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STRUCTURAL CHANGES IN UNIONIZATION: 1973-1981

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ABSTRACT

This paper presents a decomposition of the decline in union density into structural and within sector components using CPS data for private sector workers. We find that 58 to 68 percent of the decline in private sector unionization between 1973 and 1981 can be accounted for by structural changes in the economy, particularly in the occupational, educational and gender distribution of the workforce. This is a large impact, but we find that while structural change is important, its importance was not appreciably greater during the 1970s than during previous decades. At the same time, we find that the decline of private sector unionization within sectors has been pervasive, accounting for 32 to 42 percent of union decline. As part of this analysis we find that the decline in union density has been greater in those sectors of the economy where employment decline has been greater. This fact can help reconcile previous divergent findings on the importance of structural change.

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I. Seven Simple Explanations of the Decline in Unions

The proportion of the workforce that is unionized (union density) has been falling since the mid-1950s. Recent declines have raised the spectre of the death of collective bargaining, and provoked questions about the long-term growth and decline of unionism.

There are a number of common beliefs that offer simple and plausible sounding explanations for the decline in the unionized proportion of the work force during the 1970's:

1) Industry has been moving to the South and the West from the North-East and North-Central regions. Since the South and West have always been relatively anti-union, this geographic shift explains the decline in unionization.

2) The U.S. manufacturing sector has been in decline, and that this sector has always been organized labor's chief stomping ground. The unions are simply dying out along with their prime habitat.

3) White-collar employment is on the rise. As blue-collar jobs fade away, so do unions which have never found the key to white-collar organization.

4) The workforce is becoming more highly educated, and so less desirous of unions.

5) Women have never welcomed unions. More women in the labor force means less room for union organization.

6) Blacks have been receptive to unions, but as the black proportion of the workforce fades, so do unions' hopes.

7) The young don't appreciate the security unions provide to senior workers, and the workforce has become younger.

Other explanations have been offered in terms of 8) increasing managerial resistance prompted by union-wage premiums, 9) an exogenous change in worker preferences, 10) a shift in NLRB politics, and 11) relatively slower employment growth in union plants. We focus on the first seven explanations here.

In many of these cases, the premise of the argument is correct. The proportion of the workforce employed in the South and West, outside manufacturing, and in white-collar jobs is increasing. And indeed, unions have traditionally been weak in these sectors. At the same time, the female, white, and highly-educated fractions of the workforce have been increasing.

What each of these arguments presumes is that each type of worker or job has some normal or equilibrium level of unionization which tends to remain unchanged even as the composition of the workforce changes. In practice this may not be too bad an assumption. As the data in Table 1 show, the proportion of different labor market groups who are union members varies widely in the cross-section but little over time. This has led several authors to attempt to assess the extent to which changes in the composition of the labor force are responsible for the decline in union density by regressing union membership on dummy variables for job and personal characteristics to obtain predicted union density for subclasses of workers. These values are then multiplied by the change in the percent of each type of worker in the labor force to obtain a predicted decline in union density. This is then compared to the actual decline to determine what percent of the total decline was due

to the changes in labor force composition. This approach implies a great deal of faith in the initial assumption that each worker attribute or job type has a fixed level of union density associated with it.

It is also possible that there are important interactions between the dimensions considered by past authors. Women in production jobs in manufacturing may have much the same probability of being union members as males, while women in the service industry may be much less likely than men to be unionized. Further, while the densities in Table 1 are very stable there are some substantial changes, and the amount of change differs between groups. Again, it would not be unreasonable to expect that the same forces which are causing the manufacturing sector to shrink relative to the service sector may also be making unions in those industries less viable. If either of these problems is significant, existing estimates of the role of structural shifts in the decline in union density may be inaccurate.

This paper examines the appropriateness of the standard method for discerning the importance of structural change. We find that it has led some authors to overstate the extent of structural change though not by a great deal. We conclude that between 1973 and 1981 between 58 and 68 percent of the total decline in union density in the private sector is due in some sense to structural change.

