independent. For these reasons the relationship between effort and wage rates is likely to be weak. Our argument that the rate of effort is the subject of struggle is a rejection of the assumption in the hoarding literature that the firm is free to choose the "rate of utilization". It seems reasonable to argue, in addition, that it will be attempts to change the rate of effort which will invoke particular resistance. This means that, having allowed the rate of effort to fall in the downturn, the firm may face difficulties in attempting to raise it again during the upturn. This ratchet effect is a cost of labour hoarding which the firm needs to take into account.

Our analysis also implies that the firm has an interest in limiting the degree of solidarity among workers since solidarity increases monopoly power. Reich and Devine (1981) have argued that the division of labour helps in this respect by reducing the opportunities for inter-personal interaction and communication between workers. Given that the development of solidarity requires interactions among workers a further determinant will be the length of time over which the workforce has been together. Thus the firm may use employment reductions during a downturn as a means of restricting the development of solidarity. Redundancies also give firms the opportunity to dismiss particular workers who are active in organising the workers without the fear that victimisation could be proved. A further point is that the existence

of struggle suggests a possible disadvantage to the firm of reducing hours rather than employment during a downturn. This stems from the fact that a reduction in hours will reduce the level of workers' utility^{5/} whereas if employment is reduced then the remaining workers are no worse off than before. The potential problem for the firm which reduces hours is that worker may succeed in restoring hours to their "normal" level before the firm would choose to. In contrast workers who have been dismissed cannot exert pressure to be re-hired.

Finally, account needs to be taken of the exogenous determinants of the relative strengths of firms and workers. An important feature of a cyclical downturn is that it involves not only a reduction in demand for the firm's product but also a deterioration, from the point of view of workers, in external labour market conditions. This will tend to increase the relative power of firms for the following reasons. First, if firms are not recruiting they no longer need to pay so much attention to how potential applicants view conditions inside the firm.^{6/} Secondly, for existing workers the cost of quitting will be higher and hence they will accept lower levels of utility before leaving. Moreover, the firm may actually wish to induce quits in order to avoid firing costs associated with employment reductions. Finally, if workers are collectively organised it is the strike threat rather than the quit threat which may be more important. Again we would expect the relative power of firms to increase since the cost of a strike in terms of lost production will be less in a downturn.^{7/} Firms may be able to use this increase in relative power to reduce wage rates, or, more important from our point of view, to raise the level of effort. Thus for firms where the costs of adjustment of hours or

employment are low there may be an increase in output per person-hour, a possibility not recognised in the existing literature. Furthermore, not all firms will suffer a fall in demand during the recession, and those where output is increasing may be able to achieve this by increasing the rate of effort. Thus in aggregate cross-section studies this tends to reduce the overall degree of labour-hoarding in CF's.

4. THE LABOUR-MANAGED FIRM

In the LMF we assume that decisions are taken by majority vote with each worker having one vote, and that members receive, as income, equal shares of the total net revenue. We now examine how the labour input will be adjusted in response to the reduction in output and deterioration in the labour market, remembering that the objective is to identify the major differences between LMF and CF behaviour.

Consider first the rate of effort. For the CF we argued that a reduction in the rate of effort was unlikely to lead to significant reductions in costs and hence will not be seen by the employer as producing positive benefits. In the LMF by contrast the immediate beneficiaries, the workers, are also the controllers of the firm. Thus the perceived benefits of reductions in the rate of effort are greater in the LMF than the CF. It was also argued that the CF may face problems in attempting to raise the rate of effort in the upturn. Will the same be true in the LMF? The traditional argument from organisational theorists is that since a worker's income is based

