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The Impact of Collective Bargaining on Competitiveness and Employment

A Review of the Literature

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How does collective bargaining affect the performance of the firm? Does it improve or worsen productivity? Does collective bargaining inherently increase costs? Are organized firms less profitable than those which are not organized? Does union organization lower stockholder returns and discourage new investment? Are organized firms more likely to fail than non-union firms? These questions have been a topic of research, and of controversy, for more than a century. For most of this period, researchers have sought to answer these questions through detailed institutional analyses of firms and industries with *Union Policies and Industrial Management* (Slichter 1941), which provides a landmark example. In the last 20 years, econometric methods have been brought to bear on these questions. Beginning with “Trade Unions in the Production Process” (Brown and Medoff 1978), more than 60 published articles have examined some aspect of the collective bargaining/firm performance relationship in the United States. The literature has grown sufficiently large—and remained controversial—that there are four extant reviews: Hirsch and Addison (1986), Addison and Hirsch (1989), Belman (1992), and Kuhn (1998).

GENERAL THEORETICAL CONSIDERATIONS

Standard static economic models provide little room for unions to have a positive effect on firm performance. In the static model, firms in competitive industries operate on their efficiency frontiers. Unions, interlopers in an already efficient production process, affect firms by increasing compensation and negotiating rules that reduce the flexibility of work practices. Both lead to higher production costs and lower profits. Higher wages and benefits of organized firms increase costs and reduce profits, although these effects may be partially counteracted if firms use their escalated compensation to attract more productive employees. The labor productivity of organized firms may also be higher than that of unorganized firms if they adjust to escalated labor costs by substituting capital for more expensive labor. Despite such adaptations, organized firms are seen as experiencing higher production costs and reduced profits, because they have been moved away from the profit-maximizing combination of inputs. The effects of higher compensation are magnified where unions negotiate work rules that limit management flexibility. Such rules move firms inside their efficiency frontier, further degrading firm performance. The lower profits and consequent lower rates of return on investment realized by organized firms lead to lower levels of investment and increase the likelihood of firms' failure.

An implicit assumption of these models, one required for firms to operate on their efficiency frontier, is that employee effort is fully under the control of the firm and therefore maximized (Altman 2000). While this reasonably holds where managers and owners have complete information on their employees' actions and can impose sanctions in the absence of maximum efforts, in situations in which the marginal transaction costs of writing effort-specific labor contracts, metering and monitoring employees, and enforcing the contracts exceed their marginal benefits (which is likely to be the case in the vast majority of firms), employees will be afforded some discretion over their work efforts. It is probable that firms can monitor and control the physical effort expended by employees. Employee discretion over effort is likely to be greatest, however, and most difficult for firms to monitor when that effort involves sharing employee-specific informa-

tion with the firm that can be used to enhance firm performance. Firms which, because of the nature of their employment relationship, fail to elicit the full discretionary information-sharing effort of their employees will suffer some degree of x-inefficiency and operate inside their efficiency frontier. The lesser technical efficiency of such firms may, however, be balanced by reduced direct labor costs if their “employment package” is less generous than that of firms which better elicit employee effort and have higher output per unit of labor input. Where employees have some control over work effort, different approaches to the employment relationship may successfully coexist and be equally effective at minimizing costs.

If a firm is operating below its efficiency frontier, there may be conditions under which unions would enhance firm performance. Building on Altman’s approach, unionization may be viewed as a reorganization of the production process, providing advantages and disadvantages for the firm. On the one hand, unions may have all the negative efficiency effects contemplated by the leaner, traditional economic theories. On the other hand, the representative and protective functions of unions may provide opportunities for firms to better their performance by eliciting greater commitment and information-sharing effort from their employees than would be forthcoming in the absence of a union. Employee information sharing is likely to be greater in a unionized than in a non-union setting for two reasons: 1) collective bargaining mandates negotiation and contact between the employer and elected employee representatives, thus providing established channels that are accepted by employees; and 2) employees can negotiate over the “price” to be paid for this information, perhaps in the form of increased compensation, or guarantees that they will not be disadvantaged. In regimes lacking employee representation, the rules of the workplace are often uncertain and their interpretation is, in the final analysis, made unilaterally by an interested party. Under such conditions, employees are likely to try to secure and improve their position through opportunistic behavior such as reserving knowledge that is potentially useful to the firm. Such behavior is less necessary where there is employee representation, as there are established interpretations of rules and a structure that provides substantive and procedural due process.¹ Thus, unions and collective bargaining may improve firm

performance by providing employee collective voice to which employers are legally required to listen.

In a non-union setting, with no formal, legally mandated voice mechanism, employees' fundamental means of communicating dissatisfaction with the employment relationship is through exit. This is costly, as the firm loses trained and productive employees. In contrast, unions provide a protected forum through which employees can make their views known to their employer and reduce the impetus for employees to leave the firm. The representative function of the union also provides a structure through which the employer can elicit a frank response to contemplated changes in the employment relationship and seek employees' untrammelled consent. Collective voice is particularly important where the labor force has divergent interests, and where changes in production arrangements and employment policies will have divergent effects on the labor force. Collective organization provides a means through which employees can negotiate among themselves and develop a mutually acceptable arrangement with the employer.

