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Labor Market Policies in Response to Structural Changes in Labor Demand

Michael L. Wachter and William L. Wascher

Introduction

The United States economy is about to complete its tenth year of secular stagnation. It will celebrate that anniversary in an atmosphere of a strong economic recovery, but a recovery that began with the unemployment rate at a new post-Great Depression high of over 10 percent. One result of this growth slowdown has been the emergence of a new structural unemployment issue: high rates of unemployment among semi-skilled and skilled workers who had previously exhibited a record of employment stability. In this paper we shall focus on this issue and examine its short- and long-run manifestations and policy implications.

The displaced worker problem has clearly been exacerbated by the current recession. To what extent, however, will the ongoing recovery, if sustained, provide a complete cure? That is, will the equilibrium unemployment rate be higher over the next several years as a consequence of increased structural unemployment among displaced workers? Some argue that the number of displaced workers, reflecting trends in technological change and international trade, is on a long-run uptrend. According to this view, the displaced worker phenomenon is an early warning indicator of a mismatch problem, particularly in manufacturing, between the available supply of and demand for production workers.

Typically, a discussion of labor market problems and policies,

especially when unemployment rates are high, focuses on training and job creation policies. We shall do this to some degree, but the essence of our argument is somewhat different.

First, in the summer of 1983, it is difficult to recommend a new round of employment and training policies. The implications of the budget deficit for employment over the longer run make it more likely that government expenditures should be decreased rather than increased. In addition, the record of the 1970s suggests that labor market policies tend to be pro rather than countercyclical, perhaps even more so than other stabilization policies. As the current recession again proves, policy debate over cyclical unemployment tends to begin in earnest about the time that the economy reaches its recession trough. Funding for new jobs thus begins at the time that private sector employmeht is growing strongly. Of course, there is always the chance that the current recovery will be short lived, so that 1983 versions of employment policy would fortuitously prove to be timely. The perverde timing of employment programs, however, appears to be endemic rather than simply bad luck in forecasting.'

Secondly, the underlying problem facing displaced workers does not involve employment difficulties or a shortage of jobs; rather, it involves wages. Displaced workers, by definition, have accumulated a certain amount of job-specific human capital and/or have been paid a union wage premium. This means that the displaced workers have opportunity wages that are lower — and at times considerably lower — than the wages attained in their last jobs. Their jobs can be restored, but not their old wage rates. The mismatch in the labor market is thus due to a mismatch of displaced workers' wages on their past jobs with their opportunity wages on new jobs.

The record of the past decade suggests that the American economy has no difficulty creating jobs that fit the labor force. Although the 1970s compare unfavorably with the 1960s with respect to almost all economic indicators, one exception has been employment growth. While employment increased at an average of 1.9 percent per year during the high-growth, low-inflation 1960s, it grew at an average of 2.4 percent per year during the low-growth, high-inflation 1970s. The problem area of the last decade has not been job creation but rather real wage growth. In 1979, even before the two recessions of

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1. This issue is discussed in Wachter, "The Training Component of Growth Policies." We do not deal with this topic here.

of the 1980s, real wages were no higher than they had been in 1971. By 1982, real wages had fallen to levels first attained in 1967.

The U.S. labor market has also exhibited another trait over the past decade: a high variance in interindustry wage changes. The time series of wages across industries exhibits an increasing coefficient of variation over time. The increased variance that has been occurring since the early 1970s has resulted in a widening of the interindustry wage structure. Whereas union-nonunion or high wage-low wage industry wage differentials exhibited little secular change between the early 1950s and the late 1960s, they have increased persistently over the 1970s.

As a consequence, although real wages have declined for most American workers, some groups have either avoided or mitigated the decline. In a number of manufacturing industries, for example, real wage growth has been well above that achieved by other American workers. It is likely that the severity of the displaced worker phenomenon is an outgrowth of the intersection of the recession and the increased variance in the employment and wage structures.

Specifically, the income loss to displaced workers is greater the larger the wage premium they enjoy over their opportunity wage. Moreover, the higher the union wage premium, or the premium not dictated by job-specific human capital, the greater the likelihood that workers will be displaced. In fact, the pulling apart of the wage structure has been quantitatively large enough to explain much of the displacement that has occurred in several of the declining industries.

To what extent will the displaced worker problem grow over the next decade? Over the near term, the outlook is favorable since spikes in the variance of interindustry employment tend to occur during recessions. If the economic recovery continues through 1985, manufacturing employment, even in the long-run declining industries, will increase; that is, the cycle effect will outweigh the trend effect.. Employment in some of the declining industries is unlikely, however, to reach peak levels attained in 1979:IV.

Over the longer run, concerns about a growing mismatch between unskilled workers and high skill job requirements appear to be unfounded. Future business cycle recessions will generate displacement, as occurred during 1980-82, but increased rates of technological change are likely to improve the ability of the economy to absorb the available labor supply.

Moreover, labor supply factors should be highly favorable over the

next decade. The percentage of young workers in the labor market will be decreasing as an increasing percentage of the baby boom cohort enters its early career stage. The increasing labor force participation rate is likely, at least, to slow its ascent. Perhaps most important, however, is that the percentage rate of increase of the total labor force will decline sharply. This labor market environment, if it does develop, should make the task of dealing with displaced workers more manageable.

Policy approaches for displaced workers must be understood in the context of the specific nature of the problem and the outlook for the 1980s. First, there are likely to be fewer displaced workers over the next several years than there are today, but more than there were during the tranquil 1960s. Given the stage of the business cycle and the past record of employment programs, it is too late to mount major new federal initiatives in this area. Secondly, although the displaced worker can be reabsorbed into new employment, the wage loss cannot be undone. Some offset, however, is possible.

Labor market policies that can be used in dealing with the problems posed by worker displacement include special income transfer programs of the type currently in use, the extension of CETA on-the-job training efforts, and employment tax credits or vouchers specifically targeted toward these workers. The degree to which these programs can be relied upon, however, should be strongly influenced by the fact that government policy remedies can efficiently provide only a limited offset to the losses suffered by workers.

This suggests that employers and labor unions give greater attention to collective bargaining initiatives that would minimize job displacements, even at the tradeoff of real wage objectives. That phenomenon is already apparent in a recession environment, as workers "give back" wages in return for improved job security. During an economic upturn, if the threat of displacement remains, continued willingness to trade off gains for increased job security in collective bargaining is needed. In other words, the parties may find it necessary to narrow the wage structure differentials that have emerged during the 1970s.

Defining the displaced worker problem

The displaced worker phenomenon is difficult to measure, partly because of the lack of consensus as to what is meant by the term "displaced worker." Some appear to use the term interchangeably with

individuals who have permanently lost their jobs during the current downturn. However, for analytical purposes, this categorization is not useful since it overlaps with traditional measures of cyclical unemployment.

In order to focus on structural changes in the labor market, we adopt a definition which confines the problem to forces that affect the equilibrium rather than the cyclical rate of unemployment. Specifically, the term displaced worker is used in this paper to refer to those workers who suffer a permanent loss of their current job in an industry with a negative trend rate of employment growth and for whom a change in jobs will prove costly. Displaced workers are thus people who have made an investment in seniority and job-specific training and/or who have received a union wage premium that cannot be recovered in the next cyclical upturn by being reemployed in a new job.

Since there is no way of knowing whether any given worker will be rehired in the next upturn, the number of displaced workers can only be measured by adopting some proxy variables that approximate the definitional characteristics. For purposes of this paper, the displaced worker is defined as one who held previous employment with some length of job tenure in a declining industry.'

Declining industries are those industries that have experienced structural employment declines due to either reduced output levels or reduced manhour requirements at any given level of output. The structural as distinct from cyclical employment decline has been attributed largely to long-term trends in international trade competition and the adoption of labor-saving technologies, in particular those based on microelectronics.

The length of job tenure criterion is adopted to distinguish between those who have settled into what had promised to be their lifetime or career jobs and those who did not have jobs with much tenure at the time they were discharged. The latter group has made less of an investment in training specific to their previous jobs and are younger on average. As a consequence they can typically change jobs at lower cost to themselves.

The Congressional Budget Office (CBO) has compiled statistics showing the number of displaced workers as of January 1983, based

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2. The term can also be defined as involving declining occupations rather than declining industries.

on 1982 data. Defining a declining industry as one in which employ-
ment levels fell from 1978 to 1980, they found that 1.290 million of
the unemployed were from declining industries, and that 280,000 of
those workers also had 10 or more years of job tenure.[3] (See Table 1.)
The industries that contributed the most to the displaced worker pop-
ulation were the automotive, primary metals, textiles, wearing
apparel, and lumber industries.