The rest of this paper proceeds in five sections. Section II discusses the current population survey samples used in the analysis. The changing locus of unionism, and the pervasive nature of union decline are shown in Section III. Section IV presents our basic framework for decomposing the impact of structural changes on the percent unionized. The importance of

individual dimensions of structural change are analyzed in Section V. Section VI presents our main results from a simultaneous structural decomposition. To shed some light on the extent to which structural change in the late 1970s and early 1980s was unusually great, Section VII compares our results with those of other economists for earlier periods. our conclusions are presented in Section VIII.

II. The Current Population Survey Data

The analysis here is based on union membership reported annually in the May Current Population Survey (CPS) sample. Our study starts in 1973 because that is the first year in which the union question was asked. To augment sample size and insulate from cyclical variation, we group CPS observations for the years 1973, 1974 and 1975 (hereafter referred to as Y74), and for 1979, 1980 and 1981 (hereafter Y80). We then compare changes between these two sets of grouped years in employment and unionization across and within sectors. In each year the sample is limited to employed people reporting union status, region, industry, occupation, race, sex, age, and education.

Starting in 1977 the CPS changed the "union" question from "Does (respondent) belong to a labor union on this job?" to "On this job, is (respondent) a member of a labor union or of an employee association similar to a union?" To create a consistent series across time, we had to eliminate association members from our analysis. In 1970, the BLS reported 2,635,000 association members, 96.7 percent of whom were employed by governments (BLS Directory 1979, Table 16, p.67). The privately employed remainder were in the

service sector, represented by the National Education Association (private schools), the American Nurses Association, and the National Federation of Licensed Practical Nurses. Since the union-like associations are found in the professional service and government sectors, we eliminated these sectors from our analysis.

While this does result in a more consistent series of unionization data over time, it will overstate the decline in unionization over-all because these association-rich sectors are precisely the ones in which the incidence of collective bargaining has been increasing. The union movement is far from dead. In the two sectors not examined here, professional service and government, we see compelling evidence that unions are redirecting their organizing energies successfully towards growing parts of the economy. The analysis here focuses only on the private sector, and so does not treat, for example, the growth of AFSCME to become the largest union within the AFL-CIO today.

There are 110,200 CPS observations in Y74, and 104,700 in Y80. The Y80 sample is smaller because in 1981 the CPS only asked the union question to that portion of the respondents who were leaving the revolving CPS sample. The results reported here are based on these weighted samples.

III. The Changing Locus of Unionization, 1973-1981

Only 22.4 percent of this weighted sample were reported as union members in Y80. This is a 2.4 percentage point, or 10 percent decline from the 24.8 percent that were union members roughly six years previously in Y74. This 2.4

percentage point drop during the late 1970's is striking when placed in historical perspective, and marks a major decline in unions' fortunes. For comparison, Dickens and Leonard report that between 1974 and 1980 the proportion of private non-agricultural non-construction wage and salary workers organized fell from 26.2 to 21.2, a 5.0 percentage point drop, or 34 percent of the 14.9 percentage point drop from the peak 36.1 percent organized in 1954. Similarly, Pencavel and Hartsog report that between 1974 and 1980 the fraction of full-time equivalent employees represented by trade unions fell from 27.2 to 23.8 (Table 1, p.5), a 3.4 percentage point drop, or 37 percent of the 9.3 percentage point drop from 33.1 percent represented in 1958 (the earliest year they report).

In contrast, Kokkelenberg and Sockell (K&S) (1975, Table 4, p. 533) using three year moving averages of CPS data report that the percentage of workers unionized rose slightly from 1974 (24.7 percent) to 1980 (25.0 percent). We also report three year averages of CPS data for Y74 and Y80. K&S find a slight (0.3 percentage point) increase where we finds a decline (2.4) because they include the professional service and government sectors, although they also note (p. 501) the change over time in the CPS question from union membership to membership in a union or union-like employee association. This undoubtedly accounts for a substantial part of the astounding 9 percentage point increase in "unionization" that K&S observe (p. 501) among technical, professional and kindred workers. With the exceptions of communications and utilities, personal and professional service and public administration, K&S find, as other researchers have, that unionization has declined across industry.

