The Impact of Regional Difference in Unionism on Employment

by Edward Montgomery

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Introduction

Almost 20 percent of the people in the work force are union members. Just in terms of numbers, trade unions are an important influence in the labor market and in the U.S. economy. Further, unions are widely believed to play a major role in determining workers' standard of living and how work is done and in affecting firms' profitability. Freeman and Medoff (1984) recently presented evidence suggesting that unions affect labor markets in a variety of ways. The beneficial effects of unions include protection for older workers, reduced quit rates, reduced earnings inequality, and increased productivity. Unions might adversely affect profits and stock prices and might increase the number of workers laid off in cyclical downturns, as well.

Although the impact of unions on these measures of economic performance has been studied, the majority of research on unions concerns how they affect compensation. Freeman and Medoff (1984) show that unions increase Mnge benefits, and there is a large body of empirical evidence that suggests unions raise the relative wages of their members.' In addition, unions have been found to affect the wages of nonunion members, although the direction and magnitude of this effect is ambiguous. Despite the attention focused on how unions affect wages, little attention has been paid to how this change in the relative cost of unionized labor affects employment—clearly an important part of assessing the welfare costs and benefits of unionism.*(By "welfare costs," we mean social or aggregate costs and not simply private costs and benefits to union members.) If unions succeed in raising wages only at the cost of massive employment reductions, as some analysts believe is the case, the welfare implications are radically different than if wage increases could be achieved with little or no impact on aggregate employment.

This study examines whether changes in unionism affect the aggregate level of employment in the economy, and in particular, whether an individual who lives in a standard metropolitan statistical area (SMSA) where unions are rare or weak is more likely to be employed than an individual who lives in an area where unions are strong.

Whether or not unions have a harmful effect on employment is also important to analysts of regional unemployment differences. Murphy (1985), found that differences in sensitivity to demand conditions in the product market and in wage differentials are vital in determining regional differences in unemployment rates. Since unions have been found to affect both of these variables, differences in the extent or impact of unionism could be important in understanding regional unemployment rate differentials.

1 See Parsley (1980) for a review of this voluminous literature.

2 There have been studies of the relative wage effect of unions across industries, occupations, and race and gender groups.

In fact, Freeman and Medoff's study (1984) suggests that unemployment rates are 1.0 percent higher in areas with a high degree of unionism relative to low unionism areas. However, since they also fail to find any correlation between the degree of unionism and the employment rate, a further, more explicit analysis of this question seems to be necessary to determine what effect, if any, unions have on aggregate and regional employment rates.

I. Previous Literature

Most studies of the employment effects of unions have been on the industry level.[3] Industry or firm studies, however, may overestimate the disemployment effect of unions, because they ignore the fact that some or all of the displaced workers may become re-employed in other industries or firms. Consequently, these studies cannot provide estimates of the net or aggregate employment effect of unions.

Lewis (1963 and 1964) provided the first analysis of the relative wage and employment effects of unions on an aggregate basis. Lewis divides the economy into a union and a nonunion sector. Industries with a relatively high degree of unionism, like manufacturing and mining, are part of the unionized sector, while those with a low degree of unionism are part of the nonunion sector.[4] Using time series data, Lewis estimates whether changes in relative employment levels across these two sectors can be attributed to differences in the average union/nonunion wage premium and to the average percent unionized. His results suggest that unions have a significant negative effect on relative employment levels and man-hours worked.

Pencavel and Hartsog (1984) recently updated and extended this seminal work. They failed, however, to find any consistent negative impact of unionism on man-hours. In fact, they conclude that the hypothesis that unionism depresses man-hours can be accepted only for the late 1920s and early 1930s. This basic result is not sensitive to whether the employment and wage effects of unions are estimated with Lewis' reduced form model or with a structural model that they developed.[5]

These results might be ambiguous because aggregate data are not suited to testing the employment effects of unionism. Aggregating industries into two sectors ignores the effects of unions *within* these sectors and, thus, may not yield good estimates of the overall effect of unions on employment and wages. Further, the absence of controls for changes in labor quality across sectors means that these studies might overestimate the impact of unions on wages and underestimate the effects on employment. In other words, if firms respond to the union wage demands by hiring for higher-quality labor, then "quality-adjusted wages will not rise as much as measured wages.[6] Since firms may substitute skilled for unskilled workers, the effect on total demand for labor could differ from the effect on a particular type of labor.[7]