TABLE 1
Estimated Numbers of Dislocated Workers in January 1983
Under Alternative Eligibility Standards and Economic Assumptions
(in thousands)

Eligibility criteria	Base on 1982 Data*
Single criterion	
Declining industry	1,290
10 years or more of job tenure	870
More than 45 years of age	1,160
Multiple criteria	
Declining industry and	
10 years or more of job tenure	280
45 or more years of age	280

Source: Congressional Budget Office estimates based on tabulations from U.S. Bureau of the
Census, *Current Population Survey* (March 1982).
* Assumes that the number of dislocated workers in each category decreases proportionately
with the projected change in the aggregate number of unemployed workers between the first
quarter of 1982 and the first quarter of 1983, a reduction of nearly 5 percent.

Reflecting a broader definition of displaced workers, higher esti-
mates are obtained by the National Council on Employment Policy.
The council defined displaced workers as those who (1) were previ-
ously employed in stable jobs, (2) had been laid off with little chance
of recall, and (3) were unlikely to find new employment using their
familiar skills at near their customary rates of pay.[4]

As in the CBO example, this definition cannot be quantified with-

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3. The Congressional Budget Office presented various calculations based on different fore-
casts of the economy between 1980 and January 1983. The numbers in Table 1 are based on the
forecast that turned out to be most relevant to the actual state of the economy in January 1983.
Dislocated Workers: Issues and Federal Options, Congressional Budget Office (July 1982).

4. *The Displaced Worker in American Society: An Overdue Policy Issue.* National Council
on Employment Policy (February 1983), p. 1.

out adopting proxy measures. The council notes that, "According to the December 1982 BLS release, of the 12.0 million unemployed, 7.3 million had lost their last job. Only 2.5 million of these considered themselves to be on layoff with expectations of recall by their former employers, and even for many of these the hope will prove illusory. In the broadest sense, if all those who have lost jobs to which they do not expect to be recalled are considered displaced, this would make the number of displaced workers close to 5 million."[5]

These estimates are much larger than the CBO estimates because they do not restrict displaced workers by job tenure, or as losing jobs in industries with a negative long-run employment trend. Rather, the council accepts the workers' assessment of their recall possibilities as indicating displacement. As a consequence, the 5 million number is likely to combine both cyclical and long-run displacement, and includes those who may suffer a considerable wage loss as well as those whose opportunity wage is approximately equal to their last wage.

As indicated above, we adopt the CBO estimate since their construct is geared to structural rather than cyclical forces. Our interest is in the effect of displacement on structural or equilibrium unemployment rather than cyclical unemployment. Of course, cyclical and structrural problems are interrelated. The displaced worker problem, and structural problems in general, emerge during the recession stage of the business cycle.

Recessions are associated with a speedup in structural changes that are occurring in the economy. High-cost or uncompetitive industries (from an international trade perspective) can prosper when economic activity is strong, but suffer disproportionately when the economy turns downward. That is, periods of high aggregate demand tend to mask longer-run negative trends in firms' product demand. In addition, cyclical excess demand conditions will generate prices that can cover the high cost producers. As demand slackens and product prices decline, it is the highest cost producers who suffer first and foremost. These producers are more likely to close plants or shut down operations during a recession. Thus, although the underlying long-run trend is steadily downward for the declining industries, observed labor demand will stagnate during expansions and ratchet downward during successive periods of weak product prices.

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5. *The Displaced Worker* (1983), p. 2.

The economic nature of the problem

The underlying labor market mechanism appropriate for displaced workers indicates that the problem is more of a wage than an employment problem.[6] From the vantage point of the workers, the jobs that are lost are those in which the workers have invested in specific training, acquired the benefits of seniority, and/or received a wage premium due to unionization. Starting a new job compromises those gains. In addition, whereas seniority is a benefit to workers on established jobs, that age factor is a liability when searching for a new job.

A worker, before being displaced, can be viewed as having a potential flow of wage income shown by the age-earnings profile in Figure 1. The age-earnings profile slopes upward since workers tend to receive higher wages as they age (curve AA'). This can be attributed to a return on specific training and/or a seniority system in which the length of job tenure is itself rewarded. If jobs are unionized and the union succeeds in raising wages, the age-earnings profile can be depicted as BB'.

Workers who are displaced can, after some time, find a job. In this new job, the workers can be assumed to lose the benefits of unionization, job seniority, and any investments in specific training. The "opportunity" wage or the wage on the new job is shown by the curve 0 0'. This curve depicts the beginning wage on the new job for displaced workers of different ages. It is shown to decline with age, at least after a certain point in the life cycle. The decline reflects a number of factors ranging from institutional customs or hiring practices to declining skill with age. The older workers, precisely because of their age, find it more difficult and less profitable to invest in new specific training.

The difference between workers' rising age-earnings profiles (BB') and the declining opportunity wages (00') yields the annual wage loss to the displaced workers. That annual loss increases significantly with age. The lifetime as distinct from the annual earnings loss would be the area between the two curves beginning at the time of displacement. Clearly, the oldest workers, although they have the largest annual loss, will not have the largest lifetime earnings loss. That distinction is more likely to befall displaced workers who are in their late forties or early fifties. There is no unique age at which the

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6. The treatment in this section is drawn from Wachter (1983).

FIGURE 1
LOSS OF EARNINGS OF DISPLACED WORKERS
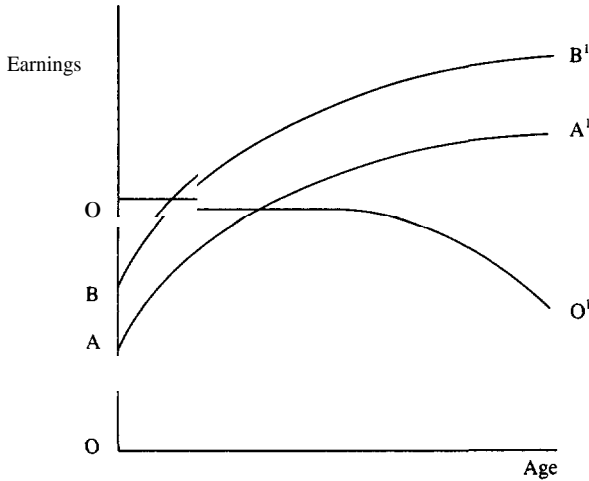
AA^1 = average earnings profile for the blue collar worker after he retains employment.
BB^1 = average earnings profile for the union member.
OO^1 = opportunity wage for the displaced worker; that is, the wage that they can obtain on a new job in a competitive labor market.
AA' − OO^1 is the annual earnings loss to a nonunion displaced worker.
BB^1 − OO' is the annual earnings loss to a displaced union worker.

loss would be a maximum; rather, it would vary with the nature of the industry and occupation and the quantity of specific training. It is this potential, ***permanent*** lifetime income loss — a loss that is worse for older workers who are too young for early retirement — that is at the heart of the displaced worker problem.

Newly displaced workers are likely to begin their job search looking for jobs that can use their specific training skills and that pay a wage rate comparable to the wage paid on the lost job. Consequently, even in an expanding economy, they are likely to face a lengthy bout of unemployment until their reservation wage — that is, the wage at which they will accept a new job — falls to their opportunity wage. The higher the wage on the lost job, the longer the period of unemployment. For some workers, the earnings replaced by unemployment insurance may be close to the earnings available on the alternative jobs.'

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7. Although displacement has been defined in terms of declining industry employment and

Empirical studies based on plant closings in the early 1970s support the conclusion that workers permanently displaced, unlike those on temporary layoffs, may suffer substantial losses in earnings for prolonged periods of time. Clearly, however, the size of the earnings loss much higher for unionized workers in high-wage industries than for workers in low-wage industries. Earnings losses over 25 percent can be found for automobile and steel workers. For those in apparel and textiles, the losses are more likely to be under 10 percent.'

Relative wages

The increasing union wage premium

Although an analysis of the causes of the ongoing structural change is beyond the scope of this paper, one aspect of the topic is of central concern. In the discussion above, it was argued that the cost of displacement is a function of the difference between individuals' wage rates on their last job and their opportunity wages. To the extent that individuals' wage rates represent a union wage premium, the opportunity wage on new jobs in different firms will be lower by that amount.

Wage rates, however, not only play a pivotal role in defining the problem of displacement, they also are crucial as a casual element in explaining the extent to which displacement is likely to take place. Specifically, any job with an increasing wage premium, that is, a wage above the market clearing wage, has a higher risk of displacement than a similarly situated job that pays the equilibrium wage.

