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WAGE TRENDS AND WAGE CONCESSIONS:  
IMPLICATIONS FOR MEDIUM-TERM ECONOMIC EXPANSION

by

Daniel J.B. Mitchell\*

\*Daniel J.B. Mitchell  
Director  
Institute of Industrial Relations  
UCLA  
Los Angeles, California 90024  
(213) 825-4339

and

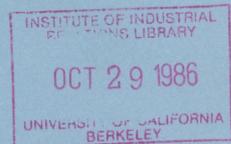
Professor  
Graduate School of Management  
UCLA

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INSTITUTE OF INDUSTRIAL RELATIONS (Los Angeles)

UNIVERSITY OF CALIFORNIA

LOS ANGELES 90024



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EXPANSION

**DANIEL J.B. MITCHELL**

Director  
Institute of Industrial Relations  
U.C.L.A.  
Los Angeles, California 90024  
(213) 825-4339

and

Professor  
Graduate School of Management  
U.C.L.A.

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## SUMMARY

Wage trends -- especially union wage concessions -- during the 1980s suggest that a shift in wage norms has occurred. If so, the outlook for economic expansion without accelerating inflation is much improved. The paper argues that, indeed, a norm shift has occurred (primarily in the union sector) and that a lower rate of unemployment than currently exists could be attained without fears of a renewed inflation. Thus, for the balance of the 1980s, lack of appropriate economic expansion could only be due to either poor economic policy or incredible bad luck.

To document the norm shift, the paper first examines arguments that recent wage concessions have been due to special factors such as de-regulation and foreign competition. It is found that the concessions are too widespread to fit such an interpretation. There is now less upward pressure on wages, given surrounding economic conditions, than there was in the 1970s.

Much of the weakness shown in union bargaining is due to the substantial growth of nonunion competition. Unionization at the industry level has slipped. The overall national slippage in unionization is not primarily a reflection of a change in industry mix. This slippage will be hard to recoup. Thus, there is little probability that union bargaining strength will return to earlier levels in the next few years.

The paper also examines the proposition that wages -- and union wages in particular -- have become more cyclically sensitive. Regression analysis of two data sets indicates that the sensitivity of wage change to unemployment will show a marked increase when data from the 1980s are added to the sample. However, it appears that this seeming increase in sensitivity is due to a change in norms in the 1980s and that the apparent sensitivity may simply be a statistical illusion. The main piece of evidence in favor of greater sensitivity is the spread of profit sharing plans in certain union settlements, a development still in an embryonic form.

Finally, a model is developed linking wage and price setting to the level of economic activity (unemployment). It is from this model that the optimistic conclusions concerning the potential for economic expansion in the 1980s are drawn.

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Wage Trends and Wage Concessions:  
Implications for Medium-Term Economic Expansion

Daniel J.B. Mitchell  
University of California, Los Angeles

Forecasters generally focus on the short term. They are asked where the economy will be heading in the next quarter or year. In this paper, however, I will assign myself the task of looking over a medium term horizon, i.e., the next 3-4 years. I will ask what current labor market trends imply for the economic outlook over that horizon, particularly those trends which have characterized wage setting and collective bargaining.

Macroeconomists, beginning with Keynes, have seen wage determination as both important and -- at the same time -- peculiar. In Keynesian economics, the labor market was a peculiar place, characterized by such irrationalities as money illusion, which simply had to be taken as given.<sup>1</sup>/ Keynes described wage determination as a bargaining process, in part because he was writing from a British perspective at a time when British trade unions were already a significant force. My own bias in this area is to view wage bargaining as potentially shortsighted, i.e., bargainers may not be able to perceive the longer term consequences of their actions, but to avoid value charged words as "irrational" and "illusion."

In the U.S., early postwar critics of Keynes also tended to

be skeptical about the importance of unions in overall wage determination.<sup>2</sup>/ But since that period enough evidence has accumulated suggesting that unions do matter in wage setting to permit me to take that proposition as a given, too. Thus, although some readers may be unhappy with my starting premises, in what follows I will assume that recent union wage developments -- and especially the wage concession movement -- has important macroeconomic consequences.

#### I. A View from the 1970s.

In a book written in the late 1970s, and in related papers, I noted a tendency for union wages to rise faster than nonunion after the Korean War.<sup>3</sup>/ This tendency was reversed only during the early 1960s, a period I will discuss below. During the same observation period, union wages seemed less sensitive to business cycle conditions than nonunion, despite the fact that other aspects of the union labor market (employment, strikes, petitions before the National Labor Relations Board) showed distinct cyclical influence. Finally, I noted that the unionized percentage of the workforce had exhibited a gradual decline -- particularly when the public sector was excluded -- so that unions could be described as doing "better for fewer."<sup>4</sup>/ The decline was faster than could be explained by changes in the industrial composition of employment. I concluded at the time

that "a prudent forecaster would probably predict an eventual halt in the widening of the union-nonunion earnings differential, but there is little to suggest precisely when this might happen."\_5\_/

## II. Recent Wage Trends.

Of course, we now know when it happened. Table 1 shows the trend in union and nonunion wages during 1976-86. Measured by wages alone, the reversal of the widening trend occurred in 1982, a year characterized by notable concession bargaining in industries such as automobiles and trucking.\_6\_/ On a total compensation basis, the reversal appears in 1983. Also reversing during this period was a tendency for wage adjustments under escalated contracts to outpace those without cost-of-living adjustment (COLA) clauses. The COLA/non-COLA reversal reflects both a slowdown in inflation as measured by the Consumer Price Index (CPI) as well as a number of concession agreements in the COLA sector.

There has been considerable debate over whether recent wage trends, particularly with regard to union concession bargaining, are "normal" or "abnormal" given surrounding economic circumstances, e.g., low price inflation and high unemployment.\_7\_/ Although a precise definition of concession bargaining is difficult (since all negotiations involve give and

Table 1  
Private Union and Nonunion Annualized Pay Trends  
(percent)

	1976-79	1980	1981	1982	1983	1984	1985	1986
<b>Wages &amp; Salaries</b>								
Union	8.2	10.9	9.6	6.5	4.6	3.4	3.1	-.1 <sup>1</sup>
Nonunion	7.3	8.0	8.5	6.1	5.2	4.5	4.6	-.1 <sup>1</sup>
<b>Total Compensation</b>								
Union	n.a.	11.1	10.7	7.2	5.8	4.3	2.6	-.1 <sup>1</sup>
Nonunion	n.a.	8.9	9.4	6.0	5.7	5.2	4.6	-.1 <sup>1</sup>
-----								
<b>Wage Changes in Major Union Contracts Expiring in period indicated<sup>2</sup></b>								
Escalated <sup>3</sup>	8.3	8.4	8.6	8.8	8.1	3.9	3.8	3.1
Nonescalated	4.4	7.5	7.7	7.4	9.6	7.4	4.6	3.6

<sup>1</sup>First six months.

<sup>2</sup>Agreements covering 1,000 or more workers.

<sup>3</sup>Estimates may be slightly understated due to omission of final escalator payments during period indicated.

Source: Current Wage Developments, Monthly Labor Review, various issues.

\*\*\*Note: Missing data for 1986 to be added when available.\*\*\*

take), I have used the proportion of union contracts providing wage adjustments of zero or less in the first contract year as a proxy for such bargaining in previous work. As Table 2 shows, there have been three episodes in which this proportion has risen notably since the end of the Korean War.

The first notable jump in union wage freezes and cuts occurred immediately after the Korean War, a period when membership was at its peak relative to the overall labor force at the time and many thought that with the merger of the rival AFL and CIO, unionization of the workforce would go on rising. Contract duration tended to be shorter in the mid-1950s than subsequently, so that flexible adjustment to an economic downturn was easier. Nevertheless, the concession bargaining of that period was confined to weaker sectors, such as apparel, where nonunion competition was a significant threat.

A second episode of increased wage freezes and cuts occurred in the early 1960s, following two back-to-back recessions and a decline in inflation. By this point, the fact that unionization had reached its peak was becoming apparent.<sup>8</sup> Management had basically been caught off base by the rapid rise in unionization in the 1930s and 1940s and had tended to take a reactive position. But by the early 1960s, management began to formulate a more pro-active, aggressive strategy.<sup>9</sup> Unions had just

Table 2

Proportion of Settlements Involving Wage Freezes and Cuts,  
Inflation, and Unemployment: 1952-86  
(percent)

Year	Percentage of Settlements with First-Year Wage Freezes and Cuts <sup>1</sup>	Change in Consumer Price Index <sup>2</sup>	Overall Unemployment Rate	Unemployment Rate for Married Males with Spouse Present
1952	7	0.9	3.0	1.4
1953	7	0.6	2.9	1.7
1954	10	-0.5	5.5	4.0
1955	6	0.4	4.4	2.6
1956	3	2.9	4.1	2.3
1957	4	3.0	4.3	2.8
1958	6	1.8	6.8	5.1
1959	3	1.5	5.5	3.6
1960	3	1.5	5.5	3.7
1961	7	0.7	6.7	4.6
1962	10	1.2	5.5	3.6
1963	10	1.6	5.7	3.4
1964	8	1.2	5.2	2.8
1965	5	1.9	4.5	2.4
1966	2	3.4	3.8	1.9
1967	1	4.7	3.8	1.8
-----				
1981	3	8.9	7.6	4.3
1982	12	3.9	9.7	6.5
1983	28	3.3	9.6	6.5
1984	27	3.5	7.5	4.6
1985	25	3.6	7.2	4.3
1986- first half	34	-0.2	7.1 <sup>3</sup>	4.4 <sup>3</sup>

Note: Data from the Bureau of National Affairs, Inc. series on wage freezes and cuts are not available for years 1968-80.

<sup>1</sup>From Bureau of National Affairs, Inc. contract files.

<sup>2</sup>CPI-W on a December-to-December basis 1952-85; December-to-June annualized basis for 1986.

<sup>3</sup>Average of monthly, seasonally adjusted figures.

Source: Daily Labor Report, various issues; U.S. Bureau of Labor Statistics.

taken a political beating with the passage of the Landrum-Griffin Act in 1959. Finally, the early 1960s were years in which balance of payments problems for the U.S. and growing foreign competition was recognized. This time, therefore, concession bargaining was felt in sectors where unions had established strong positions, notably in steel.

