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WHY WORKERS WANT UNIONS: THE ROLE OF
RELATIVE WAGES AND JOB CHARACTERISTICS

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I. Introduction

Why is it that some workers want unions to represent them and other workers do not? The question is basic to our understanding of union growth and behavior. The answer must depend on what workers think unions can and will do for them and on how much particular workers value such union accomplishments. There are a number of potential points where a worker's preferences about unions could be observed: in a worker's decision to vote for having a union at the workplace; in the worker's decision to join an existing union in an open shop; in the worker's decision to take a job in a unionized firm; and in a worker's political behavior toward the leadership and policies of his or her union. Unfortunately, the decision about the union is complicated by other potentially confounding decisions such as the undesirability of being a "free rider" in an open shop, the "tied sale" of taking a job and joining a union, and the array of interests which may determine the formation of political coalitions in unions.

In many instances the data which have previously been available for economic analysis of questions about the extent of unionization have generally been limited to cross-sections of industry aggregates or economy-wide time series.¹ More recently, economists have used data on individuals to estimate models of the joint determination of earnings and union membership.² Lee (1976) and Heckman and Neumann (1977) model union membership decisions as a function of earnings differences and individual characteristics such as education and labor market experience. Abowd and Farber (1977) develop a similar framework while recognizing that there may be an excess supply of workers to the union sector resulting in a queue for union jobs. Unfortunately, even the micro-data sets used by these studies have little information on the distribution of wages and job characteristics

in the worker's particular firm. There have been earlier interview-type studies of many workers in the same firm, but these have usually been impressionistic and take an organizational or sociological perspective.³ For example, the most frequently cited study of "Why Workers Join Unions" (Seidman, London, and Karsh [1951]) concluded after talking with 114 members of a United Steel Workers of America local:

Though the authors have long been suspicious of the neat motivational schemes so often advanced to explain why workers join unions, they were surprised to discover that not one of these 114 [union] members stated that he joined to get higher wages. This suggests that much of our economic thinking, which assumes that workers join unions largely to maximize their income, may rest on a faulty understanding of workers' motivations. [p. 84]

While the case for non-monetary incentives may be clear, the article also provides many anecdotes which could easily be interpreted (contrary to the stated and widely cited conclusion) as worker interest in unions because of monetary benefits.⁴ Such considerations suggest that the appropriate framework for analyzing workers' decisions about unions is one of utility maximization where both monetary and non-monetary considerations are incorporated.

Our study uses a unique set of voting and other data on 817 workers in 29 union representation elections supervised by the National Labor Relations Board (NLRB) during the early 1970's. These data are used to estimate a model of workers who vote so as to maximize their expected utility with respect to both wage and non-wage dimensions of their employment. Such data have three considerable advantages: First, since the workers voting are already employed, the union representation decision can be observed directly and is isolated from the employment decision.⁵ Second, there are data on enough workers in particular firms so that one can test hypotheses about relative and absolute wage effects on the desire for having a union represent the worker. Third, unlike the frequent analyses of current union-status questions for individual workers, the worker's evaluation of the relative costs and benefits of the union is current and does

not reflect the inertia of someone who may have joined a union some years before and never bothered to get out.

In the next section, a theoretical framework which determines the individual decision to vote for a union in a NLRB election and a probit specification for estimation of the model are developed. Section III contains a brief description of the data. In Section IV, maximum likelihood estimates of the model are discussed. Finally, Section V contains a summary of the results and a discussion of some of the implications of the study.

II. A Model of Vote Determination

We are trying to understand the decision process of workers on a particular job who must choose whether or not they prefer their job to become a union job, i.e., whether they would prefer that job to be covered by a collective bargaining agreement.⁶ If the expected utility from their job being a union job is higher than from it not being a union job, then they will vote for the union. Otherwise, they will vote against the union. There are several important dimensions of such a model: (1) the probability statements about alternative states of employment in which the worker may find him or herself; (2) the arguments of the utility function, especially wage and job characteristics; and (3) tastes which may vary systematically across subsets of the working population because of differences in background or differences in perceptions about what it is that unions would do for particular subgroups. Before developing the model more formally, it is important to consider what labor economist know about union effects on wages and job characteristics. To the extent that workers are well-informed and rational about their decisions, they would be expected to act in their self-interest with respect to such union performance, or at least that would be one of the important hypotheses to examine.

Most of the analytical work on unions and relative wages has had to focus on the interfirm distribution of earnings, especially the upward shift in the mean of the earnings distribution in more unionized industries [cf. Lewis, 1963]. But in deciding on the votes within a firm, the effect of the union on the intra-firm distribution of earnings is likely to be crucial. It is a question about not only the size but the distribution of labor's share. The institutional literature from at least the time of the Webbs has concentrated on the standardization of rates of pay under collective bargaining agreements and the implicit reduction in the variance of intrafirm earnings associated with such a policy. Slichter, Healy, and Livernash [1960] summarize the evidence as follows:

The influence of unions has clearly been one of minimizing and eliminating judgment-based differences in pay for individuals employed on the same job. One avenue of influence has been toward the establishment of systems of single job rates rather than rate ranges. A second influence has been toward automatic or nearly automatic wage progression to the maximum within rate-range systems. [p. 602]

Even where union and management have agreed on merit systems of compensation, the difficulty of measuring ability and performance has caused them to follow "the path of least resistance . . . equality of treatment." [p. 604]. Freeman [1977] has recently reviewed the evidence on wage dispersion within the unionized sector of the economy and he concludes that intra-firm wage standardization (combined with both standardization of blue collar wages across establishments and reduction of the white collar/blue collar differential) has reduced dispersion of wages within the organized sector. The effect is so large that it more than offsets the union-induced increases in inter-industry earnings. "[O]n net," he finds "unionism reduces inequality."⁷ Hence a worker must expect that the distribution of wages in her or his firm will have a higher mean but a lower variance under a union agreement. Depending on where the distributions might (if at all) cross, workers on the upper portion of the wage distribution might

eventually expect to have lower real wages under a union contract and even more workers might expect to have lower relative wages. So even in the absence of union-induced unemployment effects and other union effects on job characteristics, some workers may have a monetary incentive for rejecting a union. The opposite argument applies, of course, for those on the other end of the distribution. Thus a worker's expected location within the firm's wage distribution is likely to be an important determinant of attitudes toward unionization.⁸