on the product of the LMF as a whole rather than his or her own product, but he or she receives all the benefits from shirking, the LMF suffers from free-rider abuses. Thus Williamson (1980) regards CF's and LMF's as equally inefficient in providing incentives for effort. This suggests, then, that the LMF will also face difficulties in raising the rate of effort in an upturn. However, this neglects the crucial differences which follow from the fact that in a LMF workers collectively determine the desired level of effort and directly receive the benefits from its attainment. Therefore, as Reich and Devine (1981) point out, there is no collective resistance to securing the chosen level of effort. On the contrary, collective pressures such as cajoling, ribbing, ostracism and a basic desire to conform to peer group norms, are actively directed towards its attainment. In addition the horizontal monitoring in LMF's will generally be more effective than the vertical monitoring of CF's. In the LMF there are incentives to develop a collective consciousness which is made easier by the fact that individual compliance is more likely where there has been active involvement in the decision-making. Unlike the CF there is no-one with an incentive to encourage individualism.^{8/} The available evidence provides tentative support for these arguments. Espinosa and Zimbalist (1978 p.143-146) found that absenteeism dropped significantly following the introduction of worker control in Chilean enterprises, and Thomas and Logan (1982 p.50) report that absenteeism in the Mandragon co-operatives is only half that of the local CF's. In a series of studies of French Co-operatives Batstone (1978) found that greater reliance was placed on self-discipline than in CF's and Gunn (1980) reports that the Plywood co-operatives of the Pacific Northwest devote fewer resources

to supervision than comparable CF's.

Our discussion of CF's also showed that the deterioration in the labour market presented the firms with the possibility of raising the level of effort and we suggested that this would actually take place in some firms. In contrast, there is no mechanism whereby the deterioration in the labour market will, by itself, affect conditions within a LMF. To see this, suppose a particular firm did not suffer a fall in demand for its product. If it were a CF we would expect some increase in the rate of effort and/or a fall in the wage as the employer takes advantage of the reduction in workers' strength. In the LMF there would be no effect at all. In this sense the LMF provides a pure case of an internal labour market. The difference arises because the CF always aims to force workers onto their supply curves to minimise costs whereas such behaviour is absent in a LMF. It will be seen below that where a LMF faces a fall in output the external labour market is relevant in that the fate of departing members will be taken into account in deciding whether to reduce membership. In this case however we are more likely to get reductions in the rate of effort as the labour market worsens.

Turning now to hours of work, both the CF employer and the LMF members derive benefits from a reduction in hours, the former from a cut in the wage bill and the latter from an increase in leisure time. However in the CF we noted the possibility that workers may succeed in restoring hours to their normal level which, other things being equal, is an argument for cutting employment rather than hours. This argument clearly does not apply in the LMF where there is no distributional struggle.^{9/}

The final method of reducing the labour input is through a cut in employment. For the CF we saw that this brings benefits in the form of a reduction in the wage bill and possibly helps to contain the development of solidarity among the workforce. On the cost side there may, first of all, be technical inflexibilities arising from the division of labour. Secondly there are adjustment costs associated with hiring, firing and training which become less relevant the higher is the rate of voluntary quits. Finally there may be some long-term costs if we accept the implicit contract arguments. For the LMF the considerations are very different. If we accept Reich and Devine's (1981) argument that the division of labour will be less in a LMF then the technical opportunities for reducing employment will be greater in a LMF. The evidence on this is mixed possibly because, as Thomas and Logan (1982) argue in relation to the Mondragon co-operatives, the available technology is largely determined by capitalism.^{10/} More importantly however all of the arguments below suggest that employment adjustment will in fact be less in LMF's, whatever the technical possibilities.

Firstly, the benefits of a smaller wage, or rather income bill will only accrue to those workers who remain in the LMF. The Illyrian model assumes that it will in fact be the welfare of those that remain which is maximised^{11/}. This would also be true if we accept Furubotn's (1976) view that the LMF will in practice be controlled by a dominant group. However we have assumed a LMF in which all workers have an equal say in decision-making. In addition, if all members are to be treated equally then any selections for dismissal must be done on a random basis. In such a situation the LMF members in voting

on whether to reduce employment in the downturn, will take into account the probability that they will be selected and their expected utility level outside the firm, as well as the benefit if they remained.^{12/} Thus in the LMF the fate of dismissed workers enters directly into the calculation on the cost side whereas in the CF we have argued that any increase in costs, on account of implicit contracts, is likely to be small. Clearly then the LMF will be less likely to reduce employment the greater the degree of risk aversion among members and the worse the conditions in the external labour market.