Kahn (1978), Kahn and Morimune (1979), and Holzer (1982) provide cross-section estimates of the effects of variations in the extent of union membership across SMSAs on employment, hours worked, and unemployment stability. In these cross-section studies, the fraction of employed workers in an SMSA who are union members is used as a measure of union strength, because it is believed that unionism affects all workers in the same labor market, not just those in the same industry. Workers who may be displaced because of union wage demands are likely to seek employment not just in that industry, but throughout the local labor market. Studies with detailed cross-section data, either from the Current Population Survey (CPS) or the Survey of Economic Opportunity (SEO), offer better control for individual characteristics and for labor market variables that affect employment. These cross-section studies avoid some of the aggregation problems that crop up in aggregate time series studies, and thus, are preferable.

Nevertheless, results of these cross-section studies are somewhat inconclusive. Kahn (1978) finds that annual hours worked are significantly reduced for nonunion females, but not for nonunion males; these effects did not differ by race. Holzer (1982),

3 See Lewis (1963) lor a review of some of these industry studies.

4 The union sector was made up of mining, construction, manufacturing, transportation, communication, and public utilities; the nonunion sector was made up of all others, except military and government relief.

5 The structural model of the labor market that is used by Peccavel and Hartsog (1984) was developed to test for the wage and employment effects of unions without assuming that employment is unilaterally set by employers or that the union wage premium is exogenous. It should also be noted that their model also differs from that estimated by Lewis (1964) in that they use only the percent organized variable to capture the effect of unionism and not the estimated union wage premium.

6 The potential importance of these biases can be seen by the fact that the estimates of the quality-adjusted union relative wage effect differ substantially from those derived in cross-section studies.

7 See Pencavel and Hartsog (1984, p. 216) for a further discussion of these limitations.

however, finds a consistently significant negative employment effect for young white males and a negative but insignificant effect for older white males and black males. His results are sensitive to the sample year and to the specification of the estimated equation.

The difference in these results may be due to differences in sample years or the fact that Kahn (1978) examines annual hours worked, while Holzer (1982) looks at employment levels. Given this, it may be useful to examine in greater detail whether the disemployment effect of unionism occurs primarily through employment levels or through the number of hours worked by those who remain employed. Further, since Pencavel and Hartsog (1984) also found that the employment effect of unionism varies across time, it would seem that an analysis using recent data would be a valuable contribution to the literature.

II. Theory

The simple one-sector neoclassical model yields fairly straightforward predictions about the effects of unionism.[8] As seen in *figure* 1, if unions increase wages above the competitive wage level W_o to W_u, employment (or hours worked) falls from E_o to E_u. The reduction in employment depends on the elasticity of labor demand and on the size of the union wage premium.

With a fixed labor force, or inelastically supplied labor, this reduction in employment translates into an equal increase in the level of involuntary unemployment. In this case, E_o-E_u workers would like to work, but are unable to gain employment at the new union wage rate. Thus, in the context of a simple one-sector model with a fixed labor force, the employment and unemployment effects of unions are of equal magnitude. If labor is elastically supplied however, the effect on measured unemployment of an increase in union wages is somewhat more ambiguous. In this case E_1 - E_u workers want employment, but cannot get it at the union wage. These workers show up as unemployed only if they continue to engage in search for the rationed E_u jobs. As Welch (1974) points out, determining how many of these workers will remain on the labor force requires a model of probabilistic search behavior. Consequently, this simple model yields ambiguous predictions about the effect of unions on the measured unemployment, but predicts unambiguously that employmentwill fall. The effect on total employment, E_T, in this model depends upon the impact of unions on wages and the elasticity of labor demand in the economy.