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length of job tenure, a regional dimension can also be introduced. The declining industry base is largely in the industrial north central and northeastern states. Since some towns and cities in these regions have a heavy concentration of employment in declining Industries, alternative employment opportunities are limited. As a consequence, job displacement requires geographical mobility

The human capital framework analyzes migration as a type of investment decision, where discounted benefits and costs are equilibrated. The older the worker, the fewer the number of post-migration years in which to gamer the benefits of the geographic move and the greater the fixed investment in the original community in terms of social and psychological relationships. The fact that other family members may still be employed adds another cost dimension to geographical mobility.

Fixed investment in specific training, union wage premium, and housing all become obsolete and, like the plants in which they worked, must be simply written off. The policy issue for the truly displaced worker is not how to regain those lost fixed assets but rather how best to make new Investments at a time when remaining worklife expectancy is short.

8. A summary of these results is presented in Marin (1983).

The existence of increasing wage premiums in certain industries is shown by increases in the coefficient of variation of average hourly earnings of production workers in manufacturing industries. (See Table 2.) Of particular interest is the steady rise in the coefficient of variation since 1970.

TABLE 2
Wage Dispersion in Manufacturing
1947-1982

Year	Coefficient of variation in average hourly earnings	Year	Coefficient of variation in average hourly earnings
1947	13.36	1965	18.53
1948	14.47	1966	18.47
1949	15.43	1967	17.69
1950	14.96	1968	17.24
1951	15.12	1969	17.33
1952	15.87	1970	17.01
1953	16.41	1971	18.06
1954	16.78	1972	19.12
1955	17.52	1973	19.26
1956	17.16	1974	19.43
1957	17.50	1975	20.44
1958	18.16	1976	21.35
1959	18.77	1977	21.85
1960	18.73	1978	22.32
1961	18.88	1979	22.44
1962	18.87	1980	22.61
1963	19.06	1981	23.59
1964	18.74	1982	24.05

The coefficient of variation is the variance in the level of average hourly earnings across industries divided by the mean value. Average hourly earnings are obtained from U.S. Bureau of Labor Statistics, *Employment and Earnings,* various issues.

Studies of the dispersion in wages between high- and low-wage or union and nonunion industries have indicated that the wage structure should vary systematically over the business cycle.[9] In particular, the wage setting process in high-wage or unionized industries responds to market conditions with a longer time lag than does wage setting in

9. See, for example, Wachter (1970).

low-wage industries. This longer lag means that the time series of wage changes in high wage industries should tend to be relatively acyclical. With their relatively fixed profile of wage increases, the high-wage industries should experience an increased wage premium during downturns in business activity, but give back those gains during the subsequent upswing.

Through the **mid-1970s,** the empirical evidence on the cyclical behavior of wage differentials supported this theory. High wage premiums, after growing through most of the **1950s,** tended to decline during the 1960s. Again, as anticipated, wage premiums grew during the high unemployment years of 1970 and 1971.

The breakdown in the cyclical behavior of the interindustry wage structure began during the expansion of the early 1970s. Whereas wage gains in the low-wage industries were predicted, by the theory, to be higher than in the high-wage or unionized industries, the reverse occurred. The coefficient of variation in wages among industries continued to grow, reflecting the large wage gains in the already high-wage industries. This development has been associated with the spread of COLA clauses in collective bargaining contracts. Before adoption of these clauses, unanticipated high inflation rates caused union wage increases to lag nonunion increases. With these clauses in effect, union wages responded more quickly to the higher inflation rates. The percentage of workers under major collective bargaining agreements with COLA coverage jumped from 27.8 percent in 1972 to 61.2 percent in 1977.[10]

The impact of COLA clauses on relative wages was heightened by two unanticipated factors. The first was that a large component of the inflation increases during the 1970s was caused by supply shocks. This was unlike the inflation of the **1960s,** which emanated from domestic excess demand conditions and thus caused nonunion wages to increase by the same amount. During the **1970s,** nonunion wages trailed behind the inflation rate as real wages declined. Since the COLA clauses did not differentiate between external supply and domestic demand inflation processes, the unionized workers were equally protected against both contingencies. The result was that

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10. Wachter and Wachter (1978) discuss the implications of COLA for the breakdown in the cyclical pattern of relative wage increases. For a discussion of COLA provisions, see Hendricks and Kahn (1983) and Ehrenberg (1983). For the data on the growth of COLA provisions in union contracts, see Davis (1983).

inflation resulting from supply shocks caused the interindustry wage dispersion to increase.

The second factor was that the CPI-W, the primary index in COLA clauses, overstated the inflation rate. Although the problems created by the CPI formula in use during the 1970s are well known and are not repeated here, the flaws in the CPI-W provided an overkill in cost-of-living protection. To see the magnitude of the problem, we have worked out an example in which the personal consumption deflator (PCE) is used as a true measure of the cost of living. The coverage rate most frequently found in COLA clauses provides for an increase of 1 cent for every 0.3 rise in the index. Between 1973 and 1982, the CPI-W increased by 155.5 points, from 133.1 to 288.6. If, on the other hand, the CPI-W had only increased as rapidly as the PCE during that period, then it would have only reached 268.2 by 1982. The difference in annual wage levels is $1,414." That represents an increase of more than 20 percent based on 1973 wage levels and an increase of slightly under 10 percent based on 1982 wages.

Although the COLA overkill could account for much of the puzzling increase in the wage dispersion among industries, we cannot explain why firms did not offset COLA increases by granting lower straight wage adjustments. Institutional and industry-specific factors and information lags probably explain some of the inability of firms to adjust relative wages. One example is the steel industry's experimental no-strike agreement.

The potential impact of increase wage dispersion

It is likely that the increased wage dispersion was one factor which caused the job displacement problem. Employment displacement effects caused by high relative wages should be traced out by a downward movement along the industries' demand curve for labor as well as by an inward shift of the curve.

To examine the potential magnitude of the problem, we estimated a cross-sectional relationship between the relative wage performance and relative employment change of 45 two-digit industries between

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11. Using the CPI-W measure, model COLA provisions accounted for a $5.18 increase in hourly wages. Had the PCE been used instead, the increase would have been $4.50. The difference is $0.68. The annual difference given in the text is based on a figure of 2,080 hours per year. In addition, all of these calculations are for straight-time pay. Fringe benefits that are determined by straight-time salaries would increase by the same rate.

1973 and 1982. The results are the following:

$$e = -0.116 + 0.972\ q + 0.646\ p - 0.566\ w \quad R^2 = 0.76 \quad (1)$$
$$\quad\ (0.71) \qquad (8.66) \qquad\quad (8.53) \qquad (2.26)$$

The equation was estimated in log linear form and included all of the two-digit industries for which data were available. The dependent variable is the relative employment change between those two years for each industry, while the independent variables are the relative output, relative price, and relative wage changes for the respective industries.

The results indicate that relative employment responded negatively to relative wage increases with an elasticity of 0.57. The wage elasticity is computed holding relative output constant and so represents an own wage substitution effect. Since the wage variable measures the percent change in wages in excess of the average for the private economy, it is not surprising that the elasticity is fairly high.

It is interesting to note that the industries used in the CBO calculations as the home base for the most displaced workers did have increasing relative wages over the 1973 to 1982 time period. Wages in the lumber industry, for example, increased at a 0.72 annual percentage rate, faster than for the overall economy between 1973 and 1982. The comparable figure for primary metals is a 1.59 annual percentage growth in the wage premium, and for motor vehicles it is a 0.97 annual percentage growth premium. Since the textile industry increased its wages at an annual percentage rate of only 0.17 faster than the overall economy, it can be viewed as somewhat of an exception.

Relative wage levels, of course, are only part of the story, a point which is illustrated by the predicament of the textile industry. Moreover, the rising value of the dollar has had a larger quantitative effect on the American wage level relative to its trading partners than domestic relative wage changes. In fact, real wage growth in the United States has been below that of other OECD countries.

In terms of comparative advantage, however, those domestic industries with increasing relative wages will always be more vulnerable than will those with declining relative wages. Economy-wide negative output effects associated with the rising value of the dollar, on the other hand, are likely to be self-limiting and will be dominated by increasing scale effects in the expansion phase of the business

cycle. The point concerning increasing industry-specific relative wages is that that effect is permanent and not self-limiting without corrective measures on the part of the industry wage-setting mechanism.