The other major dimension of union behavior is modification of job characteristics, especially perceived arbitrariness on the part of supervisors. Collective bargaining imposes a "web of rules" on industrial relations according to the institutional literature. Slichter, Healy, and Livernash's [1960] survey of collective bargaining agreements gives some idea of the range of application of these rules: hiring, seniority, promotion, work scheduling, work assignment, etc. The issue is perhaps best illustrated by their discussion of disciplinary procedures:

Few areas of personnel policy have been more significantly affected by collective bargaining than management's administration of employee discipline. The origin of a union in many enterprises can be traced to a belief on the part of employees that the company had been arbitrary, discriminatory, or capricious in meting out discipline. There have been foremen who acted like little czars in administering discipline and companies that imposed the most extremely personal rules upon employees . . . Even where there was little evidence of such irresponsible behavior on the part of management, the union seeking to organize employees often impressed upon employees the protection offered by collective bargaining against unfair disciplinary treatment. [p. 624]

Now obviously not everyone will benefit from the substitution of bureaucratic rules for personal rule. Only those who perceive that the current system operates against their interests and believe that a union will enforce what is to them a fairer system of industrial relations will favor a union.

With the above understanding of union behavior in mind, we can begin to develop our decision model.

Consider individuals (indexed by i) working on a particular job who have to choose whether they want that job to become a union job. Assume that (1) there is some utility attached to the job if it remains nonunion (V_{ni}), (2) there is some probability that the worker will be able to retain that job if it remains nonunion (P_{ni}), and (3) there is the utility of some certainty-equivalent alternative job available to individual i if the job currently held is lost (V_{ai}). The implication is that there is an expected utility ($E(V_{ni})$) attached to the current job if it remains nonunion. This can be expressed as

$$E(V_{ni}) = P_{ni} V_{ni} + (1 - P_{ni}) V_{ai}. \quad (1)$$

Analogously, every individual has expectations about both the utility attached to the job if it becomes a union job (V_{ui}) and the probability of keeping the job if it becomes a union job (P_{ui}). The utility attached to the certainty equivalent alternative job is independent of the union status of the current job. The expected utility ($E(V_{ui})$) attached to the current job becoming a union job is⁹

$$E(V_{ui}) = P_{ui} V_{ui} + (1 - P_{ui}) V_{ai} \quad (2)$$

The decision of individual i rests on whether his expected utility is greater in his job when it is nonunion or when it is union. Only if $Z_i > 0$, where

$$Z_i = E(V_{ui}) - E(V_{ni}), \quad (3)$$

will individual i vote for the union.¹⁰ Substitution of equations (1) and (2) into equation (3) and rearrangement of terms yields

$$Z_i = P_{ui}(V_{ui} - V_{ni}) + (P_{ui} - P_{ni})(V_{ni} - V_{ai}) > 0 \quad (4)$$

as the condition for individual i to vote for the union.¹¹

Under either of two special conditions, the second term in equation (4) will be zero implying that the union vote decision is strictly a function of the perceived difference in utility between the current job as a union job and the current job as a nonunion job ($V_{ui} - V_{ni}$). The first condition is that unionization of the job have no effect on job security ($P_{ui} = P_{ni}$). This makes the certainty equivalent alternative job irrelevant to the vote decision. However, this condition is not likely to be satisfied because, as unions raise the average wage of their members, employers of union labor should reduce the size of their labor forces. This implies that on average workers will be more likely to lose their jobs if the establishment becomes unionized, i.e. $P_{ui} < P_{ni}$.

The second condition is that the certainty equivalent alternative job have utility equal to that of the currently held nonunion job ($V_{ni} = V_{ai}$). This implies that current nonunion job security (P_{ni}) is of no interest to individual i because an equally valued job is always available. If the nonunion job is part of a competitive labor market, then there ought to be other jobs that are available to workers which yield about the same utility. However, given labor market imperfections, it is possible that $V_{ni} \neq V_{ai}$. This is discussed below in more detail.

With this basic choice framework in hand, it is necessary to relate it to observable data. Let each individual's utility index be

$$V_i = f(W_i, J_i, M_i) \quad (5)$$

where W_i represents the hourly wage of individual i and J_i represents non-wage aspects of employment such as relationships with supervisors, chances for promotion, and feelings about the type of work being performed.¹² M_i represents any unmeasured tastes of individual i for or against union membership that is not captured by W_i and J_i . Further assume the utility index has the very simple form

$$V_i = \gamma_0 + \gamma_1 W_i + \gamma_2 J_i + M_i U \quad (6)$$

where γ_1 and γ_2 are greater than zero and U is a variable which takes the value 1 for union jobs and zero otherwise. The implication of this specification is not only that the utility function is separable in the wages and the non-wage aspects of working but also that the workers are risk neutral with respect to both W_i and J_i .¹⁴

Let W_{ni} , W_{ui} , and W_{ai} represent the wages of the current nonunion, expected union, and certainty equivalent jobs respectively. Similarly let J_{ni} , J_{ui} , and J_{ai} represent the non-wage aspects of the current nonunion, expected union, and certainty equivalent jobs respectively. These definitions together with equations (4) and (6) imply that¹³

$$Z_i = P_{ui} [\gamma_1 (W_{ui} - W_{ni}) + \gamma_2 (J_{ui} - J_{ni}) + M_i] \\ + (P_{ui} - P_{ni}) [\gamma_1 (W_{ni} - W_{ai}) + \gamma_2 (J_{ni} - J_{ai})]. \quad (7)$$

We now need to relate the largely unobservable variables in equation (7) to the data available to us.

The probability of keeping the current job if the union wins the election (P_{ui}) is likely to be a direct function of seniority. The workers with the greatest risk of losing their job in a layoff are those with little seniority.¹⁵ It is assumed that

$$P_{ui} = \alpha_0 + \alpha_1 T_{1i} + \alpha_2 T_{2i} \quad (8)$$

where T_{1i} is a dummy variable which equals one if individual i has seniority of less than one year and which equals zero otherwise. T_{2i} is a dummy variable which equals one if individual i has seniority between one and two years and which equals zero otherwise. Because the base group is the high seniority group, it is expected that α_0 will be positive while α_1 and α_2 will be negative with $\alpha_1 < \alpha_2$.

The change in the probability of keeping the current job if the union wins

$(P_{ui} - P_{ni})$ may be negative if the union raises wages. However, if the worker is worried about keeping his job in the current nonunion situation then he may feel that the union will increase his job security. It is assumed that

$$P_{ui} - P_{ni} = \delta_0 + \delta_1 DS_i \quad (9)$$

where DS_i is a dummy variable which equals one if individual i is dissatisfied with the job security of his nonunion job and which equals zero otherwise. It is expected that δ_0 will be negative and δ_1 will be positive.

