ECONSTOR
Make Your Publications Visible.

A Service of
ZBW
Leibniz-Informationszentrum Wirtschaft
Leibniz Information Centre for Economics

Jones, Derek C.; Pliskin, Jeffrey

Working Paper

The Effects of Worker Participation, Employee Ownership and Profit Sharing on Economics Performance: A Partial Review

Working Paper, No. 13

Provided in Cooperation with:
Levy Economics Institute of Bard College

Suggested Citation: Jones, Derek C.; Pliskin, Jeffrey (1988) : The Effects of Worker Participation, Employee Ownership and Profit Sharing on Economics Performance: A Partial Review, Working Paper, No. 13, Levy Economics Institute of Bard College, Annandale-on-Hudson, NY

This Version is available at:
https://hdl.handle.net/10419/186705

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.

WWW.ECONSTOR.EU

Mitglied der Leibniz-Gemeinschaft

The Effects of Worker Participation, Employee Ownership and Profit Sharing on Economics Performance: A Partial Review

by

Derek C. Jones and Jeffrey Pliskin

Working Paper No. 13

November 1988

Submitted to The Jerome Levy Economics Institute, Bard College, Annandale-On-Hudson, NY.

Abstract

For alternative sharing arrangements we review theory on the economic effects on employment, productivity, investment, income and wealth distribution, and life cycle and survival. We find that predictions are often ambiguous and that sometimes the nature and size of the specific effect is determined in part by the particular institutional arrangements. Next recent econometric work is studied. We review studies using aggregate and industry level time series data for Japan as well as studies that use enterprise and establishment level data for firms in North America and Western Europe. Worker participation, employee share ownership and profit sharing schemes are often found to affect the economic performance of firms. For some issues, however, we sometimes find that studies obtained conflicting results. However, the available evidence is strongly suggestive that for employee ownership schemes to have a strong positive impact they need to be accompanied by provision for worker participation in decision making.

I. INTRODUCTION

Recently, there has been considerable attention given by economists, labor relations specialists, policy makers, and the media to alternative forms of business organization and of workers' remuneration. In part, this reflects the disappointing macroeconomic performance of industrial nations during the past decade and a perception that many industries were losing their ability to compete with foreign firms. The failure of these economies to attain full employment with stable prices has stimulated interest in alternative labor compensation schemes that would link part of employee compensation to the performance of the firm, thereby improving worker productivity and the firm's competitiveness. These alternative compensation schemes include profit and value added sharing, employee share ownership, and productivity gainsharing. Concern about the competitiveness of domestic firms has also increased interest in various forms of worker participation in decision-making such as quality circles, labor management committees, worker councils, and worker directors.

The various proposed reforms of labor compensation systems and business organization would expand employee participation in at least one of three dimensions: surplus (profits), ownership, and decision-making. Unfortunately, economic theory typically yields conflicting predictions of the effects of greater participation on important variables such as employment, productivity, and investment. In addition, theory does not unambiguously indicate if simultaneous changes in two or more dimensions would be reinforcing or offsetting.

In light of the failure of economic theory to provide policy makers with clear guidance, we will survey some of the recent empirical work on the

economic effects of a few alternatives to conventional firms.[1] The first is profit and value added sharing, which has been the focus of much research in recent years because of the work of Martin Weitzman (1983, 1984, 1985, 1986, 1988). Weitzman claims that unemployment will be lower and macroeconomic shocks will produce smaller employment fluctuations in a profit sharing system than in a conventional fixed wage system. Weitzman's ideas have attracted interest among policy makers and the media as well as among academics. In 1987, the British government granted tax relief to encourage firms to adopt profit related pay. In the United States, the New York Times (1985) praised Weitzman's proposed idea for a share economy and argued that it "deserves attraction and debate."

An alternative form of financial participation is employee share ownership schemes. In these plans, workers are given or are able to purchase cheaply shares of the firm in which they work, and typically do not exercise much influence over the enterprise's operations. (Most employee stock ownership schemes (ESOPs) in the U.S. are of this form.) U.S. ESOPs have attracted much attention recently and by 1986 about 7500 ESOPs covered about 7,500,000 workers. In Canada, employee share ownership schemes have been introduced at a very rapid rate over the past few years (Toronto Stock Exchange (1987)). Moreover, this "phenomenal growth" was not supported by the sort of tax incentives available to U.S. ESOPs. As we will discuss below, the economic effects of these schemes might differ from those of cash-based profit sharing.

The third alternative that we will review is producer (industrial/worker) cooperatives (PCs). In these firms, employees participate in profits, ownership, and decision-making. One reason to include these firms in the survey is the growing body of empirical work on the effects on (total factor)

productivity in PCs of various forms of financial sharing and participation in decision making. This literature might help to identify which forms of participation are likely to have favorable effects. Like other forms of sharing, PCs have grown rapidly in recent years and Sibille (1983) estimates employment in western European PCs at about half a million.

This paper is organized as follows. In section 2, we sketch some of the theoretical arguments on the economic effects of alternative sharing arrangements. The existing econometric literature on these effects is partially surveyed in the third section. Finally, we offer a few concluding comments.

II. THEORETICAL BACKGROUND

In this section we outline some theoretical arguments on the economic effects of alternative sharing arrangements on the economic performance of the firm. Our review will be brief because in general economic theory does not provide unambiguous conclusions. We will focus on five main measures of performance -- employment, productivity, investment, income and wealth distribution and life cycle and survival -- because they are the variables around which most policy discussions center. Although some might argue that the most important reason to adopt reforms that increase worker participation is that it will promote the growth of economic democracy, this sort of ideological discussion is beyond the scope of this paper.