Employment Effects on Unions

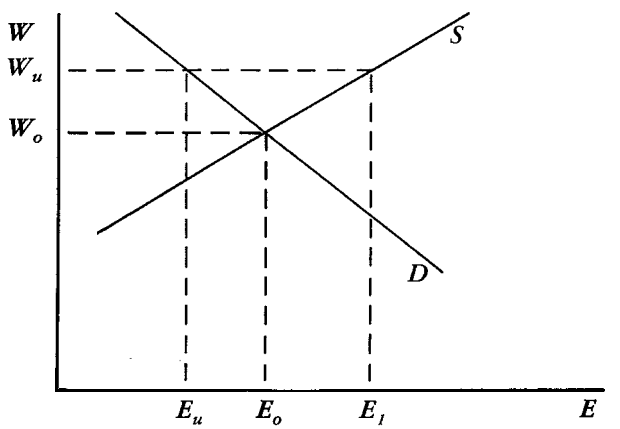

FIGURE 1

$$(1)\quad \frac{\partial E_T}{E_T} = \eta \dot{w}$$

where

$\dot{w}$ = the percentage changes in wages,
η = the elasticity of labor demand.

A fundamental problem with this simple one-sector analysis is that it does not allow for the possibility that there are nonunion workers in the economy. Consequently, this simple model may be useful in analyzing the employment in this simple model results from profit-maximizing firms moving up their labor-demand curves in response to union wage demands.[9] The size of the reduction in employ-

[8] Much of the theory used in this section was developed in the minimum wage literature by Welch (1974), Gramlich (1976), and Mincer (1976). These models provide a useful framework for analyzing the employment and unemployment consequences of the imposition of a wage rate that is above the market-clearing value.

[9] It should be noted that this result depends on the assumption that in the face of union wage demands, employers remain on their labor-demand curves when setting employment. Although this model of employment determination is in widespread use, recent work by McDonald and Solow (1981) and Pencavel and Hartsog (1984) has called its validity into question. An employment rule that allows firms to set employment after the wage is given may not be Pareto-optimal, because it leaves workers and firms off the contract curve. An optimal employment rule would involve the joint determination of employment and wages by labor and management. Under such a rule, movements in union wages need not be associated with movements along the labor demand curve and may, in fact, imply a positive association between wage increases and the level of employment. Clearly, if bargaining takes this form, there will be no aggregate employment loss resulting from unionism.

employment effects of unions within a firm, but will be of limited value in studying the industry-wide or aggregate consequences. Multi-sector models that allow for the presence of a nonunion sector have been developed by Johnson and Mieszkowski (1970) and Diewert (1974).

These general equilibrium models examine the impact of unions on nonunion wages in a world with varying factor intensities. Within the minimum wage literature, Welch (1974), Mincer (1976), and Gramlich (1976) have also developed multi-sector models to study the employment and unemployment effects of legislated wage floors, but they have typically assumed that factor intensities do not vary across sectors.

In a multi-sector model, an increase in wages in the union sector again leads to a reduction in employment in the unionized sector, as employers move up their labor demand schedules. The higher wage W_u, creates an excess supply of workers who are now willing to work in the nonunion sector if the nonunion wage is also W_u. The addition of these workers to the nonunion sector shifts out the supply curve in that sector.[10] This increase in the supply of labor in the nonunion sector will alter either wages or employment in the nonunion sector, and most likely both.[11]

Effect of Unions on Nonunion Employment

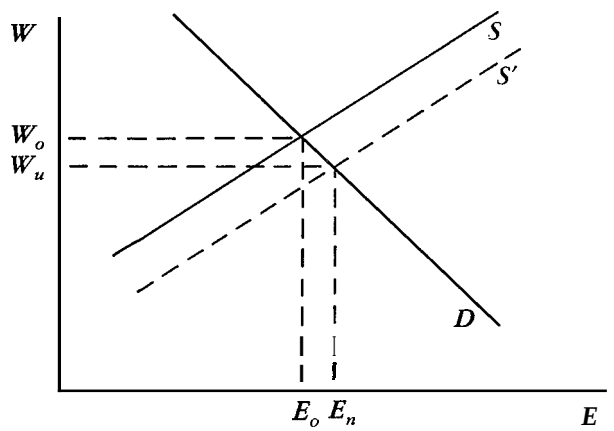

FIGURE 2

As seen in *figure* 2, the increased supply of workers to the nonunion sector tends to depress wages in that sector. Unless the elasticity of labor supply is zero, nonunion wages will not fall enough to prevent total employment from falling. Falling wages in the nonunion sector cause workers with high reservation wages to withdraw from the labor force, thus causing total employment to decline. Only if the supply of labor is inelastic, will total employment remain fixed.