Unionization may also improve firm performance by forcing improvements in managerial performance. The costs of poor management may be mitigated in a non-union workplace as bad production planning, and inconsistent labor policies may be offset by low pay and exceptional flexibility in the deployment of labor. Such solutions are more expensive—if not unavailable—under collective bargaining, where inordinate and ill-considered use of overtime, sudden shifts in employment, and inconsistencies in the application of rules are limited by the agreement. In order to survive and profit, organized firms have to improve their planning of production and the quality of their supervision, in essence being “shocked” into efficient production practices.

Unions may also solve problems related to information, transaction costs, and public goods through the hiring and training of employees. In industries such as construction, where the term of employment with any individual employer is short and there is substantial occupational skill and knowledge, firms will be reluctant to undertake training as they are unlikely to recover their costs. Unions potentially provide a structure under which employers can collectively finance training programs for employees who will, over their working lives, be shared among those firms. The union may also play an oversight role, ensur-

ing that employers adhere to the training regime required to provide appropriately skilled employees. In labor markets where employees are transient among firms, unions may also serve to certify the skills of employees and reduce the time and expenditure required to locate appropriately skilled employees.

A similar public goods situation might also exist outside construction. The longer employer tenure of unionized employees increases the return from firm-specific training, as unionized employees are less likely than their non-union counterparts to quit and take their training elsewhere (see Freeman and Medoff 1986).

A final suggestion of the literature is that industrial relations climate rather than union organization, *per se*, is the key variable in determining the effect of collective bargaining on organizational performance. Collective organization can provide a mechanism through which managers and employees propose, discuss, and agree upon the organization of the firm. In such circumstances, the firm is likely to be more efficient than one in which decisions are taken unilaterally by management. In contrast, where relations between managers and employees are conflictual, collective organization becomes a tool in that conflict. It may be that the nature of the employment relationship, the level of trust between the parties, the history of unilateralism or mutuality, and the parties' acceptance of the legitimacy of one another's goals play key roles in determining the effectiveness of an organization, whether unionized or non-union, as well as the effectiveness of collective bargaining on organizational performance.

The foregoing theoretical discussion points out that the efficiency effects may not be as straightforward as traditional, lean economic theories would predict. While collective bargaining and unionization may negatively affect firms' efficiency on the production frontier, it is not likely that very many firms operate on that frontier at all times. Once the assumption of efficient production in the absence of a union is relaxed, it is possible to conceive of situations in which the presence of a union might enhance efficiency, or be associated with no effect. Thus, the predicted effects of unions on firm performance are not unambiguously negative. The matter is best determined by empirical work, and it is to that work that this chapter now turns.

EMPIRICAL RESEARCH ON COLLECTIVE BARGAINING AND ORGANIZATIONAL PERFORMANCE

Empirical research on the effect of collective bargaining on organizational performance typically addresses one of four broad topics: 1) the effect on firm productivity and costs; 2) the effect on productivity growth; 3) the effect on firm profits, investment, and survival; and 4) the role of industrial relations climate on organizational outcomes. Drawing on Belman (1992) and on Kuhn (1998), we review the literature on the United States up to the early 1990s and supplement this with a discussion of more recent research.²

Effects on Productivity and Costs

The effect of unions on firm productivity and costs has been studied by comparisons across industries, within industries, and within firms. While the former has the advantage of providing more general answers to the question of interest, the more narrowly defined within-industry and within-firm studies are advantageous in using measurement of inputs and outputs and models that better reflect the industry or organization under study. For example, while inter-industry studies must use price-based measures of output, such as value added, industry studies may use physical as well as price-based measures of output.

There are only two inter-industry studies of productivity and costs: Brown and Medoff (1978) and Clark (1984). The former, which considers the effect of union density on state by industry-value added, suggests that organized establishments are between 19.5 and 24 percent more productive, depending on the controls incorporated into the model. Using a product line data set for 250 large firms, Clark finds a small, economically inconsequential union effect on productivity. Belman (1992) suggests that the difference between these findings might be reconciled if positive productivity effects are the consequence of shock effects in less well managed small and mid-sized firms. Larger firms, such as those found in Clark's sample, may already be well managed and so do not benefit from organization. Neither study indicates that unions have a consistently negative effect on productivity, as suggested by standard theory.

Intra-industry studies of the effect of unions on productivity and costs are more prevalent than inter-industry studies. These include the cement industry (Clark 1980a,b), construction (Allen 1984, 1986a,b, 1988b; Cavalluzzo and Baldwin 1993), hospitals (Sloan and Adamache 1984; Register 1988), banking (Graddy and Hall 1985), coal (Conner-ton, Freeman, and Medoff 1983; Boal 1990; Boal and Pencavel 1994; Byrnes et al. 1987), wooden furniture (Frantz 1976), machining (Kelley and Xue 1990), steel finishing (Ichniowski and Shaw 1995), and trucking (Delery et al. 2000). Considering the studies prior to 1992, Belman (1992) concluded that the effects of unions on productivity and costs vary by industry and by the period under consideration. There is scant evidence that unions act to reduce productivity. The only consistent negative finding was in the banking sector, while there is substantial evidence that unions act to improve productivity in many industries. Clark's work on cement plants finds that organization is associated with a productivity shock effect of 7 to 12 percent. The extensive work on construction by Allen suggests that organization is associated with higher productivity, particularly on projects that require higher-skilled workers.

Union effects on costs are less clear-cut than union effects on productivity. Unions reduce unit costs in private construction but are associated with higher unit costs in public construction. Later work by Cavalluzzo and Baldwin (1993) suggests that labor productivity was 38 percent higher on organized construction sites. The outcomes in construction are of particular interest because of the role that building trades unions play in the training process and in reducing employer search costs.