We first consider the effects of profit sharing on the level and the variability of employment. There are three arguments for profit sharing (see Blanchflower and Oswald (1987a) and Estrin, Grout and Wadhwani (1987)). The first, which is traditional, is that profit sharing increases productivity by inducing changes in workers' attitudes toward the firm. Although this

productivity argument is not derived from a formal model, the presumption is that profit sharing improves morale, thereby increasing effort and reducing absenteeism and labor turnover. (However, Jensen and Meckling (1979) dispute the claim that profit sharing enhances productivity. See below.) The lower turnover rate would reduce training costs and might be associated with more firm-specific human capital investments. If profit sharing raises the marginal and average product of labor at each level of employment, then a profit sharing firm will employ more workers at a given level of pay than a conventional fixed wage firm (Bradley and Estrin (1987)). However, the higher average product of labor implies that a profit sharing firm will, other things equal, employ fewer workers at a given level of output.

The second traditional argument is that remuneration would be more flexible under profit sharing. Thus, compensation would respond more quickly to unanticipated aggregate demand or aggregate supply shocks under profit sharing than under a fixed wage system in which wages are set by long-term contracts. This in turn implies that a profit sharing firm should exhibit less employment variability.

The third argument is one that is due to Weitzman. Weitzman considers a "share economy" in which most or all firms have adopted profit sharing and contrasts this economy to one populated by conventional firms. The key element in Weitzman's case for a profit sharing system is that such a system would likely be characterized by an excess demand for labor. In contrast, the conventional fixed wage economy would likely experience excess labor supply or labor market clearing. In a share economy in which firms compensate workers with both a base wage and a share of profits, labor shortages may arise because firms will want to hire workers to equate the value of the marginal product of

labor to the base wage (the marginal cost of labor) rather than to total remuneration. If the base wage is set sufficiently low, demand for labor would exceed the available supply, which is determined by total remuneration. One implication of an excess demand for labor is that a negative aggregate demand shock would increase unemployment by a smaller amount than under a fixed wage system.

Weitzman's theoretical case for profit sharing has been criticized for its sensitivity to a number of its assumptions, especially those related to whether the base wage or total remuneration is the marginal cost of labor and to how the firm and its employees bargain (for example, see Estrin and Wilson (1986), Blanchflower and Oswald (1987a), and Estrin, Grout and Wadhwani (1987)). If firms view total remuneration as the marginal cost of labor perhaps because of tight labor markets, Weitzman's employment effects will not arise. In addition, it has been argued that profit sharing may not raise employment levels if the firm does not have exclusive control over the level of employment perhaps because of the role of unions (see Tracy (1986) for a simple illustrative model). Weitzman assumes that the firm controls the employment decision and he (Weitzman, 1986) is critical of labor-managed firms because existing members make the hiring decisions.

An additional argument against Weitzman's share economy is that it would depress investment because the owners of firms would have less incentive to invest when workers share some of the profits arising from investments (for example, see Meade (1986)). However, Weitzman (1986) argues that investment might be higher in a profit sharing system than in a fixed wage system. One reason for Weitzman's favorable outlook is that output will be stabilized near the full-capacity level.

In contrast to the positive effects on employment that some researchers expect for profit sharing, the standard model of a labor- managed firm implies that employment will be lower in worker cooperatives than in conventional firms (Bonin and Putterman (1986))[2]. The key feature of the model underlying this outcome is that the objective of the worker coop is to maximize income per worker rather than total profits. Members of worker cooperatives have an incentive to restrict employment to avoid diluting their share of the firm's profits.

The argument that productivity would be higher in a worker cooperative than in a conventional firm is similar to the one given above for profit sharing. However, worker participation in decision-making might be a source of an additional improvement: workers in participatory firms might exhibit more cooperative behavior which would reduce the costs of monitoring a worker's effort (Fitzroy and Kraft (1987b)). Thus, financial sharing and worker participation in decision-making might have reinforcing effects on productivity.

The opposing view is given in Jensen and Meckling (1979), who argue that the cost of monitoring workers increases with the degree of worker participation in decision-making: the more monitors, the higher the cost. Moreover, if workers share in the firm's profits, managers will have a greater incentive to shirk their monitoring function. Thus, Jensen and Meckling predict that productivity will be lower in participatory firms.

The dominant view is that labor-managed firms will underinvest (see, for example, Vanek (1975), and Furubotn and Pejovich (1970)). The main argument is that members of labor-managed firms are unable to recover their share of retained earnings because some of these earnings become part of the collective

reserves. Thus, members require a higher than normal return on investment projects, which implies some profitable projects are not undertaken.

The employment and productivity effects of employee share ownership schemes is expected to depend upon the type of scheme (Estrin, Grout, and Wadhwani (1987)). For example, the effect should be similar to that obtained under profit sharing if employees receive shares whose value is determined by the firm's profits. However, if workers' share of the firm's equity becomes sufficiently large, then our discussion of worker cooperatives becomes relevant.

The fourth area of interest, and one for which little detailed work has yet been completed, is income and wealth distribution. Various ad hoc arguments have been presented as to why there might be higher distributive efficiency both within individual firms with sharing arrangements and among firms within a sector of sharing firms (Vanek (1970). Also, much of the impetus behind the ESOP legislation in the U.S. is the stated intent of its proponents to make the distribution of wealth in the U.S. less unequal via a strategy of encouraging capital accumulation by individual employees.

The final area of interest is whether or not the life cycle for and survival potential of sharing firms differs systematically both among firms with differing share arrangements and also compared with capitalist firms. Here the economic theory is best developed for the labor-managed firm. While most authors have expounded theories which imply that all labor-managed firms will display a life cycle, they disagree over the underlying determinants and ultimate consequences of the degeneration process. Some analysts stress both the structure of ownership and capital formation (see Vanek (1975), while others point to the use of hired labor (see Miyazaki (1984) or Ben-Ner

(1984)). But there is almost general agreement among economic theorists that labor-managed firms will either fail as productive units in the long term or convert into another form of enterprise.[3] While this theoretical pessimism as to the survival potential of labor-managed firms will not necessarily carry over to theories dealing with other forms of sharing, it does, at least, provide pause for concern.

In summary, the predictions yielded by economic theory are often ambiguous. In some cases, the direction of an effect is determined by particular institutional arrangements of the scheme. Also, the size of an effect of one share arrangement may depend upon the nature and the extent of other forms of participation.

