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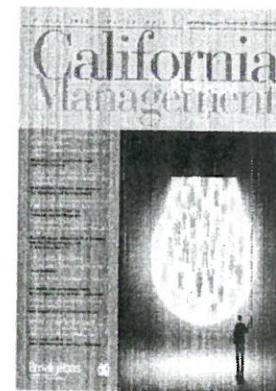
Employer-provided benefits such as pensions and health insurance are commonplace in the U.S. economy, thanks to generous tax subsidies. These benefits are often not 100% portable from job to job and thus interfere with labor mobility. Yet changes in the American economy are likely to make mobility more important in the future. It is important that benefits be made portable and that all sources of social insurance—not just employers—be made eligible for the same tax subsidies. There should be no public policy presumption that social insurance is best provided in the workplace.

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## UNION EFFECTS ON PRODUCTIVITY: EVIDENCE FROM WESTERN U.S. SAWMILLS

MERWIN W. MITCHELL and JOE A. STONE\*

The authors conjecture that previous studies have tended to overestimate the productivity of union firms relative to nonunion firms due to inadequate controls for output quality and input usage—important omissions if the higher cost of unionized labor leads to less labor-intensive products and techniques. To avoid those problems, this study examines a fairly standardized commodity, lumber, and controls for detailed product attributes and inputs. An analysis of data from a survey administered by the authors shows that unionized sawmills were between 12% and 21% less productive than nonunionized mills in fiscal year 1986. As predicted, when product quality and raw material usage are not included in the analysis, the estimate of union productivity is biased upward.

SEVERAL recent studies address the question of whether and how unions affect production technology in the private sector. Most find that unions increase productivity, suggesting that any negative effects of restrictive work rules and other constraints on employers are outweighed by the positive effects of better communication, improved screening, increased morale, lower turnover, and the like (as argued by Freeman and Medoff [1984] and others). Addison and Hirsch (1989), however, are skeptical of this finding,

arguing that it is tainted by a number of methodological problems, including the use in some studies of value-added measures of output (measures that mix price and quantity variations) and the failure to measure all major inputs accurately.

In this study, we reexamine the union productivity issue using firm-level data for fiscal year 1986 that enable us to account for the major dimensions of product quality and types of inputs, including raw materials. Thus, we are able to address directly two of the objections raised by Addison and Hirsch to previous estimates of union productivity effects. The firms we analyze are all from the western sawmill industry and, with the exception of a few easily observed differences, produce a standardized product, lumber.

### Literature Review

Among the published studies examining union productivity effects, the most detailed are Clark's (1980a and 1980b) studies of cement producers and Allen's

\* Merwin Mitchell is Assistant Professor of Economics at the University of Nevada at Reno, and Joe Stone is W E Miner Professor of Economics at the University of Oregon. The authors thank Steve Allen, Kelly Eakin, Randall Eberts, Greg Hundley, Daniel McMillen, John Pencavel, Larry Singell, Wesley Wilson, and participants in the Applied Microeconomics Workshop at the University of Oregon for helpful comments.

A data appendix and copies of the computer programs used to generate the results in the paper are available from Joe A. Stone at the Department of Economics, University of Oregon, Eugene, OR 97403.

### Concluding Remarks

Previous studies of union/nonunion differences in productivity in the private sector have suffered from several problems. Many have employed value-added measures rather than physical output measures, an approach with well-known drawbacks. Some studies of the cement and construction industries have used physical measures of output, but they have not adequately accounted for product heterogeneity and have not controlled for raw material usage—potentially serious omissions, we have argued, because unionized firms may shift toward less labor-intensive products and production techniques. We have attempted to avert these problems by relying on a relatively standardized commodity, lumber, and utilizing detailed product attributes and a measure of raw material usage. We find unionized plants to be significantly less productive than nonunionized plants (by about 12–21%). If the controls for product quality and raw material usage are omitted, however, the estimated union effect on productivity is biased upward and no longer statistically significant.

We hypothesize that the productivity

differential may arise, at least in part, through greater attention to machinery maintenance and repair by workers in nonunion mills, who are subject to "incentive pay" programs, or through the greater flexibility of the work force in nonunion mills, where workers are more apt to learn and perform a variety of jobs other than their own. Thus, unions may decrease sawmill productivity via subtle changes in the technology of production. It is also possible that the productivity differences we find are spuriously related to union status, although we have explored and ruled out two explanations in that category (mill vintage and endogeneity of union status). In any event, factors that have previously been cited to explain possible union productivity advantages, such as better training, lower turnover, improved morale, and superior management in union firms, do not appear to be dominant factors in the western sawmill industry. Only further research can show whether our results reflect features peculiar to this industry or arise solely from superior controls for product quality and raw material usage.

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# Information Sharing and Firm Performance in Japan

MOTOHIRO MORISHIMA\*

*North American firms have begun to show greater interest in sharing private business information with unions and employees, a labor relations practice widely institutionalized in Japan. This study uses a survey of Japanese joint consultation committees and publicly available business data to examine the effects of information sharing on a firm's profitability, productivity, and labor cost. The results generally show a positive association of information sharing with profitability and productivity and a negative association with labor cost.*

SHARING BUSINESS INFORMATION with labor is a practice that is increasingly accepted by corporations in North America. Within the United States' unionized sector, the National Labor Relations Act requires an employer to disclose certain types of financial information in the process of collective bargaining (O'Reilly and Simon, 1980; Kleiner, 1984). More importantly, recent surveys of executives in large U.S. corporations reveal that firms share more business and financial information with their unions and employees than is required by law, and that information sharing within the nonunion sector—where the statutory requirement for information disclosure is much less stringent—is as extensive as in the union sector (Lewin, 1984; Kleiner and Bouillon, 1988). The motivation behind voluntary

\* Department of Policy Management, Keio University. Earlier versions of this paper were presented at the First Meeting of the Japan Social Sciences Association of Canada, Montreal, October 1988, and the Forty-first Annual Meeting of the Industrial Relations Research Association, New York, December 1988. This research was funded in part by a Japanese Ministry of Education 1981 Grant-in-Aid for Scientific Research (No. 545051) and a Simon Fraser University President's Research Grant. The author is grateful to both organizations for their financial support, to Professor Yoko Sano for her encouragement, to Nancy Bartter, Jack Fiorito, Takao Kato, Larry Pinfield, Haruo Shimada, Mark Wexler, and two anonymous reviewers for their advice and comments on previous drafts, to Lesley Wong for her research assistance, and to the Asian Studies Library, University of British Columbia.

information disclosure seems to be economic gain, including improved firm performance (Lewin, 1984).