In the two-sector model, the effect of unions on total employment still depends upon their impact on average wages in the economy. The change in average wages is a weighted average of the percentage change in the wages in the union and nonunion sectors:

$$(2) \quad \dot{w} = k\ \dot{w}_u + (1\text{-}k)\ \dot{w}_n,$$

where

k = percent of employment that is unionized,
w_i = percentage change in wages in sector i.

Given this, the effect on aggregate employment of an increase in union wages (or in the percent of the work force that is organized) will depend on the impact of such a change on nonunion wages. Unless the increase in union wages is offset by a reduction in nonunion wages such that:

$$(3) \quad \dot{w}_n \neq \frac{-k\ \dot{w}_u}{1 - k},$$

average wages, and hence employment, will change. As seen in *figure* 2, the actual change in nonunion wages depends, in part, upon the number of workers displaced from the union sector (the shift in the supply curve to the nonunion sector) as a result of the increased union wage. Given this increased supply, equilibrium is reestablished by falling wages, which increase demand and cause some workers to withdraw from the labor force. Consequently, the aggregate employment effect of unions depends upon the amount of increased demand and

10 Gramlich (1976) has noted that if union jobs go to workers with the lowest reservation wage, then the supply curve for workers in the nonunion sector shifts out only in that region above the reservation wages of the displaced workers. If jobs are assigned randomly, then a parallel shift in the labor supply curve occurs.

11 Mincer's (1976) analysis implies that the existence of a union premium may cause some workers to prefer being unemployed but in the queue for union jobs to being employed in the nonunion sector. Consequently, a union wage premium may cause labor to flow from the nonunion to union sector. He has shown that a net flow of labor from the union to nonunion sector occurs if the elasticity of demand for labor exceeds the turnover rate in the union sector. As noted by Holzer (1982), given the low turnover rates in the unionized sector, this condition will, in general, be met.

reduction in supply in the nonunion sector that results from the drop in wages.

It can be shown that in a two-sector model with constant factor intensities, the changes in nonunion wages will be a function of the elasticity of labor supply, ϵ, the elasticities of labor demand in the union, η_u, and nonunion sectors, η_n, the percent unionized, k, and the change in union wages, $\dot{w}_u$.[12] Thus:

$$(4)\quad \dot{w}_n = \frac{-k\,(\eta_u - \epsilon)\,\dot{w}_u}{(\eta_u - \epsilon)\,[(1-k) + \epsilon w_u] + k\epsilon\,(\eta_u - \eta_n)\,\dot{w}_u}$$

From equation (4) we see that unless the elasticity of labor supply is zero ($\epsilon = 0$), nonunion wages will not fall enough to prevent average wages from rising and total employment from falling. Falling wages in the nonunion sector cause workers with high reservation wages to withdraw from the labor force, thus causing total employment to decline.[13] Since previous research has found that unions tend to organize industries where the elasticity of labor demand is low, it is interesting to note that the greater the elasticity of labor demand in the nonunion sector relative to the union sector, the smaller the drop in nonunion wages, and the smaller the aggregate employment loss.[14] Using equations (1), (2), and (4), we can express the change in total employment as a function of the union wage change:

$$(5)\quad \frac{\partial E_T}{E_T} = \frac{1}{A}\left\{[\eta_u k\,\dot{w}_u]\,A - [(1-k)\,\eta_n k\,\dot{w}_u\,(\eta_u - \epsilon)]\right\}$$

where

$$A = (\eta_u - \epsilon)\,[(1-k) + \epsilon\,\dot{w}_u] + kt\,(\eta_u - \eta_n)\dot{w}_u.$$

The higher the elasticity of supply, t, or elasticity of demand in the union sector, η_u, or the greater the percent organized, k, the greater the disemployment effect associated with an increase in union wages. As the percent organized rises, more workers are in the union sector, and hence, are affected by the increase in union wages. However, if labor supply is inelastic, total employment will remain fixed.