This decline in unionization has been a pervasive phenomenon. Table 1 shows that the percentage of the private workforce has declined since 1973 just about any way it is cut. In all the industries, occupations, regions, age groups and sexes considered here the unionized proportion of the workforce fell. This proportion even fell in some of the unions' strongholds: the primary metals and automotive industries, and the mining and construction sectors. Further disaggregation would do little to change this picture of pervasive overall decline in unions' fortunes. The rays of hope for unions in Table 1 are a nearly stable share of non-white workers and a slightly growing share of college graduates.

Table 1 carries a simple but important lesson for those who would argue that unions are in decline mainly because of structural changes that have reduced employment in traditionally union intensive sectors. Since the proportion unionized is falling within nearly every sector, the overall proportion unionized would have fallen substantially even if the structure of employment were frozen at 1974 levels.

IV. Framework for Structural Decomposition

All of the factors presented in the introduction have one thing is common: They all explain the decline in the aggregate percent unionized in terms of a shift in the composition of the economy or the workforce from sectors in which unions are strong to sectors in which unions are weak. They all explain the decline of unions by reference to structural changes in the composition of industry or the workforce.

This lends itself to a mode of analysis that is straightforward, although it may be difficult to operationalize. The aggregate proportion of the workforce organized at time t is given by the identity:

$$(1) \qquad U^t = \Sigma_i S_i^t U_i^t$$

where S_i^t is the ratio of employment in sector i to total employment and U_i^t is the ratio of unionized workers to all workers in sector i. The change over time in the proportion unionized is then given by:

$$(2) \qquad U^{t+1} - U^t = \Sigma_i [S_i^t \Delta U_i + U_i^t \Delta S_i + \Delta U_i \Delta S_i]$$

where $\Delta U_i = U_i^{t+1} - U_i^t$, etc. Using this standard identify, the change in aggregate proportion unionized can be divided into:

(1) within sector changes in proportion unionized,

(2) structural composition effects due to changes in the share of employment across industries, and

(3) an interaction term.

Dividing equation (2) through by ΔU we get

$$(3) \qquad 1 = \frac{\Sigma_i S_i^t \Delta U_i}{\Delta U} + \frac{\Sigma_i U_i^t \Delta S_i}{\Delta U} + \frac{\Sigma_i \Delta U_i \Delta S_i}{\Delta U}$$

We shall refer to these three terms as the within sector, composition, and interaction effects respectively. The second term is structural change

weighted by initial unionization. The sum of the last two terms is structural change weighted by last period unionization.

The value added of this paper is in applying this decomposition simultaneously and consistently to a number of the most prominent structural explanations for the recent decline of unions. Previous work in this area (reviewed in Section VII) examines structural change along fewer dimensions and at a rougher level of aggregation. More important, they do not account fully for interactions along different dimensions. The regressions typically used in the past ignore such interactions, and so may either under- or over-predict the importance of structural change along a given dimension. In addition, past studies use the maintained assumption that unionization has been fixed over time within cells. Here, we allow explicitly for both within and across cell changes, for their interaction, and for interactions along a number of dimensions of structural change.

V. What Accounts for Union Decline in the 1970s?

The proportion of the workforce organized has been in continual decline since 1954, and this decline accelerated during the 1970's. This section measures the role played in explaining this recent decline by seven structural factors: changes in region, industry, occupation, education, sex, race, and age. The interaction of these seven factors is analyzed in Section VI. Here we consider the impact of each factor in isolation.

Table 2 shows the results of seven separate one-variable simulations. The categories used in the seven simulations are those shown in Table 1. For

example, the first row of this table shows how much the unionized percent of the workforce would have fallen if:

(1) the percent unionized within each industry (in Table 1) were held fixed at 1974 levels while employment shares across industries shifted in their historical patterns,

(2) the distribution of employment across industries were held fixed as in 1973, while within-industry percent union followed its historical pattern, and

(3) only the interaction of changes in employment share and changes in within sector unionization mattered.

All of the structural changes are less important than the within-sector changes. The shift in the workforce away from blue-collar and towards white-collar work has been the single most important structural change, and can itself account for 33 percent of the overall decline in unions. The other important structural changes, and the share of the overall union decline each can respectively explain (ignoring interactions) are: education (22 percent), industry (12 percent), and gender (19 percent). The movement of employment to the young plays only a minor role (9 percent) as does the shift to the South and West (5 percent), and shifts in the race of the workforce are inconsequential.