There has been little empirical documentation of the effects of corporate information sharing on firm performance (but see Kleiner and Bouillon, 1988). This scarcity of research may reflect the relative recency of North American management's interest in information sharing as a method of constructing integrative labor-management relations which eventually strengthen the competitive position of the firm (Craft, 1981; Kochan and Katz, 1988). Japanese unions and employers, in contrast, have long been aware of the importance of information sharing in an industrial relations system (Shirai, 1983). After bitter and protracted strikes in the forties and early fifties, both management and labor made concerted efforts to restore industrial peace and to develop a stable industrial relations system. According to Shimada (1982), these efforts led to the development of key aspects of the modern Japanese industrial relations system, including the joint consultation system, a cornerstone of labor-management information sharing (Inagami, 1983; Park, 1984). After successful diffusion in the union sector, information sharing has also spread to nonunion firms.

Thus, as a positive, strategic industrial relations policy, information sharing is much more firmly institutionalized in Japanese enterprises than in North American ones. Evaluating Japan's experiences, especially regarding the joint consultation system, sheds light on the role of information sharing used as a firm-level industrial relations policy. This paper uses results from a survey of the Japanese joint consultation system and publicly available business data to explore how information sharing between an employer and a union is related to firm performance. Overall, the results suggest that information sharing enhances firm profitability and productivity and reduces labor cost, but these benefits may be more significant for manufacturing than nonmanufacturing firms. Moreover, the economic gains associated with information sharing are consistent with the effects of other, complementary aspects of the Japanese industrial relations system.

The joint consultation system (*Roshi Kyogi Sei*) serves two major functions within the framework of Japanese enterprise unionism:<sup>1</sup> sharing of business information and prior consultation by management with the union on upcoming business decisions, such as investment programs, new technology, plant relocation, etc. (see Shirai, 1983).

In order to perform these functions, many Japanese corporations establish two tiers of communication. At the workplace level, information sharing

<sup>1</sup> What follows is a general description of the joint consultation system; for details, see Nitta (1984).

THE EFFECT OF UNIONIZATION AND CIVIL SERVICE  
ON THE SALARIES AND PRODUCTIVITY OF REGULATORS<sup>1</sup>

by Eli M. Noam

A large number of recent studies have investigated the effect of unionization on the compensation of private and public employees.<sup>2</sup> Other analyses, noticeably smaller in number and concentrating exclusively on the private sector, have looked at the effects of unionization on productivity (Clark 1980a, b; Brown and Medoff 1978; Ehrenberg and Schwarz 1981). Their focus is on the question of whether union protection reduces the incentives for employee performance, or whether it leads to a work force with higher morale and lower turnover, and hence to greater labor productivity. Surprisingly, no study has yet integrated the simultaneous effects of unionization on compensation and on productivity, even though they are plainly two sides of the same coin. A salary increase may attract a better and more productive quality of employee, while more productive employees may command higher salaries. Because of this simultaneity, an analysis of the effect of unionization on compensation is not conclusive without an investigation of the effects of unionization on productivity, and vice versa. Quite possibly, changes in wages that are attributed to unions are overestimated because they partly reflect changes in productivity due to an upgraded work force.

The aim of this paper is three-fold. First, to provide a simultaneous analysis of the salary and productivity effects of unionization, an approach that has not been taken by any previous study. Second, to investigate the relation of

unionization (and of civil service tenure) to the productivity of public employees, since past work on unions and their impact on productivity has dealt with the private sector only.<sup>3</sup> And third, to look at the effects of unionization (and civil service) on regulators, since regulation is a public service that has not yet been investigated at all for its sensitivity to unionization.

The paper proceeds by developing a brief model of productivity and salary under a union and a non-union state, showing that the direction of a union effect is ambiguous theoretically and dependent on the parameters of the model. It then estimates these relations empirically for local building departments, finding significantly higher salaries but no higher productivity where unionization and civil service exist.

#### The Model

Assume a production function for a fixed-capital service of public administration, such as regulatory oversight, of a Cobb-Douglas form

$$\phi = \alpha (QL)^{\beta} \quad (1)$$

where  $\phi$  = units of output

$L$  = units of labor in hours

$Q$  = quality of labor

and  $\alpha > 0, 0 < \beta < 1$

The supply of labor is perfectly elastic at the prevailing wage. Only one type of labor is hired. The quality of labor  $Q$  that is hired is a function of wage rate paid

other hand, is not found to be higher where unionization and civil service exist, for both definitions of productivity.

### Conclusion

This paper constructed two simple models of salaries and productivity under unions and without them. It then tested these relations empirically by using the data for building departments of 1100 American cities and towns and applies them in two interactive models. The results show that where public employee unions exist, the salaries of public employees in local regulatory agencies are higher, while productivity is not found to be increased.