In a general equilibrium model with variable factor intensities, the effect of unions on wages in the nonunion sector, and hence total employment, is ambiguous. If the unionized sector is the intensive sector then, as shown in Johnson and Mieszkowski (1979), both the substitution and the scale effect will result in a reduced capital/labor ratio in the nonunion sector, and hence, a reduction in the marginal product of labor and wages.

However, with a capital-intensive unionized sector, nonunion workers will get higher wages if the scale effect is greater than the substitution effect and lower wages if the converse is true. In either case, increases in union wages or in the percent of the labor force that is unionized tends to be associated with an increase in average wages and a drop in total employment, as long as labor supply is not completely inelastic.

The theoretical models discussed in this section imply that increase in either the percent unionized or in the union/nonunion wage differential can lead to a reduction in aggregate employment. The size of the disemployment effect will depend, in part, upon the elasticity of labor supply, where the more elastic the supply, the greater the reduction in employment. As seen in equation (5), the employment effect of unionism depends upon the extent of union strength, which is a function of both the union wage premium and the percent of the work force receiving it. Based on this theory, we would expect an inverse relationship between union strength and employment. We would also expect this effect to be small, if the elasticity of labor supply is near zero.

III. Empirical Results

To test for the employment and unemployment effects of unions, we used data from the 1983 Current Population Survey (CPS) Earnings File and Census data on SMSA characteristics. This data set was chosen, in part, because it contains detailed personal characteristics for each respondent, which allow us to control for differences in worker quality. In addition, it contains earnings and union membership data across individuals in each SMSA. To ensure a

12 See Welch (1974, p. 304, equation [6]), for derivation of a similar result under the assumption that demand elasticities do not vary across sectors.

13 It is possible that the existence of a union wage premium may actually draw more workers into the labor force than exit because of the depressed nonunion wage rate. This will occur, however, only if the turnover rate exceeds the elasticity of demand for labor. As noted earlier, this condition is unlikely to hold in the union sector.

14 See Freeman and Medoff (1984)

sufficient sample size in each of the 44 SMSAs in our sample, we combined the survey responses for each month over the year, yielding a sample of 104,409 observations.[15]

To examine the disemployment effect of unions, we initially looked at the effect of unionism on the probability of an individual in the population being employed. Because displaced workers from the unionized sector may either become unemployed or withdraw from the labor force, the employment and unemployment effects of unionism need not be the same. Since the distinction between unemployed and not-in-the-labor-force may not be pronounced, and since some of those displaced by unions may withdraw from the labor force, the probability of being employed might be a better measure of the "true" disemployment effect of unionism than the probability of being counted as unemployed. An additional benefit from focusing on employment status is that we can examine whether unionism has a different effect on the likelihood of getting part-time work than on getting full-time work. These effects may differ substantially if unionism affects the length of the workweek for those who remain employed.

As shown in section II, the effect of unionism on employment is a function of both the percent organized and the union wage premium. Consequently, the measure of the effect of unionism that we used is the product of the percent of employment in an SMSA that is unionized and the union/nonunion wage differential.[16] This index is similar to the Kaitz index, which is widely used to examine potential disemployment effects of a legislated minimum wage increase. It appears that unions impact aggregate employment via their effect on the average cost of labor. The distortion in labor costs due to unionism is the change in wages—that is, the union wage premium times the number of workers who receive that wage.[17]

Previous cross-section work by Holzer (1982), Kahn and Morimune (1979), and Kahn (1978) has implicitly limited the effect of unions on employment to differences in the percent organized from SMSA to SMSA. This is like constraining the union relative wage effect to be the same across SMSAs, which may be inappropriate for theoretical and econometric reasons.

Recent theoretical work by Lazear (1983) suggests that the percent unionized in an industry or region is not a good measure of union power. He shows that to the degree the cost of running a union differs across industries, different wage/employment packages are negotiated by unions facing the same opportunity locus or having the same strength. That is, unions in industries where costs are high tend to prefer higher wage/lower employment share packages than unions in relatively low-cost markets. Consequently, the percent of employment that is unionized or the union wage premium varies across industries or regions, even though union power is the same.