In order to estimate the total employment displacement effect in manufacturing due to rising relative wages, it is necessary to have an estimate of the wage elasticity for employment that *includes the scale effect*. Unfortunately for our purposes, most existing econometric estimates of the demand curve for labor on the industry level measure only the substitution effect; that is, output is used as an independent variable along with the various factor input prices. The literature suggests an elasticity of approximately 0.30 for this substitution effect, holding output constant.[12]

The data show that of 21 manufacturing industries, 17 increased their wages for production and other nonsupervisory personnel relative to those wages paid elsewhere in the (private, nonagricultural) economy. If we assume that the elasticity of 0.3 is correct, then it is possible to compute the employment loss due to the increase in relative wages for those industries with high relative wages. The decline in manhours is shown in Table 3, column 3.

Employment elasticities with respect to wages, not holding output constant, are likely to be considerably higher (in absolute value) than the numbers reported in Table 3, column 3. For example, in competitive industries, wage elasticities can be close to infinite if the higher wage causes those firms to have higher costs than other firms in the industry. Calculating these elasticities with respect to internationally traded goods is particularly difficult because of the need to have accurate price information for foreign competitors. An attempt at estimating these wage elasticities is beyond the scope of this paper. Moreover, there is surprisingly little in the way of an academic literature to draw upon.[13]

In columns 4 and 5, we provide disemployment effects based on wage elasticities of employment of 0.6 and 1.0, respectively. An elasticity of 1.O, when output is not held constant, would seem to be quite reasonable. In this latter case, one finds that a high percentage of the displacement effect can be attributed to rising relative wages.

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12. See, for example, Hamermesh (1976, 1983) and Clark and Freeman (1980).

13. An exception is the recent study by Grossman (1982). He calculates employment elasticities with respect to import prices for nine industries.

TABLE 3

The Displacement Effect of Relative Wages
1973 to 1982
(millions of manhours)

Industry	Annual percent change in relative wages	Actual change in manhours	Change in rnanhours with 0.3 wage elasticity	Change in manhours with 0.6 wage elasticity	Change in rnanhours with 0.1 wage elasticity
Lumber	0.72	−362.12	−30.45	−60.30	−99.22
Furniture and fixtures	−0.15	− 197.42	4.22	8.45	14.12
Stone, clay, and glass	0.85	− 355.79	− 35.47	− 70.14	− 115.14
Primary metals	1.59	− 925.90	− 117.03	− 229.11	− 371.22
Fabricated metals	0.55	631.10	− 53.23	− 105.67	− 174.37
Machinery	0.40	− 63.61	− 49.49	− 98.44	− 162.91
Electrical machinery	0.78	− 27.44	− 86.95	− 172.07	− 282.79
Motor vehicles	0.97	− 755.70	− 57.18	− 112.87	− 184.90
Other transportation equipment	1.73	185.60	− 90.85	− 177.56	− 287.08
Instruments	1.13	274.22	− 35.87	− 70.65	− 115.39
Miscellaneous	0.03	− 146.15	− 0.66	− 1.32	− 2.20
Food	0.57	−225.68	−55.11	− 109.38	− 180.44
Tobacco	3.17	−26.61	− 12.95	−24.83	−39.13
Textiles	0.17	−687.29	−9.69	− 19.34	−32.13
Apparel	−0.41	−594.61	29.61	59.54	99.97
Paper products	1.44	− 138.33	−60.55	− 118.76	− 192.91
Printing and publishing	− 0.64	267.41	37.90	76.45	128.91
Chemicals	1.41	28.86	−85.06	− 166.91	−271.27
Petroleum	2.12	46.78	−23.86	−46.38	−74.46
Rubber	0.31	−42.46	− 12.52	−24.93	−41.31
Leather	−0.21	− 169.29	3.16	6.34	10.61

The calculations compute the changes in manhours from their 1973 values using the actual relative wage change between 1973 and 1982. Wages are average hourly earnings and are obtained from U.S. Bureau of Labor Statistics, *Employment and Earnings,* various issues. Manhours are the product of average weekly hours and employment adjusted to an annual basis, and are obtained from the same source.

In lumber, for example, if the wage elasticity is 1.O, 22 percent of the manhours decline between 1973 and 1982 would be due to rising relative wages. For primary metals, the corresponding figure would be 40 percent, and for motor vehicles it would be 24 percent. For textiles, on the other hand, only 5 percent of the employment loss would be explained by wage effects (given an elasticity of 1.0).

The above figures are in terms of manhours. It is interesting to convert those numbers into employment. Suppose that the average full-time worker has a 35-hour week for 50 weeks per year. Dividing the total manhour loss in the above four industries by 1,750 yields a job or employment loss of 396,829. This is quite close to the total number of displaced workers in those industries estimated by the CBO. Although the calculations reported here are quite rough, the order of magnitudes would probably not be greatly affected by alternative calculation schemes.[14] Relative wage increases in manufacturing have the potential to explain an important component of the displaced worker phenomenon.

The outlook for the 1980s

The public debate with respect to worker displacement addresses future as well as current concerns. To what extent is this problem likely to be a continuing difficulty that contributes to an ongoing mismatch between the available workers and the available jobs and, thus, to an increase in the economy's equilibrium unemployment rate?

Two aspects of this problem need to be considered. The first concerns the near-term outlook for displaced workers as the economy recovers. The second concerns the degree of job displacement that is likely to occur, on average, over the next decade.

The near-term outlook

We argue that the count of displaced workers is likely to be considerably lower in the future than it is today — that is, the number of newly displaced workers should be lower than the number absorbed into employment. Although displaced workers stay unemployed longer than the average unemployed worker, they eventually do find new jobs. Studies of past plant closings suggest that the 50-year-old

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14. For example, using a 40-hour week for 52 weeks yields an employment loss of **333.871.**

will be unemployed twice as long as the 25-year-old."

The displaced worker phenomenon is a byproduct of divergent employment growth across industries. This interindustry employment variance tends to be particularly high during recessions. Table 4 depicts the variance of employment (or **manhour**) changes across industries over time.

The data highlight three related facts. First, divergent interindustry employment behavior has been associated with the downside of the business cycle. Spikes in employment instability occurred in 1973-1975, 1980, and 1982. Secondly, reflecting the different cyclical episodes, interindustry employment variance was higher in the 1970s than during the 1960s. (The 1950s also had periods of divergent employment growth, especially around the Korean War and the recession of 1958.)[16] Thirdly, the lower employment variance during recoveries indicates that at least some of the industries with declining **manhours** during the downturn do not catch up by registering unusually large gains during the subsequent upswing.

To test whether the seeds of this historical pattern can be found in current data, we estimated a series of reduced form industry **manhours** equations and projected **manhours** through the next recovery. The equations were constructed so as to contain aggregate output and unemployment, industry trends, and autocorrelated components. The dependent variables were the log level of **manhours** for each of the two-digit manufacturing industries. The exogenous variables were limited to those for which forecasts through 1985 were available from a range of econometric models. The equation form chosen contained a time trend, two lagged dependent variables, and current and two lagged values of both aggregate output and a cyclical unemployment measure adjusted for demographic changes."[17] The forecast for aggregate unemployment and output was from **Wharton** Econometrics. Details are presented in the appendix.

Pushed by a projected overall economic recovery, manufacturing labor demand should rise strongly between 1982:IV and 1985:IV.

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15. See, for example, Gordus, Jarley, and **Ferman (1981)**, and **Lipsky** (1970).

16. **Sectoral** shifts as a cause of unemployment were explored by Lilien (1982). Based on an increase in "job losers and leavers" for any given level of aggregate demand, he argued that a **significant** portion of unemployment that had been labeled cyclical should **be** reclassified as noncyclical.

17. Several forms of the equation were estimated. Although specific industry forecasts differed in a few cases, projections of total **manhours** were not sensitive (at the level of accuracy that we used) to the individual equation specification. For the projections, the same equation was used for each industry.

TABLE 4

Variance in Interindustry Employment Changes
Two-Digit Manufacturing Industries
1950 to **1982**

Year	Employment	Manhours
1950	27.96	47.91
1951	44.42	66.79
1952	20.55	20.11
1953	25.53	30.30
1954	21.74	27.72
1955	17.31	30.81
1956	15.81	24.69
1957	8.26	8.71
1958	27.24	35.60
1959	16.33	25.72
1960	6.46	7.78
1961	9.92	12.55
1962	9.42	18.47
1963	5.59	6.42
1964	4.01	5.67
1965	12.38	19.01
1966	17.13	19.74
1967	8.24	10.25
1968	6.24	13.02
1969	5.65	7.92
1970	12.00	17.11
1971	15.26	20.71
1972	11.06	15.38
1973	17.24	23.37
1974	12.93	19.67
1975	17.63	19.42
1976	8.36	17.63
1977	16.64	20.07
1978	6.65	7.10
1979	8.30	11.29
1980	25.82	31.18
1981	6.68	11.66
1982	17.74	25.43

Calculations represent the variance in the quarterly rate of change across industries. Data are from U.S. Bureau of Labor Statistics, *Employment and Earnings,* **various issues.**

Manhours are projected to increase from 37.0 billion to 41.2 billion. Because our simulation begins at the recession trough, 1982:IV, and contains lagged dependent variables, the values in Table 5 should be viewed as conservative estimates of manhours for a recovery lasting through 1985. Since the economy is not projected to be at its potential output and/or equilibrium unemployment rate level as of 1985:IV, further cyclical recovery is possible. This, however, is not a guaranteed result for all industries since the negative trend offsets the declining (although still positive) aggregate output growth rate for some industries even before 1985:IV.