The third column of Table 2 shows a positive interaction effect in many cases. On average the percent unions is falling within sectors, and employment is shifting to low union sectors. Importantly, unionism is decreasing where employment is decreasing. At the same time, unions are making headway in some growing sectors, particularly in white-collar and

clerical jobs, and among the highly educated.

VI. The Interaction of Structural Changes

Considered individually, structural changes each account for a substantial portion of the decline in unions, but none of these changes have occurred individually. Between 1974 and 1980 a larger fraction of the workforce did move into sectors that have traditionally had low unionization such as the South and West, services, and white-collar work. If summed together, these changes appear to explain a great deal of the decline in unionization. But by summing them, one would make the error of double (or worse) counting, and so overstates the importance of structural changes. Seven one-way decompositions will count a job that moves from North to South, from manufacturing to service, from blue-collar to white-collar, from old to young, from high-school dropout to college graduate, from male to female and from black to white seven times. The seven-way decomposition used in this section counts this single change once.

We cross-tabulate employment and union membership across eight industries, three occupations, three regions, two education levels, two age groups, two races and just two sexes, for a total of 1152 cells. The groupings, and the marginal distribution of percent union are presented in Table 1.

How much of the 2.4 percentage point decline in unionization can be accounted for by structural changes? If the distribution of jobs across sectors had been frozen in 1974, we would expect the proportion unionized to

fall to 23.8. In other words, the within-sector decline in the percent unionized can account for 42 percent of the overall decline in unionism. We could stop here and still have reached a very important conclusion regarding the decline of unionism. Even if not a single job had moved to the South or out of manufacturing, etc., unionization would still have fallen by 42 percent of its actual decline.

The structural changes by themselves can account for 68 percent of the decline in unionism. If the percent unionized within each sector were frozen at its 1974 level, structural changes alone would reduce unionization to 23.1 percent in 1980. Together the within and between sector changes account for over 100% of the change. The next section explains why.

The Interaction Effect: Declining Unionism in Declining Sectors

A new ingredient here is the interaction term, which has been missing from previous analyses. It is true that employment share is growing in low-union sectors and that on average the percent unionized is falling within these sectors. But, the percent unionized is decreasing even more where employment share in decreasing. The interaction of ΔS and ΔU is .0024, and this positive interaction balances against both the negative composition, and the negative within sector effects. In other words, unionism is declining in most sectors -- enough to account for 42 percent of the overall decline, and employment is moving into low percent-union sectors -- enough to explain 68 percent of the drop in unionism. But where employment is declining, so is the percent union, enough to undo 10 percent of the pure structural effect. In other words, weighting by end period unionization, structural change can

account for 58 percent of the union decline, and within sector declines can account for 32 percent of total union decline. In a peculiar but not inconsequential sense then, the decline in the percent unionized within many of the traditionally union intensive sectors is of secondary importance because these sectors are in decline themselves. The cause of this phenomenon deserves further research.

Consideration of the interaction effect suggests and ambiguity in the estimation of the amount of change which can be attributed to structural factors and the amount of change taking place within sectors. Structural change as given by equation (2) is simply:

$$(4) \qquad \Sigma U_i^{74} \Delta S_i$$

This weights the structural changes by initial period unionization in each sector. Alternatively, one could weight by end period unionization, but this is simply the sum of the above structural effect and of the interaction term:

$$(5) \qquad \Sigma U_i^{80} \Delta S_i = \Sigma U_i^{74} \Delta S_i + \Sigma \Delta U_i \Delta S_i$$

Weighting by end of period unionization then, we find that structural change can account for 58 percent of union decline. Similarly,

$$(6) \qquad \Sigma S_i^{80} \Delta U_i = \Sigma S_i^{74} \Delta U_i + \Sigma \Delta U_i \Delta S_i$$

So weighting by end period structure, within sector declines can account for 32 percent of union decline.