III. EMPIRICAL EVIDENCE

This survey of empirical work on the economic effects of alternative sharing arrangements will be limited to recent econometric studies.[4] We will begin with evidence for aggregate and industry level time series data for Japan, which reflects the importance of the Japanese bonus system. Bonuses have accounted for as much as 25% of Japanese workers' pay and have exhibited a large cyclical component. Thus, the Japanese economy has some features of Weitzman's share economy. The rest of this section will summarize work that used enterprise and establishment level data for firms in the United Kingdom, West Germany, the United States, France, and Italy.

Freeman and Weitzman (1987, p. 189) conclude that the Japanese bonus system is partly responsible for "the success of the Japanese economy by automatically helping to stabilize unemployment at relatively low levels." Most of the results reported in their paper were based on macroeconomic time series data and one digit industry level data for the 1958-83 period. Their principal

findings include that the bonus responds to changing economic conditions to a greater degree than wages and that employment varies inversely with the base wage and positively with the bonus. This second finding was obtained from estimated employment equations in which the natural logarithm of employment is a function of the real wage rate, the real bonus per worker, real output (as a measure of demand) and other variables. Freeman and Weitzman interpret the second finding as providing some support for one aspect of the share economy: the base wage is the firm's marginal cost of labor.

Wadhwani (1987) and Estrin, Grout, and Wadhwani (1987) argue that the Japanese data do not support Weitzman's claims for a profit sharing system. For example, Wadhwani finds that the proportion of firms that experience labor shortages was lower for Japan than for four European nations between 1976-83, which contradicts Weitzman's prediction that a share economy is likely to be characterized by an excess demand for labor. In addition, he finds that the variability of the deviation of Japanese output from measures of potential output generally exceeded the variability of the deviation for most industrial nations. This does not suggest that the bonus system has stabilized the Japanese economy. Estrin, Grout, and Wadhwani observe that a conventional neoclassical labor demand model specifies that employment is a function of the capital stock rather than output. When they modify Freeman and Weitzman's employment equation by replacing output with the capital stock, their estimated employment equation is consistent with employment depending only on total remuneration, which is contrary to Weitzman's assumption that the base wage is the marginal cost of labor. However, one might be reluctant to place too much emphasis on Estrin, Grout and Wadhwani's result because both the coefficient on the (real) wage and the coefficient on the ratio of the bonus to the wage are

positive; however, neither is statistically significant at conventional levels. Still, one cannot be confident that the superior macroeconomic performance of the Japanese economy is attributable to its bonus system and that the Japanese data support Weitzman's claims for a share economy.

The evidence obtained from enterprise level data on the employment effects of profit sharing is also inconclusive. Two recent studies of British firms -- Estrin and Wilson (1986) and Bradley and Estrin (1987) found that profit sharing increased the level of employment. Estrin and Wilson used a short panel data set of 52 firms in the engineering and metal working sectors over 1978-82, a period when the British economy was in a deep recession, to estimate employment and remuneration equations. They used a dummy variable to indicate if the firm had either a profit sharing or a value added cash bonus scheme. The coefficient on the dummy variable in their estimated employment equation indicated that profit and value added sharing increased employment by 12% after controlling for the capital stock, total remuneration, product market power, aggregate and industry demand, and the skill structure of the labor force. In addition, profit sharing lowered remuneration by 4%, which caused an additional 1% rise in employment.

Bradley and Estrin (1987) investigated the effects of profit sharing on the level of employment using data on the John Lewis Partnership, a worker owned firm which the authors argued behaved as if it were a conventional profit maximizing firm that distributed a share of its profits as an employee bonus, and its four main competitors in the retail sector. Their sample period was 1970-1985. An employment equation was estimated with four firm specific dummy variables for the four competitors to capture the effects of profit sharing. The estimated coefficients of these dummy variables indicated that employment

at John Lewis Partnership exceeded employment at each competitor by 20% to 37% after controlling for remuneration, sales, and retail sales. Bradley and Estrin also report the results of estimating equations that explain the rate of change in employment in terms of the rate of change of remuneration, sales, and retail sales as well as the four firm specific dummy variables. Since none of the dummy variables was individually significant, the authors state that one cannot claim that profit sharing affects the rate of change of employment. However, their equation did not allow them to examine if employment at John Lewis exhibits less responsiveness to demand shocks than employment at its competitors. Finally, they estimate an employment equation using only data for John Lewis in which (the natural logarithm of) total remuneration is decomposed into the (natural logarithm of the) base wage and the ratio of the bonus to the base wage. They find some evidence that employment is affected differently by the base wage and by the bonus, which is a necessary outcome for the sort of behavior Weitzman predicts for firms in the share economy.

The British profit sharing firms in the Estrin and Wilson and the Bradley and Estrin samples distributed profits as a cash bonus. In contrast, Blanchflower and Oswald (1987b) investigated the employment effects of employee share ownership schemes. Blanchflower and Oswald used survey data (the 1980 Workplace Industrial Relations Survey -- WIRS) for 637 establishments in the British manufacturing sector. A dummy variable indicated if the enterprise had an employee share ownership scheme in which workers receive or can purchase cheaply shares of the firm. Data were not available on cash-based profit sharing. Unlike the previous two papers, Blanchflower and Oswald find that employee share ownership did not have a statistically significant effect on either the level of employment or the responsiveness of employment to firm

specific demand shocks. However, one should view these results with some caution because as Blanchflower and Oswald acknowledge, they lack data on remuneration and have only qualitative measures of the level of and the change in demand for each firm's products.

A second study that lacked information on cash-based sharing is Kruse (1987) who used a panel data set of 1491 American firms over the 1971-1985 period to investigate the effects of profit sharing on the variability of employment. Profit sharing data were limited to profit sharing pension plans; no data were available on cash-only plans. Two (alternative) measures of profit sharing were used -- a dummy variable and the percent of employees covered. Kruse found that the response of employment to changes in the (national) civilian unemployment rate was lower for profit sharing firms and for some specifications significantly so for firms in the manufacturing sector. These results support Weitzman's claim that profit sharing stabilizes employment. Moreover, his finding that data for manufacturing firms yielded stronger evidence for Weitzman's claim than the non-manufacturing firm data is what one would expect.