## THE DISTRIBUTIONAL AND EFFICIENCY EFFECTS OF TRADE UNIONS IN BRITAIN\*

JOHN H. PENCABEL†

### I. THE SETTING

During the last two decades, the major public policy issues in the United States with respect to the operation of labour markets have been concerned with income maintenance, manpower training, and anti-discrimination programmes while interest in the activities of trade unions has waned. On the other hand, in Britain trade unionism has become one of the most keenly debated issues of public policy. Normally, academics are not tardy in reallocating their time to the study of new public policy questions and in this case the public's concern with the operations of trade unions in Britain has generated a flurry of work by industrial relations researchers. By contrast, notwithstanding the potential for high returns in terms of professional esteem and perhaps public recognition, analytical economists appear not to have redirected their energies to the study of trade unions. To provide one indicator of this, in the first half of this decade (i.e. from 1970 to 1975) of the 350 major articles published in the forty-nine issues of the *Economic Journal* and *Economica*, Britain's two leading journals in applied economics, I identify merely three that set as their task the causes or consequences of trade union behaviour.<sup>1</sup> Over the same period these two journals published twenty-eight articles on issues in the history of economic doctrine, matters that hardly arouse the same public concern. Again, of the 611 titles of theses for degrees awarded in the U.K. and published in the *Economic Journal* from 1973 to 1976, only sixteen (or 2·6 per cent) fall into the category 'Trade unions, collective bargaining, and labour-management relations' and it appears that most of these were in the industrial relations vein rather than in analytical economics. This general observation should be amended perhaps in light of the research into the role of trade unions in the process of inflation, but this work has rarely gone beyond measurement without theory.

This unresponsiveness on the part of British economists to the problems thrown up by trade unionism requires some explanation. No doubt a number of factors are at work here, but I suspect a contributory reason is the widespread belief in Britain that trade unions are not amenable to the sort of analysis economists apply to consumers, firms, or government policy. The argument runs that the constraints under which unions operate or the purposes that guide their behaviour are either too complex or involve too many 'non-economic' elements for the economist to make a useful contribution to a proper understanding of them. Or that the consequences of bargaining are so critically linked to the interplay of bluff, pressure, threat and misperception which in their turn elude straightforward quantification that the economist searches in vain for systematic and measurable relationships. It would be comforting if these arguments could be countered with a carefully reasoned, well-articulated theory of union behaviour buttressed with an inventory of empiri-

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† Associate Professor, Department of Economics, Stanford University, California.

cal evidence, but I am not in a position to do this. Notwithstanding some brave and worthy efforts,<sup>2</sup> there is no prevailing model of the trade union that permits the economist to derive useful inferences about labour market behaviour.

And yet I shall argue in this paper that the analytical economist is particularly well suited to an examination of a number of issues highly relevant to an evaluation of the operation of trade unions. My purpose here is not to present the conclusions of an exhaustive programme of research; on the contrary, the evidence below should be understood as merely a first pass at several problems and subsequent enquiry may well reverse these results. The work reported here is merely suggestive of the sort of analysis that the economist can pursue with advantage. The purpose of this paper is to identify the kind of information required from research by economists in order to answer some critical questions concerning the activities of trade unions in Britain. At present, this information is lacking, so that any judgements involve a good deal of speculation and should not be held with a great degree of confidence. If there is one message from this paper it is that we remain woefully ignorant of the distributional and efficiency aspects of British trade unions today. In the efficiency case, economists have not seriously examined the issues at the empirical level, while the literature on the effects of trade unions on wages is severely hampered by the quality of the available data. Confident inferences must await further research. However, the editors of this symposium have encouraged me not to allow ignorance to prevent me from expressing some opinions and I have willingly followed their invitation! It should be emphasised that naturally these opinions are conditional on the present state of knowledge and may well require reassessment in the light of future research.

My procedure in this paper is to follow the economist's familiar device of distinguishing the efficiency from the distributional aspects of unionism. Of course, any implications for the efficiency of resource allocation will normally have distributional consequences, so the distinction is solely for analytical convenience. In Section II, I sketch the arguments relating to the effects of trade unions on the efficiency of production and then present some estimates of a production function for the British coal industry. Incidentally, let us not commit the vulgar error of thinking that questions of efficiency are out of place in an evaluation of the activities of trade unions. This argument would contend that trade unions have secured for the worker a sense of self-esteem and dignity which transcend and render inapplicable narrow criteria like the maximisation of output. Whether or not these worthy goals have been gained, in fact, by unionism, a proper consideration of such a position is well beyond the scope of this paper. It seems worthwhile, however, to find out to what extent, if at all, these ends have been pursued at a net cost to society. I then turn in Section III to the influence of trade unions on wages, first their effects on wages at a given point in time and then their effects on wages over time. This naturally leads in Section IV to some discussion of government economic policy and labour law. It will become clear that many important topics such as the causes and consequences of industrial strikes, the internal organisation of trade unions, and the participation of unions in upper-management decisions will be ignored here. This silence does not mean that these are inconsequential issues in the evaluation of trade union activities, only that limitations on space and time demand that some matters be postponed to a future occasion.

## II. TRADE UNIONS AND THE EFFICIENCY OF PRODUCTION

### II.1 *Wage-Induced and Non-Wage-Induced Inefficiencies*

Suppose a trade union effects an increase in the price of labour and then leaves the firm free to adjust to this change in relative input prices. This wage increase

... some forms of association force upon public attention the practical difficulty of so regulating the right of association that its exercise may neither trench upon each citizen's individual freedom nor shake the supreme authority of the State . . . how can the right of combined action be curtailed without depriving individual liberty of half its value; how can it be left unrestricted without destroying either the liberty of individual citizens, or the power of the government?<sup>43</sup>

In the private sector of the economy dispensing with multi-employers' bargaining and reducing the size of bargaining units so that each union negotiated with a single firm would preserve for workers the principle of freedom of association yet provide far more discipline on employers each of whom would have more cause for concern that their incomes would suffer if wage increases were passed on to consumers in the form of higher prices. Naturally this would alter little when a single firm already dominates the industry, the principal examples being the state nationalised industries. In the latter some restraint in collective bargaining would be achieved by linking wages in some fashion to the financial performance of the industry. This would have to be part of a revamping of the pricing policy of the nationalised industries that would involve more stringent conditions on the running of budget deficits and more frequent resort to differential pricing schemes. In general, the state should occupy a more neutral stance in setting the climate for collective bargaining negotiations by not supporting union wages scales in non-unionised employments, by abolishing Wages Councils and Statutory Joint Industrial Councils, and by replacing a policy of minimising unemployment with one that guarantees a minimum annual income for all families whether or not members of those families are at work in the labour market. However, the observer cannot be sanguine about the future course of events in Britain, given the chain of political interdependence: a change in government policy and in the law to moderate the state's support of the activities of trade unions are unlikely to occur when the unions are such an influential pressure group on Parliamentary government; yet short of change in policy and in the law it is difficult to see how this influence can be moderated.