Manufacturing manhours, although exceeding 1982:IV levels, are not expected to recover back to 1979:IV peak levels by 1985:IV. Although all industries are expected to have higher manhour levels in 1985:IV, compared with trough readings in 1982:IV, the degree of recovery varies widely. Strong employment gains are forecast for electrical machinery and instruments in the durable goods sector and for printing and petroleum in nondurable goods. For these industries, manhours in 1985:IV are far beyond the 1979:IV levels. The weakest recoveries are projected for primary metals; textiles; stone, clay, and glass; machinery; leather; and lumber. Hence, the declining industries are projected to maintain their long-run decline.

The calculations in Table 5 support the contention that the magnitude of the displaced worker problem is likely to lessen over the next several years. Economic recovery, as currently projected, will make a large dent in the problem. Although manufacturing will not regain prior levels, this reflects only a slight worsening of trends already underway for most of the past decade. As shown in Table 6, employment growth in manufacturing had largely ceased by 1970. Although economy-wide employment growth throughout the 1970s was more rapid than it had been during the 1960s, the new jobs were very heavily concentrated in services, wholesale and retail trade, and state and local government.[18]

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18. The shifting pattern of employment by industry also masks greater stability in the skill distribution of the population. Individuals with the education and skill levels that would have led to employment as operatives in the 1950s are becoming service workers or clerical workers in the 1980s. Thus a tilt in the distribution of employment across skill categories, as would be implied if the long-run mismatch story were to hold, is not apparent in the data.

The Bureau of Labor Statistics' employment by industry and occupations projections to 1990 are based on extrapolations of current levels and observable trends. Although they do project that the highest percentage growth occupations will be in some computer-based fields, the total

TABLE 5

Industry Manhours Simulations
Trough-Based Scenario
(millions)

Industry	1979:IV	1982:IV	1985:IV
Manufacturing	**43,743.16**	**37,008.00**	41,241.45
Durable goods	**26,819.07**	**21,633.82**	24,649.27
Lumber	**1,538.49**	**1,231.73**	1,336.59
Furniture and Fixtures	**996.00**	**849.97**	943.60
Stone, clay, and glass	**1,511.34**	**1,166.25**	1,244.72
Primary metals	**2,632.14**	**1,650.28**	1,756.19
Fabricated metals	**3,613.53**	**2,779.17**	3,183.88
Machinery	**5,338.96**	**4,317.33**	4,444.43
Electrical machinery	**4,500.21**	**4,016.60**	4,798.53
Transportation equipment	4,304.26	3,454.38	4,345.54
Motor vehicles	1,913.85	1,341.00	1,696.94
Instruments	1,490.70	1,415.61	1,777.82
Miscellaneous	893.44	752.50	817.97
Nondurable goods	16,924.09	15,374.18	16,592.18
Food	3,594.07	3,361.64	3,403.19
Tobacco	135.14	124.33	124.55
Textiles	1,864.46	1,458.17	1,493.45
Apparel	2,359.71	2,075.27	2,151.48
Paper products	1,571.84	1,412.39	1,576.26
Printing and publishing	2,429.07	2,441.18	2,780.80
Chemicals	2,420.81	2,251.95	2,496.31
Petroleum	479.54	469.83	506.68
Rubber	1,607.72	1,399.51	1,662.30
Leather	461.73	379.90	397.16

Values for 1979:IV and 1982:IV are actual manhours on an annual basis for each quarter. The values for 1985:IV are simulated using a cyclical manhours regression for each industry and aggregate projections of GNP and unemployment rates from Wharton Econometrics. Details are given in the appendix.

TABLE 6
Change in Wage and Salary
Workers in Nonagricultural Establishments
1970 to 1981

	Employment change (millions)	Percentage of 1973 level in each industry*	Percentage of 1970-1981 change from each industry?
Total	20.225	100.0	100.0
Manufacturing	0.806	27.3	4.0
Mining	0.509	0.9	2.5
Construction	0.588	5.1	2.9
Transportation and public utilities	0.642	6.4	3.2
Wholesale and retail trade	5.511	21.2	27.2
Finance, insurance, and real estate	1.656	5.1	8.2
Services	7.044	6.3	34.8
Government federal	0.041	3.9	0.2
state and local	3.430	13.9	17.0

Source: *Economic Report of the President* (February 1983).
* The percentage of total employment in 1970 that was employed in each industry.
† The percentage of the change in employment between 1970 and 1981 that is accounted for by each industry.

The long-run mismatch

Some researchers have argued that the number of displaced work-ers will grow dramatically over the remainder of this decade due to technological innovations. For example, recent studies argue that the introduction of microelectronic (high-tech) technologies could cause a job loss of 3 million during the 1980s and up to 7 million by the year

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number involved is quite small. Examples are data processing machine mechanics, computer system analysts, and computer operators. In addition, certain low skilled occupations and labor-intensive industries are also expected to grow rapidly. Examples are food preparation and service workers, child care attendants, and nurses' aides and orderlies. These latter projections clearly reflect employment growth due to the high income elasticities of those fields. Whereas data processing machine mechanics will grow rapidly due to technological innovations, nurses' aides and orderlies will grow rapidly because society will be wealthier.

The results for the broadly defined occupational groups support these conclusions. The fast-est growth sector is likely to remain the service sector with total growth to 1990 of 31.4 percent. Support for the contention that the shift out of traditional blue collar work will continue is also found in the BLS projections, as those occupations are projected to grow only by 18.6 percent.

Detailed occupational projections can be found in Carey (1982).

2000.[19] The latter figure would mean a loss of one-third of the manufacturing jobs currently in existence. These numbers have been used by some researchers to reach the pessimistic conclusion that job growth in low-skilled, blue collar (and, perhaps, white collar) employment will be insufficient over the next decade to match the increased numbers of workers needing jobs. In the worst case, the mismatch could cause ongoing problems of technological-based job displacement for already employed older workers.

Our argument is that the mismatch scenario is a very low probability event.

Our contention with the mismatch scenario is basic and concerns the application of the economic model of technological change. The mismatch view is based on a partial rather than a general equilibrium view of the economy. Several issues are crucial here. First, is technological change labor saving, labor using, or neutral? Second, in each case, how will technological change affect aggregate employment and wages?

To address these issues, it is useful to refer to a simple model of technological change.[20] Assume a general neoclassical production function of the form

$$O = F(K, L; t) \tag{2}$$

where O is output, K is the capital input, L is the labor input, and t is a time index. In per capita terms, this is

$$q = f(k; t). \tag{3}$$

Under the usual efficiency conditions with output as the numeraire, the real wage rate and rental rate are

$$w = F_L(K, L; t) \tag{4}$$
$$r = F_K(K, L; t). \tag{5}$$

The direct effect of technological change is that fewer inputs than had previously been the case are needed to produce a given output quan-

19. See, for example, Ayers and Miller (1982) and "The Impacts of Robotics," Carnegie Mellon University (1981).

20. Burmeister and Dobell (1970) present a detailed discussion of technological change.

tity. However, technological change may result in a substitution effect among the inputs of production that alters relative usage and/or factor prices. Technological change is considered to be neutral if, and only if, the relative shares

$$\frac{S_L}{S_K} = \frac{wL}{rK} \tag{6}$$

remain constant; is labor saving if the relative share of labor falls; and is labor using if the relative share of labor rises.

The definition of technological change used here is in terms of a constant capital-output ratio. If the relative shares remain constant, then technological change is referred to as Harrod neutral.

In Figure 2, the production function shifts between time t_0 and t_1, while the capital-output ratio remains constant. Capital's share

$$S_K = \frac{rK}{Q} = \frac{rk}{q} \tag{7}$$

must also remain constant for the technological change to be neutral. Since k/q is a constant, this implies that the profit rate, $r = f_k$, must also be constant.