Strike incidence is a measure of industrial relations tension. Table 3 provides a ranking, based on years of lowest levels of four strike indexes, of strike activity. The years appearing on the table are either from the 1980s or the 1960s, suggesting similarities of the two periods. While there have been some bitter strikes in recent years, there have also been well-publicized cases in which striking union workers have lost their jobs and been replaced.<sup>10</sup> Union workers recognize the risks of striking and are therefore more reluctant to walk out.

Thus, an argument over whether union wage behavior and concessions are "abnormal" serves little purpose. We are basically analyzing only three observations: 1954, the early 1960s, and the 1980s, hardly a sufficient sample to base a judgment. What we can say is that these episodes are unusual and -- as will be elaborated below -- that the current episode is likely to have a more long-lasting effect than the other two.

Table 3  
Strike Incidence Measures

<u>Years of Lowest Strike Incidence by Various Measures</u>			
Number of Major Stoppages Beginning <sup>1</sup> (1)	Number of Workers In- volved in Major Stoppages <sup>1</sup> (2)	Number of Workdays Idle due to Major Work Stop- pages <sup>1</sup> (3)	Workers with a Job but not at Work due to Industrial Disputes <sup>2</sup> (4)
Period Covered:			
1947-85	1947-85	1947-85	1957-85
-----			
1985	1985	1985	1962
1984	1984	1984	1982
1983	1963	1982	1960, 1984 <sup>3</sup>
1982	1982	1963	1963
1981	1981	1961	1985

Note: Table shows years during period covered ranked by lowest value of strike incidence measure.

<sup>1</sup>Major stoppages are those involving 1,000 or more workers.

<sup>2</sup>Based on Current Population Survey.

<sup>3</sup>Two years shown are tied for rank of third lowest.

Source: Employment and Earnings, Current Wage Developments, various issues.

### III. The Norm-Shift View.

In analyzing the union wage concessions of the 1980s, I have found it useful to borrow the norm-shift hypothesis of George L. Perry.<sup>11</sup>/ Perry's view is that given the infrequency of episodes of "subnormal" wage inflation, it is best to view such events as discrete events in which a climatological change occurs in the labor market. The shift in wage-change norms may be triggered by standard macro variables, e.g., high unemployment, or by political factors such as the Kennedy administration's wage/price guideposts. Less important than the initial spark is the tendency for the impulse to spread to sectors that were not necessarily close to the point of origin.

In a 1985 paper for the Brookings Panel on Economic Activity, I found support for the Perry hypothesis regarding the union sector.<sup>12</sup>/ However, I noted that there were reasons to believe that, although a norm shift had occurred, it was confined largely to union situations. In support of this proposition, Tables 4 and 5 update similar tables found in the Brookings paper, but provide more recent data and revised estimates for the 1980s.

Table 4 graphically illustrates the spread of concession bargaining from industry to industry. As each year passes, the incidence of union wage settlements of zero or less seems to spread to new industries. I will say more about the sectoral composition of concessions below. However, it is readily

Table 4: Industry Composition of Wage Freezes and Cuts, 1981-86

Industry	1981	1982	1983	1984	Jan. 1985- June 1986
Metals	X	X	X	X	X
Motor vehicles <sup>1</sup>	X	X	X	X	X
Retail foodstores <sup>2</sup>	X	X	X	X	X
Machinery	X	X	X	X	X
Meatpacking	X	X	X	X	X
Airlines	X	X	X	X	X
Printing & publishing	X	X	X	X	X
Health care	X	X	X	X	X
Lumber & paper	X	X	X	X	X
Ordnance	X			X	X
Construction		X	X	X	X
Transit & bus lines		X	X	X	X
Rubber		X		X	X
Trucking		X	X	X	
Aerospace		X	X	X	X
Textiles		X	X	X	X
Food mfg. exc. meatpacking		X	X	X	X
Instruments		X	X	X	X
Chemicals		X	X	X	X
Furniture		X	X	X	X
Hotels & restaurants		X	X	X	X
Shipping		X	X	X	X
Other transp. equipment <sup>3</sup>		X	X	X	X
Brick, clay, stone		X	X	X	X
Finance, insurance		X		X	X
Communications		X		X	X
Apparel		X		X	X
Business services			X		X
Railroads			X		X
Unions <sup>4</sup>			X	X	X
Cement			X	X	
Entertainment			X	X	X
Mining			X	X	X
Warehousing			X		X
Glass			X		X
Education			X		X
Retail exc. foodstores				X	X
Leather				X	
Petroleum				X	X
Tobacco				X	X
Utilities				X	
Agric., forestry, fishing					X

Table 4 -- continued

Note: An "X" indicates at least one contract involving a first-year wage adjustment of zero or less was found in the industry and year indicated.

<sup>1</sup>Includes motor vehicle parts.

<sup>2</sup>Includes related wholesale operations.

<sup>3</sup>Excludes motor vehicles and parts and aerospace.

<sup>4</sup>Unions in their role as employers of their own staffs.

Table 5  
Actual and Predicted Wage Indexes, 1980-85  
(percent)

Wage Index	1980	1981	1982	1983	1984	1985
<b>Union Indexes</b>						
Median First-Year Wage Adjustments:						
Actual	9.4	11.0	3.7	3.7	2.2	2.3
Predicted	10.9	12.4	10.3	6.8	5.6	5.8
Median First-Year Wage Increases:						
Actual	9.4	11.0	7.1	5.8	2.9	4.0
Predicted	11.0	12.4	10.5	7.1	5.8	6.0
Median Effective Wage Adjustments:						
Actual	10.7	10.5	6.7	4.7	3.8	3.5
Predicted	10.2	11.3	9.7	7.1	5.2	5.6
-----						
Wage Index for Selected Nonunion Industries, Changes in Hourly Earnings:						
Actual	7.9	8.4	5.7	5.2	4.3	3.8
Predicted	7.8	8.6	7.1	4.9	4.2	4.4
-----						
<b>All-Sector Wage Indexes</b>						
Compensation per Hour:						
Actual	10.4	9.4	7.8	4.1	3.6	3.7
Predicted	10.3	11.5	9.8	6.7	5.5	5.8
Hourly Earnings:						
Actual	9.0	9.1	6.8	4.6	3.4	3.0
Predicted	9.5	10.7	9.1	6.1	4.9	5.2

Note: This table updates figures originally presented in Daniel J.B. Mitchell, "Shifting Norms in Wage Determination," Brookings Papers on Economic Activity (2:1985), p. 579. Data for 1985 did not appear in the original. Data revisions are reflected in some of the other year estimates.

apparent from the table that not all of the sectors with concessions fit neatly into the deregulation/foreign trade stories that are often told to explain recent wage developments.

Table 5 shows actual and predicted values for selected indexes of union, nonunion, and all-sector rates of pay change. The predictions are from simple wage equations whose purpose is simply to illustrate what econometric studies are likely to yield.<sup>13</sup> Three characteristics can be highlighted. First, it is the union indexes which most dramatically are overpredicted in the 1980s. This result occurs even when the index used is adjusted to include only wage increases, i.e., when the wage freezes and cuts are removed. Second, an index based on selected nonunion industries shows a lesser tendency toward overprediction.<sup>14</sup> Third, there is overprediction apparent for the global indexes (union plus nonunion).

When added together, these three characteristics suggest that much of the Perry-style norm shift of the 1980s is a union phenomenon. This union concentration may also have characterized the 1960s since Perry's own work from that era suggested that the downward shift was concentrated in more "visible" sectors. At the time, Perry pointed to political visibility in an effort to demonstrate the efficacy of the federal wage guideposts program.<sup>15</sup> But visible industries, as he selected them, were those with high concentrations of union workers.

#### IV. Norm Shift or Special Factors?

I am going to argue below that not only was there a discrete shift in wage norms in the 1980s, especially within the union sector, but that this shift is likely to be more persistent than its predecessor in the early 1960s. I am also going to argue that the current shift has important macroeconomic implications. Specifically, in my view more real expansion of the economy is possible without accelerating inflation than the typical forecast currently suggests. However, since my 1985 Brookings paper supporting the norm-shift view evoked some skepticism, it is necessary first to look more closely at the available data on wage concessions.

The Bureau of National Affairs, Inc., a private reporting service, maintains a file of union contract settlements which are reported on a biweekly basis in the Daily Labor Report. It is possible to cull from the listings those contracts providing first year wage adjustments of zero or less. The sectoral composition of these concession contracts can then be studied, along with information on other contractual features which characterized the agreements. This data file, for example, was used to produce Table 2.

i. Foreign Trade and Deregulation.

A common explanation of the union wage concessions which occurred in the 1980s was that special factors accounted for the unusual reaction. Usually cited are deregulation and foreign trade competition. Deregulation actually began in the 1970s, whereas acute foreign trade problems developed mainly in the 1980s. Deregulation consisted of a combination of legislative and judicial actions which relaxed government restrictions on pricing and entry in transportation and communications. Resulting increased competition in the product market led to downward pressure on wages in the labor market, as previously existing economic "rents" disappeared.

The foreign trade factor was closely tied to the exchange value of the U.S. dollar. During the late 1970s, a relatively low-valued dollar -- perhaps reflecting a fear that the U.S. could not bring its inflationary problems under control -- produced an export boom. Foreign wage levels measured in U.S. dollars had shown a long term tendency to catch up with American levels, at least in developed countries. But by the late 1970s, wages in several European countries actually exceeded those in the U.S.\_16\_/ After 1980, however, the dollar appreciated substantially, and by far more than relative national price movements seemed to warrant. Commentators during the period of appreciation tended to attribute the dollar's sudden appeal on

world markets to a revision of inflation expectations, the attraction of foreign capital to high U.S. interest rates which were in turn attributed to the enlarged federal budget deficit, and exogenous capital flight from Europe and elsewhere.\_17\_/

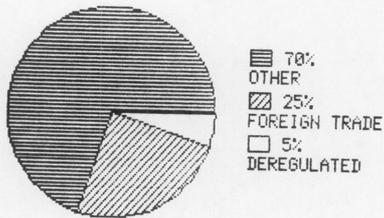
Whatever the cause, the dollar rose sharply until early 1985, and then began to depreciate. During the much of the 1980s, therefore, foreign suppliers enjoyed a substantial advantage in world and U.S. domestic markets. Again, as in the case of deregulation, a product market development put downward pressure on wages in the labor market, as American levels of labor cost became progressively less competitive.

