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IN

UNION AND OPEN SHOP CONSTRUCTION

by

Clinton Currier Bourdon

Submitted to the Department of Urban Studies and Planning
on December 15, 1982 in Partial Fulfillment of the
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ABSTRACT

Craft unions in the construction industry have long enjoyed relatively high hourly wages and benefits and have played major roles in the training, hiring, and assignment of construction labor. But in the 1970s they became increasingly threatened by the widespread growth of nonunion construction firms and labor. This spread of nonunion firms in the industry permits a detailed comparison of compensation and work practices in the union and open shop sectors of construction. This comparison allows a unique analysis of the union impact on both compensation and construction labor market institutions.

A single-equation econometric estimation of the union/nonunion wage differential in construction using a micro-data base on workers' wages, characteristics, and union status provided evidence of a union wage differential in construction exceeding fifty percent. But further analysis showed that this estimate may be biased upward by the heteroegenity of skills and occupations in construction as well as by the positive correlation of wages and union status. Other observations of union/nonunion wage differential, based on sample surveys designed to control for skill level, occupation, and type of construction, revealed much lower union wage differentials which varied considerably by trades and geographic area.

Labor market institutions in construction, such as apprenticeship, hiring halls, and jurisdictions, are often seen as largely restrictive union practices, or labor market distortions, which serve to maintain high union wages. Interviews with a sample of union and open shop contractors showed, however, that (1) similar institutions existed in both sectors of the industry and thus were not a function of union status alone but an outgrowth of market structure, firm size, and technology and (2) these institutions could enhance the efficiency of construction labor markets by facilitating investment in training, job referrals, and the retention of a skilled but mobile labor force.

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1. INTRODUCTION AND SUMMARY

1.1 The Study of Unions

The industrial relations and labor economics literature of the nineteen-fifties is rich in descriptive studies of union behavior in particular sectors of the economy. Economists such as Segal, Chamberlain, Slichter, Dunlop, and Levinson wrote detailed studies of union impact on all aspects of the terms and conditions of employment in industries as various as trucking, construction, and paper. Lewis' work in the late nineteen-fifties was, however, the first economic study of unions which was rigorously analytical and largely quantitative in approach. At the time, Lewis' pioneering study of the union impact on wages alone was a useful complement to the more "institutionalist" approach which included a range of other issues in its analysis. Among these other issues were work rules and featherbedding; labor and product market structure; jurisdictional definitions; technological change; and management interests and ideology.

Ever since the publication of Lewis' book, however, economic analysis of union impact has focused almost entirely on the union/non-union wage differential issue. The development of micro data bases unavailable to Lewis, first on an industry then on an individual level, facilitated the use of regression analysis to control for other than the "pure" union impact on wages. Currently, single-equation regressions which estimate the common proportional impact of

unionism on wages by industry group, while controlling for personal characteristics of workers (as a proxy for productivity), are the mainstay of the dwindling literature on union impact and behavior.

This near degeneration of the literature into simple regression-running cannot be ascribed solely to the quantitative perversity of modern economics. Occasional attempts to include various institutional or structural variables in union wage equations, such as the industry concentration ratio, have not been very successful. Nonetheless, the possible impacts of unions on non-wage aspects of the employment relation, either deleterious or beneficial, have continued to remain largely unstudied or analyzed. In contemporary economic analysis unions are now simple, homogeneous organizations ('unionism is unionism' as Reder put it in a critique of Lewis) with a single argument in their utility function: to raise wages above a competitive norm. If successful, and labor supply is excessive due to the higher wages, then unions may only become interested in non-wage institutions in order to restrict worker entry and ration employment.

Despite what Ashenfelter calls this neoclassical "consensus" that has been reached both on how to approach the study of unions and on their wage impact there are odd strands in the literature which challenge the common view. Three most important of these are the following:

(1) Endogenous Unions: the standard approach to the analysis of union impact is to assume unions are an exogenous,

independent force which acting alone raise wages. The common expression of this theory is a single equation regression where wages are a function of both human capital variables (X_{ij}) and union power:

$$W_i = b_o + \sum_j b_j X_{ij} + b_1 U_i + \varepsilon_i$$

so that unionism is simply a dummy variable (U_i) affecting the wages of a particular worker i. Ashenfelter and Johnson, drawing on some of the institutional literature of the 1950's, show that since unions provide non-wage services to workers (e.g., grievance procedures) they may be demanded by higher wage or income workers. (In other words, union services have a high wage or income elasticity.) If this is the case, the single-equation estimates of union impact will be biased since, while measuring the impact of unionism on wages, they will be also capturing some of the influence of wages on unionism. In a two- and three-stage least squares estimation of simultaneous equations relating wages to unionism and vice versa, Ashenfelter and Johnson found the union coefficient in the wage equation, though positive and substantial, was insignificant. They concluded that the simultaneous relationship of unionism and wages had been underemphasized. Yet, their findings have not been elaborated on - partly due to the difficulty of specifying the simultaneous equations.

(2) Labor-management Cooperation: The contemporary economic model of unionism stresses the adversary role unions play in wrestling higher wages from profits (in concentrated industries) or from consumers (in competitive industries). What this model overlooks is the beneficial role unions may play in the management and organization of workers in

some companies and industries. On the basis of at least some writing and field research, one could hypothesize that unions provide services not only to workers but to corporate management. Indeed, if as Dunlop claims, "the net effect of collective bargaining is to increase productivity through a higher quality of the labor force" unions may aid consumers as well. Apparently, economists may have overemphasized the adversary role of unions, focusing solely on their presumable rational strategies to raise wages and ignoring the contribution they make to personnel management and productivity. Unions may do this by organizing and helping administrators design and administer personnel procedures, job training, health and safety programs, etc. Of course, continuing labor strife in various industries, concern over "management rights," and continuing employer opposition to perceived extensions of union power through legislation are clear evidence that unions, whatever their possible productivity contributions, are not welcomed - never mind sought out - by management. Nonetheless, there is scattered evidence in the idustrial relations literature that labor-management relations can be harmonious and mutually beneficial. (There is even a radical literature that argues that union leadership actually serve management interests against the rank and file.) Perhaps a succinct quote from a British worker (from industrial relations field research on productivity bargaining) can point towards a slight expansion of the purely adversary model of unions:

> "On the job we work as a team. When it comes to money we're on different sides. It's as simple as that."

(3) Unions and Productivity: Freeman's recent work on the impact of unionization on the quit rate and on voiced discontent is the only new quantitative work on union impact which is not entirely wage oriented. Freeman finds that unions lower the quit rate while raising voiced dissatisfaction. If skills and training are firm-specific, then a lower quit rate should lower training needs and total labor costs to firms: thus, unions raise efficiency. Freeman hypothesizes that the way unions lower quit rates is by acting as a collective voice for workers. This results in a fuller expression of worker preferences and the achievement of some collective benefits, particularly those with high fixed costs, possibly unobtainable in a marginal world of competitive labor markets.

The addition of these strands of the literature to the standard neoclassical model of union complicates but does not necessarily contradict the usual economic approach to unions. No one would argue that unions do not seek to improve the terms and conditions of employment, of which wages are clearly an important part; only that this is only part of what unions do. Attention to only wage effects, or even only to adversary bargaining, misses other, equally important elements of union behavior. These other elements are crucial in any comprehensive understanding of the net costs and benefits of unions in labor market. In short, contemporary neoclassical economics portrays unions simply as a labor market distortion in contrast to a hypothetical competitive labor market. The reality of union behavior and impact is more complex because in actuality the

characteristics of both labor markets and the employment relations often diverge from a competitive ideal.

1.2 Craft Unions in Construction

The building trades unions in the construction industry are an excellent candidate for a less narrow (or neoclassical) and more "institutional" study of unions. Their high hourly wages supposedly represent the fruits of tremendous union market power. Their power over hiring and training institutions which supposedly control labor market entry in construction, while never empirically demonstrated, is legendary. In addition, they appear to represent one of the vestiges of classic craft unionism in the economy, with the connotations that nomenclature carries for worker interest in and control over occupational definition, work rules, and technology.

To begin to describe the impact the building trades have on the labor market and labor-management relations in construction, two types of empirical research were undertaken. The first of these was the creation of a wage questionnaire to be mailed to a random sample of union and non-union construction contractors in two SMSA's. This questionnaire was designed to allow not only the reporting of hourly wage and benefits by occupation and nominal skill level, but also to include data on firm characteristics, in order to permit wages to be related to product and firm attributes in the industry. The second type of research was the design and application of an open-ended interview schedule for a small sample of union and open shop contractors in the same cities. The schedule was developed in order to report and

compare labor-management practices in five areas (occupational definition and work assignment; work rules and technology; skill levels and definition; hiring; and training) for union and nonunion contractors in the same product markets and of equivalent firm size. The purpose of this research approach was two-fold: first, to identify systematically the actual non-wage impact of the unions on the industry across a wide range of issues, without relying on hearsay, polemic, or generalization from particular (and usually extreme) incidents; and second to permit as rigorous a comparison as possible between union and nonunion labor market behavior, so as to control for supposed influences of the unions alone.

It is important to note that the field research focused on the collection and analysis of data on wages and on management descriptions of labor market behavior in either a union or nonunion context. No attempt was made to directly identify union goals (i.e., utility function) or bargaining strategies or to compare management and union points of view. The research was seen as simply an initial step in understanding labor markets in the construction industry and in gathering some empirical information on the unions' role in it. This data, and hypotheses derived from it, were to serve as a basis for subsequent discussion and research on union objectives, policy, and strategy.

The findings of the research can be summarized in the following points:

(1) Construction is a highly differentiated industry, whose activities range in size and complexity from residential rehabilitation

to nuclear power plant construction. In the two metropolitan areas studied, the survey results showed that nonunion firms were strongly represented - even predominant - in residential construction and in small scale commercial building. Union firms were larger, both in average employment and in dollar volume, and were concentrated in larger scale commercial building and heavy and highway construction.

(2) The interviews with contractors revealed that due to the product differentiation within the industry, similar occupational and skill nomenclature (e.g., "journeyman carpenter") can represent a broad range of actual tasks and competence. Although the union sector of the industry is much more formal in its occupational definition, through jurisdictional boundaries, and in its skill and wage structure, these structures are by no means rigid. Informal, idiosyncratic variations in tasks and workers' skills are commonplace, particularly in contexts - such as small-scale work or more rural areas - where the formal structures are awkward and inefficient. In the nonunion sector, however, there are few if any commonly accepted occupational definitions or skill gradings: management is free to arrange and re-arrange tasks into firm-specific occupations in order to fit the type of work in which the firm specializes. In some cases, this flexibility results in the large-scale substitution of semi-skilled labor called "helpers" for skilled workers on routine parts of many craft jobs. In other cases, it results in more broadly, but thinly, trained men as "general building mechanics" to do a myriad of odd jobs for general contractors. Since some nonunion firms specialize in only one type of work, such as cement slab construction or drywall installation,

occupations grow up around these intermediate products, in contrast to union jurisdictions which tend to be more material-oriented. At the same time, many open shop firms, particularly mechanical subcontractors, are virtually identical to union firms in both wage and occupational structure. Also, the organization of firms in the industry, with a common separation into general and specialized subcontractors, help to maintain some consistency in occupational and skill categories.

(3) The complexity of occupational and skill definition poses obvious problems for evaluating union/nonunion wage differentials. If union carpenters are not the same in terms of tasks and skills as nonunion carpenters, in part due to the technological and materials differences between products in the industry, then wage comparison between them will be biased by unobserved skill (productivity) variations. In the standard approach to estimating the pure union wage impact, the wage equation contains several human capital variables as proxies for the productivity determinants of the (unobserved) competitive wage. Yet, in estimates of this type of equation undertaken on the Parnes data file for craftsmen, foremen and kindred workers in construction and in other industries, the usual human capital variables were insignificant in construction. As expected, however, the union wage impact in construction was substantial: ranging from fifty-five to nearly seventy percent for different years and regions. Since the variables which usually control for skill differences were both small in size of coefficients and statistically insignficant at conventional confidence levels, the interpretation of this union/nonunion wage

differential as a pure monopoly rent is suspect. It is undoubtedly some combination of skill differences and union market power.

The wage survey was also designed to give a more detailed picture of union and nonunion wage structure and differences. Gross comparisons of mean wages for union and nonunion "journeymen" (as defined by respondents) in similar types of construction evidenced wage differentials for roughly forty percent - with substantial variations around this for different trades. Nonunion wages were found to be relatively similar between residential and commercial construction, while union rates were virtually identical for most commercial and heavy and highway work. The few special union rates for residential construction were much lower than the commercial rate and were comparable to nonunion rates in those product markets. Tabulation of the data by firm size showed that two-thirds of the large open shop firms paid higher wages than their smaller counterparts and that these wages were only twenty percent or so below the union scale. Other characteristics of the union/nonunion wage structure, such as the contrast between the common hourly rate for union mechanics and the extreme dispersion of open shop rates, were also observed. Hourly benefit levels were also reported and tabulated, despite the difficulty in estimating these for open shop workers due to the informal and varying nature of their firms' policies. Approximately fifty percent of the open shop journeymen in the sample received benefits and the level of these was roughly half the hourly rate of employer contribution to union plans.

There is no simple interpretation of the findings of the wage survey. The combination of major differences in product type, firm size, and wage levels between the union and nonunion sectors suggests that some of the wage differences are explained by worker skill variations rather than by pure union power. For the most part, the type and scale of work undertaken by open shop contractors is different enough from union work that the nonunion wage cannot be identified as the shadow price of union labor. At worst, the exact size of the union wage premium in construction must remain unknown; at best, it might be judged to be roughly ten to twenty percent above the "competitive" (i.e. open shop) alternative, a differential not out of keeping with estimates of union impact in other sectors, although substantially lower than that estimated econometrically.

Non-wage Impacts

(4) Formal training systems are virtually identical in union and nonunion construction. Multi-year apprenticeship programs are the most important source of skilled manpower in the mechanical trades. The similarity in format and content of these programs is due primarily to government certification requirements, which tend to impose a union structure on the industry, but is also a function of the commitment of specialty subcontractors, and their associations, both union and nonunion, to developing a skilled labor force. Open shop resistance to standard apprenticeship programs comes largely from general contractors who desire either more broadly or more narrowly trained workers which do not fit into the usual union classifications.

The main innovation in training in the open shop sector has been the expansion of "task training" methods in large-scale construction. This system trains new hires in an on-the-job context in a number of specialized tasks which are sub-specialties within a trade or occupation. This type of training permits very large nonunion contractors to subdivide labor into smaller skill categories (at lower wages) on long-term, large-scale construction projects.

Interviews with union contractors confirmed the findings of other field research that apprenticeship programs are not a major barrier to entry into the construction labor force. There is enough informal entry in most trades to provide a flexible and responsive labor supply.

(5) Technology, both in terms of machines and materials used, is virtually identical in both union and nonunion sectors. Despite the publicity given to union opposition to prefabricated materials or other labor-saving innovations, little consistent or successful resistance was found. Where unions did oppose particular materials, it was either due to the lack of a union manufacturer or was a very small part of a general assembly.

Union work rules, also infamous for their inefficiency, were found to have little, if any, deleterious impact on costs in large scale construction and to be informally modified or ignored on smaller scale work. There were particular exceptions to this pattern; some trades like the ironworkers and the operating engineers were generally condemned for their featherbedding rules and behavior, but on the whole the formal restrictions were not onerous.

What was reported as most costly and bothersome to union contractors was not the formal structure of union work rules but the informal problems with worker attitudes and union politics. In their own view, management of union firms suffered more from inter- and intra-union disputes and from uncertainty about union enforcement of contract provisions than it did from many other aspect of union-management relations.

(6) Hiring systems were found, with some exceptions, to be equally informal and non-restrictive in both union and nonunion sectors. Usually, men were hired directly by contractors through referrals from their foremen or other employees. Union contractors viewed the hiring hall not as a restriction on their labor supply but as an important institution in transferring men between firms and projects. It permitted them to assemble and rapidly employ a crew when they needed more mechanics than could be hired quickly by informal or formal means. Open shop firms also relied on informal hiring methods, supplemented by newspaper want ads and government employment agencies. But these firms felt constrained in undertaking larger scale projects due to their lack of access to an external skilled labor pool. For this reason, two open shop contractor associations have begun referral systems to meet the needs of their firms and workers.

For union contractors, the main problem with the hiring hall was the lack of skilled or qualified men available through it. Many contractors used the hall only as a last resort, and even then tried to request workers by name, due to low skill levels of workers

coming out of the hall. Apparently, the best workers stay permanently with firms or circulate on the basis of informal referrals. As a consequence, out-of-town contractors who had neither a local pool of contracts or a good relationship with the union business agent were forced to take the worst men from the hall.

(7) The market context in which the survey was done make it difficult to evaluate, even qualitatively, the competitive nature and prospects of the nonunion sector of the construction industry. The apparent rapid growth of the open shop seemed to stem from the boom in construction in the late 1960's. At the time, the union sector was fully occupied in major industrial and commercial building, particularly in center city areas, leaving low-rise, smaller scale commercial activity in the suburbs to nonunion firms. But the deep recession in construction in the early 1970's affected both sectors of the industry. The open shop was by no means prospering disproportionately at the time the survey was undertaken - despite their apparent competitive advantage in the smaller scale building and alteration work which continued through the recession.

In addition to these cyclical impacts on the extent of union organization in the industry, there appeared to be some signs of a secular trend towards increased nonunion activity. In Massachusetts, for example, areas and types of construction which ten or twenty years ago had been union were now entirely nonunion. This was particularly true of the smaller cities outside of Boston metropolitan area and of residential work throughout the SMSA and state. One possible

explanation for this change may be found in construction technology. Many open shop firms seemed to be engaged in a relatively routine and specialized on-site assembly process of prefabricated components. This substitution of materials for skilled labor allowed them to use unskilled or semi-skilled workers at lower wages who were either attached to the firm or hired from the external market. Subcontracting of various specialized building systems, as well as many basic components, also allowed firms to remain small and specialized. In other words, a change in technology had permitted the industrial organization of the industry, organized around a group of small specialized firms, to substitute for larger firms with a more skilled and mobile labor force. However, this type of organization was viable mainly in residential and small-scale commercial work. Larger projects, with unique building attributes and volatile labor demands, were still the domain of the union contractor. Although the turmoil in the industry in the mid-1970's reflects both the impact of the recession and the greater competitiveness of the open shop, there still are major areas of virtual union monopoly in different types of construction. This monopoly is apparently due less to union restrictive power - either institutional, political, or physical - than it is to the unions' ability to organize and maintain a pool of skilled and mobile workmen as a resource for large, complex and uncertain construction projects.

Overall, two general conclusions from the contractor interviews can be made:

(1) Labor-management and labor market institutions in union and open shop construction vary more by product market and firm size than they do by union status. In general, union rules on jurisdictions, skill level, technology and work practices, hiring and training are neither as inefficient nor as inflexible as they have been portrayed. For the most part, these union institutions help make large-scale construction more efficient by organizing and maintaining an external pool of skilled labor for many firms to use. In smaller scale union construction, the rules are often overlooked or loosely interpreted to fit the context. While open shop contractors have the unchallenged advantage of "the right to manage," their practices, again with some significant exceptions, do not differ substantially from union operations on comparable work (if any). The major advantage of the open shop firm is internal flexibility on the assignment and control of work. Their major disadvantage is the lack of access to an external labor pool which enable them to bid on large-scale work.

(2) The apparent growth of the open shop sector has brought a convergence in many types of labor market institutions. Open shop firms, through associations, are creating and adopting hiring referral systems; apprenticeship training; and even common occupational classifications and wage rates. To some extent this convergence is due to government pressure (e.g., approving only "traditional" apprenticeship programs); in other cases, such as referral systems, it is due to the needs of the firms themselves. Important innovations in open

shop work have been the widespread use of helpers as less costly, semi-skilled mechanics and the attempted creation of new occupational classifications which cross traditional jurisdictions (e.g., general building mechanic) for particular types of work. Other major open shop innovations are the activities of some large general contractors in training and using a more specialized, narrowly trained workforce for routine tasks on large-scale industrial construction.

1.3 External Labor Markets and Endogenous Unions

In the neoclassical model of unions, the primary goal of the organization is to increase the economic rent of its members by bargaining for higher wages and benefits (or other pecuniary conditions of work) and then rationing the labor supply in order to protect the disequilibrium position. The costs unions impose are thus seen as a rational outcome of some bargaining strategy which is a trade-off between income and employment goals. One crude measure of union success (or impact) is the resulting union/nonunion wage differential.

The field research on the building trades' unions was not designed to be a direct test of this neoclassical view. Yet the results of the investigation, while not clearly contradicting this model, make it seem simplistic to the point of irrelevance. While higher wages, benefits and better working conditions are clearly goals of the building trades unions, the extent to which they attain these goals, it appears, cannot simply be measured by the union/nonunion wage differential. There are too many other influences on this variable for it to be used an an indicator of union market power. In

other words, in industries like construction where there are considerable variations in product types and workers skills, the nonunion wage cannot be taken to even approximate the shadow price of union labor. For the most part, the nonunion sector of the industry has represented either a small competitive fringe around the union sector or a concentration of firms in a special branch of the industry - like residential construction. Thus, measurement of the magnitude of the true union wage premium and of its impact on costs of construction might better be undertaken by other means. This would include the analysis of the shadow price of particular skill classes of labor under given market conditions, itself a very difficult task, or the empirical study of the unit costs of labor for identical construction projects. Neither of these types of research has been undertaken, either in construction (with one minor exception) or in other industries. Without them, the exact magnitude of the "pure" union wage premium must remain indeterminate.

Economists who erroneously rely on the size of the union/nonunion wage differential as a proxy for the union wage impact go on to hypothesize - if not conclude - that the building trades maintain a wage premium through the operations of restrictive labor market institutions: the hiring hall; apprenticeship programs; etc. The field research did not substantiate this view. These, as well as other non-wage impacts of craft unions, appeared to be less restrictive than flexible and functional. Either the unions do not have the market power to operate these institutions restrictively or the rent they extract through bargaining is not great enough to make labor supply

restrictions necessary. But in stressing the institutional costs and impacts of unionism, on the basis of a rational bargaining model, economists do overlook many real costs unions can impose through political disputes and idiosyncratic and uncertain enforcement of rules. Apparently, management - as opposed to academic - resentment of unions stems less from their contractual gains in wages, benefits and rules than from the potential disruption of hierarchical power in the workplace or jobsite.

The greatest drawback of the neoclassical model, however, is its comparison of the presumed results of union impact with the hypothetical efficiency of a competitive labor market. In a comparative static model, with homogeneous labor and spot wage contracts between workers and employees, any institution such as a union is clearly a distortion. In actuality, however, the nature of labor markets and employment relations do not conform to competitive assumptions. Williamson, following the decription of internal labor markets by Doeringer and Piore, has shown how institutional structures can enhance efficiency in the context of common organizational failures. For Williamson, real labor markets have endemic problems of uncertainty; small numbers bargaining; and information and transactions costs. These markets characteristics, coupled with the "bounded rationality" of the participants, make employment relations based on spot contracts, contingent claims contracts, and the like infeasible and unlikely. The alternative, an internal labor market, is an institutional structuring of the employment relations which permits a flexible, yet robust, wage-effort bargain. Workers accept

hierarchy, direction, and demands for differing degrees of work effort in exchange for implicit contracts of present and future benefits.

In construction, due to the geographical fragmentation of the industry, very few firms are large enough to create and maintain an internal labor market of skilled workers. Rather, the crucial and unique labor problem facing the industry is how to organize a casual labor market for skilled workers external to various firms. In this context, workers and employees alike need common market institutions to standardize and regulate the employment relation. Rigid occupational definitions (craft jurisdictions), skill classifications, and wage levels both reduce uncertainty in training and job characteristics for workers as well as provide general standards and criteria for all firms in the industry. An alternative way of organizing such a labor market, perhaps through consecutive spot contracts negotiated by individual workers, might break down due to the high level of transactions costs involved and the uncertainty introduced by small numbers bargaining under differing market conditions. Other labor market institutions in construction, such as hiring halls, also provide services to both workers and employers alike. Workers, faced with a high probability of unemployment, may find a central labor exchange more efficient than individual job search; while employers, needing to hire and fire large numbers of skilled workers over different intervals, require a source of referral for both hiring and placement. In sum, due to the geographic variability and uncertainty in construction demand, few firms are large enough

to create an internal labor pool of skilled workers with firm-specific skills and occupations. On their own, however, competitive firms might have some difficulty in agreeing on and organizing shared external labor market structure.

Nonetheless, the industrial organization of much, but not all, of the construction industry necessitates some form of external labor market. Skilled workers in the industry, facing both the uncertainties and transactions costs caused by rotating jobs, have an incentive to create and maintain certain market institutions. These are the key elements of the non-wage impacts of the building trades craft unions: jurisdictions; skill classification; hiring halls; etc. All of these institutions structure a labor market in a way valuable to both firms and workers. Indeed, they are often operated by joint management and labor committees; historically, the employers have even cooperated in the unions' initiation and maintenance of such structures. Thus, an interpretation of these institutions which stresses their role as solely serving the unions' distributive interest in controlling and reducing the labor supply is misguided. While such labor monopoly may occur, the field research showed that it is not endemic or perhaps even typical. Rather, the craft labor market institutions can play an efficiency-enhancing role of organizing a casual labor market.

In contrast, during the nineteen-fifties and early sixties, the open shop sector in construction was largely confined to either residential building in many areas of the country or very large-scale industrial and heavy construction in the South. Both of these types

of construction allow a labor market to be organized on a firm specific basis, either through the coordination of subcontracting by many very small firms, as in residential work, or by an internal labor market, made possible by the local stability of demand generated by multi-million dollar, multi-year projects. In the late sixties and to the present, there has been an apparent growth in the open shop sector to the point where it now competes for medium and large-scale commercial work with union firms. To some degree the recent competitive success of the nonunion firms has been due not simply to lower wages but to the adoption of a different wage and occupational structure than union firms. By remaining outside of the craft institutions of the union sector, open shop firms have been able to use more specialized, narrowly trained mechanics in unique, noncraft occupations and to substitute less skilled workers for routine aspects of skilled work. However, the growth of many open shop firms has recently been constrained by the lack of an external labor pool of skilled workers, of predictable skills and wages, which can be obtained for temporary employment on larger projects. This constraint has been met by the attempt to create many common labor market institutions, hiring halls and apprentice training in particular, similar to those found in the union sector. It is not clear that these institutions will be operable or successful, but they do represent a convergence of the type of labor market structures between the union and open shop sectors.

In sum, craft unions are not simply a labor market distortion in an otherwise competitive labor market. In the context of

the particular characteristics of the construction industry, the union plays a much more complex role. By helping to maintain and operate certain market institutions, it serves both the efficiency goals of firms and the efficiency and distribution goals of skilled workers. Whether such labor market structures can be organized without either unions or formal worker participation remains to be seen.

2. ECONOMIC ANALYSIS OF UNION IMPACT

> "...the central problem of (measuring union/nonunion wage differentials) is adjusting the wage data used for the effects of factors other than unionism that are correlated with the wage effect of unionism."
>
> H.G. Lewis

Ever since the major impacts of industrial unionism began to be felt in the late 1940's, economists have struggled with the difficulty of measuring the union/nonunion wage differential. That is, what is the percentage increase in wages, if any, that is attributable solely to unionization? As the quote from Lewis implies, this seemingly simple problem is actually quite complex; perhaps, as later research would show, even intractable. The economic literature since Lewis' summary work encompasses some variety in analytic approach, using different data sources, and different time periods. The result, as usual, is a multitude of differing estimates of union wage impact, with an (almost) general consensus that the impact is statistically significant, positive, and anywhere from negligible to over 30 percent. The qualification on general consensus arises from the belief of some economists that unions have no significant exogenous impact at all on wages. The reputation and work of these economists is substantial enough that the issue of a union wage impact is by no means settled. But, like many "old" issues in social science, they are never settled; interest and research just fade away.

The following discussion of the work on estimating union/nonunion wage differentials is divided into three sections. The first section describes the results of the research using single-equation estimates of union impact. The second section criticizes the theoretical specification of the single-equation approach and presents a simultaneous equation analysis. The third section questions the whole emphasis on the average wage impact of unionism and raises issues of union's impact on the wage structure; on non-wage aspects of work; and on other aspects of union influence.

2.1 Union Wage Impact: Lewis and Critiques

H.G. Lewis' book on union wages capped a decade of economic research on estimating the effect of "unionism" upon relative wages.[1] The book not only summarized most, if not all, of previous research; it also reported on new findings generated by theses directed by Lewis at Chicago. Also, Lewis' summary work apparently influenced the direction of most subsequent research on economic issues of unionism. The major questions asked by Lewis on the first page of the book are the same ones that recur in the economic literature from 1963 on. These questions are:

> By how much has unionism increased the average wage of union labor relative to the average wage of all labor, both union and nonunion? Reduced the average wage of nonunion labor relative to the average wage of all labor?

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[1] H. Gregg Lewis, Unionism and Relative Wages in the U.S. (University of Chicago Press, 1963).

> To what extent has unionism affected, in different proportions, the average wages of different industries?
>
> How variable were the effects of unionism on relative wages from one date to another during the last forty years? How much of this variability can be explained by changes in the rate of inflation of the general price level of general money wage level? By changes in the degree of unionization of the labor force?
>
> How much higher or lower is the relative inequality in average wages among industries than it would be in the absence of relative wage effects of unionism? The amount of relative inequality in the distribution of wages among all workers?

Lewis' answers to these questions can be presented quite briefly. He found that the average relative wage effect of unionism was to raise union wage above nonunion wages by 15 to 20 percent in 1923-29, by more than 25 percent in 1931-33, by 10-20 percent in 1939-41, by 0-5 percent in 1945-49, and by 10-15 percent in 1957-58. At the least, these estimates establish that the average wage impact has varied considerably over time - usually as Lewis notes in Chapter 9, widening in recessions and contracting in expansions. In addition, Lewis found on the basis of a review of numerous studies, that the average union wage impact differed considerably between occupations, industries, and geographic areas. The impact was greatest in manufacturing and least in service industries. Occupations such as barbers, motormen, and building craftsmen fell in between at levels of five to twenty-five percent.

Though Lewis' work is seen as a landmark, substantial criticism of it has and can be made. Reder's review article of the

book summarized, in a slightly confused way, the difficulties in Lewis' treatment.[2] Reder's work previsaged much of the research that was to follow. Reder noted that Lewis compared average wages in two different groups of workers: those who were completely or substantially unionized and those who were not. Obviously, the two groups would be chosen from the same industry so that, as Lewis puts it, "the true relative wage effect index, R_i, measures the effect of unionism on the average relative wage of a group of labor of given relative quality at given relative non-pecuniary terms of employment."[3] Since the labor force data available to Lewis were not sufficiently detailed to permit precise specification of worker quality, he noted that "unionism itself may have effects on relative labor quality and relative wage effects." Reder's critique of Lewis' work focused on these possible biases in estimating the union wage differential. Reder identifies the two main types of bias that may occur: (1) collinearity and/or specification errors and (2) simultaneity. His discussion notes both of these but interweaves their effect. For example, Reder restates Lewis' measurement of union impact as a functional relationship where $W=f(L,Q,U)$ and W is the observed average wage of a labor group; L is the relative quantity hired of that group, Q is a quality index; and U is a measure of the relative extent of union membership. (This last variable, though obviously crucial, was

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[2] Melvin Reder, "Unions and Wages: The Problems of Measurement," Journal of Political Economy, April 1965.

[3] Lewis, op. cit., p. 45.

often difficult to measure in most early studies when union membership data by industry were scarce.) Reder then derives the "true relative wage effect" as

$$\frac{\partial W}{\partial U} = \frac{dW}{dU} - \left(\frac{\partial W}{\partial L}\frac{dL}{dU} + \frac{\partial W}{\partial Q}\frac{dQ}{dU}\right)$$

Thus, the impact of unionism on wages is a function of changes in wages alone corrected by the changes in unionism for the demand for labor (both positive and negative) and by any "quality effect" caused by (or simply correlated with) unionism. Because these latter two impacts are usually unobserved, Lewis could only make ad hoc judgment as to the direction and size of the bias introduced into estimates of $\frac{\partial W}{\partial U}$ when $\frac{dW}{dU}$ is used as its surrogate.

One of these issues of bias, correcting for elements of labor force quality that may be correlated with unionism, became the central issue in most of the subsequent economic analyses of union wage impacts. Multivariate regression analysis, using micro-data sets on worker characteristics, was used to solve one of the problems Reder noted.

Initially, Reder was skeptical that this type of analysis could be done: he notes,

> "To introduce this dimension (labor quality) implies the existence of a factor continuum with a manifold infinity of factors, minutely differing from one another in every relevant aspect. The empirical relevance of such a construction should be established rather than presumed."[4]

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[4] Reder, op. cit., p. 191.

The later results, only partly resolving Reder's uneasiness are described below. Subsequently, the second type of bias which Reder noted is discussed. This bias results from the possible simultaneous determination of union and other impacts on wages. If only high wage groups tend to become unionized or if unions first induce quality and then wage changes in a labor force once organized, then the wage impact of unionism will be wrongly attributed to unions rather than other forces. This type of approach is not common in the literature - only two economists have considered it - yet it seems particularly attractive to labor economists and industrial relation experts. This is discussed in the second section below.

2.2 Single Equation Estimates

The now standard approach to estimating a union/non-union wage differential is exemplified by the recent work of Oaxaca and of Ashenfelter.[5] They develop a model for estimating union wage impact in a single equation, multi-variate form which, first, recognizes and controls for worker characteristics which may bias the wage impact attributed to unionism and, second, treats the observed wage as a function of unobserved union and competitive influences. To control for worker characteristics, the usual human capital variables reflecting age, race, sex, schooling, health and part-time employment are

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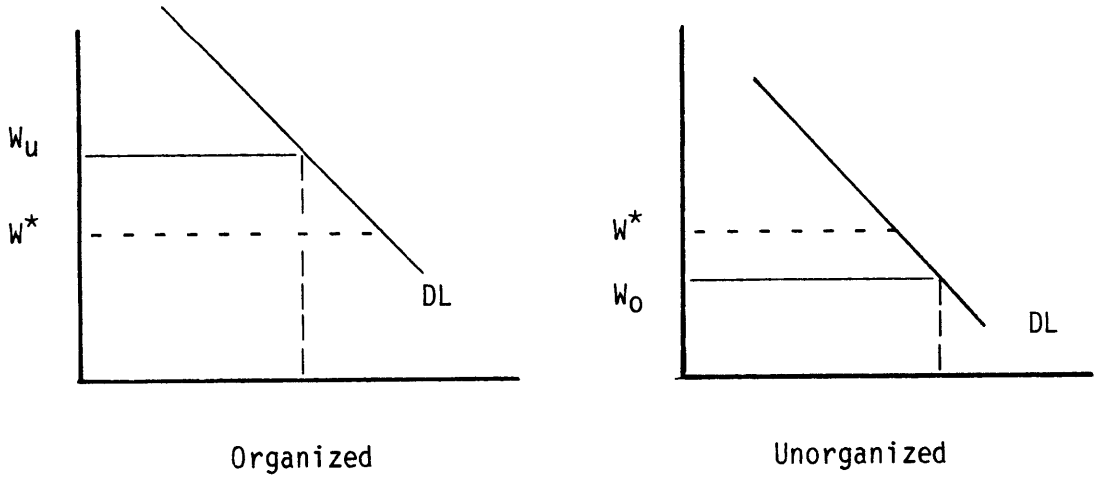
[5] Ronald Oaxaca, "Estimation of Union/Nonunion Wage Differentials Within Occupational/Regional Subgroups" Journal of Human Resources, Fall 1975, and Orley Ashenfelter, "Union Relative Wage Effects: New Evidence..." unpublished mimeo, Princeton University, May 1976.

included. A variable reflecting size of urban area is also included to control for cost of living differences. To reflect the union impact on wages, Oaxaca develops a union dummy variable and a constant term which reflects a combination of the competitive wage and so-called spill-over and threat of unionism. For example, the diagram below shows the common assumption that unions raise wages in a market above the competitive level W*, to W_u. (See Figure 1) In so doing, they cause unemployment which spills over into the organized sector and, drives down the wage to W_0. Thus the differential, $^{WU}/_{Wo}$, does not reflect the union impact over W*, which is unobserved, but on the observable non-union wage W_0. This tends to overstate the "pure" union wage impact. However, some observers of labor markets have hypothesized that unorganized employers might devise ways, largely by raising wages, to forestall union organizing attempts. This so-called "threat effect" of unions on wages would raise W_0 and diminish the observed union wage impact.

Figure 1 - Union Impact on Wages



As a result, the observed union age differential is the outcome of some resolution in a particular labor market, of forces raising and depressing W_o. Oaxaca develops this argument in the following way. Let the relation between the non-union wage and the competitive wage be expressed as:

$$(1) \qquad \ln (W^n) = \ln (W^c) + \ln (\delta^{nc} + 1)$$

where W^n is the non-union wage and W^c is the competitive wage. Then δ^{nc} can be greater or smaller than 1 due to either threat effects or spillover effects, respectively. But $\ln(W^c)$ can be replaced by observable determinants of the competitive wage:

$$(2) \qquad \ln (W^n) = \sum_j B_j X_j + \ln (\delta^{nc} + 1)$$

where X_j is a vector of worker characteristics in occupation j. Then, the observed wage of the i^{th} worker in a cross-section analysis is:

$$(3) \qquad \ln (Wi) = \sum_i B_j X_{ij} + \ln (\delta^{nc} + 1) + \ln (\delta^{un} + 1) U_i + \varepsilon_i$$

So in equation 3, which can be estimated, the level of the competitive wage becomes subsumed in the constant term and the term $\ln (\delta^{un} + 1) U_i$ is a dummy variable for union membership for each worker i.

In addition, when estimating equation (3) Oaxaca controls for occuptation and region as well as worker characteristics. Because of this, δ^{nc} and δ^{un} do not need to be constant across workers but can

vary systematically between occupations and regions. As a result, Oaxaca derives the estimating equation:

$$(4)\quad \ln(w_i) = \sum_k \sum_m [\, \Delta_{km} V_{ikm} V_i^P + \sigma_{km} V_{imk} P_i + \sigma_{km} V_{ikm} G_i + \sigma_{km} V_{ikm} S_i] + \sum_i B_j X_{ij} + \varepsilon_i$$

where K is K^{th} occupation in n^{th} region and V_{ikm} is a multiplicative dummy variable for those effects and the effects of employment in the unionized private sector (Ui^P); the non-union private sector (P_i); government (G_i) or self-employment (S_i). The X_{ij} again control for the worker characteristics mentioned above. The model is estimated for ten occupational categories; four regions; two races and both sexes.

Oaxaca's results show considerable variation in union impact. Differentials for all occupations are usually highest in the South and lowest in the Northeast. Across occupations, unions produce great gains for lower skill groups (laborers receive 26 to 45 percent more when unionized) and lower gains for white-collar workers (clerical workers get a 2 to 20 percent difference and managers receive a negative differential). Over-all, white males show an eleven percent gain; black males twenty-five percent increase, and white females a twenty-two percent increment due to unionization. It is interesting to note that the union differentials for white craftsmen across regions are generally lower than those of white operatives. In the Northeast and North Central regions, for example, craftsmen receive differentials of 8 and 12 percent respectively while operatives get 12 and 20 percent.