Except for Kruse's use of the percent of employees covered by profit sharing pension plans, the studies based on enterprise level data reviewed so far have attempted to estimate the employment effects of profit sharing by comparing profit sharing and conventional firms while simultaneously controlling for other effects (e.g., remuneration) on employment. The use of a continuous measure of the importance of profit sharing rather than a dummy variable for the existence of a scheme would allow researchers to attempt to exploit variations in the extent of profit sharing by the sharing firms in their sample. Jones and Pliskin (1989) constructed a continuous measure of

profit sharing (the ratio of the bonus to total remuneration) to examine the sensitivity of their results to the choice of how profit sharing was measured. In addition, they investigated if the effects of profit sharing depended on the degree of worker participation in decision-making (which was proxied by two alternative measures -- the proportion of workers who were members of the PCs in the sample and the proportion of the board of directors who were workers). Their sample consisted of panel data on 127 British firms[5] in the printing, footwear, and clothing industries that were characterized by a variety of sharing arrangements including firms completely controlled by their workers (producer cooperatives), profit sharing firms, and firms with no share features at all. Although some of the firms that had a profit sharing scheme distributed the bonus entirely in the form of cash, many distributed profits as shares. (Data were not available to identify which firms had cash-based profit sharing.)

The authors' principal finding was that the employment effect of profit sharing is dependent upon the way in which profit sharing is measured, how employment is specified to respond to past as well as current values of its determinants, and whether or not measures of employee participation in decision making are included in the employment equation. In general, the estimated effect of profit sharing on employment was negative and significant when profit sharing was represented by a dummy variable. A positive and significant effect was sometimes found when the continuous measure of profit sharing was used. However, the results obtained from models which used a dummy variable were in most instances implausibly large if one takes into account both the direct effect represented by the coefficient on the dummy variable and the indirect effect arising from the lagged value of employment. Since it is not clear that

their continuous measure of profit sharing adequately captured inter-firm differences, one should not conclude that the results based on this variable are correct. However, it does suggest that the findings of other studies that used a dummy variable might be less than definitive. Their results on the effect of including a measure of worker participation in decision making illustrates that the impact of a particular sharing scheme may have different effects in different organizational structures.[6] Two alternative measures of worker participation were used: the proportion of the members of the Board who are workers and the proportion of the workforce who are members of the producer cooperatives in their sample. Both the sign and the magnitude of the effect of worker participation on the employment effect of profit sharing varied across specifications.

Finally, for a typical profit sharing firm in their data set, when their continuous measure of profit sharing was used, the estimated employment effects typically ranged from -6% to +6%. These effects are much more modest than those obtained by Bradley and Estrin (1987) and by Estrin and Wilson (1986). One partial explanation for the difference between Jones and Pliskin's results and those obtained by Bradley and Estrin is that the bonus paid by the John Lewis Partnership accounted for a larger fraction of workers' income than is true for a typical firm in the Jones and Pliskin sample. This is not a possible explanation for the Estrin and Wilson result. The bonus paid by a typical firm in Estrin and Wilson sample is around 3% of average pay which is similar to the practice of firms in the Jones and Pliskin sample. An additional reason why Estrin and Wilson and Bradley and Estrin obtained larger estimated effects is that they studied cash-based profit sharing while most of the firms in the Jones and Pliskin study distributed the bonus in the form of

shares.

Other available empirical evidence on the employment and wage effects of varieties of the share economy for the U.S. is very slim and does not yet provide definitive results. So far as ESOPs and ESPPs are concerned, much of the available evidence is concerned with the job saving impact of employee buyouts. Various studies (e.g., Logue et al (1986)) point to the low failure rate of firms in distress that had adopted employee ownership. Then there are conspicuous success stories, e.g., the O & O supermarkets in Philadelphia (Granrose, et al. (1986)). While clearly there is a correlation between jobs saved and employee ownership, the context within which buyouts emerge, (involving a gamut of changes that seldom are controlled for in the available studies), means that it is premature to conclude from these studies that it is ownership per se that is the dominant force at work in these cases.

Similar problems beset most other studies, even those that ostensibly have more controls. An example is Rosen and Klein (1983) who use data gathered from a survey of individual firms with ESOPs to compare average annual increases in employment with industry averages. For the 43 firms responding they find an average annual increase in employment in firms with ESOPs that was about three times the relevant industry average. In a later study under the aegis of the same organization that sponsored the study by Rosen and Klein, (namely the National Centre for Employee Ownership), Quarrey (1986) compares the employment growth of each of 55 ESOP companies with 292 non-ESOP companies. He finds that a statistically significant difference with ESOPs growing 6.5 percentage points faster than non-ESOP firms. In the same study, Quarrey was also able to compare the employment record for ESOPs alone before and after the introduction of the ESOP scheme. The author finds that

> . . .in terms of employment growth the ESOP companies grew 5.05% faster than their comparison companies after their ESOPs compared to only 1.2% faster before their ESOPS. . .an improvement in employment growth of 3.8% per year. . . (p. 29).

While these are impressive results, and as sometimes noted by the authors, it is dangerous to draw too strong conclusions from these studies. There is a potential for bias resulting not only from the selection of the particular ESOP firms but also because of the failure to use an equivalent sampling frame when selecting both ESOPs and non-ESOPs. Moreover one also needs to know over how many years these differences were measured and, in particular, whether the difference is sustained over a long period after the introduction of the ESOP.