It is possible to group industries by susceptibility to deregulation and foreign trade.\_18\_/ As Figure 1A shows, deregulation affected a relatively small proportion of production and nonsupervisory workers, the kind of employee most likely to be unionized. Foreign trade affected a larger proportion, although 70% of employment fell outside either sector. However, as Figure 1B illustrates, union workers are not randomly spread throughout the economy.

In the 1930s and 1940s (and before in the case of railroads), the protective nature of transportation regulation may well have attracted -- or supported -- union organizing efforts. Unionization in the telephone industry was aided not only by regulation, but also, ironically, by the formation of

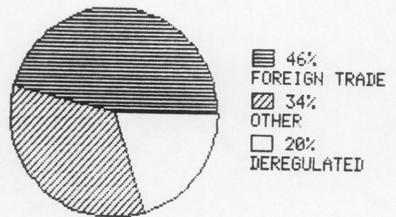
Figures 1A-1D: Distribution of Employment and Union Contracts by Sector

FIGURE 1A



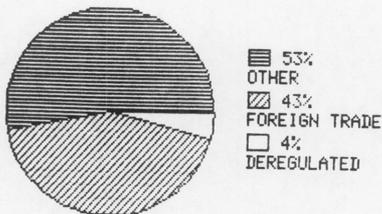
Production and non-supervisory employment, 1979

FIGURE 1B



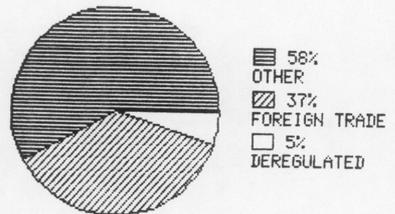
Workers covered by major union agreements, 1979

FIGURE 1C



All union contracts, 1981-85

FIGURE 1D



Concession contracts, 1981-85

company-dominated unions in the Bell system as a device to avoid independent unions. These company unions were eventually largely co-opted and absorbed by the Communications Workers.

The foreign trade sector is composed of most manufacturing and mining industries. These industries have been traditional centers of unionization. During the formative years of unionization, the 1930s and 1940s, foreign competition was a negligible factor and much of manufacturing was export-oriented. Not surprisingly, official union policy until the 1960s was generally pro-free trade and anti-tariff.<sup>19/</sup> Thus, it is not surprising that as of 1979, about two thirds of union workers under major union contracts fell in the deregulated and foreign trade sectors.

However, the proportion of union workers is not the only relevant measure. Many union workers fall under smaller agreements. As Figure 1C shows, 53% of all 1981-85 union contracts in the BNA files were outside the foreign trade/deregulated sectors. And when the sample is confined to concession agreements (Figure 1D), 58% of the agreements negotiated were in the "other" sector. Thus, much concession bargaining cannot be directly attributed to either deregulation or foreign trade.

Obviously, for certain industries, discussion of concessions would be impossible with reference to deregulation or foreign

trade. Airlines are an example of the former and steel of the latter. Without denying the obvious, I will pose the following question: Which is a better general explanation of the concession movement and the downward shift in union wage-change norms: deregulation/foreign trade or sliding union employment and representation rates? I will argue that the latter is a better explanation and that -- since lost members and representation rates will be difficult for unions to recover -- union wage-change norms are likely to remain depressed, even in the face of general economic expansion.

ii. Dissecting the Concessions.

Although I have used first year wage freeze or cut to define concession settlements, there are in reality levels of concession severity. Some concession agreements, for example, contain COLA clauses so that even with a basic wage freeze, actual wages rose in response to CPI increases. However, many COLA clauses in recent years -- especially in concession contracts -- have been limited by caps, corridors, and other such devices.<sup>20</sup> Thus, concessions can be ranked in order of ascending severity as follows:

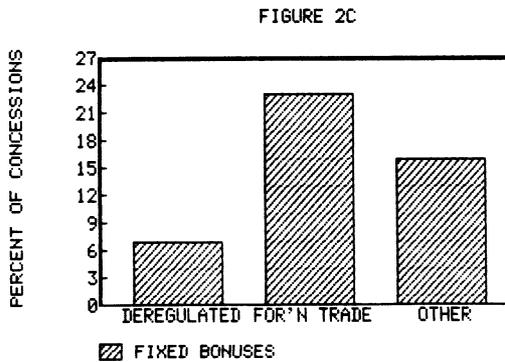
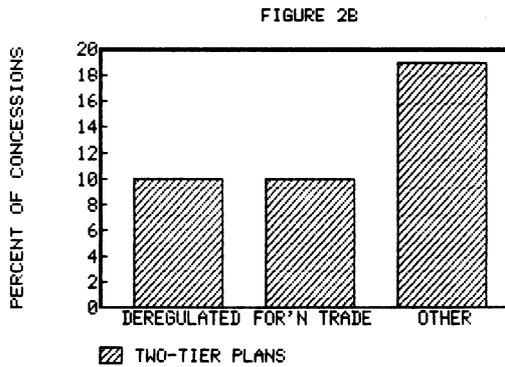
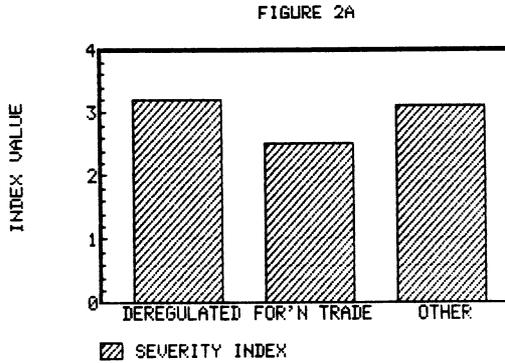
- 1) A wage freeze with unlimited COLA.
- 2) A wage freeze with limited COLA.

- 3) A wage freeze with no COLA.
- 4) A wage cut.

Using the numerical ranking as a weight, an index of concession severity can be developed and applied across the deregulated, foreign trade, and other sectors. The index will vary from 1 to 4, with higher values indicating greater concessions on the union side. If the concession story was basically one of deregulation and foreign trade, the severest concessions ought to be found in those sectors. But as Figure 2A shows, the story turns out not to be so simple. The concession severity index is about the same for the deregulated and "other" sectors and lowest for foreign trade-affected industries.

As the concession movement developed in the 1980s, certain accompanying contractual devices became progressively common. One such device was the two-tier wage plan. Under these plans, new hires are paid less than current workers, thus reducing the average wage as the proportion of new hires grows over time. Not surprisingly, it is management which is the advocate of such plans.<sup>21</sup> However, unions agree to them to spare current workers -- who must ratify the settlement -- from wage cuts. If concessions were largely the product of deregulation and foreign trade, two-tier pay plans should be most common in those sectors. But as Figure 2B shows, the facts are just the opposite.

Figures 2A-2C: Characteristics of Concession Contracts by Sector



Two-tier plans are much more common in the "other" sector than elsewhere.

Another device which accompanied the concession movement was the use of fixed bonus plans in lieu of wage increases. Thus, instead of, say, three 3% wage increases in each year of a three year agreement, a contract might specify the payment of annual lump-sum bonuses equal to 3% of annual pay with no increase in the base wage. A series of annual 3% wage increases in a conventional three year agreement adds up to 9% (ignoring compounding, if any), whereas the fixed bonus plan is equivalent to a 3% wage increase occurring only in the first year in terms of cost to the employer.

Thus, contracts with fixed bonuses, even though they specify no wage increase, are really equivalent to modest pay hikes. They should be least common where the pressure for true concessions is strongest. In fact, they were most common in the foreign trade sector according to Figure 2C, and least common in the deregulated sector.

A deregulation/foreign trade story of concessions suggests that most concessions should have been in those sectors, but that turned out not to be so. The story suggests that the "other" sector should have had the least severe concessions, the lowest incidence of two-tier pay plans, and the highest incidence of fixed bonus plans. Again, the data do not support these

predictions. The evidence suggests, therefore, that the general cause of concessions must be sought in some other explanation.

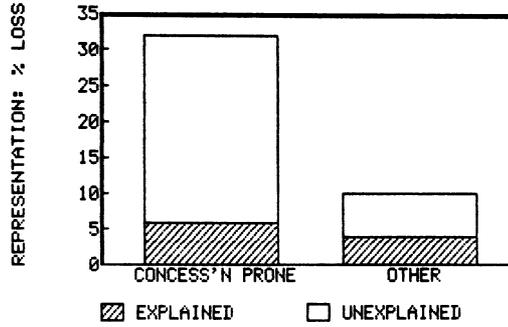
iii. Union Employment Erosion.

Using a detailed industry breakdown, it is possible to "forecast" union employment losses during the 1980s on the basis of industry employment trends. That is, if heavily unionized industries lost employment relative to other industries, union employment would tend to fall due to the compositional shift. If union employment fell faster than predicted on the basis of the compositional shift, the losses could only be due to declining unionization rates within industries.

Figure 3 combines such a calculation with data from the BNA contract file on union concession rates during 1981-85. Industries with above average concession rates are designated as "concession prone"; those with below average rates are designated as "other". As the figure shows, what distinguishes the concession prone industries from the others is the relatively sharp drop in union-represented workers in the former. Moreover, the figure reveals that the proportion of the drop in both sectors explained by compositional factors is about the same. It is the unexplained union employment loss which differentiates the two sectors. The concession-prone sector is characterized by especially rapid decreases in unionization rates within

Erosion of Major Union Representation, 1979-85

FIGURE 3



industries.

Unionization rates can fall because previously unionized firms and facilities convert to nonunion status, or because unionized firms establish new nonunion facilities and close down union facilities, or because new nonunion firms enter the market and take business from union competitors. All of these processes have been occurring and as they occur, they weaken union bargaining power. As the unionization rate falls within an industry, union bargainers are forced to choose between meeting the nonunion wage or losing jobs. It is that process which has the essential feature of the 1980s concession movement.