## APPENDIX

The purpose of this appendix is simply to specify the precise definitions of the variables used in estimating the coal production function described in the main text of this paper.

- X measures the annual output of coal in thousands of tons. Source: Board of Trade (Department of Labour Statistics), *Seventeenth Abstract of Labour Statistics of the United Kingdom*, London, H.M.S.O. Cd. 7733, 1915, pp. 32-3.
- L = D × E where E measures the average number of persons employed in and about coal mines in any year. Source: *Ibid.*, pp. 320-21. D is the fraction of a six-day week on which coal was hewn and wound at collieries and is an estimate of the utilisation rate of manpower. Source: *Ibid.*, p. 10.
- K = D × M where M is the total number of coal-cutting machines in use. Source: Annual issues of *Mines and Quarries: General Report and Statistics, Part II Labour* and appearing in Parliamentary Accounts and Papers. The use of D here clearly involves the assumption that the labour utilisation rate was proportional to the utilisation rate of machines. This is not an uncommon assumption forced upon those who fit production functions; for instance, Robert Solow follows an analogous procedure in his seminal paper 'Technical



# Wages, Productivity, and Costs in Union and Nonunion Hospitals

CHARLES A. REGISTER\*

*University of Baltimore, MD 21201*

*This paper considers the effects of labor unions on the economic performance of hospitals. Two data sets are considered. The first includes 275 hospitals from 13 urban areas; the second includes 114 hospitals from Ohio. The analysis is designed to determine whether or not union-induced productivity improvements occur within the rather noncompetitive hospital market and questions whether or not there are cost differences between union and nonunion hospitals. On the question of productivity, both data sets indicate that positive effects occur in the hospital sector. The answer to the second question is less clear. The primary data set indicates that unionized hospitals actually have lower costs than their nonunion counterparts, while the Ohio sample indicates that unionized hospital costs are lower, but not significantly so.*

## I. Introduction

Over the past decade, a great deal of controversy has arisen concerning the impact of unions on firm performance. The traditional "monopoly" view holds that unions serve to increase wages in the absence of productivity enhancements, thereby increasing the cost of production for the firm. Consistent with the monopoly view, unions are also thought to lead to productivity reductions, in some cases, through factors such as restrictive work rules and strike activities. To the extent that unions are associated with productivity declines, the upward pressure on costs from the union wage effect is given further strength.

During the 1970s, new, more positive appraisals of the effect of unions were developed, which may be synthesized as the "competitive" model. This model suggests that unions may not weaken the competitiveness of organized firms in that the upward cost pressure of union wage gains is offset through a positive, union-induced productivity gain. The improved productivity may result from either "shock" effects or the provision of a "collective voice" to the firm's employees. The shock argument is closely related to Leibenstein's (1966)  $X$ -inefficiency idea. In this context, the argument suggests that the management of a recently organized firm will respond to the increased costs associated with unionization by reducing

\*The author wishes to thank Donald R. Williams and an anonymous referee for their valuable comments.

organizational slack within the firm so as to remain competitive in the product market. The collective voice argument is found in the works of Freeman (1976) and Freeman and Medoff (1984) and has its roots in the work of Hirschman (1970). Here, unions are thought to provide the potential for increased productivity through factors such as reduced turnover rates and reduced rivalry on the production floor.<sup>1</sup>

The two opposing views concerning the effect of unions indicate that in order to determine the effect one must consider not only the union wage effect but also whether or not a union productivity effect exists. Should the monopoly view be correct, the primary effect of unions is to increase costs. But should the competitive view hold, the effect is less clear. That is, if a positive union effect on productivity exists, the union wage premium may not be translated into higher costs for the firm. Empirically, there is evidence to support both views. For example, unions have been found to be associated with reduced productivity in coal mining (Connerton et al., 1979), manufacturing (Clark, 1984), the economy (Warren, 1985), and commercial banking (Graddy and Hall, 1985). Consistent with the competitive view, positive union effects on productivity have been reported in manufacturing (Brown and Medoff, 1978), wooden furniture manufacturing (Frantz, 1976), cement (Clark, 1980), and commercial office-building construction (Allen, 1986). Given such divergent outcomes, one might find it somewhat surprising if a consensus were to develop. Yet, to a very limited degree, a consensus seems to be forming. In their survey of the effect of unions, Hirsch and Addison (1986) draw three conclusions. First, to the extent that positive union productivity effects exist, they are typically due to shock effects rather than to the influence of collective voice. Second, given that the source of positive productivity effects is thought to be shock, the existence of such effects is likely to be confined to the relatively competitive portions of the private sector. Third, even when positive productivity effects occur, they are unlikely to be of the magnitude necessary to offset the wage premium, thereby leaving costs higher in unionized environments.

For Hirsch and Addison, then, the institution of a union results primarily in a wage premium that may be somewhat offset by a productivity enhancement. Most importantly, it is concluded that the existence of a productivity enhancement is unlikely to occur when the organized firm operates in noncompetitive product markets. While it remains much too early to claim that these conclusions represent a consensus — and, in fact, there is great disagreement as to the relative strengths of the wage and productivity effects — the competitive/noncompetitive dichotomy that underlies the conclusions reached by Hirsch and Addison does seem to be gaining support. That is, if it is accepted that positive union effects on productivity occur, many analysts would agree that they are most likely to occur

<sup>1</sup>For a more thorough discussion of these viewpoints, see Freeman and Medoff (1984, pp. 162-80) or Hirsch and Addison (1986, pp. 180-208).

when the firm operates in a competitive environment. This view is clearly evidenced by Allen (1987, pp. 370-71) in his discussion of results from an analysis of union and nonunion construction projects:

. . . reduced efficiency results when the building trades unions operate in an environment where managers lack incentives to minimize costs. Although further work is clearly necessary, these findings point to a more general model where the behavior of unions fits the framework of the "competitive union" model when product markets are competitive, whereas the "monopoly union" model best describes union behavior in other settings.