Ashenfelter's recent work on the union wage differential uses the 20,000 observations of the Current Population Survey as a micro-data base. He estimates an equation similar to Oaxaca's and gets similar results. Controlling for education (measured by years of schooling): work experience (age minus years of schooling minus six); marital status; and SMSA size, he finds unionism raised wages of all workers by 11 percent in 1967; 14 percent in 1973 and 16 percent in 1975. In detailed analysis of union impact by occupation and industry, the differential varies from negative (but insignificant) in white-collar occupations to positive and highly significant for craftsmen, operatives and laborers in construction, durable and non-durable manufacturing and other major industry categories. The lowest differentials generally occur in non-durable manufacturing, about 12 to 16 percent for different occupations in the three years studies, and the highest occur in construction, varying from 30 to 51 percent. (No regional differences in these differentials is reported due to the specification of the equation.) Ashenfelter does not include any analysis of why the union wage differential varies. He approaches the question as a pure problem of price distortion in allocating resources which has some distributive overtones:

> "...the existence of differential wage rates for similar workers has important implications for the allocative efficiency of labor markets. Artifically expensive labor in some sectors of the economy relative to others may imply artifically expensive goods in some sectors of the economy relative to others and hence too little production and consumption of the former relative to the latter. On the

> other hand, it is important to know whether some classes of workers gain more from unionized labor markets than others. In this sense, belonging to a union is a special privilege and we should wonder whether blacks, women, and other special groups receive a proportionate share of the privileges."

The work of Ashenfelter and Oaxaca exemplifies, in the words of the former, the "broad consensus" that now exists in the profession as to the wage impact of unions. The consensus has developed, Ashenfelter notes, due to the "quality of measurement devices and of the microeconomic data available, (eliminating) some of the ambiguity of measurement present in the earlier studies." Ironically, one major and quite provocative challenge to that consensus was made by Ashenfelter himself in work previous to his analysis of the CPS data. Before considering issues raised in that challenge, one other aspect of the single equation approach deserves attention. That is the role of market structure in the determination of the size of the union wage differential.

2.3 Union Wage Impact and Market Structure

Parallel to the analysis of the impact of personal characteristics on union wage differentials has been work including variables related to the product market structure of unionized firms. Many observers of union wage policy have concluded that the degree of competition in the product market must have some impact on the ability of the union to make wage gains. Early empirical work by Ross and Goldner, Bowen, Levinson, and Segal seemed to confirm that wages rose more rapidly in industrial sectors characterized by relatively strong

union strength (as measured by the proportion of production workers covered by collective agreements), relatively high "degree of monopoly" (as measured by concentration ratios) and relatively high profit rates.[6] Critiques of these studies by Rees and by Lewis emphasized that while these variables (unionization, concentration, high profits) were often correlated in U.S. manufacturing, they were not so in the rest of the economy. Thus, once could not always conclude that the ability of a union to achieve large wage increases is facilitated by a monopolistic product market. Lewis's empirical analysis, in fact, showed that while both the extent of unionism and concentration were significant and positive variables in a wage equation, an interaction term combining these two was negative.

Later work has both confirmed and attacked the position taken by Rees and Lewis. Weiss, in his analysis of static union/non-union wage differentials, confirmed Lewis's finding on wage impacts: both extent of unionism and concentration were positively correlated with annual earnings but an interaction term combining these variables was negative.[7] In addition, Weiss also included personal characteristics of workers as variables in the equation and found that, once these were controlled for, the impact of both extent of unionism and concentration became insignificant. He then concluded that with so

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[6] See especially Harold Levinson, "Unionism, Concentration, and Wage Changes: Towards a Unified Theory," in Determining Forces in Collective Wage Bargaining (Witey, New York, 1968).

[7] Leonard W. Weiss, "Concentration and Labor Earnings," American Economic Review, March 1966.

little independent influence of unionization or concentration on earnings, "The general picture is one of fairly efficiently working labor markets, even where substantial monopoly may exist."

Despite Weiss' findings, Levinson and Segal persisted in theoretical rationalization of the possible impact of market structure on wages.[8] Both stressed that any form of monopoly in the product market - be it through sectoral concentration of spatial characteristics - should result in higher wage gains to unionization. Levinson concluded that "the greater degree of concentration in an industry, the greater will the union's ability to maintain a high degree of organizational strength and consequently the greater will be its rate of increase in wages." Both Segal and Levinson stressed, however, that the key to this hypothesis was the definition of concentration. They suggested that in industries characterized by both a high degree of competition among firms and limited entry due to spatial isolation of markets (e.g. trucking and construction) union wage gains might be greater than in concentrated manufacturing industries. This would come about through a strong union facing down a large number of small companies with either limited financial reserves to withstand a strike or little ability to maintain a strong employers association. Consequently, Segal and Levinson re-emphasized the importance of market structure on union wages, but in such a way as to complicate empirical measures of impact. Either a high degree

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[8] Marin Segal, "Union Wage Impact and Market Structure," Quarterly Journal of Economics, February 1964.

of concentration or low concentration coupled with barriers to entry could make substantial union wage gains possible. Thus, Segal finds that measuring or describing market structure is more complicated than supposed; and suggests five relevant aspects to structure not captured in the simplistic concentration ratios used by Weiss and others.

In sum, recent econometric work has dropped concentration ratios from union wage equations - largely due to the critique by Rees and Lewis and the findings by Weiss - and in so doing has ignored all relations between union impact and market structure. At the least, Levinson and Segal show that this approach is not justified and that some continuing attention to market structure is warranted.

2.4 Wages and Endogenous Unions

Ashenfelter and Johnson, in a brief review of the literature on union wage impacts, note that what all the statistical estimates have in common is a "basic dependence on the accuracy of a model which posits that unionism and labor quality are exogenous determinants of wages, i.e., that there is a unicausal relationship from the level of labor quality and the extent of unionism to the level of the wage." Surprisingly, they find this commonplace assumption, one that they had used and were to use in subsequent research, unjustified. On the basis of critiques by Reder and Lewis and their own "elementary theoretical considerations," they go on to develop a model in which the extent of unionism, labor quality, and wage are jointly determined

endogenous variables. As such, these variables are themselves functions of other exogenous forces which are not included in single equation models of the union wage impact.[9]

In brief, Ashenfelter and Johnson develop a three-equation simultaneous system where wages, unionism, and labor quality are both independent and dependent variables:

$$(1) \qquad \ln W_i = \alpha_0 + \alpha_1 E_i + \alpha_2 U_i + \alpha_3 A_i + \varepsilon_i$$

$$(2) \qquad U_i = \beta_0 + \beta_i \ln W_i + B_2 Z_i + \varepsilon_i$$

$$(3) \qquad E_i = \gamma_0 + R_i \gamma' + \varepsilon_i$$

Each of these equations has, in turn, been developed from assumptions and neoclassical theory about the causes of wage determination, unionization, and labor quality. Without going into great detail about the assumptions and the theory, the following must serve to explicate the specification of the equations:

Equation (2) is, in effect, a reduced form of two structural equations representing the demand and supply for union services. Their review of two or three obscure articles substantiates the obvious fact that workers join unions for reasons other than wage increases (e.g. for non-pecuniary benefits such as grievance procedures and seniority systems). In addition, they posit, following Dunlop's "membership function," a direct influence of wages upon extent of

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[9] Orley Ashenfelter and George Johnson, "Unionism Relative Wages, and Labor Quality in U.S. Manufacturing," International Economic Review, October 1972.

unionism in an industry: "To the typical worker, the benefits of unionism are derived from...the potential relative wage advantage due to union membership." Thus, the typical worker sees the purchase of unionism...in part as an investment good and in part as consumption good." These attributes of unionism, when combined with variables representing "taste parameters" and costs of membership, give a demand function for unionism. In parallel, they develop a supply function for union services whose main argument is the cost of supply of union services to the industry (i.e., costs of organization). These demand and supply functions then contribute one variable each to equation (2). In this equation the extent of unionism is, in theory, positively related to industry wages W, (the usual income effect on consumption of a normal good) and negatively related to costs of providing union services or organizing an industry, Z. (Taste parameters which also might effect the extent of organization across industries are "assumed to be invariant" and dropped from further discussion.) So, equation (2) as written "only suggests that the extent of union membership will tend to be relatively greater in industries with realtively high wages and in which cost of organizing and servicing union members are relatively low."

Equation (3) is the outcome of another laborious effort at derivation. E_i represents labor quality by industry and, while this might be taken as exogenous, it is in fact determined by firms as they simultaneously bargain over wages and set hiring standards. Firms have to trade-off increase in labor quality brought by

higher wages with increases in productive efficiency of workers due to their higher quality. Then, the amount of labor quality in each industry will be a function of the differing contributions skilled labor make to productive efficiency. Thus, E is positively related to R, an index of labor efficiency.

While the specification of any of these three equations might be analyzed further, the real point at issue is how their simultaneity may bias the results if any one equation is estimated alone. In particular, if equation (1) is estimated by OLS, biased and inconsistent estimators will result. In all likelihood, the OLS estimates of α_2, the effect of unionism on wages will be biased upward due to its receiving some of the credit for the relationship specified in equation (2), the impact of wages on unionism. More precisely, if:

$$\operatorname*{plim}_{N\to\infty} (\hat{\alpha}_2 - \alpha_2) = \frac{(1-e^2)\ \Delta}{(1-\alpha_2\ \beta_1)\ \Delta} \left[\beta_i \mathrm{Var}(\varepsilon_i) + \mathrm{Cov}\ (\varepsilon_i, \varepsilon_2)\right]$$

states the conditions for an unbiased consistent estimator, then α_2 will be inconsistent if $\mathrm{Cov}(\varepsilon_i, \varepsilon_2) \neq 0$. In addition, the bias will be positive since α_1 and β_1 are positive (in theory), making $(1 - \alpha_1\ \beta_1) > 0$. Similar analyses of bias can be made for equations (2) and (3) above. It is sufficient here just to emphasize that the hypothetical simultaneity does positively bias estimates of α_2. As a consequence, single equation estimates of the impact of unionism on wages may overstate the "exogenous" impact of unions.

In empirical testing of this model described, Ashenfelter and Johnson estimated equations (1) and (2) with two-stage least

squares to correct for the bias. Surprisingly enough, they then found that α_2, which was highly significant and substantial (.46) in OLS estimates, became statistically insignificant, though positive. In three-stage least squares estimation of all three equations, they find "the regression coefficient of unionism actually negative, although it clearly would not be judged significantly different from zero..." As a result, they conclude that they are "uncertain of the magnitude of the effects of unions on interindustry wage differences..." Clearly, approaching the analysis of union wage impact from a perspective which permits the simultaneous determination of wages, unionism, and labor quality result in much less certainty about the impact of unions. In a later article, Johnson reviews this contribution to the debate on the economic analysis of unions and bewails the fact that it has been largely ignored by other economists.[10]

2.5 Union Wage Impact - A Critique

Since the early 1950's, the economic literature on the impact of unions has developed in a particular way. Work in the fifties and early sixties was a combination of empirical analysis (e.g. Lewis) and institutional description and analysis (e.g. Reder and Segal). The combination of these two approaches give the impression that there was a common intellectual community concerned, in complementary ways, with the same issues. More importantly, the approaches

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[10] George Johnson, "Economic Analysis of Trade Unionism," Papers and Proceedings, American Economic Association, May 1975.

taken by the empiricists and the institutionalists were open and amenable to comments and critiques by those of the "opposite" persuasion. Since the 1950's, these two approaches to the study of unions have diverged. The "institutionalist" literature on unions peaked with books like Levinson's Determining Forces in Collection Wage Bargaining and Slichter's The Impact of Collective Bargaining on Management and then disappeared from view. The empirical trend continued, with greater detail and rigor, but with little real following or interest in the profession or the general public. As Ashenfelter commented, since the very existence of unions is no longer of great public concern, analyses of their static impact have only a small academic interest.

As a result, by the middle 1970's academic analysis of union impact had been narrowed down to the single equation approach described above. The approach and results of that analysis were described as a "consensus" even by those who had, at other times, contradicted the usual findings. The implications of the findings were held to be important only inasmuch as union influences on wages affected prices, thereby distorting allocation of factor inputs and commodity output. In sum, most economists were content to see unions as simply one exogenous variable in a wage equation whose impact on allocation would occur only through its measured effect on the average wage paid to labor. This view, while providing a satisfactory resolution to Lewis' basic question, seriously distorts the role unions actually play in markets and in politics. Unions do have an

impact on allocation, but that impact is not confirmed simply to affecting the price of labor. In the now standard economic analysis of the union wage impact, there is complete omission of the other myriad channels unions may use to affect the "terms and conditions of employment." Before attempting a more complete description of union impact, it might be well to review in brief the limitations of current economic analysis.

First, the "consensus" that Ashenfelter celebrates does not really exist. The work of Lewis, Oaxaca, and Ashenfelter does help in clarifying the impact of unions on wages. However, the posititve and sometimes significant impact they attribute is challenged in Ashenfelter's and Weiss's previous work. Apparently, even elementary assumptions about "endogenous" unions or the relation between unions and worker quality can substantially reduce the union wage coefficient and/or make it statistically insignificant at conventional confidence levels. Since some labor economists and industrial relations experts would concur with this "endogenous" view of unions, the issue of the extent of the union wage impact is by no means settled.

Second, and equally important, all the analysis of unions, either exogenous or endogenous, adopts the view that Reder describes as "unionism is unionism." That is, no attempt is made to differentiate between types of unions or the different sectors of the economy in which they operate. As a result, one of the more intriguing results of the exogenous (or single equation) approach is overlooked. Oaxaca and others show that the impact of unions varies substantially across

regions, industries and occupations. This result however does not lead them to ask why this should be the case, never mind to attempt an explanation of the phenomenon. Indeed, there is even no attention as to why the extent of organization of workers should vary in different sectors of the economy. The older, institutionalist literature which attributed differences in union impact to market structure, union leadership capabilities, member preferences, government help or hindrance and general economic conditions is ignored. As a result, "unionism" in the single equation estimates becomes only, in Samuelson's phrase, a "suitably named dummy variable."

Third, the focus on wage impact of unionism implicitly reduces the activities of unions solely to those that can be measured by wage (and fringe benefits) alone. This focus omits the major role unions play in effecting other aspects of work life. Again, the institutionalists have described some of these, but their descriptive work has not been integrated into quantitative analysis. Even the old institutional analysis was quite limited, however, usually confining itself only to descriptions of grievance procedures, seniority systems, etc.

For example, the Slichter, Healy, and Livernash volume records union influence on twenty-four different aspects of labor-management relations, in addition to collective bargaining over wages and benefits.[11] The nature of this influence and the issues involved are described in detail, with a considerable amount of eclectic

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[11] Sumner H. Slichter, James J. Healy, E. Robert Livernash, The Impact of Collective Bargaining on Management, (The Brookings Institution, 1960).

material included as illustration. Little or no attempt is made, however, o generalize on the basis of the impacts listed. Unions are described in a largely adversary role to management on most of the issues studied. The union position ranges from conservative to "irrational" depending on the specific illustration chosen. No attempt is made to compare union impacts on specific procedures - seniority, for example - with personnel practices in nonunion firms. As a result, the authors implicitly describe how difficult it may be to manage under collective bargaining constraints without exploring similar (or equivalent) difficulties in nonunion environments.

A more normative approach to union non-wage impacts is evidenced in an earlier work by Chamberlain, The Union Challenge to Management Control.[12] Chamberlain's work reflects the concern (pre-Lewis) that the most substantial effects of unions were not on wages but on company operations and production practices. The range of union influence in these areas was seen to be so great as to transgress on "management rights." During the 1940's, considerable time and effort was expended trying to delineate areas of pure management control from areas subject to union influence. Chamberlain's book records and analyzes this debate, one that he describes as central to both the National Industrial Conference after WWI and the National Labor-Management Conference after WWII. His work reports management

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[12] Neil Chamberlain, The Union Challenge to Management Control, (Harper & Brothers, 1948).

fears of loss of necessary power to run the business due to union influence on not only wages but on other aspects of operations: ranging from production scheduling to choice of technology. Chamberlain describes management as seeing union as a threat to their complete authority and freedom to discharge their responsibility to the stockholders to run the company. Unions threatened management's power, recognition, and status in interfered with its self-perceived rational, pragmatic, corporate-oriented decision-making. "The unions' concepts are predominantly in terms of welfare rather than efficiency," one manager commented. In contrast, the unions took a paradoxical stance on "management rights." On the one hand, they refused to acknowledge that <u>any</u> aspect of corporate decision-making was necessarily removed from collective bargaining or union influence. On the other hand, they were at the same time willing to accept management's power and responsibility for operating a firm. They resolved this apparent contradiction by being pragmatic. One union leader said: "Our basic motivation is security. As long as management decisons don't adversely affect the security of the workers or their union, we're glad to let the management run the business..." Nonetheless, Chamberlain documents continual conflict and dissension over what the proper sphere of influence of both management and labor should be. He concludes that it is impossible to delineate separate sets of management rights or union responsibilities and he expects conflict to continue until both sides can "reach an understanding which permits them to achieve their goals jointly." The concluding chapters of

the book describe a "functional integration" theory of management where both parties work cooperatively for common objectives.[13]

This paramount concern with the nonwage influence of unions apparently declined in the 1950's. The Slichter, Healy, Livernash book represents the only substantial and widely known work in this area between 1946 and the present. As a result, the economics literature became dominated by the concerns of the "Lewis school" which were almost completely noninstitutional in nature. Only recently have new trends in research appeared which redress the balance. An example of this is the research by Kochan on collective bargaining structures in the public sector.[14] Kochan shows that the local unions he studied had over seventy different bargaining goals. Only one of these was wages; others ranged from grievances to bulletin boards. Attempts to weigh the goals, in the belief that wages and some others must be more important, failed: all were deemed of roughly equivalent importance in bargaining. So it is clear that unions continue to value other goals than wages and affect other aspects of work. In bargaining, they undoubtedly make trade-offs between these goals. Consequently, a low wage impact of unionism does not necessarily mean a small impact of unionism on workers, employers, or labor costs.

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[13] A recent work by a student of Chamberlain's, R. Herding, argues that unions have been too "integrated" in firm operations to the point of co-option. See Richard Herding, Job Control and Union Structure (Rotterdam University Press, 1972).

[14] Thomas N. Kochan and Hoyt Wheeler, "Municipal Collective Bargaining: A Model and Analysis of Bargaining Outcomes," Industrial and Labor Relations Review, October 1975.

More significantly, Freeman's recent research, "Non-Wage Effects of Trade Unions on the Labor Market: An Exit-Voice Analysis," challenges much of the economic literature on unions and signals a new direction for the theory of union behavior.[15] Not only does Freeman concentrate on non-wage impacts of unions, he also rationalizes the efficiency contributions they may make in labor markets. Unlike most economists, who describe unions simply as acting to distort labor markets through raising wages above equilibrium, Freeman shows that they may plan an important and necessary role as the "collective voice" of workers in firms. He writes "the major advantages of unionization are that it provides: a direct channel of communication between workers and management; an alternative mode of expressing discontent than quitting, with consequent reductions in turnover costs and increases in specific training and work conditions; and social relations of production which can mitigate the problems associated with authority relations in firms." As a result of these advantages, unions provide not only monopoly wage gain to workers but, through reduction of quits due to better communication about work conditions, gains to employers as well. "The reduction in quits will reduce labor turnover and training costs and increase firm-specific investments in human capital and possibly have efficiency gains." The key breakthrough in Freeman's work does not lie in the particular approach to nonwage impacts or in their empirical measure-

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[15] Richard Freeman, "Non-wage Effects of Trade Unions on the Labor Market," (mimeo, Harvard University, Department of Economics, 1976).

ment through the impact on the quit rate. Rather, it comes from the fact that for nearly the first time in recent economic analysis unions are seen as beneficial to both workers and managers and to labor markets as a whole. That this view is not totally inconceivable is born out by at least one of the few surveys on union-management relations. In the 1950's, Chalmers and Derber studied a sample of firms in "Illini City" and found that in 31 of the 41 establishments surveyed, management referred favorably to the union.[16] While there are many ways to interpret this finding, it is one fact which must temper the adversary relationship emphasized by economists and institutionalists alike.

Finally, there is very little in the recent economics literature about either the dynamics of union wage behavior or the impact of unions on a wage structure, rather than just on an average wage. The extent of dynamics is limited to the observation that union wage changes lag periods of tight labor market. Thus, unions cannot be held accountable, through cost push, for starting periods of inflationary wage increases. While this observation is now commonplace, the explanation of union behavior that underlies it has never been developed. In addition, this approach to union wage changes is a purely aggregate one. It focuses either on macroeconomic averages or on sectoral averages. Very little work has been done on

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[16] W. Ellison Chalmers, Milton Derber, et al., Labor-Management Relations in Illini City, (University of Illinois Press, 1953).

union wage policy at an industry level. This is unfortunate since occasionally unions have adopted wage policies which were disastrous to their ability to control the industry. (As a result, the unions rapidly lost ground to non-union competition - in coal mining in the 1920's, in the rubber industry in the 1960's and in local trucking in the 1970's.) These policies are hard to explain under the usual assumptions about unions acting rationally to maximize the wage bill or the wage level for all employed members. In addition, industrial relation specialists have recognized that unions often have wage goals that encompass a range of wages and occupations within a plant. Industrial unions apparently act to narrow skill differentials, raising the pay of the lowest labor grade and often holding back increases for the most skilled. (This policy continually causes difficulties with skilled craftsmen in the UAW contracts.) With one notable exception, the work of Sherwin Rosen, this wage structure impact of unionism has been ignored by economists.[17]

The proper study of unions and union impact should discuss all the issues raised above. Economic research should not only describe the wage imnpact but place it in the context of other goals and effects of unions. Only in this way can the relative importance of the wage impact be seen. Further, a study should attempt to explain, on a microeconomic basis, why the results of unions were of the observed magnitude. In doing this, it must analyze the role of market structure,

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[17] Sherwin Rosen, "Unionism and the Occupational Wage Structure in the U.S.," International Economic Review, June 1970.

employers' reactions, rank and file preferences and government policy in the formation and accomplishment of union objectives. The reuslt of this approach will show that unions affect labor allocation, but in ways far removed from the mere raising of the hourly wage.

The legacy of Lewis to the economics profession has been beneficial inasmuch as it has encouraged the rigorous estimation of union/nonunion wage differences. The same legacy has been harmful to the degree it, coupled with the now common quantitative preoccupations of the profession, has encouraged researchers to ignore all non-wage impacts. The focus on wage differentials alone has warped economists' analysis of unions to the point that these institutions are seen simply as mysterious exogenous forces in wage equations that serve only to distort the price of labor. Most, if not all, "institutionalist" analysis is then derived by deduction from this wage distortion: union labor market structures serve only to maintain the wage premium by restricting the supply of labor. This view of "union as distortions" can be challenged. Ashenfelter and Johnson's work on endogenous unions provides one basis; Freeman's approach permits a different attack. Attention to the actual operation and function of unions in real labor markets can provide yet a third source of challenge. In the following, the role of craft unions in the construction industry will serve as a case study of union impact which will illuminate not only unions' function in that industry but also illustrate the range and nature of union impacts.

3. UNION WAGE AND OCCUPATION DIFFERENTIALS

The construction industry is an ideal focus for research which seeks a more complete description of the impact of unions on labor markets. Craft unions in the industry are often cited, usually pejoratively, as having a broad effect on all aspects of construction operations. The building trades also represent unions which are presumed to have substantial market power: evidenced by high hourly wages and many "restrictive" work practices. So construction is manifestly an industry where both the size and range of union impact is so great as to permit clear delineations of union/nonunion differences.

Unfortunately, academic economists know very little about the construction industry. In the past seventy years, there have been only three major works which attempt a comprehensive treatment of labor relations in the industry. Two of these, one by Haber[1] and the other by Haber and Levinson[2], are now largely out-dated. The third, by Mills[3], is much more current. While it contains the most rigorous analysis available on several important topics in the industry (wage determination; apprenticeship training; and minority hiring) it

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[1] William Haber, Industrial Relations in the Building Industry, 2nd edition, New York: Arno Press, 1971.

[2] William Haber and Harold Levinson, Labor Relations and Productivity in the Building Trades, Ann Arbor: University of Michigan Press, 1956.

[3] D. Quinn Mills, Industrial Relations and Manpower in Construction, Cambridge: MIT Press, 1972.

uses no direct field research and ignores the open shop sector of the industry completely. In contrast, a recent study by Northrup and Foster, entitled Open Shop Construction[4], attempts a broad coverage of labor relations issues in the industry on the basis of field research. This work is limited, however, by the authors' ignorance of and lack of attention to union construction practices. Outside of these studies, there are a few monographs on particular aspects of construction labor markets. Notable among these, again for being based on field research, are Marshall, et. al.'s Training and Entry in Union Construction[5] and Foster's Manpower in Homebuilding[6].

The result of this relative dearth of academic work on labor in construction is not only a lack of knowledge about open shop labor practices but considerable ignorance about union behavior as well. Although the building trades are usually described as "craft unions" this appellation really has very little content, except as a contrast to "industrial" unions. Very few, in fact, of the building trades are pure craft unions, in the sense of unions being organized around one particular type of skill or occupation. The plasterers, laborers, bricklayers and perhaps the ironworkers qualify as "pure" craft unions; while the carpenters, operating engineers, and plumbers

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[4] Herbert Northrup and Howard Foster, Open Shop Construction, Philadelphia: University of Pennsylvania Press, 1975.

[5] Ray Marshall, et. al., Training and Entry into Union Construction, U.S. Department of Labor Manpower Administration Monograph 39, U.S. Government Printing Office, 1975.

[6] Howard Foster, Manpower in Homebuilding: A Preliminary Analysis, Philadelphia: University of Pennsylvania Press, 1974.

are all amalgamated unions comprising at least two or three fairly distinct occupations. Even unions like the painters are not purely craft oriented since, west of the Mississippi, the painters include the floor layers within their jurisdiction.

Although the definition of what is a craft union is of more than semantic interest, as will be discussed below, what is of greater import here is the point that little in fact is known about how craft unions and union labor markets in construction actually operate. Clearly, before any union/nonunion comparison can be made, the actual, rather than the supposed, character of the union sector must be established. Although this point may appear - and is - obvious, it has been ignored by such recent students of the industry as Northrup and Foster.

To organize a union/nonunion comparision then in construction, there must be a concentration on empirical research on three basic issues: wage levels; nonwage, labor market institutions; and the general "organization of work." It is the presupposition of this study that craft unions affect, in coordination with or opposition to the management groups, all three of these areas of construction industry operations. Craft unions define, through jurisdictions and skill categories like journeyman and apprentice, an occupational structure which may necessitate certain wage levels. Craft unions may also play a major role in hiring, training, onsite labor management, and technological innovation. Craft unions also may help sustain a

"craft" organization of work which is different from hierarchical, bureaucratic or industrial forms of labor management.

In the chapters which follow, the basic issues in each of these areas will be described. Existing literature will be noted in the few cases where it is relevant. As a prelude to that discussion, one brief comment on the construction industry is necessary. Construction is, as Quinn Mills once commented, "a hundred different industries." To the uninitiated, the complexity of the industry is neither significant nor comprehensible. Yet, the varieties of product types, firm sizes and characteristics and regional peculiarities play a major role in shaping both the labor force and the labor market institutions in the industry. The chief failing of most studies or reports on the industry, whether academic or journalistic, is over-generalization. Examples of gross generalization abound: ranging from the supposed dominance of the union hiring hall in referring workers to the supposed reliance on apprenticeship to both train and limit the labor supply. In fact, both the hiring hall and apprenticeship programs play vastly different roles for particular craft unions, even in one geographic area. The ignorance of the complexity of the industry most often manifests itself in wage comparisons. Carpenters' union and nonunion hourly rates, for example, are often compared without regard to either the occupational and skill levels which occur within the category "carpenter" or without attention to the different product markets or types of construction in which they are involved. The result is a very biased - and very

naive - view of the impact of unions on wages and, in general, on the industry itself.

Union/Nonunion Wage Differentials in Construction

Estimating a wage differential between workers which is solely the result of union influence is a notoriously difficult procedure. Academic studies from Lewis in the 1950's to Oaxaca in 1975 have struggled with the problem of isolating union effects on wages while controlling for industry, firm, and worker characteristics. Most research on this topic may, in fact, present a biased estimate of the impact of unions on wages by not controlling for product market characteristics, plant size, workers' skills and experience, etc. In the construction industry, these problems of unbiased estimation are doubly difficult. This is partly due to the industry's incorporation of a wide variety of productive activities, ranging from residential rehabilitation to nuclear power plant construction. It is also due to the great variance in workers' characteristics, particularly in terms of mechanical skills, experience, and supervisory capability. This variance is disguised by the fact that workers with vastly different capabilities working in quite separate product markets may all have the same occupational title: carpenter or pipefitter.

The research to date on the union/nonunion wage differential in construction has not dealt adequately with the special nature of the industry. Data which purport to show sizable union wage premiums are, in fact, based on very poorly designed and poorly tabulated surveys or questionnaires. The poor design results either from an inattention

to the different skill classifications in union and nonunion construction or from a failure to control for the many other influences on relative union and nonunion wages mentioned above. The surveys, recently published by BLS and by Northrup and Foster, do find both a large dispersion in nonunion rates of pay for a given construction craft and a substantial differential between the union scale and the nonunion mean wage for that craft.[7] Yet, due to the poor design and data tabulation of the surveys, both wage dispersion and the differential can be explained by any or all of the following factors.

1. geographic differentials in basic rates
2. type of construction (commercial, residential, etc.)
3. size of construction firm
4. influence of prevailing wage laws
5. individual levels of skill or experience
6. individual levels of supervisory resonsibility

For an unbiased estimate of union/nonunion wage differential, only the fifth and sixth factors listed above are of major interest. To provide data for such an estimate, a questionnaire must first define homogeneous skill categories in both union and nonunion construction and then compare wages for these categories within similar product market. Then, using such a questionnaire, the survey must be designed to control for the influences of the other factors mentioned.

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[7] U.S. Bureau of Labor Statistics, Industrial Wage Survey: Contract Construction, Bulletin 1911, Washington, D.C.: Government Printing Office, 1976.

HUD-NAHB Nonunion Wage Survey

The survey instrument was designed to provide data on union and nonunion wages and benefits, while controlling for other influences on wages. (The survey was designed by the author and administered through the National Association of Homebuilders under a research grant from HUD.) To do this, the survey was:

1. restricted in geographic coverage to wages paid by contractors in a specific metropolitan area and within a given radius of so many miles of the center of that area;
2. the type of construction in which the contractor specializes was clearly defined;
3. the size of the contractor - either in terms of employment or work volume - is given;
4. various levels of skill are defined for each trade in a way compatible to nonunion construction;
5. the supervisory activity of some journeymen is noted and controlled for.

The survey instrument was designed to be mailed to a random sample of contractors, nonunion and union, including general contractors, subcontractors, and home builders, in a specified SMSA. (A separate survey was designed to guide in-depth interviews with roughly 30 contractors in each area. This survey provided ancillary data on hiring, training, manning, and wage policies in the union and nonunion

sector and is described in Chapter 4.) Due to its design, the mail survey permits analysis of the causes of wage variation within the nonunion sector, as well as between it and unionized construction. For example:

- occupational differentials in the nonunion sector can be compared to union differentials;
- variations in wages within the nonunion sector can be tabulated by contractor size and/or product market differences;
- in addition, distribution of nonunion activity over particular product markets contractor types can be analyzed for each metropolitan area surveyed.

Ideally, a wage survey in construction should be of individuals, in order to relate their personal characteristics (human capital proxies for productivity) to their wage rates (or total hourly compensation). Unfortunately due to the difficulty of identifying a universe of individuals working in construction, generating a random sample of workers (never mind obtaining an adequate level of survey responses) was beyond the scope and resources of the project.

Occupational Classifications

In construction, the most intractable part of a union/nonunion wage comparison is creating similar occupational categories in each sector of the industry. The questionnaire to be used in the survey leaves the occupational categories open, in order that they be named by each contractor. In many cases, the contractor response was to list

occupations by craft; using nomenclature common to both the union and nonunion sectors: carpenter; pipefitter; electrician; etc. In other cases, contractors named occupations unique to nonunion construction: nailer; concrete mechanic; craftsman; etc. Even if similar trade classifications are used, the questionnaire asks that contractors rank workers by skill level within a trade, differentiating between foremen, journeymen, helpers and apprentices. This skill breakdown should permit a more accurate comparison between the wages of union and nonunion journeymen. For example, in the union building trades, there are few if any helper categories. However, nonunion contractors often employ men called "helpers" who are either unregistered apprentices of men with skill levels between a laborer and a journeyman. Past wage surveys have not recognized this category and may have led nonunion contractors to report wages for helpers along with journeyman wage in the nonunion sector and to increase the reported union/nonunion differential.

Even if wages for apparently similar skill levels and occupational types are contrasted in union and nonunion firms, there is still a problem of comparability. Using union trade classifications in order to group labor of comparable skills and occupations does imply that journeyman carpenters, for example, are the same in both union and nonunion work. In other words, if we want to compare the union/nonunion wage differential for carpenters we need a homogeneous occupational and skill classification "carpenter" common to both sectors of the industry. Unfortunately, no such homogeneous category may exist in fact. Union carpenters may range in skills

from a master journeyman with a wide range of experience and duties to a simple "journeyman" with only one skill and one job: hanging sheet-rock or building forms for concrete. Despite the range of jobs undertaken by carpenters in the union sector, the myth (or ideal) of a well-trained journeyman persists and all are paid the same rate. In effect, the union sector defines an hourly wage for an occupation and then assumes that all labor paid that wage is homogeneous. Apprenticeship programs and jurisdictional definitions work to maintain the role of formal occupational definitions when, in fact, the actual skills and duties of a journeyman may vary considerably.

In the nonunion sectors there are no formal jurisdictional boundaries. Nonetheless, for a variety of reasons there are some occupations with job clusters or tasks roughly comparable to the union sector. One major force for similarity is, of course, the fact that construction technology is nearly identical in both union and nonunion building. Technology should not be seen as completely determining the job structure, however, since another major force for occupational similarity between the two sectors lies in government regulations. Government procedures for apprentice training, for the licensing of some trades (electricians, plumbers), and for reporting payment of prevailing wages all impose a union defined occupational structure on the industry. Due to this government influence, most nonunion contractors define their labor force in union terminology even when their "carpenters" or "laborers" do work that in the union sector would be assigned in part to these trades and in part to several others.

Thus, in the nonunion sector, there are occupations denominated by union trade names but encompassing a range of skills and a range of tasks not always found in these occupations in union construction. As a result, comparing nonunion journeymen "carpenters" to union journeyman "carpenters" will at times be comparing apples and oranges. This makes it difficult to impossible to attribute any wage differential solely to union influences: the differential may well be a function of random differences in skills and tasks. The problem is made more difficult by the fact that union/nonunion occupational comparability varies by trade (electricians, owing to state licensing requirements, are more comparable skill-occupational categories than carpenters), by type of construction, and even by construction firms.

Without data on the skills and tasks of individual journeymen, no completely unbiased estimate of a union wage differential can be made. The wage survey approximates this type of analysis by carefully controlling for wages paid particular occupations by type of contractor and by product market. Survey wage data will be reported below, for example, for nonunion carpenters working for particular types of subcontractors in residential construction. These nonunion carpenters' wages can then be compared to other nonunion carpenters in heavy and highway work, general building, etc. Then weighted means of one or 11 of these nonunion wage distributions will be chosen for comparison to the relevant union scale wage - which may itself vary by product market.

In addition, another part of this study will attempt to use existing micro data sets on worker profiles (from the Parnes Logitudinal Work History Survey tapes) to relate wages and earnings in union and nonunion construction to individual worker characteristics. A hedonic wage equation will be defined which will include, along with age, race, and education of worker, a union/nonunion dummy variable. The results from this analysis will supplement the findings from the wage survey.

BLS and Northrup/Foster Wage Studies

The only recent research on union/nonunion differences in the construction industry have been undertaken by the BLS, on wages and benefits alone, and by Northrup and Foster, on the labor management practices of open shop construction.

Since 1972 the BLS has supplemented its annual wage surveys of union construction with a special survey designed to capture nonunion activity as well. Sample surveys have been undertaken in 1972, 1973, and 1976 in seventeen metropolitan areas; at present, published results are only available for the first two yars. The methodology and sophistication of the surveys have improved since the initial efforts. For example, the largely nonunion skill classification of "helper" was included in the 1973 survey but not the previous one; and in the data analysis in 1973 greater attention has been paid to union/nonunion differences by product market and firm size. For many geographic areas, however, the nonunion coverage is quite limited. This is due, in part, to the choice of cities: the BLS included in

its choice of areas eight cities which are almost entirely union. Outside of five southern metropolitan areas, only Boston, Nassau-Suffolk, and Denver show any evidence of open shop activity. The limited coverage is also due to the sample design: only firms with eight or more employees were included in the sample. To the extent that nonunion firms are smaller than this, they will be under-represented.

In the metropolitan areas where there is both union and nonunion activity, compensation differentials (including both wages and benefits) were found to be substantial. Union carpenters typically earned between 35 and 55 percent more per hour than nonunion carpenters; for laborers, the union/nonunion differential was larger - ranging from 26 to 81 percent. Comparisons for cement masons, plumbers, and electricians showed similar margins in favor of union rates - typically 40 to 60 percent above nonunion rates for cement masons and plumbers, and 45 to 60 percent for electricians. At least part of these substantial differentials is due to the lower benefits, as well as hourly wages, in the open shop sector. The BLS did not attempt to measure nonunion benefits in cents per hour terms, but a reporting of their incidence found that a majority of firms in all cities did not provide paid holidays; vacations; or health, insurance, and retirement plans.

One of the more interesting tabulations in the 1973 BLS study is the reporting of percent union workers by product market and firm size. Areas which are (by reputation) predominantly union tend to be highly unionized in all three "branches" of the industry: general contrctors in commercial building; heavy and highway general

contractors; and special trades contractors. Conversely, the South shows levels of unionization in these types of firms. Yet, even in some strong union areas, many smaller firms are nonunion. For example, in Boston, Newark, and Philadelphia where 95 percent or more of the large contractors are union, only 60 to 79 percent of the smaller firms are union. For Baltimore, the differences in unionization by size of firm are even more striking. Unfortunately, the BLS does not follow up on this apparent coincidence between industrial organization and unionization.

Foster and Northrup's work, Open Shop Construction, is based on an analysis of survey sources, secondary material, and field research. While some parts of the book provide valuable insights into construction operations, much of the book is so biased against unions as to be suspect. (For example, the authors assert that "...the open shop sector is both more hospitable as a whole to minority employment and, being without craft restrictions and union rigidities, more capable of dealing with the problem" although their own data do not confirm this. More recent data from the Bureau of Apprenticeship and Training has shown much higher percentages of minorities in certified union programs.)

The least satisfactory part of Foster and Northrup's work is their wage data. Although they note in other parts of their book the lack of occupational comparability, they use similar survey formats for both open shop and union firms. Further, they fail to specify geographic area or product market. (In addition, neither Foster and Northrup or the BLS report standard errors for their sample

statistics.) Nonetheless, their reported union/nonunion wage differentials fall in the same range as those reported by the BLS: 35 to 62 percent higher for union carpenters and 50 to 70 percent greater for union laborers. They also report coefficients of variation for their sample since nonunion firms usually pay different hourly wages for men in the same occupation. These coefficients are often substantial, ranging from .10 to .42 across trades.

In summarizing their wage findings, Foster and Northrup note bleatedly the possibilities of bias:

> "To some extent, the (union/nonunion) wage ranges depicted in the table may be misleading. Wages paid by nonunion contractors will differ not only according to worker competence, but also as a function of training and experience. Low paid "carpenters" may, in fact, be helpers or trainees whose wages will rise steadily as they gain practice at their trade...Unfortunately, in the absence of uniformly accepted occupational definitions, it is impossible to state with precision how much of a rate range stems from differences in competence and how much from differences in extent of training or experience."[8]

3.1 Wage Equations: Craft Union Impact

The data on individual workers collected and tabulated in the longitudinal work history files provides one means of testing hypotheses about union impacts on wages. The Parnes data makes available the individual worker characteristics thought by economists from Lewis to Ashenfelter to be important in controlling for, and

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[8] H. Northrup and H. Foster, op. cit., p. 204.

thus isolating, the pure union wage effect.[9] In addition, the Parnes data can be used to focus on the impact of unionism among craft workers, since this is the occupation which, in cross-section studies, manifests the highest union wage differential: up to 40% in some estimates. The disadvantage of the Parnes data for this purpose is the small sample of craft workers. The sample is particularly small if comparisions are to be made between the craft union impact in construction and the impact in other industries. Nonetheless, there is no reason to believe the sample is nonrandom or unrepresentative. Thus the data can be used, at least on an experimental basis, to test hypotheses about the nature of craft union wage impacts and how those may differ between construction and other industries. In addition, the availability of Parnes data for two years, 1969 and 1971, also permits a test of whether the union impact changes at all even over a short time-span.