Secondly whereas the detrimental effect on solidarity of a reduction in employment is a benefit to the CF it is a cost to the LMF because, as was seen earlier, solidarity is an important source of incentives for effort in the LMF.

Finally, it was suggested that the CF may be able to avoid firing costs if, via increases in effort and for reductions in the wage rate, it is able to increase the number of quits. For the LMF this option is not open since members clearly do not force themselves down to their supply curves.

5. CONCLUSIONS

In making comparisons between LMF's and CF's the usual practice is to assume that each firm pursues its maximand subject to an identical production function and that the CF faces an exogenous wage rate.^{13/} We have argued however that this approach is inadequate because it ignores the importance of struggle in the CF. For our purposes this

requires rejecting the simple production function in favour of a model in which conflict over the rate of effort plays a central role. From this perspective the paper examined how each of the firms would divide a reduction in the labour input between its three components - employment, hours and effort - during a cyclical downturn. The aim was not to describe in detail the behaviour of the firms but to identify the major differences between the CF and LMF.

The overall conclusion from the analysis is that CF's will, relative to LMF's, tend to reduce employment more than effort for a given reduction in the labour input. In support of this it was noted, first of all, that the CF is unlikely to enjoy a significant fall in costs following a reduction in effort and will need to take account of possible difficulties in raising effort at a later date. Moreover, the deterioration in the external labour market may enable a CF to increase the rate of effort. In contrast, a cut in employment will directly reduce the wage bill and may help contain the development of solidarity among the workforce. The LMF members on the other hand will take account of the possibility that they will be among those selected for dismissal, and hence membership reductions become less likely the worse the conditions in the labour market. Furthermore, any reduction in solidarity is a cost rather than a benefit to the LMF. Finally, since the workers control the LMF, full account will be taken of the reduction in disutility associated with a fall in the rate of effort.

A further point of interest is that these differences in behaviour are likely to become more marked as the actual and expected duration of a downturn increases. First, the factors which restrict employment reductions in the CF become less important. Thus technical inflexibilities may gradually be overcome and any implicit contract gains from holding employment stable will be pushed further into the future and made more uncertain. Also, adjustment costs, being of a once and for all nature, decline in importance relative to wage bill savings as the expected duration of the recession increases. For the LMF on the other hand, the costs of being among those dismissed are greater the longer the expected duration of the recession and hence members will be less likely to vote for employment reductions.

Footnotes

1. See for example Bowers, Deaton and Turk (1982) for the U.K.
2. This notion of utilization is found for example in Taylor, (1970) Knight and Wilson (1974) and McKendrick (1975).
3. See for example Okun (1981).
4. An exception is Knight and Wilson (1974) who point out that the firm could either switch labour to non-productive work such as routine maintenance, or allow the rate of effort to fall by reducing track speeds or lengthening work breaks. Apart from noting this point the rate of effort does not however feature in their analysis.
5. This assumes workers were not initially supplying more hours than they would like at the given wage rate.
6. As noted earlier, implicit contract arguments suggest firms do need to take this into account, since it affects costs in the long-run. We have argued however that the relationship between the rate of effort, the reputation of the firm, and costs may be fairly weak.
7. See Mulvey (1978) for a discussion.
8. Chinn (1979) discusses the importance of "cohesion" between workers in Chinese collectives and presents a model of labour supply in which cohesion plays a central role.
9. As noted earlier a potential type of struggle in an LMF is the free rider problem in the supply of effort. We have argued however that this is less important in the LMF than CF. As far as hours are concerned, free-rider issues only arise if individuals each determine their own supply of hours.
10. Both Batstone (1978) and Gunn (1980) found that the LMF's they examined, in France and the U.S.A. respectively, retained the same work methods as CF's. Similarly, Thomas and Logan (1982 p.66) suggests there have been limited opportunities for the Mondragon co-operatives to reorganise the work process. On the other hand Abell and Mahony (1980), in their pilot study of small industrial producer co-operatives in developing countries, found that although tasks remained the same there was more rotation of workers between tasks. Espinosa and Zimbalist found a positive correlation between participation and job enlargement, in Chile, but no correlation with job rotation.
11. The Illyrian model assumes that the maximand of the LMF is the maximisation of income per member. Since its introduction by Ward (1958) it has been the main focus of analysis in the literature.