Further, as long as nonunion competition remains strong, union bargaining power will remain weak. Only by raising unionization rates back to the levels of the 1970s, will unions be able to regain bargaining strength comparable to what they enjoyed during that period. However, the prospect of substantial organizing successes -- at least in the private sector -- is not good. Despite some interesting and innovative union initiatives, there is no sign of an organizing turnaround and the political/legal climate is not conducive to such a development.\_22\_/

Given the economic environment surrounding the union sector, forecasters who predict rising wage inflation over the next few years must be implicitly expecting such pressures to arise from

nonunion firms. Nonunion employers, however, will produce such pressures only if they find that their existing wage levels are inadequate to recruit and retain labor. With relatively high unemployment rates characterizing the economy, such a generalized labor shortage is remote. And I will argue below that even if the unemployment rate drops, the U.S. economy is farther from a labor-shortage than conventional wisdom assumes.

#### V. Source of the Erosion.

Table 1 has already illustrated the tendency of union wages to rise faster than nonunion during the period from the mid 1970s to the early 1980s. Unfortunately, the Employment Cost Index (ECI), on which that table is based, is not available for earlier periods. Indeed, on a total compensation basis, the ECI is not available until the 1980s. Thus, trends in union and nonunion wages must be gleaned from other sources of data.

One such data source is the national income accounts, which provide annual information on total compensation per full-time equivalent employee on a detailed industry basis. Using data on workers covered by major union agreements, it is possible to calculate industry-level major unionization rates for years beginning in the late 1960s. The detailed industry/year observations can then be broken down into two categories: those with above average unionization rates ("heavily unionized

industries") and those with below average rates ("lightly unionized industries").<sub>23/</sub> Trends in compensation changes in the two sectors can be taken as rough proxies for pay trends in union and nonunion situations.

Table 6 presents these proxy pay trends for the period 1969-84. As might have been anticipated, union wages are shown generally to have risen faster than nonunion throughout the 1970s. An initial break from this trend occurred in 1979-80, with a second break occurring in 1983-84. The timing of the trend reversal is somewhat earlier than indicated by the ECI series. But it might be noted that 1979 was the first year in which cracks in union bargaining structure appeared. In 1979, for example, auto industry bargaining changed from the "Big 3" companies (General Motors, Ford, and Chrysler) to "Big 2" bargaining. Chrysler -- then on the verge of bankruptcy -- negotiated a deviant (less costly) contract. Also, steel bargaining in 1980 produced a contract which cannot be classified as a concession, but which nevertheless provided less of a wage increase than might have been anticipated, given the Experimental Negotiating Agreement bargaining structure under which the industry then operated.<sub>24/</sub>

Despite these cracks, it appears that much of the early softness in union wage trends came from contracts already in force, i.e., contracts which were not being renegotiated in 1979

Table 6

Annual Change in Compensation per Full-Time Equivalent  
Employee in Heavily and Lightly Unionized Industries,  
1969-84  
(percent)

Year	Heavily Unionized Industries <sup>1</sup>	Lightly Unionized Industries <sup>1</sup>	Heavily Unionized Industries with Heavy Renegotiation Rates <sup>2</sup>
1969	6.9	6.8	7.4
1970	7.4	6.4	6.0
1971	8.0	6.5	8.8
1972	7.2	6.8	8.0
1973	7.6	6.8	8.8
1974	8.9	8.2	10.2
1975	11.1	9.5	12.9
1976	9.8	8.4	8.7
1977	8.6	8.1	9.5
1978	9.6	8.2	*
1979	8.1	9.0	8.5
1980	10.3	10.7	11.2
1981	10.0	9.1	8.8
1982	8.7	8.6	7.6
1983	6.4	6.6	5.7
1984	3.5	4.6	5.8

\*No industries in this category.

<sup>1</sup>Heavily unionized industries are those with major unionization rates which exceeds the mean for all industry/year observations. All other industries are characterized as lightly unionized. The mean value was 24.2771%.

<sup>2</sup>Heavily unionized industries in which 50% or more of the workers under major agreements are covered by contract expirations.

Source: Survey of Current Business, Monthly Labor Review, various issues.

or 1980. To provide some information on this tendency, column (3) of Table 6 shows compensation changes for industries characterized by both high unionization and high rates of renegotiation.<sup>25</sup> The high rates of inflation which characterized 1979-80 may not have been fully anticipated by union negotiators in earlier years, especially those with nonescalated agreements. But, of course, those who were actually negotiating during that period were aware of the prevailing inflation. As can be seen from the table, during 1979-80, industries in which renegotiations were generally taking place had higher rates of wage inflation than those living under continuing, long term contracts.

The same kind of lag, but in reverse, took place during the disinflation of the early 1980s. During 1981-83, union industries with high rates of renegotiation produced lower rates of pay change than those with predominantly continuing contracts. Union wages generally ran below nonunion during 1983-84 but renegotiating industries exhibited still lower rates of pay change. In 1984, the pattern reversed, with concessions from earlier years now dominating the union series.

Revealing as the comparisons of Table 6 are, they nevertheless could be hiding forces in the economy which might explain the union/nonunion pay divergence of the 1970s. Perhaps there were forces unrelated to unionization -- either at the

macro or industry level -- which caused wages in heavily unionized industries to rise faster than wages elsewhere. This possibility can be explored by estimating wage-change equations which include the major unionization rate and other variables. If unionization appears as a significant variable, even in the presence of other explanatory factors, then the case for a causal relationship between unionization and the relative pace of wage change is stronger.

Using the pooled, cross-section industry/year observations on which Table 6 was based, I have estimated a series of wage change equations. Apart from the major unionization rate (UNRATIO), the equations included the percent change in the Consumer Price Index for urban wage and clerical workers lagged one year (PCPIWL1), the inverse of the unemployment rate for married males with spouse present UMINV, and a variable measuring the influence of past wage trends on current wage developments (ADJCATL1). This last variable is the current ratio of the industry pay level to the all-industry mean pay level divided by the same ratio for base year 1968. It is lagged one year and annualized from the base year. ADJCATL1 will enter the wage change equations negatively if a catch-up process is operating whereby previous wage lags of an industry relative to its 1968 standing are "made up" or partially made up in the current year. The ADJCATL1 variable will enter the equation with a positive coefficient if

there existed general forces causing continuing divergence of wage levels.

Table 7, column (1), shows that even in a wage equation containing these other variables, UNRATIO had a positive and significant impact on the pace of wage change during 1969-84. ADJCATL1 also was positive and significant, suggesting a force for divergence in wage levels across industries for this period. The fact that UNRATIO remains positive and significant in the presence of ADJCATL1 is a strong indication that collective bargaining had an independent and causal effect in overall wage divergence.

Columns (2) and (3) suggest that the union impact was felt in the 1970s but not thereafter; UNRATIO is significant in the equation for 1969-79 which appears in column (2) but its coefficient is zero in the equation for 1980-84 [column(3)]. For the overall period 1969-84, the UNRATIO coefficient of .01 means that a hypothetical industry with a unionization rate of 100% would have experienced wage increases of 1 percentage point per year above the rate for a hypothetical industry with a unionization rate of 0%. This difference is a marked discrepancy given that the forces captured by ADJCATL1 are not included.

There was a tendency exhibited on Table 6 of wages to rise faster in unionized industries during years of heavy contract renegotiations. But Table 7 reveals that the union impact --

Table 7

Pooled, Cross-Section Regressions Explaining Annual  
Industry/Year Changes in Compensation per Full-Time  
Equivalent Employee

Period -->	1969-84	1969-79	1980-84	1969-84
Inclusion Criteria -->	All Obser- vations	All Obser- vations	All Obser- vations	UNRATIO > Mean NEWRATIO > 50%
Column -->	(1)	(2)	(3)	(4)
UNRATIO	.01**	.01**	.00	.00
PCPIWL1	.49**	.42**	.56**	.39**
UMINV	3.85**	-.11	-1.05	6.38*
ADJCATL1	60.19**	66.45**	56.52**	92.58**
Constant <sup>1</sup>	-57.33	-61.46	-53.64	-89.44
Adjusted R <sup>2</sup>	.38	.34	.53	.22
Number of Observations	496	341	155	62

\*Significant at 90% confidence level.

\*\*Significant at 95% confidence level.

<sup>1</sup>Significance level not calculated for constant.

Note: Dependent variable is annual percent change in compensation  
per full-time equivalent employee.

Table 7 -- continued

Period -->	1969-84	1969-84	1969-84	1969-79
Inclusion Criteria -->	UNRATIO > Mean NEWRATIO < 50%	UNRATIO > Mean	UNRATIO < Mean	UNRATIO < Mean
Column -->	(5)	(6)	(7)	(8)
UNRATIO	.02**	.02*	.03**	.04**
PCPIWL1	.57**	.52**	.47**	.41**
UMINV	3.98**	4.41**	3.54**	.34
ADJCATL1	53.93**	66.35**	45.99**	66.48**
Constant <sup>1</sup>	-52.51	-64.36	-43.00	-61.83
Adjusted R <sup>2</sup>	.35	.31	.46	.43
Number of Observations	133	195	301	193

\*Significant at 90% confidence level.

\*\*Significant at 95% confidence level.

<sup>1</sup>Significance level not calculated for constant.

Note: Dependent variable is annual percent change in compensation per full-time equivalent employee.

after controlling for other influences -- was concentrated in years of light bargaining. Columns (4), (5), and (6) show that within the group of heavily unionized industries UNRATIO had a positive and significant coefficient. However, this impact stemmed entirely from industry/year observations in which the proportion of major workers under expiring contracts (NEWRATIO) was less than 50%. After controlling for ADJCATL1, it appears that the union institution of deferred wage adjustments under long term agreements played a substantial role in the widening union/nonunion pay gap.

Long term union agreements with escalators posed a special problem in the 1970s. During that decade, difficulties arose with the use of the CPI as a guide for wage change that had not occurred earlier. Table 8, for example, shows the inflation rate as measured by the CPI during 1959-69 and 1969-79 in column (1). Column (2) removes the impact of "volatile" elements of the CPI as it was then calculated, namely food, energy, and mortgage interest rates.<sup>27</sup> These elements, while they affect workers' "cost of living", do not reflect employers' "ability to pay" for most firms.