The equation to be estimated consists of the now standard form of the union-nonunion wage equation, compiled with some different estimating procedures. The "standard" form, described by Oaxaca and other, posits that the observed market wage for individuals is some function of the competitive wage, W_i^c, and proportional impact of unionism, ∂^{un}, if the individual's wages are determined by collective bargaining. Equation (1) represents this multiplicative relationship in natural log form:

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[9] Herbert Parnes, et. al., The National Longitudinal Survey of Older Men, Ann Arbor: University of Michigan Press, 1971.

$$(1) \quad \ln(W_i) = \ln(W_i^c) + \ln(\partial^{un} + 1)\, U.$$

Since the competitive wage, W_i^c, is unobserved it must be replaced in the estimation by proxies. These proxies are observed individual "human capital" characteristics, given in a vector form $B_i X_j$, and an unobserved noncompetitive impact of unionism, ∂^{nc}, which represents "threat" or "spillover" effects. Thus, equation (2) represents the estimating form of equation (1):

$$(2) \quad \ln(W_i) = \Sigma_j \beta_i X_{ij} + \ln(\partial_{nc} + 1) + \ln(\partial^{nc} + 1)U + \varepsilon_i$$

In the estimation, the noncompetitive impacts become subsumed in the constant term and the union impact is entered as a dummy variable. After estimation, the coefficient on the union dummy variable can be translated into the proportional impact of unionism.

Of course, as noted above in Chapter 2, there are a variety of implicit and explicit assumptions about the nature of union wage impacts behind this kind of estimation. One important problem is the nature of the "spillover" or "threat" effects. If these effects are large, due to union power or aggressiveness, substantially raising the wage in the unorganized sector, the observed union wage impact might be very small. An econometrician, without any independent estimation of the competitive wage, might conclude that the union wage impact was small when, in fact, the opposite would be true. Equally important is the assumption of the constant proportional form of the union wage effect. This view allows for a neat point estimate of the union wage impact as a percentage of the nonunion wage but it does not necessarily represent the actual form in which union impacts might occur. Unions could quite reasonably, bargain

for absolute differentials over a nonunion situation or bargain with differing goals for different workers.

In addition, both Oaxaca and Ashenfelter estimate this type of equation on the basis of dummy variables for industry and occupation of workers.[10] In other words, they admit that the constant proportional impact of unions may differ between industries and occupations. (Why it may not also differ within these groups, given the high variance in intra-occupational earnings, is overlooked.) To correct for the inter-occupational/industrial impacts, they use multiplicative dummy variables for different industries and occupations, combined with common human capital characteristics (age, education, experience, etc.) Technically, however, this heavy reliance on dummy variables is correct only if the error term of the equation is not correlated with any of the dummy variables. If there is any reason to suspect that the specification of the human capital proxies should change as industry and occupation change, then this estimation is biased.

To correct some of the problems inherent in the Oaxaca/Ashenfelter estimation approach, wage equations were developed to include both a unionization variable and personal characteristics related to "human capital." These equations were then estimated on data for craftsman, foreman, and kindred workers and for laborers stratified by industry (using construction and other industries) and

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[10] Ronald Oaxaca, "Estimation of Union/Nonunion Wage Differentials Within Occupational Regional Subgroups," Journal of Human Resources, Fall 1975, pp. 529-536.

by region (the four basic census regions). This approach allows for different specification of the equation for different occupation/industry strata, avoiding the assumption of a uncorrelated error term when dummy variables are used. While this change may improve the reliability of some of the estimates, it should be emphasized that a main drawback of the Parnes data for evaluation of the union wage impact in construction is the lack of any detailed industry classification. In other words, if, as has been argued above, there are major wage differences between residential, commercial, and heavy and highway work which become confused with union/nonunion differentials, these differentials will remain uncontrolled in the Parnes estimations. While this is a major failing of the data, its uniqueness as a source of information on workers characteristics makes the estimation results informative, if not definitive.

Before reporting the estimation results, it is of some interest just to note the differences in the union and nonunion wage rates before controlling for personal characteristics. Table 3.1.1 presents the mean and standard deviation for hourly wages by region for the two occupations studied, craftsmen and laborers, in two industries, construction and "other". It is obvious from the table that the uncontrolled union impact is substantially greater in construction, ranging from 20 to over 100 percent, than it is in other industries. In the other industries, the union wage differential for craftsmen, excepting the extreme low and high values in the East North Central and East South Central, falls quite consistently between 20 and 29 percent. The dispersion of wage is also consistently

smaller among unionized craftsmen in other industries, a finding that is consistent with other results. In construction, the dispersion follows a similar pattern: being smaller in the union section of the industry in the northeast and south, and larger in the union sector in the west.

Among laborers, the range of gross union wage impact is even more marked. In both industry groups, it ranges from nearly 40 percent to over 100 percent. In construction, the differential is equivalent to the union increment for craftsman while in other industries the differential substantially exceeds the craftsmen's.

Finally, one interesting result from the comparision of hourly wages across industries is the sectional differences between union and nonunion rates. Over the nine regions, a comparison of nonunion rates for craftsmen in construction with the nonunion rates for craftsmen in other industries shows that the former are not consistently greater or less than the latter. In fact, with two exceptions, the nonunion rates for craftsmen across industries are roughly comparable. In construction, however, the union rate for craftsmen consistently exceeds the union rate for craftsmen in other industries in all nine regions. And it exceeds it by a substantial amount--not as much, of course, as the percent difference over the nonunion craftsmen rate in construction, but still by twenty to thirty percent. This anomaly of rough equivalence between the nonunion craftsman rates across sectors (perhaps attributable to competitive forces) and the large differences between union rates is just another

example of the unexplained ways union wage impacts differ by product sector.

Estimation Results

The union/nonunion wage equations were estimated in various forms and specifications at both the national and regional level for the years 1969 and 1971. For construction, the results for craftsman etc. were generally consistent: a point estimate of coefficient in the union dummy variable of .43 to .57. This implies a union wage differential of 55 to 77 percent; a differential higher than any previous econometric estimates, but one consistent with gross wage comparisons such as those above. For other industries, the differential was much smaller, ranging from 9 to 30 percent, but the estimates tended to be more inconsistent between different specifications of the equation.

At the national level, construction union wage differentials were estimated at 67 percent in 1969 and 68 percent in 1971, using the log form of the equation -- a form that usually fits better in both national and regional estimates. Although the union coefficient is strongly significant, the standard errors of the estimate are large enough to give confidence intervals, at the 95% level, of roughly 25% above and below the point estimate of 67 percent. This, then, presents a picture of a wage impact which may be, in fact, anywhere from 42 percent to 92 percent. As important as the union coefficient itself, is the role the other variables play in the whole equation. For the construction industry, there were no variables related to the "human capital" determinants of wages which were

statistically significant. Neither education, occupational training, job tenure, years of experience in the industry, or even marital status were consistently significant in national or regional equations. This implies that whatever the "human capital" component of wages represents in construction, it is not easily captured by the standard proxies for on-the-job skills and productivity. (This finding, of course, confirms the doubts about using similarly specified wage equations across industries, as Oaxaca and Ashenfelter do.) The other variables in the construction equation do have the expected signs and impact and are significant. Race is strongly negative as is size of area and part-time work.

In other industries, at the national level, the union wage impact has a point estimate of 13 percent in 1969 and 12 percent in 1971. Unlike the construction industry, many other variables are significant in the wage equation. Education, occupational training, and experience are all significant and positive, though the size of the impact varies considerably. (These categories are not, by the way, highly collinear.) In addition, race, area size, and part-time work are significant with the expected signs. Interestingly enough, the size of the negative coefficient on the race variable in other industries is about half its size in construction.

Regionally, for craftmen in both industries, the results are not very much different from the national estimates. There is, however, more variation in results. In some cases, the equations fit better regionally (or fit better in the linear form); in other cases, they do not fit at all. In general, the fit for both the linear and

log form for construction gives roughly the same R^2, while one or the other fits better for other industries in different regions.

Regional Comparisons

There are a plethora of regional wage equations: the log and linear forms for two industries in four regions for two years, 1969 and 1971. Since all of these equations are based on a very small sample of workers in each region, the results, though statistically significant in most cases, may not be very robust. What is important here is not a detailed comparison of results by region, but developing some sense of gross regional differences. In general, the most important results are:

1. Although the log form fits best for both industries in most regions, the linear form of the equation has comparable, though slightly smaller R^2's, in most regions and a higher R^2 in the south for construction.

2. Union wage impacts in other industries are insignificant in the Northeast, though they are strongly significant in the South. To the contrary, union wage impacts in construction are insignificant in the South (in the log form) but significant in the Northeast.

3. In the West, the wage equation which fits very well for other industries in all three other regions becomes completely insignificant. The construction equation, however, remains significant, with a comparable R^2, and shows a positive and substantial union impact--one equivalent to the union impact in other regions.

4. The other variables in the equations have a significance and size comparable to the national findings. In construction, the human capital variables continue to be insignificant and even turn negative in some regions. In other industries, education, training, experience, and marital status all continue to be significant and positive.

A summary of the union wage impacts for both industries by region is presented in Tables 3.1.6 and 3.1.8. The results confirm previous findings that union wage impacts do vary by region, even controlling for occupation and industry. More importantly, these results indicate that different specifications of the wage equation may be important in capturing precisely how union wage impacts do differ. The insignificance of the union coefficient in construction in the south (in the log form) and the failure of the standard wage equation to fit in the West for other industries point towards substantial unexplained differences in the form and nature of union influence in different geographic areas. Statistical procedures which use all dummy variables to capture these differences, in fact, only gloss over them. In effect, that estimation approach imposes a form of union wage impact on occupations and regions where it may not be very appropriate.

Laborers

Unskilled occupations often exhibit very high union wage differentials. Oaxaca finds unionized laborers being paid a substantial percent more due to their union status; Ashenfelter's findings

established a large differential. It is not clear why unionization should have such a substantial impact among low-skilled workers. Other workers of comparable status, such as low skilled factory operatives in textiles, manifest a much smaller union wage differential. In theory, the high elasticity of supply of low skilled labor should mitigate whatever independent monopoly power unions may create. The fact that this apparently does not happen may be due to the influence of relative wages or the wage structure in a particular industry. In manufacturing, industrial unions bargain for all workers and wage increases are likely to increase the wages of those at the bottom of the job ladder as well as those at the top. In construction, the laborers' union has maintained relative parity in the wage structure over at least the last fifteen years. In the early 1960's, the laborers earned, on average, 50 percent of the top wage and they maintained the same differential into the mid-1970's. As a result, by following the wage pattern for all construction wages in an area, laborers were earning nearly $9/hour in Boston and nearly $10/hour in Buffalo.

The wage equations for laborers in both construction and other industries are found in Table 3.1.5. (They were estimated only at the national level due to very small samples in each region.) In both 1969 and 1971, the union wage differential in both industries was, as expected, quite substantial. In construction, it was roughly 72% in 1969 and 97% in 1971. In other industries, the union wage impact was 2 to 4 times greater than for craftsmen in those industries.

In 1969 it was 44% and in 1971, 41 percent. The impact of the other variables in the wage equation for construction was similar to that for craftsmen: all of the human capital variables were insignificant. For other industries, this was also true, in contrast to the significance of education and occupational training for craftsmen, with the exception of experience which also proved positive and significant, though very small, in the laborers equation. Despite the lack of significance of many of these variables, the R^2 for the national equations was very high. This suggests that the union variable may play a uniquely significant role in wage determination in this sector, or that it is correlated with other wage determining influences which are not specified in the equation.

In any event, unionism is significant in wage determination for laborers, but again, the particular role that variable plays in combination with other independent influences on wages is somewhat unique both to laborers as an occupation and to each type of work: construction and other industries. Some variables which capture these other influences for one occupation like craftsmen are insignificant when used with laborers.

Annual Income

One of the most frequent assertions encountered in the open shop sectors of the construction industry is the statement that, although open shop hourly wages may be lower than the union scale, annual incomes are comparable due to greater year-round employment. Open shop contractors feel that their workers have a stronger attachment

to a firm than the union journeyman and as a result get virtually full-time employment all year. Union craftsmen are supposed to suffer from long periods of seasonal inactivity which substantially reduces their annual income. Only one study, however, has ever clearly delineated the impact of seasonability on annual incomes of union members. It found that a substantial number of journeymen worked 1800 to 2000 hours per year. Other investigations have confirmed there there is a significant number of journeymen in the union sector who remain permanently attached to a firm and to whom the firm is informally committed to providing full-time work.

Since the Parnes data report annual income by occupation for both union and nonunion members, the relationship between union status and income can be tested. The gross comparisons for construction and other industries are presented in Table 3.1.3. To say the least, the data does not support the open shop assertion. Union journeymen's annual income in the three regions noted is 100 to 200 percent greater than craftsman in the nonunion sector. On the other hand, the annual incomes of union and nonunion workers in other industries are much more comparable. It should also be noted that the annual income of union construction journeyman is only slightly higher than that of union craftsman in other industries. Apparently, the high hourly wage in construction, and the resulting wage differential between union construction and other unionized craftsman (noted in Table 3.1.1 above) does not result in substantially greater mean incomes. Presumably, this is due to the differences in mean hours worked annually by craftsmen in the two sectors. The high union wage serves to offset, on the

average, the effect of seasonal unemployment in the construction industry. So even though union construction workers have hourly wages which are 30 to 60 percent higher than union craftsmen in other industries, their mean annual income differences are much smaller: varying from 11 to 18 percent in the three regions in Table 3.1.3.

Summary: Union Wage Equations

The results reported above replicate in some ways previous research on union wage impact. The findings confirm the existence and size of a union impact on wages for craftsmen. However, the close attention paid to different specifications of the wage equation reveals, first, that the size of the union wage differential is substantially different for craftsmen in construction and in other industries; and, second, that the nature of the differential and the role of the other independent variables differ considerably between industries. This second finding casts some doubt on the provision of estimates of a constant, proportional impact of unions on wages for all craftsmen.

Nonetheless, it is apparent that in construction the gross wage comparisons and the estimational wage equations substantiate the existence of a large increment in wages due to unionization. The estimated size of this, over fifty percent in many cases, puts it completely outside the observed range of union impacts in other industries. What accounts for this substantial and unique ability to raise wages? There are several explanations which remain to be tested. These are:

1. That the union differential is largely the result of "union monopoly power" and that construction unions, by limiting entry, can easily raise wages in labor markets with inelastic labor demand. This explanation, while common to most economic analysis, begs the question: what is the source of the great monopoly power and what has prevented open shop competition from eroding it? In addition, the explanation is inconsistent with the observed flexibility of unions in the industry in admitting and training workers. Craft unions in construction may attempt to control the labor supply in construction; they do not necessarily limit it.

2. That the union differential is largely the result of differences in worker skill or other personal characteristics between the "union" sector of the industry and "nonunion" work. Obviously, these characteristics would have to be different from those controlled for in the estimations above and found to be insignificant. One way to attempt a different form of control between worker characteristics is to compare wages of union and nonunion workers in particular product markets of construction. In other words, construction skills are so peculiar or elusive that they are not reflected even in the usual observed worker characteristics found significant in other industries. In the absence of other data sources on the skill characteristics of construction workers, it may be possible to use product markets as a proxy for skill differences. Construction is really many different industries and journeymen in residential construction or rehabilitation may have characteristics and skills

different from those who build highrise office buildings or highways. For this reason, an interview survey of union and nonunion wages by major product market and size and type of firm was designed. The results are reported in Chapter 4.

Table 3.1.1

HOURLY WAGE AND STANDARD DEVIATION FOR CRAFTSMEN, FOREMEN AND KINDRED WORKERS IN CONSTRUCTION AND OTHER INDUSTRIES, 1969

Region	CONSTRUCTION				Construction Union Differ.	Other Industry Union Differ.	OTHER INDUSTRIES			
	Union		Nonunion				Union		Nonunion	
	Mean	S.D.	Mean	S.D.			Mean	S.D.	Mean	S.D.
Northeast	5.31	1.33	4.19	1.78	27%	---	3.28	.54	3.53	.73
Midatlantic	6.15	1.06	3.59	.67	71%	28%	3.93	.90	3.06	1.45
E. North Central	6.12	1.14	4.09	1.35	50%	8%	4.11	.87	3.81	1.23
W. North Central	5.38	1.17	1.88	.18	>100%	26%	4.07	.99	3.22	1.34
South Atlantic	4.03	1.84	2.85	1.43	41%	25%	3.65	1.04	2.92	1.18
E. South Central	5.14	.61	1.90	1.25	>100%	75%	3.69	.31	2.11	.71
W. South Central	5.35	.69	2.90	.31	85%	21%	3.70	1.02	3.07	.75
Mountain	4.96	.80	4.15	1.63	20%	---	----	----	3.46	.55
Pacific	6.10	.81	3.76	.42	62%	20%	4.69	1.05	3.92	.97

Source: Parnes, op. cit.

Table 3.1.2

HOURLY WAGE FOR LABORERS IN CONSTRUCTION AND OTHER INDUSTRIES, 1969, SELECTED REGIONS

Region	Construction		Construction Union Differential	Other Industries		Union Differential
	Union Mean	Nonunion Mean		Union Mean	Nonunion Mean	
Midatlantic	4.11	3.11	32%	3.23	2.16	49%
East Central	5.22	3.48	50%	3.49	3.42	44%
South Atlantic	2.79	2.01	39%	2.93	1.63	80%
W. South Central	4.07	1.77	>100%	3.53	1.74	>100%

Source: Parnes, op. cit.

Table 3.1.3

MEAN ANNUAL EARNINGS OF CRAFTSMEN, FOREMEN, AND KINDRED WORKERS IN CONSTRUCTION AND OTHER INDUSTRIES

By Union and Nonunion Status (1971) And Weeks Unemployed (1969)

Region	ANNUAL EARNINGS				WEEKS UNEMPLOYED			
	Construction		Other Industries		Construction		Other Industries	
	Union	Nonunion	Union	Nonunion	Union	Nonunion	Union	Nonunion
Midatlantic	$10,397	$3,353	$ 9,340	$9,967	4.9	2.3	.1	.5
E. North Central	11,814	4,136	10,735	7,850	4.8	.7	.2	.8
South Atlantic	11,196	5,055	9,502	8,950	3.8	2.1	.3	.2

Source: Parnes, op. cit.

Table 3.1.4

WAGE EQUATIONS FOR CRAFTSMEN, FOREMEN, AND KINDRED WORKERS IN CONSTRUCTION AND OTHER INDUSTRIES, 1969 AND 1971.

(National Sample)

Dependent Variable	Coverage	Constant	Race	Area Size	Hours Worked	Collective Bargaining	Education	Occupational Training	Experience	Marital Status
LNW 69	All	.9317	-.2564	-.0266	-.9493	.2414	.0192	-----	.0018	.1562
R^2 = .39			(.0480)	(.0069)	(.0518)	(.0367)	(.0066)	-----	(.0016)	(.1199)
LNW: 69	C	1.4450	-.5976	-.0549	-.3897	.5132	.0151	-----	.0048	-.1754
R^2 = .27			(.1462)	(.0205)	(.1802)	(.1190)	(.0218)	-----	(.0054)	(.5144)
LNW 69	C	1.4016	-.6247	-.0521	-.3103	.5728	.0129	.0067	-----	-----
R^2 = .32			(.1302)	(.0182)	(.1599)	(.1058)	(.0193)	(.0038)	-----	-----
LNW 69	O	.5474	-.2737	-.0288	-.0555	.1239	.0292	.0020	.00612	.4170
R^2 = .31			(.0446)	(.0059)	(.1011)	(.0311)	(.0056)	(.0009)	(.0013)	(.1054)
HRW 69	C	4.3940	-1.75	-.132	-.227	2.08	-----	.001	-----	-----
R^2 = .59			(.224)	(.033)	(.285)	(.187)	-----	(.007)	-----	-----
HRW 69	O	3.0480	-.882	-.098	.756	.339	.117	-----	-----	-----
R^2 = .22			(.153)	(.020)	(.351)	(.107)	(.019)	-----	-----	-----
LNW 71	All	.9392	-.2506	.0221	.1827	.2136	.0195	.0020	.0017	.3058
R^2 = .28			(.0383)	(.0051)	(.0603)	(.0278)	(.0049)	(.0009)	(.0012)	(.1156)
LNW 71	C	1.3416	-.2701	-.0266	.0660	.5165	.0203	.0016	-----	-----
R^2 = .64			(.0601)	(.0085)	(.0640)	(.0503)	(.0085)	(.0019)	-----	-----
HRW 71	C	4.0580	-1.1855	-.1292	.0746	2.575	.0923	.0049	4.058	-----
R^2 = .65			(.2930)	(.0417)	(.3123)	(.0353)	(.0416)	(.0092)	-----	-----
LNW 71	O	.9396	-.2387	-.0262	.0590	.1130	.0254	.0022	.0042	.2167
R^2 = .18			(.0404)	(.0052)	(.0845)	(.0284)	(.0051)	(.0009)	(.0013)	(.1065)
HRW 71	O	2.2175	-.799	-.094	.594	.349	.110	.010	.0165	.968
R^2 = .23			(.173)	(.023)	(.362)	(.122)	(.022)	(.004)	(.006)	(.457)

See notes to Table 3.1.5 and Table 3.1.7

Table 3.1.5

WAGE EQUATIONS FOR LABORERS IN CONSTRUCTION AND OTHER INDUSTRIES, 1971 NATIONAL SAMPLE

Dependent Variable	Coverage	Constant	Race	Area Size	Hours Worked	Collective Bargaining	Education	Occupational Training	Experience	Marital Status
LNW 71	All	.5796	-.1238	-.0376	-.1766	.4361	.0205	-.0025	-.0025	.3419
R^2 = .47			(.0625)	(.0112)	(.0831)	(.0619)	(.0098)	(.0023)	(.0025)	(.1700)
LNW 71	C	1.2640	-.2097	-.0490	.5305	.6771	.0049	-----	-.0064	-----
R^2 = .55			(.1446)	(.0249)	(.4032)	(.1411)	(.0209)	-----	(.0075)	-----
LNW 71	O	.3912	-.1135	-.0328	-.1804	.3430	.0338	-----	.0069	.3165
R^2 = .51			(.0623)	(.0117)	(.0784)	(.0639)	(.0106)	-----	(.0025)	(.1554)
LNW 69	C	1.081	-.1490	-.0527	.1177	.5225	-----	.0047	-----	-----
R^2 = .55			(.0808)	(.0142)	(.0996)	(.0752)	-----	(.0128)	-----	-----
LNW 69	O	.7888	-.1165	-.0422	.0197	.3672	-----	-----	.0092	-----
R^2 = .52			(.0483)	(.0087)	(.0610)	(.0507)	-----	-----	(.0023)	-----

Note: "All" refers to the combined sample of workers in construction and other industries
"C" is the sample of workers in construction alone
"O" is the sample of workers in other industries alone

Standard errors in parenthesis. Date Source: Parnes, op. cit.

Table 3.1.6

WAGE EQUATIONS FOR CRAFTSMEN, FOREMEN, AND KINDRED WORKERS

IN CONSTRUCTION AND OTHER INDUSTRIES, 1969

(Regional Sample)

Dependent Variable	Coverage	Constant	Race	Area Size	Hours Worked	Collective Bargaining	Education	Occupational Training	Experience	Marital Status
Northeast										
LNW 69	C	1.365	-.2451	-.0079	.1290	.4294	-.0042	.0017	-----	-----
R^2 = .54			(.1538)	(.0117)	(.1067)	(.0823)	(.0175)	(.0025)	-----	-----
LNW 69	O	.6588	-.2788	-.0208	.3338	.01266	-----	.0033	.0067	.3091
R^2 = .25			(.1079)	(.0121)	(.1745)	(.0635)	-----	(.0016)	(.0028)	(.2015)
N. Central										
LNW 69	C	1.3578	-.4817	-.0193	.0310	.5518	-.0032	.0047	-----	-----
R^2 = .33			(.1347)	(.0152)	(.1377)	(.1127)	(.0164)	(.0070)	-----	-----
LNW 69	O	.5455	-.1903	-.0251	-.5522	.0527	.0291	.4021	.0064	.4675
R^2 = .33			(.0706)	(.01086)	(.1824)	(.0459)	(.0088)	(.0014)	(.0018)	(.1812)
South										
LNW 69	C	2.018	-.5270	-.0958	-1.327	.4685	-.0262	-.0316	-----	-----
R^2 = .28			(.2882)	(.0592)	(.4772)	(.2713)	(.0454)	(.0121)	-----	-----
LNW 69	O	.6411	-.3610	-.0352	-.0924	.2592	.0171	.0016	.0056	.3967
R^2 = .38			(.0790)	(.0136)	(.1892)	(.0678)	(.0105)	(.0024)	(.0031)	(.1872)
LNW 69	C	1.352	-.1786	-.0133	-.1569	.4447	.0056	.0004	-----	-----
R^2 = .52			(.1068)	(.0126)	(.1089)	(.0861)	(.0148)	(.0018)	-----	-----

Standard errors in parenthesis.
See Notes, Table 3.1.5 and Table 3.1.7.
Data Source: Parnes, op. cit.

Table 3.1.7

WAGE EQUATION VARIABLES

LNW	Natural log of the straight hourly wage rate.
HRW	Absolute value of the hourly wage rate.
RACE	Dummy variable: 0 for white, 1 for other.
AREA SIZE	Discontinuous variable increasing from 1, largest metropolitan areas, to 9., rural areas.
HOURS WORKED	Dummy variable: 0 for full-time; 1 for part-time (worked less than 35 hours).
COLLECTIVE BARGAINING	Dummy variable: 0 for "nonunion;" 1 if wages determined by collective bargaining.
EDUCATION	Years completed of formal schooling.
OCCUPATIONAL TRAINING	Months completed, all types of occupational training programs.

Table 3.1.8

SUMMARY OF ECONOMETRIC ESTIMATES OF UNION IMPACT, CONSTRUCTION AND OTHER INDUSTRIES, 1969 AND 1971, NATIONAL & REGIONAL SAMPLE

NATIONAL	UNION/NONUNION WAGE DIFFERENTIAL	
	1969	1971
Construction		
Log	67%	68%
Linear	45%	---
Other Industries		
Log	13%	12%
Linear	9%	---
REGIONAL		
Northeast		
Construction	54%	49%
Other	1%	0%
Northcentral		
Construction	74%	50%
Other	5%	0%
South		
Construction	60%	48%
Other	30%	24%

Table 3.1.9

REPRESENTATIVE SELECTION OF CRAFTSMEN, FOREMEN, AND KINDRED WORKERS IN "OTHER INDUSTRIES" FROM PARNES FILE.

Baker	Metal Molders
Blacksmiths	Photoengravers/Lithographers
Bookbinders	Pressmen and Plate Printers
Cabinet Makers	Shoemakers
Compositors/Typesetters	Metal Rollers
Engravers	Tailors
Jewelers	Upholsterers
Locomotive Engineers	Fishermen
Mechanics/Repairman (Autos, Airplane, T.V., etc.)	

Source: Parnes, op. cit.

3.2 1976 Union/Nonunion Wage Survey in Construction

Because of the deficiencies of existing data sources on wages in construction, a survey was designed in 1975 to provide additional data. The survey was administered in 1976 by mail in eight U.S. cities; results for two cities, Boston and Denver, are reported below.

The design of the survey sought to overcome most of the drawbacks of previous work. The main questionnaire asked for information on firm type (general or type of subcontractor); product market; size (in terms of volume of contract work); and employment levels. Wages were to be reported by four different skill levels (working foreman; journeyman; apprentice; helper) within each craft. The craft names were left open so that nonunion contractors could use other than union craft designations. Wages paid due to prevailing wage laws were to be excluded: only "market" nonunion wages were to be reported. Finally, a specific geographic area was designated on a map as the reporting area: usually an SMSA.

The survey was administered in particular cities because of the reported mix of both union and nonunion work in all types of construction in those areas. The universe of firms in the construction industry in each city was created by combining membership lists of major contractor associations, particularly the Associated General Contractors, and a comprehensive list of construction firms developed by Dun and Bradstreet. On the basis of the universe list, a random sample totaling fifty percent of the firms in the universe; was designed

to provide statistically significant information on wages and benefits for all firms. (Unfortunately, due to a lack of identification of most firms by union or nonunion status, no stratification by that dimension was possible.) Finally, the survey questionnaire, after minor revisions from a pilot test, was mailed to 11 firms in the sample. A follow-up mailing to non-respondents, in addition to phone calls, was used to increase the response rate.

Despite the care in designing and administering the survey, the response rate was reasonably low (approximately 20 to 25%). This was not unexpected. Preliminary interviews with firms and associations in the industry revealed that most wage surveys which have been undertaken have been relatively unsuccessful. Nonunion firms in particular are secretive about wage scales, both for political and competitive reasons. In addition, the small size of most construction firms coupled with their low levels of office staffing make responding to questionnaires costly and low in priority. But low response does create some problems for statistical presentation and analysis. Ideally, a random sample of firms should be designated and responses evolved from this sample. However, this approach requires explicit identification of firms by name and a follow-up to non-respondent firms. If firms are secretive about wages, this attention to their particular response may make them even more uncooperative. An alternative approach is to choose a large sample and, by promising anonymity, hope to generate a large number of responses and then

correct for response by doing a third survey of non-respondents and creating a non-response adjustment factor to weight the responses in the original survey. This second approach was taken here.

All of this is simply evidence that accurate, detailed wage information is very difficult to compile. This is particularly true when the survey questionnaire is complex enough to permit the wage data to be controlled and tabulated by firm size; product market; workers skill level, etc. Complexity of the questionnaire obviously lowers the response rate. In addition, wages are often secret and idiosyncratic; evoking them from a neutral to hostile group of firms is difficult and costly. (The hostility of open shop contractors emanates from their being continually attacked by unions for paying "substandard wages." At least one previous wage survey undertaken by the government with the promise of anonymity ended up in the hands of a union business agent and was used in legislative testimony. Thus, the political climate in the industry makes any pretension to academic neutrality or confidentiality suspect.)

Nonetheless, sample wage results are available. In particular, wage contours in nonunion construction can be defined on the basis of the survey information. These contours can then be compared to union rates to generate more precise wage differentials by craft and skill level in particular types of construction product markets. Despite the caveats on sample coverage above, the information compiled from the survey is the most detailed and extensive available: there is no comparable data source either in terms of size or coverage of both skill classifications and firm characteristics.

Union and Nonunion Employment

The extent of nonunion employment in the major construction product markets has been a mystery. Although it is believed that there has been a recent increase in open shop activity there are no time-series on union versus nonunion activity to confirm such a trend. Data from the 1976 survey, however, provide a static comparison of the proportion of construction employment that is union in Boston and Denver. (See Table 3.2.1) The sample proportion of nonunion employment is, respectively, 15 percent and 35 percent in those SMSAs.

In Denver, as in Boston, union employment is concentrated in commercial and industrial building. In both SMSAs, roughly 55% of employment by general contractors and 88 percent of employment by sub-contractors is in this product market. Heavy and highway construction makes up the other large category of union work. There is virtually no union employment in residential construction in Denver. The larger percentage in residential work in Boston may reflect the union role in the state-subsidized low and middle income housing in Massachusetts. In contrast, nonunion contractors do the major proportion of their work in residential construction in both cities - nearly roughly sixty percent of total open shop employment. A considerable proportion of nonunion work, however, is also in the commercial building sector: roughly thirty to forty percent of employment in each city. Heavy and highway work is not a large part of open shop employment in either metropolitan area.

Table 3.2.1

UNION AND OPEN SHOP EMPLOYMENT DISTRIBUTION BY PRODUCT MARKET, 1976

	Total Firms	Residential	Commercial Building	Heavy and Highway	Employment Total	Percent Nonunion Employment
DENVER						
Union						
General Contractor	157	53	1,382	1,162	2,597	
Subcontractor	215	299	3,323	192	3,814	
					6,411	
Nonunion						
General Contractor	110					
Subcontractor	98	2,325	1,052	87	3,464	35%
BOSTON						
Union						
General Contractor	195	215	5,029	1,940	8,184	
Subcontractor	276	253	4,272	271	4,296	
					12,980	
Nonunion						
General Contractor	101					
Subcontractor	103	1,252	954	85	2,291	15%

Source: Author's mail survey of union and open shop construction firms, 1976.

The marked differences in union and nonunion participation in residential construction is not surprising. Though it has never been quantitatively described, residential work has generally been conceded to be almost completely nonunion in most parts of the country. (This has not always been the case, however. Haber and Levinson report substantial amounts of union homebuilding in Boston and other cities in the early 1950's.) In contrast to the differences in residential work, the survey data do show considerable open shop activity in types of construction still thought to be predominantly union: particularly in commercial and industrial construction. In Boston, this union predominance is still clearly the case given the small total size of the nonunion sector. In Denver, however, the open shop sector is considerably larger in its relative share of the commercial and industrial work.

In their present tabulation the data do not reveal finer breakdowns that can be made within product markets: either by firm size or other types of construction. It is quite possible that even within a product type, union and open shop firms represent, on the whole, different types, sizes, and location of construction. Nonunion firms are said to specialize in small-scale commercial building (shopping centers, gas stations, and small offices) in the suburban rings of metropolitan areas. Union firms still control most of the large-scale, center-city, high-rise building and all of the major industrial work in both SMSAs. Thus, even controlling for some product market differences may leave substantial variations in the type of construction work and in the resulting skill level and composition of the labor force.

Union and Nonunion Firm Size

The employment data described above show, in Boston, that although open shop firms comprise 30% of the total firms in the sample, they only account for 15% of total employment. In Denver, the size of nonunion firms is, on the average, much more comparable to the union sector: nonunion firms are 36 percent of firms in the sample and account for 35 percent of the employment. These employment figures can be compared to the data on the distribution of firms by size and volume in Tables 3.2.2 through 3.2.5.

In Boston, the open shop firms are concentrated in the smallest categories of total employment. Fifty-nine percent of nonunion commercial general contractors have less than ten employees; only thirty-one percent of comparable union firms are this small. Conversely, thirty-five percent of union commercial generals have more than 26 employees; no nonunion firms in the sample were this large. This distribution by number of construction field employers is roughly mirrored in the reported total dollar volume of contracts for union and nonunion firms. Fifty-six percent of the union general contractors and forty-five percent of the union subcontractors concentrating in commercial and industrial work report over one million dollars in gross revenue. Only twenty-five and five percent of similar open shop firms are that large.

In Denver, the distribution of firms over size classes is more equal. Where Boston has no commercial open shop general contractors reporting more than 26 employees, twenty-one percent of the

Table 3.2.2

PERCENT OF UNION AND NONUNION FIRMS BY DOLLAR VOLUME OF ACTIVITY

BOSTON 1976

	Percent					Total
	<$100,000	$100-500,000	$.5 - $ 5m.	$1 - 5.	$5 m.	Firms
RESIDENTIAL						
Union General	0	0	25	25	50	4
Union Subcontractor	0	67	33	0	0	6
Nonunion General	39	28	15	19	0	54
Nonunion Subcontractor	54	36	10	0	0	39
COMMERCIAL & INDUSTRIAL						
Union General	2	18	24	34	22	67
Union Subcontractor	3	33	20	38	7	143
Nonunion General	13	34	28	23	2	47
Nonunion Subcontractor	22	58	15	5	0	74

Source: See Table 3.2.1 and text.

Table 3.2.3

UNION AND NONUNION FIRMS, PERCENTAGE DISTRIBUTION BY NUMBER OF FIELD EMPLOYEES,

BOSTON 1976

	Percent						Total
	1 to 5	6 to 10	11 to 25	26 to 50	51 to 75	>76	Firms
RESIDENTIAL							
Union General	20	20	40	0	0	20	5
Union Sub	0	80	20	0	0	0	5
Nonunion Gen.	59	24	15	0	0	2.4	41
Nonunion Subs.	63	19	16	3	0	0	32
COMMERCIAL & INDUSTRIAL							
Union Gen.	20	11	34	15	5	15	65
Union Sub.	19	16	29	21	5	10	136
Nonunion Gen.	27	32	41	0	0	0	37
Nonunion Sub.	36	22	33	7	0	1	72

Source: See Table 3.2.1 and text.

Table 3.2.4

PERCENT OF UNION AND NONUNION FIRMS BY DOLLAR VOLUME OF ACTIVITY

DENVER 1976

	Percent					Total
	<$100,000	$100-500,000	$.5 - $5m.	$1 - $5.	$5 m.	Firms
RESIDENTIAL						
Union General	--	--	50	50	--	2
Union Subcontractor	7	43	7	36	7	14
Nonunion General	25	16	25	28	6	51
Nonunion Subcontractor	25	52	14	9	0	57
COMMERCIAL & INDUSTRIAL						
Union General	5	3	13	42	37	38
Union Subcontractor	5	29	22	36	8	107
Nonunion General	2	45	27	23	3	44
Nonunion Subcontractor	20	45	22	13	0	40

Source: See Table 3.2.1 and text.

Table 3.2.5

UNION AND NONUNION FIRMS, PERCENTAGE DISTRIBUTION BY NUMBER OF FIELD EMPLOYEES, DENVER 1976

	Percent						Total Firms
	1 to 5	6 to 10	11 to 25	26 to 50	51 to 75	>75	
RESIDENTIAL							
Union General	--	--	100	--	--	--	1
Union Subcontractor	43	36	--	21	--	--	14
Nonunion General	35	25	20	10	5	5	40
Nonunion Subcontractor	18	37	31	6	8	0	49
COMMERCIAL & INDUSTRIAL							
Union General	5	22	30	19	8	16	37
Union Subcontractor	18	18	26	22	4	12	107
Nonunion General	28	28	23	11	5	5	39
Nonunion Subcontractor	33	25	28	14	0	0	36

Source: See Table 3.2.1 and text.

equivalent general contractors in Denver are this big. Nonetheless, large union firms still predominate - forty-three percent of them have more than twenty-six employees. And a larger proportion of nonunion firms in Denver are smaller in terms of both dollar volume and employment.

Like the glass which can be seen as half empty, or half full, these size distributions can be interpreted two ways. In one light, they do show the significant difference in scale of firms in the open shop and union sector. As a result, there simply are very few, if any, comparable open shop firms to the larger union general contractors and subcontractors and there are relatively few small union firms. In another light, the distributions evidence a considerable over-lap in firm sizes in the two sectors. Fifty-five percent of the union generals in Denver do between 0.5 and 5 million dollars a year in volume; sixty percent of the nonunion generals are of equivalent size. In Boston 55 percent of union and non-union firms in this middle category are also roughly equal in dollar volume. So comparing the size distributions brings out both the discrepancy in size at the tails as well as the substantial overlap in the middle.

The extremes of the distribution of firms sizes may, in fact, be a good proxy for the substantially different types and scales of projects the firms undertake. To be consistent, the overlap in sizes may represent a type of work that is presently an area of competition between organized and unorganized firms.

Wage Differentials and Contours

As described above, one way to correct for unobserved skill differences in the construction labor force is to make union/nonunion wage comparisons only within particular product markets. The survey results presented in Table 3.2.6 and 3.2.7 make this comparison possible. The wage data are tabulated for journeymen and helpers in eleven different trades in Boston and Denver. With these data, comparisons can be made between the average hourly rates of nonunion mechanics in three product markets and the equivalent union rates. For the most part, the relevant union rate is the "building rate" negotiated for most commercial and industrial work. In addition, the unions also may have special rates for some trades in heavy and highway construction. Occasionally, the unions may negotiate a "residential" rate, for home-building or small-scale residential work; usually this rate is seventy-five to eighty percent of the commercial wage rate, plus the normal fringe benefit package.