For worker coops, the available empirical evidence is often difficult to evaluate. On the one hand, it is apparent that (as elsewhere) there has not been sustained and massive job creation in the worker coop sector. And there exist many examples of individual worker coops, that were formerly capitalist firms, soon perishing without any long-term job gains -- e.g., Rath Packing. Sometimes, as with newly established coops, this reflected ultimately doomed attempts to establish firms at sizes below minimum efficient scale, either because of capital shortages or ideological preference for smallness. Also the historical landscape is dotted with instances of what were once flourishing coops disappearing. In some cases, as with the Minneapolis cooperages, it seems that aging workers were collectively unable to respond to rapid technical change and demand fluctuations (Jones (1979)). At the same time there are conspicuous success stories. For example, evaluations of the cost effectiveness of job-creation in worker coops are nearly all encouraging -- note, for example, the low estimates for cost per job created found in extant U.S. worker owned firms (e.g., Logue, et al.). Also, during the Great

Depression, in the U.S. worker coops were found to be a cost-effective way of rehabilitating the unemployed during times of generalized unemployment (Jones and Schneider (1984).

Most of the econometric evidence of the effects of profit sharing and other forms of participation on productivity was obtained using data on PCs with different patterns of participation in profits, ownership, and decision making. However, there are some exceptions that compared firms with some share arrangements and conventional firms. Two of these are reviewed below. In addition, we review some work that studied if participation affects the financial performance of firms. Superior financial performances might reflect higher productivity.

Fitzroy and Kraft (1986, 1987a, 1987b) investigated the effects of profit sharing on (total factor) productivity and on the return on assets (measured by the ratio of cash flow to the book value of assets). Their sample consisted of two years (1977 and 1979) of data on 65 firms in the West German metal working industry. They found that both productivity (proxied by the residuals of a Cobb Douglas production function) and the return on assets were positively related to profit sharing, which was measured by the profit share income per employee. In addition, the ratio of worker capital to total capital, a measure of financial participation, had a positive effect on both variables. In contrast, a dummy variable for the existence of works councils, an indicator of employee participation in decision-making, was negatively related to productivity. (Their equation for profitability did not include the works council dummy.) Their results suggest that performance is positively related to financial participation but negatively related to decision-making participation.

Blanchflower and Oswald (1988) used the 1984 Workplace Industrial Relations Survey to study how the financial performance of firms was related to three types of profit related pay -- share ownership, profit sharing, and a value-added bonus. All three types of profit related pay were represented by dummy variables. They found that none of the coefficients on the dummy variables was individually significant. (The coefficients for profit and value added sharing were both positive while the coefficient for employee share ownership was negative.) The main determinants of financial performance were size of the establishment, growth of demand for the firm's product, the proportion of turnover accounted for by wages and salaries, and unionization. However, the quality of the data on financial performance (their measure was a dummy variable indicating if the establishment's financial performance was viewed by its managers to be above average) suggests that one should be cautious in drawing general inferences.

The remaining studies that we survey estimated production functions that were augmented by variables measuring various forms of participation. This approach has also been used to investigate issues such as the effects of unionization on productivity (see Brown and Medoff (1978)).

Conte and Svejnar (1988) used a sample of 40 U.S. firms consisting of profit sharing companies, producer cooperatives in the plywood industry, and firms with employee stock ownership plans (ESOPs) to investigate how profit sharing (captured by a dummy variable), direct employee ownership and indirect ownership (i.e., through ESOPs) affect productivity. Both ownership measures were represented by continuous variables (indicating the percentage of the company's stock owned by nonmanagerial employees) and also captured by a common dummy variable (indicating the absence of stock ownership by nonmanagerial

employees). They found that in most of their results profit sharing did not significantly affect productivity. The effect of employee ownership on productivity depended on the proportion owned by employees. A small ownership stake would improve productivity, while a firm entirely owned by its workers would be less productive than a conventional firm. However, as the authors note, the negative effect of direct ownership might reflect that plywood PCs were the only firms in their sample with a large amount of direct ownership, and therefore, their estimate of the coefficient on the direct ownership variable might be capturing industry differences rather than the effects of participation in ownership. Perhaps their most interesting result was for decision-making participation. Here they found that participation in decisions over wages uniformly had a positive effect on productivity, but participation in decisions over production is not statistically significant. However, their sample was characterized by very little participation over production so that they were not surprised that this form of sharing did not have an effect.

Estrin, Jones, and Svejnar (1987) estimated production functions for producer cooperatives in France, Italy, and the United Kingdom using a common group of participatory variables as well as other controls. Separate production functions were estimated for each nation and for industries or sectors in each nation. Data on French PCs were for 1978 and 1979 and covered six industries. The sample of Italian PCs was a panel data set over the 1976-80 period which included firms in both the manufacturing and construction sectors. The panel data on British PCs contained some 50 firms in three industries which were sampled for 5 year intervals between 1948 and 1968. The authors found that the effects of the various forms of worker participation varied across nations and industries as one might expect. However, the various

participatory variables were jointly significant in all estimated models and the net effect was positive. In general, profit sharing (measured by the average surplus distributed per worker) was found to have a positive effect on productivity. The amount of capital owned per worker and worker participation in decision-making (proxied by the proportion of the work force who are members) had positive effects in most cases. The percent of the total capital that is owned by the cooperative itself (rather than by individual members) was found to be statistically insignificant or to have a negative effect. Finally, worker loans did not have a statistically significant effect. Thus, the effect of different forms of participation differ and they vary across institutional settings.

Jones (1987) studied the productivity effects of financial participation and a particular form of participation in decision-making -- worker representation on the board of directors -- in a sample of 50 British retail cooperatives for 1978. The data set contains both coops in which many workers are members and directors and other coops that exclude workers from membership. Although the latter co-ops are still legally owned by consumers, they are, from the standpoint of their employees, no different from private companies. He finds that the presence of worker directors modestly increases productivity, whereas, surprisingly, financial participation in the firm by employees reduces productivity. Unlike other financial participation variables, profit sharing (measured by the dividend distributed per member) had a positive but statistically insignificant impact on productivity. The net impact on productivity of both forms of participation is small but positive.

Returning to the U.S. one of the first major studies was by Conte and Tannenbaum (reported in 1978, 1980).[7] For a sample of 98 firms with employee

ownership (including PCs) they found that companies with more employee ownership had higher profits relative to companies with less employee ownership. An attempt was made to control for the effect of worker participation in decision-making; this factor was not found to be associated with higher relative profits. While the authors concluded that their findings were suggestive of a link between employee ownership and profitability, the limitations that often handicap pioneering studies, e.g., a small sample that is probably subject to selection bias and a crude measure of de jure participation -- necessarily mean that one must be very cautious in accepting this conclusion.