12. Steinherr and Thisse (1979) presents a perfectly competitive model in which members take into account the possibility of their own dismissal.
13. See Ireland and Law (1982) for a comprehensive survey.

References

- ABELL, P. and MAHONEY, M. (1980) "Economic and social potential of industrial Cooperatives in developing countries. International Cooperative Alliance, London.
- BATSTONE, E. (1978) "The organisation and behaviour of French producer cooperatives". Unpublished manuscript, Industrial Relations Research Unit, University of Warwick, Coventry, U.K.
- BOWERS, J., DEATON, D. and TURK, J. (1982) "Labour Hoarding in British Industry" Basil Blackwell, Oxford.
- CHINN, D.L. (1979) "Team Cohesion and Collective-labor supply in Chinese agriculture". Journal of Comparative Economics, 3.
- ESPINOSA, J.G. and ZIMBALIST, A.S. (1978) "Economic democracy: Workers participation in Chilean industry 1970-73." Academic Press, New York.
- FURUBOTN, E.G. (1976) "The Long-Run Analysis of the Labor-Managed Firm: An Alternative Interpretation". American Economic Review, 66, 104-33.
- GORDON, R.J. (1982) "Why U.S. Wage and Employment Behaviour Differs from that in Britain and Japan". Economic Journal, 92, 13-44.
- GUNN, C.E. (1980) "Plywood cooperatives of the Pacific Northwest: Lessons for workers' self-management in the United States". Economic Analysis and Workers' Management, 14.
- IRELAND, N.J. and LAW, P.J. (1982) "Economics of Labour-Managed Enterprises." Croon Helm, London.
- KNIGHT, K.G. and WILSON, R.A. (1974) "Labour Hoarding, Employment and Unemployment in British Manufacturing Industry" Applied Economics, 6, 303-310.
- MCKENDRICK, S. (1975) "An Inter-Industry analysis of Labour Hoarding in Britain" Applied Economics, 7, 101-118.
- MULVEY, C. (1978) "The Economic Analysis of Trade Unions" Martin Robertson, Oxford.
- OI, W.Y. (1962) "Labor as a Quasi-Fixed Factor" Journal of Political Economy, 70, 538-55.
- OKUN, A.M. (1981) "Prices and Quantities: A Macroeconomic Analysis" Basil Blackwell, Oxford.
- REICH, M. and DEVINE, J. (1981) "The Microeconomics of conflict and hierarchy in capitalist production". Review of Radical Political Economics, 12:4.
- SIMON, H.A. (1978) "Rationality as a Process and Product of Thought" American Economic Review, 68, 2, 1-16.

- STEINHERR, A. and THISSE, J.-F. (1979) "Is there a Negatively-Sloped Supply Curve in the Labour-Managed Firm?" *Economic Analysis and Workers' Management*, 12, 23-33.
- TAYLOR, J. (1970) "Hidden Unemployment, Hoarded Labor, and the Phillips Curve" *Southern Economic Journal*, 37, 1-16.
- TAYLOR, J. (1974) "Unemployment and Wage Inflation" Longman, London.
- THOMAS, H. and LOGAN, C. (1982) "Mondragon: An Economic Analysis" George Allen & Unwin, London.
- WARD, B. (1958) "The Firm in Illyria: Market Syndicalism" *American Economic Review*, 48, 4, 566-589.
- WILLIAMSON, O.E. (1975) "Markets and hierarchies: Analysis and anti-trust implications: A study in the economics of internal organisation". Free Press, New York.
- WILLIAMSON, O.E. (1980) "The organisation of work: A comparative institutional assessment". *Journal of Economic Behaviour and Organisation*, 1.