In Boston, comparisons between mean hourly wages in open shop commercial building and the union scale (excluding benefits) reveal somewhat lower union differentials than those obtained through regression estimates or simple wage comparisons. The unweighted average of the differentials in Boston is 41 percent, with a range of between 16 percent for operating engineers to 73 percent for painters. In Denver, although it apparently has a much larger nonunion sector, the differentials are of a similar magnitude. The mean is 40 percent and the range is from eleven percent for laborers to 68 percent for plumbers.

Table 3.2.6

UNION AND NONUNION CONSTRUCTION WAGE RATES, BOSTON SMSA, 1976

TRADE	1 NONUNION			2 UNION			3 Union Differential (Commercial Building)
	Commercial Building	Residential	Heavy & Highway	Commercial Building	Residential	Heavy & Highway	
Bricklayer							
Journeyman	7.78 (.30)	7.04 (.16)	---	9.90/1.75	---	---	27%
Helper	6.13 (.45)	4.95 (.28)	---	---	---	---	
Carpenter							
Journeyman	8.19 (.19)	6.73 (.13)	---	10.00/1.60	---	---	22%
Helper	5.20 (.24)	4.23 (.14)	---	---	---	---	
Electrician							
Journeyman	6.21 (.08)	6.55 (.25)	---	11.25/2.16	---	---	50%
Helper	3.83 (.08)	4.56 (.26)	---	---	---	---	
Ironworker							
Journeyman	6.29 (.52)	----	---	10.49/2.20	---	12.69	67%
Helper	3.13 (.33)	----	---	---	---	---	
Operating Engineer							
Journeyman	9.12 (.67)	6.75 (.19)	11.07 (.59)	10.61/1.90	---	12.00/77	16%
Helper	3.42 (.54)	3.75 (.37)	---	---	---	---	

Table 3.2.6

UNION AND NONUNION CONSTRUCTION WAGE RATES, BOSTON SMSA, 1976

TRADE	1 NONUNION Commercial Building	Residential	Heavy & Highway	2 UNION Commercial Building	Residential	Heavy & Highway	3 Union Differential (Commercial Building)
Painter							
Journeyman	5.64 (.09)	6.83 (.32)	---	9.76/1.77	---	---	73%
Helper	4.32 (.26)	3.67 (.07)	---	---	---	---	
Plumbers & Pipefitters							
Journeyman	7.31 (.32)	7.12 (.16)	8.43 (.05)	10.80/2.30	---	---	48%
Helper	4.88 (.57)	4.34 (.29)	---	---	---	---	
Roofer							
Journeyman	7.34 (.15)	----	---	9.75/1.90	---	---	33%
Helper	5.07 (.11)	----	---	---	---	---	
Sheet Metal Worker							
Journeyman	6.12 (.20)	8.08 (.49)	---	12.39 total	---	---	N/A
Helper	3.82 (.28)	----	---	---	---	---	
Teamster							
Driver	5.38 (.11)	6.79 (.18)	8.75 (.26)	8.11/.85	---	---	51%
Laborer	6.10	5.42	7.19	7.50/1.35	---	8.95	23%
Journeyman	(.18)	(.23)	(.15)				
				Mean Union Wage Differential:			41%
				Differential Range:			16 to 73%

1. Hourly wage only, excluding benefits. Standard errors in parentheses.
2. Hourly wage/total benefits.
3. The union wage differential here is the percent difference between the union journeyman's commercial building rate and the nonunion journeyman's commercial building rate.

Source: See Table 3.2.1 and text.

Table 3.2.7

UNION AND NONUNION CONSTRUCTION WAGE RATES, DENVER/BOULDER SMSA, 1976

TRADE	1 NONUNION			2 UNION			3 Union Differential
	Commercial Building	Residential	Heavy & Highway	Commercial Building	Residential	Heavy & Highway	(Commercial Building)
Bricklayer							
Journeyman	7.97 (.33)	7.47 (.17)	---	9.95/1.30	---	---	25%
Helper	6.25 (.60)	4.72 (.09)	---	---	---	---	
Carpenter							
Journeyman	6.95 (.12)	6.09 (.05)	---	9.19/1.73	6.15/1.98	8.54/1.98	32%
Helper	4.62 (.13)	3.87 (.06)	---	---	---	---	
Electrician							
Journeyman	7.66 (.17)	6.60 (.29)	---	10.94/1.31	7.20/.64	---	43%
Helper	4.36 (.23)	4.00 (.37)	---	---	---	---	
Ironworker							
Journeyman	6.94 (.16)	6.88 (.07)	---	9.75/1.86	---	---	41%
Helper	6.27 (.29)	4.25 (.18)	---	---	---	---	
Operating Engineer							
Journeyman	6.97 (.24)	6.22 (.19)	6.23 (.30)	8.50/1.54	---	---	22%
Helper	5.66 (.22)	3.75 (.15)	---	---	---	---	

Table 3.2.7

UNION AND NONUNION CONSTRUCTION WAGE RATES, BOSTON SMSA, 1976

TRADE	1 NONUNION Commercial Building	Residential	Heavy & Highway	2 UNION Commercial Building	Residential	Heavy & Highway	3 Union Differential (Commercial Building)
Painter							
Journeyman	7.00	6.43	---	10.04/1.10	---	---	43%
	(.34)	(.23)					
Helper	4.25	3.86	---	---	---	---	
	(.22)	(.14)					
Plumbers & Pipefitters							
Journeyman	6.12	6.91	---	10.30/1.75	---	---	68%
	(.26)	(.21)	---				
Helper	3.77	4.34	---	---	---	---	
	(.03)	(.29)					
Roofer							
Journeyman	8.42	5.15	---	9.41/.95	---	---	12%
	(.25)	(.38)					
Helper	4.13	3.55	---	---	---	---	
	(.12)	(.11)					
Sheet Metal Worker							
Journeyman	8.51	6.86	---	10.67/1.91	---	---	25%
	(.28)	(.19)					
Helper	3.80	4.42	---	---	---	---	
	(.23)	(.12)					
Teamster							
Driver	----	6.11	---	7.55/.40	---	---	N/A
	----	(.13)	---				
Laborer	5.73	4.33	---	6.35/.94	---	---	11%
Journeyman	(.22)	(.08)	---				
				Mean Union Wage Differential:			40%
				Differential Range:			11 to 68%

1. Hourly wage only, excluding benefits. Standard errors in parentheses.
2. Hourly wage/total benefits.
3. The union wage differential here is the percent difference between the union journeyman's commercial building rate and the nonunion journeyman's commercial building rate.

Source: See Table 3.2.1 and text.

Since benefits make up a substantial portion of total hourly earnings of union journeymen - up to twenty percent in some cases - the inclusion of these in the comparison may widen the union/nonunion gap considerably. Some examples of benefits reported paid to nonunion journeymen are given in Table 3.2.8 and 9. Unfortunately, these are not tabulated by product market, but for the sample as a whole in each metropolitan area. On the average, the benefit levels for open shop journeyman are roughly fifty percent of the employer contributions in the union sector. So a pure union/nonunion wage comparison does understate the union earnings differential. The task of comparing the total earnings package is complicated, however, by the variety of fringe benefits found in the open shop sector. These range from formal health and welfare plans to ad hoc, informal bonus systems and profit-sharing. In some cases where benefits are paid, contractors do not know the hourly cost and thus are not likely to report them accurately or at all. In contrast, union contracts specify, to the one-hundredth of a cent in some cases, the hourly employer contributions to all fringe benefit plans. This contrast in reporting style and formality may bias comparisons of the total pay package in the unions' favor.

Wage Contours

The data reported in Table 3.2.6 and 3.2.7 also permit identification of wage contours. Dunlop, in the classic essay on "the task of contemporary wage theory" defines wage contours as the range of wages paid to the same occupation in different product

Table 3.2.8

AVERAGE HOURLY FRINGE BENEFITS ALL OPEN SHOP CONSTRUCTION FIRMS, 1976

City: Boston

OCCUPATION	# OF FIRMS	# OF WORKERS	SAMPLE MEAN	SAMPLE MEDIAN	RANGE LOW	RANGE HIGH
Bricklayer						
Working Foreman	4	4	.90 (.23)	.50	.50	1.60
Journeymen	3	15	2.13 (.19)	2.50	.50	2.50
Apprentice	1	1	.25 (.00)	.25	.25	.25
Helpers	3	3	.67 (.14)	.50	.50	1.00
Carpenter						
Working Foreman	19	44	.98 (.07)	1.25	.20	1.50
Journeymen	17	82	.92 (.04)	1.00	.15	1.50
Apprentice	10	40	.87 (.04)	1.00	.20	1.50
Helper	7	25	.69 (.02)	.75	.50	1.00
Electrician						
Working Foreman	9	45	1.65 (.08)	1.95	.15	2.55
Journeymen	7	63	1.30 (.07)	1.50	.10	2.55
Apprentice	7	38	1.16 (.18)	1.35	.05	2.55
Helper	4	35	1.20 (.04)	1.35	.63	1.35

Standard errors in parenthesis.
Source: See Table 3.2.1.

Table 3.2.9

AVERAGE HOURLY FRINGE BENEFITS ALL OPEN SHOP CONSTRUCTION FIRMS, 1976

City: Denver/Boulder

OCCUPATION	# OF FIRMS	# OF WORKERS	SAMPLE MEAN	SAMPLE MEDIAN	RANGE LOW	RANGE HIGH
Bricklayer						
Working Foreman	2	4	2.25 (.22)	2.00	2.00	3.00
Journeymen	5	11	1.29 (.24)	2.00	.25	2.01
Apprentice	1	1	2.00 (.00)	2.00	2.00	2.00
Helpers	1	5	1.19 (.00)	1.19	1.19	1.19
Carpenter						
Working Foreman	25	98	1.59 (.19)	.80	.10	6.71
Journeymen	24	248	.63 (.03)	.47	.10	2.04
Apprentice	12	77	.60 (.04)	.36	.10	1.20
Helper	8	51	.69 (.05)	.70	.20	1.40
Electrician						
Working Foreman	9	17	1.29 (.24)	1.30	.20	3.50
Journeymen	8	22	1.14 (.19)	1.00	.25	3.00
Apprentice	5	8	.86 (.36)	.30	.10	2.60
Helper	2	8	.75 (.23)	.10	.10	1.40

Standard errors in parenthesis.
Source: See Table 3.2.1

markets. Dunlop does not theorize as to why these wage differences should exist, but presumably they are a function of unobserved skill differentials within occupations which correlate with product markets. (If, of course, markets were highly segmented on the supply side, the contours could also result from rents earned by different skill groups. In a competitive market these rents should be competed away, leaving the contours as evidence only of skill differences.)

The wage data for nonunion construction does give some evidence in support of wage contours across construction product markets. In thirteen out of seventeen trades in both cities for which rates can be compared between commercial and residential building, the commercial rate is slightly to substantially higher. Tests for significant differences between means reveal, though, that in only nine cases are there wage differences significant at the 95 percent level. In five of these significant differences, the commercial mean is higher. This is not strong evidence of major skill differences, but it is suggestive that some unreported skills are roughly correlated with product markets. Of course, the relative equivalence of wages between markets, in contrast to the larger union product market differentials noted below can be used to support a competitive view of labor markets too: the lack of substantial differentials implies considerable mobility of similar labor types between sub-markets. (This mobility is consistent with the interview data on open shop contractors - some worked in both low-rise residential and small-scale commercial building.)

The union wage contours are less well-defined. The few rates negotiated with heavy and highway contractors are quite similar to the commercial rate. This finding in Denver and Boston is not inconsistent with apparent national patterns: heavy and highway rates are usually the same, or slightly greater than, the commercial rate. The two examples of residential rates in Denver, however, are more interesting. In negotiating the rates for carpenters and electricians, the union has approximated (or met) the observed competitive rate in the open shop sector. In fact, the carpenters' rate is part of a union program, called CHOP, to organize residential construction. In Boston, there are no residential rates reported in effect in 1976. Attempts to negotiate a reduced rate for federal housing program failed during 1977 and, at present, the union does all public residential work (both state and federal) at the commercial building scale.

Firm Size and Wages

The final attempt that can be made to approximate homogenous occupational categories between union and nonunion work is to compare journeymen in firms of roughly equivalent size in the same product market. This comparison is limited, of course, by the small number of large nonunion firms. Table 3.2.10 presents results from the available data on four crafts in small and large firms in commercial building in Boston and Denver. Of the seven examples of occupations with workers in both firm size categories, six show significant differences between the mean wages. In five out of these six,

the hourly wage is substantially higher in the larger firm. A comparison of these higher nonunion wages with the union scale results in an unweighted mean differential of twenty-nine percent. There are two anomalies in this comparison: carpenters show only a 4% differential in Boston and open shop electricians in large firms in that area apparently are paid less than in small firms.

Without additional information on worker characteristics - or even direct measures of productivity - comparisons based on firm size are about as close as one can come to approximating the "competitive" wage of union labor. It is suggestive, but no more than that, that these comparisons reduce the union-differential to a more moderate thirty percent. Obviously, a smaller union wage premium is both easier to sustain in market and easier to rationalize as indicative of other unobserved skill differentials than the gross differentials of fifty percent or more reported above.

Nonunion Wage Dispersion

One of the phenomena most frequently overlooked by economists studying the wage impact on wages is the substantial variance in nonunion wages within occupations. This dispersion is sometimes so great as to have prompted Raimon to characterize wages of semi-skilled workers as "indeterminate." Raimon also showed that in unionized labor markets, the union impact narrowed the wage dispersion among semi-skilled factory operatives. While much of Raimon's work has been superceded by econometric estimates of hedonic wage equations, the inability of such equations to explain all variation on the basis of

observed human capital attributes leaves much dispersion still "indeterminate."

For the skill levels "journeymen" and "helpers" in five construction occupations in Boston and Denver, the dispersion of wages is presented in Tables 3.2.11 and 3.2.12. These dispersions reflect wages paid to the occupations across all product markets; consequently, some of the variance is due to major skill differences. Several notable facts emerge from the dispersions. The first is the extreme range of wages paid for nominally the "same" occupation in the "same" industry: construction. Clearly, with this great a variance in wages the kind of attention to unobserved differences in skill levels attempted above is justified. Second, there is substantial overlap between the wage range for journeymen and for helpers, although there remains an obvious difference in means within each skill group. Again, this points up the difficulties of defining homogeneous skill and job classification in the industry. Third, the upper tail of the journeyman's wage range usually overlaps with the union wage scale (excluding benefits). In some cases this overlap is very small; yet for five out the eight skilled occupations and for laborers in both cities well over ten percent of the sample of nonunion journeymen earn within one dollar of the union scale. In addition, a substantial percentage of the foremen earn the union rate or more. If "threat" effects can be discounted, this overlap between the upper tail of the nonunion wage dispersion and the union scale suggests that the union rate is not very far removed from at least one indicator of the competitive wage or marginal product of some workers in construction.

Table 3.2.10

OPEN SHOP WAGE RATES BY SIZE OF FIRM

COMMERCIAL BUILDING CONTRACTORS

	General Contractor		Union	Subcontractor	
BOSTON	Small	Large	Rate	Small	Large
Bricklayers	7.44	9.55	9.90	7.75	----
	(.21)	(.52)		(.17)	----
Carpenters	7.34	7.85	10.00	9.28	----
	(.09)	(.47)		(.39)	----
Electricians	6.11	4.08	11.25	6.52	6.11
	(.21)	(.36)		(.14)	(.35)
Plumbers	5.91	8.43	10.80	7.80	6.90
	(.15)	(.05)		(.25)	(.24)
DENVER					
Bricklayers	5.68	----	----	8.52	----
	(.16)	----		(.63)	----
Carpenters	5.71	6.98	9.19	8.15	----
	(.10)	(.14)		(.23)	----
Electricians	7.13	8.50	10.94	7.50	----
	(.21)	(.26)		(.10)	----
Plumbers	4.82	8.00	10.30	5.91	6.80
	(.25)	(.24)		(.54)	(.22)

Note: Standard errors in parentheses.
Source: See Table 3.2.1.

Table 3.2.11

Boston Hourly Wage Distribution (Range in $)

	F*	W*	2.50 2.99	3.00 3.99	4.00 4.99	5.00 5.99	6.00 6.99	7.00 7.99	8.00 8.99	9.00 9.99	10.00 10.99	11.00 11.99	12.00 12.99	13.00 13.99	14.00 20.00
Bricklayer															
Foreman	22	34	-	--	--	1	1	2	14	6	8	2	--	--	--
Journeyman	19	67	-	--	--	10	20	20	8	4	5	--	--	--	--
Apprentice	9	19	-	--	14	3	2	--	--	--	--	--	--	--	--
Helper	14	26	-	8	5	4	5	4	--	--	--	--	--	--	--
Carpenter															
Foreman	60	137	-	5	5	11	29	22	30	3	22	1	6	2	1
Journeyman	50	212	-	1	13	23	52	56	35	13	8	7	--	4	--
Apprentice	30	77	-	12	29	21	12	2	1	--	--	--	--	--	--
Helper	27	71	8	14	24	9	15	1	--	--	--	--	--	--	--
Electrician															
Foreman	39	73	-	--	1	12	19	24	13	--	1	--	2	--	1
Journeyman	27	117	-	--	2	41	58	11	4	--	--	1	--	--	--
Apprentice	24	69	4	19	24	16	5	--	--	1	--	--	--	--	--
Helper	23	78	8	38	23	8	1	--	--	--	--	--	--	--	--
Plumber															
Foreman	32	73	-	--	--	3	12	12	27	2	9	7	--	--	1
Journeyman	38	131	-	--	4	20	27	36	30	8	4	--	2	--	--
Apprentice	34	272	2	13	29	220	7	1	--	--	--	--	--	--	--
Helper	12	26	-	6	12	7	1	--	--	--	--	--	--	--	--
Laborer															
Foreman	28	63	1	2	9	9	8	8	24	1	1	--	--	--	--
Journeyman	31	144	-	15	27	38	11	34	18	--	1	--	--	--	--
Apprentice	5	13	1	4	5	3	--	--	--	--	--	--	--	--	--
Helper	9	17	-	8	3	6	--	--	--	--	--	--	--	--	--

*F = Number of Firms; W = Number of Workers.
Source: See Table 3.1.2.

Table 3.2.12

Denver/Boulder Hourly Wage Distribution (Range in $)

	F*	W*	2.50 2.99	3.00 3.99	4.00 4.99	5.00 5.99	6.00 6.99	7.00 7.99	8.00 8.99	9.00 9.99	10.00 10.99	11.00 11.99	12.00 12.99	13.00 13.99	14.00 20.00
Bricklayer															
Foreman	16	29	--	--	--	5	5	2	5	12	--	--	--	--	--
Journeyman	20	84	--	--	1	11	20	19	21	5	2	5	--	--	--
Apprentice	14	47	--	15	3	21	7	--	1	--	--	--	--	--	--
Helper	10	44	--	6	21	12	--	5	--	--	--	--	--	--	--
Carpenter															
Foreman	77	209	--	1	1	13	57	58	47	15	12	1	4	--	--
Journeyman	82	703	--	13	128	161	192	133	71	3	2	--	--	--	--
Apprentice	47	285	--	56	134	78	14	3	--	--	--	--	--	--	--
Helper	38	154	9	71	65	4	5	--	--	--	--	--	--	--	--
Electrician															
Foreman	21	35	--	1	--	2	3	13	8	4	2	1	--	--	1
Journeyman	17	47	--	--	2	4	9	19	7	6	--	--	--	--	--
Apprentice	15	33	--	4	16	10	3	--	--	--	--	--	--	--	--
Helper	9	24	3	6	9	6	--	--	--	--	--	--	--	--	--
Plumber															
Foreman	22	57	--	6	1	9	13	8	11	2	3	4	--	--	--
Journeyman	26	99	--	6	15	17	28	14	14	5	--	--	--	--	--
Apprentice	15	54	--	9	20	23	2	--	--	--	--	--	--	--	--
Helper	14	88	1	75	7	3	--	2	--	--	--	--	--	--	--
Laborer															
Foreman	37	126	1	11	26	23	25	4	6	1	3	14	5	5	2
Journeyman	33	211	2	82	50	41	27	7	--	2	--	--	--	--	--
Apprentice	16	57	--	11	25	18	3	--	--	--	--	--	--	--	--
Helper	17	132	13	92	13	1	13	--	--	--	--	--	--	--	--

*F = Number of Firms; W = Number of Workers.
Source: See Table 3.2.1.

Indeed, if the union rate is compared to only these higher wages in the open shop sector, the union/nonunion wage differential drops to about five percent.

One other fact of interest may be gleaned from comparisons of the wage dispersion: occupations which, due to technology and/or licensing requirements, might be presumed to be more "homogeneous" in skill composition - such as electricians - do not evidence much less dispersion than those, like carpenters, which are disparate and unlicensed. All of the skilled trades manifest roughly the same wide variance in wages; their helpers have a narrower, but similarly consistent, range. Part of this wage dispersion in the open shop sector results from many different firm-specific occupational definitions. Many firms included in the questionnaire occupational titles which indicated a much narrower range of skills than contained in the (ideal) broadly-trained journeyman in union craft occupations. Table 3.2.13 lists the open shop names for occupations similar to union carpenters, sheetmetal workers, and plumbers. In cases such as "drywall nailer," "aluminum siding mechanic," and "welder" the titles imply a much finer division of labor in some open shop firms which, if filled by a semi-skilled, very specialized workman, may carry a lower equilibrium wage. Such a reliance on heterogeneous, specialized workers skilled in only a few construction tasks may explain the wide distribution of wages across the lower end of the open shop wage distribution.

Finally, it should be noted that the wage dispersion evident in open shop construction is, in fact, a result of a conscious wage

Table 3.2.13

UNION AND OPEN SHOP OCCUPATIONAL TITLES

UNION TITLE	OPEN SHOP TITLES
Carpenters:	Carpenters:
Carpenters	Rough Carpenter
Millwrights and Pile Drivers	Framer
Floor Layers	Finish Carpenter
Drywall	Roof Carpenter
	Drywall Nailer
	Drywall Taper
	Drywall Scraper
	Formsetter
	Cabinet Maker
Plumbers:	Plumbers:
	Pipe Layer
	Pipe Welder
	Pipe Installer
	Water System Installer
	Sprinkler Installer
	Pump Installer
Sheet Metal Worker:	Sheet Metal:
	Refrigeration Mechanic
	Sheeters
	Welders
	Air Conditioning Mechanic
	Aluminum Siding Mechanic
	Gutter and Pipe Work
	Duct Installer

Source: See Table 3.1.2 and text.

policy by nonunion contractors. In the field interviews, one of the most highly prized aspects of the flexibility of nonunion management was the ability to pay individual workers "what they were worth." This led many firms to create wage structures to reward many firm-specific attributes, as well as fitting compensation to idiosyncratic characteristics of workers, such as "initiative" or "integrity," in addition to obviously productive traits such as "mechanical skill" or "experience." As a result of this management approach, most wage levels were bargained individually with workers and were not set by any standard formula even within one firm. The union wage structure, where most journeymen get a fixed hourly rate, was seen as a great threat to both individual motivation and management rights by open shop contractors.

Craft Union Wage and Skill Structure

One of the hallmarks of craft unions is the bifurcation of the occupational structure into a high skill group, journeymen, and a lower skill group, apprentices. A separate union, laborers, is available for some unskilled work but, due to jurisdictional lines, they are severely circumscribed in their activities. Carrying of iron rods, electrical or plumbing fixtures, and wood cannot be done by laborers but only by journeymen or apprentices of the ironworkers, plumbers, electricians, and carpenters. At present, very few of the building trades have an unskilled or helper category internal to the jurisdiction. For the most part, apprentices play this role: performing routine or unskilled tasks. This has not always been the

case, however. In the early years of the building trades unions between 1880 and 1920, nearly every craft had helpers. Some of these were, in fact, informal apprentices; others were permanently fixed in that grade. In at least one case, the steamfitters in Chicago, the helpers formed a separate local union. Ordinarily, helpers were assigned to journeymen on a 1:1 ratio and a basic crew for plumbing, carpentry or electrical work would consist of even proportions of journeymen and helpers.

The creation and structuring of formal apprentice programs by some unions did away in most cases with the helper category. One of the primary goals of the U.S. in the 1880's, its formative years, was controlling entry and training in the trade. The means for doing this was the structuring of four to five year apprenticeship programs which would permit entry on the basis of specified criteria and at the same time eliminate the widespread practice of employing helpers who might, through informal training, flood the trade with journeymen. At this time, the high ratios of four or so journeymen to one apprentice were established and usually applied on a firm, rather than a project, basis. It should be noted that the employers were not completely opposed to this restructuring of the labor force. They, as well as their journeymen, suffered from competition from small contractors who, after one or two years' work as a helper, had set up shops on their own and competed for work. Apprenticeships served to help control entry not only into the labor force but, given the low costs of entry in creating small firms, into the product market as well.

In contrast to the rigid union apprenticeship programs, one of the supposed advantages of open shop firms has been the ability to maintain some flexibility in skill categories and ratios. For the most part, these "categories" are largely informal and are visible only by noting the differing wage dispersion in roughly defined skill levels such as foreman, journeyman, helper, and apprentice. However, large union firms such as Daniels, Inc. and Brown and Root, Inc. have developed formal systems of labor grading within each craft category. Brown and Root, for example, has four grades of pipefitters, with different skill and wage levels, below the level of "craftsman." While these grades may be comparable to first through fourth year apprentices in the union system, there are two notable differences: there are no time limits attached to the grade and there are no fixed ratios between the lower grades and craftsman.

Offsetting the open shop contractors' freedom to substitute unskilled or semi-skilled labor for skilled journeymen may be the necessity to provide supervision for those labor groups. Ideally, the union journeyman is both mechanically skilled and professionally trained to work independently on varied aspects of construction. Lesser skilled mechanics, lacking training, broad experience, or standards of the craft, may require both assistance and supervision to work productively. This supervision costs money and may offset at least some of the gains from the lower unskilled wages.

In sum, there may be major differences between the wage and skill structure of union and open shop construction. The difference in these structures might be said to represent two different labor

technologies of work: one focused on the "journeyman" and one a finer, more "industrial," division of labor. Of course, there are no necessary or obvious implications of these differences in skill structure for overall efficiency of union or open shop construction. The trade-offs may be such, in fact, that the total wage bill will be equivalent: a larger number of both unskilled and supervisory workers in open shop construction will be offset by fewer of both in union construction combined with more highly paid journeymen. Only empirical studies of the costs of actual construction projects can confirm whether this trade-off, or equivalent wage bill, exists. However, attention to the entire wage and skill structure of both union and open shop construction again confirms that concern with a single wage differential is misguided. Union journeymen may in fact earn more per hour than nonunion mechanics, but at least part of this differential could represent embodied supervisory skills. In the open shop sector these are not contained in the "journeyman" and thus not reflected in the wage; but have to be provided in an additional number of foremen at a higher labor cost.

The data available on skill ratios available from the survey confirm the hypothetical ratios described above. In its present form the data cannot be tabulated on a firm or project basis, so aggregations across all firms in one product market will have to suffice. For six occupations in Boston, the average skill ratios in open shop work were .6 foremen to one journeyman to .7 helpers and apprentices. Similar results were reported for Denver: .5 to 1 to 1.1. (See Table 3.2.14). These ratios can be compared to "best practice" estimates on the ratio of foremen to journeymen in union commercial construction. These

estimates are roughly one foreman to ten journeymen, though practice may vary widely by type and scale of project. The ratio of apprentices to union journeymen is usually one for every four or five journeymen employed in a firm. So, a presumed ratio of skills in union work is: .1 to 1 to .2. Comparison of this ratio with the survey results on the open shop reveal the expected differences: open shop construction employs both more workers and apprentices and more foremen than union work.

Union Wage Differentials - Implications

What the numerous percentages show in the above sections is that it is very difficult to fix on one estimate of the union/nonunion wage differential in construction. In large part, this is due to the complexity of both demand and labor supply in the industry. Products are highly differentiated; while the character of the labor force can vary substantially even within common occupational classifications. Although other industries may be equally complex, the econometric estimation of wage differentials appears to provide for them a more valid comparison of union and nonunion labor than it does in construction. However, it may be that closer attention to industrial organization, product differentiation, and worker characteristics and preferences in some manufacturing industries would also raise questions about the true size of a union wage differential.

The comparative data on union and nonunion wages does give some insight into the different wage structures in each sector of the construction industry. But it also presents a difficult problem for

Table 3.2.14

SKILL RATIOS (BUILDING)

	Average Skill Ratio	Plumber/ Pipefitter		Sheetmetal		Bricklayer		Carpenter		Electrician		Operating Engineer		Union
DENVER		#	R	#	R	#	R	#	R	#	R	#	R	
Working Foreman	.5	18	.6	14	.3	12	.4	65	.5	22	.7	10	.4	.1
Journeyman	1.0	30	1.0	57	1.0	34	1.0	125	1.0	34	1.0	23	1.0	1.0
Apprentices & Helpers	1.1	81	2.7	21	.4	28	.8	91	.7	40	1.2	14	.6	.2
BOSTON														
Working Foreman	.6	18	.7	15	.6	10	.5	51	.5	56	.6	7	.5	.1
Journeyman	1.0	27	1.0	27	1.0	19	1.0	94	1.0	89	1.0	15	1.0	1.0
Apprentices & Helpers	.7	21	.8	16	.6	8	.4	53	.6	104	1.2	5	.3	.2

Note: The skill ratio, R, is the number of foremen or apprentices/helpers per journeyman. The number in column # is the total number of foremen, journeymen, or apprentice/helper reported in the survey.

the analysis of the union impact on industry and even for the theory of union behavior. Obviously, one would like to have a consistent and simple estimate of the union wage premium - or, conversely, of the shadow price of union labor supply - in order to integrate it with the observations on the non-wage behavior of unions to be presented in Chapter Four. A relatively small union wage premium is reflected by some of the percentages computed above; it is also consistent with the interview findings reported below of a lack of union limitation of the labor supply. But such a small premium is certainly not in keeping with general, qualitative impression of the building trades' "monopoly power" and "high wages." Even if this conventional wisdom is wrong, which it very well may be, it leaves one rather fundamental question unresolved. Given that the construction unions are monopolistic, in that they are in some sense single suppliers of labor to union firms, what monopoly power do they possess, if any, and how do they use it?

The answer to this question requires that the information on both wage and non-wage impacts of the unions be integrated with observations on the industrial organization of construction; on the trends and elasticities of product demand and of labor supply; on the strategies of workers, firms, unions and employee associations in the industry. In addition, attention should be paid to the role of government bureaucracies and legislative and executive bodies. All of these economic and political structures impinge upon, as well as being influenced by, union goals and behavior. The scope of this research, limited largely to management interviews and wage surveys,

is not adequate to portray the full complexity of the industry or the unions' role in it. Nonetheless, these observations can be used to develop a tentative model of the union behavior which is related to the structure of the construction industry. This is presented in Chapter Five.

In terms of estimating the impact of union wages on construction costs, however, a new and different academic methodology is clearly needed. If there are major differences in workers skills and occupation structure between the union and nonunion sectors of construction, further research must either compare construction costs or worker productivity directly or develop better proxies for individual skills. In fact, the only study to undertake a direct cost comparison of similar types of construction built by union and nonunion contractors, research by Mandelstam in the early 1960's, found that although nonunion hourly wages were substantially lower than union rates, the total wage bill for both organized and open shop contractors was virtually identical.[12] In other words, although nonunion contractors paid lower wages they used more labor: a clear indication that the lower wage reflected lower productivity. With the rapid rise in union wages in the late 1960's these results may no longer be valid (i.e. it may be very difficult for the unions to "earn" the high hourly wage in all sectors of construction) but at least such comparative cost studies can focus directly on actual productivity in particular market contexts and not rely on proxies for skills or assumptions about competitive market outcomes.

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[12] Allan Mandelstam, "The Effects of Unions on Efficiency in the Residential Construction Industry: A Case Study," Industrial and Labor Relations Review, Volume 18, 1965, pp. 503-521.

4. NONWAGE IMPACT OF CRAFT UNIONS IN CONSTRUCTION

4.1 The Labor-Management Context

> "A union does not limit its function to raising wages, shortening hours and improving working conditions, but assumes the perogative of protecting them against any contingency."
>
> Haber[1]

> "...there is no clear understanding of what the various devices of union influence at the plant level imply in terms of interests of the respective parties: which devices serve whose interests, and under what conditions; and what are the aggregate functions of job control rights? Analysis should include workers, union bureaucracy and management as distinct parties, and should pay attention to whether the cost of union progress in a particular relationship is passed on to groups elsewhere in society."
>
> R. Herding[2]

Craft unions, particularly in the construction industry, have always been exemplars of the industrial relations adage that 'unions affect everything' in the employment relation. The building trade unions define, through jurisdictions, the exact nature of the work their members can and cannot do. The unions also determine wages for specific skill levels in a trade, usually just a "journeyman" or an "apprentice", not permitting large variations in either wages of men in one skill classification or in the classifications

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[1] William Haber, Industrial Relations in the Building Industry, Harvard University Press, 1930, p. 214.

[2] R. Herding, Job Control and Union Structure, Rotterdam University Press, 1972, p. 12.

themselves. Collective bargaining contracts may also contain provisions relating to many aspects of the on-site construction work: tools used; number of men required; materials permitted; scheduling and shift work; etc. In addition, the union may also play a major role in the referral of men to the contractor and in the operation of apprenticeship and other training programs.

It might be supposed that there would be a variety of ways to describe and analyze the complex impact of these nonwage activities of craft unions. Yet, most often in the popular press, examples of some particular work practice will be used as sufficient evidence of the general inefficiency and impracticality of craft union methods. Especially "restrictive" practices will be used to indict all union effects as clearly inefficient. In the few examples of serious academic research in construction, a less perjorative description of union practices is given. But because of the special circumstances under which the two cases of major field research have been done by Haber and Levinson and Foster and Northrup, no attempt was made to see to what extent the "union work practices" were in fact peculiar only to the unionized sector of the industry. Haber and Levinson's survey in the early 1950's was based almost entirely on union contractors.[3] Foster and Northrup's empirical study covered only the open shop sector, though they make some allegations about union

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[3] William Haber and Harold Levinson, Labor Relations and Productivity in the Building Trades, University of Michigan Press, 1956.

activity.[4] As a result, there is still no clear understanding of the extent to which the nonwage aspects of union impact are solely attributable to unions themselves or largely a characteristic of the "normal" labor market organization of the construction industry. Obviously, some facts about the incidence and types of union impacts on the industry must be gathered before any evaluation of the contribution to or detraction from the efficiency of the industry can be made.

More importantly, owing to the absence of comparative union/nonunion field research, there is very little evidence in the labor economics and industrial relations literature that academics really understand the nature of union-management relations, particulary in regard to the nonwage aspects of union behavior. Because collective bargaining is an inherently adversary process, evidencing a struggle over the distribution of gains from work, all aspects of union-management relations have come to be interpreted in an adversary - or distributive - context. This interpretation is particularly characteristic of writing on craft unions, especially in the construction industry. Yet, the lack of consistent and comparative evidence for restrictive practices (in the building trades, at least) coupled with the relative absence of acknowledgement of the positive contributions that craft unions may make raises questions about a purely one-dimensional, adversary or distributive, view of labor management

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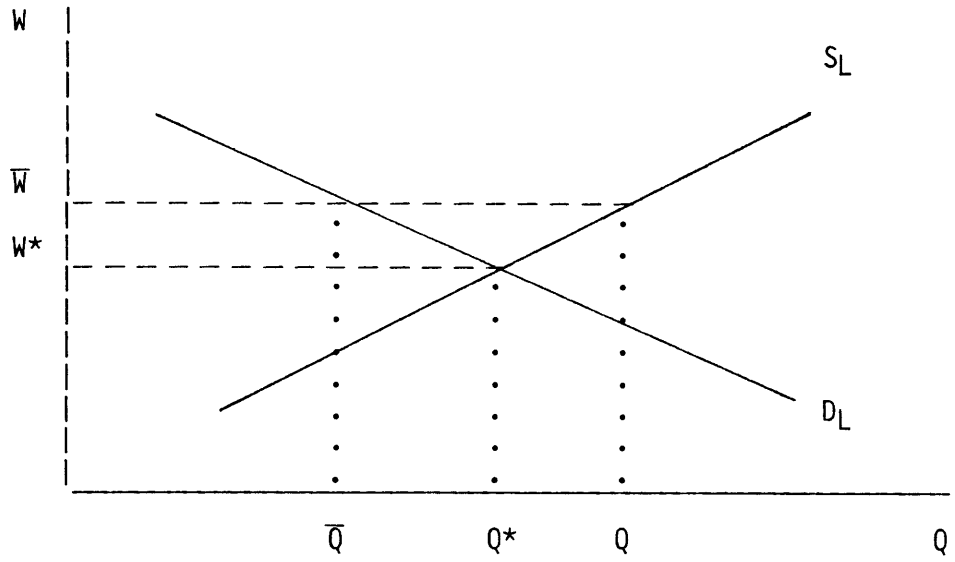
[4] F. Northrup and Howard Foster, Open Shop Construction, University of Pennsylvania Press, 1975.

relations. It may be that union behavior makes some positive contributions to management efficiency which are overlooked - or at least under-emphasized - when union activity and goals are interpreted solely in a distributive context.

In fact, descriptions of union non-wage behavior are more often deduced by labor economists from the monopoly model of unionism that they are induced from field research. According to the monopoly model, a union which succeeds in raising wages above equilibrium must then restrict entry to protect the disequilibrium wage. In its simplest form, (see figure 4-1) the union raises the wage to $\overline{W}$, requiring that it restrict entry to $\overline{Q}$; otherwise, workers out to Q on the supply curve would be available for employment and bid wages down to W*. While, in the very short run, strikes may play the role of restricting supply, the union must adapt other means to sustain the higher wage in the face of presumably elastic labor supply. These "other means" are taken to be many of the nonwage elements of collective bargaining. Thus, as Haber's quote above suggests, many of the institutional activities of unions have been assumed to be the necessary and rational manifestations of union wage gains.

In the following, a new attempt is made to define and discuss objectively the key types of nonwage union impact in construction. These impacts include: (1) jurisdictional definition; (2) skill and wage structures; (3) technology and work rules; (4) hiring and referral systems; and (5) training and apprenticeship programs. On the basis of the existing research and theory a short description of the supposed union impacts and goals is given for each

Diagram 4-1 - Union Labor Monopoly



of these five aspects of labor-management relations. Then, survey results from interviews with sixty-five union and nonunion contractors are presented in order to describe empirically, on a comparative basis, actual labor-management practice. Finally, a sketchy and somewhat intuitive "map" of the industry is developed which relates particular types of nonwage behavior in the industry to firm and project size; different product markets; and union and nonunion organization.

Survey Issues and Methodology

To begin to answer many of the questions about the role of nonwage union impacts on construction labor management, sixty-five contractors were interviewed in Boston and Denver during the summer of 1976. The survey approach was designed to contrast union and nonunion contractors in comparable product markets and of comparable

firm sizes. Thus, an attempt was made, given limited resources, to include union and nonunion general and subcontractors, both small and large firms, in residential, commercial, and heavy and highway construction.

The survey instrument was designed largely on the basis of informal discussions with nonunion contractors in the Boston area in 1975. The discussion topics covered: background information on the type of firm; skill and occupation definitions; jurisdictional problems; use of tools and materials; hiring practices; and training. Because of the length of the final questionnaire developed from these interviews, very few of these issues could be covered in depth. Each alone is sufficient for a comparable union/nonunion study. As a result, the survey coverage is occasionally incomplete, particularly where the respondent chose to expound on one or more questions and not on others.