Extractive industries have a reputation for conflictual labor relations, and studies of bituminous coal confirm the centrality of industrial conflict in determining unions' effect on productivity (Kerr, Harbison, and Dunlop 1960). Byrnes et al. (1987) found that organized surface mines were more productive than their non-union counterparts. Connerton, Freeman, and Medoff (1983) found that the effect of unions on mine productivity varied: in periods of labor peace, organized mines were 30 percent more productive than non-union mines; in periods of industrial conflict, organized mines were 15 percent less productive than non-union mines. Boal (1990) considers the effect of unions on productivity in the 1920s, while Boal and Pencavel (1994)

examine the effect on days of operation from 1897 to 1937. The first finds that unions did not affect productivity in larger mines in the 1920s but were associated with lower productivity in smaller mines. Boal suggests that this is the result of the lesser sophistication in labor relations in smaller mines. Boal and Pencavel find no relationship between unionization and days of operation except for the period from 1921 to 1930, when mines in fully organized counties had 25 percent fewer operating days than mines in unorganized counties. Although the authors suggest that this is the result of unions' limitation of days of work, this was also a period of intense conflict—conflict that eventually led to federal military intervention, as the industry in West Virginia de-unionized. The negative effect of organization on operating days is then as likely to have reflected the events around the long strike, such as the Matewan Massacre and the Battle of Beal Mountain as a commitment to limiting working days.³

Bronars, Deere, and Tracy (1994) and Hirsch (1991b) are unique in using Compustat data to examine the effect of unions on multiple measures of firm performance, including profitability, investment, sales, employment growth, and productivity.⁴ Bronars, Deere, and Tracy use the union contract files of the Bureau of Labor Statistics to obtain matching data on the extent of organization by firm. The authors test several specifications and compare results obtained with their firm level unionization measure with the use of more aggregate measures of union density. Although results vary considerably by specifications, the findings suggest that firms with higher unionization have higher productivity in manufacturing, suggesting that unionized employers offset the union wage and benefit premium through improved productivity. Outside manufacturing, the relationship is too sensitive to specification, functional form, and period to support any conclusions about union effects.⁵ This research considers whether unions influence other aspects of firm performance, including capital expenditures, capital-to-labor ratios, advertising-to-sales ratios, and investment in research and development, and it finds little evidence for any effect.

In contrast, Hirsch (1991b) finds that organized firms are substantially less productive than similar non-union firms. Data on unionization were obtained from a survey of Compustat firms. Initial estimates indicate that firms with the average level of organization (42.3 percent) would have 3.5 percent lower factor productivity as measured by value

added per employee. The results are sensitive to inclusion of industry controls. Models with no controls for industry indicate much larger negative union productivity effects; estimates from models that include highly disaggregate measures of industry find union productivity effects in the range of -1 to -1.5 percent. Conflation of industry effects with firm unionization is also apparent in the preferred estimate, which incorporates measures of the characteristics of two-digit industry, including a measure of industry union density. The coefficient on industry density is positive and sufficiently large in magnitude: a 10-percentage-point increase in industry density would be associated with a 2.8-percentage-point increase in firm productivity, to potentially offset the negative effect of firm union density. Hirsch speculates that this effect is due to escalated product prices in heavily organized industries or incomplete specification of the determinants of productivity correlated with industry density. The sensitivity of the estimates to industry controls may, however, reflect measurement problems in the construction of the dependent variable, value added per employee, suggesting that the estimates of union effects may be inaccurate.⁶

Two recent studies provide indirect evidence of a negative union productivity effect in steel and in trucking. Ichniowski and Shaw's 1995 study of steel finishing lines focuses on the determinants and consequences of human resource management practices. They find that human resource management (HRM) practices cluster on a continuum from traditional to new and that the cluster of the newest practices is associated with a 6 percent higher ratio of actual to scheduled operating time. Organized plants, however, are substantially less likely to adopt new HRM practices. Although the authors do not test the effect of unions on operating time per se, by reducing the likelihood that firms adopt more efficient HRM practices, unions are potentially associated with lower productivity. Delery et al. (2000) examine the premise that organized firms have lower turnover and quit rates among trucking firms with 30 or more employees. Their evidence suggests that, after accounting for the effect of unions on wages, neither unions nor "voice" procedures are associated with reduced turnover or quits.⁷

Taken together, current studies remain favorable to the view that collective bargaining typically has a favorable positive effect on the productivity performance of the firm, suggesting that non-union firms rarely operate at maximum efficiency. The union effects, however,

vary considerably by industry and by time period, and they are sensitive to the degree of conflict between employees and employers. Where it has been studied, the effect of unions on costs is typically less favorable as gains in productivity are offset by escalated compensation costs.

Effects on Profitability, Investment, and Firm Failure

While studies of productivity and costs are fundamentally about the effect of collective bargaining on firm efficiency, studies of profitability consider both the efficiency and distributional effects of bargaining. Although any negative effect on profits may originate in reduced efficiency, it may also result from unions using bargaining power to claim part of the profits typically going to shareholders. Research interest has focused on the subsidiary issue of the circumstances under which unions can claim a share of firm profits. In competitive markets, unions' claim of a share of capital income would result, in time, in the firm going out of business as new capital was diverted from reinvestment in the company. Once the assumption of competitive markets is relaxed, however, the long-run results of union diversion of profits to compensation become difficult to predict. For example, where a firm realizes rents from market power in imperfectly competitive markets, the firm may generate sufficient profits to maintain investment at an optimal level. In such a situation, the union compensation premium may be a diversion from other uses of profits, such as dividends. In addition, unions may be able to claim quasi-rents from physical investment where such investment is not readily reversed and is long lived.