Greater union strength is indicated by a better wage/employment share package, not just a higher percent unionized. Consequently, it is necessary to control for both the wage premium and the percent unionized to get a measure of union strength across markets. To the degree the union relative wage effect differs across SMSAs, failure to control for differences in the wage premium will yield inefficient and potentially biased estimates. Since the union wage premium may be determined by many of the same exogenous variables that determine employment, this term is likely to be correlated with the independent variables in the model. The result may indicate that the estimated coefficients in previous studies are biased.

To construct our measure of union strength, it was first necessary to derive an estimate of the union/nonunion wage differential in each SMSA. To do this, we estimated separate wage equations for union and nonunion members in each SMSA:

$$(6) \quad \ln W_{ik} = \beta X_{ik} + e_i$$

where W_{ik} is average hourly earnings of individual, i, in SMSA, k, X_{ik} is a vector of individual characteristics that determine wages, and e_i is an error term. In estimating these wage equations, we included controls for schooling, experience,

15 Beginning in 1981, the CPS reduced the number of surveyed individuals and asked detailed employment questions of only one-quarter of the sample each month. As a result, there were fewer than 30 union members in many of the SMSAs in any given month.

16 We restrict our sample to the nonfarm economy when calculating both the union wage premium and the percent of employed who are union members. The sample was restricted to civilians age 16 to 65, working for wages and salary.

17 Because the multiplicative form places strong restrictions on how the percent organized, k, and the union wage premium, z, affect employment, we also estimated our employment equations using several other constructions of the union strength variable. In particular, we estimated an eauation where these terms were entered separately and equations with multiplicative indexes that rise more than proportionately with changes in the percent unionized ($zk/(1-K)$) or with the union wage premium (z^2k). Because of their qualitative nature, our results were not sensitive to the use of these other indexes.

experience squared, occupation, industry, race, gender and full-time, veterans, and marital status.[18] From equation (6) the union/nonunion wage differential for each SMSA, z_k, was calculated as:

$$(7) \quad z_k = \exp\{(\beta_u - \beta_n)\ \overline{X}\} - 1,$$

where β, represents the estimated coefficients from the union or nonunion wage regression and Xis the mean value of the individual characteristics in each SMSA.

This procedure treats union status as exogenous when estimating the union wage premium. Work by Heckman (1978), Duncan and Leigh (1985), and others suggests that this may yield biased estimates of the "true" union wage effect because it ignores the selectivity problem associated with the joint determination of union membership and the union wage premium. Work by Freeman and Medoff (1981) and Freeman (1984), however, suggests that current econometric techniques for addressing this problem suffer from extreme sensitivity to changes in sample period or model specification. Consequently, they have argued against using such corrections as the inverse of the Mills ratio in estimating this differential and, instead, advocate using Ordinary Least Squares (OLS) estimates, which do not appear to suffer from these problems.

Because we are only interested in the effect of variations in the size of this premium on employment and not in its level per se, we have chosen to use the estimates from these OLS regressions. Although a selectivity bias may mean that the estimated wage differentials are biased upwards, unless the selectivity bias varies across SMSAs in a way that is correlated with the error term in our employment equation, the employment equations should yield unbiased estimates of the effect of union strength on employment.[19]

In examining potential disemployment effects of unions, we attempted to control for other factors besides unionism that may shift either the supply or demand for labor, and hence, affect the likelihood of an individual being employed. Included in the model are controls for shifts in local demand or supply of labor, such as the unemployment rate in the SMSA, the size of the population, and the proportion of the population receiving AFDC.

The effect of differences in the level of human capital are captured by controls for the number of years of schooling and labor market experience, while race and sex dummies are included to capture the effect of differences in tastes or discrimination. Finally, nine regional dummies are included to control for omitted factors that potentially vary across regions of the country.[20] The resultant employment equation can be written as:

$$(8) \quad E_{ij} = \beta\ Y_{ij} + \delta\ UN_j + e_{ij},$$

where E_{ij} is a dummy indicating employment status of the ith individual in the jth SMSA, Y_{ij} is a vector of personal and SMSA-specific characteristics that affect the probability of being employed; UN_j is the product of the percent organized in an SMSA and the union/nonunion wage differential in that SMSA.