Construction firms were chosen for the survey on the basis of referrals by local contractor association representatives. Usually the author was referred to specific individuals in the firm. Survey interviews were usually held at the office of the contractor and lasted from twenty minutes to an hour, depending on the time and interest of the contractor. The survey approach was generally open-ended; the range of issues discussed in the questionnaire was explained, general comments were requested, and the ensuing conversation was directed to complete most of the questions.

In general, gathering this kind of data on behavior of workers, unions, and firms presents great problems for social

scientists. If what is desired is a true reporting of day-to-day operations in construction, then some form of participant observation is best. Since the comparative approach of this survey would make such participant observation costly and time-consuming, the survey interviews had to be undertaken in a manner to evoke "honest" comments and observations. In order to accomplish this, contractors were not contacted on a random basis nor was the survey approach highly structured or "objective". Rather, contractors were pre-selected by association executives as those most likely to be cooperative and informative. Personal referrals were made to the individuals interviewed and, in at least some of the cases, the interviews began with a general conversation about union or open shop problems in the industry that served, among other things, to establish the credentials of the interviewer as one who was well-informed about the industry and not in need of a laborious education. While this approach may have biased the sample of firms chosen or affected some of the survey results, the purpose of the survey was not entirely to describe firms themselves but to establish some general patterns of labor and management behavior in the union and nonunion sectors of the industry. More precise measurements and interpretations of these differences may have to await in-depth study of each of the nonwage issues described.

The following sections report on the survey findings. Five issues are covered: (1) jurisdictional definitions; (2) skill levels and occupational structure; (3) tools and work practices; (4) hiring process; and (5) training and apprenticeships. Survey findings on

these issues are reported for (1) general contractors in commercial building, both small and large and union and nonunion, (2) for subcontractors along the same dimensions. The information on open shop general contractors is supplemented by material on the operations of Daniels International Inc. and Brown and Root, Inc., as there are no comparable nonunion general contractors in the Boston and Denver area. In addition, general information on trends in the industry, obtained from contractor association staffs and trade publications, is included where relevant.

4.2 Jurisdiction--Introduction

Over the past eighty years or so of their history, U.S. building trades unions have been continually plagued by problems of jurisdictional definition and disputes. In the construction industry, there have been two main underlying causes of these jurisdictional difficulties. The first cause lies in the ambiguous character of a craft union itself: an ambiguity which may give rise to competition between craft unions or between craft and "industrial" unions in organizing workers. The second cause lies in the tension between the contractor's need for a flexible organization of on-site work and the unions' desire for clear task demarcations which, by controlling jobs, will help to maintain the political identity and economic strength of the local union. Note that there are two meanings of "jurisdiction". One is the allocation of organizing rights to a particular union, in order to prevent dual or competitive unions within the AFL-CIO. The

other is the content of work undertaken by the membership of a particular building trades unions.

Craft unions in construction are organized by combining workers with particular tasks or capabilities into self-governing local bodies. At present, there are eighteen different building trade unions affiliated with the AFL-CIO, each of which is granted "exclusive jurisdiction" over the organizing workers within its craft (See Table 4.1). However, the existing craft structure of the union organization has been determined and shaped as much by historical circumstance and political forces as by construction technology and labor market conditions. In the nineteenth century, most craft unions were very narrowly defined around workers with a single capability and function. By the end of the nineteenth century, as larger national unions grew out of local associations, rivalries occurred as to which unions would organize which workers. The desire of some unions to enlarge and strengthen their political and economic structure led to the inclusion of workers in related, or even distant, occupations. Different philosophies of union organization, such as the "one big union" of the Knights of Labor, also led to an attempt to organize regardless of occupation, rather than because of it. The present craft structure of the U.S. building trades is, then partly a result of these union rivalries. The rivalries brought the creation of the Building Trades Departent in the AFL in 1908, which made many attempts to resolve jurisdiction problems in organizing, but competition

Table 4.1

BUILDING TRADES' UNIONS AND THEIR JURISDICTIONS
(Some Examples)

UNITED BROTHERHOOD OF CARPENTERS AND JOINERS - The Brotherhood asserts jurisdiction over most work operations involving wood, plastics, and metals where used in place of wood (such as light metal stucco), and substitute materials, and over thirty subdivisions of the carpenter's trade. The major occupational elements of the international are general-construction carpenters, millwrights, piledrivers, marine carpenters, millmen, lumber and sawmill workers, and furniture workers. Most members are organized into either general-construction, pile-drivers, dock builders, millwrights, or wood-products-industry locals. The general construction locals are by far the largest element of the international union.

THE UNION ASSOCIATION OF JOURNEYMEN AND APPRENTICES OF THE PLUMBING AND PIPE FITTING INDUSTRY - The UA has membership and bargaining agreements in the following industries: industrial maintenance, pipeline construction, gas distribution and utilities, pipe-fabrication shops, panelboards, instrumentation and control manu-facturing, refrigeration and air-conditioning installation, building construction, and naval and private shipyards.

THE BRICKLAYERS, MASONS AND PLASTERERS INTERNATIONAL UNION - the BMPIU asserts jurisdiction over the following types of work: brick-masonry, stonemasonry, marble masonry, plastering, marbel, mosaic and terrazzo work, the laying, pointing, calking and cleaning, and cement or concrete-block laying. Local unions may be of a single type, or mixed. Large cities have the most extensive specialization of craft and local union jurisdictions. In New York City, there are separate locals of brickmasons, pointers, and tile setters, each with an exclusive jurisdiction.

THE INTERNATIONAL BROTHERHOOD OF ELECTRICAL WORKERS - The IBEW includes membership in the following industries: electrical construction, electrical manufacturing, communications (including radio, television, telephone), and power utilities. The international asserts jurisdiction over the manufacture, assembly, construction, installation erection, maintenance, repair, and operation of all electrical equipment and all materials and equipment required in the production and delivery of electricity.

SHEET METAL WORKERS' INTERNATIONAL ASSOCIATION - The jurisdiction of the international includes fabrication, assembly, handling, and erection of all sheetmetal work, including all air-handling systems, ductwork, etc. The union represents employees of contractors in the building industry and of production or industrial companies in railroads, shipyards, etc.

Source: D.Q. Mills, "The Labor Force and Industrial Relations" in J. O'Brien and R. Zilly (eds) Contractor's Management Handbook McGraw-Hill, 1971.

persisted, both between the AFL unions and later between them and the CIO. At present, the matter continues to be resolved by the granting of exclusive jurisdiction to the different craft unions and by policing of those jurisdictions by the Building Trades Department.

As the result of this evolution of the construction craft union in the U.S., the narrowness of the craft oriented union has sometimes been lost. Some craft unions grew by resolving jurisdictional problems through amalgamation: the plumber, pipefitters, and steamfitters, for example, is a combined union of various pipe trades or specializations which in many cases existed as separate local craft unions. (In some cases, usually in large cities, there are still separate locals for plumbers and pipefitters in the U.A.) Other unions, like the carpenter, joiners, and millwrights, grew both by amalgamation; by organizing factory workers doing cabinetry and by signing up ancillary trades, such as the floor layers. Still other unions, like the Elevator Constructors, combine different workers of different skills around the installation of a particular product. Finally, some unions like the ironworkers do not include any semi-skilled workers or laborers while others, like the bricklayers and masons do. As a consequence, there is a separate union in the building trades for common laborers whose jurisdiction includes the less skilled work outside of all of the other trades.

Not only is the organization structure of craft unions in the U.S. not always determined by the particular skills of workers, the structure is unique to the U.S. Other countries, with similar if

not identical construction technology, manifest a different variety of craft organizations. In England, the plumbers and electricians form one union. In Denmark, all of the laborers and semi-skilled workers are in one large union while the craft unions are limited to highly skilled specialists.

Thus, the present structure of the building trades unions established the concept of exclusive jurisdiction over types of construction work. The carpenters control work relating to wood, but also are assigned some tasks which involve metal (normally the province of ironworkers) because these tasks were formerly done by carpenters before metal forms and frames were substituted for wood ones. Electricians control all installation of materials relating to electrical conduit and fixtures, and so forth. Records of jurisdictional agreements between trades are described in "the Green Book", which is published by the National Joint Board for the Settlement of Jurisdictional Disputes. The Board both attempts to come to voluntary agreements over the assignment of work, particularly in the case of new materials and technology, as well as acting to resolve jurisdictional disputes which occur in the industry.

Jurisdictional disputes arise on the work site for a variety of reasons. (Note again, as Dunlop comments, that "In the jurisdictional dispute proper the contending organizations are not seeking new members; they are demanding the work in dispute for existing members.")

One fairly comprehensive list of dispute causes included:[5]

1. overlapping of jurisdictional claims and skills of craft unions
2. existence of dual unionism
3. aggressiveness of some unions
4. changes in methods, machinery, and materials
5. actions of employers
6. differing local customs or practice

The concept of exclusive jurisdiction and the activities of the Joint Board have not served to eliminate all disputes caused for any one or more of these reasons. Of the six mentioned, existence of dual unions is probably the least important: dual unionism is usually not an issue between the AFL Building Trades, although it often is a cause of disputes between the building trades and the teamsters. The relative importance of other causes of disputes is unknown. The most recent detailed study of jurisdictional problems found, though, that most of the disputes occurred between eight unions and usually involved work in the boundary between the skills or materials used by different crafts.[6] Although not all jurisdictional disputes result in work

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[5] Kenneth Strand, Jurisdictional Disputes in Construction (Washington State University Press, 1961).

[6] Ibid., pp. 50-55.

stoppages, the number of stoppages is very high--partly due to the short-term nature of most construction work. In many cases the disputes are caused, willingly or unwillingly, by contractors. In construction contractors have the management responsibility to make the work assignment, but to do it in accordance with Green Book regulations or, in their absence, in accordance with "area practice." In undertaking their management role, contractors may cause disputes by: making no assignment; making mistakes about assignments; economizing and assigning work in one jurisdiction to another trade with a lower rate (this is often the cause of disputes between carpenters and laborers); or by assigning work to their permanent journeymen, in order to keep them employed, even though the work is in the province of another union. Finally, general contractors and various subcontractors may compete among themselves for particular work and this competition may result in the trades they employ crossing jurisdictional lines.

In sum, in terms of the day-to-day operations of a construction project, jurisdictions define occupational boundaries between tasks. Disputes arise apparently because the variety of construction work is so great that there are almost always opportunities to use men outside of their trade jurisdiction. This kind of short-run flexibility may be very important to construction management: it permits temporarily unused men to fill in at other tasks and it saves hiring specialized workers for only a small quantity of work. To the extent that unions

are rigid about jurisdictional assignments, this management flexibility is severely constrained and project costs may be increased. And, in general, one of the greatest sources of management resentment of unions, in construction and in other industries, is their interference with "the right to manage" which of course includes work assignment.

Despite all of the research and management concern about jurisdictional problems in construction, there have been two basic issues overlooked. The first is to what extent the existance of jurisdictions is unique to union construction. The implication of some of the writing on craft unions is that jurisdictions are, in large part, relatively arbitrary occupational boundaries drawn to suit the political and institutional needs of the unions themselves. This view tends to support a belief that jurisdictional rules are created, maintained, and imposed by unions on the industry in furtherance of their political and short-run economic goals. It may be, however, the jurisdictions only reflect "natural" groupings of tasks into occupations as they would occur in construction without the presence of unions. Only a detailed comparison of union and nonunion construction can substantiate the sources of jurisdictional definition.

Second, jurisdictions, as they are codified by union agreements, obviously restrict the short-run flexibility of labor allocation in construction. Yet they have obvious benefits in creating and protecting the jobs and occupational rights of different groups of workers. In fact, Dunlop refers to jurisdiction as defining labor

"property" which the unions protect. Other analysts speak of the role jurisdictions play in creating employment and see them as the worker's justifiable response to a perceived "job scarcity". These distributional purposes of jurisdictions may be verifiable and should be subject to survey research.

It is clear that jurisdictions may play a beneficial political role of limiting competition between unions, but that this jurisdictional structure, if rigidly adhered to, will limit management flexibility and may create some inefficiencies in the allocation of labor on job-sites. Further, it is apparent that jurisdiction may also benefit various workers to the extent they create jobs or prevent the erosion of jobs through competition by other (cheaper) trades. So jurisdictions are important to maintaining a union and union power. What is not clear is: (1) to what extent are jurisdictions "foreign" or "artificial" or obsolete or obstructionist definitions of occupation which are imposed on the industry by unions, or to what extent are they simply codifications of an occupational structure created by technology and labor market forces; and (2) to what extent do jurisdictions and craft unions stabilize the labor force in the industry by helping to define how workers can be screened, hired, specialized in training, and employed. In other words, formal occupational definition and identity may be important in providing security and status to skilled workers in an industry such as construction. Some occupational definition may come naturally through the labor market and the craft unions in these cases may only

reflect and amplify that. In other cases, there may be no inherent or necessary definition of an occupation due to the variety and flexibility of the work. In these circumstances, the unions, through craft and jurisdictional definitions, may help impose a structure which will result in clear work assignments, wage scales, and status differentiation.

This clear occupational definition may be crucial to maintaining a skilled labor force attached to an industry where the employment relation with particular firms is very unstable. By providing such definition and contributing to the maintenance of a skilled labor force, jurisdictions may actually increase the efficiency of the industry. Only a comparison between union and nonunion construction establish where occupations are basically endogenous and unions pick them up and where unions exogenously impose jurisdictional categories which may have both distributive and efficiency implications.

The structure of management in the construction industry adds an additional complication to the understanding of jurisdictions. Construction activity is organized around two basic types of firms, general contractors and subcontractors that undertake specific, though varied, parts of a construction project. Some idea of the complexity of work on even small buildings is given by the list of nearly forty areas of expenditure in Table 4.2. Each one of these areas may be the content of work assigned to one subcontractor on a particular project. However, the exact division of labor between general and subcontractors will vary over both projects and product markets.

Table 4.2

COMMERCIAL BUILDING COMPONENTS

General conditions and management
Sitework (clearing and grubbing)
Roads and walks
Landscaping
Excavation
Caissons and pilings
Formed concrete
Exterior masonry
Structural steel
Miscellaneous metal, including stairs
Ornamental metal
Carpentry
Air conditioning enclosures
Waterproofing and dampproofing
Roofing and flashing
Metal doors and frames
Metal windows
Wood doors, windows, and trim
Hardware
Glass and glazing
Store front and lobby
Curtain wall
Lath and plaster
Drywall
Tile work
Terrazzo
Acoustical ceiling
Resilient flooring
Carpet
Painting
Toilet partitions
Special equipment
Elevators
Plumbing
Sprinklers
HVAC
Electrical
Miscellaneous
Parking

In some cases, the general may play a very small part in actual on-site labor and limit its role to the management of a large group of highly specialized subcontracting firms.

The firm structure of general and subcontractors may be both wider or narrower than craft jurisdictions. In many cases, there will be a rough coincidence between the work of the subcontractor, say heating, plumbing and air conditioning firms, and the crafts they employ: plumbers and pipefitters; sheet metal workers; and insulators. When this occurs, it is in the interest of the subcontractor to support the jurisdictional claims of the crafts: jurisdictions will define a joint monopoly on work. But such coincident interests do not always hold. The work of general contractors may overlap several jurisdictions and thus the interests of the firm may be at best neutral with regard to work assignment. At the other extreme, a subcontractor may be so specialized, say in parquet floor laying, as to work entirely within one sub-craft area: floorlayers of the carpenters. In between, conflicts between subcontractors over work may become jurisdictional disputes between crafts.

The complexity of the relation between craft unions and the specialization of firms in construction obviously destroys any attempt to portray jurisdictional lines as union artifacts or as antithetical to management's interests. Thus, it is important to describe how union and management interests converge and diverge in this area and compare the resulting structures and tensions to behavior in open shop construction.

Firms and Jurisdiction: Survey Results

General Contractors

Most of the anecdotes concerning jurisdictional problems come from the context of the union general contractor. This is because the general usually hires a group of related trades, commonly referred to as the "basic trades" which construct the structural frame of a building. Among these trades are carpenters, laborers, bricklayers, cement masons, iron workers, and operating engineers. Since these trades normally work together on a site during the early stages of construction there is continual opportunity for disputes over jurisdiction.

In Boston and Denver, however, the survey results showed that union contractors, though irate about jurisdictional rigidities, also enjoyed considerable flexibility in craft assignment. Large union general contractors were most concerned about jurisdictional problems. But this concern did not stem from a sense of any inefficiency causes by the existence of jurisdictional lines. Rather, it was due to the costly nature of the disputes themselves in terms of lost work-time. Either avoiding, if possible, or resolving, if necessary, jurisdictional stoppages was a continual, onerous burden on project management. Continual attempts to resolve the bases of the disputes through formal boards for hearings or through contract language revision have apparently failed to eliminate them.

In Boston in 1976, for example, all specific jurisdictional language between carpenters and laborers had been removed from contracts to remove any incentive for disputes. The contracts still

stipulated that assignments were to be made "in accordance with area practice." At least one union project superintendent thought this would be enough to permit disputes to arise if pushed by an ambitious steward or truculent business agent.

Though disputes are clearly a problem for the large union contractor, the existence of jurisdictions per se does not appear to be. Most of the contractors work on projects of a sufficient scale to employ dozens of men in different trades. This scale of work supports the division of labor defined by jurisdictions. Several carpenters can be employed at the same time in various aspects of carpentry work. Crews of ironworkers (rodmen) and cement masons can work exclusively on large-scale contract forms and slabs. In the context of a large construction project, disputes only arise over new materials in tasks on the boundary of different jurisdictions. The only real problem of efficient allocation of labor which large contractors face is in having a "multi-skilled" crew to complete work not done by the basic trades or specialty subcontractors. At the end of large projects, one contractor reported, there is always a large volume of detailed work to be finished: light plates to be put on; doors to be painted; glass panes to be fixed or installed. Most of these simple tasks could be done by experienced laborers--who are on the site cleaning up--but jurisdictional rules prevent laborers from doing any of this work. As a result, journeymen in diferent trades have to be brought back, usually for a full-day, to do a few hours work.

Small union general contractors could be greatly hindered by jurisdictional rules. A small construction job, requiring a half dozen men, might not have sufficient work to employ carpenters, iron-workers, operating engineers, etc. full time every day, but under rigid jurisdictions such trades would have to be employed whenever even a small amount of work in their craft was needed. In many cases, small union generals are not hindered because these jurisdictional rules are not enforced. In setting concrete, for example, union generals use their carpenters and laborers to do the work of iron-workers and cement masons to avoid employing these trades for only a few hours a day. These minor infractions of union rules are usually overlooked, especially if they are of short duration or in rural areas where it is obvious that importing another craft is costly. Overlooking these incidents gives both a contractor and the union a flexibility to adapt jurisdiction rules to differing circumstances. The only problem is that the contractor bears the risk: the rules always could be enforced. Thus it is hard for him to bid a job and know beforehand exactly what his labor costs might be. So the flexibility helps the efficiency of the small general, but the uncertainty makes it risky for the contractor to bid very low. One small contractor in Denver noted that he had to bid concrete work on one project at a cost of $2500. If he could get by doing it with his own supervisor setting the reinforcing bars as he usually did the cost would be only $800.

The experience of union generals outside of the commercial building area is less well documented. One or two interviews with

heavy and highway contractors show an even greater jurisdictional mixing than among small union generals. Contractors employing laborers, operating engineers, and carpenters in water and sewer plant construction or in highway report an almost complete intermixing of tasks. Carpenters will do laborer's work; laborers will serve as operators on small equipment; both will do iron and concrete work. Whether this is common practice or just incidental is unknown. It may be that in union work which depends largely on only the three trades mentioned informal procedures for working across jurisdictions have developed.

In general, then, while the work-assignment implications of jurisdictional boundaries are easy to document in their absurd extreme they are not always inefficient in the union contractor. Large-scale work makes them relatively efficient; small-scale work may find them ignored. In all cases, of course, the role jurisdictions actually do play is at the discretion of the business agent and/or steward of the crafts involved. Outside of jurisdiction disputes themselves, one major problem jurisdiction lines cause is in the uncertainty they raise about manning.

Apparently, the other major difficulty with jurisdictions for the union general is the lack of fit beween the occupations they define and the firm's on-site labor needs. Over the past seventy years, changes in construction technology have reduced the general contractor to largely a project management role. Whereas the general, with his own workforce, used to undertake the construction of the foundation and structural frame of a building, the continual

development of sophisticated steel and concrete technology has moved most of the generals' main tasks off to subcontractors. On major buildings or projects (from two or three million dollars) speciality subcontractors will be engaged for steel frame erection or for use of particular forming devices for cement foundations or floors. As a result, the on-site activities of the general contractor are usually confined to small tasks: "anything the subcontractors don't do." For these tasks, the generals will employ carpenters and laborers but, as mentioned above, they need workers with skills in other areas. Thus, in the area of general contracting, the craft occupational structure of the basic trades unions are, in formal terms, somewhat out of date with the changes in technology and firm structure.

Among non-union generals, there is a great sense of pride in their flexible work-force. All of the non-union generals interviewed in Boston and Denver were small contractors. As a result, their scale of operations on-site rarely justified more than one dozen men specializing in the basic trades. These journeymen often had occupational labels similar to union journeymen, but did a wide variety of other tasks. For example, carpenters would often do iron work or laborers would work on painting if the need arose on-site. Although labeled as a particular trade, the non-union generals often spoke of these men as general mechanics who <u>did</u> "everything the subcontractors didn't do." This blurring of occupational lines usually occurred for one of several reasons: most often, it was due simply to the variety of tasks needed to be done on small-scale construction, where there was not enough work to support one or more

full-time ironworkers, operating engineers, etc. Being exposed to this variety, men would tend to pick up complementary skills in building and use these when necessary to complete a day's work or a job. Some open shop contractors began to formalize this process and refer to their men as general mechanics composing a "work crew". The crew itself would be charged with a particular aspect of construction: pouring cement slabs in forms; or erecting a steel building. In the cement slab example, members of the crew would do all the work of five trades. (In union construction, laborers and operating engineers would clear, grade and grout the site; carpenters would build cement forms; ironworkers would set the reinforcing bars; and laborers and cement masons would pour and finish the concrete.) In nonunion work, a contractor will use a crew which will do little else except cement slab work and whose members will know enough of each of the trade specialities to do the type and scale of work the contractor undertakes. In the erection of metal buildings, the workers were basically ironworkers, rigging a frame in a building and attaching metal siding and roofs, but in the course of construction would also operate small cranes or do light carpentry. As a result, new occupations were in fact formed, "general building mechanic" combining many of the skills of the basic trades or a "steel building erector," adding to the skills of an ironworker those of carpentry, roofer, and crane operator. However, the exact content or nomenclature used to describe these occupations varied by contractor. Some open shop contractors were very similar in the variety of tasks performed by their "carpenters", others were traditional in not extensively mixing tasks into new

occupations. In effect, the contractor was free to create occupations as the nature of the project or the capabilities of his labor force permitted. Thus, the freedom of work assignment, coupled with the variety of tasks associated with different types of building, leads to a very fluid occupational definition. It should be stressed though that the occupations which result are not entirely open. They are largely shaped by the particular product the contractor is constructing; thus occupations are organized around a type or phase of construction: concrete forms; structural framing; metal buildings, etc.

Among large non-union generals like Daniels and Brown and Root, jurisdictional lines and on-site work organization is very similar to union work. Again, it is the scale of activity which supports the craft specializations defined as jurisdictions. (However, there are major differences in skill levels and skill ratios used by large non-union generals and these are described in the next section). Non-union generals like Daniels and Brown and Root do not hire men classified as "general mechanics" nor do they tend to move men from craft area to craft area on a job-site. Rather, the large projects which they build will often employ hundreds of workers of one craft--such as pipefitters--who will do nothing but cut, fit, and weld pipe. Of course, these contractors do enjoy a complete absence of jurisdictional lines and can move men to any small specific tasks when needed, but all the while they program and organize the on-site workforce using mostly common craft classifications.

The large nonunion generals do, however, report differences from similar union general contractors. First, they can create one

or two new occupations to suit a particular type of work. For example, Brown and Root constructs a large number of chemical plants which require numerous values and instruments throughout the piping system. The company has developed a single classification, instrument fitter, to specialize in this work. Second, both Daniels and Brown and Root report that many of the men hired as semi-skilled mechanics for routine carpentry or cement work early in a project may stay on, be re-trained on-site, and do routine electrical or painting work in the later stages on construction. Whether this crossing of jurisdictional lines over-time, as it were, is unique to open shop construction is not known.

Subcontractors

Among nonunion subcontractors, the lack of formal jurisdictional lines has two contrasting implications. First, it may make very little difference since the occupational structure of the mechanical trades is often defined "exogenously" by state licensing of electricians and plumbers or by the structure of subcontracting. State licensing boards define tests for construction occupations by reflecting "traditional" practice in the industry. (This usually means adopting union occupational structure.) The structure of subcontracting also defines similar occupations in the mechanical trades: many open shop subs are identical types of electrical, plumbing, or HVAC firms as their union counterparts. However, the second implication of the lack of jurisdiction rigidity is that some occupation flexibility is possible. This can occur in one of two ways: first, it permits

mechanical crafts to do (or not do) certain related tasks at the discretion of the contractor. For example, open shop plumbers often dig their own trenches for pipe--something they would require laborers to do on union work. Laborers or helpers can be used in open shop construction to wash sinks and bathtubs or set fixtures, work which union plumbers control. In addition, pipefitters may also do pipe insulation work in open shop construction: something which is the province of another trade in union construction. So, the lack of jurisdiction does give the open shop subcontrctor greater flexibility to do ancillary work.

In addition, the jurisdiction flexibility also permits men to be shifted about within large diversified subcontracting firms. For example, open subs in Boston and Denver often combine plumbing subcontracting with HVAC work. The former requires plumbers working on wet pipe, the latter requires sheet metal fabrication. In a firm which does both, those who are specialists in either can be combined with or supplemented by men who can do a little (or a lot) of both. In this way, the firm can maintain permanent employment of its workforce by shifting them from product to product as demand changes. In other words, jurisdiction flexibility contributes to the diversification of the firm and may make possible larger, yet reasonably stable, subcontractors.

This kind of shifting of men as demand changes within a firm is similar to an aspect of jurisdiction flexibility in large open shop generals discussed above. Even though, at one point in time, their jurisdiction lines and occupations look similar to union ones,

they claim that some men work at different trades at different times over the life of the project. For example, carpenters may work on wood forms for the first year of a large job and then move to be electrician helpers (doing light wiring) in later stages. When men are deeply trained in one occupation, as in union work, and codify this by union membership in that craft, this kind of flexibility over time rarely occurs.

Finally, all open shop contractors commented that jurisdiction flexibility was very important to them in employing men in seasonal lows. During winter months, any particular firm may have little work for its permanent crew of journeymen. If these men are constrained by rigid limits on what they can do, their employability is obviously limited. Open shop employees credit their (self-described) ability to ensure more permanent employment to their workers to lack of jurisdiction lines. (Note, however, that this permanent employment may in fact only be a function of size. Small union contractors also try to maintain most of their workforce on a year-round basis. And, on the average, other survey data do not substantiate the assertion that men work more hours per year in open shop as opposed to union construction.

Residential Contruction

The construction of dwellings is, in itself, at least three different types of industries. Many single-family houses are built by very small builders/developers who are also their own contractors and labor force. A few larger builders in the industry develop

tracts or garden apartments on a speculative basis, acting as their own general contractors and using all subcontractors for the actual on-site work. High rise apartments and condominiums are built by developers who usually take bid from both generals and subs and let the general manage the on-site work. These developers act, then, much like a client for commercial and industrial building.

Because of the limited scope of the survey, very few builders were interviewed in Boston and Denver. Those that were fell into the middle category implied above: developers who built annually ten to twenty single family homes or a similar number of garden apartments. In both cities, the majority of single-family and low-rise residential construction is nonunion. These builders usually employ only a few on-site workers, whose skills may range from a general superintendent to a simple cleaning laborer or satchman. Almost all of the on-site work is done by subcontractors. One builder listed fifteen to twenty different subs whom he employed at different times and whose duties encompassed the entire range of construction. Many of these subs worked regularly for the builder; others were contacted through competitive bidding procedures. Most of the subcontractors are also nonunion. The exception to this in the two cities are subs on very large scale developments; on high-rise buildings; or on publicly subsidized new construction.

A representative list of subcontractors is given in Table 4.3. It is obvious that "jurisdictions" as such do not exist in open shop residential building except as they are defined by the subcontract. Flooring subs, for example, will have men whose tasks

are defined solely by the product which they install. Different types of flooring (tile v. carpet) may bring different subcontrcting firms or different specialities from the same firm. As a result, the occupational structure in residential work is defined by very narrow, almost single task, jobs. The degree of specialization which can occur is exemplified by carpenters who do framing.

Table 4.3 Residential Subcontractors

General Excavation	Heating
Landscaping	Insulation
Sidewalks and driveway	Drywall
Foundation	Finish Carpentry
General Framing	Flooring
Roofing and Siding	Ceramic Tile
Windows	Painting
Electrical	Ceilings
Plumbing	Brickwork

When one of these was asked to define his job he replied, a "second floor framer." In other words, within a crew erecting the wooden frame of a house, he would only work on the second floor beams and joists. Other "carpenters" working for sliding roofing, or interior subs, would then come in and do paneling in each of those areas. So, in sum, the concept of jurisdiction exists in residential work not around a general trade but as a function of the extreme spcialization of the subcontractor and his individual workmen.

4.3 Skill Level and Skill Structure

Union crafts usually organize their internal skill structure into two basic categories: journeymen and apprentices. Journeymen are those highly skilled, "well-rounded" craftsmen who make up the core of the workforce. In theory, their skill level is defined by the accomplishment of all the tasks set forth in a multi-year apprentice training program. Apprentices are, of course, learning to become journeymen by following a prescribed course of training composed of on-the-job experience in specified tasks and after hours instruction.

It is difficult to describe, in the abstract, how the label "journeymen" describes the skill level of a worker. The craft union usually defines the range of mechanical competence of the journeyman by the training program for apprenticeship. In addition, the tradition of craft unions and the organization of craft work carry the implications that it is the journeyman who both embodies the standards of the craft and is capable of self-supervision in meeting them. Thus, a journeyman is ideally more than simple one skilled worker in a job hierarchy: he is an independent craftsman charged with defining what needs to be done and accomplishing it efficiently and competently.

The problem with this abstract ideal of a journeyman's skills is that the definition may have no basis in fact, either as a description of how a building trades journeyman actually works or even as a concept. The craft unions of the building trades are themselves not particularly oquacious on their definition of a journeyman. Journeymen are usually described as simply those mechanics who can earn the hourly wage that union members receive. In addition,

the reality of craft union operation, as described below, often fails to meet many of the presumed ideals set forth above on a journeyman's skills. As a consequence, it may be better simply to describe what journeymen are found to do in union construction and relate this to a skill level. Then we can return to the issue as to whether this description of a journeyman best suits the "craft" ideal described above, or another sense of craft organization, or even of a distinctive craft mode of work at all.

Union General Contractors

Union general contractors employ journeymen and apprentices in the basic trades: carpentry, ironworkers, operating engineers, bricklayers, cement masons. Formally, the range of skills of these men varies only between that of the journeyman at one hourly rate and apprentices at various percentages of the hourly rate depending on years in the program. All work within the jurisdiction of each trade must be performed then by these skill levels--from first year apprentice through journeyman. Again, formally, there are two supplements to this skill structure: laborers who do routine, unskilled work complementary to some of the trades activities (but of course outside their jurisdiction) and foremen who supervise the journeyman in one trade or several trades. In two of the basic trades, there are also categories of helpers: unskilled or semiskilled men who do routine work, in aid of the journeyman. For bricklayers, these are the "tenders" who carry bricks and mortar. for operating engineers, they are the oilers who clean, oil, and do simple maintenance on equipment.

This formal skill structure also carries with it, as a part of union contracts, rigid ratios of the number of apprentices to journeyman. These ratios, which usually range around one apprentice to every four or five journeymen, serve to limit the number of lesser skilled mechanics in each craft in or attached to a firm. As a result of the definitions of jurisdiction, journeymen, and apprentice and the ratios in the contract, the skill structure of a general contractor is formally shaped like a diamond: there are a few foremen on top, a large number of undifferentiated journeymen in the middle and a small number of apprentices (supplemented by helpers in the cases mentioned) at the bottom. This skill structure is matched by a wage structure. The union contract sets a journeyman's hourly wage (at a minimum); defines a minium increment per hour for foreman; and sets a wage scale for apprentices as a function of a percent of the journeyman's wage. So, from the point of view of the firm, there is a clear skill structure attached to a fairly rigid wage structure. More importantly, each skill category is defined implicitly as homogenous: all journeymen must receive the same (minimum) hourly wage and benefits.

In fact, the structure is not so simple. When interviewed, union contractors stressed the following points about their workers:

- All journeymen are by no means of comparable mechanical skill, supervisory capability, or productivity. The best journeymen are usually referred to a "lead men" or "key men" and they form the core of a small work crew. These key men, while perhaps earning the

contract hourly wage or slight premiums above it, are rewarded by relatively permanent employment with the firm and by annual bonuses when profits permit.

- Other journeymen, which a contractor may hire through the business agent or from referrals by his foreman or workers, vary in skill level, as one put it, "from zero to 100". Many contractors said that they had to take ten carpenters from the hall to be sure of finding one good one to employ. (The rest are released after a day or so) Another contractor spoke of being referred men who were so incompetent as carpenters that they ruined door assemblies during installation--at a cost of $350 per assembly.

- The contractors stressed that the ability of the union to supply reasonably skilled men varied with the state of the labor market. In peaks of activity, good men were impossible to get and were never available through the hall. In slumps, capable men came directly to the firm or were referred by word of mouth through present employees. Over-all, however, the union was recognized as providing a pool of reasonably skilled men who could be easily assembled in large numbers. It is simply reported that the variance in skill level was quite high.

Due to the differences in skills, contractors resented paying one wage to all journeymen. They also felt that journeymen were being overpaid to do many routine tasks that fell within their jurisdiction. As far as possible, apprentices, being the only source of cheap labor, were used for these duties--a situation which does not always contribute to their training. Of course, the restrictions

on number of apprentices reduced their availability for routine work also. In some cases, the skill levels or productivity of entire trades was in disrepute. Carpenters in Boston were thought to be largely incompetent by some contractors, even for the simple task of rough carpentry used by many generals in concrete setting. One general commented that most of his laborers were better carpenters than the craftsmen themselves. Ironworkers were described as another trade with very low productivity, less because of lack of skill than due to an unwillingness to work. There were frequent complaints in Boston but not in Denver of getting "4 hours work for 8 hours pay."

Whether these complaints about the skill level or attitude of individuals in trades is justified or not, there is a consistent report in both cities of tremendous variations in journeyman skill levels. Since this variation cannot be reflected in hourly wages, it was compensated for by annual income: the best journeymen were employed the longest. The worst worked fewer hours per year usually for a number of different contractors. Of course, while this variation in annual income may serve to equilibrate labor supply, ensuring that the best are rewarded, contractors still faced a distortion due to having to pay a single hourly wage. As a result, most reacted very favorably when a less rigid wage structure was suggested: they would, for example, welcome three classifications of carpenters, with differing wage scales, depending on ability. Although it was unclear who would determine what defined the skill in each wage category, the sense of having some recognized wage variation among journeymen was accepted.

Union Subcontractors

Many of the same problems with union skill categories and structure were mentioned by union subcontractors. They felt also that the variance in skills of journeymen did not justify a single hourly wage--particularly the high ones now prevailing. They felt the need for other categories or levels in the skill structure, to provide a job for "helpers" to do routine work now assigned to journeymen or the few apprentices. The importance of helpers was particularly stressed by the mechanical subs whose skilled journeyman electricians and plumbers do most of the unskilled work in their trade due to jurisdictional restrictions. For example, only electricians can unload electrical supplies from trucks, pull wire through conduits, or do other unskilled jobs related to electrical wiring. Plumbers also do all the routine tasks associated with pipe installation: from carrying of material to the washing of bathtubs.

Again, apprentices can be used to do many of these tasks (and usually are) but both their scarcity and their cost make them inefficient for this. (Hourly wage and apprentices are no longer low for many of the mechanical trades due to the rapid rise in the wages of the journeymen's scale.) One major difference between the union generals and the mechanical subs is in reaction to skill variance. Since electricians and plumbers have to be licensed by the state, most licensed mechanics are competent craftsmen. Outside of this, the desire for a helper category in the main mechanical trades and the need for some wage flexibility by skill level was evident.

Open Shop Generals and Subcontractors

The skill and wage structure in open shop construction differs in two major ways from union firms. First, the concept of journeymen is more loosely conceived and accompanied by suitably varied wages. Second, there is greater reliance on semi-skilled workers to perform routine tasks.

Among nonunion generals, the appellation "journeyman" usually is simply used to describe more highly paid members of the workforce. The skills of these journeymen vary within firms and across firms. In some cases, they may be highly skilled carpenters; in others, they may be jack-of-all trades whose value lies not in their depth of skill in any one trade but in their versatility. Wage variations, again within and/or across firms, reflect these skill differences. Differences in wages also reflect different values contractors place on different attributes of the worker. Characteristics such as "mechanical skill", "attitude", "experience", and so forth are all rewarded, but different contractors place different weights on each.

Most general contractors also employ helpers in the basic trades. These men can be simply semi-skilled workers doing the routine work in specific trades or can be floaters who do less skilled work across many trades. In many cases, these helpers are informal apprentices: men hired with the expectation that they will learn on the job and progress to higher skills levels and journeyman status. However, the management flexibility of nonunion work permits helpers also to be paid a range of wages, again on a basis of the contractors

weighing of various personal attributes. In addition, since the firm is not constrained by apprentice ratios in collective bargaining contracts, as many helpers can be hired as desired. There is nothing to prevent the substitution of cheaper, lesser skilled men for more highly trained, experienced journeymen. As a result, open shop firms often work on a ratio of from one helper to one journeyman to five helpers to one "lead" journeyman.

Very large open shop generals like Daniels and Brown and Root have formalized this skill structure around the use of semi-skilled, partially trained mechanics. Brown and Root in particular has adopted a skill structure within each craft that comprises four grades of skill. For example, pipe fitters range from an entry level of pipefitter I, where a worker is still receiving elementary training after hours, to a pipefitter IV, the highest rank below "craftsman" status. (In Brown and Root terminology, a craftsman is comparable to a well-rounded, experienced journeyman). The four grades of pipefitter are differentiated by specific skill attainments and by commensurate wage levels. Of course, this structure is similar to that of a union journeyman and first to four year apprentices. However, there are two important differences: there are no restrictions placed on the number of lower grade pipefitters and there are no time limits on progress for a one grade to another.

Open shop subcontractors cover a range of types of construction and exhibit a variety of firm characteristics. In Boston and Denver most all small-scale residential work is performed by small open shop subs. As described above, these firms are likely to be very small

and highly specialized. Often they are composed of one "master" who contracts the work on a fixed-fee basis from a builder and then hires specialists to complete the contract. For example, a framing sub may simply be one man who does the bidding and organizes the on-site work with several hired carpenters to help. Since the work is done on a fixed-price basis, speed in production is the source of profits. As a consequence, workers become highly trained in a few simple repetitive tasks which can be done very quickly. For example, in a drywall subcontractor, some men will only cut and fit sheet-rock; others will only nail it, usually using air-powered nail guns; and others will only tape and finish the joints. The hourly earnings of these workers will depend on their ability to work quickly and effectively at only these particular tasks.

In some cases there are union subcontracting firms which operate in comparable ways to the open shop side just described. In commercial building, for example, there are drywall subcontractors who employ union carpenters who may have done nothing other than hang or tape drywall during their construction careers. Though these men are highly specialized in the performance of a routine, simple task they are still classified as journeymen and paid the union scale for journeymen carpenters.