VII. Comparisons to Earlier Analyses

Are the structural changes we have observed here a new development accelerating the decline in percent unionized in the late 70s and early 80s, or are they rather just a continuation of past trends? For the period from the mid-50s to 1977, similar decompositions are reported by Henry Farber (1985, Table 2.5, p.22). In simple one-way decompositions of the type reported here, Farber's and our results for the percent of the decline in unionization accounted for by structural changes are given in Table 4. We decompose in greater detail and along more dimensions than Farber, but for a shorter period than the mid-50s to 1977 period that he analyzes. This difference is important since the late 70s and early 80s we concentrate on here are a period in which the decline of unions accelerated, and in particular because the blame for this acceleration has often been placed on the decline of manufacturing industries. Yet Farber's calculation of the importance of this factor since the mid-50s is larger than our analagous calculation for the more recent period -- .17 compared to .12 of the union decline accounted for by industry shifts. It is by no means obvious from this comparison that the restructuring of American industry has contributed to a greater decline of unions recently than in the 60s or late 50s. If anything, these results suggest the opposite. We also find a similarly diminished role for shifts in the regional or gender distributon of the workforce in recent years, compared to Farber. In contrast, we find that occupational shifts are of greater importance in recent years. In addition, while Farber presents no simple decompositions for age, race or education, we find the first two to be

of negligible importance, while increases in educational levels are the second most important single factor in accounting for the decline in percent unionized.

The sum of Farber's individual shifts can account for 79 percent of the overall decline in union density. As Farber notes, however, this is likely to be an overstatement because of the correlation of changes along different dimensions. To address this issue, a cross-section regression from the 1977 Quality of Employment Survey (Q.E.S.) is presented. This is a regression of union status on dichotomous variables for race, sex, the South, manufacturing, and clerical, service, professional and technical occupations. Using this method and making the strong assumption that the propensity to unionize with these groups has not changed between the mid-1950s and 1977, Farber concludes that only about 41 percent of the drop in the extent of unionization can be accounted for by gross shifts in the industry, occupation, region and gender of the labor force. This is less than the 68 percent we calculate here using a more detailed decomposition, more dimensions, and a different technique for a more recent period.

Comparing Farber's regressions with his decomposition, we see that changes in occupation, sex and industry are correlated with each other. The importance of each of these factors is reduced in the regression that controls for all of them at the same time. Comparing Farber's regression with our decomposition, shifts in the occupational and gender distribution of the workforce appear to have become more important recently. Recent industry shifts appear either to have dominated Farber's results for the longer period, or else to be a continuation of post-war trends in accounting for union decline.

Richard Freeman and James Medoff (1984, p.225) report an analysis similar to that of Farber. In a pooled 1973-1975 May CPS sample, they calculate linear probability estimates of the probability of unionization as a function of industry, occupation, region, gender, age, race and education. They then ask how changes in the distribution of employment across these classes, holding the within class union propensity fixed, would be expected to change the overall percent unionized, between 1954 and 1979. As Table 4 shows, the Freeman and Medoff results, which are most directly comparable to Farber's regression results, show a greater impact of industrial and occupational shifts. Freeman and Medoff's results also imply that part of the effect we find here for education is correlated with other factors, such as occupation.

Comparing the three sets of findings, the greatest difference is between Farber and the other two. Table 5 summarizes the proportion of union decline that can be accounted for in total by each of the three studies. Weighting by initial period unionization, we find that 68 percent of the decline of unions can be accounted for by structural change. This is quite close to Freeman and Medoff's 72 percent, for a longer period but with less disaggregation. These two studies, using different techniques for different periods of time, are in close agreement in finding that structural shifts in employment across industries, occupations, regions and genders can account for the greater part of the decline in the percent unionized. A comparison of the two studies suggests that the period from 1973 to 1981 was not greatly different from the entire post 1954 period in the role played by structural shifts in accounting for the decline in percent unionized.