The results of estimating these linear probability employment equations for the employed workers and for part-time and full-time employed workers separately are presented in table 1.[21] The signs of the variables that control for local labor market conditons and individual characteristics are generally consistent with theoretical predictions. Increases in human capital (schooling and experience) and local demand (lower unemployment) lead to increases in the likelihood that an individual will be employed. Conversely, increases in the fraction of the population receiving AFDC has a negative, albeit insignificant, effect on the likelihood of being employed. As seen in regression (1), in table 1, increases in union strength have a negative and significant impact on the probability of being employed.

18 Since the respondents were only asked their union status and the earnings questions in the last month of their rotation in the CPS sample, we also included monthly dummies to control for seasonal variations.

19 Obviously, to the degree this is not true, the selectivity bias from the wage equation will be canied into the employment equation biasing these coefficients. Thus, it may be that our estimates provide an upper boundary on the size of the employment effect of unions.

20 We alsc included monthly dummies to control for seasonal variations in employment.

21 There are several well-known problems with the linear probability model having lo do with heteroskedasticily and prediction that lie outside the 0-1 interval. Because of the cost of estimating logit equations with a data set this large however, we have not attempted to estimate this model using maximum likelihood techniques. Nonetheless, the estimates from the linear probability model should be consistent.

Thus, the fraction of the population employed in an SMSA is inversely related to the extent of unionism and to the union wage premium. The magnitude of this effect can be captured by calculating the change in the probability of being employed for a base case or average worker when the value of the union strength variable changes by one standard deviation from its mean value.[22] The expected probability of being employed declines from 0.829 to 0.825 with this increase in union strength. On the other hand, the probability of the average worker in the SMSA where union strength is highest (San Bernardino, CA) being employed is only about 2 percent less than it is if that worker lived in the SMSA where union strength is the least (Atlanta, GA).[23] Thus, it would appear that changes in the extent of union strength have only a very limited impact on aggregate employment.

Given this reduction in the probability of gaining employment due to unionism, it is of interest to see if unionism also affects the length of the workweek for those who remain employed. If unionism has no effect on hours worked, then the effect on the probability of working full time should be the same as it is on the likelihood of working part time. Conversely, if employers cut their employees' hours, then the union variable should be positive in a regression where the dependent variable is the probability of working part time regression and negative in a regression where the dependent variable is probability of working full time. In regression (2) the dependent variable equals 1 if an individual is employed full time and zero otherwise; in regression (3) the dependent variable equals 1 if an individual is employed part time and zero otherwise.

We found that the union variable was negative and significant in the full-time employment equation, while it was positive but insignificant in the part-time employment equation. In addition, both the point estimate and the degree of significance of the union strength variable are higher in the full-time equation than in the total employment equation. Using these estimated coefficients, a standard deviation increase in union strength leads to a 0.7 percent reduction in the probability of being employed full time and a 1.5 percent increase in the probability of being employed part time.[24] If our base-case worker lived in Cleveland, he would be approximately 2 percent less likely to be working full time, and 4 percent more likely to be working part time than if he lived in the lowest union strength SMSA Thus, these results suggest that part of the disemployment effect of unions comes through reducing the number of hours worked on that job.

As a further test of this hypothesis, we re-estimated the employment equation with the probability of working part time if an individual was employed as the dependent variable. Unions may reduce the workweek by increasing the relative frequency of part-time jobs. As seen in regression (4), increases in union strength increase the fraction of employment that is part time. A standard deviation increase in union strength increases the likelihood of working part time for the base-case worker by about 3 percent.[25] Given these estimates, the conditional probability that an average worker has a full-time job (as opposed to a part-time job) is about 8 percent less in the Cleveland SMSA than in the lowest union strength SMSA Thus, these estimates suggest that increases in union wages (or the percent organized) might have a bigger effect on hours worked per week or on the mix of full-time and part-time jobs than on the level of total employment. This shift toward more part-time jobs may occur because unionized workers are more likely to work full time than nonunion workers, and because unionized workers are more likely to accept layoffs than reduced hours.[26] Thus, an increase in the cost of union labor will primarily cause a reduction in the number of full-time jobs in the union sector, because unionized workers tend not to engage in work-sharing arrangements to reduce hours worked. Some of the displaced workers, however, will find employment in the nonunion sector where there are more part-time jobs. Employment will thus tend to fall by less than the drop in the number of full-time jobs.