Studies of profitability, the most common topic of research, may be divided between those that use firm data to construct measures such as price/cost margins ($[\text{sales} - \text{payroll} - \text{materials costs}] / \text{sales}$) and Tobin's q (value of firms equity and debt / replacement cost of assets), and those that use stock market data to assess the effect of changes in union status and collective bargaining outcomes on the valuation of firm stocks. An almost universal result from these studies is that unions are associated with reduced profitability. What remains at issue is circumstances under which unions are able to claim a share of firm profits.

Freeman (1983), Freeman and Medoff (1984), Karier (1985, 1988), and Voos and Mishel (1986) have estimated the effect of unions on profitability using industry data obtained from the U.S. Census. Although such studies suffer the disadvantage of using data averaged across firms within an industry, the data reflect firms' domestic (U.S.) operations, simplifying the specification of equations and providing an appropriate match between dependent and explanatory variables. Freeman and Freeman and Medoff find that price/cost margins are reduced between 0 and 37 percent and return on capital was reduced between 9 and 32 percent in the presence of unions, but that unions did not reduce firms' profitability in competitive markets. Karier finds similar results with unions reducing price/cost margins by 14 percent in highly monopolized markets but having no effect in competitive markets. Voos and Mishel find that unions reduce price/cost margins by between 22 and 35 percent but do not consider the effect of competitiveness of the market.

Studies of firms are potentially superior to industry studies, because the lower level of aggregation may allow researchers to better isolate the mechanisms through which unions affect profitability. This advantage is purchased at the cost of challenges in collection of data. Data on the firm unionization are not available from standard sources; researchers must locate appropriate sources and compile the data. Becker and Olson (1992) used pension data collected by the U.S. Department of Labor to estimate union density for large firms; Hirsch (1991a) conducted a survey of Compustat firms that collected data on organization; Bronars, Deere, and Tracy (1994) use data from the Bureau of Labor Statistics collective bargaining agreement file to determine unionization levels within the firm. All of these approaches result in partial samples of the population of firms. Hirsch reports obtaining data from 620 of 1,900 Compustat firms initially surveyed, and Bronars et al. sample sizes range from 120 to 130, less than 10 percent of the Compustat firms. Such extensive incomplete coverage raises the potential for substantial nonrandomness in the sample and consequent bias in the estimates.⁸ A second daunting problem is that because measures of firm profitability include profits from overseas operations, the models need to incorporate controls for the extent and performance of overseas operations. The absence of controls for foreign operations from any of the firm estimates shadows this literature.⁹

Finally, Standard & Poor's Compustat data are limited to very large firms and, as such, are unrepresentative of the economy as a whole.

Belman (1992) reviews studies by Salinger (1984), Clark (1984), Hirsch and Connolly (1987), Connolly, Hirsch, and Hirschy (1986), Becker and Olson (1992), Voos and Mishel (1986), and Allen (1988a,b). As with the industry studies, these studies suggest that organized firms have lower price/cost margins and lower q 's than firms that are not organized. For example, Clark found that unions reduced returns on sales by 16 percent while reducing returns on capital by 19 percent. As in the industry studies, another issue is whether unions reduce the profits of all firms, or only of firms that are earning economic rents. Salinger's work suggests that unions reduce monopoly rents. Hirsch and Connolly (1987), however, do not support this conclusion. They find that unions capture rents from sunk research and development investments. These results are specific to Tobin's q but are not found when price/cost margins are the dependent variable.¹⁰ Becker and Olson (1992) also find that the negative relationship between unionization and profits is related to union capture of rents on intangibles, but, as with Hirsch's research, these results are sensitive to the measure of profit. In contrast to other studies, Allen finds that unions do not reduce profits in construction. The unique nature of unionism in construction, which results in substantial employer savings in recruitment and training costs in a transient labor market for generally skilled employees, may account for this difference.

More recent research is provided by Hirsch (1990, 1991a,b, 1992), Hirsch and Morgan (1994), and Bronars, Deere, and Tracy (1994). Hirsch's extensive work on this issue builds on his survey of firms in the Compustat database to determine the company's extent of unionization in the 1970s and 1980s.¹¹ These data were then matched to Compustat panels on firms to measure the relationship between firm unionization and various measures of firm performance between 1972 and 1980. Depending on the specification used, Tobin's q is 20 percent lower, and return on capital, π , is 14 percent lower in the typical union firm (with union density of 42.3 percent). Estimates of the effect of unions on profits are, however, sensitive to controls for industry, particularly to inclusion of industry indicator variables. In the presence of such indicators, the coefficient on firm density becomes nonsignificant for q and becomes small and only marginally significant for π .¹² Further esti-

mates suggest that the reduced profitability of organized firms may be attributed to unions appropriating rents from firms' investments in research and development and fixed capital and that, as a result, organized firms may invest less than unorganized firms in research and development and fixed capital.¹³ These results are consistent with unions capturing rents where firms are unable to protect those rents from partial appropriation through collective bargaining. Building on prior work by Becker and Olson (1986), Hirsch and Morgan (1994) find that shareholder risks decline with the extent of union coverage in the 1970s. They found that highly unionized firms had lower returns during this period but that this relationship between shareholder returns and coverage broke down in the 1980s.