Open shop subs in commercial building range across the usual types of mechanical and basic trades subcontracting. In some cases, open shop firms are almost identical in skill and wage structure to union firms. This is particularly true among the licensed mechanical trades where electricians and plumbers have to pass standardized

tests. One electrical contractor in Denver for example, classifies most of his men as journeymen, pays them all the same hourly wages, and supplements them with apprentices in government certified open-shop training programs. The wage and benefit package is almost identical to that of a union firm. In fact, when the owner wanted to go union, in order to bid on larger contracts as a sub to union generals, his workmen vetoed the idea: they had all the advantages of a union shop without paying dues or being answerable to a local business agent.

While some commercial open shop subs are similar to union firms, others are markedly different. Many vary the wage for journeymen with different skills, experience, etc. Often, journeymen and helpers work on projects in a 1:1 ratio, a much higher ratio of skilled to semi-skilled workers than found in union work. Again, helpers are often informal apprentices who are expected not only to assit on routine work but also work on the job and progress to journeyman status. Due to the structure of subcontracting, there is little opportunity for open shop firms to develop occupations substantially different from union trade classifications. However, since there are no rigid jurisdictional lines, nonunion subs can be flexible in work assignment. This flexibility is usually used in either of two ways. First, craftsmen may occasionally do work outside of their "jurisdiction" but important to the completion of the project. For example, one electrical sub trained his electricians to weld in order that they could install junction boxes for electrical switches. Otherwise, he would have had to sub this work to a welding firm. Second, firms may

have men who can do routine work in two or more trades. A HVAC and plumbing sub moves men from NV to wet pipe as demand changes. This flexibility in assignment, in both cases, was seen to contribute to the ability to employ men full-time year round.

In sum, the union firms faced a supply of labor with clear skill demarcations at a fixed wage. There are apparently major quality variations in workmen at each skill level (journeyman and apprentice). Firms can only adjust to these variations by varying the time employed: the best journeymen are kept on permanently as foremen or lead men while the worst are released after one day's work. For the union firm, formal skill ratios are also fixed and it cannot effectively substitute less-skilled, cheaper labor for routine aspects of skilled jobs. Of course, this substitution takes places in actuality--temporary, low-skilled "journeymen" do less skilled work under supervision--but this substitution is not reflected in the hourly wage or cost of labor to the firm.

The nonunion firms hire and pay labor on the basis of firm-specific characteristics of work. As a result, there are a range of skills and wages found among journeymen, helpers, and apprentices in most open shop contractors. In addition, these contractors are free to design and assign work to whomever they please: this often results in both the specialization of many men, as semi-skilled helpers, in the performance of routine tasks and in different skill ratios among firms. Open shop firms themselves also appear to be smaller and more specialized, so their occupations and skill definitions are often specific not only to the firm but also to a particular type of construction.

4.4 Technology and Work Practices

> "The effect of unions on efficiency is a controversial area in industrial relations, as can be seen from the terms used in discussing it. In objecting to a rapid pace of work, unions talk of speed-ups and sweat-shops; employers discuss union working rules in terms of featherbedding. Issues of efficiency become entangled with those of health and saftey, and the effect of the union as an organization is often hard to distinguish from the informal restriction of output practiced by work groups."
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> A. Rees[7]

The building trades unions are notorious for resistance to technical innovations in building technology. In some cases, this resistance manifests itself as opposition to particular tools used in on-site work: spray guns or rollers opposed by painters, for example. In other cases, opposition is to particular building materials: plastic pipe opposed by plumbers. In addition, there is an attempt by some to control manning and use of equipment: operating engineers may require operators on all machinery and may prohibit one man from operating more than two different pieces of equipment in one day's work. Yet, while clear cases of resistance to innovation have occurred at some time in almost all of the different craft unions in construction, hostility to change is by no means universal or even typical. In fact, the only serious research on the union's impact on changing technology in construction dates from Haber and Levinson's work in the early fifties.

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[7] Albert Rees, The Economics of Trade Unions, (University of Chicago Press, 1962).

They stressed that the industry as a whole was not backward in adopting new technology, despite the claims about that in the popular press. Although the role of local unions toward innovation was so varied "no generalization" can be made, they found the unions generally more receptive to new techniques than commonly thought. Power machinery, ranging from hand tools to on-site fabrication machinery, was accepted and used by cement finishers, carpenters, bricklayers, plumbers, and sheet metal workers. New materials were generally either accepted by unions, such as pre-cut wood units by carpenters, or rejected by both unions and subcontractors. Both plumbers and plumbing subs, for example, opposed some prefabricated bathroom units. Where union opposition alone did occur, it was often inconsistent. The plastering gun was accepted by some locals and rejected by others. Painters used rollers and spray guns under differing terms in different local contracts. Electricians were occasionally involved in disputes over the installation of flexible conduit.

Haber and Levinson did very little direct union/nonunion comparisons on the adoption of innovations. Where they did so, they found that the comparable nonunion contractor was often not taking advantage of his "free" status and adopting the new technology. In painting, for example, rollers were often not used by nonunion subs because of the type of paint or surface to be covered. Rivet guns were introduced very slowly into both union and open shop construction largely due to early concern for safety in their use.

Despite the extreme variation in their findings, Haber and Levinson do offer some basic economic rationalizations about union reaction to innovation. They note that where union resistance does occur it is often instigated by a fear of a craft union that its skills would be degradated by some new technology. Prefabricated wood components, in particular, as well as some types of materials like plastic pipe, substantially reduce the skill component in carpentry or plumbing. This skill degradation could be the first step in substituting lesser skilled, lower wage labor for journeymen. In other cases, the resistance to labor-saving innovations was simply a union's attempt at maintaining employment through the exercise of market power. Clearly, the goals of craft unions extend beyond wage bargaining to "employment bargaining" and either restrictions on technology or manning regulations are an exercise in preventing contractors from cutting labor costs by "under-manning". Although the recent economic analysis of unions has stressed the wage impact, earlier studies have shown that unions may bargain to increase employment or to increase, at least temporarily, both employment and wages.[8]

Beyond these obvious goals of unions in maintaining skills and employment, Haber and Levinson attribute product market

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[8] Paul Weinstein, "Featherbedding: A Theoretical Analysis," in P. Weinstein (ed.) Featherbedding and Technological Change, (D.C. Heath 1965) and G. Nutter, "The Limits of Union Power," in Philip Bradley (ed.) The Public Stake in Union Power, (University of Virginia Press, 1959).

characteristics as the major factor in explaining the acceptance of innovations. The key characteristic is of course, the elasticity of the derived demand for labor. In circumstances where the elasticity is very low, the reduction in unit labor costs that a technical change could bring will not result in any substantial increase in employment. If the elasticity of demand is high, however, the outcome is reversed: lower costs may sustain or increase employment. Haber and Levinson note that though demand for any particular construction trade is usually inelastic, due to the well-known Marshallian conditions, the elasticity will be higher if direct substitutes are available. For example, plasterers accepted the plaster gun in order to compete with drywall. Painters used rollers and spray guns in order to compete with prefinished materials. In both of these cases, the trade was directly threatened by a competitive material or process and its increase in productivity was the only means to maintain employment. (It should be noted that there were other means used: the plasterers in some areas tried to eliminate drywall usage through affecting building codes.) Another example of competitive acceptance of innovations has been the bricklayers. They have actively cooperated with masonry suppliers to develop cheaper and easier to install bricks and blocks. Again, this was motivated by the competition from exposed concrete surfaces.

In sum, the pure substitution effect of other factors for labor will always decrease employment. Since the elasticity of derived demand for any particular trade in construction can be expected to be low, the negative substitution effect is not likely to

be offset by increases in product demand and hence labor demand. As a result, it is not surprising that craft unions would use any power they possess to limit innovation and preserve employment. Indeed, a large amount of litigation has taken place precisely over the rights and powers of construction unions to bargain and enforce "work presentation" clauses in contracts. In some cases, unions have acted alone, as in National Woodwork and many others; in a few cases, such as the celebrated Allen Bradley v. IBEW, they have been shown to collaborate with subcontractors to preserve work for both firms and workers.[9] But despite the economic rationality of such restrictive behavior, and numerous legal cases in which it is attacked, there is no consistent survey evidence that unions do affect technology in construction or that they have impeded its progress over time.

Work Rules

In his discussion of union practices affecting employment and productivity, Rees mentions several impacts unions may have:

- work rules that increase the number employed;
- restriction of output;
- regulating hours of work; and
- guarantees of work to an individual employee.

Work rules in union construction provide some examples of all these types of practice. Manning requirements on machinery by

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[9] Arthur Smith, Jr., "Boycotts of Prefabricated Building Products and the Regulation of Technological Change in Construction Jobsites," Industrial and Labor Relations Review, January 1972.

the operating engineers certainly increases the number employed. Hours of work are regulated and overtime is often double or even triple time. There are no formal restrictions on output in building trade union contracts, but output is said to be informally restricted. Guarantees of work to an individual employee is rare, but practices such as "show-up time", where a worker is paid for several hours work even if none is available, is common in the industry.

Again, the issue is whether these supposedly inefficient practices are peculiarly union or serve only union interests. For example, one classic study has shown that while union works may restrict, output can also be informally restricted among nonunion workers. In other cases, work rule that increase the number employed may serve to benefit employers as well as union workers. This is certainly the case among subcontractors in construction where, for example, management and labor in the mechanical trades have a common interest in maintaining their share of the work. Finally, at least some of the "restrictive" practices which exist in unionized industries may have been the result of past trade-offs in collective bargaining. As a result, their existence is no more irrational or ineffeicient than gains in wages or fringe benefits. The infamous "fireman rule" on diesel locomotives is, in fact, an example of this kind of past employment, rather than wage, bargaining. Consequently, unions cannot be generally disparaged for creating inefficiencies without a rather detailed and comprehensive knowledge of the circumstances in which certain work practices have developed. Attention in particular to comparable nonunion practices and to employer interests is vital in assessing the differences unions make.

Finally, a note on trends in construction labor use may put the work practices issues in perspective. Since the Haber and Levinson research in the nineteen fifties, both total employment in construction and union membership in the building trades have increased in absolute terms. At the same time, according to a recent study by the BLS, on-site labor requirements per $1,000 of building costs, have dropped by nearly twenty-five percent (See Table 4.4). This decrease may represent some combination of subsitution of capital, in terms of machinery and prefabricated materials, for labor and as a neutral increase in labor productivity. The trends are not consistent with a hypotheses of "excessive" restrictive work practices or avoidance of technological change by construction unions--although, of course, there is no evidence of what changes might have occurred without unions at all. At the least, the unions were either accommodating enough to permit change (given particular bargaining goals) or powerless to prevent considerable technological change.

Survey Findings

Union contractors reported little interference by unions with either building materials used or with on-site technology. Most general and subcontractors reported that they used whatever building materials the codes permitted. In some cases, there had been union protests or stoppages over use of plastic pipe or prefitted sprinkler systems, for example, but these had not continued and any restrictions were not part of a written contract. In some cases, unions did require on-site fabrication of materials which could have

been obtained prefab, but these restrictions were not major or onerous. For example, plumbers refuse to use pre-bent elbows for pipes and required that these be bent at the site. In the cases of restrictions which had occurred in the past, the union, in this case the plumbers, was said to have accepted any prefitted pipe system as long as it had "some kind of union label."

Union contractors were greatly concerned, on the other hand, with manning requirements and other work practice issues. It is largely among general contractors dealing with the basic trades that different types of "restrictive work practices" arise. (In subcontractors, these issues are similar, if not identified, to the problems of jurisdictional and skill level described above in section 2 and 3. For example, use of skilled men to do unskilled work.) In Boston and Denver, for example, there are continuing problems with the operating engineers over the manning of pumps. The engineers require all pumps of 2 inch diameter or more to be manned during operation. Contractors are trying to change this to drop the manning requirement for pumps over 3 inches in diameter. Operating engineers may also require an oiler be hired for small cranes; contractors feel that an operator is all that is necessary. Ironworkers often want contractors to hire a "rigging crew" of a certain size for any project; contractors want to be free to hire as few men as are necessary. Bricklayers have requirements that a scaffold has to be built so men work facing the wall; also they may require one man on a wall to build only corners, while other men build only the wall. Contractors, under certain circumstances, may not want to use scaffolds and may want to move men around.

Table 4.4

FEDERAL OFFICE BUILDING CONSTRUCTION:

LABOR REQUIREMENTS AND COST COMPONENTS

Labor Requirements*	1959	1973	1975
Total	108.7	85.8	81.1
Onsite	97.1	74.4	70.2
Offsite	11.6	11.5	10.9
Distribution of Costs			
Onsite Wages	29%	34%	n.a.
Materials, Equipment and Supplies	53.3%	50%	n.a.
Profit and Overhead	17.7%	16%	n.a.

*Labor requirements are employee hours per 1,000 1959 dollars.

Source: U.S. Bureau of Labor Statistics report cited in Engineering News-Record, December 2, 1976.

The only problem unique to union subcontractors relates not to the type of tools used, but to the ownership of tools. Many union contracts in the mechanical trades require that the contractor supply the hand tools needed for the job. The contractors prefer, however, that the journeymen supply their own--this is not because of the cost difference, but because the journeymen will value and care for their own tools, but have a tendency to loose or misuse the contractor's.

In open shop firms, there are no restrictions on tools or materials used or other "work practice" rules other than those imposed by government building codes or safety regulations. Due to this, the nonunion contractor celebrates his freedom and flexibility in manning; in work technology; or in building materials. In fact, few consistent differences could be found between union and open shop firms in this regard. Open shop contractors were free to use all prefab materials, union made or not, making no concessions to the creation of on-site work. They were also free, in the case of the mechanical subs, to require that their journeymen furnish their own tools. Finally, they could make any provisions they desired on manning of machinery work or assignment of men. Despite this vaunted flexibility, their operations did not appear to differ substantially from union firms in regard to either technology or work practices.

In sum, there is no doubt that at times and in various places the building trades unions have resisted innovation or maintained restrictive work practices. Yet the survey results do not support the contention that this has been a consistent or effective policy. Both the trend data by the BLS on "labor productivity" and the union/

nonunion comparisons of practices evidence change in labor input over time and a cross-section similarity in work practices. Neither of these phenomena are consistent with hypotheses or allegations as to "excessive" union power over work and technology. Surprisingly, most of the complaints of union contractors, when justified, appear to be over trivial issues. Certain unions, like the operating engineers and the ironworkers, do have obvious but isolated featherbedding practices. Yet, these practices, in terms of actual costs imposed on contractors or concrete benefits accruing to unions, cannot result in substantial losses or gains. Whether two-inch pumps are manned or will not significantly affect contractors' profits on a multi-million dollar building or balloon the membership of the operating engineers. (Admittedly, estimating the actual impact of union work practices on costs must await careful cost comparisons for similar projects undertaken by union and open shop contractors.)

Thus, the problem with union work practices in construction appears to be as much a symbolic as pure economic issue. The presence of unions on a job-site automatically interfers with a contractor's "right to manage." Whether the unions adopt formal restrictive practices or not, their presence can always complicate any change management feels necessary. The resentment of management to unions in construction seems to stem less from the imposition of real costs (although this sensitivity is changing as open shop competition grows) than from the uncertainty and instability of union reaction. When interviewed, project managers and small contractors always stressed the role of "politics" in determining union behavior. On a job-site,

a project manager may deal with six to eighteen different trades. Each of these may have a steward on-site; all will have a local business agent. The temper of this union leadership, in policing the agreements, determines the flow of work. Contractors have the sense that work stoppages often occur largely because of intro- and inter-union competition over policital leadership. Local union business agents are elected; stewards may be running for office. Their campaigns and their attractiveness to the membership may depend on how "tough" they are on management. Harassment of management, even over--or perhaps especially over--trivial issues like work rules, apparently plays an important role in building a personal constituency. The complications of a multi-union structure in the industry only expands the opportunity for this kind of political competition. It also makes the whole construction industry in an area vunerable to minor disputes in even small local unions.

4.5 Hiring and Screening Systems

> "...Job information is transmitted through a grapevine involving workers, builders, sub-contracts, and material supplies...the hall was used only as a last resort, since many builders feel that only workers with limited talent have to rely on it to find work."
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> H.A. Foster[10]

For an industry like construction, which must rely on a geographically mobile labor force to man large projects, the systems

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[10] Harold Foster, Manpower in Homebuilding, (University of Philadephia, 1974).

of labor market information exchange, referral, screening and hiring are of crucial importance. Although most contractors staff their projects with at least a few of their permanent men, they often need additional workers from different occupations on short notice. In union construction, the hiring process has often been described as being controlled solely by the unions. The building trades' supposed power to raise and maintain high hourly wages is presumed to stem from their control over the labor supply through the hiring hall. The local business agent is said to play the central role: he receives all requests from contractors for journeyman and assigns men from a queue or on the basis of his preference from those available in the hall. This total control of the hiring process is often described as illegal since it conflicts with federal legislation prohibiting closed shops. The control is also taken to be a means of limiting the labor supply in construction unions: a "fact" which is often deduced from the high hourly wage in the industry.

In fact, the role that unions play in the hiring process in construction may be vastly over-rated. At the least, like most union institutions in the industry, the role and impact varies by craft, by geographic area, and over time. Some observers, like Foster, have shown that informal processes of referral dominate the hiring process in at least two geographic areas. In Cleveland and in Erie County, Foster found that the union hiring hall only served as a secondary source of labor when preferred sources were exhausted. Other observers and participants in the industry have noted that, though the unions participate in the hiring process, they by no means control it. A

survey of their membership by the AGC, for example, showed that only 4% said that they had to hire through a "restrictive hiring hall"; other studies note how flexible many locals are in admitting men for work, sometimes on a temporary or "permit" basis, to meet peak labor demands. Finally, the sense of the union sector of the industry is now that very few, if any, collective bargaining contracts require any more than the contractor call the hall first and if the local cannot meet his demand, then he is free to hire anyone. These impressions are largely confirmed by surveys and studies by the Department of Labor. One survey of job search methods found that only fifteen percent or so of craftsmen relied on a hiring hall as a primary source of job information. Most received information from friends or past or present employers.[11] A study of major contracts in the construction industry by the BLS found that only half required that the union either be the "sole and exclusive source of applicants for employment" or "recognized as the principal source of (workers) and shall be given the first opportunity to refer qualified applicants..."[12]

Whether even these formal requirements are actually followed or not in practice is difficult to say. Certainly, some trades like the electricians and plumbers generally maintain formal referral systems run through a hall. Other trades, like ironworkers, often

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[11] U.S. Department of Labor, BLS Bulletin 1886, Job Seeking Methods Used by Americans As Workers, (Washington, D.C., 1975).

[12] U.S. Department of Labor, Exclusive Work Referral Systems in the Building Trades (U.S. Government Printing Office, 1970).

pick up work directly through referrals by former foremen. Bethlehem Steel, for example, is said to man many local projects simply by calling foremen in the area who have worked for it previously and letting them assemble a crew through their own contacts.

All this serves to show that the role of the union and the hiring hall may not be as great as supposed. Informal processes of referral may predominate in many, if not all, trades. In open shop construction there is, of course, not even a formal structure of the union referral system. As a consequence, open shop contractors should be free to hire whoever they please. A comparative documentation will show if and how hiring processes differ. It may also demonstrate comparable needs for similar structures, such as a central referral system or "hiring hall", in both union and nonunion sectors of the industry.

Survey Findings

There were very few significant differences reported in hiring practices between different types of firms, either union or open shop. Union firms, either general or subcontractor, most often hired by word of mouth through their foremen or present employees. When they did hire through a hiring hall they often requested journeymen by name: thus avoiding the personnel assignment function of the business agent. The exceptions to this "informal" approach to hiring came from two circumstances. First, when a large number of journeymen in a particular trade was needed for a project (and/or the project was in a different area of the main office of the firm) the union

business agent or hiring hall played the major role in recruitment and referral. These were found by contractors to be adequate mechanisms to assemble large crews quickly. The only problem was the variation in quality, particularly in times of peak demand. One contractor said that at times of low unemployment the hall could only furnish "warm bodies" and not skilled journeymen.

Second, in times of high unemployment in construction, the hiring hall was not needed. Men continually came to the offices or gates of projects looking for work and the needed crews could be obtained through these men or through referrals by employed journeyman to friends who were not working.

The methods used by open shop contractors were similarly informal. Most men were hired by word of mouth through present employees. Some recruited directly from local vocational schools. Other found that men came to the main office or gate. When larger numbers were needed, recruitment was supplemented by newspaper ads or using the local public employment service. Open shop contractors also varied their recruitment strategies with the state of the labor market: in troughs, men came to them; in peaks, continual, aggressive efforts using all information channels were needed to find anyone remotely capable of construction work.

Since the hiring occurs in a similar fashion in both union and open shop sides of the industry, the impact of the union can only be judged to be slight. It does play a role in referral of large numbers of journeyman when needed by a contractor, but otherwise is relatively passive. Open shop contractors often spoke of the problems

they might have in doing larger scale work without access to a labor pool. Union contractors obviously had this access, but with two limitations. The union acted as a straight referral agency without, contractors claimed, adequately screening workers for quality or capabilities. In addition, in times of peak employment the union was not anymore capable of furnishing qualified workers than any other source.

In most cases, open shop contractors found themselves recruiting as well as screening workers. Men were hired on the basis of their verbal statement of their abilities. After a short try out of a day or a week, they were either let go or kept on at a slightly higher wage. Open shop contractors did not mention this hiring and screening process as costly, but there are some obvious costs in management time and lost output in testing workers this way. Yet, since the union contractors also had to screen workers through on-site trials, the costs of screening were similar.

In sum, the main difference--and advantage--in hiring and screening process between union and nonunion contractors was the ability of the former to man large projects quickly through referrals by a local union business agent. However, the varied quality of these referrals, particularly at a time of peak demand, made additional recruitment and screening efforts necessary. Open shop contractors felt severely constrained, in most cases, without this access to a common labor pool. Apparently, they would not bid on larger contracts due to the risk of not being able to obtain men: conversely, they could not keep too many skilled men on the payroll for fear of not

having contracts to employ them. As a result, associations of nonunion contractors have begun experiments in operating their own referral systems on a centralized, multi-trade basis. These systems are expected to serve the dual purpose of referring men to the contractor upon demand and placing men temporarily laid off by some firms.

One association of nonunion contractors, the Associated Builders and Contractors, has begun a referral system in Tampa open to its members and all workers. The Associated General Contractors, an association of both union and open shop general contractors only, has experimented with referral systems in Houston and Forth Worth, Texas. Under the AGC system, which is financed by the local chapter of the association, construction workers call the registry and leave their name and qualifications. When any employer needs workers, it can call and obtain a list of registrants whom it then can contact and interview. However, the referral system makes no guarantee as to the skill or qualifications of persons seeking employment. The referral system's aim, according to the AGC chapter, is "to create a labor pool of both skilled and unskilled, union labor and nonunion workers."[13] The manager of the system notes though that the nonunion contractors, who do not have access to the building trade hiring halls, derive greater benefits from such a system is somewhat experimental, it has already been attacked by the local Building Trades Council. The executive secretary of the Council was quoted as saying that he considers that AGC registry a "divide and conquer"

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[13] Bureau of National Affairs, Construction Labor Reports, June 18, 1977.

tactic, with a two-fold purpose: "To supply the rate with his people and to divide the union journeyman from his union, telling him he doesn't need the union hiring hall." He continued, "Mostly, it's the open shoppers who have come to town that need the referral. They've adopted this program out of desperation, trying to secure qualified employees. With most of the crafts working, all they can get is rats and nail-benders."

4.6 Training and Apprenticeship

In the literature on building trades unions, apprenticeship has usually been described less as a training system for construction workers than as a union mechanism for limiting entry into a craft. For example, Barbash asserts that apprenticeship "serves two interpendent sets of interests for the craft union: (1) the maintenance of a high wage position and of employment opportunities for its permanent membership, and (2) the conservation of the union's power as an institution to advance these ends."[14] The view that apprenticeship serves only to maintain the monopoly power of the union has, however, never been substantiated. Recent field research by Marshall and others shown that apprenticeship is only one of the forms of entry into journeyman status.[15] While it is the predominant route for many of the mechanical trades, like plumbers and electricians,

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[14] Jack Barbarsh, "Union Interests in Apprenticeship and Other Training Forms," Journal of Human Resources, Vol. III, 1968.

[15] Roy Marshall, et al., Training and Entry Into Union Construction, U.S. DOL, Manpower Administration Monograph #39 (U.S. Government Printing Office, 1975).

most of the journeymen in the basic trades were never formally apprenticed; they developed skills through on-the-job training in union and nonunion work and were admitted to journeyman status during times of high labor demand. Statistical studies of trends in apprenticeship enrollment, first by Mills and later by Mattila, have also shown that the numbers of apprentices are more responsive than believed to construction labor demand.[16] Both of these findings indicate that apprenticeship systems are much more open and responsive to market forces than a pure monopoly model would predict.

The focus on the "restrictive" role of apprenticeships has relatively obscured a realization, found in the earlier literature, that the structure of apprentice training plays an important role in the definition of occupation content in craft labor market. As Motley wrote in 1906, apprenticeship justifies a uniform wage rate for employers since uniform training reduces "inequalities as to individual workmanship" and assures "a force of workmen of uniform abilities."[17] A commonly accepted definition of occupational content, embodied in apprenticeship standards and curriculum, also strengthens a worker's employment security. A journeyman can qualify for employment in his

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[16] D.Q. Mills, Chapter 8, "The Numerical Adequacy of Apprenticeship Programs," in Industrial Relations and Manpower in Construction, (MIT Press, 1972), and John Mattila and Peter Mattila, "Construction Apprenticeship in the Detroit Labor Market," Industrial Relations, February 1976.

[17] James Motley, "Apprenticeship in the Building Trades," in J. Hollander and G. Barnett (eds.) Studies in American Trade Unionism (New York, 1906).

craft in a labor market which ranges over numerous firms. In contrast, a factory worker moves with comparative mobility only within the internal labor market of the enterprise. As Kerr wrote in the 1950's, "Once fully in the market the craft worker can move anywhere within it... The worker gets his security not from the individual employer but from his skill."[18] In contemporary "human capital" terms, apprenticeship provides general training for workers in an industry where they may be little or no specific training for different firms.

Survey Findings

Subcontractors

Both union and open shop subcontractors use formal apprentice systems to train workers. In the union sector, as Marshall found, apprentice training is particularly prevalent among the mechanical trades employed by subcontractors in electrical, plumbing and HVAC work. These same types of subcontractors who are nonunion also have formal training schemes. Many of these are apprentice programs certified for government funding by either a state apprenticeship council or the local office of the Department of Labor's Bureau of Apprenticeship and Training. Since the criteria for certification are usually drawn from existing union programs, open shop apprentice programs in Boston and Denver are virtually identical to the union system.

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[18] Clark Kerr, "The Balkanization of Labor Markets," in E. W. Bakke et. al. (eds.) Labor Mobility and Economic Opportunity (MIT Press, 1954).

The management of union subcontracting firms had very few complaints or problems with the apprenticeship system. As members of the local joint apprenticeship committee which administered the program, they also felt involved and responsible for the operation of the programs. There were no claims that the union unduly restricted entry into the training process; rather, there was more concern that many subcontractors were not willing enough to employ apprentices and contribute to the on-the-job aspect of the program. All the union subcontractors felt that apprenticeship training of the present variety and length was necessary to train a highly skilled, experienced, and well-rounded journeyman in the trade.

Nonunion subcontractors also supported the apprenticeship system in the mechanical trades. Their programs were operated unilaterally by a few members of the ABC's local apprenticeship committee; there was no formal worker participation on the committees. Also, there was very little evidence that in the nonunion sector workers rotated among firms for both employment and training. Open shop apprentices appeared to be committed to work in the firm and the apprenticeship system only served to bring them together once or twice a week for related, after hours instruction. The rest of the time their on-the-job training and experience were limited to whatever work the firm had under contract. The major complaint of the subcontractors was that the union-like curriculum was too restrictive in terms of skills. Many open shop subcontractors moved men across jurisdictional lines as needs dictated, and, as a consequence, wanted

broader training for some of their men. One or two firms undertook in-house training to supplement the skills of their journeymen for the occupational duties specific to the firm.

General Contractors

Most of the complaints about the apprenticeship system came from both union and nonunion contractors employing the basic trades. Union general contractors felt that apprenticeship programs were usually too long for most of their men. The skills and tasks of most carpenters, ironworkers, painters, and cement masons were not complex enough to require a lengthy (three years or more) apprenticeship. Most of the basic trades were highly specialized workmen doing a few relatively simple, routine tasks. Many of the skills that apprentices learned in related training or were supposed to be exposed to on the job were, in fact, irrelevant to their work. At the same time, some men were being hired directly as journeyman and put to work at the full hourly rate doing semi-skilled, routine work in carpentry, painting, etc. This contrast was said to explain the high drop-out rate from the basic trades apprentice programs - a rate that exceeded fifty percent a year in some cases. The main function of apprenticeship in the basic trades was said to be training of future foreman; as a result, only men with a commitment and ability to go on to supervisory work were said to stay in these programs.

Open shop general contractors were less involved in formal apprenticeship programs. They often hired men with limited skills or experience for a few specific tasks in the firm. These workers were

usually classified as "helpers" and occasionally progressed to journeyman status solely through informal on-the-job training within the firm itself. Most of the open shop general contractors felt that this informal training was quite sufficient. Their comments, such as "It doesn't take three years to train a carpenter," reflected the limited range of skills expected from most of their workforce.

There were two major exceptions, however, to these patterns of informal training in the basic trades. Open shop general contractors in California associated with the AGC have been trying to create a new occupational classification, "general building mechanic", and have developed a two-year apprentice curriculum for it. The occupation responds to the need of the general contractor to have a multi-skilled journeyman to supplement the work of the specialized subcontractors on the site. Government certification, which permits some public funding of related training and use of apprentices at lower wages on public construction projects, has been denied by the California State Apprenticeship Council. The reason is that the occupation is not one "traditionally" recognized in construction. The AEC is now suing the SAC in order to certify the program.

The other major exception to the pattern of informal training has been the development of "task training" systems by the large open shop contractors. These task training methods are designed to ture new hires, largely unskilled, into rudimentary carpenters, pipefitters, electricians and the like so that they can perform routine work under supervision on large scale industrial and heavy construction. Under

the tasks training system, the contractor first subdivides the work into a series of relatively routine steps or tasks and then trains workers on-site to perform those tasks. The costs of training and of curriculum development are borne by the firm or in some cases are contributed by the project owner as a "public service". The ABC is in the process of adapting the training systems developed by Brown and Root and by Daniels for use by its members in various cities. The idea is that firms will be able to choose particular training modules to prepare their workforce to use specific skills on particular construction projects. Thus, workers can be trained for the specific needs of the firm on an as-needed basis. No attempt need be made, in theory, to train "well rounded" journeymen since the range of skills in a standard apprentice program may be irrelevant to a particular firm's type of work or internal occupational structure.

4.7 Other Survey Findings

During the course fo the interviews, several other topics or issues were raised which did not fall into any of the categories of nonwage impacts discussed above. They are discussed separately here.

Wages and Labor Supply

The monopoly view of craft unions in construction supposes that unions act directly to limit the labor supply in order to maintain the high hourly wage. No direct evidence of such limitation was found: the union certainly tries to control the labor supply to ensure that all

employers signatory to a contract adhere to the wage, benefit and, to a lesser extent, the work rule provisions of the contract. But control did not mean limit; on the contrary, the unions appeared willing to furnish an very elastic supply of workers at the fixed hourly rate. Indeed, in many cases, the union was seen as the only source of skilled men available for temporary work at a pre-determined wage. The only incidence of labor shortages which were mentioned were those which occurred in the late 1960's during an unprecedented boom in construction in Boston and Denver. The union does restrict the supply of labor to union contractors, of course, in the sense that workers cannot directly compete by working for lower money wages. Yet the hiring process appears open enough that workers can and do compete in terms of individual productivity. This variation in effective wages (or labor cost to the firm per unit of output) is recognized by firms so that productive workers can be rewarded by faster referrals and even permanent attachment to a firm. Thus, the union firm faces a fairly elastic supply of heterogenous labor at a fixed wage. Self-selection and competition among workers for jobs works to equilibrate the market in all but the peak periods of demand.

In contrast, the open shop firm could vary wages in order to hire workers of different skills. Most contractors found that labor at the lower end of the wage scale was readily obtainable when needed, and appreciated the flexibility of paying each man "what he was worth." In most nonunion firms both the entry wage and succeeding increments were bargained out individually with workers. At the

opposite end of the wage scale were the firm's lead journeymen and foremen who received the highest hourly wages (at time comparable to union scale), benefits, and bonuses. In between these two extremes was a range of journeyman and helpers at different hourly wages. The only problem with this organization was the uncertainty the firm faced in hiring more skilled men. Although the firm could draw on entry-level unskilled and semi-skilled men fairly easily, they could not be certain of assembling a crew of more skilled men at a predictable wage. This was particularly true if the employment was to be temporary and the men could not be rewarded with more permanent employment. As a result, most open shop firms spoke of not being above to do "larger work" or compete with union contractors on many projects. The implication was that there was so much uncertainty as to whether these jobs could be manned and at what wage, that it was nearly impossible to construct a reasonable bid. Therefore, the firms only undertook work they could man internally - supplementing their permanent crew with a few outside helpers or laborers - and were only very slowly accumulating enough experience, manpower, and stability to bid on larger projects.

Technology, Prefabrication, and Skills

The construction of buildings, although it is an industry once described as "the industry the industrial revolution forgot," is a process increasingly dominated by advanced technology. One of the forms which technological change has taken is the increased prefabrication and standardization of building components. While

complete factory assembly of residential units or other structures has not advanced markedly, the use of labor-saving materials in many types of buildings has increased. Doors, which were once entirely cut and machined for locks, knobs, hinges, louvers, and glass windows by jobsite carpenters now arrive at the site precut, premachined for hardware, and usually prehung in standard frames. Piping systems on boilers and heating and cooling units in the past were built to order from raw pipe onsite, and are now often fabricated at a factory as part of a standardized component system. Even entire buildings, usually of low-rise metal frame construction, can be ordered from catalog components and quickly bolted together on a simple concrete slab foundation.

These advances in building technology, which unfortunately have never been recorded comprehensively, have reduced some types of construction to virtually an on-site assembly process. As a result, the need for highly skilled craftsmen, capable of solving detailed technical problems in the construction of unique buildings from raw and unfinished materials has diminished. Many open shop contractors saw these technological developments as having contributed to their success. This was not because they could use the new materials and technology while the unions resisted them. It was simply because the union skill level and wage scale appeared to be oriented towards a type and scale of construction where prefabrication did not dominate. In Boston and Denver, the unions controlled work on high-rise buildings, hospitals, airline terminals, and industrial plants; all large,

unique contracts calling for the newest in structural steel framing, concrete form work, or complex electrical and mechanical sub-systems. The open shop contractors were limited to smaller buildings, repetitively built (gas stations, warehouses, shopping center) or built from standard components (small office buildings, schools, or garden apartments). On this scale and type of construction, they could substitute materials for skilled labor. As a consequence, their larger number of helpers and specialized, semi-skilled journeyman could be employed at an hourly wage below the union scale.

"Atmosphere"

Both Boston and Denver are metropolitan areas which presently have substantial percentages of construction operating open shop. Yet the attitudes of the unions and the general atmosphere of labor-management relations was vastly different in the two cities. In Denver, the building trades were most often described as "rational", "moderate", and "flexible". This attitude was usually attributed to the fact that the union were less well entrenched in Colorado than in the East. Outside Denver, open shop activity is quite strong in heavy and highway construction and in small-scale commercial building in smaller cities. As a presumed result of these competitive pressures, the building trades were viewed by management as being both cooperative and innovative. As an example of the former, the AGC had begun, in conjunction with the Building Trades Council and specialty subcontractor associations, a marketing campaign to promote the quality and efficiency

of union construction. As an example of the latter, some unions were beginning to adopt innovative training techniques, relying on more initial classroom instruction for apprentices before they started on-the-job training. The employers viewed this as a step towards making beginning apprentices more productive and, hence, more employable.

This atmosphere of cooperation, tempered, of course, with resentment carried over from collective bargaining about wages and work rules, was almost exactly the opposite of the climate in Boston. The Boston metropolitan area, indeed the whole state of Massachusetts, had always been a very strong union area. However, over the last decade a considerable amount of open shop activity had grown up in the suburban ring round Boston and in the older cities and mill towns forty or fifty miles away. At the same time, the dramatic increase in high-rise and public building in the inner cities of the metropolitan area provided considerable work for union firms and union members. Then, the very abrupt decline in construction activity in the mid-1970's reduced work available to both the union and open shop sectro alike and forced much more competition between them for the existing jobs. In this context, management of union firms saw the building trades as very unwilling or unable to compromise on wages or work rules in order to compete. There was a sense that the unions had enjoyed a monopoly over certain types of work for so long that they were <u>unable</u> to compromise and compete. From what could be gleaned about the union attitude from interviews with management and some business agents, it appeared that the unions perceived less competition

and more residual monopoly power. Their response was, on the one hand, to portray the employers' talk of "open shop competition" as merely a bargaining ploy to change wages and conditions in contracts and, on the other hand, to attack the open shop firms for "unfair competition", claiming that they hired illegal immigrants, paid below the prevailing wage, and the like. In response, many smaller union firms were simply giving up bargaining for changes and were going open shop or, at the least, setting up an open shop subsidiary as an experiment to remain competitive for some types of work. By 1976, the local chapter of AGC, hitherto entirely union in membership for over fifty years, had begun an open shop division in Boston to serve its nonunion contractors. However, despite these tensions, larger contractors in the Boston area, remained more or less content with their status as union firms. Despite their continuing difficulties with some work rules or jurisdictional disputes, they recognized that they had no alternative pool of manpower to do this kind of construction.

Finally, what was most remarkable about the attitudes of construction management was that despite any or all of the adversary issues between them and the unions, very few union contractors could be described as "anti-union." On the contrary, most spoke of the important role the unions played in structuring the labor market and in maintaining a pool of skilled workers they could draw on for temporary work as needed. In both Boston and Denver, all of the large contractors - and some of the small firms - felt they could compete with the open shop sector because the skills and productivity of the union mechanics more than offset the higher wages.

4.8 Nonwage Impacts: Summary and Implications

Both in the first section of this chapter and in the introductions to the description of the different impacts, two continuing themes have emerged. Economists and labor relations experts usually view the nonwage activity of unions as (1) restrictive, in the sense that they are used to maintain both the organizational and labor market power of unions by limiting the labor supply; and (2) exogenous, in the sense that they are imposed entirey by unions to serve their goals and the goals of their membership. A section from Barbash's article on apprenticeship best summarized this point of view:

> In order for the craft union to be effective in asserting the interests of its constituents, it must be concerned with its power as an organization. In fact, the power of the craft union as an organization is probably indispensable in maintaining an occupation as a craft. Without the craft union, most craft occupations would cease being crafts; that is, the skill content of the craft would be diluted and standards of entry weakened. The converse is also true. If an occupation is diminished in its craft qualities by a lowering of standards, the union based on the craft is diminished in power as a craft union. Absent the union interest, most employers would not on their own retain apprenticeship and other standards of entry that go into the making of a craft.[19]

The comparative research on union and nonunion labor management practices does not substantiate these views of nonwage impacts.

The general findings of the interviews can best be summarized as:

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[19] Jack Barbash, op. cit.

(1) the nonwage activities of building trades unions appear to be more functional than restrictive. Though the rules regarding jurisdictions, skill definitions, hiring and so forth do restrict management behavior so as to assume work on particular conditions for union members, these rules also act to structure labor relations between a mobile group of skilled workers and a large number of firms. In addition, the rules seem less to be imposed by unions than to be inherent in the industrial organization and technology of the larger firms in the industry.

(2) the building trades unions do not appear to have such an unvarying degree of market power that they can rigidly adhere to rules which serve only their own interests. Rather, they have adopted new technologies and do adapt work rules and conditions to fit different circumstances.