As the table shows, the presence of the volatile elements in the CPI of 1959-69 made no difference in its overall trend. But thereafter, the volatile elements pushed up the index faster than other prices, thus pushing up the overall index. Thus, in the

1970s, a tension between the "cost of living" and "ability to pay" concepts was created by the pattern of price change. In the union sector, where worker perspectives are more likely to reflect themselves in wage outcomes, the view of the CPI as a cost of living index prevailed, particularly in years when no renegotiation was occurring and escalators called the tune. But in the nonunion sector, where employer preferences are more important in determining wage decisions, that part of the CPI which reflected elements unrelated to ability to pay could be ignored as employers made unilateral (unescalated) wage decisions.

Table 8 also shows the well-publicized drop in productivity improvement during the 1970s in column (3). During 1959-69, compensation per hour rose at an annual rate of 4.8%, which happens to be the sum of the price inflation rate (2.3%) and the productivity improvement rate (2.5%). This relationship is the "normal" one which economists typically expect. But during the 1970s, such a prediction would have overstated actual aggregate wage change. If based on the official CPI, the predicted annual rate of pay change would have been 8.4%, e.g., 7.1% inflation + 1.3% productivity. Based on the ability to pay version of the CPI, the predicted rate would have been about 7% (5.7% + 1.3%). Actual results came out at an in-between rate of 8%. However, this average was composed of a relative slowdown of nonunion

Table 8

Annualized Rates of Change in Prices, Productivity,  
and Compensation per Hour, 1959-79

Period	Consumer Price Index <sup>1</sup>		Productivity <sup>3</sup>	Compensation Per Hour <sup>4</sup>
	All Items (1)	Excluding Volatile Items <sup>2</sup> (2)		
1959-69	2.3	2.3	2.5	4.8
1969-79	7.1	5.7	1.3	8.0

<sup>1</sup>CPI-U beginning in 1978.

<sup>2</sup>Excludes food, energy, and shelter.

<sup>3</sup>Output per hour in the nonfarm, business economy.

<sup>4</sup>Nonfarm, business economy.

Source: U.S. President, Economic Report of the President, 1986  
(Washington: GPO, 1986), pp. 318-319, 302.

wages compared with union wages. Nonunion pay was, thus, more reflective of employers' "ability to pay" than union pay. Given the significance of this observation -- and the imprecision of the "ability to pay" notion -- I will explore this idea further in section VII, below.

The tendency of nonunion wages to stick with ability to pay, and of union wages to exceed it, is important to an understanding of union membership erosion. During the 1970s, unionized employers were presented with economic incentives to shift to nonunion status; nonunion employers became determined -- for the same reasons -- not to be unionized. Union membership erosion and union pay developments are clearly related phenomena. In the 1970s, the latter was the causal factor. The widening gap between union and nonunion pay led to employer strategies of union avoidance. But in the 1980s, the causal relationship reversed. Erosion of union membership led to a weakening of union bargaining power and resultant union wage concessions as the nonunion sector increasingly became a product market competitor.

Columns (7) and (8) of Table 7 provide an interesting perspective on the resistance of nonunion employers to unionization during the 1970s. It was during this period that the policies of union avoidance which had developed in the 1960s became especially apparent. The industries covered by columns

(7) and (8) are those in which the major unionization rate was below the all-industry/year mean. Yet within this subgroup, not only is the coefficient of UNRATIO positive and significant, but it is also larger than the UNRATIO coefficient estimated in other equations, particularly when the sample is confined to 1969-79.

Taken literally, these coefficients suggest that an increase in unionization in predominantly nonunion industries would have had a larger wage impact than the same increase in heavily unionized industries. Thus, union avoidance strategies might have been expected to be particularly intense in industries where unionization was not the general pattern, e.g., more management resistance to unionization in textiles and high-tech than in machinery and metals. Although some anecdotal evidence in support of this hypothesis can be cited, more evidence than I can develop here would need to be gathered before the supposition can be adequately tested.

#### VI. More Cyclical Sensitivity of Union Wages?

Generally, union wages have been viewed as less cyclically responsive than nonunion wages. In part, this phenomenon has been explained by the use of long term contracts in the union sector which extend beyond the cycle. And in part the limited responsiveness has been attributed to internal union political structures which cater to the "median voter," i.e., a union

member with sufficient seniority to provide insulation from layoffs.<sup>28</sup>/ The insulated median voter/union member is threatened only by severe economic downturns in which mass layoffs, plant closings, and bankruptcies can occur. Hence, according to this view, union wages are rendered insensitive to all but the largest cyclical fluctuations.

i. Regression Evidence on Sensitivity.

Table 7, column (6), reports a significant and positive coefficient for 1969-84 on UMINV, the inverse of the unemployment rate for married males with spouse present. The equation in that column applies to industry/year observations with above average major unionization rates. Unemployment for married males (spouse present) was used, simply because that measure seemed to "work" best in most equations. However, the same qualitative findings apply to the overall unemployment rate and other cyclical indexes. The equation suggests, in short, that there is some cyclical sensitivity in union wage setting.

If the coefficient of UMINV in column (6) is taken literally, a rise in married male (spouse present) unemployment from 2.8% to 4.2% -- which was the actual increase from 1979 to 1980 -- could be expected to lower the rate of wage inflation by about 0.5 percentage points. Not surprisingly, if the sample is confined to industry/year observations in which at least half of the

workers under major contracts were scheduled to renegotiate [column (4)], the coefficient of UMINV is higher than the average in column (6) for heavily unionized industries. Conversely, if the sample is confined to observations where less than half are renegotiating [column (5)], the coefficient is lower than the average.

Table 7 also suggests that it would be wrong to view nonunion wage setting as highly market responsive in contrast to the union sector. In fact, the coefficient on UMINV in column (7) -- which limits the sample to industry/year observations with below average major unionization, is smaller than the corresponding coefficient in column (6) applying to heavily unionized industries. Nonunion wage setting is not highly sensitive to the business cycle. The fact that neither sector -- union or nonunion -- is particularly responsive in wage setting to the business cycle poses a dilemma for macroeconomic policy which I will discuss more fully below in section VII.

It is important to look carefully at the underpinnings of Table 7's results before accepting its equations as simple guides to the future. Columns (1), (2), and (3) run the same regression over all industries for the periods 1969-84, 1969-79, and 1980-84. As can be readily seen, the coefficient of UMINV is significant only in the comprehensive 1969-84 equation. No cyclical sensitivity of wage change was registered in the 1970s

[column (2)], despite the severe recession in the middle of that decade. Nor is cyclical sensitivity reported for the 1980s, taken alone. Thus, it appears that a structural shift occurred after 1979 and produced a composite, significant coefficient when the two periods (1969-79 and 1980-84) are combined. In the present (post-shift) era, there is no guarantee, however, that UMINV has acquired a significant and positive influence.

There are some difficulties, in any case, with the kind of data used to estimate the equations of Table 7. They are not wage rates, but rather earnings figures, obtained from a diverse group of industries. Moreover, their ability to isolate union sector wage determination is limited by the crude technique employed of separating observations based on their major unionization rates. To obtain further insight into union wage setting, I have drawn a sample of 22 union bargaining relationships from the journal Current Wage Developments (CWD). These relationships produced a total of 101 contracts with negotiation dates ranging from 1974 to 1986.\_29\_/

From information in the CWD reports, I calculated actual wage rate changes stemming from first year, escalated, and deferred adjustments in each contract. Following my earlier work for Brookings, I estimated wage-change equations using as explanatory variables the percentage rate of change of the CPI for urban workers and clerical workers lagged one year (PCPIWL1), the

inverse of the unemployment rate for married males with spouse present (UMINV), and a variable COLA set equal to zero for nonescalated contracts and equal to the annualized rate of CPI change during the life of the contract for those agreements with escalators.\_30\_/

Finally, to capture any underlying pressures for catch-up or wage divergence, I included the variable RATIO defined as the ratio -- lagged one year -- of average hourly earnings in the industry of negotiations to nonfarm average hourly earnings divided by the same ratio as of 1968. As with the ADJCATL1 variable used on Table 7, a negative coefficient on RATIO indicates a catch-up effect while a positive coefficient suggests a force for wage divergence. However, RATIO is a more troublesome variable than ADJCATL1 since it is based on industry earnings rather than the actual wage in the union contract and thus is inconsistent with the dependent variable. Unfortunately, the absolute union wage was not available.\_31\_/

Table 9 presents summary results from the union contract regressions. Columns (1) and (2) report results, respectively, for first year wage adjustments (excluding escalator payments) -- denoted FIRST -- and annualized life of contract wage adjustments (including escalator payments) -- denoted LIFE. Because wage negotiations in the construction industry appear to have followed different patterns in the 1970s than those in other industries,

Table 9

Union Contract Regressions Explaining Annual Wage Change  
During the First Year and Over Contract Life

Dependent Variable -->	FIRST	LIFE	FIRST	LIFE
	All	All	Non- construction	Non- construction
Inclusion Criteria -->				
Column -->	(1)	(2)	(3)	(4)
PCPIWL1	.72**	.62**	.55**	.39**
UMINV	26.65**	21.93**	25.34**	18.66**
COLA	-	.09	-	.18*
RATIO	4.46	3.65	5.16	3.80
Constant <sup>1</sup>	-10.38	-7.27	-9.62	-5.35
Adjusted R <sup>2</sup>	.14	.18	.14	.18
Number of Observations	101	101	94	94

\*Significant at 90% confidence level.

\*\*Significant at 95% confidence level.

<sup>1</sup>Significance level not calculated for constant.

Table 9 -- continued

Dependent Variable -->	FIRST	LIFE
	Nonconstruction & FIRST > 0	Nonconstruction & FIRST > 0
	(5)	(6)
Inclusion Criteria -->		
Column -->		
PCPIWL1	.47**	.41**
UMINV	7.08	8.29**
COLA	-	.12**
RATIO	-3.10	-.52
Constant <sup>1</sup>	5.67	2.74
Adjusted R <sup>2</sup>	.21	.35
Number of Observations	84	84

\*Significant at 90% confidence level.