In section II, it was shown that the disemployment effect of unions was a function of the elasticity of labor supply. The greater the elasticity of supply, the greater the disemploy-

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22 The base-case worker is a single white male with 12.6 years of schooling, 18.5 years of experience who lives in the East-North-Central region of the United States in an SMSA with an unemployment rate of 9.4 percent in March, a population of 3,479,000 where 5.5 percent of the population receives AFDC, and the union strength variable equals 0.031.

23 The union strength variable equals 0.0367 in Cleveland and 0.0016 in Atlanta. In Cleveland, the probability of being employed is 0.827, while it is 0.837 in Atlanta.

24 The probability of being employed full time and part time for our base-case workers is 0.707 and 0.104, respectively.

25 The probability that the job a worker has is a part-time one for the base-case worker is 0.1429.

26 See Freeman and Medoff (1984) for a discussion of this issue.

ment effect. Given this, we might expect that the disemployment effect would be largest for groups with a weak labor force attachment or a high elasticity of labor supply. Teen-agers or young people may be more adversely affected than older workers, and females may suffer more than males. To test for differences in the disemployment effect across groups, we estimated separate employment equations for part-time and full-time workers by gender and age group. These results are presented in *appendix II.*

The basic predictions of our theory seem to hold. Based on the point estimates from these regressions, we see that the disemployment effect of unions is smaller for prime-age males than for teen-agers or 20-to 24-year-old males. In fact, prime-age males do not appear to be adversely affected by changes in union strength at all. This probably reflects their strong labor force attachment or the low elasticity of labor supply. Interestingly, the evidence does not support the hypothesis that teen-agers are more adversely affected than 20-to 24-year-olds. As expected, the disemployment effect of unionism is greater for prime-age females than for prime age males.[27] In general, increases in either the union wage premium or the percent organized affect the workweek, or the likelihood of being employed part time, more for females than for males.

IV. Conclusions and Implications

Results of estimates of the effect of changes in union strength on the likelihood of being employed are presented here. They suggest that in areas where the unionized percent of the labor force is large, or where the union/nonunion wage premium is large, workers are less likely to be employed. Besides affecting the number of workers employed, unions reduce the likelihood of an individual having a full-time job by altering the mix of part-time and full-time jobs in the economy. Thus, unions appear to adversely affect the average workweek for those who remained employed. These disemployment effects are felt mainly by females and young men, with little, if any, negative impact on prime-age males.

This disemployment effect was quite small, however. Unionism has a larger effect on the mix of part-time and full-time employment (and hence the workweek) than on the number of jobs. All of these effects are dwarfed in importance by other factors: the state of the local labor market and the level of the individual's human capital, or skills. Changes in schooling, experience, and local labor market conditions have a much greater impact on the likelihood of being employed than does unionism. For instance, a standard deviation increase in the number of years of schooling increases the likelihood of being employed for the base-case worker about 10.6 percent, while a standard deviation increase in the number of years of potential labor market experience increases it by 36.6 percent.[28] Thus, a standard deviation change in these measures of human capital is approximately 10 to 30 times more important than a similar change in union strength. This result implies that differences in union wage differentials, or the percent organized, are not the primary cause of regional differences in employment rates.

Data Appendix

The data for this study come from the Current Population Survey 1983 and from the Bureau of Census, *County and City Data* ***Book,*** *1982.*

UN is the product of the percent unionized and the union wage premium in each SMSA.

Unemployment Rate is the local unemployment rate for all workers in the SMSA.

Population is the number of people living in the SMSA.

AFDC is the proportion of the population in the SMSA receiving AFDC payments.

Schooling is the number of years of schooling completed by the individual.

Experience is calculated as Age -Schooling -6.

Race is a dummy that equals 1 if the individual is white.

Sex is a dummy that equals 1 if the individual is a male.

In addition to these variables, each regression contains a dummy term that equals 1 if the individual is married, nine regional dummies where the omitted catagory is the East-North-Central region and 11 monthly dummies to control for the month the individual was surveyed. The complete regression results are available from the author upon request.

27 The adverse effect of unionism increases with age for females. Whether this reflects a greater attachment to the labor force is a question for further research.

28 The standard deviation is 2.9 years for schooling and 14.4 years for experience.

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