The expected effect of unionization of the current job on wage $(W_{ui} - W_{ni})$ is hypothesized to be a function of the position of individual i in the internal earnings distribution of the particular firm. This is based on previously discussed evidence that unions tend to raise the average level of earnings of their members but reduce its dispersion. Under these circumstances, workers at the upper end of the earnings distribution will expect that their earnings will rise by less than (or even fall relative to) the earnings of workers at the lower end of the earnings distribution if the union wins the election.

As a measure of the worker's position in the earnings distribution of the company, the standardized deviation from the within-firm mean wage of each worker (DEV_i) was calculated. This is

$$DEV_i = \frac{W_i - \bar{W}_j}{\sigma_j} \quad (10)$$

where W_i is the current wage of individual i , \bar{W}_j is the average wage in the j^{th} firm (where individual i works), and σ_j is the standard deviation of the wage in the j^{th} firm.¹⁶ On the basis of these considerations, a specification for $(W_{ui} - W_{ni})$ is

$$W_{ui} - W_{ni} = \lambda_0 + \lambda_1 (DEV_i + \lambda_2 \frac{1}{\sigma_j}) \quad (11)$$

where λ_0 is included to account for any direct costs of union membership such as dues payments. The second term $(DEV_i + \lambda_2 \frac{1}{\sigma_j})$ represents the expected impact of the union on the wage of individual i . $\lambda_2 \frac{1}{\sigma_j}$ is included to measure the number of standard deviations above the mean that workers expect the union to increase their wages. For any individual earning more than $-\lambda_2 \frac{1}{\sigma_j}$ standard deviations above the within firm mean, the union will actually lower the wage.¹⁷ It is expected that λ_1 will be negative to reflect the hypothesis that individuals higher in the earnings distribution expect a smaller impact on their earnings from unionization. λ_2 will be negative assuming that unions raise the wages of at least some workers who are above the mean.

The change in the nonwage aspects of the current job after unionization ($J_{ui} - J_{ni}$) could be measured in many categories. Data limitations force consideration of three basic ones. Formally,

$$J_{ui} - J_{ni} = \theta_0 + \theta_1 RDET_i + \theta_2 FIMP_i + \theta_3 PRO_i \quad (12)$$

where $RDET_i$, $FIMP_i$, and PRO_i are dummy variables defined below.

If individuals currently maintain a good relationship with their supervisors and if they feel that unions (in general) interfere with such good relationships, then they would have reason to feel that unionization of their current jobs would make them worse off. $RDET_i$ is a dummy variable which equals one if individual i expects unionization to cause this sort of relationship deterioration and which equals zero otherwise.¹⁸ It is expected that θ_1 will be negative.

The second non-wage impact of unions is on fairness of treatment by supervisors. If individuals feel that supervisors in their company play favorites and if they feel that unions (in general) ensure fair treatment, then they would have reason to feel that unionization of their jobs would make them better off.

$FIMP_i$ is a dummy variable which equals one if individual i expects unionization to cause this sort of improvement in fairness and which equals zero otherwise.¹⁹ It is expected that θ_2 will be positive.

The final nonwage aspect of employment is the effect of unionization on the chances for advancement within the firm. Unions often make promotions within the nonsupervisory workforce largely a function of seniority.²⁰ This may work to the disadvantage of ambitious employees who feel that they will be promoted on their merits. PRO_i is a dummy variable which equals one if individual i feels that there is a good chance that he will be promoted and which equals zero otherwise.²¹ To the extent that unions actually reduce promotion possibilities for workers who expect promotions, $(J_{ui} - J_{ni})$ will be reduced and for this reason θ_3 is expected to be negative.

Tastes (M_i) for or against union membership unrelated to income or job attributes are assumed to be a function of individual characteristics including age, sex, race, education, and the urbanity of the environment where the individual was raised. The latter characteristic refers to whether the individual was raised in a large city, a small city, a suburb, or a rural area.²² Let

$$M_i = X_i' \mu \quad (13)$$

where X_i is a vector of dummy variables corresponding to the above attributes and μ is a vector of parameters.

The last element of Z_i is the difference between current utility and utility from the certainty equivalent alternative job

$$V_{ni} - V_{ai} = \gamma_1 (W_{ni} - W_{ai}) + \gamma_2 (J_{ni} - J_{ai}). \quad (14)$$

It is assumed, unless individuals feel that it would be difficult to find equivalent jobs elsewhere, that they can find equivalent jobs. This implies that $V_{ni} - V_{ai} = 0$. However, if an individual feels that it would be difficult to find an equivalent job, then $V_{ni} - V_{ai}$ equals a positive constant (ϕ). Thus,

$$V_{ni} - V_{ai} = \phi \text{ DIFF}_i \quad (15)$$

where DIFF_i is a dummy variable which equals one if individual i feels that it would be difficult to find an equivalent job and which equals zero otherwise.²³

Assume that there is a random component in Z_i which is represented by a standard normal random variable (ϵ_i) subtracted from Z_i . These random components are distributed independently over the sample. The condition for any individual i to vote for the union becomes $Z_i - \epsilon_i > 0$ or

$$\epsilon_i < Z_i . \quad (16)$$

This is simply a probit specification, and the probability that individual i votes for the union (VFR_i) is

$$\Pr(\text{VFR}_i) = \int_{-\infty}^{Z_i} f(\epsilon) d\epsilon \quad (17)$$

where $f(\epsilon)$ is a standard normal density function. The probability that individual i votes against the union (NVFR_i) is

$$\Pr(\text{NVFR}_i) = 1 - \Pr(\text{VFR}_i) = \int_{Z_i}^{\infty} f(\epsilon) d\epsilon \quad (18)$$

The log-likelihood function for a sample of size n is

$$\ln L = \sum_{i=1}^m \ln \Pr(\text{VFR}_i) + \sum_{i=m+1}^n \ln(1 - \Pr(\text{VFR}_i)) \quad (19)$$

where the first m individuals voted for the union and the rest voted against the union.