The present paper tests two central propositions of this competitive/non-competitive dichotomy: First, are positive union productivity effects confined to competitive environments? Second, if such effects exist within a relatively non-competitive environment, can unionized firms in that environment have lower costs? The sector to be considered is the hospital market, which provides a solid test for the competitive/noncompetitive dichotomy, given the lack of true price competition within the sector brought on by the sector's peculiar institutional features. Key among these noncompetitive factors are the sector's preponderance of nonprofit firms (about 90 percent) and the fact that few, if any, consumers pay the full cost of the services. Taken together, it is reasonably safe to assume that strict adherence to cost minimization may not accurately reflect the goals of hospitals.<sup>2</sup> In such an environment, are union wage premiums merely passed on to third-party payers (governments and insurance companies) in the form of higher costs or, contrary to the competitive/noncompetitive dichotomy, are such wage premiums mitigated by productivity enhancements?

## II. *The MSA Data*

The primary data for the analysis come from the American Hospital Association's 1984 (1985) survey of hospitals. From this source, individual hospital level data are drawn for short-term, general medical, acute care hospitals in each of 13 Metropolitan Statistical Areas.<sup>3</sup> While analyzing hospitals in only 13 MSAs limits the extent to which the results of the study may be generalized, this grouping of hospitals is important in and of itself because it represents about 15 percent of the U.S. population. The data include information on individual hospital inputs, outputs, types of services and facilities offered, and the relevant costs of providing care. Hospitals in nine of these areas comprise the nonunion sector, a determination based on published U.S. Bureau of Labor Statistics (1984b) data. In each of these

<sup>2</sup>There is evidence to support the contention that cost minimization should not, of necessity, be thought to be the primary goal of hospitals. For example, consider Bauerschmidt and Jacobs (1985).

<sup>3</sup>The nine nonunion MSAs are Atlanta, Dallas-Fort Worth, Houston, Miami, Chicago, Kansas City, Milwaukee, St. Louis, and Denver-Boulder. The four union areas are New York, Minneapolis-St. Paul, San Francisco-Oakland, and Seattle-Everett.

hospital employment, the union in the present study reflects a majority of those employees who directly provide care to patients. Given this difference, the two studies may simply be testing the effects of different types of unions and differing degrees of unionization.

A final point about comparing the results of Sloan and Adamache (or other, similar studies) with this study concerns the extent to which the results of this study are inconsistent with previous work. While this study does report results that differ from those reported by Sloan and Adamache (and others), there is prior support for these results. Specifically, consistent with the major contention of this paper, Miller et al. (1977) report that productivity increased significantly following the institution of unions in the hospitals of three midwestern states. Further, Miller et al. identify the primary cause of the increased productivity as being a 50 percent decline in turnover rates within the unionized hospitals.

For these reasons, the results of this study should not be viewed as contradicting previous research findings but merely as adding to our still incomplete understanding of how unions influence firm performance. That is, given the substantial differences in samples, sample periods, empirical specifications, and variable definitions, direct comparisons of results are at best difficult and perhaps misleading.

#### *V. Conclusions*

This paper offers evidence concerning the effects of labor unions on the economic performance of hospitals. The importance of the question centers on what appears to be a growing consensus that positive, union-induced productivity effects are confined to the relatively competitive portions of the private sectors of the economy. If this is the case, one would expect to find either no change or perhaps a decline in productivity within the unionized hospitals. Coupled with the anticipated positive union wage effect, the institution of unions within hospitals would be expected to increase the cost of providing hospital care.

Using a sample of 275 hospitals drawn from 13 MSAs, models were developed and estimated to show the effects that unions have on wages, productivity, and costs. The wage equation estimate indicated that unions do increase hospital employee wages, while the productivity equation estimate indicated that unionized hospital employees are more productive than their nonunion counterparts. Thus, a tradeoff exists in evaluating the effect of unions on hospital performance. If the wage increase more than offset the productivity gain, then one would conclude that the institution of the unions had a negative effect on the hospital sector. Conversely, if the wage gain less than fully offset the productivity gain, then the net effect on hospital sector performance was positive. The estimation of the average cost function was designed to determine this net union effect. From this estimation process, it was determined that the increase in productivity enjoyed by unionized hospitals more than offset the cost of higher wages; that is, unionized

hospitals enjoyed a cost advantage over their nonunion counterparts, even though they paid significantly greater wages.

To test these results, a secondary data set of 114 Ohio hospitals was considered. The estimation of similar models indicated that unionized hospitals in Ohio paid greater wages and enjoyed increased productivity, both outcomes in accordance with the findings of the primary data set. The only disagreement between the two data sets was with regard to the relative strengths of the wage and productivity effects. In the Ohio sample, the two effects roughly offset one another, leaving the average cost of providing hospital care lower in unionized hospitals, but not significantly so. With regard to the primary question addressed in this paper, the two samples yield the same conclusion. The monopoly model of union behavior that one would assume to apply to unions in the hospital sector given the competitive/noncompetitive dichotomy and the sector's lack of competition fails to accurately describe union behavior. There is evidence that the positive union effect on productivity that the dichotomy ascribes to unions of competitive sectors may also occur in relatively noncompetitive markets. Further, there appears to be some evidence, though admittedly weak, that unions may be associated with reduced firm costs.

If one is to accept these results (or any empirical results suggesting that unions may be associated with reduced costs), consideration must be given to the practical issue of why firms do not seek out unions. That is, if unions are found to be associated with reduced costs, it would seem that, far from resisting organizational drives, the managements of nonunion firms would encourage collective bargaining. While nothing in this paper supports any conclusion on this point, some speculation may be in order.