(3) many of the nonwage impacts, such as jurisdictional lines and hiring halls, directly serve some employers' interests. The strength of some union institutions and rules appears to be less a function of market or bargaining power and more a function of working in harmony with management's needs.

(4) labor management relations and rules in nonunion firms are different in many important respects from union construction practices. However, the most important differences (in occupations and in fixed skill and wage levels) appear to be caused, at least in part, by the substantial differences in firm size, product type, and project size between the union and nonunion sectors. Thus, unionization as

well as job and labor market characteristics appear to be simultaneously determined along with project size and type.

(5) union activity, when it does adversely affect on-site management, appears to be dominated by political concerns of stewards and business agents. These concerns, though politically rational (if votes are won by being 'tough on management') are economically very costly, in terms of lost output and work time in disputes. This behavior, endemic to construction, is a continuation of collective bargaining after the contracts have been signed - a syndrome most labor agreements try to avoid through no-strike agreements. What is important to note here is that this nonwage impact of the unions was both the most disturbing to management and the least related (apparently) to 'rational' union nonwage goals of restricting labor supply.

In sum, the survey findings clearly do not substantiate the view that many of the nonwage attributes of construction craft unions are purely exogenous. More often, they appear rooted in the particular character of some types of production in the industry. On the other hand, the implications of the findings for the monopoly model are less clear; no apparent restriction on labor supply as such was found.

Firm Size, Product Market, and Unionization

One can envision, on the basis of the survey, a schematic picture of the organization of the construction industry which relates the degree of unionization to the dimensions of firm size and product type noted above. In Boston and Denver, union activity dominates the large scale commercial and heavy and highway sectors. Nonunion

activity is largely confined to smaller scale residential and commercial work. (It should be noted that any neat divisions in this schematic view are muddied considerably by subcontracting. Some union subcontractors may be employed by nonunion general contractors on otherwise open shop project. Conversely, some nonunion subcontractors may work on small parts of large-scale union projects.)

The type of construction which is dominated by the unions is characterized by a labor market where large numbers of skilled journeymen, defined along craft lines, rotate between projects and firms. Nonunion construction is dominated by smaller firms with firm-specific occupations and small "internal" labor markets. These firms hire unskilled and semi-skilled workers to supplement their permanent crew. The nonunion sector of the industry appears to be characterized by small product-oriented (i.e. highly specialized) firms with firm-specific skills and occupations. However, there are a few very large firms like Brown and Root which use numbers of semi-skilled workers in sub-divided work on large projects. The union sector contains larger, more diversified general and subcontractors which undertake a range of projects with varying workloads and large crews, although at least a few union firms are as small and as specialized as some of the nonunion companies. (See the list of firm sizes and other data in Appendix I to Chapter 4.)

Over the past several years, there has been an apparent expansion in the type of construction activity controlled by nonunion contractors. Recently, there has been a severe contraction in the

large scale work which is still almost entirely union. As a result of these trends, the middle section of the chart, medium scale commercial and industrial building, is increasingly an area of direct competition between union and open-shop firms. The result of this competition is creating some move towards convergence of labor market institutions. Unions are under pressure to be even more flexible about work rules and to adapt them consistently to smaller scale construction. They are being pressured to institute helper categories in many trades to do routine work. At the same time, nonunion firms are showing more interest in creating many labor market institutions which are similar to union companies'. Among these are referral systems; apprenticeship training programs (both in traditional and in new occupations); and even common occupational classifications and wage rates for those training programs.

Given this growing convergence in many types of labor-management institutions, it is apparent that 'what unions do' is operate - or at least aid - some important aspects of the employment relation which firms would have to undertake themselves. In manufacturing and services, individual firms are large and stable enough to provide an internal labor market which can provide many of the services furnished by unions. In the construction industry, however, firms have to cooperate in order to structure an "external" labor market which can sustain a pool of skilled workers attached to the industry and not to any particular firm. Craft unions may play not only a vital, but an essential, role in that inter-firm cooperation.

Whether open shop construction firms can, in fact, cooperate to create and maintain common labor market institutions peculiar to large scale complex construction activity is not yet known. Thus, the nature and contributions of craft unions in structuring an "external" labor market are explored further in Chapter 5.

Appendix I:

CHARACTERISTICS OF CONSTRUCTION FIRMS INTERVIEWED IN BOSTON AND DENVER

Total: Sixty-two firms -- Thirty-eight nonunion
Twenty-four union

BOSTON

Median Size:	Union General Contractors	--	40 field employees
	Nonunion Generals	--	20 field employees
	Union Subcontractors	--	20 field employees
	Nonunion Subs	--	10 field employees
Age:	Union firms	Mean:	27 years
	Nonunion firms	Mean:	11 years

DENVER

Median Size:	Union General Contractors	--	35 field employees
	Nonunion General Contractors	--	15 field employees
	Union Subcontractors	--	6 field employees
	Nonunion Subs	--	15 field employees
Age:	Union firms	Mean:	17 years
	Nonunion firms	Mean:	9 years

5. CRAFT UNIONS: ROLE AND IMPACT

The survey results reported and analyzed in Chapters Three and Four present some particular views of the impact of unions on management and on wage structure in the industry. In the course of that survey no direct attempt was made to analyze these issues from the point of view of the unions themselves. Rather, the survey information is to be seen as a necessary prelude to research on the building trades' goals and behavior. Nonetheless, some attempt can be made to integrate the survey results into a coherent, although still hypothetical, description of industry structure and union impact. As a prelude to that description, a final note is warranted on the economic literature on union behavior.

5.1 Models of Union Behavior

The Ross-Dunlop debate in the early 1950's centered on differing interpretations of union goals and behavior.[1] Even though that debate was never resolved, economists have continued to adopt Dunlop's early approach. Unions, acting as largely economic institutions, are assumed to have an objective function and maximize that subject to constraints. A common assumption is that they maximize the monopolistic bent of their members. As Rosen descibes it, "Assume

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1. For a recent review, see D.B. Mitchell, "Union Wage Policies: The Ross-Dunlop Debate Reopened," Industrial Relations, February 1972.

the main objective of a union is to maximize income of employed members over and above what they could earn in alternative pursuits and net of all other nonwage costs accruing to the union."[2] Then, in this maximization process, unions are expected to take account of constraints on their behavior due to such factors as the degree of product monopoly in the industry; the extent of organization by the union; the elasticity of demand for productions of union firms; the elasticity of labor supply and so forth.

There are several problems with this interpretation of union behavior. First, the theory has never really been tested. Case studies of union behavior are rare to nonexistent; aggregate studies of union/nonunion wage differentials ignore both product and labor market structure and identification of union goals. If case studies were undertaken, they might show that unions maximize along other market dimensions -- the wage bill, total employment, or even nonwage attributes of work. Second, two of the few case studies of union behavior which have been undertaken show that the degree of union impact is more a function of the self-serving acquiescence of management than it is of pure power in the labor market. Williamson's economic analysis of United Mine Workers v. Pennington demonstrates the conditions under which it is beneficial to large mining companies to accept high union wages.[3] Hayden, in a recent study

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2. Sherwin Rosen, "Unionism and the Occupational Wage Structure in the United States," International Economic Review, June 1970.

3 Oliver Williamson, "Wage Rates as a Barrier to Entry: The Pennington Case in Perspective," Quarterly Journal of Economics, February 1968.

of the Teamsters union, shows that in a regulated industry employers may even encourage union wage increases: the union wage scale in trucking serves to limit entry (as in mining); provide a basis for coordinated price increases; and, under certain regulatory rules and other conditions, even raise profits.[4]

Third, though the economic view of unions as maximizing monopolists is capable of integrating a variety of goals into the formulation of the objective function, this view does overlook the institutional role of unions in a labor market. For example, Cox describes a collective bargaining agreement as an instrument of government as well as an instrument of exchange. "The collective agreement governs complex, many-sided reltions between large-numbers of people in a going concern for very substantial periods of time."[5] Unions may serve both to voice and channel conflict in an organization and to support and participate in a continuous system of personnel management. These roles may be just as important to workers (and management) as the union's contribution to economic rent. It is important to stress that this institutional role of unions is not the same as its impact on the nonwage attributes of work. That impact may change the outcome of the employment relation; as an "instrument of government" the union may be necessary for a particular employment relation to exist at all. Unions may fulfill crucial non-pecuniary

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[4] James Hayden, "Collective Bargaining and Cartelization: An Analysis of Teamster Power in the Regulated Trucking Industry," Harvard College Senior Economics Thesis, 1977.

[5] Archibald Cox, "The Legal Nature of Collective Bargaining Agreements," Michigan Law Review, November 1958.

aspirations of workers -- for status, participation, and control -- that are not captured by the calculative assumptions of economic rationality.

In sum, if the study of unions is to be renewed as an intellectual endeavor, it will have to be advanced beyond the simplistic and partial approach of the usual economic theory. Unions certainly are economic agents to some degree; more attention simply has to be paid to the market and management contexts in which they operate. At the same time, unions are political and governmental institutions which may reflect both economic and non-economic organizational and membership goals. And unions, as a collective voice of workers in the labor market, may make some unique attributes of work and employment possible.

In the following, craft unions in construction are analyzed from these perspectives. First, a simple market model of the industry is presented which attempts to integrate the wage and nonwage impacts described above into a coherent interpretation of union behavior. Second, the role of union institutions in structuring an "external" labor market for skilled workers in construction is contrasted with open shop employers' attempts to accomplish similar objectives.

5.2 Market Structure and Union Behavior

The following describes, in a schematic way, a simple market model and a description of union behavior which is compatible with the empirical findings of the survey.

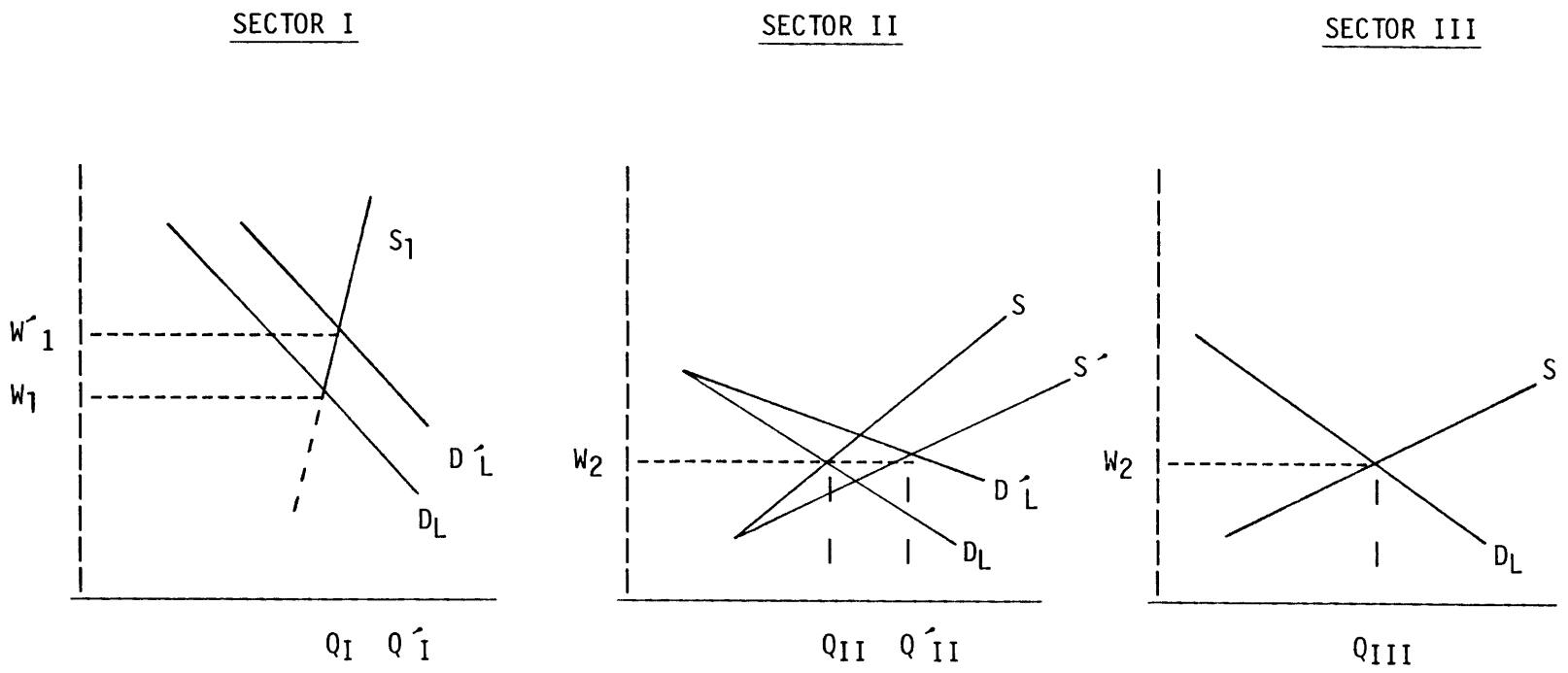
Assume the construction industry in a large metropolitan area (like those in the survey) has three distinct sectors. These sectors are distinguished by different elasticities and levels of product demand for particular types of construction: Sector I is composed of large-scale commercial and industrial building for private and public clients; and Sector III is entirely residential, but in single-family home building. Assume that due to economies of scale in project management and design, median firm size is largest in Sector I. This implies that there are barriers to entry, but the product market is still competitive as the existing firms in Sector I compete through secret bidding, for construction contracts. In contrast, in Sectors II and III, there are few if any economies of scale and as a result firms are small, numerous, and highly competitive.

On the factor supply side, assume first that all firms buy material inputs from competitive suppliers. Second, assume that there are two different skill classes of labor: a highly skilled, broadly-trained group necessary for the complex and unique work in Sector I and a less skilled, more specialized group sufficient for the more routine work in Sectors II and III. At the outset, there is competition in the labor market and thus there are only two labor supply curves representing the different social opportunity costs of labor to each sector. (See Figure 5.2.1).

The combination of these supply and demand attributes in three sectors gives a status equilibrium for labor demand and supply pictured in Figure 5.2.1. The derived demand for labor is assumed to

Figure 5.2.1

THE LABOR MARKET STRUCTURE IN THE CONSTRUCTION INDUSTRY



be roughly inelastic and more elastic in Sectors I and Sectors II/III respectively in keeping with the elasticities of product demand in those sectors and the small share of labor as a percentage of total construction costs. The labor supply curves have, explicitly, different levels due to skill differences and also may have different elasticities if alternate employment for the more skilled group in Section I is highly productive. The resulting inter-sectoral wage differential, W_1/W_2, is a pure skill premium.

Now suppose there are two time periods, Phase I and Phase II, characterized first by union activity and then by changes in demand and technology. In Phase I, a union tries to organize workers in all sectors but finds, due to the variety of market conditions, that different wage and non-wage goals may be suitable for each sector. The inelasticities of labor demand and suppply in Sector I make a policy of high wages and non-wage benefits relatively easy to enforce and sustain. Yet, this same policy in Sectors II and III may bring substantial unemployment (moving up a more elastic demand curve) and competition (from the elastic labor supply). Assume that the union, rather than adopting a separate wage/non-wage package for each sector, attempts to bargain out a compromise solution.

If the union is somewhat attentive to the more competitive supply of labor in Sectors II and III, the union may settle for a wage/non-wage package only slightly above W_1. This gives it some gains in economic rent without great loss in employment. Since W_1 alone exceeds the competitive wage in the other sectors, the union

cannot impose the same package on those sectors without facing initial unemployment and, if it cannot restrict entry of additional labor, eventual decline due to competition from lower cost, nonunion firms. However, the union could increase employment in Sector II by acting like a discriminating monopolist and relaxing, on an informal basis, some nonwage aspects of the agreement. These changes would lower production costs for union firms in Sector II and expand union employment towards Q_{II}.

With this type of union behavior, the outcome in terms of efficiency and distribution are fairly straightforward. The union, acting somewhat like a discriminating monopolist, can achieve some gains in rent in one sector and some gains in employment in another. This union policy is relatively easy to sustain since it approximates the competitive solution; there is very little distortion of factor prices and hence little deadweight loss. Of course, the union is not acting like a pure discriminating monopolist: it is not maximizing rent in all sectors. Yet, given some constraints on union power - particularly the competitive environment in Sectors II and III - and some other union goals, which may be non-economic, this type of union policy is reasonable.

Now, assume in Phase II, two major changes occur: First, demand increases in all sectors, but particularly in Sector I, and, second, there is an evolution in construction technology which permits the substitution of prefabricated materials for skilled labor, particularly in Sectors II and III. The union might respond to the

increase in demand in Sector I by some increases in the wage/nonwage package, say to W_1'. The increase in demand offsets the static losses which might occur given this wage increase alone. Nonetheless, this package is now very difficult to sustain in Sectors II and III. Although the derived demand for labor has increased in those sectors, it has also become more elastic due to the increase in the elasticity of substitution of labor for materials. At the same time the decrease in skills demanded has shifted the labor supply curve to the right: firms now face an even lower opportunity cost of less skilled labor. Although the union might still try to compete in Sectors II and III, it may find that the informal, ad hoc relaxation of part of its wage/nonwage package less effective in meeting competition. In this predicament, two of its options would be either to give up union employment in Sectors II and III entirely and concentrate on gains in Sector I or to act more formally as a discriminating monopolist and bargain separate contracts with lower wages and different work-rules for these other types of construction work.

Union Goals

What this market structure tells us about union behavior is the following:

1) unions can and may approximate a competitive solution if and when they adjust their policy across different market segments. This behavior implies that a union, attentive to employment goals in a competitive submarket, may modify its 'economic rent' goals in a submarket in which it has more market power.

2) In a competitive industry, any increases in factor costs will be passed through to consumers. Depending on the elasticity of demand in different sub-markets these increased costs will have differing impacts on production demand and on derived demand for labor. Employers in different sub-markets, facing different demand elasticities, may have different price preferences. As a result, there may be greater or lesser sensitivity among employers to union wage gains. This difference in sensitivity may make employer coalitions which bargain with the union very unstable. For example, employers in Sector I may be very willing, with an inelastic demand, to 'give the union what it wants.' Employers in Sector II would tend to be more resistant.

3) In addition to the question of wage levels, employers may also have an interest in cooperating with the union over wage uniformity. If the union "takes wages out of competition" by bargaining uniform rates for the whole local industry, the union also reduces competition among firms. Firms then can compete only on the basis of management ability, profit levels, and overhead costs.

4) Any government intervention in the industry, such as prevailing wage laws, which impose elements of the union agreement on all firms in the industry doing public construction obviously lessens competitive pressures on the union. In fact, such government intervention is probably more effective than the union ever could be in translating terms and conditions of employment bargained for Sector I into other types and scales of construction activity.

5) If the union approximates a competitive solution in terms of wages and employment, it may rely on its nonwage and non-pecuniary impacts as incentives to workers to remain members. In many cases, these impacts may be appreciated by employers since they might have to provide them or an approximation of them, to hold skilled workers in an open shop, competitive market environment.

6) The main difficulty the union faces is not a variation on the static problem of maximization, but a dynamic version of this problem. As supply and demand conditions change in different markets, the union may have to substantially redefine its policies in order to accomplish similar wage and employment goals. The process of reforming policies under some uncertainty as to the real extent of market changes and with different factions in the union disagreeing over strategy, is obviously fraught with political problems for the union leadership.

Actual Trends in Construction

In a not very disguised form, the two "phases" described above are meant to illustrate the major changes in the construction industry in the last thirty years. This period encompasses the post-WWII boom in construction and the building peak in the late 1960's. (The story ends before the recent deep recession in the industry which began in 1974).

Phase I is meant to correspond to a time in the 1950's and early 1960's when the union role in the industry appeared to have stabilized. Union construction predominated in both large and small

scale commercial building in most areas of the country. (It should be noted that prior to this period, up to the late 1940's and early 1950's, the unions apparently controlled some single-family home-building and other residential work. They either lost or opted out of this in 1950, except for California and some areas in the mid-West.)

The presumed stability in the industry (there are, of course, no time series of the percentage of construction work or employment that is union) is signalled by the apparent lack of major open shop competition and the relatively slow rise in union wages. Although construction wage and benefit levels have always been comparatively high on an hourly basis, wages in the nineteen fifties were not increasing faster than wages in comparably skilled, heavily union industries. (See Table 5.2.1)

This stability (which implicitly allows for a wide variation in local market conditions and union behavior due to the geographic diversity of the industry) was shattered by the rapid expansion in construction in the late 1960's. For the first time in the post-war period, unemployment in construction went down to six percent and stayed below ten percent for five consecutive years, from 1965 to 1970. At the same time, the mix of construction activity changed: the volume of both public and private commercial and industrial work rose as a percentage of total volume. The combination of this period of low unemployment and high, inelastic demand apparently caused a rapid change in the relative power of the unions in some sectors of the industry. The signs of this were the number of strikes and the large wage settlements which really began in 1965 and 1966

in some areas but which escalated and became widespread by 1968 and 1969.

What the analysis of Phase II suggests is that once the old equilibrium had broken down, the unions had a difficult time establishing a new wage policy in a different market context. In essence, due to technological change and perhaps also to geographic dispersion (the growth of small-scale commercial activity in suburban areas), the market segments of the construction industry were pulling apart. The unions chose initially (by design or mistake) to stay with the high sector of the industry and bargained wages and other contract attributes in that context. Although this level of union benefits became increasingly difficult to sustain in other sectors of the industry, the tremendous volume of large-scale work may have made up for employment losses in small-scale construction. Membership data for the building trade unions is scarce, unreliable, and biased (since a considerable but unknown amount of non-construction employment is included), but the data which do exist show small increases in union size throughout the late sixties and early 1970's. (See Table 5.2.2) As long as employment was growing in the richer end of the market, unions (and some employers) may have been willing to give up competing for other work.

In the meantime, the technological changes and increased volume of other work permitted entry by open shop firms. Although this competition was largely limited to small-scale work, some large firms were making inroads in a few types of traditionally union activity. In addition, substitution of some open shop labor was taking

Table 5.2.1

AVERAGE WEEKLY EARNINGS IN CONSTRUCTION AND MANUFACTURING DURABLE GOODS

Year	Construction	Durables	Differential
1950	$ 70	$ 60	13%
1955	91	82	11%
1960	113	97	16%
1965	138	117	18%
1970	195	143	36%
1976	284	225	26%

Source: U.S. Department of Labor, Employment and Training Report of the President 1977, Table C-3, pg. 222.

Table 5.2.2

CONSTRUCTION UNION MEMBERSHIP LEVELS, AND PERCENT OF ALL UNION MEMBERSHIP AND OF TOTAL CONSTRUCTION EMPLOYMENT

Year	Members	Percent of All AFL-CIO Union Membership	Percent of Contract Construction Employment[1]
1956	2,122,000.	12.8	81
1958[2]	2,256,000.	15.2	95
1960	2,203,000.	14.7	90
1962	2,339,000.	15.8	95
1964	2,248,000.	14.9	87
1968	2,452,000.	15.8	88
1970	2,476,000.	15.6	84

[1] Employment is of non-supervisory workers on payrolls.

[2] After 1958, data include Alaska and Hawaii.

place within (and on) largely union projects. For example, the work of many of the basic trades on large-scale construction could be undertaken quite cheaply by open shop firms (in painting, landscaping, carpentry) while the more complex mechanical work was subcontracted to union firms. This inter-mixing of union and nonunion labor on job sites was permitted by the Denver Building Trades decision of 1953. As a result, by the mid-1970's, it was becoming difficult to characterize projects as either "union" or not.

At the time of the 1976 survey on wages and other issues, the industry was in turmoil due to both the union/nonunion tensions and to the unprecedented downturn in construction activity. Due to the coincidence of these changes, it was often difficult to interpret whether the behavior of unions and union firms was influenced by open shop competition as such or by the relative lack of work or, most likely, by both. In the current market context, the unions in Boston, Denver, and nationally - depending on particular local conditions - seemed to be following a variety of strategies. Among these are:

- no formal concessions in wages or other measures coupled with informal relaxation of all contract stipulations except the wage and benefit levels;
- structural changes in work rules or other conditions in agreements for specific projects; some lower wage rates for particular projects or sectors;
- sporadic, but isolated, attacks on open shop firms and job-sites; some general picketing and harassment.
- legislative attempts to overturn the Denver Building trades decision in order to use picketing to enforce a "common labor policy" on job-sites: i.e. to make projects which are partially union, all union.

At the same time, employer associations have attempted to rebuild and restructure local bargaining in order to survive in the industry as union firms. Also, since the wage escalation in the late 1960's, some large construction user groups have become more directly involved in the industry. This signifies an awareness on behalf of industrialists that their own inelasticity of demand has been a major cause of some of the problems in the industry.

At present, it is not clear what the resolution of these different trends will be. A resurgence in volume in the industry is probably necessary for the existing tendencies to be sorted out. At the least, both the union and the open shop sector face major challenges in the near future. The unions may be forced, if there is not a recovery in large-scale construction, to make major concessions in order to survive in small-scale work. On the other hand, the open shop sector still needs to prove that it can supplant the union in the type of work in which the latter now dominates. The key difficulty that the nonunion sector may have in understanding this is the problem of organizing a labor market where skilled workers become variable costs - and not, as in manufacturing, quasi-fixed factors - to large-scale firms.

5.3 Craft Unions and External Labor Markets

According to Freeman, industrial unions provide services to workers and employers alike in acting as a collective "voice" for workers in shaping the employment relation. As a consequence, the

quit rate is reduced, while expressed dissatisfaction is raised, in unionized industries.[6] For workers in many craft unions, employment instability is an inherent aspect of the labor market: in construction, in particular, many craftsmen tend to move between firms and projects and demand dictates. Thus, it is not likely that craft unions will play an equivalent role in stabilizing the attachment of journeymen to a firm. On the contrary, they should play an important role in permitting mobility between firms in the context of the skilled workers' attachment to the industry. Before analyzing the particular structures which building trades unions and firms operate in construction labor markets, it would be well to review the empirical findings presented in the chapters above.

Union and Open Shop Construction

The picture that emerges from the data on union wages and work practices presented above is roughly the following: in Boston and Denver, union firms are larger than their counterparts, and completely dominate the large-scale ($2m. projects and up) commercial building sector. All high-risk offices; hospitals; hotels; high-rise housing; and large industrial plant construction is union work in both cities. Until recently, nearly all of the large-scale heavy and highway work was also union in those metropolitan areas. The union firms report that one of their major advantages is access to a skilled labor pool: either directly through the hall or indirectly through

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[6] Richard Freeman, "Non-wage Effects of Trade Unions on the Labor Market," (Harvard University Department of Economics mimeo, February 1976).

an informal network of referrals. The occupational definition of this pool and its pre-determined wage permits them to estimate labor costs and make competitive bids on projects over a two or three year time period. In general, union "restrictions" in jurisdictions, technology and the like are not onerous; by and large, they fit both the organization of firms in the industry and the technology and division of labor on large-scale work. Unions can and do cause disruptions over details of contract language and management practice: the cost of these disruptions, their seemingly sporadic and irrational nature; and the uncertainty they introduce into construction activity is perceived as one of the major burdens of operating as a union contractor. Other difficulties are the variation in quality of journeymen (with a fixed wage); the problems of coordination of work and rules between eighteen different and independent unions; the inefficiency of some jurisdictional and work rules; and the occasional misfit between jurisdictionally defined occupations and changing needs of particular firms. Overall, the union craft institutions, developed with the employer associations in bargaining and, in many cases, operated jointly by both management and labor provide important services to the industry. The formal structure of these institutions, however, is often adjusted informally to fit the particular needs of different size contractors and product types. Small contractors, for example, are rarely held to the details of work agreements that fit naturally in large-scale construction.

Open shop firms, in contrast, are smaller and concentrated in residential and small-scale work. They tend to rely on a work

force that is permanently employed by the firm (as do small union contractors), hiring mainly unskilled and semi-skilled men from the outside for seasonal peaks. Open shop firms dominate the construction of single story and low-rise commercial and residential buildings, particularly in suburban areas. Service stations, warehouse, single story steel frame buildings for small factories, garden apartments, small restaurants, etc., are traditionally non-union work. Open shop contractors rely on specialization of their firm and work force to compete for particular kinds of work. Skills and occupations are often firm-specific and relate to the joint activities of a permanent work-crew in the firm. Larger open shop firms - those who have grown rapidly in the past five years - find that their continued growth is constrained by an inability to man, temporarily, large projects.

For example, open shop firms cannot find, hire, and fire twenty journeymen plumbers for work on a sizable contract. Without this kind of labor pool, they cannot estimate and bid on large, long-range work. So small firms work on a "spot" basis: small construction or in alteration and repairs where their specialization and flexibility is an asset. Although there are non-union apprentice programs (which, owing to government regulations have to be virtually identical to union programs) considerable training occurs informally in non-union firms, on an on-the-job basis. Due to the specialization of a firm's work, this training is also firm-specific; firms can rarely bear the costs of producing "well-rounded" journeymen if this diversity of skills is not needed by the firm. Journeymen themselves

have little or no incentive to invest in "general" training (i.e., a range of skills used in the industry as a whole) if their major employment opportunities lie in permanent attachment to small specialized firms. Without hiring halls or extensive, formal OJT programs there are very few opportunities for skilled workers to rotate through different jobs with different firms in the industry. Thus, any investment individual journeymen want to make in broadening their skills would have to come in private, after-hours training.

Given this general overview of the differences and similarities of union and open-shop construction, the peculiar role that "craft" labor market institutions play can be analyzed. This analysis must describe the possible constributions to labor market (and, hence, productive) efficiency that these institutions make. The construction industry, particularly large-scale commercial building, presents unique difficulties in organizing large pools of skilled labor in an environment where uncertainty and mobility are paramount factors. Craft labor market institutions may be one way of structuring this market so as to minimize common organizational failures. Paradoxically, the same institutions which contribute to efficiency in the industry may also be used by unions as "distributive" mechanisms. This obviously creates tension between labor and management over the nature and control of issues like jurisdictional rules; training; etc. The specific elements of that tension are described below. Open shop construction may be another way to organize the industry, along lines of firm-specific specialization and employment, supplemented by a pool of unskilled and semi-skilled labor. Whether this

alternative is really applicable (or cost-effective) in other than small-scale or large, but routine work is unresolved, but the specific institutional alternatives open shop construction may create are intriguing.

5.3.1 Labor Market Institutions: The 'Organizational Failures' Approach

> "...task idiosyncracies are common, these give rise to small-number exchange conditions, and market contracting is supplemented by an employment relation principally for this reason."
>
> O. Williamson[7]

Williamson's analysis of internal labor markets provides another starting point for describing and evaluating industrial relations' rules and institutions. Williamson begins by describing alternate institutional forms of the employment relation. Two candidates, contingent claims contracting and sequential spot contracting, are eliminated early on due to the excessive demands the former makes on rational decision-making under uncertainty and the latter makes on good faith bargaining. Williamson describes an economic world of idiosyncratic jobs; of uncertainty; and of actors characterized by bounded rationality and opportunism. In this world, normal market relations are either difficult or impossible to sustain and, more importantly, are less efficient than "institutional" employment relations. Williamson demonstrates this, somewhat opaquely, by showing the efficiency or "system-maintaining" properties inherent in the internal labor markets described by Piore and Doeringer. He writes,

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[7] Oliver Williamson, Markets and Hierarchies, (Free Press, 1975), p. 62.

> internal labor markets serve to promote efficiency. Job evaluation attached wages to jobs, rather than to individuals, thereby foreclosing individual bargaining. The resulting wage structure reflects objective long-term job values rather than current bargaining exigencies. Internal promotion ladders encourage a positive worker attitude toward on-the-job training and enable the firm to reward cooperative behavior. A grievance procedure, with impartial arbitration as the usual final step, allows the firm and the workers to deal with continually changing conditions in a relatively nonlitigious manner. Contract revision and renewal take place in an atmosphere of mutual restraint in which the parties are committed to continuing accommodation. Unionization commonly facilitates the orderly achievement of these results, though it is not strictly necessary, especially in small organizations.[8]

In sum, Williamson's analysis of the relative inefficiency of different employment relations stems from an emphasis on:

- uncertainty
- task idiosyncracies
- bounded rationality
- opportunity

Because of the prevalence of these in labor markets, transactions costs are reduced by institutional structures and by labor-management rules governing the employment relation (i.e., hierarchy).

Construction Industry: Production Processes and Labor Markets

Williamson's analysis, while realistic in many respects, is also curiously abstract. "Transactions costs," which are at the center of his analysis of institutional structures, are illusive in definition and nearly impossible to quantify. And for labor market applications, his only concrete references are to those described by Piore and

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[8] Williamson, Ibid., p. 81.

Doeringer: internal markets in manufacturing firms. In many ways, however, Williamson's approach is helpful in understanding the "external" labor markets organized by craft unions in construction.

In order to justify this approach, considerable familiarity with the production process in the construction industry is needed. The keys to understanding that process are noting the role played by flexibility in the skills and output characteristics of firms and instability of skilled workers' relation to firms and of firms to each other. Firms in the industry are required to bid on and build projects to individual specifications of different clients. Though there is some standardization and prefabrication in the industry, most large-scale projects are unique in many ways. This uniqueness creates major "idiosyncracies" in tasks to a degree unimagined by Williamson's or Piore and Doeringer's description of task or job specific skills in manufacturing. In the latter, the idiosyncracies may be marginal adjustments to a routine task; in construction, the peculiarity of work is central to the completion of the specified, unique product. For this reason, considerable flexibility in skills is needed by workers in the industry. Indeed, one of the dimensions of skill for a journeyman is breadth of competence in different skills and with different materials.

Construction is so complex an activity that no single craftsman or group of diversified craftsmen joined as a firm could hope to be master of all the range of skills needed. Table 4.2 presented a list of over forty different specializations used in constructing a moderately large building. For the most part, this

range of tasks is accomplished by different subcontractors who work on the project site for short periods of time. The instability of the industry comes in part from these temporary associations of a multitude of different firms. In turn, each of these firms will employ some members of one to several of the eighteen different building trades unions. If the project is of any substantial size, most of the subcontractors will temporarily draw on a skilled labor pool external to the firm for temporary workers. For example, mechanical subs doing the heating, ventilating, and cooling systems will hire from five to thirty skilled journeymen to accomplish the particular tasks of the project during a period of several weeks' employment. To this dual nature of the instability in the industry - relatively small firms contracting and recontracting with one another and large numbers of skilled workers working for a variety of firms on a temporary basis - is added yet another type of instability: competition. Most construction projects are of fairly short duration, from six months to two years for small and medium scale building. Firms usually have to bid on work for each project. In this kind of competitive environment, with very short "production runs," firms are necessarily myopic: there is no guarantee of a fixed market share beyond the work that is under contract. This uncertainty severely constrains the firms' ability to invest in fixed capital machinery or in "quasi-fixed" factors like skilled labor. This uncertainty also prompts the diversity and limited specialiation of subcontrctors and skilled workers. No one

construction project can sustain them for long; they must be fit to move along and between projects as demand dictates. To the extent that some specialization will improve their productivity, lower costs and their bids, it is valued. However, extreme specialization is usually constrained by the natural diversity of output in the industry. Some degree of flexibility and skill breadth is needed to continue to work regularly.

Thus, the organization and operation of construction projects consists in two functions: one is the on-site coordination of firms, machinery, and manpower to produce a complex product efficiently. This function has been extensively developed by engineers using CPM and PERT methods. The other management function in the industry is simply bringing together, from the outside market, existing firms and existing skilled workers for temporary employment. Few construction projects are so large and so long as to permit extensive on-the-job training for either management or labor. As a result, the construction industry as a whole must sustain specialized firms and highly skilled workers so that they can be shifted through temporary projects as demand dictates. How this pool of skilled workers is maintained external to any one firm is the central problem facing both the industrial organization and the labor force in the industry.

Unlike the manufacturing examples in Williamson's analysis, there are no substantial internal labor markets in contract construction. No labor market has to solve problems of internal allocation of labor within a firm. Rather, it must solve problems of continually allocating

and reallocating labor between firms. And it must do this so that both skilled workers have some certainty of employment and firms have some certainty of obtaining qualified workers at known wages. Craft union institutions work to structure this external labor market in ways which reduce transaction costs, by providing common rules for all firms and workers, and, more importantly, provide occupational identity and stability for skilled workers. For example:

- Jurisdictional boundaries and rigid skill classifications with fixed wages provide, for workers, a certainty in both range of skills required and a return for those skills, independent of particular, temporary employment conditions. It is unlikely that workers would (or could) invest in general training for employment in the industry without the protection that jurisdictions and a fixed wage structure give. For employers, these structures also have a function: they permit firms to allocate work by trade and skill category and estimate the costs of the work, before bidding on contracts. Without clear skill delimitations and fixed wages, the inherent variety of construction work would become "a bloomin', buzzin' confusion." As Williamson notes, "In comparison with the firm, markets lack a rich and common rating language." Where, as in the construction industry, internal labor markets of one firm cannot be substituted for market transactions, the external market must be so structured to provide common signals to all firms and workers.

- Formal apprentice training programs rely on the industry as a whole to provide on-the-job training which any one firm may be unable to undertake. Apprentice programs are structural so as to

rotate men through a variety of tasks within a building trade occupation. This guarantees them some divesity in skills needed to ensure relatively stable employment. Individual firms, limited by present work, cannot provide such varied experience or afford opportunities to invest in other than immediately productive skills. Limits on apprentices, while guaranteeing more jobs for journeymen, also ensure that some OJT can be guided by more experienced journeymen and that employees do not attempt to substitute cheaper labor or limited skills for journeymen at times when that would be "efficient."

- Work rules provide protection for journeymen and firms against hazardous or exploitative practices of firms seeking to gain competitive advantages. The short duration of construction work and the temporary contracts between firms provide ample opportunities for temporary exploitation, under some conditions, of workers by firms or of firms by workers. This is what Williamson calls the danger of "opportunism" which arises in small numbers bargaining problems. Common work rules, like common wages, do away with continual, fractious bargaining in favor of common rules arrived at through contractual agreement.

- Hiring halls exist as supplementary sources of job information and referral to provide easy and low-cost access to jobs by workers and to provide easy and low-cost access to jobs by workers and to workers by firms. In an industry where turnover is high, reliance on individual job search or firm recruitment may be very costly and too risky.

These craft labor market institutions are remarkably only in contrast to the alternative market structures. For the employment relation in the firm, Williamson discounts two market alternatives to internal labor markets: contingent claims contracting and sequential spot contracting. The former fails to be viable due to uncertainty: no contract can comprehensively deal with all future possibilities. Due to bounded rationality, any contract which attempted to encompass all eventualities would be either incomprehensible or incomplete. It would either be, ex ante, difficult to write or, ex post, impossible to enforce. The latter alternative, sequential spot contracting, fails due to opportunism: "the idiosyncratic nature of the work experience effectively destroys parity at the contract renewal interval." Without this parity, either workers or employers are able to exploit temporary advantages in small numbers bargaining with the resulting inefficiencies in allocation. Due to the variety and instability of work and the employment relation in construction, these two alternate forms of labor market structure are also inapplicable. First, due to the variety of construction work - the lack of homogeneity in either working conditions and materials, or products - contingent claims contractng for other than very temporary labor services is impossible.

Second, due to the uncertainty as to demand conditions facing the firm and its need to bid fixed cost contracts for work, sequential spot contracting is unfeasible: temporary shortages of labor or key steps in the construction process could be used to

appropriate nearly all returns to firms by its workers. Conversely, firms could exploit temporary advantages over workers for short-run profit gains. In general, with either of these contractual alternatives, considerable transactions costs can be envisioned, forcing a need to recontract or interpret past contracts as production conditions change or are altered by circumstance. However, the common rules provided for the external labor market by craft union rules avoid these transactions costs. While the implications of the rules may, at any one time, appear to cause inefficiencies, the operation of the system as a whole should be more efficient in comparison to the alternative. It is unlikely that highly skilled workers could be attached to an industry and not to a firm or that firms could continually recontract with other firms and with groups of workers without some common agreement on wages, occupational structure, and work conditions. It is precisely these rules and institutions which permit the maintenance of an external pool of skilled workers and of specialized firms which can be continuously drawn on for temporary production within the industry.