\*\*Significant at 95% confidence level.

<sup>1</sup>Significance level not calculated.

columns (3) and (4) repeat the regressions, but exclude construction agreements.<sub>32</sub>/ Finally, in order to determine the magnitude of the concession contracts on the overall results, columns (5) and (6) exclude all contracts which featured first year wage adjustments of zero or less.

The variable of greatest interest on Table 9 is UMINV. Generally, the coefficients of UMINV found when actual union wage-rate change are employed are quite a bit higher than corresponding magnitudes of Table 7. Thus, for example, if the coefficient of UMINV found in column (3) of Table 9 is taken literally, a jump in married male (spouse present) unemployment from 2.8% to 4.6% -- the same jump utilized above -- would produce a drop in first year wage adjustments of 3 percentage points. A somewhat smaller magnitude would occur over the life of the contract. However, Table 9 reaffirms the structural shift conclusion I drew earlier from Table 7; the coefficients of UMINV drop substantially once concession contracts are excluded [columns (5) and (6)]. Indeed, the coefficient drops below conventional significance levels in the regression for FIRST [column (5)].<sub>33</sub>/

In essence, what is occurring on Tables 7 and 9 is the twin observations of high unemployment in the 1980s (as compared with the 1970s), combined with a marked decrease in wage inflation. Although the pooling technique creates a high number of

observations, there are really only two periods that matter: the 1980s and the 1970s. Thus, as noted earlier, it would be risky to project an increased future level of wage sensitivity to the business cycle on the evidence so far presented. Indeed, forecasters would be well advised to treat their models' wage equations with caution over the next few years until a greater sense of the true coefficients can be established.

ii. Other Evidence on Cyclical Sensitivity.

There are various ways in which union wages might become more sensitive to the business cycle. One would be for the parties to negotiate more frequently and with an eye toward current economic conditions. Prior to the concession era, union contracts typically ran 2-3 years in duration. As Table 10 shows, there has been no trend away from this practice, even when the sample is confined to concession contracts.

Another method of adding wage sensitivity to the cycle is the adoption of profit sharing. Since profits are cyclically sensitive, the profit sharing bonus would automatically contain a cyclical element. Martin Weitzman of MIT has been an advocate of profit sharing as a source of macroeconomic benefits.<sup>34</sup> Although Weitzman has been skeptical about the role unions could play in a "share economy," it could be argued that unions would be ideally suited to help administer such plans on behalf of

Table 10

Trends in Contract Duration, Profit Sharing,  
and Fixed Bonus Plans, 1981-86

	Duration of Contracts (months)		Percentage of Contracts with Indicated Feature:	
	Concessions <sup>2</sup>	All	Profit Sharing <sup>1</sup> Concessions <sup>2</sup>	Fixed Bonus <sup>1</sup> Concessions <sup>2</sup>
1981	24	32	10	0
1982	30	29	6	0
1983	29	32	5	2
1984	29	31	3	8
1985	31	32	8	38
1986- first half	31	33	9	61

<sup>1</sup>Excluding construction.

<sup>2</sup>Contracts with first-year wage freezes and cuts.

Source: Based on data drawn from Daily Labor Report, various issues.

their members. Unions could provide an auditing function concerning the calculation of firm profits not available to nonunion workers. Profit sharing could provide unions with a route into managerial decisions making. Finally, profit sharing could be combined with contractual devices designed to provide greater job security, since employers would have automatic labor cost relief when profits fell through a channel other than layoffs.\_35\_/

Despite these potential advantages, until the 1980s, unions showed little interest in profit sharing. The auto concessions of 1982, however, saw the adoption of profit sharing in two major contract situations: General Motors and Ford. Thereafter, union interest in profit sharing seemed to decline. Recently, as Table 10 shows, interest in profit sharing -- at least in concession agreements -- appears to have revived. Profit sharing plans have appeared in the steel industry, for example. If profit sharing does spread, union pay might develop greater cyclical sensitivity on a "permanent" basis.

Formal profit sharing plans can be complex, particularly if they are designed to conform to the tax code. There is an alternative, informal model of quasi-profit sharing in which bonuses are determined annually in reference to the firm's economic situation. Some observers have argued that the Japanese bonus system operates in this fashion and helps explain such

features of Japanese economic life as employment stability in the face of cyclical fluctuations, low unemployment rates, and "lifetime" job systems.<sup>36</sup> It is noteworthy, therefore, that fixed bonus systems have become prominent features of current concession bargaining. Concession agreements -- as I noted in section IV -- often feature substitution of a lump sum bonus for a pay increase.

So far, bonus plans have not permitted flexibility in the amount of the payout. Thus, the recent development of bonuses in the U.S. has not followed the Japanese model. But if bonuses do become a standard feature of collective bargaining, they could be made less rigid and could ultimately evolve into a form of quasi-profit sharing. At the moment, however, it is simply too early to know on the basis of econometric evidence or contractual analysis whether American wage determination has become, or will become, more sensitive to macroeconomic fluctuations.

A major gap in current knowledge concerns trends in pay practices in the nonunion sector. Despite the fact that the bulk of wage decisions are now nonunion, collection of labor statistics on nonunion pay practices is spotty. Information on pay practices in nonunion firms is typically less accessible than on union firms, since explicit, written contracts are unusual in nonunion situations.

## VII. Wage Norms and Prospects for Economic Expansion.

It is useful at this point to summarize the evidence developed so far in order to highlight its implications in this concluding section. Wages have generally risen slowly in the 1980s compared with what might have been expected on the basis of economic relationships which existed in the 1970s and before. It appears that most of the relaxation of wage pressure has stemmed from the union sector, although it is still too early to assess whether wage adjustments have become more sensitive to business cycle influences. Union wage levels have come under (downward) pressure because of an earlier widening of the union/nonunion pay differential. A strategy of union avoidance on the part of employers, partly in response to these earlier pay trends, has substantially eroded union membership, and thus union bargaining power.

The prospects are dim for a dramatic shift in the economic, legal, and political environments surrounding collective bargaining which would strengthen union bargaining power -- at least during the remaining years of this decade. Thus, wage norms should remain depressed; there need be no quick reversion to past practice as occurred after 1954 and after the early 1960s. Obviously, the weakened state of unions has many implications beyond the strictly economic. However, in the remainder of this section I will focus only on the macroeconomic

consequences of reduced upward pressure on wages.

i. The Real Wage Literature.

In the late 1970s, most industrialized countries found themselves with higher unemployment rates than had existed prior to the OPEC oil price shock of 1973-74. Productivity performance also deteriorated. Thus, the poor unemployment showing was especially surprising since reduced productivity growth should have meant MORE jobs per unit of output than otherwise, a factor which would -- other things equal -- reduce the level of unemployment. One of the byproducts of these distressing economic phenomena was the development of a literature relating real wages to unemployment, often in a cross-country context.\_37\_/

Although it would be impossible to review this literature in detail here, it does have a common theme. Specifically, real wage authors argue that it is likely that the high unemployment in the late 1970s in some countries was due to a push for a too-high real wage. They suggest that the OPEC price shocks contributed to wage demands designed to prevent the erosion of worker purchasing power which were "inappropriate" from a domestic perspective. The OPEC inflation was imported and did not represent domestic economic trends. Thus, wage demands squeezed profits and, thus -- according to the real wage

literature -- reduced the demand for labor.

Various names were attached to real wage pressures. Some authors referred to wage "gaps." In Australia, there was reference to a "real wage overhang."<sup>38</sup>/ Many authors used an unfortunate terminology for the real wage/unemployment linkage; they termed the resulting unemployment as "classical." Classical unemployment in the real wage literature is contrasted with traditional "Keynesian" unemployment, with the latter -- but not the former -- capable of being remedied by expansionary demand policy. Labeling the unemployment of the late 1970s and early 1980s as classical led to substantial efforts to estimate national production functions. It produced discussions reminiscent of numerous debates in the 1930s over whether high wages were the cause of the Great Depression (or were needed to escape from it).

But it is best to avoid trying to put the story into the classical mold and instead to focus on the interaction of monetary policy with labor and product market developments. This approach will allow the key elements of the real wage literature to be applied to analysis of the outlook for the U.S. economy in the late 1980s, given the labor market trends already outlined. I will assume in the remaining discussion that monetary policy is made with the objective of avoiding an acceleration in inflation. This assumption has sometimes been made explicit in the real wage

literature.<sub>39</sub>/ I will further assume that monetary policy can affect the level of real demand and the unemployment rate; this supposition should also not be controversial. Analysis of labor and product market conditions will then lead to the conclusion that reduced pressure on wages -- and more competition in product markets -- has produced a pattern of decelerating inflation and now widens the potential for real economic expansion.

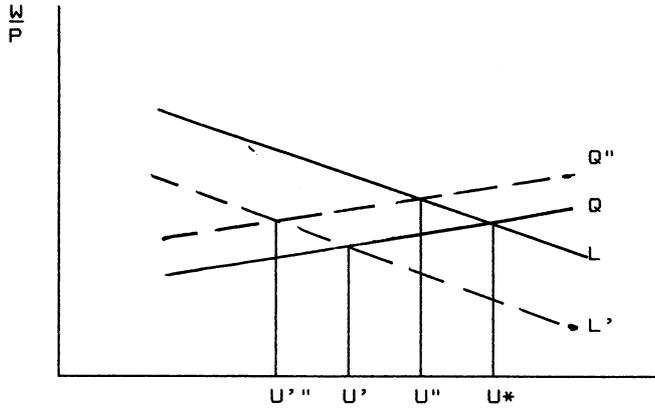
ii. A Simple Real Wage/Unemployment Model.

Consider, first, the labor market. Define the real wage as  $W/P$ , where  $W$  is a wage index and  $P$  is a price index. If, ultimately, wage targets and wage setting can be viewed in real terms, then higher unemployment -- which weakens unions and reduces employee turnover -- is consistent with lower real wages. The relationship between the targets of wage setters and the level of unemployment can be expressed as the downward sloping line labeled  $L$  on Figure 4.<sub>40</sub>/ Since wage changes are not very responsive to unemployment in the short run (as shown by the regressions of Table 7, for example), it takes "much" unemployment over an extended period to knock down the real wage target substantially.