First, consider the goals of the organization. If the only goal of the hospital is cost minimization, then explaining managerial opposition to unionization is quite difficult. If, however, goals other than cost minimization come into play, it is rather easy to show that managerial opposition to unionization can exist even when it is known that unionization reduces costs. For example, suppose that the hospital is operated by the manager in a way that maximizes the manager's utility. Further, suppose that the manager derives utility from a variety of factors including the power of autonomous decision making. One characteristic of the unionized environment is a reduction in this type of managerial autonomy. Thus, management may be willing to "pay" for the power of autonomous decision making in the form of increased costs by resisting unionization.

The necessary pre-condition for this type of behavior to occur is that the firm not be a strict cost minimizer. The usefulness of this pre-condition is probably correctly challenged with regard to most settings. There are strong theoretical and empirical reasons, however, to believe that hospitals are not typically operated under the constraints of cost minimization. On the theoretical level, managerial utility maximization models have become commonplace in the hospital literature. For example, Lee (1971) developed a model that indicates that the manager of the

hospital will attempt to maximize his or her utility, which is thought to be determined by factors such as job security, personal prestige, income, and power. Lee uses this model to show that hospital managers are likely to purchase status-related inputs even when those inputs are not justified on a cost-benefit basis. Similarly, to the extent that managers receive satisfaction from decision-making power, the utility maximization model of Lee might explain managerial opposition to unionization even if unionization is thought to be associated with reduced costs.

On an empirical level, it should be recalled that approximately 90 percent of short-term, general medical hospitals in the U.S. are operated on a nonprofit basis. In such an atmosphere, the mechanisms necessary to ensure cost minimization are likely to be quite weak. As evidence, Bauerschmidt and Jacobs (1985) report that neither the trustees nor managers of nonprofit hospitals typically behave so as to minimize costs. Considering the financial managers of 60 hospitals, Bauerschmidt and Jacobs find that trustees are primarily interested in achieving a target rate of return (with emphasis on making care affordable), while managers are driven by a desire for the hospital to break even.

A second reason why management may oppose unionization concerns the ways in which costs may be reduced in response to unionization. The most commonly accepted avenue of reduced costs (increased productivity) is through reduced *X*-inefficiency. Typically, the slack or inefficiency is thought to entail practices such as on-the-job leisure for the managers or frequent business trips to hospitable climates. To the extent that costs are reduced by reducing this type of inefficiency, managerial opposition to unionization should not be surprising. That is, while it may be possible to eliminate the negative effects of the union wage premium, this may occur at the expense of management.

A third reason why management may resist cost-reducing unionization is related to the question of whether or not the management believes unionization is necessary to achieve the cost reductions. This may be made more clear by considering how the reduced costs are thought to come about. From the "shock" argument, it is suggested that costs may fall as *X*-inefficiency is reduced. From the "voice" argument, reductions in costs are thought to be due, in general, to improved communication between management and the workers. It should be clear that neither of these productivity enhancements is union-specific. That is, while these may come about in a unionized environment, there is no reason to believe that managers view unionization as a necessary condition to achieve these efficiency gains. In this way, the managements of nonunion firms may resist organization not because they do not desire reduced costs, but because they feel that the benefits of unionization are attainable without incurring the costs of the union wage premium.

Finally, it may be that the management of nonunion firms resist organization simply because, while productivity may increase, the cost-increasing pressure of the wage premium is more obvious and easily attributed to unionization. That is, when unionization occurs, the management quickly and fully sees the cost in terms

of increased wages. The mitigating productivity effects, if they exist, are likely to be more difficult to identify and more difficult to positively attribute to unionization. Thus, at least in the short run, management may mistakenly oppose organization due to a failure to fully appreciate the effects of unionization.

This is not to say that the results of this study should be generalized to the entire hospital sector of the economy or to any other relatively noncompetitive sector. Others who consider union effects from other geographic areas and employing differing techniques may find opposing results. The conclusion that should be drawn from this work is simply that support is given to the proposition that there are times and situations in which the effects of unions on the performance of firms is undeniably positive and that this competitive model of union behavior may not be confined to relatively competitive sectors of the economy.

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# Collective Bargaining, Teachers, and Student Achievement\*

CHARLES A. REGISTER

*University of Baltimore, MD 21201*

PAUL W. GRIMES

*Mississippi State University, Starkville, MS 39762*

*Approximately two-thirds of the nation's elementary and secondary schoolteachers are represented by the American Federation of Teachers or the National Education Association. Surprisingly, however, relatively little is known of the impact of teachers' unions on student achievement. The authors offer evidence on this point by estimating "college entrance exam production functions" for a national sample of 2,360 students. Of particular importance, the estimation includes a correction for the selectivity bias inherent if the analysis considers only the performance of test-takers. Results indicate that students in a unionized environment score about 4.7 percent higher on their college entrance exams (SAT and ACT) than their counterparts from a nonunion environment.*

## I. Introduction

While public sector unionism is a fairly recent phenomenon, collective bargaining has been commonplace in elementary and secondary education for nearly a century. Together, the American Federation of Teachers (AFT) and the National Education Association (NEA) represent approximately two million teachers in formal collective bargaining agreements. Given this history, it is surprising that so little is known about the impact of teachers' unions on the production of educational services.<sup>1</sup> Of primary interest in this analysis is the impact of teachers' unions on student achievement.

Our understanding of the union-achievement relationship is, at best, murky. Eberts and Stone (1987) offered evidence when they considered the performance of fourth-graders on a standardized mathematics exam in union and nonunion school districts. Their results were somewhat mixed: unionization was associated with improved performance for average students but with reduced performance for students either significantly above or below average. In a study more closely

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related to this analysis, Kurth (1987) sought to determine whether or not the growth of unions in teaching has been associated with the recent decline in high school student achievement on the Scholastic Aptitude Test (SAT). The analysis involved regressing statewide average SAT scores on various social and financial resource variables as well as a union variable for 1972-1983. The results suggested that the growth in teachers' unions during 1972-1983 was the most significant factor in the decline of SAT scores. Kurth's results have not gone unchallenged (see Nelson and Gould, 1988), and the impact of collective bargaining on student achievement remains an open issue.