Two institutional alternatives may exist though to the craft union structure in the external labor market in construction. One of these is the creation of the same institutions (occupational identity; apprentice training; work rules; and hiring or referral systems) by an association of nonunion or open shop firms. The other is to change the industrial organization of the industry so that firms are either small enough or large enough to do without an external

skilled labor pool. Both of these alternatives, with examples of their manifestation in the construction industry, are explored below. First, however, each of the distinctly "union" institutions is described and analyzed in greater detail. Throughout this description, it should be emphasized that the characteristics of the structures or institutions being discussed are quite idealized. The descriptions represent ideal or model types of union behavior particularly characteristic of large-scale commercial and industrial building. In addition, it must be stressed that although the institutions are described as "union" this is meant in the sense that they characterize labor market operations in large-scale construction covered by collective bargaining agreements. The "union" characterization is not meant to imply that the institutions are unilaterally imposed by the building trades on management in the industry. To the contrary, management plays a major role in creating and sustaining these institutions in collective bargaining and employer representatives usually participate in the operation of many of the resulting committees and associations. For example, management representatives are always represented on joint apprenticeship committees and have been involved at times in both defining jurisdictions and resolving disputes. For this reason, management is implicated, as it were, in both the character and the operation of the "union" institutions themselves.

5.3.2 Occupational Definition: Towards a Theory of Jurisdictions

Economists have given very little consideration to the analysis of occupational structure and change. Outside some brief

comments by Arrow and an article by Houthakker, Scoville is the only one to develop a theory of job design on the basis of neoclassical analysis of costs and productivity.[9] Scoville begins by defining "jobs" as groups of "tasks" where tasks are the smallest skill or activity elements. Unlike authors who assume that the task combinations which comprise jobs are simply given by technology, as in Adam Smith's famous pin-making examples, Scoville shows that jobs may arise out of interaction between employers' and workers' preferences and economic incentives. He notes,

> "...the apparent fixed relationship between means of production and specific jobs, which impresses itself upon observers of work in highly capitalized industries, is either illusory or a short-run phenomenon...Tasks and duties can be reshuffled among jobs in several ways - by altering the horizontal time and functions sequence involved, by incorporating or deleting vertical (supervisory and quality control) functions, by inclusion or separation of maintenance, repair and supply functions... Moreover, that which appears fixed at a point in time may be quite variable in the face of options presented by continual technological advance (Piore)."[10]

Scoville chooses "narrowness" versus "breadth" as the crucial dimension in job (or occupational) definition. The subdivision of labor, as described by Smith and then Taylor, has increasingly permitted the increased specialization of workers to the point where

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[9] K. Arrow, "The Theory of Discrimination," in O. Ashenfelter and A. Rees, Discrimination in Labor Markets (Princeton University Press, 1973); James Scoville, "A Theory of Jobs and Training," Industrial Relations, Vol. 9, 1969, pp. 36-53; and H. Houthakker, Economics and Biology: Specialization and Speciation," Kyklos, 1956.

[10] Scoville, op. cit., p. 47.

many perform only a few routine tasks. This specialization has been pursued due to the belief that labor productivity continues to rise as the divison of labor becomes finer and finer. Recently, worker dissatisfaction has raised the costs of this specialization and routinization of work to the point where job redesign now aimed at "enlargement," is again an issue. In this context Scoville proposes a model of employers' and workers' economic behavior related to the relative "narrowness" of a job.

For employers, the determinants of optimal job breadth are four cost curves, which combine to form a conveniently convex total cost curve (see Figure 5.3.1). The minimum point of the total cost curve determines the relative narrowness of a job. Scoville hypothesizes that:

(1) supervisory costs fall as the supervisory function is incorporated with production work by job enlargement;

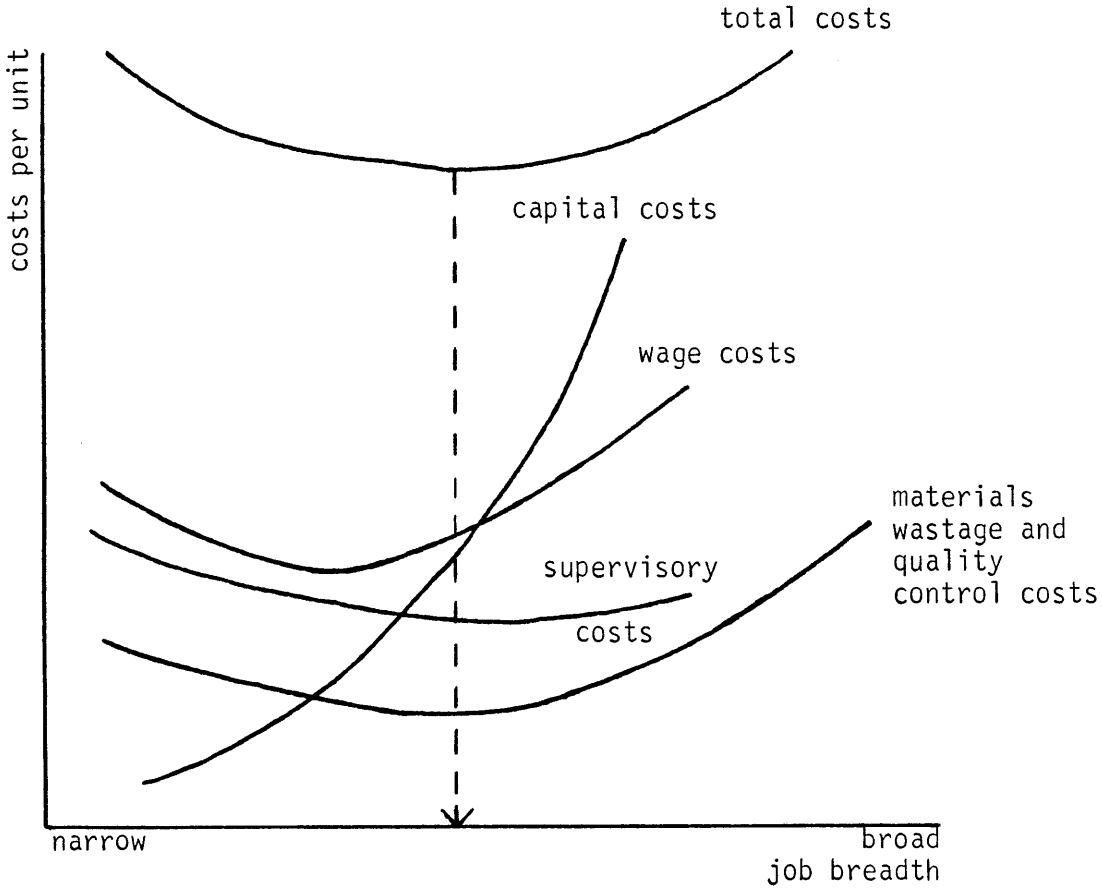
(2) materials, wastage and quality control costs are high in narrow jobs (due to low motivation of workers); decline and then rise in broad jobs (because of the loss in skill specialization);

(3) capital costs rise continuously due to the increase in inventory costs of goods in process;

(4) net wage costs are high for narrow jobs (owing to cost of turnover); decline; and then rise as training costs increase in broad jobs.

Figure 5.3.1

EMPLOYERS' MODEL OF OPTIMAL JOB BREADTH



Source: J. Scoville, op. cit., p. 42.

With these curves defined (hypothetically) in the graph, a determinate solution as to job breadth emerges: the minimum of the total cost curve. It is, of course, easy to criticize the exact shape of any of these curves or to test qualitatively the impact of a change in shape of any one curve on the minimum of the total cost curve. More important, the exact shape of the curves empirically will depend on the technology and labor market structure of a particular industry. Scoville's analysis is apparently oriented toward industrial firms engaged in continuous process production (e.g., pin making). For a construction firm, engaged in production of the relatively unique good for a short period of time, the curves may have a substantially different appearance. If the firm is myopic - and, in construction it is likely to be so because of the cash flow constraints of discontinuous payment only for work completed - it may stress immediate production gains achieved through specialization over supposed benefits attainable by job breadth. Due to the relatively short time workers are employed on construction jobs, the costs of turnover arising from dissatisfaction with routine tasks is likely to be low. Supervisory costs may decline slightly if workers are "well-rounded" but relatively little supervision may be needed on a particular project if most tasks on that project, though unique to the project, are repetitive. Thus the supervisory cost curve may be nearly flat. Capital costs may not rise abruptly: this rise is largely a function of speed in production and there is no reason, a priori, to assume "narrow" jobs reduce project completion time. Quite the opposite may be true. Finally, the net wage cost curve

may also be flatter due to the lower costs of turnover at one end and the (indeterminate or project-specific) training costs at the other.

The difficulty of applying this model to employers in the construction industry is that the exact shape of the curves, and hence, the optimal job breadth, will vary by project type at one point in time. In addition, the curves will shift over time because of change in product composition and technology. Overall, one might hazard the generalization that employers will find relatively "narrow" jobs more economical. They may be solely interested in skills and output specific to a particular project and thus adopt, as firms, a narrow view of construction jobs and occupations. However, employers will be aware that project types will vary over time and, therefore, different kinds of tasks skills will be needed from workers in the future. Nonetheless, there will be considerable uncertainty as to what skills will be needed and when. This uncertainty is likely to reduce any one employer's incentive to develop and train most men in broad occupations. The firm is more likely to retain a few highly skilled men on a permanent basis and supplement these with temporary hires from an external labor pool. Given the nature and complexity of the particular construction project, and a range of skilled men available from this labor pool, the firm will have to bear the costs of hiring, screening, and training. If the temporary jobs are routine, these hiring transaction costs are likely to be low, and the firm can rely on fitting "unskilled" workers into narrow, temporary jobs. If the temporary jobs are unique and/or complex, the transactions and training costs

are likely to be quite high. But a firm, acting alone, will have no incentive (or resources) to develop hiring and training systems which are applicable to more than the specific needs of the project. At most, it might be willing to invest in some specific training of a few workers attached to the firm to prepare them for different work the firm might undertake in the future. It is highly unlikely that any firm would invest in specific training for a large number of workers ex ante - that is, before the specific construction project is under contract. Ex post, there may be limited time available for training, particularly if jobs are complex and training costs, due to demand for OJT, experience, and practice, is costly and difficult. In sum, the "production run" for a construction firm is limited to only one or a few projects. This short period does not allow for extensive investment by the firm in quasi-fixed factors like skilled construction labor.

For workers, Scoville also presents a cost model of optimal occupational breadth. Workers' interests, in terms of breadth, are potentially different from employers'. Scoville sees workers concerned with three types of costs (see Figure 5.3.2):

(1) worker-borne training costs, which should rise as jobs broaden;

(2) probability of employment, which should increase as workers skilled are broadened:

(3) "wage-productivity nexus" which represents the workers' perceived trade-off in earning ability in narrow versus broad jobs.

Graph 5.3.2

WORKERS' MODEL OF OPTIMAL JOB BREADTH

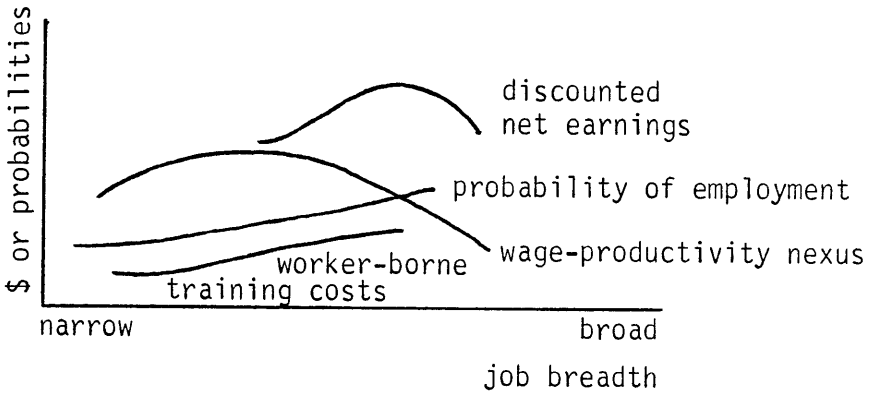
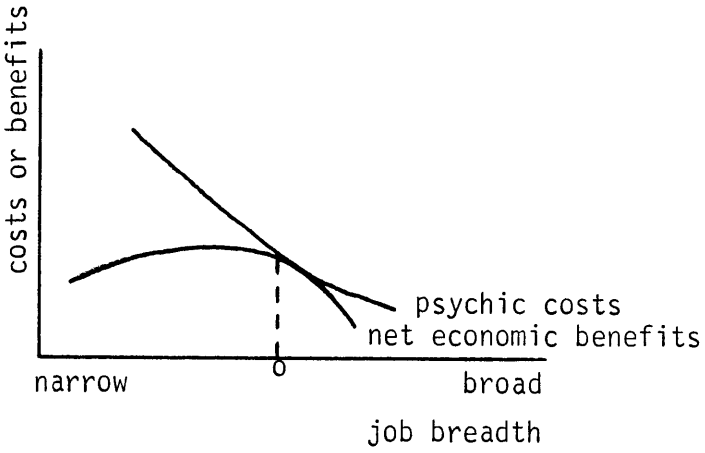


Figure 5.3.3

WORKERS' PREFERENCES ON JOB BREADTH



Source: J. Scoville, op. cit., pp. 44, 45.

These cost curves are not as clearly defined as Scoville's view of employers' interest. Yet their qualitative implication is clear: workers' economic interest in broader jobs, which raise the probability of employment, are tempered by the increased costs of training and the potential loss in productivity due to being "too broad" (i.e., the 'jack-of-all-trade, master-of-none' syndrome). The result will be a concave net earnings curve which will define the pure economic benefits. Scoville then hypothesizes that the actual choice of job breadth will result from the combination of net economic benefits and workers' preferences (i.e., psychic costs) as to job diversity (see Figure 5.3.3).

For construction workers, cost curves are likely to imply net economic benefits in broader jobs or occupations. In an industry characterized by the movement of many men from firm to firm, the probability of employment will increase the more diverse the worker's skills. If jobs on different projects are relatively unique and require some degree of flexibility, innovation, and self-supervision to accomplish, then the wage-productivity nexus should be relatively flat. (In other words, in a world of diverse and uncertain tasks, a jack-of-all-trades is more of an optimal worker.) However, worker-borne training costs will rise as jobs broaden and this alone will cause the discounted net earnings function to decline as jobs broaden. Finally, it is not clear what psychic costs are involved in choosing between breadth of construction jobs. It would be hard to differentiate these costs from pure economic preferences. The net earnings function

alone, then, may be sufficient to define optimal job breadth from the workers' point of view. (Also, if status or prestige is attached to broad jobs, independent of the economic value of diverse skills, then lower psychic costs may be associated with job breadth.)

Scoville's model of job design gives a context in which to evaluate the role and influence of craft unions, in construction, on the organization of work. As indicated above, the short-run, small-firm, uncertain, project-specific nature of construction activity creates a tension between the immediate occupational needs of firms and the job desires of workers. Firms may be able to reward only immediate, limited productivity; workers will desire broader jobs and training to increase employment probability in moving between firms and projects. At the same time, firms may realize that access to a broadly trained labor pool may decrease their project costs. Yet individual firms may not have resources to create such an external pool and associations of firms may risk attracting "free riders" (as well as anti-trust action) if they pool resources to train and manage "external" employees. In construction, craft unions resolve both the tension between broad and narrow jobs and the dilemma over collective action.

The craft union concepts of a jurisdiction and of a journeyman define broad occupations at a relatively high level of skill. This definition, in the context of the organization of much of the construction industry (small firms and mobile workers) serves several coincident purposes:

(1) it reflects workers' desires for a diversity of skills which increase probability of employment and may imply high wages and status;

(2) it reflects employers' implicit needs for a skilled labor pool external to the firm; a pool which can in part be created and managed by a number of workers and firms as a "collective good;"

(3) it provides some occupational structure and identity which permits (a) hiring and screening with lower transactions costs and (b) some certainty to workers to invest in general training which will be saleable to a variety of firms in the industry;

(4) it provides a common job definition to which a common wage level can be attached, thus eliminating the costs of monopolistic bargaining (opportunism) from every hiring process.

An example of a craft-defined occupation may make these purposes clearer and more complete. The skill (or task) components of the occupation carpenter as it is "traditionally" defined in U.S. construction covers over thirty different subspecialties. Obviously, from this range of tasks it is a broadly defined occupation. Yet it is clear that any one task might become the specialization of one or a number of men if there were enough work to justify that fine a division of labor. Presumably, construction work is so varied and so uncertain in its composition that such a high degree of specialization

is risky. Craft jurisdictions and apprentice training programs incorporate all these tasks into one occupation and thus provide the diversity or breadth that serves both workers and firms.

The apprentice system in construction structures the on-the-job training process in a way which guarantees the workers diverse skills within a defined and protected jurisdiction while also rotating an apprentice through jobs and firms in a defined program and at fixed wages. It would be virtually impossible to expect individual workers to be able to arrange such a program. Given opportunism, the transactions costs would be insurmountable for all but the most persistent. However, craft unions and associations acting jointly to govern the OJT training process can provide the structure necessary. Within the structure, workers can then invest themselves, through lower wages and foregone leisure, in those skills specific to a firm or project which comprise, in sum, general training for the industry as a whole.

In static terms, then, the craft labor market institution of "jurisdictions" and "journeymen" contribute to the efficiency of the industry. They permit, in combination with other institutions analyzed below, relatively low-cost system maintaining solutions to managing a skilled labor pool connected to a large number of firms. If workers are risk-adverse, then to the extent these institutions reduce uncertainty in occupational employment and earnings, they work to lower the mean wage or earnings necessary in an industry to maintain a skilled labor force. At any given time, the operations of these institutions may appear to be inefficient (e.g. petty jurisdictional

squabbles or use of skilled journeymen to do routine work). And the continuous economic pressures on employers to narrowly define jobs, or to economize in the short-run, may cause disruptive tensions with unions committed to broader jobs or on-going institutional structures. In addition, the unions themselves, particularly under monopoly conditions may use these structures to force distributive gains from employers. Unions can use jurisdictions to control work or require journeymen on jobs to inflate employment levels. Additional costs from this activity may be borne by employers or passed on to consumers. It is up to the unions, pressured by the employers, to permit flexibility in the application of institutional norms to a variety of situations. Not surprisingly, this need for flexibility coupled with uncertainty on behalf of both unions and employers as to the real purpose of the variation can cause disruption. Unions may always be suspicious that flexibility means management retraction of rights; employers fear adherence to detail in all rules means productive inefficiency. The deciding factor which resolves the issue and permits either cooperation for flexibility or inhibits it is a combination of "atmosphere" and competitive pressures.

The relative efficiency of the craft union occupational structure can be challenged in at least two ways. First, demand may increase in volume and/or constancy to permit and sustain a finer division of labor. With high demand, the advantage of specialization, greater productivity in narrow tasks, outweigh the disadvantage, uncertainty of employment. Such specialization would tend to break down

the labor pool of broadly trained craftsmen into task-oriented workers many of whom might be more permanently attached to specialized sub-contractors or move between a few specialized firms. Second, technological change in production can change the derived demand for skilled labor. To the extent that offsite processing of materials or standardization of building components can substitute for skilled on-site labor, the skill demands of contractors will be reduced.

Over the last seven years, construction technology has evolved from an industry in which most work was undertaken on-site to meet the specific requirements of a unique building to an industry characterized more by the local assembly of prefabricated components. This "assembly" process substitutes on-site skills for off-site capital-intensive technology. It also implies a demand from unskilled or semi-skilled labor (in routine, limited tasks) that can be met by hiring from an undifferentiated labor pool. Both of these trends, particularly in combination, provide potential advantages for the open shop contractor. They permit an alternative institutional organization of the industry based on firm specialization and semi-skilled labor. Two examples of these trends are the organization of residential construction, particularly single-family home-building, and some large-scale heavy construction, such as power plants and highways. Residential work is usually small-scale, very standardized, and relies heavily on the installation of pre-fabricated components. Homebuilders act less as general contractors than as developers: they finance the construction of houses and manage the building process but most of the construction

work is done by highly specialized subcontractors. These subs are usually very small firms which work on a variety of projects on a fixed-cost basis. At the other extreme are large projects, like nuclear power plants, which last for five to ten years and cost hundreds of millions of dollars. Construction work on this scale is so large and so stable that it permits both extreme specialization of labor in repetitive tasks and considerable on-site training in those tasks. For example, in large-scale power or chemical plants, workmen may do nothing except cut and weld pipe for two years. This kind of stability in a particular type of work permits specific training of semi-skilled labor.

5.3.3 Training and Apprenticeship

The nature of training in construction is largely determined by the occupational structure and skill demands in the industry as a whole. Union apprenticeship programs emphasize broad training across many tasks in an occupation. There is a heavy, though not exclusive reliance on on-the-job training and considerable stress on experience: the programs last from two to five years.

Over the last ten to fifteen years, there has been some dissatisfaction expressed by construction management and, implicitly, by apprentices themselves with the structure and operation of union programs. Some prefabrication has reduced skill demands in the industry but apprentice programs have been slow to recognize this and change the training process. Increased specialization by subcontractors in various construction operations, like drywall or cement form work, has

reduced the need for broadly trained craftsmen. Informal entry to journeymen status without completion of full apprentice programs, a process that predominates in some trades, has also reduced incentives for invstment in training. This fact, in addition to other difficulties in program operation, has led to substantial drop-out rates in union programs.

Nonunion training in construction is both similar and substantially different from the union system. Many open shop programs are initially the same in structure and content to union plans. This is due to the government regulation: in order for apprentices to be officially recognized as such the programs must be certified. Government agencies, like the Federal BAT and State SACs, usually adopt union plans as standards for certification. The substantial differences in nonunion programs are either (1) reliance on in-house training by some firms or (2) the design of new occupations and training plans, such as "general building mechanics," by some firms and associations.

In general, there appear to be two key differences between the union and the open shop approach to training. One of these involves the structure of the program and has implications for the efficiency of the training process. The other relates to distributive issues as to who bears the cost of training.

The union apprenticeship exemplifies a structure of training and job progression in an "external" labor market. Broadly trained, highly skilled workers who are attached to the industry (and not a

firm) can be produced by a formal system of job rotation. In this process, many firms contribute opportunities for specific training. Access to the wide range of experience and skills of foremen and journeymen in a variety of firms is assured. At the same time, the danger of workers becoming "too broadly" trained is avoided through the structuring of the training within one jurisdiction. The structure of the program guarantees to workers a fixed wage across firms and a progression of increases in the wage as their experience and skills increase. The transactions costs and uncertainty involved in any alternative to this structured approach are clearly enormous. Individual workers are unlikely to be able to bargain and recontract continuously in order to work their way around the industry broadening their skills. Even if they did so, they would have little sense of what returns there would be to such broad, but industry-specific, training since the returns would be idiosyncratic: unique to the skill composition and bargaining power of each individual.

In contrast, non-union firms undertake informal training of semi-skilled men only in the limited range of tasks needed by the firm - substituting, in effect, an internal labor market for an external one. Workers' skills may become mixed across traditional (i.e., union) craft lines. New occupations of greater generality (building mechanic) or specificity (instrument fitter) are created and trained for low-skilled, entry-level hires. Some large-scale non-union contractors have developed, at their own expense, in-house training materials to create a semi-skilled, specifically trained labor pool where and when needed. Flexibility in training, combined with advanced technology, firm

specialization, and a fine division of labor allows these open-shop firms to maintain large numbers of productive, yet semi-skilled, mechanics. Yet the result of most open-shop training is not a large, external labor of skilled men but a smaller group, attached to firms, with perhaps a narrower range of skills. And this lack of an external source of skilled labor supply severely constrains the firms' ability to take on large-scale projects. When and if they do so, extra training costs are involved.

This leads to the second implication of the union/nonunion differences in training: the distribution of costs. Under formal apprenticeship systems, individual workers bear much of the cost of OJT through prescribed lower hourly wages. In addition, all employers in the industry pay a small "tax," on the basis of hours worked by their journeymen, to support the activities of the Joint Apprenticeship Committee. Finally, most of the after-hours training is paid for by government vocational education programs. But, over all, the major costs of training are borne by the workers in the form of lower wages and foregone leisure in attending after hours classes. This is not surprising since, if the training is "general training" for the industry as a whole, it is the workers and not the firms which should pay for most of it. Most of the training in the open shop sector, however, is firm-specific. As a result, its costs should be borne by the firm. In fact, this is largely the case. Small firms undertake limited training at their own expense; large firms pay for the development of training material, instruction, and equipment.

Some of these costs are borne by the firm as general overhead and should be reflected in its prices; occasionally, direct costs for a single project's training are assumed completely by the owner. In terms of final costs to the consumer, in a competitive industry it should make no difference whether firms or workers bear training costs. If training is general, workers should recoup their investment through higher wages. If training is specific, firms must recapture their investment through higher prices.

What is crucial, though is whether open shop firms in construction could cooperate to organize a general training system for skilled workers if they ever found this to be necessary. Arrow, in a brief comment in his essay The Limits of Organization, argues that it may be difficult for firms to do so. He writes:

> "...a significant part of accumulation of human capital consists of training specific to the needs of a firm, an input of information to the worker which increases his value to the firm but not to other firms. If the function of labor is to cooperate in production with capital goods which are held widely by different firms, it would appear that virtually all training is general. But learning the information channels within a firm and the codes for transmitting information through them is indeed a skill of value only internally.
>
> One might ask, as one does frequently in the theory of the firm, why all firms do not have the same codes, so that training in the code is transferable? In the first place, in this combinatorial situation, there may easily be many optimal codes, all equally good, but to be useful in a firm it is important to know the right code. The situation here is very much that of the games of coordination which have been stressed so much by Schelling.[11]

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[11] K. Arrow, The Limits of Organization, (Norton, 1974), p. 62.

Besides the costs and difficulty of coordination to create common "codes," Arrow asserts that different firms may necessarily have different codes. He notes that,

> "...history matters. The code is determined in accordance with the best expectations at the time of the firm's creation. Since the code is part of the firm's or more generally the organization's capital, as already argued, the code of a given organization will be modified only slowly over time. Hence, the codes of organizations starting at different times will in general be different even if they are competitive firms. Indeed, individuals starting firms at the same time may well have different a priori distributions and therefore different codes."[12]

But, in construction, the union apprenticeship system does act as a code of skills and work organization that structure general training for the industry. New union firms adopt their mode of operation to fit this industry-wide code. Even if firms and workers come and go, the general structure remains and is useful for training new entrants to the stock of skilled workers. Again, it may be difficult, if not impossible, for open shop firms to duplicate this type of training system.

5.3.4 Hiring and Referral: Networks and Halls

> "What is the alternative to the hiring hall? Is it profitable to go down the corner and have a shape-up like they used to have on the waterfront? Have 500 workers show up at some candy store or something? And then have the employers go down in their trucks and say, 'You, you, you, you and you are carpenters. Hop in the truck!"

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[12] Arrow, Ibid., p. 78.

> The hiring hall provides the people with the competency and the skills to perform a certain type of work. It brings them together, so that a contractor can grab a phone and say, 'Hey, I need 40 guys on my job tomorrow.'"[13]

Union hiring halls in construction are usually considered to be essential in maintaining a "closed shop" and restricting entry to a trade so as to sustain the union's monopoly wage. In fact, evidence shows that restrictive hiring halls, in terms of formal collective bargaining agreements, are not predominant in the industry and, informally, that most workers and employers rarely rely on the hall for work referral. In addition, any use of a hall by a union to maintain a closed shop is an unfair labor practice and workers not referred for "discriminatory" reasons, such as not being a member of a labor organization, can, and occasionally do, sue.

If hiring halls do not function as restrictive mechanisms, it may not be too far-fetched to assume that they do function as hiring halls. They act as a supplementary source of information and referral for at least some workers in the industry. And in an industry characterized by instability of employment heterogeneity of workers and jobs; and high cost of time delays - both to workers and firms - the existence of halls, as referral systems, can contribute to the efficient allocation of labor. Of course, in most cases,

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[13] Painters Union President Raferty quoted in H. Johnson and N. Kotz, The Unions, (Washington Post Report, 1972), p. 145.

the maintenance by workers of informal contact networks (otherwise known as "friends") and the exchange of information between contacts and employers (otherwise known as "talking shop") may be sufficient to inform workers continually about job openings. Yet the extreme heterogeneity of construction work and the geographic diversity in its location may make the maintenance of an information network costly or cause occassional breakdowns in its usefulness. Given the short construction season and the high hourly wage, search costs after unemployment are likely to be high.

In essence, hiring halls act as "information brokers." Information theory is not so well advanced as to define under what market circumstances "brokers" will occur. Certaintly they are prominent in housing and labor markets (from employment services to executive recruiters) and not in retail sales or personal services. Apparently, it is the heterogeneity of buyers and sellers, coupled with high search costs (due, in part, to geographic dispersion) that make brokers feasible. Brokers act as joint agents for many sellers or buyers and can only survive as long as sellers or buyers bear the cost of their services and feel fairly equally treated. If, as Arrow shows, information has some characteristics of a collective good, brokers may also act to internalize externalities and achieve optimum production. For example, every seller of labor services might prefer that only his availability be known, but the costs of distributing this information widely might be prohibitive. If there are economies of scale in information processing, sellers have an incentive

to combine and use brokers. The same holds true for buyers. In addition, Boorman shows that there are costs to maintaining networks of contacts, even "weak" ones (otherwise known as "acquaintances") which may furnish job information.[14] The ex ante willingness to bear these costs (before unemployment) will depend on the probability of unemployment. If the probability is high and network maintenance costs are great, then the ex ante costs of network maintenance may be so high that the ex post reliance on a labor broker may be more efficient.

All of this serves to rationalize a simple phenomenon: the occasional to frequent use by construction firms and workers of referral systems. These systems provide a service and the craft union supports them, on the basis of a dues tax, as a collective good available to all. If the referral systems are operated well, optimal information should be present. The importance of some type of referral system in construction is shown by recent attempts by non-union contractors to create them. In fact, the major open shop contractor association is franchising a referral system package to local chapters. These systems operate in a similar manner to a union hiring hall. Whether they can be maintained on an association-sponsored or a cash payment basis remains to be seen.

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[14] Scott Boorman, "A Combinatorial Optimization Model for Transmission of Job Information Through Contact Networks," Bell Journal of Economics, Spring 1975.

At present, the open shop referral systems in Tampa and in Houston are operated and paid for by contractors' associations. Workers register with the system listing principal trade and experience; they are referred to jobs called in by contractors by the office manager of the system. Very little screening is apparently done by the referral agency. Wages are set upon hiring by the contractor.

In contrast, the union hiring halls are paid for by union dues and, although the referral process works in the same manner, the hall is nominally responsible for screening workers. Contractors can supposedly order homogeneous labor at a given wage. (In fact, quality of workers available from a union hall may vary substantially.) In theory, though, the union hall serves to finance the costs of referral and screening on the basis of payments by the sellers, the workers in the trade. In the open shop context, the costs are borne by the buyers, the contractors, and the services provided are narrower in scope.

5.3.5 Work Rules: Common Labor Standards

One of the major themes of collective bargaining in construction, as in many other industries, is to "take wages and labor standards out of competition." In seeking to negotiate a commons set of standards for an industry, unions seek to protect workers from capricious or systemic actions by firms whose competitive environment may force them to adopt various strategies to cut direct labor costs. The result of these negotiations, embodied in a web of work and other rules in a collective bargaining agreement, form a structure of governance for the employee

relation. In many industries, and perhaps particularly in construction, the resulting web of rules is often viewed as too rigid and inflexible. Indeed, the resistance of management to unions is usually motivated more by fear of interference with "management rights" than it is by unwillingness to grant higher wages. This resistance has been reflected in a biased portrayal of the nature and role of work rules.

One way to consider the function of common work rules is to imagine the employment relation in construction without them. Two alternatives are obvious. The first is to have every worker bargain individually with each firm over their particular desires for rules regarding output, mobility, breaks, safety, etc. If the bargained results were not satisfactory, workers would recontract by re-opening bargaining with that firm or another. Thus, if firms have an incentive to lower turnover costs, there should be some margin to acquiesce to workers' desires. The second alternative is to have firms set rules and standards unilaterally and hire workers on a "take it or leave it" basis. Again, competition between firms to lower both direct labor costs (through lower worker-oriented rules) and indirect labor costs (through more regulated "benefits" to reduce turnover) should result in some rough equilibrium with different firms choosing different rule packages and workers distibuting themselves among them. In the construction industry, however, neither of these alternatives may be viable or efficient in comparison to the agreement on common rules.

Individual bargaining with skilled workers, in the context of varied construction activity and over terms of a very short employment

relations, will result in very high transactions costs. It may also create numerous interpersonal inequities, as some workers may gain particular benefits in work conditions due to the market conditions under which they were hired. These differences in rules may only cause continual individual bargaining over the terms of employment, a process which can be time-consuming and expensive for management. Given the "small numbers bargaining" context in which these work conditions would be defined, either part to the agreement, may ex post, have good cause to be dissatisfied. The alternative to individual bargaining, is the unilateral determination of work rules, sometimes on an ad hoc basis, by construction management. This system would allow firms to differentiate themselves by quality of work conditions and attract workers on the basis of non-wage benefits of employment. The extremely varied nature of work in construction would force continual adjustments or interpretation of these rules. If workers felt that these changes were working against their interests, individual bargaining (or quits) would reappear, with the resulting costs.

A resolution of this problem in construction is to provide common rules for all workers and all employers. This structure serves an important purpose in several ways. First, it permits bargaining over the conditions of employment in a situation apart from the on-site management of labor. As a consequence, no "small-numbers" problems of question of temporary market power (opportunism) can arise. The results which result should reflect the average balance of power and interest between the two parties. For workers, these rules guarantee some

certainty as to emplyment conditions across firms. This lowers the costs of mobility and permits rotation of workers between firms with much less friction. For employers, the rules also serve at least one, and probably two, important roles. They also guarantee to management the access to workers at common terms and predictable conditions. Thus, on-site operations can be scheduled and costed out with fixed standards of labor use. At the same time, firms are protected from competition by other firms which might be able to exploit workers temporarily to gain a cost advantage. If work rules do take certain aspects of labor cost "out of competition" employers as well as workers gain from the resulting uniformity of conditions.

5.3.6 Sum: Efficiency Contributions of Craft Institutions

The efficiency contributions of the construction labor market institutions can be summarized by stressing three key roles they play. First, the wage, skill, and occupational structures manifested by craft unions in the building trades make it possible to sustain a skilled labor pool attached to an industry and not to a firm. By reducing uncertainty over the terms and conditions of the employment relation, the institutions work to lower the wage levels necessary to attract workers to the industry. They may also reduce a risk premium which contractors would have to include in prices if they did not have access to a labor pool at a pre-determined wage and skill level.

Second, these structures, supplemented by hiring halls and work rules, lower the transactions costs of labor mobility for both

workers and firms. Ideally, they also help limit bargaining over the employment relations to fixed intervals of contract renegotiation rather than have it continually reoccur within the changing context of every-day work.

Third, the union, as a workers' collective, pressures firms to coordinate the individual contributions the firms make in training and in employment experience into a consistent, general training program for the industry. In this way, both workers and management in the industry cooperate in the renewal of the stock of skilled craftsmen.

Apparently, the need for this kind of craft labor market institutions is limited to a particular segment of the market where the scale, variety, and variability of construction work necessitates a continual turnover of skilled workers. As nonunion firms attempt this type of work, they begin to duplicate on an open shop basis, many of the structure and institutions previously unique to union construction. In part, this process of duplication simply mean the organization and financing of some "union" institutions, like training or hiring, within a single large firm or among an association of many firms. In a competitive industry, it should make no difference in market price whether the cost of these labor services is born initially by workers or firms. In either case, they will be passed through to the consumer.

The real issue is whether open shop firms can cooperate to create these institutions and, once they are in operation, work to maintain them. In economic theory, there is probably no very strong reason why they cannot. In actuality, however, there may be many barriers - among

them being governmental regulation, anti-trust problems, union opposition, and simple costs of organizing a fragmented, competitive industry - which are hard to overcome. Yet the initial organization of craft and industrial unions had to surmount analogous obstacles and, in so doing, not only survived but prospered. Employers, after considerable turmoil, may enjoy the same success.

Yet, ironically, that very success may bring eventual, or even rapid, unionization. Once employers re-create an external labor market, they may find that skilled workers so value participation in, and some control over, labor market institutions that they will be relatively easy to organize. Indeed, if employer cooperation is so successful that some potential for monopsony power is evident, workers will have an additional incentive for the creation of a countervailing organization. The historical endurance of the building trades' unions, in the face of occasional employer attacks and without consistent government support, as in the pre-Wagner Act days, is some evidence of their natural strength. This strengthe lies both in the inherent market power and preferences of skilled workers and in the nature of the labor market. The building trades are, in effect, endogenous unions.

On the other hand, the character of the labor market in construction may be changing. Due to trends in technology and the composition of demand, firm size distribution and skill levels in the industry will continue to evolve. Some open shop firms may become very large and make it possible to substitute a form of internal labor market for craft institutions. Other nonunion firms may remain very small

and specialized, making them very difficult and costly to organize. If these trends predominate in the future, the building trade unions may have to make radical changes in their structure and operations in order to survive.

5.4 The Study of Unions

Neither the analysis of union behavior and market structure nor the examination of craft labor market institutions completely resolves the question of what unions do. In particular, the issue of the magnitude of the union wage premium (if any) is unresolved. Also, without more information from the unions themselves, little light can be shed on the relative weight the building trades' unions give to economic, institutional, and non-pecuniary goals. Nonetheless, it should be obvious that attention only to the adversary or rent-maximizing behavior of unions is a very partial view. Yet, while these other perspectives give a richer view of union behavior, market structure, and management reactions, they still do not add up to a completely consistent or coherent alternative theory of unions.

Perhaps the central problem in creating such a new theory can be expressed as a paradox: Unions seem to make, at the same time, significant contributions to both distribution and efficiency in labor markets. This paradox is manifested in the ambivalence many employers feel, at least in construction, toward the role and impact of the unions. For the building trades themselves, it is found in a tension between adversary bargaining goals and cooperation with management for the

benefit of the industry as a whole. It could be that this paradox or tension is nothing more than the necessary compromises of economic desires facing market constraints. Yet, there is a sense in some sectors of the construction industry that distribution and efficiency are inextricably intertwined and that the union is the pivotal element in that inter-connection. Indeed, it may be that distribution an efficiency are necessarily complementary goals of unions: the efficiency function they fulfill in labor market institutions may be crucial in supporting their role in distributive bargaining. Of course, this view is contrary to the common idea that union labor market goals are solely oriented toward restricting the supply of labor to raise the wage. But in fact just the opposite may be the case: the union may contribute to resolving market disfunctions in order to earn a higher wage. Although employers may implicitly recognize this when they attempt to duplicate many union institutions in an open shop setting, it is not clear that these structures can be sustained without union pressure. To resolve this issue empirically, direct studies need to be made on an industry by industry basis of the union impact on productivity and unit labor costs. The contributions unions may make in these areas has been overlooked in the concentration on wage differentials alone.

In sum, in the study of unions most economists have failed to recognize two crucial factors which bear on the understanding and evaluation of the union role. The first of these is the labor market context: union outcomes are always compared to a perfectly competitive labor market. In this hypothetical world, unions are always a "distortion."

If, as Williamson shows, real labor markets and real workers are characterized by uncertainty and bounded rationality unions, or at least some union-like institutions, may enhance efficiency and welfare. Second, economists have overlooked both how worker preferences toward unionization are formed and what is the range and ranking of these preferences. If the view is taken that "unionism is unionism" -- an exogenous force -- the interaction between skill levels, labor market context, and worker reactions is lost. In construction, at least, craft unions might best be seen as an organization of those with inherent market power who seek, through collective action, not primarily to raise wages but to achieve some status in and control of particular labor market institutions.

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