Bronars, Deere, and Tracy (1994) also examine the effect of unionization on profitability for three measures of profitability: Tobin's q , the ratio of excess market valuation to sales, and the ratio of net operating income to sales, using several specifications. Focusing on the specifications that include controls for industry and firm characteristics, there is no evidence that Tobin's q or the ratio of excess valuation to sales is lower among organized firms in the manufacturing sector, but the net operating income to sales ratio in fully organized firms is estimated to be 3 to 4 percent below that of an otherwise similar non-union firm. Among the nonmanufacturing firms, Tobin's q in a completely organized firm would be 18 to 22 percent below that of a similar unorganized firm, but there is no significant union effect on the other measures of profitability. First, differencing of the data eliminates any meaningful statistical relationship between unionization and profitability except for a negative effect for the ratio of excess market valuation to sales in nonmanufacturing. The sensitivity of the estimates to the sector, measure of profitability, and specification of the variables suggests that although some specifications of the profits equation produce the expected negative relationship, that relationship is tenuous, particularly in the manufacturing sector.¹⁴

Stock market studies consider the effect of events related to collective bargaining on the market value of firms. Under the assumption that stock markets are efficient processors of information, changes in stock valuation in response to new information reflect the expected effect of these shifts on the performance of the firm. Changes in stock valuation

in response to strikes, representation elections, and settlement of contracts will then reflect unions' effect on firm outcomes.

Events that are viewed as favorable to unions are generally associated with a reduction in the market valuation of the firm's stock. Rubeck and Zimmerman (1984) find a decline in stock valuation both when a petition for a representation election is filed and when the election is held. Stock valuation declines between 1.3 percent if the union loses and 3.8 percent if it wins. Both Greer, Martin, and Reusser (1980) and Becker and Olson (1986) found a decline in stock valuation following a strike. In contrast, concessionary contracts were associated with an increase in stock valuation (Becker 1987). Although these results might indicate that stockholders expect organized firms would operate less efficiently, it may also reflect a belief that union success will lead to the redistribution of profits from stockholders to employees. There is also internal evidence in these studies that profit declines preceded organization and that union activity might be a response to worsening economic performance.

Freeman and Kleiner (1999) consider the effect of organization on the survival of firms. In the first part of this study, the authors use Compustat data to examine the likelihood of a firm going out of business. Using a modest set of controls, the authors find that organization itself reduces the likelihood of a firm becoming insolvent but that the likelihood of insolvency rises with the level of organization. The most highly organized firms have a 23 percent likelihood of becoming insolvent, relative to a 19 percent probability of insolvency for non-union firms, for the period under consideration. In the second part of the study, the displaced worker supplement of the Current Population Survey is used to determine the effect of union membership on the probability that an employee was displaced by the permanent closure of a plant. Freeman and Kleiner's estimates indicate that union membership is unrelated to plant closing or any form of displacement. They suggest that these results are consistent with the hypothesis that unions behave in an economically rational manner in not increasing wages to the point at which the firm, plant, or business lines close down.

Taken together, the studies of the effect of collective bargaining on profits, investment, and firm failure suggest that unions do not fully pay for their higher wages and benefits through increasing productivity and reducing costs. They act to redistribute part of the shareholders'

earnings to employees, but this redistribution occurs where firms are earning rents or quasi-rents. However, the redistribution is not so large as to endanger the economic viability of the firm.

Collective Bargaining Practices and Competitiveness

The previous discussion focused on the effect of the mere incidence of collective bargaining on organizational outcomes that might be associated with the competitiveness of the firm. There is no reason to believe, however, that the existence of a bargaining relationship *per se* would necessarily result in improved firm competitiveness. Collective bargaining traditionalists might contend that the major purpose of collective bargaining is to provide employees with workplace representation rather than to encourage firm competitiveness. To the extent that this is the case, only when the union and the employer believe it is in their mutual interests to move the process toward encouraging competitiveness will it be used that way.

Since the early 1980s, many firms and unions have moved toward innovative collective bargaining and cooperative relationships as a means for fostering improved firm competitiveness and increased employment protection and job creation (Kochan, Katz, and McKersie 1986; Block, Beck, and Kruger 1996). A literature has developed that has examined the success of these innovations, and much of the pre-1990s literature is included in Belman's 1992 review. A series of studies of General Motors (Katz, Kochan, and Gobielle 1983; Kochan, Katz, and Mower 1985; Katz, Kochan, and Weber 1985) investigated the relationship between innovative industrial relations programs, industrial relations outcomes, and plant-level economic performance. They suggest that such programs have positive effects on the quality of production and a weaker but positive effect on labor efficiency (productivity). These studies also find that higher levels of conflict, such as escalated levels of grievance filing and disciplinary activity, are associated with reduced product quality and productivity. Schuster (1983) examined the impact of profit-sharing plans, gain-sharing plans, labor-management committees, quality circles, and quality of work life program on productivity (sales per employee hour worked), employment, product quality, absenteeism, voluntary turnover, tardiness, grievances, and employment security with a before-and-after study of 38 firms in

the eastern United States. Such programs had a positive impact on productivity but little effect on product quality, employment, turnover, absenteeism, tardiness, and the grievance rate. There was a strong linkage between employment security guarantees and firms' economic performance, but only 3 of 38 firms provided such guarantees.