To see what this implies for wages, we need only examine the relative share equation (6). Since K increases and r is constant, labor income, wL, must increase in order for the relative shares to remain constant. If employment remains constant, then the real wage rate will increase. In particular,

$$w = \frac{S_L}{S_K} k f_k \tag{8}$$

so that w increases linearly with k at a rate of $f_k(S_L/S_K)$.

If the profit rate, f_k, were increased after the technological change, then the technological change would be designated as labor saving. It is this latter case that researchers seem to fear with respect to the microelectronic technology.

In Figure 3, the production function shifts so that at the constant capital-output ratio, the slope, f_k, is greater at t_1 than at t_0. This means that capital's share, S_K, is now greater and the relative share
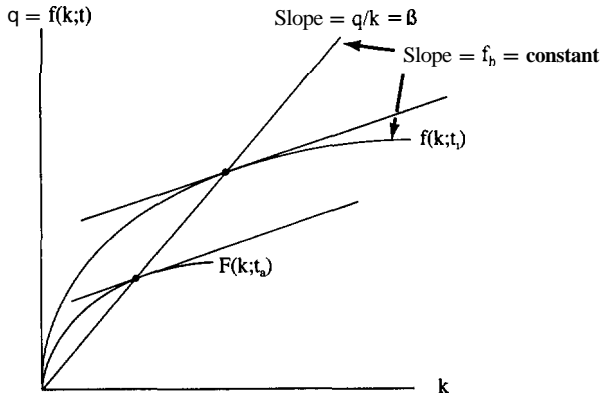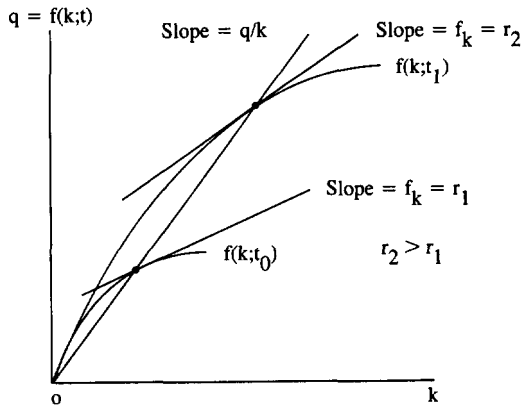
FIGURE 2.

Harrod-Neutral Technological Change

$q = f(k;t)$ Slope $= q/k = \beta$

Slope $= f_h = $ **constant**

$f(k;t_1)$

$F(k;t_a)$

k

FIGURE 3.

Labor Saving Technological Change

$q = f(k;t)$ Slope $= q/k$ Slope $= f_k = r_2$

$f(k;t_1)$

Slope $= f_k = r_1$

$f(k;t_0)$ $r_2 > r_1$

o k

of labor has fallen.

Although labor's share declines when technological change is labor-saving, the real wage rate may still increase. In (8), all three left-hand terms have now changed. S_L/S_K is lower, but k and f_k are now higher. The result is that the change in the wage rate is indeterminate. Only if the new technology were extremely labor-saving would the real wage rate actually decrease. In less extreme cases, the real wage would simply grow less rapidly than output, and labor's share of national income would decrease.

Labor-saving technological change also need not imply an increase in the unemployment rate. In the disequilibrium short run, of course, frictional unemployment may result as workers search for new jobs. Over time, the extent of unemployment reflects the downward rigidity of real wages. Since real wages decline only when technical change is extremely labor-saving, the downward rigidity issue is moot.

Outside the single good model, the aggregate impact of (labor-saving) technological change becomes more complex. For example, in a two-sector model, the sector in which the technological change occurs determines the effects on the real wages and on labor's share of total income. If the seemingly labor-saving technological change (in terms of the parameters of the sector's production function) occurred in the labor-intensive sector, the price decline in that sector would yield a shift in consumption that would favor the **labor-intensive** sector. The result could be actually to increase the demand for labor and, hence, labor's share. In addition, given that income elasticities tend to be higher for labor-intensive products, output effects are likely to work against any adverse real wage effects of labor-saving technological change.

In a model with more than two sectors, the general equilibrium effects of technological change in one sector become even less obvious. Basically, the partial equilibrium observation that a technological change is labor-saving in one sector is not sufficient to argue that it will be labor-saving in the aggregate.

The above discussion highlights the difficulties in assessing the effects of the current wave of microelectronic-based technological change (or any type of technological change), even when one can determine that the change is labor-saving in the affected sector. More problematical, however, is the original assumption that the technical change is labor-saving. The critical issue here is to determine the boundaries of the industry that has experienced a shift in its production function.

At an aggregate level, there seems little reason to fear the labor-saving scenario. Historically, broad classes of technological change, once the output effect is considered, have been neutral, tilting toward neither labor nor capital in their net effect. To the extent that the current type of technological change does not mark a sharp break with the recent past, the behavior of labor's share for the past 15 years should allay concerns that the underlying process of technological

change is labor-saving.

A final observation on the potential for a future mismatch problem involves changes in the growth rate of the labor force over the next decade. Since displaced workers may be viewed as structurally unemployed, their degree of labor market difficulty will be strongly affected by changes in actual and equilibrium employment rates.

A strongly positive factor with respect to excess demand conditions in low-wage labor markets over the next decade will be a decline in the rate of overall labor force growth. Whereas the labor force grew at slightly over 2.2 percent per year between 1970 and 1982, it will grow at only 1.5 percent between 1983 and 1990. This drop in the rate of growth of the labor force means that 6.85 million fewer workers will be entering the labor market than would have been the case if the old labor force growth rate were in effect.

In addition, since labor force growth rates are closely tied to the size of the 16- to 24-year-old population group, the change in the composition of the labor force will be a shift away from younger workers. The result will be excess demand conditions that favor youth and related unskilled labor markets and an associated increase in the relative wages of these workers. The demographic labor supply effects, tilting the labor force heavily toward job-stable older workers and away from youth workers, and the slower increase in the rate of growth in the labor force, should contribute to a decline in the equilibrium unemployment rate.

The decrease in the equilibrium rate of unemployment and the associated relative improvement in excess demand conditions in unskilled labor markets will improve the fate of displaced workers. They will find jobs more quickly and at higher wages than would have been true during the depressed low-skilled labor markets of the 1970s.

We conclude that the displaced worker problem is not so bleak as is generally believed. Although technological change may result in short-run displacement of some workers, it is also associated with periods of high economic growth. Income effects associated with an expanding economy should ease employment problems of displaced workers. In addition, the labor market in which displaced workers are likely to search for new jobs will improve during the 1980s due to a decline in labor force growth. Workers operating in these markets will experience better employment opportunities than displaced workers have in the recent past.

The potential problem area identified in this paper concerns inter-industry relative wage differentials. The recovery in manufacturing employment is likely to be strongly affected by the future course of relative wages.

Policies for displaced workers

There are three broadly defined policy approaches to the problems posed by displaced workers." The current policy is to use "special protection programs" to provide transfer payments that are more generous to displaced workers than those received by other unemployed workers. That policy approach has been criticized because, by providing supplementary benefits, it discourages workers from finding new jobs. It also does not provide the training that could better equip displaced workers for new jobs.

An alternative approach would be to make use of training programs, either by including displaced workers in the CETA-eligible population or by instituting new training programs. Currently, some of the special protection programs include provisions for training, but these are rarely utilized. The third approach would be to use vouchers or employment tax credits to make displaced workers more attractive to new employers. Employers would receive cash directly or would be able to deduct a percentage of salaries paid to eligible workers from their tax liability.

The special protection programs are specifically designed to provide supplemental aid to displaced workers when government-initiated action causes loss of seniority and firm-specific human capital through unemployment. Rather than having only one umbrella policy, numerous disjointed programs exist, each targeted at separate worker or interest groups. The best known special protection program is Trade Adjustment Assistance. TAA is an open-ended program targeted toward workers in industries that are designated as adversely impacted by import competition. Transfer payments (in the form of an extension of UI benefits), training, and relocation benefits are available. To date, only the transfer payments have been widely

Because of its large and expanding size, TAA has come under increasing scrutiny. The novel conceptual feature of TAA is that it is

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21. Parts of this section are drawn from Wachter (1983).

22. For an excellent study of special protection programs, see Martin (1983).

designed to compensate affected workers not only for their earnings losses (which are covered by UI) but also for their loss of seniority and other job-related rights that result from ***government-initiated actions,*** including free trade. Currently, workers judged eligible for the TAA program continue to receive benefits equal to unemployment insurance after the UI benefits (UI and TAA) have been received for 52 weeks. Twenty-six additional weeks of benefits are available for those workers participating in training programs.[23] This approach, however, has three serious flaws.