Substitution of equations (8), (9), (11), (12), (13), (14), and (15) into equation (7) yields

$$Z_i = [\alpha_0 + \alpha_1 T_{1i} + \alpha_2 T_{2i}] [\lambda_0 + \lambda_1 (\text{DEV}_i + \lambda_2 \frac{1}{\sigma_j}) + \theta_0 + \theta_1 \text{RDET}_i + \theta_2 \text{FIMP}_i + \theta_3 \text{PRO}_i + X_i \mu] + [\delta_0 + \delta_1 \text{DS}_i] \phi \text{DIFF}_i. \quad (20)$$

It is clear from this equation that not all of the parameters are identified. λ_0 , λ_1 , the θ vector and the μ vector are only identified up to a constant of proportionality with the α vector. In order to handle this, it is assumed that $\alpha_0 = 1$. This assumption does not change the expectations of the signs of any parameters and interpretation of the parameters is straightforward.²⁴ It is also true that λ_0 , θ_0 and any constant in μ cannot be separately identified. Thus, only one constant term (C_0) will be estimated. Finally, note that δ_0 and δ_1 are not separately identifiable from ϕ . Therefore, what is estimated are the quantities $\beta_0 = \phi\delta_0$ and $\beta_1 = \phi\delta_1$.

The implication of these identification problems and their solution is that, while it is not possible to draw quantitative conclusions from the estimates, it is possible to draw qualitative conclusions.²⁵ Recall that it was expected that $\delta_0 < 0$, $\delta_1 > 0$, and $\phi > 0$. Thus, it is expected that $\beta_0 < 0$ and $\beta_1 > 0$. Intuitively, $\beta_0 < 0$ implies that individuals who feel that it would be difficult to find an equivalent job and who are not dissatisfied with their job security would tend to vote against the union because they fear that the union may endanger their job. The interpretation of $\beta_1 > 0$ is that individuals who feel that it would be difficult to find an equivalent job but are dissatisfied with their job security would be more likely to vote for the union than the former group.²⁶

Given the above identification restrictions, equation (20) can be rewritten

as

$$Z_i = [1 + \alpha_1 T_{1i} + \alpha_2 T_{2i}] [C_0 + \lambda_1 (ADME_i) + \theta_1 RDET_i + \theta_2 FIMP_i + \theta_3 PRO_i + X_i' u] + [\beta_0 + \beta_1 DS_i] DIFF_i \quad (21)$$

where

$$ADME_i = DEV_i + \lambda_2 \frac{1}{\sigma_2} \quad (22)$$

This is the adjusted deviation from the within firm mean earnings of individual i . After a discussion of the data in the next section, equations (17), (18), and (21) will be used with the log-likelihood function defined in equation (19) to derive the maximum likelihood estimates of the parameters contained in equation (21).

III. The Data

The data were collected by J. G. Getman, S. B. Goldberg, and J. B. Herman for a study of unlawful campaigning and NLRB election outcomes.²⁷ The sample consists of a random selection of workers who participated in NLRB representation elections in twenty-nine establishments between January 1972 and September 1973.²⁸ Eighteen of the establishments including 85.2 percent of the workers in the sample were in manufacturing according to their employer's S.I.C. code. The rest were in transportation, wholesale trade, retail trade, and services. All of the plants were located in Illinois, Indiana, Iowa, Missouri, and Kentucky. The International Brotherhood of Teamsters participated in ten of the thirty-one elections studies by Getman, Goldberg, and Herman.²⁹ No other union participated in more than three elections.

The twenty-nine elections involved 2788 workers of which 1018 were interviewed both before the election to get basic information on characteristics and attitudes and after the election to determine how they voted. Individuals were deleted from the sample if they failed (or refused) to answer any of the questions relevant to this study. This resulted in a reduction in the sample to 817 individuals. Of the 201 workers who were eliminated from the sample, the questions they failed to answer most frequently concerned their vote (120), whether they felt that they were fairly treated by supervisors (64), race (52), and wage (28). In the absence of evidence to the contrary, it is assumed that there is no systematic relationship between failure to answer any of these questions and the vote.

The unions won eight of the twenty-nine elections and lost twenty-one. 1276 of the 2788 (45.8%) of the votes cast in the elections were cast for the union. This is compared to 385 (47.1%) pro-union votes from the 817 individuals in the sample. The hypothesis that the voting behavior of the sample of 817 came from a population with a pro-union vote probability of .458 cannot be rejected at conventional levels of significance.³⁰ In only two of the elections were vote proportions in the sample significantly different from the actual proportions in the election.

The construction of most of the exogenous variables is straightforward as they are with one exception dummy variables. The wage data were gathered in interval form. The midpoint of the relevant range was chosen as the wage rate of each individual reporting a wage within a closed interval. For those in the lowest interval (less than two dollars per hour), the minimum wage (\$1.60/hour) prevailing in 1972-73 was chosen as the wage rate. In the open interval (greater than \$5/hour), the wage was assumed to be \$5.75/hour. The mean and standard deviation of the wage within each firm (\bar{w}_j and σ_j) were computed on the derived "continuous" wage data.

from the entire sample of workers who answered the wage question regardless of whether they answered the other questions. The standardized deviation from the within firm mean ($DIFF_i$) for each individual was constructed from these data.³¹

Table 1 contains the means and standard deviations of the variables used in the estimation. These include the earnings, attitude, and individual characteristic variables contained in Z_i . The base group for the individual characteristics are white male workers under twenty-five years old who were raised in large cities (population greater than 100,000) and who have less than a high school education.

There are a number of related factors which restrict the sample to a rather special subgroup of the American labor force. First, the NLRB generally holds elections only if there is sufficient interest in union representation. Thus, the sample was chosen indirectly on the basis that at least some of the workers wanted the particular union as their bargaining agent. It is well known that sample selection on the basis of an endogenous variable can result in biased parameter estimates.³² On the other hand, if the preferences of the workers are clear enough, then the NLRB will certify a particular union as the exclusive bargaining agent of the workers without an election.³³ This may introduce just the opposite sort of selectivity bias by omitting workers in firms where the majority of workers clearly prefer union representation. This may be a partial explanation of why the unions lost twenty-one of the twenty-nine elections in the sample.

Another potential selection problem is that workers who are already employed in union jobs cannot be in a representation election.³⁴ These are likely to be workers who are pro-union and would tend to vote union in an election.