This study offers some additional evidence in the debate by considering the relationship between teachers' unions and student achievement on college entrance exams using recently released micro-level data. An empirical model is used, and the results of the estimation of the empirical model are described.

## II. *The Data*

In order to avoid the criticisms commonly made concerning the use of macro-level data, this analysis is based on information contained in the recently released National Assessment of Economic Education (NAEE) database, which was created by the Joint Council on Economic Education in 1987 as part of a nationwide effort to assess the quantity and quality of economic learning at the secondary level. In addition to specific variables designed to measure student understanding of economics, this database contains information on the overall academic performance of 3,016 high school seniors, their social backgrounds, and the financial and operating characteristics of their schools and the 63 school districts they represent. A detailed description of this database is presented in Baumol and Highsmith (1988). The only important information lacking in the original NAEE database is the union status of the teachers, and this information was collected directly from the school districts.<sup>2</sup>

Omitting those students for whom complete information was lacking left a sample of 2,360 students from 61 districts. Table 1 offers descriptive statistics on various relevant variables for these students and their schools. Of greatest importance to this analysis is the fact that roughly two-thirds of the students in the sample (1,570) attend schools where their teachers are represented by the AFT or the NEA. While this degree of union coverage might seem high, it is in line with the national average (Freeman, 1986). The other descriptive statistics indicate that the sample includes slightly more females than males and slightly more than 15 percent blacks. With reference to the students' schools (districts), the typical student in the sample attends a school with an enrollment of about 1,550 and a student-faculty ratio of just over 31; it spends approximately \$2,895 annually to educate each student. While none of this information suggests that the sample is unrepresentative, care should be taken when trying to generalize from the results reported. This caveat becomes particularly important when one considers similar descriptive statistics, by union status.

educational system. There could be some reverse causation here, but we can conclude that increased funding and the resulting decline in student-teacher ratios may improve student performance.

Given the somewhat arbitrary compartmentalization of the independent variables in the models, the only sociological factor that is consistently associated with achievement is mother's occupation. That is, as a mother obtains professional or managerial status, student achievement seems to rise. Interestingly, father's occupational status, while yielding the expected positive association, does not offer the same high degree of confidence. Similarly, the family's interest in the student's school work and whether or not the family is headed by a female seem to be weakly associated with student performance.

Finally, as was expected, we found that the factors that are consistently most highly correlated with performance on entrance exams are student-based. That is, enhanced performance on the exams is associated with the student's grade point average and the number of mathematics classes taken. While overt grade inflation would not be a recommended policy based on these outcomes, it seems clear that a renewed emphasis on mathematics in the primary and secondary school curricula would probably help stem the decline in entrance exam scores experienced during the last two decades. Also exhibiting significant associations with achievement are the student's race and gender. The outcomes indicate that blacks and females tend to perform worse than the white (male) reference group. Determining whether this is due to sociological factors such as differential treatment by counselors and teachers, differences in the types of schools attended, or biases built into the testing instrument itself is beyond the scope of this paper. All remaining factors lack significance levels that warrant discussion.

#### V. Conclusion

Organized labor has a long tradition in primary and secondary education. As early as 1799 teachers at the local level met to discuss problems concerning wages and conditions of employment (Braun, 1972). Organized labor is a dominant force and a force which is likely to remain important in the education of our children. However, relatively little economic research has been directed toward determining the impact of teachers' unions on student achievement. We offer evidence by estimating models for 2,360 students that are designed to determine the relationship between unionization and achievement while controlling for various institutional, sociological, and student factors. Given the usual caveats and the *ceteris paribus* assumption, we have concluded that teachers' unions are associated with a significant increase in student achievement on entrance exams. In percentage terms, students whose teachers are represented by the AFT or the NEA score approximately 4.7 percent higher on their entrance exams than do their nonunion-taught counterparts.

The finding that productivity is enhanced in an unionized environment is not unique, but it does call for some discussion. If it is to be believed that teachers'

unions and student achievement on entrance exams go hand-in-hand, the question of why that is the case cannot be avoided. Although nothing in this study is capable of answering this question in a definitive fashion, the following solutions seem plausible. First, following the work of Freeman (1976), it may simply be that education is an environment that is extremely sensitive to employee satisfaction; thus, the provision of a "collective voice" through unionization yields significant benefits in the form of increased productivity. Alternatively, "shock" effects of the sort first proposed by Leibenstein (1966) may be at work. That is, given the premium paid in the unionized environment and the traditionally tight budget constraints in education in general, increased productivity in the unionized environment may be a result of X-inefficiency reduction by administrators as a means to control school budgets. Another possibility is that the wage premium paid in the unionized districts allows those districts "first choice" when it comes to hiring. This explanation would seem to be most likely with respect to newly certified teachers. Finally, however, we cannot rule out the possibilities that test-coaching takes place more readily in the unionized environment, that the sample simply yielded results that are a fluke, or that the estimated association has little to say about causation. We can simply conclude that there is evidence that unionization of teachers appears to be positively related to student achievement on college entrance exams. Much more work is needed before conclusions of a firmer nature may be drawn.

## THE IMPACT OF UNION-MANAGEMENT COOPERATION ON PRODUCTIVITY AND EMPLOYMENT

MICHAEL SCHUSTER\*

This study examines the effects of union-management cooperative programs on productivity and employment. The author collected productivity and employment data for each of nine manufacturing plants at monthly time intervals over a period of four to five years—from two years before to at least two years after the introduction of the cooperative program. Regression analysis of these time-series data is supplemented by qualitative data from personal interviews and relevant records. The results show that after introduction of the cooperative programs, productivity increased in six of the eight firms in which it could be measured and employment remained stable in eight of the nine firms.