Next, consider the product market. Almost any theory of pricing will suggest that firms try to widen their price markups over cost when business is buoyant, but are forced to accept

Figure 4

A Real Wage/Unemployment Model



shrunkén markups during business slumps.\_41\_/ For most firms, a substantial element of the expenses over which they mark up prices will be the costs of intermediate purchases from other firms. However, at the national level -- neglecting imports -- the costs of intermediate goods net out. Thus, the product market in aggregate is really attempting to set a price markup over labor costs, i.e.,  $P/W$ \_42\_/ Target  $P/W$  will be lower during periods of high unemployment and higher during periods of low unemployment. Since  $P/W$  is simply the inverse of  $W/P$ , the product market markup target and its relationship to unemployment can be expressed on Figure 4 as line Q.

There is only one unemployment rate at which the labor and product market targets are consistent on Figure 4, namely  $U^*$ . This rate can readily be seen to be related to the "natural rate of unemployment" concept developed by Friedman and others in the late 1960s.\_43\_/ That is, at unemployment rates below  $U^*$ , inflation will tend to accelerate. And inflation will decelerate at unemployment rates above  $U^*$ . Thus, a monetary policy aimed merely at preventing an acceleration of inflation will aim for  $U^*$ . And a monetary policy aimed at lowering the inflation rate will establish a still higher unemployment rate.

The inflation acceleration/deceleration tendencies surrounding  $U^*$  can be understood by imagining that the inflation rate is initially "at rest," that is, prices are rising at a

steady pace. Thus, unemployment is at rate  $U^*$ . Now suppose that unemployment is suddenly lowered by a boost in aggregate demand. Wage setters will raise their real wage target, pushing up  $W$  relative to  $P$ . But price setters in the product market will attempt to achieve the opposite result, i.e., an increase in the markup of  $P$  relative to  $W$ . Thus,  $W$  and  $P$  will begin to chase each other upwards in an accelerating wage-price spiral. The opposite will occur when the unemployment rate is above  $U^*$ .

Note that the "natural" label applied to  $U^*$  is as misleading as the "classical" label used in the real wage literature. The unemployment rate is rooted not only in such natural factors as search costs or training costs, but instead is also a reflection of the degree of wage "pushiness" -- which can change over time -- and of the level of competition in the product market. Thus, if labor becomes less "pushy" -- shifting the labor market curve on Figure 4 from  $L$  to  $L'$ , the "natural" rate of unemployment will fall to  $U'$ . Or, if product market competition becomes more intense -- squeezing feasible profit margins -- so that  $Q$  rises to  $Q''$ , the natural unemployment rate will fall to  $U''$ .

### iii. Real Wage Problems in the 1970s.

It is easy to apply Figure 4 to the real wage problem of the 1970s. Let  $P$  stand for domestically determined prices. The OPEC price shock (an increase in foreign prices) would shift the  $L$

curve upwards, as workers had to raise wages relative to domestic prices in order to compensate for purchasing power losses due to the boost in prices determined in foreign markets. At the same time, domestic firms would try to raise their price markups over domestic wages to cover the cost of increased energy. Thus,  $Q$  shifts down. The result is a higher natural rate of unemployment. Attempts to lower unemployment through demand stimulus would lead to accelerating inflation at comparatively high unemployment levels.\_44\_/

iv. The Outlook for the Late 1980s.

The evidence presented earlier suggests that there has been a shift of wage norms in the labor market -- especially in the union component of that market -- to less wage "push," i.e., the  $L$  curve has dropped. In the product market, deregulation has expanded competition in some sectors. And even considering the decline in the U.S. dollar since early 1985, foreign competitive pressures are still more intense than they were in the late 1970s. The drop in oil prices during early 1986 also helps raise the  $Q$  curve. Thus, the natural rate of unemployment has undoubtedly fallen during the 1980s.

Estimates of the natural rate in the 1970s tended to rise with the unemployment rate, from the 4-5% range early in the decade to the 6-6.5% range by its end. However, the unemployment

rate in the 1980s has consistently been above even the most pessimistic estimates of the natural rate, suggesting that the U.S. economy has been tilted toward decelerating inflation for over six years. Assume that  $U^*$  represents the natural rate of unemployment as it existed in the late 1970s. Then the definite downward shift in  $L$ , and the likely upward shift in  $Q$ , means that the U.S. economy currently has a significantly lower natural rate of unemployment at a point such as  $U'$  on Figure 4.

Put another way, there is now substantial room for economic expansion before inflation becomes a problem. Of course, nothing requires the Federal Reserve to take advantage of that room. And, since Figure 4 reflects long term tendencies, there could be short term blips in inflation due to exogenous changes in exchange rates and farm or energy prices. Similarly, real output may shift in the short run reflecting inventory cycles, uncertainty over tax law, or weaknesses in the financial system. However, if the record of the economy between now and the end of the decade turns out to be something other than noninflationary expansion, it will be due either to extraordinarily bad luck or especially inept policy. And, in that unhappy event, the problem will most certainly not have stemmed from the labor market.

Conversely, if the U.S. economy does enjoy noninflationary expansion during the balance of the 1980s, much of the "credit" for this good performance will have to be allocated to the

downward shift of wage norms in the labor market. Of course, the pain and suffering that was created to achieve that shift -- and which is hidden in the bland recital of this decade's high unemployment rates -- ought also to be considered. But that is another story for another forum.

## FOOTNOTES

1. I have discussed the Keynesian approach to wage determination in Daniel J.B. Mitchell, "Wages and Keynes: Lessons from the Past and for the Future," UCLA Institute of Industrial Relations working paper no. 104, February 1986. Paper given to the April 1986 meetings of the Eastern Economic Association.
2. See, for example, David McCord Wright, ed., Impact of the Union: Eight Economic Theorists Evaluate the Labor Movement (New York: Kelley and Millman, 1956), especially the comments by Milton Friedman.
3. Daniel J.B. Mitchell, Unions, Wages, and Inflation (Washington: Brookings Institution, 1980), pp. 39-53.
4. Daniel J.B. Mitchell, "Collective Bargaining and Wage Determination in the 1970s," in Barbara D. Dennis, ed., Proceedings of the Thirty-Third Annual Meeting, Industrial Relations Research Association, September 5-7, 1980 (Madison, Wisc.: IRRRA, 1981), p. 142.
5. Mitchell, Unions, Wages, and Inflation, p. 211.
6. See Daniel J.B. Mitchell, "Recent Union Contract Concessions," Brookings Papers on Economic Activity (1:1982), pp. 165-201.
7. Much depended in these discussions on what aspects of wage determination were considered most important by the commentators and what time period they surveyed. For some examples of the early debate, see Audrey Freedman, "A Fundamental Change in Wage Bargaining," Challenge, vol. 25 (July/August 1982), pp. 14-17; and "Remarks of Former Labor Secretary John T. Dunlop on 1982 Wage Developments Before Conference of Business Economists," Daily Labor Report, February 23, 1982, pp. D1-D2.
8. The argument at the time that unions would slip relative to overall employment was based on changing labor force patterns and their adverse consequences for unionization. See, for example, Marten S. Estey, "The Impact of Labor Force Changes on Labor Relations," Annals of the American Academy of Political and Social Science, vol. 333 (January 1961), pp. 1-4.
9. Herbert R. Northrup, "Management's 'New Look' in Labor Relations," Industrial Relations, vol. 1 (October 1961), pp. 9-24.
10. Among the better publicized disputes in which such job losses occurred are the Continental Airlines strike and bankruptcy, the Phelps-Dodge strike, and, of course, President Reagan's firing of the air-traffic controllers in the PATCO strike.

11. George L. Perry, "Inflation in Theory and Practice," Brookings Papers on Economic Activity (1:1980), pp. 207-41; George L. Perry, "What Have We Learned About Disinflation?," Brookings Papers on Economic Activity, (2:1983), pp. 587-602; and George L. Perry, "Shifting Wage Norms and their Implications," American Economic Review (Proceedings), vol. 76 (May 1986), pp. 245-248.

12. Daniel J.B. Mitchell, "Shifting Norms in Wage Determination," Brookings Papers on Economic Activity (2:1985), pp. 575-599.

13. The regressions use as explanatory variables a current unemployment rate in inverse form and the annual percent change in the deflator for personal consumption expenditures lagged one year. The deflator was used, rather than the Consumer Price Index, because of concerns expressed at the meeting where the paper was originally presented that the CPI might have overstated actual inflation. In fact, however, the CPI works better in such regressions, suggesting that wage setters use it in their decisions, even if the index is sometimes in error. The unemployment rate used was the official, overall rate for the general wage indexes and the nonunion index and a weighted rate for the union wage index, where the weights were the proportion of union workers in different industrial sectors. For details, see, Mitchell, "Shifting Norms in Wage Determination," p. 578, footnote 4. Table 4 reflects revisions for the 1980s in the explanatory and dependent variables.

14. The nonunion industries chosen were SIC 533 (variety stores), SIC 56 (apparel stores), SIC 57 (furniture stores), and SIC 60 (banking). Earnings changes were weighted by the 1979 level of production and nonsupervisory employment. The industries were chosen because of their extremely low rates of unionization.

15. George L. Perry, "Wages and the Guideposts," American Economic Review, vol. 57 (September 1967), pp. 897-904.

16. For data, see Daniel J.B. Mitchell, "International Convergence with U.S. Wage Levels" in Barbara D. Dennis, ed., Proceedings of the Thirty-Sixth Annual Meeting, Industrial Relations Research Association, December 28-30, 1983 (Madison, Wisc.: IRRA, 1984), pp. 247-255.

17. For a discussion, see Olivier J. Blanchard and Lawrence H. Summers, "Perspectives on High World Real Interest Rates," Brookings Papers on Economic Activity (2:84), pp. 273-324.