More recent empirical studies include Tannenbaum et al. (1984), which is a follow-up to the Conte-Tannenbaum study of 1978 and Conte et al. (1981). The new study included 55 companies from Tannenbaum's 1981 study as part of a total of 115 employee owned firms. In this study the employee-ownership companies were matched with 99 comparable, traditionally owned firms. Response rates were impressively high and average about 60%. No evidence of higher profitability in the employee-ownership companies was found.

With a sample of 229 companies, Marsh and McAllister (1981) ostensibly have a bigger sample than the original study of Conte and Tannenbaum. However, for their productivity analysis, they obtained a response rate of only 15%, whereas Conte and Tannenbaum had 30 out of 98 respondents on this question. Insofar as coops are excluded, the Marsh and McAllister samples of employee owned firms is more homogeneous. However, since only 28 out of 211 have majority employee ownership, the average firm will have a very low degree of employee ownership. Consequently, the subjects of this study are very different than that of the Conte-Tannenbaum study. Using labor productivity as an indicator of enterprise

performance, Marsh and McAllister find that companies with an ESOP increased productivity over their study period at a rate of 0.78% per year, while in comparable non-ESOP firms it declined by 0.74% per year.

Since the study by Livingstone and Henry (1980) claims to look only at ESOPs, on the face of things it deals with firms similar to those examined by Marsh and McAllister. But since their study focuses exclusively on firms established before 1966, they are, in fact, dealing yet again with quite a different type of employee owned firm. In fact, since the federal ESOP program did not originate until 1974 they cannot possibly be dealing with ESOPs. Most likely their sample comprises direct ownership employee stock purchase plans. Hence the finding of Livingston and Henry that "ESOP" companies were less profitable relative to matched non-ESOP companies does not necessarily contradict these findings from other studies; in fact, the studies are examining quite different entities.

Two of the better and more recent studies that examine the issue of the performance of employee owned companies, are Quarrey (1986) and GAO (1987)[8]. When growth in sales is used as the index of performance, Quarrey finds that ESOP firms significantly outperform conventional firms, and that ESOP sample enterprises dramatically improve their performance after the plan is introduced compared to the pre ESOP period. Importantly he finds that employee ownership is more effective when worker participation is also present. In the GAO study (see also the chapter in this volume by Hanford and Grano), however, employee ownership alone does not appear to be associated with improved corporate performance. But as with Quarrey's study, there is some evidence that participation by employees in "shop floor" decisions and processes is associated with enhanced productivity.

There has been little econometric work done on the effects of sharing on investment. Blanchflower and Oswald (1987b) found that employee share ownership schemes did not have a statistically significant effect on investment. (See our discussion of their work on employment above for a description of their sample.) Since this finding was based on qualitative investment data (that only indicated if investment had been increasing, constant, or decreasing over the previous two or three years), one should view the general applicability of their result with caution.

As we discussed in section II, the conventional wisdom is that PCs will underinvest. Estrin and Jones (1988) investigated this hypothesis using data on French producer cooperatives. They estimated two models. The first used a cross section of PCs in 1979. The second used a panel of PCs over the period 1970-1979. For both models, they found that investment was explained by the firm's cash flow and by changes in value added (i.e., an accelerator effect); their proxies for the factors that theorists identified as the causes of underinvestment did not lower investment. As the authors point out, their failure to confirm the underinvestment hypothesis might be explained by institutional features of the French PC sector that would offset the tendency of PCs to invest less than conventional firms.

When we turn to the empirical evidence on income and wealth distribution so far as internal wage structures are concerned, in the U.S. there are important examples of earnings differentials within worker coops deliberately being kept within bounds that are narrower than found in comparable capitalist firms -- e.g., plywood coops in the U.S. Turning to the effects of ESOPs on the distribution of wealth, a study of 140 ESOP companies (NCEO, 1985) calculated

that

> . . .an employee earning the 1983 median wage of $18,000 per year would accumulate over $31,000 of stock in the average ESOP in ten years, . . .and $124,000 in 20 years.

When this is compared with the estimated median net financial assets of a family at retirement age of about $11,000, then it seems reasonable to conclude that ESOPs do contain great potential for broadening the ownership of wealth. However, in a more recent study of 1,113 ESOPs established between 1979 and 1983 (U. S. General Accounting Office, 1986a, p.23), it is found that the actual median accumulation is only $5,226 and that the arithmetic average is about $2,600 per participant. That is, the growth of ESOPs in the U.S. had not as yet led to the accumulation of significant capital holdings by the average employee in an ESOP firm.

Finally and briefly we turn to the evidence on life cycles and survival, the evidence for which is mostly for PCs. On the face of things the American experience does not support an optimistic view of the ability of coops to survive (Russell (1985)). However, there are cases of U.S. coops surviving for more than one generation (Jones (1979)) and for British PCs, Jones (1975) finds that not only can they survive but they may survive for periods longer than for comparable capitalist institutions. More generally, Ben-Ner (1988) finds that for worker-owned firms in several countries, overall they suffer a lower risk of demise than do capitalist firms.

Hatton (1988) investigated which factors contributed to the ability of profit sharing schemes to survive. His sample consisted of 258 British firms that introduced profit sharing between 1865 and 1913. His estimated survival functions (technically, proportional hazard models) indicate that the type of scheme affected the probability that the scheme survived: cash bonus schemes were more likely to survive than schemes including some degree of share

ownership.

The most comprehensive and reliable available evidence on life cycles (Estrin and Jones (1986)), while revealing a life cycle process for coops, indicates one that is rather different than envisaged by the theory of Ben-Ner (1984); Miyazaki (1984)). The life cycle process for French producer coops neither stresses nor conforms with in any systematic way the variables given pride of place by theorists in this area -- pay, productivity and worker-membership ratios. Importantly, tests on a large panel data set for a negative association between earnings and the worker-member ratio, other things equal, yields findings that are not consistent with current economic theory.