**R**ESEARCH on organizational change and experimentation in unionized settings is much needed.<sup>1</sup> During the last ten years, the declining growth rate of productivity has led to several cooperative attempts to increase organizational effectiveness. Although some of this activity is novel, much of it is not:<sup>2</sup> productivity programs such as

Scanlon and Rucker plans<sup>3</sup> and union-management efforts such as health and safety committees, production committees, and productivity bargaining have long histories.<sup>4</sup> Yet there has been surprisingly little empirical research on such endeavors. This paper addresses that gap in the litera-

\*The author is Associate Professor of Industrial Relations at the School of Management, Syracuse University. This research was supported by a grant from the Employment and Training Administration, U.S. Department of Labor. Helpful comments on earlier drafts of this paper were provided by James Dworkin, Susan Rhodes, Milton Derber, and Christopher Miller.

<sup>1</sup>Thomas Kochan, "Labor Management Relations Research Priorities for the 1980's," final report to the Secretary of Labor (Washington, D.C.: U.S. Department of Labor, 1980).

<sup>2</sup>There is no single volume that presents the complete history of union-management cooperation, but three excellent references are James J. Healy, ed., *Creative Collective Bargaining* (Englewood Cliffs, N.J.: Prentice-Hall, 1965); Clinton S. Golden and

Virginia Parker, *Causes of Industrial Peace Under Collective Bargaining* (New York: Harper and Row, 1953); and Arie Shirom, "Cooperation and Adjustment to Technological Change: A Study of Joint Management Union Committees," unpublished Ph.D. thesis (Madison, Wis.: University of Wisconsin, 1968).

<sup>3</sup>For a recent study of the Scanlon Plan, see J. K. White, "The Scanlon Plan: Causes and Correlates of Success," *Academy of Management Journal*, Vol. 22, No. 2 (June 1979), pp. 292–312. For a brief description of Rucker Plans, see Carl Hegel, ed., *The Encyclopedia of Management*, 2d ed. (New York: Van Nostrand Reinhold, 1973), pp. 895–900.

<sup>4</sup>A discussion of union-management safety committees may be found in Mary V. Kleeck, *Miners and Management* (New York: Russell Sage Foundation, 1934). Productivity bargaining is discussed in Industrial Relations Research Association, *Collective Bargaining and Productivity* (Madison, Wis.: IRRA, 1975).

ports their contention. Interviews with company and union officials consistently indicated that the consultants had pushed the parties too quickly and may have failed to account for internal union politics. Finally, supervision was not directly involved in the program. In spite of a positive trend in productivity, causal inferences from the operation of the committee would be inappropriate.

### Conclusions

In contrast to most previous research on union-management cooperation, this study has shown that a scientific research design and performance measures can be utilized to assess the effectiveness of such programs. This strategy is optimized by complementing it with traditional forms of qualitative analysis.

Because of the small number of firms investigated and the relatively short periods of time analyzed, the results of this study must be considered preliminary. It is nevertheless suggestive that of the nine sites studied, four experienced statistically significant abrupt positive changes in productivity, and two others demonstrated statistically significant positive trends. Employment remained stable in eight cases and dropped significantly in only one; in most instances, employment tended to follow the industry pattern.

A major finding of this study has been to document the diversity of patterns in the practice of union-management cooperation. Support was also found for several propositions in the Kochan-Dyer model. For example, cooperation requires a stimulus to change a traditional bargaining relationship; in the present study, cooperation was stimulated by the dire financial position of one company and by adverse competitive conditions in several others. Additional stimuli were provided by factors internal to the firm, including a desire to upgrade the workplace environment, improve communication, and replace or supplement an existing compensation program. One site (Eight) demonstrated that cooperation could not be imposed by actors external to

the immediate union-management relationship. Yet another site (Nine) provided evidence of the ability of coalitions to block the permanent installation of a cooperative effort.

The importance of preserving organizational equity as a condition for maintaining cooperative endeavors must not be underestimated. Several cooperative efforts resulted in very few bonus payments. In three cases, management was able to "adjust" or "manipulate" the formula: in one instance, this was accomplished by redefining the labor ratio; in the other two, management failed to raise prices during an inflationary period.

In other cases, the frequent disbursement of bonuses appeared to provide the requisite sense of organizational equity to maintain commitment over time. At the same time, however, it should not be assumed that the potential for earning a bonus will be sufficient in itself to ensure the success of a cooperative endeavor. Key management and supervisory personnel must share the goals of the cooperative effort and be willing to share their authority to make decisions. Similarly, cooperative union-management endeavors must take into account the political realities within unions; in particular, care should be taken that union leaders are not perceived as co-opted by managers or external consultants, as was the case at Site Nine.

The experience at Site Seven suggests that many union and employer representatives will need assistance in developing the proper attitudes for moving toward more cooperative strategies. In this respect, recognition must be given to the differences between unionized and nonunion settings when devising change strategies. Finally, neutrals and consultants must not only offer the parties a wide array of behavioral science training, but, as Site Nine shows, they must also be thoroughly skilled in the mechanics and implications of the collective bargaining agreement.<sup>40</sup>

<sup>40</sup>One of the great benefits to be derived from the area labor-management committee is its ability to provide this kind of expertise.

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# Enterprise unionism: the Japanese system at work

Toshiaki Tachibanaki and Tomohiko Noda

Kyoto University and St Andrews (Momoyama Gakuin) University

## 1. INTRODUCTION

The effects of unions on the economy have been much debated (Lewis, 1986; Addison and Hirsch, 1989; Booth, 1995). A large number of studies have investigated the effects of unions on economic variables such as wage differentials and productivity differences, mostly for the United States and the United Kingdom. The major results have been that there is a positive union wage differential, but the effects on productivity are either inconclusive or negative. For Japan, there are few studies (Muramatsu, 1984; Tachibanaki, 1993; Noda, 1995; Noda and Tachibanaki, 1996), probably for the following reasons. First, it was presumed that unions in Japan do not have relevant economic effects. Second, the lack of reliable data made it difficult to investigate the topic. Third, the recent decline in unionization in Japan seemed to make the issue less interesting. However, we are able to use a new and interesting data set. We also think that there are good reasons for Japanese enterprise unionism having a significant effect on the performance of Japanese firms. Furthermore, there is rising interest in the causes of the decline in union membership (Freeman and Rebick, 1989; Tachibanaki, 1993).

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