Finally, Getman, Goldberg, and Herman explicitly state that "... the primary consideration in selecting elections was the likelihood of vigorous,

Table 1: Means, Standard Deviations, and Definitions of Variables

<u>VARIABLE</u>	<u>DEFINITION</u>	<u>MEAN</u>	<u>STANDARD DEVIATION</u>
Vote	vote for union = 1	.47124	
W_i	wage of individual i	3.0279	.85316
\bar{W}_j	average wage in firm j	3.0290	.66839
σ_j	standard deviation of wage in firm j	.49126	.20844
DEV _j	standardized deviation of wage	-.00156	.96575
T ₁	< 1 yr. seniority = 1	.29988	
T ₂	1 yr. < seniority < 3 yr. = 1	.22521	
RDET	union causes relationship deterioration = 1	.27662	
FIMP	union causes fairness improvement = 1	.28764	
PRO	good chance for promotion = 1	.41493	
DS	dissatisfied with job security = 1	.34149	
DIFF	difficult to find equivalent jobs = 1	.53366	
RACE	black = 1	.10894	
SEX	female = 1	.41371	
ED _{HS}	high school graduate = 1	.35496	
ED _{COLL}	at least some college = 1	.12852	
SUB	raised in suburb = 1	.07099	
CITY ₁₀₋₁₀₀	raised in city with population 10-100k = 1	.26193	
RURAL	raised in a rural area or town = 1	.48470	
AGE ₂₅₋₄₄	25 yr. < age < 44 yr. = 1	.41860	
AGE _{> 44}	age > 44 yr. = 1	.12118	

n = 817

possible [sic] unlawful campaigning." While it is not clear how this is related to voting behavior, it may reduce the generality of the results.

Another problem is that the choice in the election is not actually of unionization versus nonunionization but of being represented by a particular union versus nonunionization. While unions are assumed to be homogeneous in this study, it may be true that an individual would join one union but not another. For example, if a particular union were thought to be corrupt, then workers might prefer another union or even nonunion status to membership in the corrupt union. It is also true that different unions might have different effects on the job. Again, it is not clear how these considerations will affect the results.

Despite these problems, the sample affords a unique opportunity to observe individuals explicitly stating their preference for union representation. On balance it is likely that the effects of the selective bias are offsetting and minor and that the results will be applicable to a wider class of workers than that contained in the sample.

IV. Results

The probit log-likelihood function defined by substituting equations (21), (17), and (18) into equation (19) was maximized with respect to the parameters contained in equation (21). The numerical optimization algorithm described in Berndt, Hall, Hall, and Hausman (1974) was used. Table 2 contains the maximum likelihood estimates of the parameters of equation (21).

The maximum log-likelihood value is -416.5297 while the log-likelihood for a model in which a worker's vote is predicted solely from the fact that 47.1 percent of the votes were pro-union is only -564.9486. The latter is a constrained version of the model where all of the parameters but C_0 are set equal to zero. The maximum likelihood estimate of C_0 in the constrained model is -.072 which makes $\int_{-\infty}^C f(\epsilon)d\epsilon = .471$. The constrained version of the model

Table 2: Maximum Likelihood Estimates of Parameters of Z_j (Equation 21)

<u>COEFFICIENT OF:</u>	<u>SYMBOL</u>	<u>COEFFICIENT</u>	<u>ASYMPTOTIC STANDARD ERROR</u>
T_1 (SEN < 1)	α_1	.1326	.2045
T_2 (1 < SEN < 3)	α_2	.1059	.2261
Constant	C_0	.0549	.2136
DEV + $\lambda_2 \frac{1}{\sigma_j}$	λ_1	-.1611	.0491
$\frac{1}{\sigma_j}$	λ_2	-.2071	.2728
RDET	θ_1	-.6065	.1250
FIMP	θ_2	.7466	.1317
PRO	θ_3	-.4531	.1130
RACE (Black = 1)	μ_1	.3595	.1496
SEX (Female = 1)	μ_2	.0799	.1089
ED _{HS}	μ_3	-.1263	.1144
ED _{COLL}	μ_4	-.0557	.1540
SUB	μ_5	.2038	.2160
CITY _{10-100K}	μ_6	.1903	.1544
RURAL	μ_7	.1202	.1367
AGE ₂₅₋₄₄	μ_8	-.1542	.1194
AGE _{> 44}	μ_9	-.3356	.1499
DIFF	β_0	-.3726	.1153
DIFF * DS	β_1	.5936	.1500

Log-Likelihood

-416.5297

is rejected at any reasonable level of significance using a likelihood ratio test $(-2(-564.9486 - (-416.5297))) = 296.8378 > \chi^2_{.005}(18) = 37.2$. Thus, the model developed in this paper does a significantly better job of explaining the vote than a random process.

There are a number of striking implications of the results in Table 2. First, the specific perceived wage and nonwage effects of unions are important determinants of the vote. Second, the individual characteristics (X_i), with the exception of race and age, seem to have little correlation with the perceived impact of unions on utility and hence little correlation with the vote. Third, tenure seems to have no relationship with the vote. Finally, individuals who feel that it would be difficult to replace their current job have a greater or lesser probability of voting for the union as they are dissatisfied or not dissatisfied respectively with their current job security. Each of these implications are discussed in turn.

Earnings and Unionization

It was hypothesized that the effect of unions on earnings is to raise the mean and to lower the dispersion. As a result, workers at the lower end of the intrafirm earnings distribution would expect a larger increase in earnings from unionization and hence would be more likely to vote for the union than workers at the upper end of the earnings distribution. This hypothesis is supported by the result that the coefficient of the adjusted standardized deviation from the within firm mean earnings $(DEV + \lambda_2 \frac{1}{\sigma_2})$ is asymptotically significantly less than zero at conventional test levels.

The choice of the adjusted standardized deviation of wages from the within firm mean as the appropriate measure of the impact of unionization on earnings was arbitrary. In order to evaluate this specification, the model was reestimated with $ADME_i$ in equation (21) replaced by

$$ADME_i = \frac{W_i - \bar{W}_j + \lambda_2}{1 - \lambda_3(1 - \sigma_j)} \quad (23)$$

Note that the estimates contained in Table 2 are derived from the special case of expression (23) where $\lambda_3 = 1$.³⁵ If $\lambda_3 = 0$ then

$$ADME_i = \frac{W_i - \bar{W}_j + \lambda_2}{1 - \lambda_3(1 - \sigma_j)} = W_i - \bar{W}_j + \lambda_2 \quad (24)$$

which is simply the unstandardized deviation from the within firm mean earnings.