IV. CONCLUSION

Our partial survey of recent econometric work on the effects of worker participation, employee share ownership, and profit sharing indicates that alternative organizational structures and labor compensation systems often affect the economic performance of firms. However, and especially for studies of firms that are primarily profit sharing, we sometimes find that studies obtained conflicting results. For many studies, in part this reflects the effects of participatory arrangements which vary across institutional settings, including the various forms of participation that characterize the firm. It is also clear that many studies, as with those for U.S. ESOPs, suffer for a variety of reasons so that one is hesitant to accept their findings in general. Not only are there problems posed by the diversity of alternative sharing arrangements, but also, without careful planning studies will likely suffer from selection bias, inappropriate sampling frames and possibly insufficiently long-lasting panels of data. In addition, there are often

crucial measurement problems. Frequently the particular measure of participation that is used is quite inadequate and does not directly capture attitudinal or behavioral characteristics. Sometimes the particular measure of "performance" has been chosen rather arbitrarily, and not derived from an explicit theoretical framework. Moreover, the particular statistical analysis used in many studies is seldom motivated by a well-reasoned empirical strategy.

In view of the several shortcomings of the available evidence it is a hazardous undertaking trying to derive definitive conclusions on the particular economic effects from this preliminary work. Clearly much more research on all of these issues and for the various forms of sharing is needed. This is perhaps especially the case for all issues except the effects of sharing schemes on company performance. Sufficient work has been done on that matter so that it does seem reasonable to conclude from the available research that normally, at worst employee ownership and worker participation schemes will have a neutral effect, and in many cases they will improve performance. The particular result depends on the specific characteristics of the particular scheme. The available evidence is strongly suggestive that for employee ownership schemes to have a strong positive impact they need to be accompanied by provision for worker participation in decision-making.

NOTES

[1]Such a survey is necessarily selective. For earlier work see the essays in Jones and Svejnar (eds.) (1982), and the surveys in Ireland and Law (1982).

[2]Note, however, that this result is dependent on the choice of the particular maximand. (See Bonin and Putterman, 1986).

[3]This pessimistic conclusion is similar to that reached earlier by the Webbs (1920).

[4]Often the conclusions derived from studies which use other techniques to examine aspects of performance are less reliable than those based on econometric analysis. For example, studies which use ratio analysis to compare productivity in sharing and non-sharing firms, often are unable to control for important variables (e.g., capital stock) that affect performance. Also such studies are restricted to comparisons of performance on average.

[5]Usable data on many of the firms exist for at least 20 years. Thus, some of the authors' econometric results are based on over 3000 observations.

[6]On the basis of conventional t-tests for differences in population means for a variety of measures of performance, Cable (1988, p. 129) concluded that profit sharing and participation in decision-making "are essentially different phenomena, typically used by different kinds of firms in different circumstances, they may well not mix."

[7]For a more comprehensive review of these studies, see the Appendix of U.S., G.A.O. (1987).

[8]The part of the GAO study that examines the relationship between enterprise performance and worker participation in ESOP firm is examined in the chapter by Hanford and Grazzo in this volume.

REFERENCES

Ben-Ner, A. (1984), "On the Stability of the Cooperative Type of Organisation," Journal of Comparative Economics, Vol. 8, pp. 247-260.

_____ (1988), "Comparative Empirical Observations on Workers-Owned and Capitalist Firms," International Journal of Industrial Organization, Vol. 6, pp. 7-32.

Blanchflower, D. G. and A. J. Oswald (1987a), "Profit Sharing -- Can It Work?", Oxford Economic Papers, 39, 1-19.

_____(1987b), "Shares for Employees: A Test of Their Effects," London School of Economics, Centre for Labour Economics, Discussion Paper No. 273.

_____(1988), "Profit Related Pay: Prose Discovered?", Economic Journal, Vol. 98, pp. 720-730.

Bonin, J. and L. Putterman (1987), Economics of Cooperation and the Labor Managed Firm. New York: Harwood.

Bradley, Keith and Saul Estrin (1987), "Profit Sharing in the Retail Trade Sector: The Relative Performance of the John Lewis Partnership," London School of Economics, Center for Labor Economics, Discussion Paper #279.

Brown, C. and J. Medoff (1978), "Trade Unions in the Productive Process," J. Political Economy 86, No. 3, pp. 355-378.

Cable, John (1988), "Is Profit Sharing Participation?," International Journal of Industrial Organization 6, pp. 121-137.

Conte, M. and J. Svejnar (1988), "Productivity Effects of Worker Participation in Management: Worker Ownership of Assets and Unionisation in U.S. Firms," International Journal of Industrial Organization, vol. 6, pp. 139-151.

Conte, M. and Tannebaum, A. (1978), "Employee-Owned Companies: Is the Difference Measurable?", Monthly Labour Review.

Conte, M., A. Tannenbaum, and D. McCulloch (1981), Employee Ownership, Ann Arbor: University of Michigan Survey Research Center.

Estrin, Saul, Paul Grout, and Sushil Wadhwani (1987), "Profit Sharing and Employee Share Ownership," Economic Policy, 2, 13-52.

Estrin, S. and D. C. Jones (1987), "Are There Life-Cycles in Employee-Owned Firms? Evidence from France," LSE Centre for Labour Economics, WP No. 962 and Department of Economics, Hamilton College, Working Paper #88/5.

_____ (1988), "Do Employee Owned Firms Invest Less?" Department of Economics, Hamilton College, Working Paper #88/10.

Estrin, S., D. C. Jones, and J. Svejnar (1987), "The Productivity Effects of Workers' Participation," Journal of Comparative Economics, Vol. 11, pp. 40-61.

Estrin, Saul and N. Wilson (1986), "The Micro-Economic Effects of Profit-Sharing: The British Experience," London School of Economics, Centre for Labour Economics, Discussion Paper No. 247.

Fitzroy, F. and K. Kraft (1986), "Profitability and Profit-Sharing," Journal of Industrial Economics, 35, pp. 113-130.