In contrast, Farber finds 41 percent of union decline attributable to structural change. The greatest differences are found in the role attributed to industry and occupation. This may be explained in part by differences in populations studied. We eliminate workers in the government and professional service industries. Most of these were government workers. Freeman and Medoff's analysis is of all private sector workers, and so also excludes government employees. The same is not true of Farber's analysis, which includes government employees. Because the white-collar blue-collar differential in union density is much lower among government employees, it stands to reason that Farber, by including government employees without interaction terms, finds that occupational structure is less important. Concerning the varying importance ascribed to industry, Farber's regression divides employment into manufacturing, and non-manufacturing, while we use eight industries and Freeman and Medoff use seven.

The interaction term we have calculated in this paper is not negligible, and can also help explain the difference between Farber, and Freeman and Medoff. We observe here that sectors with larger declines in shares of total employment also tend to have started with high unionization and to exhibit larger declines in percent unionized. Now consider two cross-section regressions of union membership of a vector of dichotomous variables representing industry, occupation, etc., estimated for two different years. Because of the type of interaction observed here, the regression estimated in the later year will tend to find smaller coefficients, and so less scope for structural change. This is because in the sectors that have experienced the greatest structural decline, the percent unionized has fallen (from the above

mean) the greatest. This is why the positive interaction terms (largely the product of two negatives) we observe here is important. In particular, Freeman and Medoff's results hinge on a cross-section regression on 1973-75 data, while Farber's depend on a 1977 cross-section. In view of the interaction effect, it is not entirely surprising that the analysis based on the later cross-section finds smaller structural effects.

What our finding indicates is that if Farber had used an earlier year to estimate his union density regression, he would have attributed more of the change to structural factors. If Freeman and Medoff had used a later year, they would have attributed less of the change to structural factors. As it is, they estimate their regression using the same sample we use to construct our base year estimates for union density. When we use those base year estimates to compute the importance of structural change, we get results very similar to theirs.

In a very different approach to examining the decline of unions, Dickens and Leonard argued that fully 63 percent of the decline between 1950 and 1979 in the percent organized among private non-construction, non-agricultural, wage and salary workers could be explained by the decline in union organizing and success rates. A residual 35 percent was explained by "economic factors," presumably differential employment growth rates in the union and non-union sectors. In other words, one might read the Dickens and Leonard results to argue that structural change could at most explain 35 percent of the union decline.

A key to reconciling our results might be to recognize that the changes in organizing and success rates measured in D+L may be in part due to

structural changes. We expect them to decline as unions' "natural territory" declines. However, Freeman (1985, p. 50) reports that structural changes have contributed only marginally to the decline in unions' success rate in NLRB certification elections. Our results here then suggest that much of the decline in union organizing rates previously observed may be due to structural changes that reduced employment in sectors in which unions had historically organized.

Dickens and Leonard also presented evidence suggesting that the structural changes of the late 1970s were not out of line with previous experience. In this light, our results here may be interpreted as the most recent manifestation of an ongoing structural change since 1950.

Criticisms of the Structural Approach

The structural approach is limited. It can tell us where changes are occurring, but it does not attempt to explain why they occurred. Three examples will illustrate the limitations this imposes. First, structural change is itself the product of larger economic forces. In particular, the decline of total employment in some industries may itself be related to the presence of unions. This would be accompanied by a declining unionization rate within the affected industries -- much as we observe here -- as union plants within the industry are particularly hard hit. Second, as mentioned above, union organizing and success rates may themselves be endogenous to structural change. Organizing and success rates may fall as union's traditional territory contracts. Third, as Freeman and Medoff (1984, p.227) point out, much the same structural changes we observe here for the U.S. have

also taken place in Canada, but without the same consequent decline in unionization. This serves as an important warning that other factors are at work beyond those considered in structural models.

VIII. Conclusion

The period between 1973 and 1981 was not so different from the previous two decades concerning the importance of structural change in accounting for the fate of unions, judging by a comparison of our results with earlier work by Freeman and Medoff. These studies find that structural change can account for more than half but less than three quarters of the decline in union density. What does appear to set the 1970s apart from earlier periods is not greater shifts in employment across industry lines, but rather greater shifts across occupations, and greater changes in the education level and gender of the workforce.