First, at the time that workers are dismissed, the workers, the policymakers, even the firms do not know which workers might eventually be recalled and which are, in fact, permanently displaced. Thus, from an economic vantage point, the unemployment and related income loss of those who eventually regain their jobs are difficult to distinguish from other temporary bouts of cyclical unemployment.

For workers who are judged eligible for TAA and are eventually recalled to their previous jobs, TAA acts as income maintenance that extends the unemployment insurance benefits normally received by unemployed workers.[24] Since studies of unemployment insurance have provided evidence that increased UI benefits increase the optimal duration of unemployment, the effect of TAA on temporarily displaced workers will be to increase unemployment rather than to provide incentives to find new employment.[25]

Secondly, Trade Adjustment Assistance does not distinguish among workers with respect to their tenure on the job. As noted earlier, the primary problem for displaced workers is a loss of wages due to a loss of seniority, job-specific skills, and/or a union wage premium rather than a loss of employment. Displaced workers are likely to find employment at lower wages in other sectors of the economy.

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23. Amendments to the TAA program were enacted in August 1981. The amendments reduced the amount of benefits received and altered TAA to be an extension of UI benefits rather than a supplement to UI. In addition, TAA offers search and relocation benefits to workers looking for new jobs. Search benefits offer a maximum of $600 with workers paying 10 percent of their total search costs. Relocation benefits have no monetary limit. Workers pay 10 percent of relocation costs and receive a "settling-in" grant of up to $600.

24. One of the early criticisms of TAA was that the administrative task of determining eligibility took so long that many workers had been recalled by the time they received their first benefit payment. Our argument is that such workers should not have been eligible for TAA at all if the program had been aimed at permanently displaced workers.

25. For a review of the unemployment insurance literature, see Welch (1977). According to Welch, there is no evidence that increased unemployment insurance benefits lead to improved new employment opportunities.

For younger workers, this does not present a severe loss due to their junior status in their previous job as well as their longer expected working life at the new job. As a consequence, relatively junior workers who have not made large investments in specific training and/or seniority are being compensated for a loss that they have not actually incurred.

Thirdly, the distinction between unemployment caused by government policy, generally interpreted, and other types of unemployment is difficult to make. Although some types of unemployment may be a very specific result of some specific government policy, most if not all unemployment can be viewed as being affected, to some extent, by general government policies. It becomes a question of political clout as to which workers are labeled eligible for TAA benefits. The special protection program approach thus serves to construct artificial distinctions among unemployed workers and to pay extended benefits to certain groups that have no greater claim on those resources than other unemployed workers.

Some of these problems could, at least conceptually, be resolved, while others are inherent in the concept of special protection. For example, a minimum length of tenure could be written directly into the eligibility criteria. This would resolve the problem of paying extra benefits to junior employees. In fact, as has been done for disadvantaged workers, programs could be targeted to certain groups of workers according to predetermined traits. Other issues, such as the categorization of some workers as unemployed because of government-initiated action, are unresolvable. This problem could be lessened if benefits were made available to tenured workers in declining industries rather than to workers displaced by government action. A battle would still take place over defining the parameters of the tenured workers in a declining industry, but the criteria could then be applied evenly to all workers.

In fact, TAA did fortuitously identify the major declining industries (see Table 7). The major beneficiaries of TAA have been workers in the automobile industry, accounting for 58 percent of the total recipients and 72 percent of the benefits between 1975 and 1981. Steel and apparel have also had a large number of workers eligible for TAA.

Although reaching the right industries, TAA did not distinguish between displaced workers and those on temporary layoff. After prior recessions, most TAA recipients were recalled by their old

TABLE 7
Trade Adjustment Assistance Outlays by Industry

Industry	Workers	Benefits (millions of dollars)
Auto	685,113	$2,217.1
Steel	137,319	350.6
Apparel	150,593	189.7
Footwear	76,176	92.2
Electronics	60,387	90.1
Fabricated metals	29,899	74.0
Textiles	26,075	44.0
Coal	7,355	17.7
		$3,075.4

Source: Philip L. Martin, *Labor Displacement and Public Policy* (Lexington, Mass.: D.C. Heath, 1983), p. 69; and U.S. Department of Labor, Office of Trade Adjustment Assistance, unpublished tabulations.

Cumulative totals, April 1975 to September 31, 1982.

firms.

The alternative is simply to fold the transfer payment provisions of these programs into the UI system. In that way, all unemployed workers would have their benefits calculated according to the same formula. This, of course, leaves unresolved the question of the degree of impact of UI benefits on the duration of unemployment. It does, however, make the problem equally sticky for all unemployed workers eligible for UI.

Providing training, as distinct from transfers, for displaced workers does not have the above limitations. If a group of workers indicates a willingness to be retrained in place of receiving supplementary unemployment benefits, then there is a presumption that they are indeed displaced and not simply on temporary layoff. Indeed, the notion of retraining for displaced workers is currently popular. One policy recommendation is to make existing training programs available to them. Many of the displaced workers would not be currently eligible for programs targeted toward disadvantaged workers, because their past wages and family income would be too high.

To what extent, however, can existing programs that were designed for disadvantaged workers deal with the unique problems posed by displaced workers? The impact of current training programs on the earnings of program participants (largely disadvantaged work-

ers) yields the following conclusions: (a) they increase the earnings of program participants, but accomplish this by increasing hours of work more than wages; (b) they train workers with marginal labor market and job attachment to hold relatively low skilled jobs; (c) they have relatively limited effect on improving job skills other than those gained through work experience.[26]

The displaced workers, however, are quite different from disadvantaged workers. In particular, displaced workers have an established work history marked by a strong job attachment and the proven ability to learn (at least certain types of) job skills. A greater percentage of them have a high school diploma or better (66.2 percent), and a smaller percentage are from the minority population than is true for the low-income family. (See Table 8.) The major differences, however, involve the considerably higher economic status of displaced workers in the year prior to being displaced. One-quarter of them came from families with income of at least $15,000, one-half were covered by employer pension plans, and more than half had one or more other family members employed.

The problem of most displaced workers is neither too few hours of work nor marginal skills; rather, it is that their previous job paid a high wage relative to the opportunity wage that they face on alternative employment. On this basis there is reason for skepticism as to the potential success of extending coverage of existing training programs.

The one possible exception to this is on-the-job training. This program can be administered as a type of voucher or employment tax credit system targeted toward displaced workers. That is, the government compensates employers directly for extra training costs associated with specially targeted workers (i.e., those eligible for the program).

The virtues of using vouchers and/or employment tax credits are several. First, they can be targeted toward the group that the government decides to aid. For example, the government could avoid extra compensation for those on temporary layoffs in declining industries (as is currently done in TAA) by using the multiple criteria listed in Table 1. In addition, only those displaced from jobs on which they

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26. For a review of training and employment programs, see *CETA's Results and Their Implications* (1981), Borus (1980), and Taggart (1981). For a negative assessment of training programs, see Kiefer (1979).

TABLE 8

Characteristics of Displaced versus Disadvantaged Workers

	Displaced worker*	Low-income family†
Percent with a high school diploma or better	66.2	55.9
Percent minority	30.6	42.7
Percent female	35.0	37.2
Percent with pension plan coverage in at least one job held during past year	**50.3**	**13.3**
Percent with family income $15,000**+** in last year	24.5	0.2
Percent in family with one or more additional workers	55.8	29.2

Source: **Marc** Bendick, Jr., and Judith Radlinski Devine, "Workers Dislocated by Economic Change: Do They Need Federal Employment and Training Assistance," *Seventh Annual Report of the National Commission for Employment Policy* (Washington, D.C.: National Commission for Employment Policy, **1981)**, pp. **175-226.**

* Workers **from** industries in which employment change was negative between **1978** and **1980** and who were unemployed for more than eight weeks. Job tenure and age were not defining characteristics.

† Low income households were defined as those whose total family income from all sources in **1979** was less than **1.5** times the Bureau of the Census' poverty threshold for a family of that size and location.

Data are for March **1980.**

had 10 or more years of tenure could be made eligible.

Secondly, the special training problems posed by these workers would be handled flexibly by the new employers through on-the-job training. This is particularly useful since many of the displaced workers are readily trainable in production level skill jobs, while others may have been unskilled laborers. The former group can be readily integrated into new jobs without remedial off-the-job training.