Table 3 contains the estimated of value of λ_1 , λ_2 , and λ_3 as well as the log-likelihood values for the models with λ_3 free, $\lambda_3 = 1$, and $\lambda_3 = 0$. The estimates of the other parameters are not presented because they are very similar to those contained in Table 2.³⁶ It is clear from Table 3 that relaxing the constraint that $\lambda_3 = 1$ results in little improvement in the likelihood function and little change in $\hat{\lambda}_1$ and $\hat{\lambda}_2$. The estimated value of λ_3 is .9909. The hypothesis that $\lambda_3 = 1$ cannot be rejected at any reasonable level of significance using either an asymptotic t-test or a likelihood ratio test. On the other hand, the hypothesis that $\lambda_3 = 0$ is rejected at reasonable levels of significance on the basis of both types of tests. These results suggest that it is the adjusted standardized deviation from the within firm mean that is the relevant measure of the perceived impact of unionization on earnings, i.e., the perceived impact is denominated in standard deviation units rather than dollars. The fact that $\hat{\lambda}_1$ is significantly less than zero in all cases implies that the inverse relationship between an individual's position in the earnings distribution of the firm and preference for unionization is robust to changes in the specification.

It is possible that the absolute level of earnings rather than some measure of the intrafirm deviation from mean earnings is the relevant measure of the perceived impact of unionization on earnings. In order to evaluate this argument,

the model was reestimated with $ADME_i$ in equation (21) replaced by

$$ADME_i = \frac{W_i - \lambda_4 \bar{W}_j + \lambda_2}{\sigma_j} \quad (25)$$

The estimates contained in Table 2 are derived from the special case of equation (25) where $\lambda_4 = 1$.³⁶ If $\lambda_4 = 0$ then

$$ADME_i = \frac{W_i + \lambda_2}{\sigma_j} \quad (26)$$

which is the special case of equation (25) where the absolute level of earnings is the relevant measure.

Table 4 contains the estimates of λ_1 , λ_2 and λ_4 as well as the log-likelihood values for the constrained and unconstrained versions of equation (25).³⁸ The estimate of λ_4 in the unconstrained model is 1.5410 with an asymptotic standard error of .3041. The hypothesis that $\lambda_4 = 0$ can be rejected at reasonable levels of significance using either an asymptotic t-test or a likelihood ratio test. This implies that the absolute level of earnings is not the relevant measure for determining the impact of unionization on earnings. The hypothesis that $\lambda_4 = 1$ (that the standardized deviation from mean earnings is the relevant earnings measure) cannot be rejected at the 5 percent level of significance using an asymptotic t-test. ($1.779 < t_{.05}(\infty) = 1.96$). However, this is contradicted by the likelihood ratio test which rejects the hypothesis that $\lambda_4 = 1$ at the same level of significance ($8.1016 > \chi_{.05}^2(1) = 3.84$). This discrepancy is due to the asymptotic nature of both of these tests. While it is not possible to resolve this problem, it is true both that the intra-firm mean earnings are important and that the inverse relationship between the position of an individual in the intra-firm earnings distribution and the vote is robust to changes in the specification of $ADME_i$.³⁹ Because of the estimates of all of the parameters of the

Table 3:

Estimation of Various Forms of Standardization of the Effect of Unions on Earnings^a

<u>ADME_i</u>	<u>Log-likelihood</u>	<u>$\hat{\lambda}_1$</u>	<u>$\hat{\lambda}_2$</u>	<u>$\hat{\lambda}_3$</u>
$W_i - \bar{W}_j + \lambda_2$	-433.0955	-.2817 (.0996)	—	0 ^b
$\frac{W_i + \bar{W}_j + \lambda_2}{1 - \lambda_3(1 - \sigma_j)}$	-416.4825	-.1630 (.0662)	-.2290 (.3835)	.9909 (.2011)
$DEV_i + \lambda_2 \frac{1}{\sigma_j}$	-416.5297	-.1611 (.0491)	-.2071 (.2728)	1 ^b

^aThe numbers in parentheses are asymptotic standard errors.

^bby assumption.

Table 4:

Estimation of the Importance of the Within Firm Mean on the Effect of Unions on Earnings^a

<u>ADME_i</u>	<u>Log-likelihood</u>	<u>$\hat{\lambda}_1$</u>	<u>$\hat{\lambda}_2$</u>	<u>$\hat{\lambda}_4$</u>
$\frac{W_i + \lambda_2}{\sigma_j}$	-420.3583	.0366 (.0287)	-1.3162 (1.3686)	0 ^b
$\frac{W_i - \lambda_4 \bar{W}_j + \lambda_2}{\sigma_j}$	-412.4789	-.1513 (.0520)	.8431 (.6382)	1.5410 (.3041)
$DEV_i + \lambda \frac{1}{\sigma_j}$	-416.5297	-.1611 (.0491)	-.2071 (.2728)	1 ^b

^aThe numbers in parentheses are asymptotic standard errors.

^bby assumption

unconstrained version of the model are very close to those contained in Table 2. The remainder of the analysis concentrates on the latter results.

The point estimate of λ_2 contained in Table 2, while not significantly different from zero, suggest that on average individuals expect unions to raise the wages of all workers who are less than .207 dollars per hour above the intra-firm mean earnings level. Given the average within firm standard deviation of earnings of .491 dollars per hour, this translates to a perceived wage advantage on average to all workers below .416 standard deviations above the mean.⁴⁰ Of course, all workers above this point in the distributions are estimated to perceive a decrease in earnings from unionization. It must be emphasized that these numbers are not at all well determined and caution is required in interpreting them.

Non Wage Aspects of Employment and Unionization

The three variables representing the effect of unionization on the non-wage aspects of employment (RDET, FIMP, PRO) all had the hypothesized significant impact on the vote. If individuals felt that unionization would cause a deterioration of the currently satisfactory supervisory relationships ($RDET_i = 1$), then they would be less likely to vote for unionization. If individuals felt that they were being treated unfairly and that unionization can help this ($FIMP_i = 1$), then they would be more likely to vote for unionization. Finally, if individuals felt that the chances for promotion were good ($PRO = 1$), then they would be less likely to vote for the union. This is interesting because it supports the view that ambitious workers who expect to get ahead find unions to be an inhibiting factor to their progress.