Rubinstein (2000) examined the difference in first-time product quality associated with union and non-union at the comanaged Saturn plant in Tennessee. Rubinstein found that the communications networks associated with union managers were associated with higher first-time quality than the communications networks associated with non-union managers.

Several studies suggest that the availability of formal procedures for resolving grievances is associated with improved firm performance but that escalated levels of grievance activity are associated with lower productivity and product quality (Norsworthy and Zabala 1985; Ichniowski and Lewin 1987; Ichniowski 1986; Goldberg and Brett 1979; Spencer 1986). Ichniowski finds that the absence of a mechanism for resolving grievances in a non-union paper mill resulted in the firm operating 19.5 percent below full labor efficiency.

Although the relationship between the quality of the collective bargaining relationship and firm performance has not been widely studied in the 1990s, there have been several notable additions to the literature. In a survey based on 194 plant managers, 74 union officers, and 135 headquarters personnel associated with the same firms, Cooke (1990) found that high union leader involvement and frequent team meetings were associated with perceived improvements ("much improvement") in quality, productivity, and supervisor-employee relations. Measures of technological displacement had a mixed effect on these outcomes, while concession bargaining measures were unrelated. In a study of 194 manufacturing firms throughout the United States and 131 manufacturing firms in Michigan, Cooke (1992) found that unionized firms with jointly administered employee participation programs achieved greater improvement on a subjective measure of product quality than unionized firms without such programs, and that unionized firms with jointly administered programs achieve quality gains equal to non-union firms with participation programs. Subcontracting was found to have a negative spillover on quality: firms that used subcontracting suffered reduced product quality relative to firms that did not subcontract. Sum-

marizing these findings, Cooke suggests that labor–management climate was a key determinant of quality.

In a study of the economic impact of the change in the collective bargaining relationship between Xerox and the Amalgamated Clothing and Textile Workers, Cutcher-Gershenfeld (1991) finds that work areas that could be identified as traditional (adversarial) were associated with significantly higher product costs, greater losses to scrap, greater productivity variation, and lower net return (a measure of actual vs. standard labor hours for producing a part) than work areas identified as transformational or transitional (work areas that exhibited less measured conflict, greater speed of conflict resolution, problem solving, worker autonomy, and worker-initiated changes).

Kelley and Harrison (1992) report that the presence of labor–management committees in a sample of small unionized machining plants was associated with lower levels of productivity and greater job insecurity. They suggest that this unexpectedly negative relationship is the result of omitted mediating variables, such as vulnerability to foreign competition. In their view, the adoption of labor–management committees is not random but a response to poor economic performance by the firm. The presence of these committees may proxy for omitted variables that are the true source poor performance.

The current literature provides considerable favorable evidence on the effect of innovative work structures on organizational performance. Evidence on the role of unions in promoting or impeding the implementation of new work practices is mixed. Ichniowski and Shaw (1995) find that organized steel finishing lines are less likely to adopt the most advanced combination of work practices. Osterman (1994) finds more mixed results in a study of the adoption of innovative work practices, where such practices are defined by the adoption of teams, job rotation, quality circles, and total quality management. The effect of unions on innovation depends greatly on the construction of the independent variable, with the estimated effect varying from positive and weakly significant to nonsignificant to negative and weakly significant. Eaton and Voos (1992) suggest that the unions play an important role in obtaining the genuine consent and participation of the labor force, and that this makes adoption of workplace innovations both more likely and effective. They suggest that, with the exception of

profit-sharing plans, organized plants are more likely to adopt workplace innovations than non-union plants.

Evidence on the effect of unions on training is mixed. Unions appear to have little effect on the amount of training in small firms, but they are associated with longer duration and total hours of training and a greater use of formal training programs in a more representative cross-section of firms. In a study of the effect of government subsidies on firm training, Holzer et al. (1993) found that the presence of a union did not affect the amount of annual quality-related training hours offered by a population of small manufacturing firms in the years 1987–1989; training hours were determined primarily by whether the firm received a government subsidy. In addition, there was no evidence suggesting that the presence of a union affected the success of that training, measured by a change in the scrap rate. Using a 1992 survey of the Small Business Administration, Black, Noel, and Wang (1999) find that weekly hours of formal and informal training are not affected by the union status of firms. Organized firms, however, provide more weeks of on- and off-site formal training than otherwise comparable firms. A larger fraction of the training provided by organized firms is formal, while non-union firms provide a larger fraction of their training as informal training by managers or co-workers.

Summarizing the knowledge as of the early 1990s, Belman (1992) wrote:

There is substantial variation in the effect of unions on firm performance and this variation is caused by differences in the relationship between labor and management. Low trust/high conflict environments, rather than unions, are the source of reduced productivity. Higher levels of trust are associated with reduced strife and, consequently, with both greater productivity and higher product quality. Further, although the level of conflict is affected by the conditions and history of a plant, firm and industry, the parties can reduce the level of conflict and share the gains from improved efficiency and quality. (Pp. 69–70)

Current evidence supports the view that special efforts by labor and management to address issues of competitiveness improve product quality and productivity but their effects may not be large. Rarely is labor relations the basis on which the firm maintains its position in the product (Block et al. 1987). Thus, labor relations is a contributor to

firm competitiveness, but it is not reasonable to expect labor relations to be the leading determinant of corporate performance.