Thirdly, the placement function, matching employers and workers, could be performed. This component would only apply, however, if the current training format were retained. In this case government counselors would influence the new career path followed by the displaced workers. With a voucher system, unless modified to introduce counseling, the workers themselves would determine the path,

limited only by the value of their particular voucher.[27]

Questions have been raised as to whether employers would partici-
pate actively in employment tax credit or voucher systems. Some
argue that government paperwork and the stigma associated with
workers who need government assistance would dissuade employers
from hiring those workers. However, the results from the use of
employer tax credits, both in this country and abroad, are reasonable
and promising. Ultimately, the success of the programs depends
upon the size of the financial incentives provided to companies that
participate in the program.

Whereas replacing lost wage rates would be very difficult, finding
new employment for displaced workers in an expanding economy
would be manageable. Since this would require only retooling and
placement, on-the-job training could facilitate the training process.
The purpose of the program, however, is not to increase long-run
employment; rather, it is to reduce the time spent unemployed and to
increase the wage rate of workers in their new jobs. With this in
mind, the current on-the-job training program would have to be
restructured to be better adapted to older workers with an established
work history."

The three approaches above share the assumption that the dis-
placed worker phenomenon represents a distinguishable labor market
policy problem. The fundamental question concerning the displaced
worker issue is what are the damages suffered by these workers that
should be viewed as compensable.

For example, suppose that the displaced workers had enjoyed a
wage premium resulting from collective bargaining agreements.
Making the workers whole could be interpreted as providing them
with a voucher or employment tax credit of sufficient value so that

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27. Conceptually, these types of programs act as wage subsidies, driving a wedge between
the wages received by the workers and the unit labor costs borne by the employers. By enabling
workers to receive a higher wage during an initial training period than dictated by skill or pro-
ductivity considerations, the subsidy generates positive work incentives. For firms, the subsidy
functions as a decrease in the wage rate. Empirical data on employment functions indicate an
own wage elasticity greater than one; that is, firms increase employment by more than I percent
for every percent decrease in the wage rate.

28. New initiatives with respect to employment tax credits or vouchers would not be suited
to the problem if it were decided that displaced workers should not be given *special* programs to
compensate them for job losses. Rather, they would need to make use of programs generally
available to all unemployed workers regardless of the presumed cause of their unemployment.
In addition, attention would need to be given to the problems posed by the higher fringe benefit
costs that are frequently associated with older workers. This topic is beyond the scope of this
paper.

they could eventually earn, as a return on their skills, the wage premium paid on their lost jobs.

There is, of course, the question as to whether any combination of vouchers or on-the-job training could be successful enough to fully compensate workers. The evidence on earnings gains from training, as indicated above, suggests that the gains are relatively small and largely occur through increased hours of work at relatively low skilled wage rates.

Even if the extra training could be accomplished, there is still the question as to whether it should be attempted. Suppose, for example, that the union wage on the lost job did, in fact, represent a wage above that dictated by competitive labor market forces. Based on a collective bargaining agreement with the past employer, the displaced unionized workers were receiving a higher wage than similarly skilled workers in nonunion firms. Although the government might want to assist the displaced workers in finding jobs at the competitive wage earned by most other workers, funding extra training to support the wage premium itself would be more difficult to justify.

Some researchers have argued that the union wage premium is actually a compensating differential for the fact that the unionized jobs are in those sectors where employment is particularly sensitive to cyclical layoffs or employment uncertainty in general. In this sense, the observed high wage is not precisely a wage premium; rather, it is a compensating wage differential for the higher risks of unemployment. If this were the case, the employment loss from the high variance employment industry would reflect the realization of a relatively high probability event (compared, for example, to being displaced from a job in the finance sector). The placement of a displaced worker in a new job — in a lower employment variance industry — could be made at the competitive, nonunion wage since the compensating risk differential would no longer be required.

A separate but even more intractable issue is posed by the notion that the government should consider some mechanism for compensating displaced workers for their lost investment in job-specific training. For example, if the government were to treat human and physical capital symmetrically, the loss of a human capital investment could yield an income tax write-off for its owner. The difficulty is that that type of training is inherently unquantifiable. Attempting even a rough estimate of its monetary value would be too speculative to serve as a guide for policymakers.

Thus, one can argue that the displaced workers' loss of a wage premium should be noncompensable from a societal perspective. What government policy could still accomplish is a reduction in the transition costs associated with finding a new job. That is, the government would attempt to restore *a job at the competitive or prevailing labor market wage* for workers with similar, broadly defined skill levels.

The degree to which the displaced worker's job and income loss are **compensable** is directly related to the question of the degree to which the displaced worker problem is different from that of the average unemployed worker. If it is decided that for either conceptual or practical reasons there is no difference, then the current array of policy programs, to the extent that each displaced worker is eligible, would be the correct policy approach.

A final policy option would be to view the problem as essentially a private-sector problem. Suppose, for example, one concludes that displaced workers are a separate category of unemployed workers but that their uniqueness is tied to the wage loss they suffer when displaced. In this case, one might be forced to rely on private-sector parties to restructure the employment relationship so as to slow the rate at which workers are displaced.

In particular, job security — that is, the protection of job-specific investments and wage premiums — is more fully an **employer-**employee problem that requires a private-sector solution. Extra attention must be given to avoiding the job loss in the first place. Where workers are unionized, they can bargain collectively with employers with respect to job protection. For example, labor unions could trade off some of their wage premium for greater worker job security.

The recent pattern of give-backs is a reflection of increased concern over job security. Give-backs have occurred in industries under considerable product market pressure emanating either from international trade competition (**e.g.,** autos and steel) or nonunion sectors in newly deregulated industries (**e.g.,** trucking and airlines). Most of the declining industries have been involved in the give-backs as well as several industries with stagnant employment that might be future candidates for the declining industry classification.

Although it is widely believed that these give-backs will be terminated once the economy recovers, some are written into contracts lasting for three or more years. As a consequence, although the give-backs may not be repeated, in these industries the new wage levels

will create a lowered base for the next round of negotiations. Hence, the interindustry wage structure should narrow over the next several years.

Conclusion

To summarize, based on CBO estimates, it appears that the structural component of the displaced worker problem is approximately 300,000 workers. As the economy recovers and employment in even the declining industries increases above 1982 trough levels, that number will decline. Hence, the problem, although severe for affected individuals, is not large in size. Contrary to some popular, pessimistic scenarios concerning long-run technological displacement in industrial employment, it can be argued that faster technological change will increase real wage growth and not unemployment.

Policies to assist those workers who are displaced must focus on the fact that those workers can be found new jobs. Most have exhibited the ability to learn marketable skills and have had a history of solid job attachment. Their problem is not so much their temporary unemployment as it is the permanent gap between their old wage level and their opportunity wage in new employment.

Government labor market policy measures can reduce the size of this gap but not eliminate it. Training and employment vouchers can return displaced workers to new jobs and probably raise their future wages somewhat above what they would have been absent government assistance. Trade Adjustment Assistance-type cash transfers can reduce the burden of the transitional period of unemployment. There is no evidence, however, to suggest that any of these measures can have a large quantitative effect in closing the wage loss gap created by job displacement.

The result is that the loss to displaced individuals can only be managed, to any significant extent, by avoiding the job loss in the first place. In terms of government policy, direct employment protection afforded to declining industries would be necessary. Tariff protection is the obvious remedy, although the enormous costs of that approach are equally obvious. Absent this radical government policy departure, the solution to job displacement rests with private-sector parties.

The evidence, although preliminary, suggests that rising union wage premiums during the 1970s and early 1980s have contributed to the displaced worker problem. First, the increase in the wage **premi-**

ums is likely to have been a factor in the long-run decline in employment in certain industries. Secondly, the increased premium has led to a larger gap between past and opportunity wages of displaced workers. If this is the case, collective bargaining initiatives to trade off wage premiums for enhanced job security could be an important element in any strategy to reduce the scope of the problem.

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Appendix

The variables are defined as follows:

UGAP: A measure of labor market tightness. It is defined as the aggregate unemployment rate divided by a demographically adjusted measure of the equilibrium unemployment rate U*.

$$\text{UGAP} = (U/U^*) \cdot 0.25.$$

Q: Real Gross National Product for the aggregate U.S. economy.

MH: **Manhours** in each industry.

Each variable includes two-quarter lags on the right-hand side of the equation. A time trend is also included in each equation.

We formulated quarterly projections of **manhours** for each industry by using forecasts of real GNP and the aggregate unemployment rate provided by **Wharton** Econometrics. The forecasts imply a gradual recovery through 1985. Unemployment rates are assumed to remain above 8 percent as the recovery slows.

The method used is simply to use the forecast values of the endogenous variables in a separate equation for each industry in order to obtain the projected **manhours** series. The values for **1985:IV** are presented in Table 5.