Individual Characteristics and the Vote

After controlling for the measurable aspects of union impact on wage, and nonwage aspects of job satisfaction, there is little systematic relationship between preferences for union membership and individual characteristics.⁴¹ Sex,

education, and the environment where raised do not have a significant impact on the vote. The conventional wisdom suggests that at least the first two of these results violates a priori expectations. It has been suggested that women have traditionally been less likely to join unions because they were generally not permanently attached to the primary labor force. The fact that the women in the sample are all full time employees implies that they do not fit the stereotypical mold. Further support for this contention is provided by the fact the simple correlations between the sex dummy and the low seniority dummies (T_1 and T_2) are $-.01$ and $-.04$ respectively. Thus, women are no more likely to be low seniority workers than men. For these reasons the lack of significance of the sex dummy is not surprising.⁴² The conventional wisdom has also held that more educated individuals are in general more independent and as a result would not be as likely to join organizations such as unions which reduce the scope for independent activity on the job. No such inverse relationship between education and the vote was found. This result is supported by Abowd and Farber (1977) who found no significant correlation between education and preference for a union job after controlling for the impact of unions on earnings.

Blacks are significantly more likely to vote for union representation than nonblacks even after controlling for the measurable aspects of union impact on jobs. Given Ashenfelter's [1972] finding that unions have on balance substantially reduced racial wage discrimination, this result is reassuring. It was also found that older workers are significantly less likely to vote for union representation after controlling for the same factors. The latter result is in accord with the conventional wisdom which suggests that older workers are more "conservative" and reluctant to join new organizations which will have an uncertain impact on their jobs.

Seniority and the Probability of Job Retention

Job seniority entered the model in a very specific way. It was hypothesized to affect the probability of retaining the job if the union won the election (P_u). This probability in turn was used to weigh any potential gains from unionization. It was found that seniority has little effect on P_u . The coefficients of T_1 and T_2 which represent low tenure employees have signs opposite to what was expected, but they are not significantly different from zero. These results suggest that individuals do not perceive their job security under unionization to be a function of their seniority.⁴³

Job Security and the Vote

Recall that it was hypothesized that individuals who felt it would be difficult to replace their current job with an equivalent job might have mixed feelings about unionization. If they were dissatisfied with their current job security, then they might feel that the union would help and they would be more prone to vote for unionization. On the other hand, workers in general who would find it difficult to replace their current job might worry that unionization would jeopardize their job.

Both of these hypotheses receive some support from the results contained in Table 2. Taking the base group to be all individuals who do not feel that it would be difficult to replace their current jobs, those who feel that it would be difficult to replace their jobs and are not dissatisfied with their job security are significantly less likely to vote for unionization ($\hat{\beta}_0 = -.3726 < 0$).⁴⁴ This (.1153) suggests that workers worry that unionization will jeopardize jobs. Compared to the latter group, those who are both dissatisfied with security and would find it difficult to replace their job are significantly more likely to vote for unionization ($\hat{\beta}_1 = .5936 > 0$). This suggests that fear of jeopardizing the (.1500) current job is moderated by dissatisfaction with current job security. This may

be due either to the fact that there is less security to jeopardize or to some expected help from unionization. Compared to the base group, the group of workers who would find it difficult to replace their job and who are dissatisfied with job security are more likely to vote for unionization ($\hat{\beta}_0 + \hat{\beta}_1 = .2210 > 0$).
(.1441)

However, this is only significantly greater than zero, at the 10 percent level. The major implication of these results is that fear of job loss is a significant factor in individual attitudes toward unionization.

V. Summary and Conclusions

In this study a model of the determination of individual votes in NLRB representation elections based on the maximization of expected utility was developed. The model was estimated using data on how individuals voted in twenty-nine elections using a probit stochastic specification.

The major implications of the results fall into four major areas. First, the perception of individuals concerning the effect of unionization on earnings is that unions raise average earnings and lower its dispersion. The result is that the perceived earnings advantage of unionization is inversely related to the individual's position in the intra-firm earnings distribution.

The second result is that the explicitly measured individual perceptions of the impact of unionization on the nonmonetary aspects of the job are important determinants of the vote. The dimensions of the job considered include fairness of treatment by supervisors, general relationships with supervisors, and the negative effect of unions on the promotion possibilities of workers who felt that they were "promotable".

Third, it was found that concern for the impact of unionization on job security is an important aspect of the unionization decision. This was a function both of current job security and the ability to replace the current job with an equivalent job.

Finally, it was found that after controlling for the effects of unionization on various aspects of the employment relationship, individual characteristics such as sex, education, and the environment where raised have little relationship with the vote. The exceptions to this are race and age. Blacks were significantly more likely to vote for unionization while older workers had a significantly lower probability of voting for unionization.

In conclusion, the data used in this study allowed us to test a model of the rational worker who considers the major dimensions of unionization stressed in the institutional literature in making decisions about whether he or she wants to be represented by a union. Such a model seems to do extremely well and offers a promising direction for future research on issues of union growth and behavior.

FOOTNOTES

¹See Dunlop (1948), Troy (1965), Ashenfelter and Pencavel (1969), Pencavel (1971), and Ashenfelter and Johnson (1972).

²See Schmidt and Strauss (1976), Lee (1976), Heckman and Neumann (1977), and Abowd and Farber (1977).

³See Whyte (1944), Bakke (1945), and Seidman, London, and Karsh (1951). Myers (1976) presents a more recent analysis of this type.

⁴Some quotes from workers by categories are:

Family background--"Even as a kid you hate the bosses when you know there is plenty, yet the family hasn't a thing." [p. 76]

Experiences within the plant--"I was getting less days than I should have and different pay rates." [p. 77]

Joining despite opposition--"In my opinion there shouldn't be a union. If I had a plant, I would never have a union because I would treat the men right and pay them right. That's the only reason you have unions." [p. 79]

⁵The Abowd and Farber (1977) work on queuing for union jobs make this consideration especially important since simultaneous models of employment and unionization suffer from the problem that "rationing" precludes us from directly observing many workers' preferences for union jobs.

⁶NLRB representation elections can involve a choice among various unions as well as the nonunion alternative. All of the elections used in the estimation below are of the single union variety, and the model developed here does not apply directly to a choice between competing unions.

⁷In addition to Freeman [1977], see Bloch and Kuskin [1978] and Abowd and Farber [1977] for estimates of earnings functions for union and non-union workers. The evidence suggests that the union earnings functions are higher and flatter in log wage-attribute space than the non-union earnings functions.

⁸The phrase "expected location" is a matter of unknown but probably important consequence. In empirical work, we can measure a worker's current location but we do not know where in the distribution a worker expects to be. Generally, if workers expect to improve their relative position in the future, then current location will be a downward biased estimate of expected location and our implicit estimate of the "crossing point" for the distributions (see below) will be biased downwards.

⁹This is actually "perceived" expected utility. It is the worker's perception of the expected utility should the job become a union job.