Collective Bargaining and Employment

Standard static neoclassical economic theory predicts that collective bargaining is associated with lower levels of employment, although more developed theories suggest different possibilities. In the standard theory, collective bargaining imposes labor costs on employers above what they would otherwise incur. Assuming competitive product and labor markets and operation on its production frontier, a firm will respond to above-market labor costs associated with collective bargaining by substituting capital for labor, thereby reducing employment. If the firm is unable to substitute capital for labor, it would operate below the level of maximum efficiency, with lower employment than otherwise due to forgone revenues.

Contract curve or efficient contract theory suggests a somewhat different result, as the union does not simply set a monopoly wage. Rather, the union bargains with the firm for a wage that is between the competitive and monopoly wage and a level of employment that is above the monopoly and potentially above the competitive employment level. In such instances, collective bargaining might be associated with higher rather than lower employment.

The negative employment effects contemplated by the standard static model may also not be found if collective bargaining improves productivity. In this case, the effects of the escalated wages are substantially and possibly fully offset by the productivity improvements associated with collective bargaining. As organized firms' unit labor costs are no higher than that of non-union firms, employment will not decline. If the productivity gains from organization are of sufficient magnitude, organized firms may have lower unit labor costs and higher employment than their non-union counterparts. This form of productivity gain is distinct from that which results when firms respond to escalated union wages by substituting capital for labor. While increasing the capital stock will boost labor productivity, it will, other things equal, be associated with a decline in employment. If union labor is itself more productive independent of the complementary capital stock,

the increase in productivity occurs without any increase in capital stock or decline in employment.

The interpretation of any negative employment findings is complicated by a U.S. legal system that allows firms to escape collective bargaining by investing away from the union. Under the U.S. system, a firm may decide to eschew the difficult and expensive strategy of directly eliminating collective bargaining in a plant that is already organized. An alternative strategy is to accept collective bargaining where it exists but strongly resist organization in new plants and focus new investment in new, non-union plants. Employment declines in the union sector as the capital stock that complements the unionized employees becomes depreciated and obsolete. Thus, a negative relationship between unionization and employment growth might then be the result of capital-stock-obsolescence-driven employment attrition in unionized plants and union avoidance rather than direct adjustments to escalated wages or other economic responses to collective bargaining.

A limitation of all of these models is that they make predictions about the level of employment but say little about how collective bargaining affects the rate of growth of employment. Some authors, such as Leonard (1992), suggest that the reduced rates of profit predicted by the standard neoclassical model will cause organized firms to have a lower rate of employment growth, but these arguments are intuitive and not derived from a formal model.

As noted by Kuhn (1998), research on the effect of unions on employment in the United States is sparse.¹⁵ Leonard (1992) investigates this issue with a sample of 1,798 California manufacturing plants over the period between 1974 and 1980. In a model that included controls for initial employment, corporate structure, percentage of nonclerical white-collar workers in the plant labor force, and industry and regional indicators, employment in unionized plants grew 9 percent more slowly than employment in non-union plants. When the sample was separated by the union status of the plant, average annual employment growth rates were 4 percent lower in unionized plants. When information on the vintage of plants was incorporated into a subsample for which such information was available, there was no statistically significant difference in the growth rates of union and non-union plants. The latter result suggests that the slower growth of employment

in organized plants may be due to unions' inability to organize newer facilities rather than any effect on employment growth rates per se.

As part of their study of Compustat firms, Bronars, Deere, and Tracy (1994) found that the employment growth was significantly slower among organized firms than among non-union firms. Employment in non-union manufacturing grew between 0.5 and 1.0 percentage points faster than among organized firms, and between 0.6 and 1.1 percentage points faster among firms outside manufacturing.

Employment effects may also reflect union preferences. In a study of bargaining behavior of locals of the International Typographical Union in 13 small towns, MaCurdy and Pencavel (1986) found that locals did not maximize rents at the expense of employment in negotiations with newspapers. Rather, consistent with the efficient contracts model, they accepted lower wages to minimize employment loss. In contrast, in a study of employment in two-digit industry manufacturing industries in 1972 and 83 construction projects in 1973–1974, Wessels (1991) found a consistently negative relationship between unionization and employment. Although significance varied by specification, the results suggested that the relationship between collective bargaining and employment was better described by a standard neoclassical model. The difference in the results between the MaCurdy and Pencavel and Wessels studies may reflect differences between the industries under study, as well as the varied goals and concerns of labor organizations. The lower employment levels found on organized construction projects is also consistent with the substantially greater productivity of unionized workers found by Allen (1984, 1988a).

Dunne and MacPherson (1994) find that there was little correlation between unionization rates by industry and plant closing between 1977 and 1982. However, industries with higher rates of organization had a higher rate of employment loss due to contractions of plants and somewhat smaller job gains associated with plant expansions. Consistent with the standard neoclassical theory, Linneman, Wachter, and Carter (1990) find that the decline in employment in unionized industries is greatest in those industries with the largest union/non-union wage differentials.