18. The material that follows is drawn from Daniel J.B. Mitchell, "Explanations of Union Wage Concessions," California Management Review, forthcoming. The three sectors were defined as follows. Deregulated sector = airlines, trucking and warehousing, railroads, and communications. Foreign trade sector = motor

vehicles and parts, rubber, machinery (electrical and nonelectrical), aerospace, paper and lumber, textiles, food manufacturing except meatcutting, instruments, chemicals, furniture, cement, mining, transportation equipment (except motore vehicles and aerospace, brick-clay-stone (except cement), glass, leather, petroleum, ordnance, apparel, tobacco, and shipping. Other sector = construction, retail foodstores (including associated wholesale operations), meatpacking, printing and publishing, entertainment, hotels and restaurants, education, finance-insurance-real estate, retail trade (except foodstores), utilities, and public transit.

19. Daniel J.B. Mitchell, "Labor and the Tariff Question," Industrial Relations, vol. 9 (May 1970), pp. 268-276.

20. Mitchell, "Shifting Norms in Wage Determination," pp. 595-597. Until 1984, most COLA clauses in concession agreements were continued, although often limited. More recently, there has been some tendency to drop COLA entirely. Given the low rate of inflation in recent years, this tendency is not unexpected. Such a trend was also found in the early 1960s.

21. Sanford M. Jacoby and Daniel J.B. Mitchell, "Management Attitudes Toward Two-Tier Pay Plans," Journal of Labor Research, vol. 7 (Summer 1986), pp. 221-237.

22. There have been moves toward centralizing greater authority with the national AFL-CIO than has previous been the practice. A recent manifestation of this centralization has been the encouragement of the concept of associate memberships for workers in nonunion situations. Various inducements for such associate memberships are planned, including a Mastercard credit card with an attractive interest rate.

23. A total of thirty-one industry categories was used for this analysis. The unionization rate was defined as major union employment divided by full-time equivalent employees in the industry. The average unionization rate was a simple average for all 496 industry/year observations for the period 1969-84. This average came to 24.2771%. Since the unionization rates generally fell over time, some industries dropped from the heavily unionized to the lightly unionized classification in later years.

24. The Experimental Negotiating Agreement required arbitration to determine the new contract if the parties could not reach an accord among themselves by a fixed date. However, it provided for a minimum settlement which incorporated the "3% plus COLA" formula which was still in vogue. Although nominally providing the minimum, the 1980 settlement used such devices as a diversion of COLA money toward pensions to do so. See "Wage Highlights," Current Wage Developments, vol. 32 (May 1980), pp. 1-2.

25. The rate of renegotiation was determined by the ratio of workers under expiring major agreements to total workers under major agreements. A high rate of renegotiation was defined as an industry/year observation with the ratio greater than 50%.

26. The ADJCATL1 variable begins at 1.00 in the first observation year. Industries with wages rising relative to others will take on values of ADJCATL1 > 1. If the industry ratio after two years was 1.0201, its ADJCATL1 value was the square root of 1.0201, e.g., 1.01.

27. In order to remove the effects of mortgage interest rates, I removed all of shelter from the index.

28. Richard B. Freeman and James L. Medoff, What Do Unions Do? (New York: Basic Books, 1984), p. 18.

29. I used only contract situations which appeared continuously in the journal from the mid 1970s to the mid 1980s. The following situations were included:

Bituminous Coal Operators and Mineworkers, 1974-88.  
 National Electrical Contractors, Orange County, Calif. and the Electrical Workers (IBEW), 1976-84.  
 Weyerhaeuser (Dierks) and the Woodworkers, 1976-84.  
 Simmons and the Upholsterers, 1976-86.  
 U.S. Potters Assn. and the Pottery Workers, 1976-85.  
 IIT Grinnell and the Molders, 1975-87.  
 General Electric and the Electronic Workers, 1976-85.  
 Chrysler and the Auto Workers, 1976-85.  
 Wilson and the Food and Commercial Workers, 1976-85.  
 American Tobacco and the Bakery, Confectionary, and Tobacco Workers, 1974-85.  
 National Women's Neckwear and Scarf Assn. and the Ladies Garment Workers, 1976-85.  
 Bowater Southern Paper and the Paperworkers, 1974-87.  
 Union Carbide (Institute) and the Machinists, 1975-87.  
 Atlantic Richfield and the Oil, Chemical, and Atomic Workers, 1975-86.  
 Firestone and the Rubberworkers, 1976-79.  
 Class 1 Railroads and the United Transportation Union, 1975-84.  
 National Master Freight Agreement (Teamsters), 1976-88.  
 General Telephone of Kentucky and the Communications Workers, 1976-88.  
 Duke Power Co. and the Electrical Workers (IBEW), 1975-85.  
 Bloomingdales and the Retail, Wholesale, and Department Store Workers, 1976-88.  
 Hospital Service Plan of N.J. and the Service Employees, 1975-88.  
 Hotel Assn. of N.Y. and the Service Employees, 1975-90.

30. For the earlier study, see Mitchell, Unions, Wages, and Inflation, pp. 137-155.

31. A variable similar to RATIO was used in the earlier study cited in the previous footnote. Since absolute wage levels are not available in Current Wage Developments, average hourly earnings in the industries of the various contracts were used to calculate percentage rates of wage change.

32. Construction featured a wage explosion in the late 1960s, special wage controls beginning in 1971 several months before wage controls were imposed elsewhere, and a second wage explosion after controls ended in early 1974. Thereafter, construction settlements were low relative to other industries under the impact of growing nonunion competition. Thus, the forces that later produced concession bargaining were already affecting behavior in construction in the late 1970s. Omission of construction also makes the results of Table 9 more comparable with the earlier study cited in footnote 30 which did not include any construction contracts.

33. The earlier study cited in footnote 30 used the overall unemployment rate in inverse form rather than the rate for married men, spouse present. After adjusting for this difference, the unemployment coefficients in the current study and the earlier one are of roughly comparable magnitudes.

34. Martin L. Weitzman, The Share Economy: Conquering Stagflation (Cambridge, Mass.: Harvard University Press, 1984).

35. Daniel J.B. Mitchell, "The Share Economy and Industrial Relations: Implications of the Weitzman Proposal," Industrial Relations, forthcoming.

36. There is debate over the degree to which the Japanese bonus system functions as a profit sharing arrangement and over the contribution it makes to employment stability. Weitzman has provided me with some preliminary work he has done indicating that the bonus system is a form of profit sharing.

37. See Jeffrey D. Sachs, "Real Wages and Unemployment in the OECD Countries," Brookings Papers on Economic Activity (1:1983), pp. 255-289; Jeffrey D. Sachs, "Wages, Profits, and Macroeconomic Adjustment," Brookings Papers on Economic Activity (2:1979), pp. 269-319; Michael Bruno, "Aggregate Supply and Demand Factors in OECD Unemployment: An Update," National Bureau of Economic Research, working paper no. 1696, September 1985; Jacques R. Artus, "The Disequilibrium Real Wage Rate Hypothesis: An Empirical Evaluation," IMF Staff Papers, vol. 31 (June 1984), pp. 249-302; Dennis Grubb, Richard Jackman, and Richard Layard, "Wage Rigidity and Unemployment in OECD Countries," European Economic Review, vol. 21 (March/April 1983), pp. 11-39; Leslie Lipschitz and Susan M. Schadler, "Relative Prices, Real Wages, and Macroeconomic Policies: Some Evidence from Manufacturing in Japan and the United

Kingdom, IMF Staff Papers, vol. 31 (June 1984), pp. 303-338. Studies have also been done involving single countries. See Jacques H. Dréze and Franco Modigliani, "The Trade-Off Between Real Wages and Employment in an Open Economy (Belgium)," European Economic Review, vol. 15 (January 1981), pp. 1-40; M.J. Andrews, D.N.F. Bell, P.G. Fisher, K.F. Wallis, and J.D. Whitley, "Models of the UK Economy and the Real Wage - Employment Debate," National Institute Economic Review, no vol. (May 1985), pp. 41-52. The diagnosis of a linkage between real wages and unemployment in Europe has been widely accepted in policy circles. Thus, a study by the IMF declares that "the rise in the share of value added going to wage costs (in Europe) ... led employers to progressively economize on the employment of labor." See International Monetary Fund, World Economic Outlook, April 1985: A Survey by the Staff of the International Monetary Fund (Washington: IMF, 1985), p. 9.

38. Discussion in the Australian context can be found in P.K. Trivedi and G.M. Baker, "Equilibrium Unemployment in Australia: Concepts and Measurement," Economic Record, vol. 61 (September 1985), pp. 629-643; J.D. Pitchford, "Unemployment, Real Wages and the Money Supply in Australia," Economic Record, vol. 59 (June 1983), pp. 118-131; Greg Turnidge and Ainsley Jolley, Real Wages and Unemployment in Australia, Victorian Chamber of Commerce, discussion paper no. 5, October 1980. I discussed the Australian situation along lines developed below in Daniel J.B. Mitchell, "The Australian Labor Market" in Richard E. Caves and Lawrence B. Krause, The Australian Economy: A View from the North (Washington: Brookings Institution, 1984), pp. 127-193, esp. pp. 146-154.

39. For example, Grubb, et al, "Wage Rigidity and Unemployment in OECD Countries," p. 15, indicate that their model is based on the assumption that governments will not tolerate a permanent increase in the inflation rate.

40. The analysis here is related to that found in Oliver J. Blanchard, "The Wage Price Spiral," National Bureau of Economic Research, working paper no. 1771, December 1985.

41. Even if the Q curve remained horizontal (no changes in markups), the model of Figure 4 would operate.

42. It is easy to widen the model to take account of productivity changes. Where productivity is a variable, the price index is essentially being marked up over unit labor costs, or -- perhaps -- trend unit labor costs. Thus, with ongoing productivity growth, steadily higher real wages are consistent with a given unemployment rate, i.e., real wages rise with productivity. The analysis below avoids taking account of a secular productivity increase for expositional purposes. But such a trend would appear on Figure 4 as an upward shift in both the L and Q curves which leaves their intersection point along the horizontal axis unchanged.

43. Milton Friedman, "The Role of Monetary Policy," American Economic Review, vol. 58 (March 1968), pp. 1-17.

44. Because the unemployment rate at which the rate of inflation accelerates is not caused by "natural" phenomena, readers may prefer alternative terminology such as "non-accelerating inflation rate of unemployment."