¹⁰This calculation does not require that the union win or lose the election if individual i votes for or against the union. It only determines what he prefers as the outcome. It is assumed that there is nothing other than casting his own vote that the individual can do to influence the outcome of the election.

¹¹If an individual would prefer the certainty equivalent alternative job to the current job should it become a union job ($V_{ui} < V_{ai}$), then he would quit if the union won the election. This is a special case where the individual forces $P_{ui} = 0$ which yields $P_{ni}(V_{ai} - V_{ni}) > 0$ as the condition for voting for the union. This is only true if $V_{ai} > V_{ni}$ which can never in fact hold because it implies that the individual is currently holding a job which is inferior to a certainty equivalent alternative. Thus, we can conclude that all individuals who would quit if the union won the election will vote against the union.

¹²Non-wage aspects of compensation such as health insurance, pensions, and vacation pay are not explicitly considered. While they may be thought of as proportional to wage income, this omission is likely to cause some distortion because the ratio of fringe benefits to total compensation is generally larger in union firms than in non-union firms. See U.S. Bureau of Labor Statistics (1975, p. 4).

¹³While union members and workers in general are likely to be risk averse, this analysis does not depend crucially on the risk preferences of the workers and for analytical convenience risk neutrality is assumed. See Farber (1977) for an analysis of the risk preferences of a group of union members.

¹⁴We are also setting U equal to its appropriate value and assuming that the certainty equivalent alternative job is a non-union job ($U = 0$). This is not strictly accurate because there is some probability that individual i could replace the current job with a union job.

¹⁵Separations for other reasons are assumed to occur randomly and to be uncorrelated with the measured characteristics of the workers.

¹⁶The relevant population to compute the average wage and standard deviation of the workers is the prospective bargaining unit. Thus, when the income distribution of the firm is referred to it is interpreted as the income distribution of the prospective bargaining unit.

¹⁷If this term were not included ($\lambda_2 = 0$) then the union would lower the wage of all workers above the mean.

¹⁸RDET_i = 1 only if the individual answered both of the following questions affirmatively: (1) "Do your supervisors show appreciation when you do a good job? (or do they just take it for granted?)" and (2) "Do you agree that unions interfere with good relations **between** companies and workers?"

¹⁹FIMP_i = 1 only if the individual answered both of the following questions affirmatively: (1) "Do the supervisors in this company play favorites? (or do they treat all employees alike?)" and (2) "Do you agree that unions make sure that employees are treated fairly by supervisors?"

²⁰See Rees (1962, p. 150).

²¹PRO_i = 1 only if individual answered the question "Do you think there is a good chance or not much chance for you to get a promotion in this company?" with a "good chance".

²²It has been argued that individuals raised on farms are more independent and hence anti-union. See Whyte (1944).

²³DIFF_i = 1 only if individual *i* answered the question "If for some reason you were to decide to quit your job with this company, do you think it would be easy or difficult for you to find as good a job elsewhere?" as "difficult".

²⁴ α_1 and α_2 are interpreted as the difference between P_{low} for low seniority workers and high seniority workers divided by P_{high} for high seniority workers.

²⁵This is true of probit models in general. The unit variance assumption on ϵ is entirely arbitrary and is required to fix the scale of the parameters.

²⁶Whether or not this group is more likely to vote for the union than the group of workers who do not feel that it would be difficult to find an equivalent job depends on whether or not $\phi\delta_0 + \phi\delta_1 > 0$.

²⁷See Getman, Goldberg, and Herman (1976) for a detailed description of the construction of the sample and the data collection procedures.

²⁸The sample is stratified in the sense that workers in smaller firms had a larger probability of inclusion on the sample. See Getman, Goldberg, and Herman (1976, p. 37).

²⁹Two elections were eliminated from our study because of a problem with the wage variable which is discussed below. For reasons of confidentiality it is not known what union was involved in any particular election.

³⁰This is admittedly weak evidence that the missing observations discussed above are not correlated with voting behavior.

³¹Two elections were eliminated from the Getman, Goldberg, Herman sample because all of the sampled workers reported a wage rate in the open interval. This not only increased the potential distortion of the \$5.75 approximation but also made computation of $DIFF_i$ impossible ($\sigma_j = 0$ implies $DIFF_i = \infty$).

³²See, for example, Hausman and Wise (1977).

³³This is generally the case if the union can get a majority of the workers in a prospective bargaining unit to sign cards stipulating that they want the union as their bargaining agent.

³⁴The NLRB does supervise decertification elections on petition from at least 30 percent of the bargaining unit, but this is a trivial proportion of the total number of elections held.

³⁵If $\lambda_3 = 1$ then

$$\frac{W_i - \bar{W}_j + \lambda_2}{1 - \lambda_3(1 - \sigma_j)} = \frac{W_i - \bar{W}_j + \lambda_2}{\sigma_j} = DEV_i + \lambda_2 \frac{1}{\sigma_j}$$

³⁶Where $\lambda_3 = 0$ it is not possible to identify C_0 and λ_2 separately. Thus, λ_2 was assumed to be zero.

³⁷If $\lambda_4 = 1$ then

$$\frac{W_i - \lambda_4 \bar{W}_j + \lambda_2}{\sigma_j} = \frac{W_i - \bar{W}_j + \lambda_2}{\sigma_j} = DEV_i + \lambda_2 \frac{1}{\sigma_j}$$

³⁸Once again, the values for the other parameters in the model are similar to those contained in Table 2.

³⁹ λ_1 is not significantly less than zero if $\lambda_4 = 0$, but this case was easily rejected by both test.

⁴⁰ $\frac{.207 \text{ dollars/hour}}{.491 \text{ dollars/hour/s.d.}} = .416 \text{ standard deviations. Also, see Footnote 8.}$

⁴¹ Of course, individual characteristics may be correlated with perceptions of the union impacts on job satisfaction. An analysis of the formation of individual attitudes toward and perceptions about unions, while interesting, is beyond the scope of this study.

⁴² Indeed, to the extent that unions (especially industrial ones) narrow the opportunity for sex discrimination in wages for workers doing similar jobs, we would expect the coefficient on sex to be positive.

⁴³ The assumption, implicit in equation (9), that $(P_u - P_n)$ is not a function of seniority maintains that seniority affects P_u and P_n equally. Thus, the results that P_u is not perceived to be a function of seniority is only weak evidence that P_n is also not perceived to be function of seniority.

⁴⁴ The numbers in parentheses below the line are asymptotic standard errors.

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