SUMMARY AND CONCLUSIONS

Although standard economic theory generates straightforward predictions regarding the effect of unions and collective bargaining on organizational performance, other more complex theoretical formulations suggest that the effects of unions may be ambiguous and difficult to predict *a priori*. The empirical research supports the latter position, and suggests that unions and collective bargaining often have a positive rather than negative effect on productivity. As unions generally increase costs of production, these results suggest that management is generally able to adjust its production processes and employment levels to unionization. Unions are also associated with lower profitability than their non-union counterparts. Whether this negative effect on profitability has a long-term negative impact on firm viability is determined by whether this union appropriation of profits is from dividends or from internally financed investment and research and development. Effects of unions and collective bargaining on other measures of organizational performance, such as product quality and training, tend to be negligible (or positive) but small, suggesting that collective bargaining does not alter these outcomes relative to what they would otherwise have been in the absence of unions. There is evidence that cooperative and nontraditional collective bargaining structures have a positive impact on workplace outcomes, such as productivity and quality, but have little effect on overall organizational performance. Finally, there is some evidence of a negative employment effect associated with collective bargaining and unionization, although it is difficult to determine whether such effects are the result of union workplace practices or employer opposition to unionism.

Overall, the effects of unions and collective bargaining are as varied as might be expected in an economy with decentralized bargaining structures and organizations with differing production functions, often operating at less than maximum efficiency and participating in markets with varying degrees of competitiveness. Straightforward predictions about the effects of unions on firm performance are likely to be an extreme oversimplification.

Notes

1. Although it is possible for non-union employers to create voluntary employee voice structures without union representation, in order to remain lawful, such structures may not incorporate bilateral communications over terms and conditions of employment. In addition, because these structures are controlled by the employer, and because the employees lack protection, employees may be less likely to share knowledge for fear it may be used to their disadvantage.
2. There has been no new literature on the effect of unions on productivity growth since Belman's review, and we omit this issue from our review.
3. This interpretation is reinforced by the Boal and Pencavel finding that unions raised wages by a meager 5 percent in this period. It is unlikely that an organization that had the ability to reduce operating days by one-quarter would settle for such a small wage advantage that the members' income was lower than their non-union counterparts.
4. Discussion of issues involved in the use of firm data is put off to the section on the effect of unions on firm profits.
5. Results range from negative and significant for 1975–1978 data with a Cobb-Douglas with industry and additional controls, to positive and significant for 1979–1982 data with a Cobb-Douglas with industry and additional controls, to negative and significant for the same year and specification when estimated with a frontier approach.
6. Hirsch (1991b) reports that labor costs, an essential element in the calculation of value added, are only available for one-quarter of the firms in the sample. For the balance of the sample, labor costs are constructed by assigning industry average labor costs to firms and assigning a 25 percent premium in labor costs to organized firms. This will create the observed negative correlation between unionization and value added as well as a strong correlation between industry and value added, and suggests that the estimates of firm level union productivity effects may be the result of construction rather than an underlying relationship. These problems are unfortunate, as the conventional measure of productivity—output per unit of labor—could have been constructed from Compustat data.
7. Delery et al.'s (2000) research is hampered by the low response rate to his survey and the even lower response to questions on turnover and quit rates.
8. Hirsch (1991b) reports that the means for his sample are similar to the means for the Compustat for the period under study. A more complete approach would have been to test the means and variances to ensure that data came from similar distributions and, because of the importance of industry to the study, to test means and variances by industry.
9. The omission of controls for foreign operations is the consequence of applying specifications developed for census industry/establishment data, which is limited to domestic operations, to data on firms which includes foreign operations.

10. Using a cross-section of New York firms, Hirsch and Link (1987) find that unionization is associated with firm managers perceiving their firms as being less innovative than their competitors.
11. Hirsch's approach to obtaining firm-level unionization data differs from that of Becker and Olson (1992), who used pension data to determine firm unionization, and of Bronars, Deere, and Tracy (1994), who used the collective bargaining files at the Bureau of Labor Statistics to determine the extent of organization. The survey was sent to 1,904 firms, and useable replies were obtained from 475 firms. This was supplemented with data from an additional 157 firms, which reported in a 1972 survey by the Conference Board. The final sample size was 632 firms.
12. The effect of controls for industry is found in Hirsch (1990). Similar results appear to characterize Table 4.4 of Hirsch (1991b) but, due to a misprint, this is not certain.
13. The measure of π is the gross return on capital (income plus depreciation plus interest income less inventory and imputed income adjustments) per unit of capital. Firm profitability is more typically constructed as net income per unit of capital, or as net operating income per unit of sales, and it is uncertain whether the results for π as constructed by Hirsch would obtain with the more conventional measures.
14. Although current studies treat unionization as a strictly exogenous variable, it may be simultaneous with profitability. One explanation of this is that unions seek to organize more profitable firms, resulting in a positive causal link between profitability and organization. A second possible explanation suggests that under U.S. labor law, large firms resist unionization by replacing union facilities with non-union facilities and resisting organization of non-union plants. Resisting unions is costly and is likely pursued more effectively by profitable firms and industries. This suggests a negative causal relationship from profitability to unionization. Either causal link would result in bias in estimates of the unionization/profitability relationship, which did not allow for simultaneity, but the direction of the bias is uncertain.
15. As in the balance of this review, we do not include articles that center on other countries or in which discussion and analysis of the United States is incidental. This reflects the focus of this review, and with regard to empirical work, authors view that cross-country measures of differences in employment relation systems are difficult to construct and their results even more difficult to interpret. Two articles that attempt to sort out the effects of international institutions on employment growth are Addison, Teixeira, and Grosso (2000) and Buchele and Christiansen (1999).

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