_____ (1987a), "Efficiency and Internal Organization: Works Councils in West German Firms," Economica, 43, pp. 493-504.

_____(1987b), "Cooperation, Productivity and Profit Sharing," Quarterly Journal of Economics, 102, 23-35.

Freeman, R. and M. Weitzman (1987), "Bonuses and Employment in Japan," Journal of the Japanese and International Economies, 1, 168-194.

Furubotn, E. G. and S. Pejovich (1970), "Property Rights and the Behaviour of the Firm in a Socialist State: The Example of Yugoslavia," Zeitschrift fur Nationalokonomie, 30, pp. 431-454.

Granrose, Cherlyn, E. Appleban and V. Singh (1985) "Saving Jobs Through Worker Buyers," Industrial Relations Research Association, Proceedings of 38th Meeting, pp. 196-204.

Hanford, Terry, J. and Patrick G. Crasso (1989) "Participation and Corporate Performance in ESOP Firms" (Chapter in this volume).

Hatton, T. J. (1988), "Profit Sharing in British Industries, 1865-1913," International Journal of Industrial Organization, Vol. 6, pp. 69-90.

Jackall, R. and H. Levin (1984), Worker Cooperatives in America, U. California: Berkeley.

Jensen, M. and W. Meckling (1979), "Rights and Production Functions: An Application to Labor-Managed Firms in Co-Determination," Journal of Business, 52:469-506.

Jones, Derek C. (1975) "British Producer Cooperatives and the Views of the Webbs on Participation and Ability to Survive," Annals of Public and Cooperative Economy, Vol. 46, pp. 23-44.

_____ (1979), "U.S. Producer Cooperatives: The Record to Date," Industrial Relations, 18, pp. 342-357.

_____ (1987), "The Productivity Effects of Worker Directors and Financial Participation by Employees in the Firm: The Case of British Retail Cooperatives," Industrial and Labor Relations Review, Vol. 41, pp. 79-92.

Jones, D. C. and J. Pliskin (1989), "The Effects of Alternative Sharing Arrangements on Employment: Preliminary Evidence from Britain," forthcoming, Industrial Relations, Spring 1989.

Jones, D. C. and D. Schneider (1984), "Self-Help Cooperatives: A Case Study of Government-Administered Assistance During the Depression," in Jackall and Levin (eds.)

Jones, D. C. and J. Svejnar (eds.) (1982), Participatory and Self-Managed Firms, Heath, Lexington, MA.

Kruse, Douglas (1987), "Profit Sharing and Employment Variability: Microeconomic Evidence," Harvard University, Mimeo

Logue, T., T. B. Quilligan and B. Weissmann (1986), Buyout: Employee Ownership as an Alternative to Plant Shutdown, the Ohio Experience. Kent, Ohio: Kent Popular Press.

Marsh, T. R. and D. McAllister (1981), "ESOPs Tables," Journal of Corporation Law, 6, No. 3 (Spring), pp. 614-617.

Meade, J. (1986), Alternative Forms of Business Organization and of Workers Remuneration, Allen & Unwin.

Mitchell, Daniel. J. B. (1987), "The Share Economy and Industrial Relations," Industrial Relations, 26, pp. 1-17.

Miyazaki, H. (1984), "On Success and Dissolution of the Labour Managed Firm in a Capitalist Economy," Journal of Political Economy, Vol. 92, No. 5, October.

New York Times (1985), "Best Idea Since Keynes," March 28, p. 30.

Quarrey, M. (1986), Employee Ownership and Corporate Performance, Arlington, VA: National Center for Employee Ownership.

Rosen, C., K. J. Klein, and K. M. Young (1985), Employee Ownership in America: The Equity Solution, Lexington: Heath.

Rosen, C. and K. Klein (1983), "Job Generating Performance of Employee Owned Companies," Monthly Labor Review, (August), pp. 15-19.

Russell, R. (1985), Sharing Ownership in the Workplace, S.U.N.Y., Albany.

Sing, B. (1984), "Employee Owned Plans Focus of Controversy in Corporate Takeovers," Los Angeles Times, May 14.

Sibille, H. (1982), Les Cooperative Ouvrieres de Production, Paris: Documnetation.

Tannenbaum, A., H. Cook and J. Lohman (1984), "Research Report: The Relationship Between Employee Ownership and the Technical Adaptiveness and Performance of Companies," unpublished paper. Ann Arbor, MI: Survey Research Center, University of Michigan, pp. 127-128.

Toronto Stock Exchange (1987), Employee Share Ownership at Canada's Public Corporations.

Tracy, Joseph (1986), "Unions and the Share Economy," Journal of Comparative Economics, 10, 433-437.

United States General Accounting Office (1986), Employee Stock Ownership Plan: Benefits and Costs of ESOP Tax Incentives for Broadening Capital Ownership.

United States General Accounting Office (1987), "Employee Stock Ownership Plans: Little Evidence of Effects on Corporate Performance."

Vanek, J. (1970), The General Theory of Labor-Managed Market Economies. Ithaca, NY: Cornell U.P.

_____ (ed.) (1975), Self-Management: Economic Liberation of Man, Penguin.

Wadhwani, S. (1987), "The Macroeconomic Implications of Profit-Sharing:Some Empirical Evidence," Economic Journal, 97, 171-183.

Webb, S. and B. Webb (1920), A Constitution for the Socialist Commonwealth of Great Britain, London: Longman.

Weitzman, M. (1983), "Some Macroeconomic Implications of Alternative Compensation Systems," Economic Journal, 93, 763-83.

_____ (1984), The Share Economy, Cambridge, MA: Harvard University Press.

_____ (1985), "The Simple Macroeconomics of Profit Sharing," American Economic Review, 75, 937-53.

_____ (1986), "Macroeconomic Implications of Profit Sharing," NBER Macroeconomics Annual, Vol. 1, 291-336.

_____ (1988), "Comment on 'Can the Share Economy Conquer Stagflation'?", Quarterly J. Economics, 103, 219-223.