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Table 1

The Changing Locus of Unionism, Y74 to Y80

	Percent Unionized	
	Y74	Y80
Occupation		
Professional, Technical	13.5	13.4
Manager, Sales, Service	7.4	6.6
Craft, Operatives, Laborers	42.4	39.2
Industry		
Mining, Construction, Stone	37.6	33.3
Ordinance, Fab. Metal, Aircraft	40.5	38.4
Other	11.6	10.3
Primary Metal, Auto	65.7	60.6
Machinery, Electronics	32.9	28.3
Food, Tobacco	42.5	40.1
Chemicals, Plastics, Petroleum, Leather, Paper	37.3	33.9
Utilities	48.3	47.5
Region		
North East and North Central	30.4	27.7
South	15.3	14.1
West	25.3	22.1
Education		
Less than College Graduate	26.8	24.4
College Graduate	8.5	9.6
Gender		
Male	30.6	28.0
Female	13.8	12.8
Age		
10 - 30	19.1	17.2
30+	28.8	26.4
Race		
White	24.3	21.5
Non-White	29.3	29.2

Note: Y74 refers to grouped observations from the May CPS sample, in 1973, 1974 and 1975.

Y80 refers to grouped observations from the May CPS sample, in 1979, 1980 and 1981.

Table 2

The Decline of Unions Y74-Y80

(Structural, Within-Sector, and Interaction Effects in Seven Separate One-way Breakdowns)

	$\Sigma U_i^{74} \Delta S_i$	$\frac{\Sigma U_i^{74} \Delta S_i}{\Delta U}$	$\Sigma S_i^{74} \Delta U$	$\frac{\Sigma S_i^{74} \Delta U}{\Delta U}$	$\Sigma \Delta S_i \Delta U_i$	$\frac{\Sigma \Delta S_i \Delta U_i}{\Delta U}$
Industry	-.30	12.3	-2.14	88.1	.036	-1.5
Occupation	-.81	33.3	-1.70	70.0	.076	-3.1
Region	-.12	4.9	-2.30	94.7	-.0022	0.09
Age	-.22	9.1	-2.22	91.4	-.024	1.0
Education	-.54	22.2	-1.99	81.9	.177	-7.3
Race	.03	- 1.2	-2.47	101.6	.013	-0.5
Sex	-.45	18.5	-2.03	83.5	.045	-1.8

Note: These are compared with a decline in aggregate unionization from 24.79 percent in 1974 to 22.36 percent in 1980, or -2.43. Y74 refers to grouped observations from the May CPS samples in 1973, 1974, and 1975. Y80 refers to grouped observations from 1979, 1980, and 1981.

Table 3

Summary of Seven-Way Cross-Tabulation of Structural Changes and the Decline of Unions, Y74-Y80

N = 1152 Cells

		Impact on Union Density	Proportion of Union Decline Accounted For
1.	Within Cell	$\sum_{i=1}^{1152} S_{74_i} \Delta U_i$	-.0102	.42
2.	Across Cell	$\sum_{i=1}^{1152} U_{74_i} \Delta S_i$	-.0165	.68
3.	Interaction	$\sum_{i=1}^{1152} \Delta S_i \Delta U_i$	.0024	-.10

Note: Cell categories are given in Table 1.

Table 4

Structural Explanations for the Decline of Unions

	Proportion of Union Decline Accounted For			
Study:	Leonard & Dickens	Farber	Farber	Freeman & Medoff
Period:	1973-81	Mid-50s-77	Mid-50s-77	1954-79
Base Sample:	CPS	Handbook of Labor Stats.	QES	CPS
Method:	Decomposition	Decomposition	Regression	Regression
Factor				
Industry	.12	.17	.10	.17
Occupation	.33	.21	.12	.25
Region	.05	.12	.12	.12
Sex	.19	.24	.05	.07
Education	.22	--	--	.06
Race	-.01	--	--	.00
Age	.09	--	--	.04

Sources: R. Freeman and J. Medoff (1984, p. 225, Table 15.2)
H. Farber, (1985, p. 22, Table 2.5).

Table 5

Total Structural Proportion of Union Decline

1.	Leonard & Dickens 1973-81 CPS Decomposition	.58 to .68
2.	Farber Mid-50s-77 1977 QES Regression	.41
3.	Freeman & Medoff 1954-79 1973-75 CPS Regression	.72